



# **Management Strategies and Challenges for Adopting Open Innovation in SME Business in Bangladesh**

Thesis submitted, in fulfillment of the requirements for the Degree of Doctor of Philosophy in  
the Department of Marketing, Faculty of Business Studies,

University of Dhaka

By

Most. Tahura Pervin

Ph.D Student

Registration No. 45

Session: 2016-17

Under the Supervision of

**Dr. Razia Begum**

Professor, Department of Marketing

Faculty of Business Studies

University of Dhaka

Date of Submission: 20 January, 2020

# **DEDICATION**

Dedicated to

My Beloved Parents, Husband, and Sons Tanzim and Tamzid

## ABSTRACT

With the advancement of technologies, business world is going to change rapidly. To sustain the business operation and to increase the competitiveness, most of the organizations are trying to adopt innovation, creativity in every step of the value chain of their businesses. For the large business organizations, it is easy to develop their own research and development units to be innovative in productions, marketing or in any other else divisions. However, due to having financial crisis and incapability of expertise, SMEs could not adopt or apply all the innovative ideas. Therefore, it is the opportunity for the SMEs to be collaborative with others or create network with others to share their innovations and implement those innovations into the operation. As a result, this will increase the productivity of the shared organizations and competitiveness than ever before. The larger numbers of Small and Medium Enterprises (SMEs) are attracting lots of entrepreneurs in Bangladesh. It is high time to research in this area, and provide clear guidelines in management and formulating strategies to adopt open innovation. Open innovations are tremendously been implemented in SMEs and creating eagerness to uplift the business performance, enhance the financial and economic conditions in the most developed countries and some developing countries also. This research aims to investigate the SMEs' systematic strategies and management of open innovation and critical factors determining their anticipated returns.

The objectives for this research study are: to identify the motivating factors and the strategies for adopting open innovation in SMEs of Bangladesh, to explore the firms' characteristics to adopt open innovation in SMEs, to find out the relationship between project level characteristics for adopting open innovation into the firms, to identify the major benefits and challenges to adopt open innovation in SMEs.

The methodology in this research is designed by using the concepts of open innovation and its implementation into the firm's level. The framework is designed from the business Strategic level of the firms, then Firms' Characteristics level and after that Project Characteristics (SFP) of the firms' level. It is attempted to find out the major factors to influence the decisions on adopting open innovation in this three levels/layers by SMEs. It is an exploratory research following by qualitative approach (due to categorical data) to meet the research objectives, as very little or almost no such study has been found in Bangladesh. Although it is being researched outside in Bangladesh rigorously, a few studies on

innovations in SMEs or adoption of Information technologies by SMEs are found in reviewing the literature in Bangladesh context. This study received a multi-stage sampling technique, which consist of stratified, purposive and random sampling that are used to administer all in a unswervingly consequent manner, which means this sampling technique is executed to the a wide range of time frame. Three regions of Dhaka division were considered for using a cluster random sampling technique. In addition to, the selected sectors/types of small and medium enterprises were taken into consideration by using the purposeful convenient sampling technique and organizations were selected by using a random sampling method in those three local regions.

Hence, the ready-made sampling format to collect date of the SMEs is not structured, a pilot survey has been taken by face to face interviews at initial level to cross check the address-database of the enlisted SMEs in the SME foundation in their yearly publications and available in the SME's foundation website. The data collection has been completed by using structured questionnaires. The questions of the survey questionnaires include open-ended questions, close-ended questions, multiple-choice questions and questions based on five point Likert scale. During the period of June-September 2018, the researcher contacted all enlisted entrepreneurs by telephone (enrolled in the SME Foundation from December 2017) to interview them and find 100 SME entrepreneurs among them. Out of 100 SMEs, only 80 SME entrepreneurs expressed their interest. Those interview processes have been administered with the professional interviewers to avoid misleading information and insufficiency of information. Before collecting actual data, pilot tests on the fifteen (n=15) SMEs were taken to verify the validity and reliability to continue the research based on the objectives and setting questionnaires. The more detailed and specific information was collected through a multi-level of cases study on those research objectives. In total nine (n=9) multi levels of clusters cases were chosen in this study.

The multiple data were analyzed using several statistical tools such as: descriptive studies which include the mean, standard deviation, frequency distribution in percent and skewness, multiple regressions, determination of coefficient, and ANOVA. The data were processed in personal computer using Statistical Packages for Social Sciences (SPSS). The survey data were analyzed using multiple regression model (MR). Through factors analysis, the major factors of each level (Strategic, firm and project) are identified. The identified major factors are tested by developing three hypotheses. Case studies were explained using thematic analysis.

The three hypothesis results show that at the strategies level, if the average numbers of companies adopt expansion strategies (blue ocean strategy), cost leadership strategies and focus strategies, companies will tend to adopt innovation but the result on competitive strategies to adopt open innovation is not clear. Therefore case study on firm competitiveness and to adopt open innovation is analyzed. At firm's characteristics the output shows that with the variation of ownership style, educational background, territories have no impact to adopt open innovation. However, the variation of sectors of the companies, expertise in managements and employees, target market and domestic or international business operation, and responsiveness toward the stakeholders motivates the organizations to adopt open innovation. at the project level, it is found that those who are planning to expand the business or product lines within next five years and are well planning to customized their services in future are likely to adopt open innovation by sharing with other partners in vertically or horizontally. Especially they are working for joint collaboration for improving their positions in case of financial and intelligence capabilities. The multiple cases studies also clarified that more clear strategies the organizations have, the more opportunities are prevailed to absorb the advanced technologies and to sustain into the competitive markets. The major challenges for adopting open innovation are found as getting license for each innovation or business operation, financing access, lacking of having appropriate partners for collaboration, Shortage of skilled human resources in firm levels and complexities in trade regulations in country context. On the other hand, the major advantages for adopting open innovations are quality improvement, cost reduction, customer satisfaction and loyalty, motivation for skilled manpower and synergy effects of combined knowledge and resources of the firm and increase the competitive advantage. The research findings might have the significant contribution and value addition to the research communities in Bangladesh context, SMEs industries and regulators who initiated the polices related to SMEs (in particular, the SME foundation for SME Development) in terms of formulating improved strategies for adopting open innovation and loan financing to SMEs. This study might help in providing financing, licensing and expertise support to the startups entrepreneurs in SMEs and for their sustainability in the business. The findings of the research model proposed that this study can improve the organizational responsibilities toward the stakeholders and these stakeholders' understandings on why some SMEs need to have been chosen for adopting open innovation concepts, and how they can be applied to the different sectors of SMEs in different markets and customers conditions.

## DECLARATION

I hereby declare that this Ph.D thesis *Management Strategies and Challenges for Adopting Open Innovation in SME Business in Bangladesh* is my own research endeavor. I also state that all the literature and information sources are properly recognized in the thesis. The thesis was once completed beneath the supervision of Dr. Razia Begum, Professor, Department of Marketing, Faculty of Business Studies, University of Dhaka. It has not previously been submitted to another university for any other degree.

Most. Tahura Pervin

Ph.D Student

Registration No.45

Ph.D Session: 2016-2017

Dr. Razia Begum

Professor, Department of Marketing

Faculty of Business Studies

University of Dhaka

## ACKNOWLEDGEMENTS

All praises to Allah SWT, the most Gracious and the most Merciful, for providing the strengths and His blessings to completing this thesis.

I would like to especially gratefulness, warmth, and admire the people below who has helped me at every point to make my research successful and to achieve my goals.

The successful completion of this research based thesis would not have turned into reality within due time without the invaluable supports of my supervisor professor Razia Begum. I am extremely grateful for her guidance and encouragement throughout this critical path, as she ambidextrously fulfilled her responsibilities as a motivator supervisor to guide my research. I was so anxious and perplexed in doing my research; she is the only person who always protected me by her motherly stance. My supervisor, whose altruistic time and concern were sometimes all that kept me going.

I express my gratefulness to Shamsun Arefin, Md. Kamruzzaman, and Dr. James Bakul Sarkar for their endless successive encouragement to complete the program and valuable suggestions. I would also like to thanks my colleagues Dr. Md. Abdur Rahman Forhad, Dr. Md. Kalimur Rahman Aftab, Md. Mazharul Alam and Mr. Mamunur Rashid for their valuable suggestions in my research work.

I want to show my warm thank to my junior Bipul Kumar Sarker, for his astute as well as constructive assistance in analyzing this thesis. His continuous opinions and suggestions never allowed me to slip from the track. I would also like to thank to all the faculties and staff members at the Department of Marketing, Faculty of Business Studies, University of Dhaka, for their kind cooperation.

My great appreciation goes to my husband who has been a true and great supporter and has unconditionally remained beside me during my good and appalling times. These pasts several years have been not an easy ride, both academically and personally. I truly thank him for sticking by my side, even when I was petulant and miserable.

Finally, I would like to acknowledge with gratitude my mother and my father for their precious time and support in all my pursuits. They not only extended their support religiously

but also emotionally. I also thankful to all others families members who are directly or indirectly been my well-wishers throughout the journey.

Most. Tahura Pervin

Ph.D Student

Registration No. 45

Session: 2016-17



## TABLE OF CONTENTS

<b>ABSTRACT</b>		i
<b>DECLARATION</b>		iv
<b>ACKNOWLEDGEMENTS</b>		v
<b>TABLE OF CONTENTS</b>		vii
<b>LIST OF TABLES</b>		xv
<b>LIST OF FIGURES</b>		xx
<b>LIST OF ABBREVIATIONS</b>		xxi
<b>Chapter 1</b>	<b>Introduction</b>	
1.1	Background of the Study	01
1.2	Statement of the Problem	03
1.3	Purposes of the Study	03
1.4	Scope of the Study	04
1.5	Significance of the Study	04
1.6	Research Context	05
1.7	Theoretical Approach	06
1.8	Research Objectives and Questions	07
1.9	Research Design	07
1.10	Structure of the Thesis	08

**Chapter 2 Literature Reviews**

2.1	Introduction	10
2.2	Previous Studies	11
2.2.1	Definitions of Innovation	11
2.2.2	Definitions of Open Innovation	13
2.2.3	Classifications of Open Innovation	17
2.2.4	Close and Open Innovations	19
2.2.5	Processes of Innovation	20
2.2.6	Definitions of SMEs	24
	Changing the Patterns of SMEs from a Closed to an Open Innovation	26
2.2.7	Approach	
2.2.8	Antecedents of Open Innovation	27
2.2.9	Importance of Applying Open Innovation in SMEs	45
2.2.10	Benefits of Open Innovation in SMEs	47
2.2.11	Challenges of Open Innovation in SMEs	48
2.2.12	Strategies for Open Innovation Management	51
2.3	Research Gap	59
2.4	Summary	61

<b>Chapter 3</b>	<b>Research Methodology</b>	
3.1	Introduction	62
3.2	Research Approaches	62
3.3	Research Design	63
3.3.1	Target Population	65
3.3.2	Samples Size	67
3.3.3	Data Collection Methods	68
3.3.4	Pilot Studies	78
3.3.4.1	Reliability Test Results	79
3.3.4.2	Validity Test Results	79
3.3.5	Interview Processes	80
3.3.6	Multiple Case Studies	81
3.4	Data Analysis	82
3.4.1	Data Analysis: Thematic Analysis Technique	82
3.4.2	Tools Used for Analysis	83
3.5	Research Hypotheses	84
3.6	Summary	87
<b>Chapter 4</b>	<b>Present Scenarios of SMEs in Bangladesh</b>	
4.1	Introduction	88
4.2	History and Growing Development of SMEs in Bangladesh	88

4.3	Present Scenarios of SMEs	89
4.4	SMEs Development in Bangladesh	91
4.4.1	SME Foundation for Small and Medium Industrial Development	93
4.4.2	Bangladesh Bank for SMEs Development	93
4.5	Growth Trend of SMEs	95
4.6	SMEs Contributions to the National Economy	96
4.7	SME Clusters	98
4.8	Summary	99
<b>Chapter 5</b>	<b>Analytical Framework for Adopting open Innovation in SMEs</b>	
5.1	Introduction	100
5.2	Ideas Generation and Mobilization	100
5.3	Innovation and Innovation Processes	101
5.4	Open Innovation and Open Innovation Processes	104
5.5	Strategies Applied in SMEs	106
5.5.1	Competitive Strategy	106
5.5.1.1	Why is Competitive Strategy and How does it Work?	107
5.5.2	Cost Leadership Strategy	107
5.5.2.1	Why is Cost Leadership Strategy and How does it Work?	108
5.5.3	Differentiation Leadership Strategy	108
5.5.3.1	Why is differentiation Leadership Strategy and How does it Work?	108

5.5.4	Focus Strategy	109
5.5.4.1	Why is Focus Strategy and How does it Work?	110
5.5.5	Blue Ocean Strategy	110
5.5.5.1	Why is Blue Ocean Strategy?	110
5.5.5.2	How does it Work?	111
5.5.6	Red Ocean strategy	113
5.5.6.1	Comparison Between ROS and BOS	113
5.5.7	Applying BOS in Organization	116
5.6	Summary	118

**Chapter 6 Challenges and Benefits to Adopt Open Innovation (OI) Management**

6.1	Introduction	119
6.2	Challenges to Adopt Open Innovation from Individual SMEs Context	120
6.3	Challenges to Adopt Open Innovation from Country Context	127
6.4	Strategies to Overcome the Challenges for Adopting Open Innovation	130
6.5	Benefits to Adopt Open Innovation from Individual SMEs Context	132
6.6	Benefits to Adopt Open Innovation from Country Context	135
6.7	Summary	137

<b>Chapter 7</b>	<b>Analysis and Findings</b>	
7.1	Introduction	138
7.2	Research Data	138
7.3	Reliability and Validity Analysis	140
7.4	Demographic Parts of the SMEs	145
7.5	Motivational Factors for Adopting Open Innovation	150
7.6	Factors Analysis	150
7.7	Descriptive Statistics	153
7.8	Organizational Characteristics	154
7.9	Basic Concepts of Open Innovation Holding by the Respondents	159
	Findings Related to the Business Strategies, Firms Characteristics and	164
7.10	Projects Characteristics Context	
7.11	Hypotheses Analysis	173
7.12	Benefits for Adopting Open Innovation in SMEs Specific Firm	184
7.13	Challenges for Adopting Open Innovation in SMEs Specific Firm	186
7.14	Major Constraints for SME Industries in Bangladesh	187
7.15	Major Findings of the Analysis	191
7.16	Summary	195
<b>Chapter 8</b>	<b>Multiple Cases Analysis (Thematic Analysis)</b>	
8.1	Introduction	196

8.2	Multiple Case Studies of SMEs in Bangladesh	197
8.2.1	Case 01: Advanced Equipment Limited	197
8.2.2	Case02: Comfort Leather	201
8.2.3	Case03: Ahmed Food Products(Pvt) Limited	202
8.2.4	Case 04: TEDFO Bangladesh Limited	204
8.2.5	Case05: KPC Industries	206
8.2.6	Case06:FM Plastic Industry Limited	210
8.2.7	Case 07: Soma Consultancy Firm	213
8.2.8	Case 08: Soundrojo Kotha Beauty Parlour and Boutique Fashion	217
8.2.9	Case 09:Annex Bangladesh	219
8.3	Discussions	220
<b>Chapter 9</b>	<b>Recommendations and Conclusion</b>	
9.1	Introduction	222
9.2	Contributions of the Research	222
9.3	Research Implications	223
9.4	Limitations of the Research	226
9.5	Recommendations	228
9.6	Direction of Future Research	229
9.7	Conclusion	230

References	232
APPENDIX-A	257
APPENDIX-B	266



## LIST OF TABLES

Table No.	Name of Tables	Page No.
2.1	Categories of Open Innovation	18
2.2	Proposed Classification of Open Innovation	19
2.3	Definition of SMEs and their Measurement Criteria	24
2.4	Definition of Small Business by Bangladesh Bank	25
2.5	Definition of Medium Business by Bangladesh Bank	26
2.6	Experimental Reviews of Strategic Management and SMEs	53
3.1	SMEs Clusters Details in Bangladesh	66
3.2	Major SMEs Clusters	66
3.3	Samples Allocation	67
3.4	Types of SMEs	68
3.5	Questions Types in the Survey	69
3.6	General Guidelines Associated to Query Formulation That Had Been Used in the Improvement of the Survey	70
3.7	Overview of the Survey Structure	73
3.8	Questions on Respondents' Demographic Information	74
3.9	Questions on SMEs Characteristics	74
3.10	A Summary of the Open Innovation Context Factors	75
3.11	A Summary of the Firms' Strategic Context Factors	75

3.12	Firms Level Characteristics	77
3.13	Project Level Characteristics	77
3.14	Participants Main Characteristics	79
3.15	Reliability Results	79
3.16	KMO and BTS Values in the Factors Context	80
3.17	SFP Proposed Hypotheses	84
4.1	Average Growth Rate of Major Sectors of GDP and Economy	90
4.2	Dedicated Contribution to GDP	90
4.3	Number of Expatriate Employees and Amount of Remittance	91
4.4	Present Scenarios of SMEs Sector	95
4.5	Condition of Manufacturing Units	97
4.6	SMEs Clusters Detail in Bangladesh	99
5.1	Innovation Mapped on the 4Ps Model	102
5.2	Strategy Focus From Traditional Competition to Creating New Market Space	115
7.3.1	Construct Reliability Results	141
7.3.2	KMO and BTS Values in the Factors Context	143
7.3.3	Summary Results of the Factors Analysis	144
7.4.1	SMEs Owner-Managers Demographic Characteristics	145
7.4.2	SMEs Demographic Characteristics	147
7.5	Motivational Factors for Adopting Open Innovation	150

7.6	Construct Factors Loading Results	151
7.7	Descriptive Statistics	153
7.8.1	Organization Formed	154
7.8.2	Next Five Years Organization's Plan	155
7.8.3	Want to Change or Not to Change of Ownership in Next Five Years	155
7.8.4	Types of Ownership After Change	156
7.8.5	Total Assets of the Organization During Establishment	156
7.8.6	Total Assets of the Organization at Present	156
7.8.7	Organization's Economic Activities	157
7.8.8	Average Rate of Returns	157
7.8.9	Investment in New Products	158
7.8.10	Income Spends on Innovation Activities	158
7.9.3	Taken any Technology in the Organization to Adopt OI	161
7.9.4	In which Sector Open Innovation is Needed in the Organization	162
7.9.5	Strategies for Adopting Open Innovation in the Organization	162
7.10.1 (a)	Frequency Analysis of Firms' Strategic Factors	164
7.10.1 (b)	Correlation Analysis Between Firms' Strategic Factors and OI	167
7.10.2 (a)	Frequency Analysis of Firms' Characteristics' Context	168
7.10.2 (b)	Correlation Analysis Between Firms' Characteristics' and OI	169
7.10.3 (a)	Frequency Analysis of Project Level Characteristics' Context	170

7.10.3 (b)	Correlation Analysis Between Project Level Characteristics' and OI	172
7.11.1(a)	Descriptive Statistics	174
7.11.1(b)	Model Summary	174
7.11.1(c)	Analysis of Variance	175
7.11.1(d)	Multiple Regression Showing the Firms Strategic Factors for Adopting Open Innovation in SMEs of Bangladesh	176
7.11.2(a)	Descriptive Statistics	178
7.11.2(b)	Model Summary	178
7.11.2(c)	Analysis of Variance	178
7.11.2(d)	Multiple Regression Showing the Firms Level Characteristics for Adopting Open Innovation in SMEs of Bangladesh	179
7.11.3(a)	Descriptive Statistics	182
7.11.3(b)	Model Summary	182
7.11.3(c)	Analysis of Variance	183
7.11.3(d)	Multiple Regression Showing the Project Level Characteristics for Adopting Open Innovation into the Firms	183
7.12	Benefits for Adopting Open Innovation	185
7.13	Challenges for Adopting Open Innovation	186
7.14.1	Constraints in Term of Finance and Regulation	188
7.14.2	General Constraints of Open Innovation in SMEs of Bangladesh	188
7.14.3	Access to Finance in SMEs in Bangladesh	189

7.14.4	Transportation System in SMEs in Bangladesh	190
7.14.5	Human Aspect of SMEs in Bangladesh	190
7.15.1	Firms Level Strategic Factors Context Related Hypotheses	192
7.15.2	Summary of the Acceptance or Rejection of the Corresponding Variables Arising From the ML Analysis	192
7.15.3	Firms' Characteristics' Context-Related Hypotheses	193
7.15.4	Summary of the Acceptance or Rejection of the Corresponding Variables Arising From the ML Analysis	193
7.15.5	Project Level Characteristics' Context-Related Hypotheses	194
7.15.6	Summary of the Acceptance or Rejection of the Corresponding Variables Arising From the ML Analysis	195

## LIST OF FIGURES

Figure No.	Name of Figures	Page No.
1.1	Theoretical Structure	6
2.1	Challenges and Opportunities for Open Innovation in SMEs	16
2.2	The Proposed Path of Open Innovation	59
3.1	The Diagram of the Research Design	64
3.2	The Model of Open Innovation Adoption by the Bangladeshi SMEs	85
5.1	Non Customer Target Areas to Formulate Blue Ocean Strategy	111
5.2	Formulation of Value Innovation	111
5.3	Blue Ocean Strategy	112
5.4	Product Changes using ERRC	117

## LIST OF ABBREVIATIONS

ADB	Asian Development Bank
ANOVA	Analysis of Variance
BBS	Bangladesh Bureau of Statistics
BGMEA	Bangladesh Garment Manufacturers and Exporters Association
BOS	Blue Ocean Strategy
BDHS	Bangladesh Demography and Household Survey
BSTI	Bangladesh Standard and Testing Institution
CA	Content Analysis
ECR	Economic Census Report
GDP	Gross Domestic Product
OI	Open Innovation
OSCBs	Other Scheduled Commercial Banks
QLs	Quantity Limitations
ROA	Returns on Advances
ROS	Red Ocean Strategy
RQs	Research Questions
R&D	Research and Development
SME	Small and Medium Enterprise
SMEs	Small and Medium Enterprises

SWOT	Strengths, Weakness, Opportunity, Threats
TA	Thematic Analysis



# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of the Study

Small and medium enterprise (SME) is one of the major sectors which play a crucial contribution to in the socio-economic development of any country especially in Bangladesh. Although the lifeblood of Bangladesh's economy is agriculture, the contribution of industrial sector for the overall socio-economic development of the country is undeniable. The role of small and medium enterprises in sustainable industrialization through national economic growth and job creation has historically been highly appreciated in the industrialized and development of the countries in the world. Even in the context of the socio-economic condition of developing countries like Bangladesh, it is near to impossible to find out the alternatives to SMEs for the national economic growth, the smooth industrialization and job creation. It is universally acknowledged that the contributions of small and medium enterprises (SMEs) are in employment, income generation, value addition and above all poverty alleviation is outstanding. The development of small and medium enterprises in the socio-economic development and poverty alleviation of the country is gaining special consideration in Bangladesh. The government of the country has recognized that the SMEs as a prioritized sector to improve the economic conditions of the residents in the country by achieving the economic growth, alleviating poverty and creating job opportunities by developing entrepreneurial skills.

Small and medium industries serve as substitute or supplementary of heavy industries; which crucial for the overall industrial progress of the country. Most of the industries in Bangladesh include micro, small and medium enterprises and most of them are labor intensive and less dependent on technology. In addition, SMEs provide job employment to the unemployed youth at the village level and increase the production of agricultural products to ensure the supply of food items. According to an economic review (2018), there are about 6 lakh small and medium enterprises in the country; which includes SMEs. In addition, about 3 million micro-enterprises are operating. 90% of the industrial units of the country belong to the SME sector. Besides, 87 percent of the total workers employed in industries and 33 per cent of the

total assembled products are in small and medium industries. In the last five years, the SME sector has been able to generate more than 2.2 percent of the government's revenue. About 80,000 men and women in the country have been able to build their careers through small and medium enterprises. 93.6 per cent of these small and medium entrepreneurs have been able to establish themselves through small enterprises and 6.4 per cent through medium enterprises.

According to the estimates of the Bangladesh Bureau of Statistics (2018), the gross domestic product (GDP) has grown by 8.1 percent in the last financial year. Its rate in the previous year was 7.86 percent. Compared to many developing countries, Bangladesh has been achieving remarkable success in achieving growth. In the fiscal year 2018-19, the growth of the country's agricultural sector has come down to 3.51 percent, which was 4.19 percent in the fiscal year 2016-17. At the same time, the contribution of agriculture sector has come down from 14.23 percent to 13.60 percent. In the 2018-19 financial years, both the contribution and growth of the industrial sector has increased. Every year 20 to 22 lakh young people are entering the labor market in the country. Thus, the socio-economic development of Bangladesh and the rural economy are largely dependent on the development and growth of this industry.

However, the benefits of SMEs are not being fully utilized due to having resources constraints and lacking entrepreneurial skill in a connective way. Many startup organizations have been compelled to shut down their businesses having financial or intellectual skill constraints; entrepreneurial spirits go down as a result. Hence, the OI model proposed, companies might integrate external and internal capabilities and innovation in a fruitful way to grow and sustain the business market during the period of technological advancement and commercialization process. The aims of the research are to show how the marketing management and strategic theories can enhance the entrepreneurs to apply into the real business environment. Mainly, this study focuses on how to conduct open innovation in SMEs and to create an idea for open innovation activities in SMEs. How entrepreneurs in this industry can gain business benefits through the application of open innovation in SMEs in Bangladesh, or what the barriers are to small and medium enterprises as a result of adopting open innovation are taken into study. This study mainly sheds the light on how open innovation affects the innovative performance of SMEs and their business sustainability opportunities.

## **1.2 Statements of the problem:**

The SMEs play a significant role and work as supplementary entities to the large companies and help the merchandises and services sectors to move toward the final clients; yielding goods and services by utilizing domestic technologies which offer lower cost. Furthermore, the sector has contributed to the solution of unemployment problem of the society by creating job opportunities and balancing the economic growth of Bangladesh. The SMEs are commonly visible in villages and small towns as well as metropolitan cities. They pre-eminently serve as the suppliers of the current demand in the local market as well as international market. To compete in an exceptionally competitive market and to generate the new sources of revenue, open innovation procedure has been expected as the new paradigm of those organizations(H. Chesbrough, 2012b; Enkel et al., 2009b; Gassmann, O., Enkel, E., & Chesbrough, 2010).With the advancement of technologies, the quick changes on the world economy has pushed the organizations to present the new and good quality of products in reducing price and also to introduce them into the market having no time lag. As a result, to survive, be competitive into the present market situation, there is no alternative for SMEs to be innovative; to adopt technologies and to build up the network with the different business parties vertically or horizontally of the county as well as the boundaries of the country.

## **1.3 Purposes of the Study:**

The purpose of this research is to give a clear idea about the successful implementation, progress, benefits, constraints and future of adopting open innovation in SMEs in Bangladesh. The purpose of this study is to recount how entrepreneurs can apply and operate open innovation in SMEs and get the benefits from it. There is still a shift in innovation among SMEs, and how entrepreneurs are making an impression of being innovative within the organization to operate the business successfully is enumerated in this study. Thus, the aim of this particular research is to concentrate on how entrepreneurs can influence the change through their current business strategies and what strategic factors; the entrepreneurs can apply to induce the external parties to choose their business and invest money or intelligence that will ultimately improve their business performance. As the SME's has very limited resources it is not generally simple to adopt close innovation system or being highly innovative for all in areas. In such manner, the present research has been led to inspect the strategies embraced various organizations to adopt open innovation system as being innovative as altogether and to adjust the theories to the application within the areas of

innovation. Moreover, the research will analyze the roles of entrepreneurs who influence the inclusion of innovation concepts in SME development within organizations. Besides, this study will also focus on how entrepreneurial efficacy and personal life experiences add to the surname and usage of intestinal and exterior raw material to improve the innovation procedure within the entrepreneur's organization.

#### **1.4 Scope of the Study:**

The research of open innovation in the SME sector of Bangladesh has opened up new aspects of the SME industries. The prospects of open innovation (OI) in SMEs industries are very much optimistic and rightful. OI is a proposition that firms can use ideas: generated from within or without the organization to look forward to adopting advanced technology into the business operations. Bangladeshi organizations can utilize the full advantages from adopting an open innovation idea. As such the whole industry is not prepared for adopting open innovation; the scope for applying open innovation is very limited. Hence, only the major and profitable sectors haven chosen for this study. In this study only major seven sectors have been selected as the pioneer for adopting open innovation in their business models. This study also includes the strategic theories which are applicable to adopting open innovation into SMEs: less expensive and also allow the companies to create their own distinctive product and brand identities by integrating ideas and capabilities.

#### **1.5 Significance of the study:**

The 21st century is moving towards an economy that is predominately determined by innovation and learning, where entrepreneurs need to perceive and expect high-technology opportunities to join the positions of future entrepreneurial leaders. This research is on to adopt open innovation in SMEs in Bangladesh which is very crucial as very little experimental research has been done on SMEs in this country. Considering the importance of socio-economic prosperity, SMEs have played a significant role in the socio-economic development of the country. In contrary, a remarkable consideration is required in this sector, due to having their small size and inadequate resources, SMEs are left with the alternative to work together with exterior raw materials to stay up with the technological advancement. In this specific context, this subjective research will highlight on the benefits of open innovative for high-tech SMEs with the respect of the development in their market. What's more, this

research will likewise cover the main inspiration that force entrepreneurs to change business from close to open innovation. This study is deliberated to be significant for the economy of Bangladesh as it aims to highlight the strategies and the factors affecting open innovation adoption in SMEs. Understanding these factors and strategies will help new and existing entrepreneurs to expand and sustain the entrepreneurial projects and to emergence of more start-ups. This will enable the entrepreneurs to be aware of the existing problems and obstacles of small and medium enterprises in advance and take necessary steps to take the advantage of fourth industrial revolution.

Furthermore, Four SMEs have been incorporated as case study analyses keeping in mind the end goal to break down how these entrepreneurs conveyed the open innovation practices to their business. These case studies and the finding of the research can be useful to the individuals who have an entrepreneurial soul and want to begin and lead their own small organizations into the domestic and international markets in a profitable and sustainable ways. The major findings and recommendations of the study will help correct and effective use of new ideas in the SME industry in Bangladesh. Above all, the government, SME foundation and the central bank will have a clear idea about the potential sectors of SMEs to prepare for adopting open innovation, policy formulation and implementation of loan financing to SMEs.

## **1.6 Research Context:**

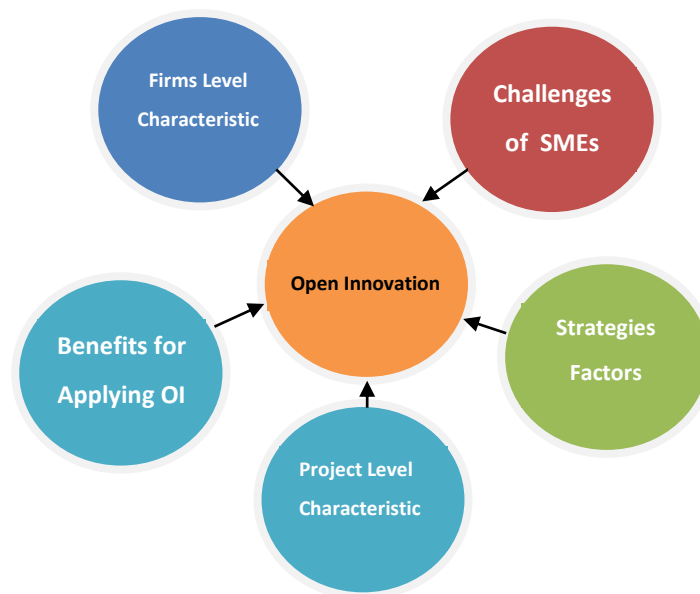
68 percent of the total population of Bangladesh is between the ages of 15 and 59 In demographic terms, these are the 'demographic dividend' groups This means that Bangladesh now has more working people than dependent people (BDHS-2014).SMEs are the largest employer sectors in Bangladesh and the largest organizational forms privately owned businesses . Hence, the current government has emphasized on the role in SMEs to encourage young entrepreneurs in Bangladesh and to provide them with adequate support and assistance from the government. Bangladesh Bank has been working since 2010 with a new division called SME and Special Program Division to develop and expand small and medium enterprises. This department is working for the development of financial services as well as overall SMEs with the aim of strengthening the SME sector in Bangladesh. According to Bangladesh Bank, the credit limit in this sector ranges from Tk 50,000 to Tk 500,000,000.

Most of the SMEs in Bangladesh are unaware of the business benefits of open innovation through pilot surveys. A review of the literature shows that the open innovation of small and

medium enterprises in Bangladesh is still in its infant position. Thus, it seems important to understand the potential factors that influence the adoption of open innovation among SMEs.

## 1.7 Theoretical Approach

Studies regarding the adoption of open innovation have identified various theories and models used as foundations to address adoption of open innovation at SMEs industries in Bangladesh. By reviewing the literature on theoretical models used for open innovation in the SME industry, the researchers discovered that the Strategic Factors-Firms Level Characteristics-Challenges-Benefits-Project Level Characteristics (MFCBP) framework has been used in open innovation in the SME industry in Bangladesh.



**Figure 1.1: Theoretical Structure (Source: Research Own design)**

## 1.8 Research Objectives and Questions

The main aims and objectives of this study are to explore the factors those influence in adopting of open innovation in SMEs in Bangladesh and to make a growing contribution to the expansion of SMEs in Bangladesh and alternative research. The purpose of this research is to create a relevant theoretical framework through which the use of open innovation in small and medium industries in Bangladesh might be further benefited. The small and medium industries of Bangladesh were chosen as the subject of study for two reasons. First, the development of Bangladesh's economy largely depends on the development of SMEs. Second, Bangladesh is one of the fastest growing countries in the world today. With the development of infrastructure in the country, the use of technology in industry has also

increased more than before. Since then, small and medium industries in Bangladesh have not lagged behind. The specific objectives of this study are set as:

1. To identify the strategies factors for adopting open innovation in SMEs of Bangladesh.
2. To explore the firms' characteristics to adopt open innovation in SMEs.
3. To find out project level characteristics for adopting open innovation into the firms.
4. To identify the benefits to adopt open innovation
5. To evaluate the challenges facing for adopting open innovation in SMEs.

Research objectives are set from the following research questions (RQs) of this study:

- i. What are the strategies factors for adopting open innovation in SMEs in Bangladesh?
- ii. What are the characteristics of firms for adopting open innovation in SMEs?
- iii. What are the project level characteristics for adopting open innovation into the firms?
- iv. What are the benefits to adopt open innovation in SMEs?
- v. What are the challenges for adopting open innovation in SMEs?

## **1.9 Research Design**

To solve the questions in this study, the design study was engaged in the thesis. The two-stage design was formed, where the researcher explored the theories using a qualitative method before moving on to quantify the hypothesis and testing in the second stage. With this in mind, this diagram targets to generalize the findings of the first section (qualitative) via the use of some quantifiable data for hypothesis testing. The methodology followed by previous studies is justified in influencing research in two ways: First, some notable features may be biased in the application of open innovation in the SME industry in Bangladesh. This is because; different factors and characteristics have a different impact on the adoption of open innovation in SMEs in Bangladesh. Second, limiting the study to a few specific factors may prevent the emergence of new features. With these issues in mind, starting with a qualitative approach it is assumed that participants express relevant motivations according to their own experience with new ideas open innovation in SMEs.

The study was conducted in two phases. This pilot survey was conducted by applying qualitative study design in September 2017, where information about the ideas and application of open innovation in SMEs in Bangladesh has been searched and full survey has

been done using the data obtained from the pilot survey during this period December 2018. In the first stage, data was collected through interviews by preparing a semi-structure questionnaire for data collection and a thematic analysis method was used for quality data analysis. In the second phase, structured questionnaires were designed for data collection. With which data was collected from small and medium enterprises in Bangladesh and SPSS software was deployed for data analysis. The population of interest for this study was SMEs who may be adopt open innovation in SME, where SMEs are defined in accordance with Ministry of Commerce and Industry and Bangladesh SME foundation.

## **1.10 Structure of the Thesis**

This thesis consists of nine chapters, of which this is the first chapter. The second chapter reviews the literature on open innovation and explores the impact of the factors associated with open innovation in the SME industry in Bangladesh and the characteristics of SMEs. Also, the chapter provides an overview of current knowledge in the field of theories used to investigate open innovation in SMEs.

*Chapter 03* provides details of the research methodology and presents the reasoning and explanation behind the research methodology used. In addition, it explores deployed data collection strategies: conducting interviews through structured questionnaires, and focus group discussions. The chapter execute with a deliberation of the sampling methods used and the methods of data analysis.

*Chapter 04* highlights the present scenario of the SME in Bangladesh. In particular, the role of this industry in the economic and social development of Bangladesh and the activities of various government and non-government organizations are also highlighted. The chapter concludes by discussing the growth of the SME sector, the contribution of SMEs to the national economy and the SME cluster.

*Chapter 05* discusses the analytical framework for adopting open innovation in SME.

Through the study and review of various literatures, researcher has presented an appropriate analysis framework for adopting the open innovative ideas of Bangladesh.



**Chapter 06** discusses the benefits and challenges of Open Innovation (OI). The challenges faced by entrepreneurs in applying the concept of open innovation in small and medium enterprises in Bangladesh have been discussed through explanations.

**Chapter 07** combines the main results and findings of this study and presents a proposed research model.

**Chapter 08** discusses case studies conducted on nine small and medium industries. It has been described in detail whether the small and medium industries of Bangladesh adopt the open innovation concept.

**Chapter 9** in concluding remarks the recommendations, discussing the contribution of this study to theory and practice. Also, the impact of the results is discussed with the owners / directors and policy makers involved in the SME industry. The chapter concludes with a discussion of research limitations and possible future research areas.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

This chapter covers the general observations of all the articles that go with the current topic. Literature is the most imperative piece of any exploration. In this topic, the literature survey is conducted from the academic researches, journals, and newspapers and opinion/comment of experts as to this explorative topic. This chapter is partitioned into two sections for example Survey of Research Articles, Review of Books, postulation and other related distributed or unpublished writing on the concerned subject.

#### **2.1 Introduction**

SMEs in Bangladesh are one of the major contributors to the Bangladesh economy and are the drivers of development. By its less capital escalated and high work retention nature, SME division has made noteworthy commitments to the assembling yield, business age, provincial industrialization and fares of the nation. We have to create procedures for reasonable development. The obstacles by the SMEs are as far as the board procedures, working capital, accomplishing feasible development, mindfulness and selection of new innovations and so on. This division needs to deliver numerous issues to be focused in the worldwide market. Reinforcing this part to meet worldwide challenge would mean engaging the whole range of SMEs, incorporating those in the casual segment and not simply send out arranged units. There is no uncertainty that basic institutional component is required which offers help, tutoring, data and market knowledge, preparing openings and an innovation scattering framework with a countrywide system that connects with all undertakings, institutional setup to contact SMEs in tending to such difficulties exists even in nations like U.S.A. In any case, amid the writing audit it was discovered that the emotionally supportive networks viability, adequacy and productivity fluctuates from one nation to the next, contingent on numerous components, for example, culture, phase of monetary improvement, dimension of rivalry and so on.

The division has reliably indicated development underway, settled venture, work and absolute fares throughout the years. One of the qualities of Indian SMEs is that of cost advantage in contrast with their worldwide partners (Singh et al., 2019) . It has been a

dynamic area notwithstanding deficiencies SMEs have enlisted higher development rate contrasted with the in general mechanical area.

So, as to pick up foundation information of issue and to distinguish suitable strategy, look into structure, strategies for estimating ideas and procedures of investigation or to break down the issue correctly, it is fitted to show that a short audit of the accessible literature relating specifically or in broadly way to the field under examination. What pursues, makes no case of being a comprehensive survey of all examinations done on this issue, rather an endeavor has been made to feature the primary issues identified with the theme at different dimensions from accessible material. Scope of books, distributed and unpublished Government records, online sources, reports, and pamphlets were surveyed for the examination.

## **2.2 Previous Studies**

Different studies have been focused on the classification of SMEs clusters, development, of policies formulation for the SMEs, the growth patterns of SME, the challenges of SMEs, and contribution of SMEs and ICT adopting of SMEs in Bangladesh and the factors responsible for it, although none of them is Google Scopus or Google cited. However, only some of the studies on adopting open innovation in SMES in Bangladesh, or challenges or opportunities for adopting innovation or open innovation by a Bangladeshi Engineer Rahman, H. were found from 2011 to 2015. On the contrary, the researches on innovation and open innovation for SMEs in the different countries are going on rigorously, some of them are enumerated in this literature.

### **2.2.1 Definitions of Innovation**

There are various types of literature on innovation that provide ideas about different definitions and methods of innovation. In broader sense, the word first introduced in Latin word, “Innovare”, means 'to create some things new or to develop new ideas. When we talk about innovation, we cannot ignore the "father's" view of innovation research - Joseph Schmpter(1934). According to him, the innovation is to develop new or significant advanced products or services, to introduce new manufacturing methods, to open new markets, to identify new sources of supply of raw materials or to create new industrial structures (Gallouj & Savona, 2009) or innovation is knowledge based(Quintane et al., 2011).

Conventionally innovation entails new ideas to reach conclusion for outcome, the process through which the outcome exposed(Quintane et al., 2011). Innovation has been conceptualized as introducing of a new product, process, method, or system. This concept can highlight the dual characters of innovation as both process and outcome. Innovation includes changing, process development and outcomes(Kogabayev & Maziliauskas, 2017). The outcome of the works needed for innovation be grouped into two different phases. The idea generation is the first phase and implantation is the second phase(Quintane et al., 2011). Therefore, innovation means introduction and application, or development or implementation.Overall innovation is defined as "the generation, acceptance and implementation of new ideas," the process of products or services. Activity-based innovations are set as the inter-related techniques (Al-Sayed & Dugdale, 2016). Innovation is a new concept, new technology creation that manages new or improved products in production, production processes or tools involved in marketing process and service development (Rahman & Ramos, 2012). This definition gives an example that innovation is a complex process which brings together many activities and does not end the process with a new invention.

Innovation has been considered as the main driver of economic prosperity and sustainability of a country through the patronizing of its entrepreneurs.(Rahman & Ramos, 2013d). in the advanced competitive and complex global business environment, most of the organizations need to have innovation either developed internally or externally to commercialized the products and services very firstly. Therefore the main functions of innovation are the development and the productivity and the type of investment and its return highly depends on the how innovation is utilized(Kogabayev & Maziliauskas, 2017).

In comprehensive intuition, there are many methods in the writing that help innovation in associations (Caetano and Amaral, 2011).Notwithstanding the over three acquired parameters of an association, because of the overall idea of innovation, frequently the whole association may should be controlled, for example, hierarchical changes or authoritative foundation the executives, and these would include apparatuses a long ways outside the ability to control of the administration of a solitary substance. They request communitarian endeavors of substances in general or people from various elements to act towards accomplishing the objective. However, in this way coming, forms stay dubious, particularly investigating the unpredictable idea of the business, and particularly when the issue goes to the small and

medium enterprises, where the basic leadership is exceptionally thin as the proprietor director in nearly in larger part of the cases needs to deal with every single choice.

Hence, one of the things that can be said about innovation is that in small and medium enterprises, innovation means one thing: Develop new ideas / technologies and lead them to success on a regular basis. Innovation is literally applying the concepts used in small and medium industries in a new way.

### **2.2.2 Definitions of Open Innovation:**

It is evident that innovation is the reality of the genuine entrepreneurs although the situation may goes worse in economic depression, financial crisis, intensity of global competition and armature technology. By being confused, entrepreneurs develop new ideas, concepts, and perceptions or apply from taking others to keep them fit into this tumbled business environment. that might be called as the paradigm of open innovation.(Rahman & Ramos, 2013e).

Open innovation is a type of innovation which has become significant in small and medium industries for developing the cost cycles, industry research and development, finding the weakness indicating sourcing and acquiring, revealing and selling(Dahlander & Gann, 2010).

OI has advanced as a thinking of innovation management after its look in Chesbrough's publications now greater than a decade ago. This idea requires an exchange of method for innovation, from a closed one to an open one which approves free transfer of ideas, understanding and technology between entrepreneurs to speed up and enhance interior innovation. open innovation is taking a leading position into the organizational management for ensuring sustainable profitability. The interest of different researchers and practitioners are increasing to find out the different aspects of innovation in products, processes, strategies, methods through a longitudinal study(Rahman & Ramos, 2013d)

OI is systems of distributive innovation which is based totally on the management of knowledge workflow in the exterior surroundings of the business enterprise and has emerge as a huge approach in many activity fields. Most studies center of attention on research of OI implementation in multinational companies, whilst SMEs have acquired much less interest in this respect. Research indicates that company size has a significant role in the adoption of OI (Brunswick and Vanhaverbeke, 2011), however that does not mean that OI is relevant only for massive companies. Moreover, the specific characteristics of SMEs can

be advantageous in imposing OI. SMEs have behavioral blessings whilst large businesses have economic benefits (Rothwell and Dodgson, 1994). SMEs' benefit lies in their entrepreneurial potential, as there is greater flexibility and faster response to modifications in the exterior environment. By opening their doors, agencies can have get admission to their partners' extra capital to control their decreased capability of lookup and improvement things to do or by way of involving the end-user in the system of innovation to enhance their marketing skills.

From 2003, the open innovation concept got popularity and was proposed for innovation as it is considered as a based on organization obligation for publicizing of the organization's innovation and joins external and internal technology to improve business standards. Chesbrough (2003a, 2003b) that introduced the concept of open innovation for the first time, and then became one of the main interests of fast-growing institutions and researchers, which included many dedicated conferences, special issue publishing and rapidly expanding literature (Elmquist, Fredberg, & Ollila, 2009). (Bogers et al., 2018; H. Chesbrough, 2003, 2004, 2006a, 2011a, 2011b, 2012a, 2017; H. Chesbrough & Bogers, 2014a; H. Chesbrough & Crowther, 2006; Henry W. Chesbrough, 2003, 2007; Deck, 2008; Enkel et al., 2009a; Gassmann et al., 2010; Helfat, 2011; Trott & Hartmann, 2009; West et al., 2006, 2014).

The open development in worldwide views (Allio, 2005; H. Chesbrough, 2003, 2004) remain as opposed to the vertical coordinated innovation worldview; where all information is disguised and exclusively constrained by the firm. The essential suspicion of the open innovation idea is that the commercialization of outer wellsprings of innovation and finding of outside ways for commercializing inside sourced innovation is beneficial for the firm (H. Chesbrough, 2006b; H. Chesbrough et al., 2018; H. Chesbrough & Bogers, 2014b; H. Chesbrough & Brunswicker, 2014; H. Chesbrough & Euchner, 2011; H W Chesbrough, 2003; Henry W. Chesbrough & Garman, 2012; West & Bogers, 2017) .(H. Chesbrough, 2003, 2006b; Henry W Chesbrough, 2006; Enkel et al., 2009a) recognized three center open innovation forms. To begin with, the outside-in procedure of open innovation incorporates various specialists and partners into the development procedure and sources developments from outside the organization (for example inbound open advancement). Outside-in co-task open innovation exercises incorporate the joint effort with outer wellsprings of advancement, or some other outside master (West and Bogers 2013). The furthermore securing exercises

that incorporate the disguise of outer protected innovation through authorizing or obtaining the IPs (Gassmann and Enkel, 2004; Laursen and Salter, 2006; Schroll and Mild, 2011). The second procedure is back to front, open innovation urges firms to use unused inward protected innovation (for example outbound open development) through selling licenses, direct permitting or on middle of the road markets (Chesbrough, 2003a, 2007). This procedure makes benefit by offering thoughts for sale to the public, selling Intellectual Property and duplicating innovation by means of exchanging thoughts to the outside condition (Gassmann and Enkel, 2004). Lastly, the third procedure is coupled procedure; coupling the outside-in and back to front procedures by working in unions with reciprocal accomplices in which give and take is pivotal for progress (Fey and Birkinshaw, 2005; Gassmann and Enkel, 2004; van de Vrande et al., 2009).

Researchers have proposed ways to classify and categorize the industries (D & T, 2010) and SMEs play an important role in supplying innovative services or products to the external periphery of the customer chain and the focus of SME innovation will result in the new level of innovation research for SME business growth and might have economic growth with collaborative, networking and sharing. The studies on open inventions in SMEs are becoming increasingly popular among SMEs. opening their innovative processes is important for the SMEs to understand the reasons and results of the use of open inventions (Baycan-Levent & Nijkamp, 2010; Bobowski et al., 2018; Brem et al., 2017; Dini et al., 2008; European Commission. Science and Society., 2008; Fernandez-Ribas, 2009; Hafkesbrink & Schroll, 2011; Jiménez, 2008; J. H. Kim & Bae, 2008; Kühne et al., 2013; Nagi, 2008; Parida et al., 2009; Rabelo, 2008; Teirlinck & Spithoven, 2019; Thomson & Dekkers, 2008; van de Vrande et al., 2009; Yun et al., 2015). It will provide reasonable ideas of why SMEs will use open inventions in their organizations and why it will provide support in related research.

(Bianchi et al., 2010) expressed that open development can be especially trying for small and medium-sized ventures, in view of their engaged business portfolio, specific learning premise, and restricted budgetary assets that can be dedicated to advancement exercises" and further refer to the accompanying difficulties for SMEs:

- i. Coming up short on the assets and capacities in assembling, conveyance and promoting, which are the key for changing innovations into new items and procedures.

- ii. Recognizable proof of promising applications where to industrially misuse restrictive innovations, which are generally in totally unique enterprises from the association's own item business.



**Figure 2.1: Challenges and opportunities for open innovation in SMEs (Adapted from Brunswicker, 2009)**

Van de Vrande et al. (2008) and Vanhaverbeke (2012) additionally underlined the absence of inward assets and market reach of SMEs to popularize new items, expecting them to team up with outer, frequently bigger accomplices for development achievement. Huizingh (2011) states that having less assets represents a test to SMEs to "construct and keep up community systems and to make and uphold licensed innovation rights".

Regarding hindrances, SMEs cannot switch technologies beyond their manufacturing lines. In reality, interior R&D has two functions: it no longer only generates new technologies, however additionally will increase absorption capacity. The potential of development, thus, depends on the level of understanding earlier gained. So SMEs with a much less intensive ability of R&D may additionally no longer be capable to take advantage of exterior knowledge effectively (Rosenberg and Steinmueller, 1988). Also, the difficulties in recruiting rather specialized employees, changing organizational culture and companion identification troubles and interplay with them are regularly described as the boundaries to OI (Van of Willy et al., 2009).



### **2.2.3 Classifications of Open Innovation:**

(Conole, 2014; Mun et al., 2019; Nerone et al., 2014; Salvador et al., 2013; Vanhaverbeke & Chesbrough, 2014) defined open innovation , its classification and how open innovation could be applied into different industries clusters.

Innovation and technical development have been the primary drivers for economic boom, managers and researchers began to companion a robust internal R&D with innovativeness. Traditionally, agencies carried out internal R&D and relied on inside resources to develop and commercialize new products that process described as ‘closed innovation model’ (Chesbrough, 2003). In recent years, due to superior international opposition and faster understanding growth, these strategies have commenced to alternate closer to a more open method (Gassmann, 2006; Porter & Stern, 2001).In 2003, Henry Chesbrough coined the term ‘open innovation’ and argued that “open innovation is a paradigm that assumes that firms can and have to use exterior ideas as well as inner ideas, and interior and external paths to market, as corporations look to strengthen their technology

- a. Open innovation was not an easy understandable concept, on the grounds that it encompasses different dimensions and can be done in distinctive ways (Huizingh, 2011). Nevertheless, most research recognized two widely wide-spread distinctions: ‘inbound open innovation’ and ‘outbound open innovation’ (Chesbrough et al., 2006; Van de Vrande et al., 2009). Inbound open innovation relates to inward flows of understanding and consists of opening up the innovation technique and obtaining know-how from exterior sources, whereas outward flows of expertise denote outbound open innovation, which refers to the commercialization of technological know-how through the use of external parties (Lichtenthaler, 2011).

Furthermore, Enkel et al. (2009) added the ‘coupled processes, an aggregate of inbound and outbound open innovation to outline “co-creation with complementary partners through alliances, cooperation and joint ventures at some point of which give and take are integral for success” (p. 313). Dahlander and Gann (2010) further classified inbound and outbound open innovation and recognized mainly 4 types of openness: revealing inside resources to the exterior environment without instant economic reward (‘revealing’), commercializing innovations and applied sciences via promoting or licensing out resources (‘selling’), the use

of external sources of innovation via scanning the external environment prior to initiating inside R&D ('sourcing') and obtaining input to the innovation process via the market area ('acquiring').

This classification can be determined in Table 2.1 Classification of Open Innovation. In the exploration stage, a firm is carrying out R&D things to do to improve the innovation, whereas in the exploitation stage the company is aiming at commercializing the innovation (Lee et al., 2010).

Table 2.1: Categorized of Open Innovation by Dahlander and Gann (2010)

	Non-Pecuniary	Pecuniary
Outbound Open Innovation	Revealing	Selling
Inbound Open Innovation	Sourcing	Acquiring

For the motive of this research, the classification supplied by using Dahlander and Gann (2010) will be modified and adapted to the thinking of exploration and exploitation, as it can be argued that, depending on the segment of the improvement procedure where an open strategy is needed, open innovation will take a different structure and, therefore, a specific method should be adopted.

Furthermore, the 'coupled process' proposed with the aid of Enkel et al. (2009) will be protected as nicely in the new proposed classification. When searching at the outbound open innovation, revealing internal know-how and assets to the external environment and promoting improvements are nevertheless applicable for, respectively, exploration and exploitation. As a ways as inbound open innovation is concerned, in the exploration phase, 'sourcing' will refer to accumulating understanding and resources in order to boost an innovation, whereas 'acquiring' in the exploitation segment will define the acquisition of an innovation from the exterior environment. Finally, for the coupled open innovation, 'pooling' will become aware of the aggregate of revealing inside sources and sourcing external resources, whereas 'jointly commercializing' will refer to the method of taking part to convey an innovation to the market. The proposed classification can be found in Table 2.3.

Table 2.2: Proposed Classification of Open Innovation

	Exploration	Exploitation
Outbound Open Innovation	Revealing	Selling
Inbound Open Innovation	Sourcing	Acquiring
Coupled Open Innovation	Pooling	Jointly Commercializing

#### 2.2.4 Close and Open Innovations:

Before adapting to the trends that influenced business to move business forward in the twenty-first century, small and medium enterprises relied on a variety of approaches. Those small and medium industrial organizations generally relied more on their internal research and development departments than on the exploitation of external resources. The normal mannequin they used was recognized as the “Closed Innovation Model”. Various researches have established that most organizations have practiced the closed innovation mannequin for the previous many years (Chesbrough, 2003; Esseiva, 2013; Gassmann, Enkel, & Chesbrough, 2010). The closed innovation mannequin is primarily based on numerous assumptions like fixed structure and cultures, IP rights, efficiency, and tight controls. All these have been modified in the contemporary marketplace. This reality leads to the thought that inside assets are most straightforward and dependable at warding off the competition. Closed innovation techniques are carried out inside the boundaries of the corporation and there are no exit mechanisms for ideas, knowledge, and improvement processes. Likewise, no thoughts from different firms are allowed to enter the company’s R&D strategies (Esseiva, 2013).

Although organizations were consequently at the beginning based on closed innovation systems, the innovative technological modifications added a transformation to an open innovation system inside the enterprise environment (Van de Vrande et al, 2009). Big organizations like for instance Xerox and IBM which in the Seventies and Eighties had been related with the closed innovation model (Chesbrough, 2003; Esseiva, 2013), have been compelled to stop their traditional way of creating innovation due to modifications in the monetary prerequisites of the enterprise world. Companies have been not acquiring the

ultimate outcomes from their operations. However, they were investing substantial resources to convey out trade in the business environment (Van deVrande et al, 2009).

The term “Open Innovation” is recommended for organizations to respond to the altering environment of business. It is argued that organizations have to introduce external knowledge and ideas. The recommended open innovative paradigm covers the approaches through which SMEs can get advantages via taking part with external resources and embracing technological changes. The open innovative paradigm offers with the integration of external and interior resources to make certain most consequences (Chesbrough, Vanhaverbeke, & West, 2006, 2014). Using the model of open innovation, organizations can invite partners, customers, and different shareholders to make contributions to the manner of innovation. In addition, organizations can take gain of the advantages of the affluence of knowledge that exists backyard the company. Disseminating their know-how does now not put them at danger in the competitive market. Open innovation employs crowd sourcing, where large numbers of people are invited to share their thoughts about an innovative objective.

To sum up the ideas of closed innovation and open innovation, are: it genuinely indicates that closed innovation has too slender a scope of resources and largely relies upon on the inside resources, whereas open innovation on the different hand is free from these barriers and consists of a wider scope of inner as nicely as exterior resources.

### **2.2.5 Processes of Innovation:**

Three aspects of process innovation are new technology, product development and system development. The most successful innovations are integrated design process, i.e. integration in the design of the enterprise, the design of the product, as well as the design and implementation of new technologies. Such an integrated design effort requires good collaboration and management of the designs, and should be supported by efficient knowledge management techniques and tools. If innovation is to help a business grow and improve its competitiveness, it is also important to plan the innovation carefully. Though some ideas may just "fall from the sky" or "come out of the blue", an organization should also have a strategic vision of how the business and the enterprise should develop. The Enterprise should not wait for the innovation to arrive arbitrarily, but rather proactively plan for innovation incorporating market trends, the competitive landscape, new technology

availability, and changes in customer preferences and trends in order to create fruitful terrier conducive for innovative thinking.(Schultheiss, 2018)

The top 20 per cent firms were compared with bottom 80 per cent firms in terms of product innovation management, systems and technology. Means of responses were compared for two sets of companies. The results showed that the characteristics of more innovative SMEs manufacturing firms are perceived to be different as compared to the less innovative SMEs manufacturing firms in Malaysia(Yahya et al., 2011)

The process of innovation in the field of economic, knowledge, field of innovation, historical time and the density of the country can be different from the different aspects. In addition, the innovation process in small and medium industries depends on the size of firm, corporate strategies and previous experience in the field of innovation. There is no innovative process that is capable of making every company's demand. Literary gives different definitions for the innovation process. Here are some important texts about them:

- i. The innovation process can be identified as an innovative solution and any initiative for the development and implementation of it (Kosała, 2015)
- ii. The innovation process is the impression of an unsatisfied need, setting the stage following the essential demonstration of knowledge, basic update and improvement (Usher 1954 in Meissner & Kotsemir, 2016, p. 17);(Brocke & Mendling, 2018; Hanelt et al., 2015; Marzi et al., 2017; Nielsen et al., 2016; Rezk et al., 2016; Tebaldi et al., 2018)

Inability to enhance or adjust to new innovations in the market can prompt the death of an association. Innovation can be as different sorts, for example, "products, services, processes, technique, plans of action, business models, marketing and esteem" (Gous 2014). Inside the area of innovation, the researcher can recognized as closed and open innovation. Closed innovation is inside centered with control dwelling inside the association (Chesbrough, 2006). In the last decade, open innovation and its demand have brought many changes in the SME industry in Bangladesh. Basically, the research and development section of the small and medium industries in our country is the main source of innovation, but by opening the outside world, often the increased needs are more appropriate, which compete with classical comprehension. Here the researcher finds two methods: open innovation and close

innovation, but open innovation is more likely to apply in the SME sector. Call the robust organizations in management, policy and practice study call fields that can help create a new idea for innovation by an effective innovation process. In this study, "A recipe has been found to innovative sustainable innovation rather than the levels of innovation" and specific stages in the study, which define the most common for successful innovation. Keep in mind that it is very important for every SMEs entrepreneur to understand the process of innovation well, but it has the ability to handle equally well and well from first to last. Let us discuss five steps of innovation process.

### **2.2.5.1 Ideas Generation and Mobilization:**

New thoughts are made amid thought age. Preparation happens when the thought is moved to an alternate physical or sensible area, for example, an outside firm or another office.

Motivation for another thought can begin from an improvement of a current thought, or something without any preparation. The Atlantic opens in new window clarifies how Apple held up three years after MP3 players were acquainted with make the iPod, which was alluring, natural and offered limit with regards to up to 1,000 melodies. On the other hand, the development of Scotch tape was a fresh out of the box new thought. Price economics opens in new window recounts to the narrative of Richard Drew, a school dropout who joined 3M, saw a requirement for a sort of tape that wouldn't destroy paint on vehicles and conquered obstacles to finish his innovation.

Because of Drew's hard working attitude, 3M furnishes representatives with time (15 percent of their workday) to investigate thoughts outside of their work assignments. Different associations have pursued this model, and powerful associations all in all furnish representatives with the time and assets to develop.

In this investigation, business visionaries must accentuate innovation to the correct degree "overemphasizing need will make a few workers leave for progressively stable occupations," while "not underlining it enough will diminish desperation and thought age no matter how you look at it."

### **2.2.5.2 Advocacy and Screening**

This stage is the ideal opportunity for gauging a thought's upsides and downsides. Advocacy and screening need to happen in the meantime to get rid of thoughts that need potential

without enabling partners to dismiss thoughts incautiously exclusively based on their oddity. The creators found that organizations had more achievement when the assessment procedure was straightforward and institutionalized, on the grounds that workers felt progressively happy with contributing when they could envision how their thoughts would be judged. For instance, one programming engineer from a data innovation association stated, "Something I have battled with is assessments of my thoughts. A portion of my thoughts light up flames around here, while others are squashed. Obviously, I develop suspicious when [the executives] request thoughts and after that don't give criticism about why a thought was not sought after."

### **2.2.5.3 Experimentations**

The experimentation arrange tests the supportability of thoughts for a specific association at a specific time and in a specific domain. At this stage, it's imperative to figure out who the client will be and what the person will utilize the development for. In light of that, the organization may find that in spite of the fact that somebody has an incredible thought, it is comparatively radical or just not directly for a specific market. Notwithstanding, it's imperative not to translate these sorts of revelations as disappointments they could really be the impetuses of new and better thoughts.

Washington Mutual Inc's, ongoing inside update gives a genuine case of how effective experimentation functions. Rather than applying another structure to every one of its branches, the banking and insurance agency, headquartered in Seattle, Washington, actualized the plan in only two or three areas to perceive how it would be gotten. Along these lines, when clients reacted positively, the bank took its development to the following dimension, applying the new structure to a few different branches. Along these lines, the organization didn't lose cash and time by applying another thought at the same time without knowing whether it would succeed.

### **2.2.5.4 Commercialization**

In the commercialization arrange the association should look to its clients to confirm that the advancement really takes care of their issues and after that ought to break down the expenses and advantages of revealing the development. The creators make a point to take note of that "an innovation is just viewed as an innovation [once] it has been popularized." Therefore, the

commercialization arrange is an essential one, like promotion in that it takes the opportune individuals to advance the plan to the following formative stage.

For instance, one CEO stated, "We took in a basic thing: Researchers and thought makers don't value the subtleties of promoting and commercialization. Before, we attempted to get the analysts associated with the commercialization parts of the business. The final product was agony and more torment."

### 2.2.5.5 Diffusion and Implementation

The level of dispersion and utilization is, as SME entrepreneurs point out, "the opposite of the corresponding currency". Evolution is one of the latest paths to innovation, broad acceptance and acquisition, to provide structure, maintenance and expected resources.

The real case of a viable way of dealing with publicity originated from the International Business Machine Corps, Which involves his staff at bat hands in the age of thought and dictates the jam of supposed progress, in doing so, they welcome delegates as well as customers, colleagues, and even the families of workers associated with the industry. IBM helps later dissemination by giving everybody a stake in the thought from the earliest starting point.

### 2.2.6 Definitions of SMEs

The technical definition of SME is given based on employment, assets, or a combination of the two. The definition varies from country to country depending on socio-economic condition. For example, some sample definitions are given below as found from work of Vadim Kotelnikov (Kotelnikov, 2007):

**Table: 2.3 Definitions of SMEs and their Measurement Criteria**

Country	Definition of SME	Measurement
China	Varies with industry, usually less than 100 employees	Employment
Hong Kong	Manufacturing– 100 or fewer employees Other – 50 or fewer employees	Employment
Indonesia	Less than 100 employees	Employment
Japan	Wholesale– less than 100 employees or JPY 100 million assets Services– less than 100 employees or JPY 50 million	Employment and Assets



	assets Retail – less than 50 employees or JPY 50 million assets Other– less than 300 employees or JPY 300 million assets	
Malaysia	Manufacturing– less than MYR 25 million or 150 employees Services– less than MYR 5 million or 50 employees Different for Bumiputra enterprises	Shareholders, Funds and Employment
Philippines	Less than 200 employees or PHP 60 million assets	Employment and Assets
Singapore	Manufacturing– fixed assets worth SGD 15 million or less Services– less than 200 employees	Employment and Assets
Taiwan	Manufacturing– less than TWD 80 million of paid-in capital or less than 200 employees Other– less than TWD 100 million annual sales revenue or less than 50 employees	Sales Revenue and Employment
Thailand	Manufacturing and services – less than 200 employees or THB 200 million assets Wholesale – less than 50 employees or THB 100 million assets Retail – less than 30 employees or THB 60 million assets	Employment and Assets

In case of Bangladesh, different economic organizations have defined small and medium enterprises differently. Bangladesh Bank, as the central bank of Bangladesh, has defined SME as below:

**Small Enterprise** refers to the firm/business which is not a public limited company and complies with the following criteria:

**Table 2.4:** Definition of Small Enterprise by Bangladesh Bank. (Bangladesh Bank, 2012)

Serial No.	Sector	Fixed Asset other than Land and Building (Tk.)	Employed Manpower (not above)
1	Service	50,000 – 50,00,000	25
2	Business	50,000 – 50,00,000	25
3	Industrial	50,000 – 1,50,00,000	50

**Medium Enterprise** refers to the firm/business which is not a public limited company and complies with the following criteria:

**Table 2.5:** Definition of Medium Enterprise by Bangladesh Bank. (Bangladesh Bank, 2012)

Serial No.	Sector	Fixed Asset other than Land and Building (Tk.)	Employed Manpower (not above)
1	Service	50,00,000 – 10,00,00,000	50
2	Business	50,00,000 – 10,00,00,000	50
3	Industrial	1,50,00,000 – 20,00,00,000	150

Bangladesh Bank SME policy includes area approach method and cluster development policy and it expresses small entrepreneurs as a priority given section in this case.

### **2.2.7 Changing the Patterns of SMEs from a Closed to an Open Innovation**

#### **Approach:**

With the advancement of technologies, the entrepreneurship has been shifted from traditional to modern innovative to keep pace with the development paradigm.. Depending on diversity and nature of the transformation, innovation has been shifted from closed peripheries to open dimension Changing a SME from closed to an open approach is challenging. Lichtenthaler (2008) found that most SMEs are as yet seeking after closed innovation over OI. I (Idrissia et al., 2012). Theyel (2013) guaranteed that more than 50 percent of SMEs in the USA are occupied with OI exercises in any event somewhat. Grimaldi et al. (2013) contend that SMEs with solid detecting, seizing, and designing capacities have more noteworthy penchants to build up an OI approach. In addition, correspondence the executives and inspiration exercises need to feature the advantages of OI among representatives to defeat change opposition. Tranekjer and Knudsen (2012) recommend that chiefs, especially the individuals who are in charge of advancement exercises, ought to urge their own organizations to pick up benefits from OI.

Lichtenthaler (2008) contends that, over the long run, a firm’s closed approach debilitates its aggressive position generously, while proactive transparency may result in significant vital advancements. Transparency requires limit spreading over, yet to what degree a SME ought to participate in limit traversing isn't adequately investigated.

Be that as it may, one examination demonstrates that the blessing of human capital at an individual dimension and social capital at both individual and authoritative dimensions are the principle determinants for limit spreading over (Comacchio et al., 2012). In light of asset shortage, SMEs can't matter organized development models (Albors-Garrigos et al., 2011). Despite the fact that new contestants have high-asset shortage, Lecocq and Demil (2006) found that new participants to an industry embrace an open framework more promptly than their officeholders.

An integrated management framework is important to help both inbound and outbound OI (Brunswick and Ehrenmann, 2013). Here, inbound OI involves that organizations screen the outer condition to insource innovation and information notwithstanding in-house R&D; outbound OI involves that organizations don't just depend on inside ways to showcase, yet additionally search for outside associations that are more qualified to popularize an innovation (Chesbrough and Crowther, 2006). Nonetheless, thinks about found that taking part in outbound OI is particularly trying for SMEs on account of their focused business portfolio, specific learning base, and asset shortage (Bianchi et al., 2010; Spithoven et al., 2013). With cautious arranging, SMEs can distinguish open doors for out-authorizing advancements that are not a piece of their center business (Bianchi et al., 2010). In contrast to extensive firms, SMEs need to work intimately with so much organization as hatcheries, living labs, inquire about associations, state organizations, and colleges for successful advancement (Hemert et al., 2013; Kang et al., 2013). Tranekjer and Knudsen (2012) contend that organizations' dynamic jobs in conveying thoughts, advances, and answers for outer gatherings help them to end up imaginative in item improvement.

### **2.2.8 Antecedents of Open Innovation:**

(Rothwell & Dodgson, 1991) While small and medium- sized enterprises (SMEs) can enjoy a number of behavioral advantages over their larger counterparts in the innovation process (e.g. rapid response to external threats and opportunities; efficient internal communication; interactive management style), they can also suffer from a number of mainly material disadvantages (e.g. inability to spread risk over a portfolio of new products; difficulties in market start- up abroad; problems in funding longer- term R&D). SME- oriented public technology policies should be adapted to the specific needs of SMEs in that they should focus on facilitating vertical (supplier- manufacturer customer) linkages and offer support throughout the innovation chain from pre- competitive research through to product

development. Numerous studies testify to the importance of firms extensively 'networking' in order to improve innovation potential.

It has been observed that, (North & Smallbone, 2000) researched in England over the 1991-96 period. It is based on a survey of 330 firms drawn from 16 sectors and makes a comparison between similar SMEs in remote and accessible rural areas. Using a multi-dimensional index of innovation, relatively little overall difference is found in the level of innovation between SMEs in the different areas. A remote rural location is shown to influence innovation in different aspects of the business in different ways. Defining Small Business Failure that accessibility of working capital, showcase determination, and rapidly changing outside market condition are the significant explanations behind disappointments in SMEs (Small Medium Enterprises).

(Hodges & Patil, 2000) in his examination about Workforce in the Small Scale Engineering Units in Kolhapur, saw that the twin issues of workforce were work turnover and non-appearance because of wage differentials and absence of social welfare measure, for example, flask and wellbeing offices that were mindful in debilitating business people. In their examination about improvement of Small Scale Industries called attention to that there is a requirement for imaginative methodologies to handle the issues which SSI business visionaries are confronting. These issues are: low quality foundation, deficient access to institutional credit, deferred installments by huge enterprises, procedural deferrals in getting government freedom, provocation by examining officers, unbending work laws, innovative out of date quality, non-accessibility of gifted labor, absence of promoting offices and so forth., The need of great importance is a community approach between the national and the state governments, nearby industry affiliations and the small scale units. Such an open private association (PPP) will eradicate significantly present requirements looked by small scale units in territories of labor accessibility, framework and access to credit.

(Egorov & Voytovich, 2001; Virtanen, 2001) evaluates entrepreneurship and entrepreneurial culture in Finland and describes the development of the Finnish venture capital market. Formulation of SME policy has been the major public effort in fostering entrepreneurship in Finland aims to identify the role of small and medium sized enterprises (SMEs) and innovation activities in economic development of the transition economy in Ukraine and inspected the current arrangements and projects worried about the advancement of small ventures in his examination Smart Strategies for Small Enterprises. They saw that SSI

division must be made exceptionally focused to confront the difficulties of advancement and globalization and furthermore there ought to be no limitation on SSIs to develop. Today, there is a basic requirement for innovative up degree, modernization and appropriation of bunch approach for speedy and compelling conveyance of contributions to SSI part. To think about levy/non-duty boundaries under WTO, survey of work laws to make them SSI amicable and improving limit usage of SSI units is the need of great importance.

Among the investigations featuring the current circumstance of SME division in Bangladesh, Raihan (2001) sees that the 50.53 percent of SMEs have no entrance to the formal wellspring of back. Just 35.79 percent of SMEs appreciate unhindered access to the formal credit. The rest (13.68 percent) of them have limited access to the formal credit. Bank credit is utilized by the small level of business people and gives financing of commonly under 20 percent of their complete cost. Greater part of the SMEs (59.6 percent) looks for fund for their working capital needs from banks, albeit just a half of them get an advance from banks.

The study found in Indian Small Scale Industries. They are making space for SMEs to coincide and giving empowering condition to a dimension playing field, furnishing them with a sensible timeframe and pace for modification, and giving sufficient shields against unreasonable exchange guide help to S Rather a portion of the money related and charge measures attempted by the administration to help SMEs are arrangement of appropriations for R&D costs, certification of advances when reached out by the Credit Guarantee Association, arrangement of investment reserves, assess decreases for capital venture, and credits for hardware renting.

(Guston & Sarewitz, 2002; Hollon et al., 2002; J. Kim & Wilemon, 2002) expressed in his article Context and Advanced Technology use by Small that plants in assembling businesses are subject to item development and will in general bunch around particular urban open and private research offices. For rustic producers, process development including cutting edge innovations is a key to survival and development. The proof introduced in his paper recommends that small, free plants that have embraced cutting edge innovations will in general be found where workforce and instruction level are moderately high and assembling area is moderately differing, given the extent of its business base. This decent variety, thus, related with nation qualities, makes the territory of living arrangement alluring, including common enhancements, vicinity to a metropolitan region and the nearness of schools.

As indicated by (Gallo & Möhring, 2002; Gray & Allan, 2002; Mcadam, 2002) a steady large scale economy, an open exchange and venture routine, and focused budgetary area are contended to be most fundamental elements for a lively private segment. Be that as it may, with a lawfulness circumstance beneath the ideal dimension, debasement well over the dimension of acknowledgment and precarious political circumstance, the local condition of Bangladesh does not go to any assistance, rather thwarts the success of SME in this nation.

(Agapitova, 2003; Jutla & Weatherbee, 2003; Romani Chocce, 2003) in his investigation about Need for Modernization of Small Scale Industries uncovered that numerous territories of the administration part are quick rising as suppliers of work and supporters of fare improvement which requires reevaluations of the view that the arrangements for small scale ventures (SSEs) advancement should focus on the assembling area. It is in this manner important to address the requirement for changes in the current arrangements and plan new approaches for small medium endeavors (SMEs) advancement which will encourage the development of suitable, esteem including and proficient ventures that can modify the mechanical charge and remain universally dynamic. The government has given pivotal significance to the SSI segment in the economy with 40 percent share in the all-out modern yield, 35 percent in fares and more than 80 percent in mechanical business. What the small business visionaries require isn't creation however institutional help to finance modernization and innovation up gradation, infrastructural bolster and sufficient working capital fund from the managing an account division. There is additionally a requirement for small business people to keep pace with the auxiliary and mechanical changes occurring in extensive enterprises.

(Boekhoudt & Van Der Stappen, 2004; Mario Davide Parrilli, 2004; "PLM for the SME: Technology No Longer Just for the Big Boys," 2004; Salojärvi, 2004; Thomas et al., 2004) called attention to that outer wellsprings of learning are ending up progressively conspicuous and furthermore that outside channels to showcase are winding up progressively important. Consequently, an assessment of new technologies at the beginning states isn't just vital yet additionally muddled. To defeat the issues related with making the change from a shut to an open advancement approach, (Chesbrough,2004) gave different measurements to help in overseeing open innovation. On the contrary, SMEs of Bangladesh have neglected to guarantee the nature of items and administrations both in local and universal markets. He additionally contends that entrance to fund wins as a standout amongst the most essential issues for the SMEs in Bangladesh. Absence of contributing or working subsidizes stays as a

standout amongst the most conspicuous whines of practically all the SME in Bangladesh. Small scale Industries Development Assistance and Services (MIDAS) (2004): A examination (2004) by Micro Industries Development Assistance and Services (MIDAS) uncovered that wellsprings of back are for the most part loved ones part in the event of SME. MIDAS attempted to distinguish the wellsprings of assets of SMEs. These are:

1. Sources of assets Percentage of back
2. Informal part 41%
3. Family individuals 20% (intrigue free)
4. 4% (with intrigue)
5. NGO 25%
6. Bank 18%

(Alba et al., 2005; Barclay & Porter, 2005; Dick & Payne, 2005; Ferneley & Bell, 2006; Graversen et al., 2005; Hjalager, 2005; Macpherson et al., 2005; Mazzarol & Reboud, 2005; McCole & Ramsey, 2005; Mouritsen et al., 2005; Ndou & Passiante, 2005; Pedersen & Saglie, 2005; Prasanth, 2005; Wood, 2005) analyzed the Current Status, Opportunities and Challenges of Cottage and Small and medium Scale Industries. The investigation uncovered policies, network, collaboration and framework for innovation in SMES around the world. The studies revealed the money related difficulties looked by urban SMEs and rural SMEs are access to moderate credit over a sensible time. Investigation has confirmed that SME advancement strategies with a grouping approach fill in as an open arrangement perspective. Further, the investigation has discovered that bunch improvement arrangements in Indonesia have not been prospering. Basically, most disappointments can be ascribed to disregarding group linkage to business sectors, ignoring or notwithstanding dissolving self-association potential, and limited help from neighborhood Government and private associations.

(Brunswicker & Kianto, 2006; H. Chesbrough et al., 2006; H. Chesbrough & Crowther, 2006a, 2006b; Chung & Tibben, 2006; Foreman-Peck et al., 2006; Islam et al., 2006; Seow & Jiyong, 2006) contend that the open advancement approach can be utilized in different enterprises also. They additionally discovered that the scan for development, both as far as income and in the quantity of new items, is a focal impetus for firms receiving the open innovation approach. The early experimental investigations on open development with a substantial example measure (2,707 assembling firms in the UK) utilizing the information

from Community Innovation Survey (CIS). They imagined two new ideas to depict the idea of an association's methodologies for getting to outside information sources: outer inquiry expansiveness and outer hunt profundity. Here, outer inquiry expansiveness alludes to the quantity of outside sources and channels a firm depends upon in its imaginative exercises, though outside hunt profundity alludes to the degree to which a firm draws profoundly from the diverse outer sources or scan channels for inventive thoughts. They found that organizations that are increasingly open to outer wellsprings of learning are bound to accomplish a larger amount of inventive execution. Open advancement inside the setting of new start-up ventures. The creators found that key difficulties for new start-up ventures talked about in the pioneering writing has restricted pertinence for new firms inside the field of implanted Linux code. They additionally exhibited that effectively taking an interest in the open advancement process gives firms visibility as for their clients and help them to build up a decent specialized notoriety and conquer limit confinements. The studies also indicated how firms unreservedly uncover their developments implanted inside the Linux framework. He found that organizations give quite a bit of their inward advancement back to the general population installed inside Linux code to inspire and get casual improvement bolster from different firms for being startup and visionaries

Shahadat and Mohammed (2006) contemplated the issues in financing and overseeing small scale endeavors in provincial territories of Bangladesh. This examination dissecting their business, found that greater part are sole proprietorship and privately-run company and financed by families, companions, relatives and from possess source. In concentrate the possibilities of their business, it is discovered that enhancements of their financial status and living conditions set up them as monetarily free. Interests for their items in the neighborhood showcase, accessibility of crude materials, modest and accessible HR are primary persuasive variables. Lacking measure of credit, extreme conventions in advance preparing framework, high fees of loan and advance handling cost, horrible reimbursement strategy and non-appearance of budgetary organizations in country zones are principle issues in financing. The working issues are deficient foundation, wasteful promoting offices and market data, absence of appropriate preparing and talented laborers, absence of legitimate R&D offices, obsolete innovation and specialized know-how, and so on. Competitiveness of Small-Scale Industries featured the significance of Small Industries and their job in the economy and the effect of financial changes on development example and efficiency execution of small scale businesses.



The Small and Medium Enterprises (SMEs) in Bangladesh the accessibility of fund is a noteworthy imperative to arrangement and development of SMEs in Bangladesh. Banks are hesitant to extend their SME credit portfolio since they don't consider SME loaning an appealing and productive endeavor. This is so in light of the fact that SMEs are viewed as high hazard borrowers on account of their low capitalization, deficient resources and their powerlessness to conform to security prerequisites of the banks. Regulatory expenses are likewise higher in light of the fact that closes checking and supervision the SME activity ends up fundamental.

Chesbrough (2007) foreseen that the following outskirts that will open up in the development and usage of the open innovation approach should do with opening up the plan of action and this new transparency will empower firms to be progressively successful in making and catching quality. Opening up the plan of action will give various favorable circumstances to firms. It will empower firms to be increasingly productive in making and catching worth. It will assist firms with creating an incentive by utilizing more thoughts and to catch more noteworthy incentive by using their key resources, assets and positions.

(Bass & Ernst-Siebert, 2007; H. Chesbrough & Schwartz, 2007; Tim Edwards, 2007; Kaivanto & Stoneman, 2007; Lambert & Abdul-Nour, 2007; Rohana Ngah & Ibrahim, 2007; Pietrobelli & Rabellotti, 2007; Sparling et al., 2007; Tovstiga & Birchall, 2008; Yang, 2007; Yeh-Yun Lin & Yi-Ching Chen, 2007) studied and believed that with open plans of action, firms will have the capacity to catch more noteworthy incentive by improving utilization of both inner and outside assets. The studies featured how the open innovation approach powers firms to reassess and change their administration methodologies. They brought up that firm and at times, even entire enterprises, for example, the product business will undoubtedly make new plans of action to tackle aggregate innovativeness dependent on the open innovation approach. They also explored how firms use innovation systems to manage a changing innovative condition. Chen(2007) also investigated how motivator structures could be set up for innovation competitions. They anticipated what kinds of items and cost structures may bring the most noteworthy advantages when utilizing the challenge way to deal with innovation. They exhibited that the effectiveness of an innovation challenge can be expanded by changing the honor structure from a settled value grant to an execution possibility grant

The Small and Medium Enterprises are the foundation of the economy in nations like Bangladesh. However, SMEs experience the ill effects of basic limitations, for example, absence of capital, challenges in acquiring crude materials, absence of access to pertinent business data, low mechanical abilities, issues caused by bulky and exorbitant bureaucratic strategies, and approaches and directions that create advertise twists. In any case, with legitimate local strategy bolster from the legislature, and an eye towards worldwide market patterns, SMEs can construct limit and receive the benefits of globalization. It is necessary to research on noted two vital zones for open innovation in between universities and firms; and Organization and management of collaborative relationships.

(Dai & Uden, 2008; HUGHES, 2008; Humphrey & Schmitz, 2008; Lei et al., 2008; Manimala, 2008; Marcati et al., 2008; R Ngah & Ibrahim, 2008; Partanen et al., 2008; Porumb & Analoui, 2008; Račić et al., 2008; Raymond & Bergeron, 2008; Rutherforda & Holmesb, 2008; Skuras et al., 2008; Tovstiga & Birchall, 2008; Vega et al., 2008; Wait et al., 2008; Xu et al., 2008) analyzed the Problems and Prospects of the Small-Scale Industries for adopting innovation and open innovation. they also provided a framework for process innovation for inside and outside networking firms to reach the maximum outputs. To address the difficulties from local markets and international market their studies found how to update their innovation and receive present day showcasing rehearses. By the presentation of the new financial approach, greater work openings are created in expansive, medium and small scale modern units in the globe. the accomplishment of that approach was progress in specialized structure of small scale modern units, quick arrangements surrounded by the administration, wastefulness to rival world-wide organizations, subjective challenge at the world-wide dimension or more all, the time required to rebuild the mechanical segment inside the nation and vital readiness of effectiveness inputs in the Era of Globalization. Consequently, those researches investigated the strategies changes with the point of enhancing the focused quality of small firms and featured to approach these arrangements to receive advantage in return. Their studies also showed that through collaboration and networking among all small industries would be able to solve the major financing and infrastructure problems. Growth of SMEs in creating nations is surely an alluring objective in perspective of their apparent commitment to decentralized employment creation and age of yield (Chen, 2011).

In creating economy like Bangladesh, SMEs assume a huge job in the improvement of the economy by making work openings and delivering helpful machine substitutes and apparatus

parts sparing tremendous measure of outside cash for our nation. About 6.0 million SMEs are effectively performing in Bangladesh which was contributing 25 percent of the all-out GDP, utilizing around 31 million individuals and giving 75 percent of family unit pay. Different classifications of SMEs together contribute between 80 to 85 percent of mechanical business and 23 percent of absolute work in Bangladesh. Bangladesh Bank Report (2008) indicated that, the key explanations for the SMEs are not going into assembling but rather are money related imperatives, inauspicious condition of utilities, innovation and arrangement discrimination's. Then again, Bank and others money related foundations by and large favor substantial undertaking customers as a result of lower progress costs, and more noteworthy accessibility of insurance. The SMEs likewise fall outside the compass of miniaturized scale back plans, and consequently are constrained to rely upon formal wellsprings of assets at a lot of higher financing costs, the Bangladesh Bank report said. The BB report, be that as it may, said that other interrelated issues like deficiency of short and long haul fund, absence of present day innovation and absence of limited time bolster administrations are significant snags in the method for advancement of the SMEs part. Higher development of the Small and Medium Enterprises (SMEs) can push slice destitution to an attractive dimension by dispensing with different biases against work serious and making employments for the gifted labor in the SME area.

(Bjerregaard, 2009; Bos-brouwers, 2009; Cai et al., 2009; Enkel et al., 2009a; Federici, 2009; Franquesa & Brandyberry, 2009; Hanif & Manarvi, 2009; Hocová et al., 2009; Huang & Li, 2009; Huggins & Johnston, 2009; Institute, 2009; Lindeke et al., 2009; Pett & Wolff, 2009; Potinecke et al., 2009; Pullen et al., 2009; Rezgui & Miles, 2009; Thorgren et al., 2009; Uden & Naaranoja, 2009; Villa & Antonelli, 2009; von Ahsen & Heesen, 2009; Yokakul & Zawdie, 2009) Enkel et al. (2009) called attention to that most researches on the open innovation approaches were about inbound open innovation forms, while outbound open innovation forms have not been investigated much. They underline that the future examinations on open innovation ought to likewise concentrate on the coupled open innovation process. The coupled innovation process involves that both inbound and outbound innovation process are embraced simultaneously. They analyzed the inspiration, achievement elements and issues of business people of SMEs in terms of salary trailed by employer stability and freedom, business visionaries based on trust worthiness, and invitingness. in Sri Lanka and Pakistan because of their noteworthy commitment to by and large economy as far as business, sends out, charge salary, advancement, evenhanded pay circulation, social

security, household assets use and local improvement. Anyway in the two nations absence of direct data is the fundamental obstruction to comprehend different issues identified with the development and improvement of SMEs. The fundamental information hotspots for this examination are the most recent national dimension Industry Census in both the nations. The primary goal of this paper was ID of issues identified with the SMEs with exceptional accentuation on definitional and future research course perspectives. The ultimate result of this examination was to demonstrate the issues rising up out of the national dimension SME information bases in Pakistan and Sri Lanka to detail intelligent approaches and procedures to create SMEs to their true abilities in order to quicken monetary development and advancement in both the nations. The issues raised and look into headings set by this paper can be utilized to any South Asian nation to build up its casual segment SMEs to true abilities.

The studies also contemplated the Challenges and Opportunities of Small and Medium Scale Enterprises and recognized the main considerations for the accomplishment of the SMEs in perspective everything being equal. The discoveries expressed that SMEs confronted diverse issues. These were money related issues, advertising, the executives and human asset issues, ecological issues and such. Insufficiency or costly of credit accessibility had the most imperative issue of the SMEs in the sub city. Increasingly over shortage of working capital, overwhelming challenge, poor business improvement administrations, insurance essential by money related foundations, conflict with neighboring ventures and absence of receptiveness among SMEs office at the season of assigning the working spot were the serious issues recognized in the investigation. They featured in some of their consolidated articles that open innovation in SMEs could make greater business openings. SME additionally cultivates the advancement of pioneering aptitudes and development. Along with destitution easing, SME can diminish the urban relocation and increment income in rustic zones. Thus it will upgrade the way of life in rustic territories. In the examination execution of SMEs in Bangladesh is observed to be essentially beneath the dimension of global standard. Despite the fact that Government of Bangladesh has stepped up with regards to guarantee the development of SME, yet those means are insufficient.

It further clarified that the significance of independent company undertakings and their commitment to the economy of various nations. Small and Medium measured undertakings have demonstrated their imperativeness in the west. They are perceived by approach creators as an essential supply for development. Furthermore, the proposal distinguishes what the

Small Business Enterprises need and what these organizations require from the Government, the budgetary establishments and the quick condition for it to endure. They also examined the Impact of Globalization on Small Scale Industries.

(V. Ahuja et al., 2010; Albors-Garrigos et al., 2010; Andersson et al., 2010; Antonioli et al., 2010; Bell & Loane, 2010; Bianchi et al., 2010; Blinn et al., 2010; Clifton et al., 2010; De Lille & Buur, 2010; Enkel & Gassmann, 2010; Gardet & Mothe, 2010; Gassmann, Enkel, et al., 2010; Gassmann, Kausch, et al., 2010; Gassmann, Zeschky, et al., 2010; Harms et al., 2010; Ismail & Alina, 2010; J. Li et al., 2010; Meyer & Thieme, 2010; M. D. Parrilli et al., 2010; Rees & Edwards, 2010; Rezgui & Miles, 2010; Romero-Martínez et al., 2010; Sandmeier et al., 2010; Tai & Watada, 2010; Turner et al., 2010; Van De Vrande et al., 2010; Vladova & Mueller, 2010; Zheng et al., 2010) recommended nine points of view for building up the open innovation approach further: Spatial point of view, structural perspective, client point of view, provider viewpoint, utilizing viewpoint, device viewpoint, institutional viewpoint and social point of view as SMEs are less dynamic than expansive firms in open advancement as a result of their specific qualities, for example, association, culture and system. An investigation by the OECD found that just 5-20% of SMEs are effectively utilizing open advancement approach. Concentrates on open advancement in SMEs are divided.

They additionally recognized nine patterns in the surviving written on open advancement:

1. industry penetration (from pioneers to mainstream);
2. R&D intensity (from high to low tech);
3. size [from large firms to small- and medium-sized enterprises (SMEs)];
4. processes (from stage gate to probe and learn);
5. structure (from stand alone to alliances);
6. universities (from ivory towers to knowledge brokers);
7. processes (from amateurs to professionals);
8. content (from products to services); and
9. IP (from protection to tradable goods).

In their studies on SME development found that economic downturns mostly affected small SMEs with few working capital, skilled workforce, etc., especially those involved with

trading and supplying products or services to other businesses. The major challenges faced by the SMEs during the bearish period thus became lower cash flows and limited financing. These studies mainly are of a qualitative nature, and lack rigorous quantitative analysis. Also, these studies mainly deal with strategies and challenges for adopting open innovation in SME Business in Bangladesh.

(Albors-Garrigós et al., 2011; Beharry & Pun, 2011; Berger-Douce, 2011; Boldrini et al., 2011; Gao, 2011; Gausdal & Nilsen, 2011; Keoplang et al., 2011; Malik & Wei, 2011; Moch et al., 2011; Pénin et al., 2011; Pett & Wolff, 2011; Qian & Chen, 2011; Romero, 2011; Rujirawanich et al., 2011; Schaarschmidt et al., 2011; Schwab et al., 2011; Şengün & Önder, 2011; Serrasqueiro et al., 2011; Siyanbola et al., 2011; Sun & Wang, 2011; Tektas et al., 2011; Thieme & Meyer, 2011; Tomlinson, 2011; Wang et al., 2011; Weitzel & McCarthy, 2011; Xerri & Brunetto, 2011) utilized a two-by-two matrix to represent that an innovation procedure can be either shut or open and that the result of the innovation procedure can be either shut or open also. As per that grid, a shut result of the innovation procedure can either be a shut innovation or a private open innovation, though an open result of the innovation procedure can be either an open innovation or an open source innovation. Their studies also broadened the open innovation approach by presenting the idea of open administration innovation. Which contend that embracing the open administration innovation approach is basic, particularly for Western firms they additionally gave a structure to the open administration innovation idea, which comprises of four principal exercises:

1. Thinking of a business as an open service business;
2. Co-creating innovations;
3. Using open innovation to accelerate and deepen service innovations; and
4. Transforming the whole business model with the help of the open service innovation approach.

These studies featured various exercises for absorptive limit inside the setting of middle people. Their examination contended that suitable absorptive limit is a precondition to open innovation. Absorptive limit implies the capacity to perceive the estimation of new data, absorb it and apply it to business closes. The open innovation idea has essentially been concentrated in cutting edge businesses inside the setting of substantial firms. They also found that technology sourcing is positively related to performance with regard to radical innovation, and technology scouting is positively related to performance with regard to incremental innovation. However, Kim and Park (2010) found that external R&D has a

positive and significant effect on innovation output, but external ideas have a negative effect, and external knowledge has no impact on innovation performance of SMEs. They also found that external innovation activities do not seem to improve the innovation performance of SMEs.

(Bharati & Chaudhury, 2012; Gardet & Fraiha, 2012; Gordon et al., 2012; Grundström et al., 2012; Halilem et al., 2012; Jean et al., 2012; D. Y. Kim et al., 2012; Klonowski, 2012; Konsti-Laakso et al., 2012; W. Krause et al., 2012; Lee et al., 2012; Lindgren, 2012; Meuleman & De Maeseneire, 2012; Ng & Kee, 2012; A. C. De Oliveira & Kaminski, 2012; Paio et al., 2012; Pullen et al., 2012; Radas & Bozic, 2012; Spiegel & Marxt, 2012; Suh & Kim, 2012; Tsou & Chen, 2012) showed that in-house R&D, innovation securing, and R&D joint effort are decidedly identified with item/administration development, protecting movement, and procedure innovation, separately. They also argued that SMEs' engagement in R&D cooperation and outsourcing has a positive impact on the internal R&D personnel of the firms to assimilate external ideas. Those studies focused on a closed, focused, and consistent new product development networking approach has resulted in high-innovation performance and significantly positively related to inter-firm cooperation, cooperation with intermediary institutes, and government agencies. The researches revealed that SMEs possess a much higher intensity – ratio of OI activities over employment – for all types of OI activities than large firms..

(Ampantzi et al., 2013; Aziz & Omar, 2013; Bala Subrahmanya, 2013; Du et al., 2013; Ebersberger & Herstad, 2013; Eppinger & Vladova, 2013; Gebhardt & Pohlmann, 2013; Hamid & Tasmin, 2013; Haron et al., 2013; Kang et al., 2013; Kaur & Mustafa, 2013; Krabye et al., 2014; Kuivalainen et al., 2013; Z. Li & Li, 2013; Mahmud et al., 2013; Muhammad et al., 2013; Ramadani et al., 2013; Ruivo et al., 2013; Salvador et al., 2013; Smes & Idt, 2013; Sok et al., 2013; Spithoven, 2013; Teirlinck & Spithoven, 2013; Villa & Bruno, 2013; Volchek et al., 2013; Yu & Ni, 2013) according to them OI has a positive effect on SMEs' new offerings. Laursen and Salter (2006) found that openness to external sources allows SMEs to bring ideas from outside to deepen their knowledge of the technological opportunities available to them. Furthermore, they argue that over-searching may negatively affect innovative performances; therefore, external searching should be performed carefully since too many search channels may hinder the main goal of searching. OI is a challenging option when business-to-business relations and formal contractual agreements to protect IPs are prevalent . (Spithoven,2013) found that SMEs had more benefits than large firms from the

use of IPR protection mechanisms and that the appropriability of the innovation is more relevant for SMEs. In contrast to large firms, SMEs need support from a wide scope of organizations. Theyel (2013) contends that the more extensive selection of OI may offer just couple of quantifiable advantages, yet it brings some roundabout advantages, for example, availability, mindfulness, and notoriety.at that time the examinations of a firm whose innovation broadly forms execution of Open Innovation rehearses is tested by social issues. (Kuivalainen,et al.,2013), in their Study on Marketing Strategies in Small Scale Industries, featured that compelling promoting of small scale modern items would guarantee larger amounts of salary, utilization, and business which increment the way of life of the general population. Advertising is requesting more noteworthy consideration not just from industrialists particularly of the small scale area yet in addition from the organizers and financial analysts.

Small scale businesses encourage the tapping of assets including enterprise, capital, work and crude materials. They can activate country funds which may some way or another stay inert or might be spent on extravagances or diverted into non gainful endeavors. The quest for monetary advancement and that of the mechanical strategy changes visualizes the innovative abilities and intensity. Institutional organizations have been setup for giving specialized, infra-auxiliary, monetary and different administrations, and limited time measures giving the financial and budgetary concessions, appropriations, reservation of the items and need in credit distribution have been received to enlarge the advancement of the small scale mechanical units. The issues and ideas that rose up out of Review of Literature are business, profitability, execution, intensity, showcasing issues and support, quality items, item development, pioneering abilities, budgetary difficulties, relative cost proficiency, development rate, administrative competency, item advancement, innovative enhancement and infrastructural offices.

(Al-Ansari et al., 2014; Bogers & West, 2014; Brink, 2014; Černá, 2014; Colomb et al., 2014; Cuerva et al., 2014; Doh & Kim, 2014; Guillaume et al., 2014; Hunter & Lean, 2014; Lisanti & Luhukay, 2014; Löfgren, 2014; Malawige & Nanayakkara, 2014; Matheis et al., 2014; OECD, 2014; Raposo et al., 2014; Struik et al., 2014; Zucchella & Siano, 2014b, 2014a) surveyed the commitment and advancement of open innovation literature. They found that the open innovation tremendously affected research and practice in the previous decade. They contend that the accompanying three patterns are to rise later on:



1. Newer and better approaches to measuring open innovation;
2. The role of appropriability in enabling open innovation; and
3. Integration of open innovation with established theories of management and economics.

West Felin and Zenger (2014) gave a structure, depicted and talked about four classes of open innovation administration shapes: markets, organizations, challenges and competitions and client or network innovation. They talk about how every administration shape is made out of a lot of instruments for:

- Communication channels for knowledge sharing;
- Incentives; and
- Property rights for appropriating value from innovation.

Martinez-Torres (2014) recommended how to discover proper thoughts from a large number of thoughts that are shared on an online network. Be that as it may, Holzmann et al. (2014) watched that matchmaking between different accomplices is a more mind boggling process than on the web advertise exchange. In general, Gambardella and Panico (2014) contend that the potential of open innovation is still exceedingly underexploited. They suggested that firms implement inbound open innovation at a moderate level and suggest that firms that adopt inbound open innovation should be cautious on capabilities and environment turbulence. Accordingly, this study contributes to open innovation literature by stressing the importance of capabilities, and insisting the applicability of capability perspective in implanting open innovation but fails to explain about technology exploration through external agents like academia. Hence there is a need to study the collaboration activities and its influence.

There are numerous small and medium endeavors in India that are developing and utilizing information as a wellspring of accomplishment. In any case, these small scale ventures anyway miss out to the huge undertakings as far as monetary maintainability, scope of items, promoting clout, brand and dealing power. These boundaries frequently go about as detour for accomplishment of small and medium endeavors in India. In any case, it is seen that there are number of small and medium endeavors that discover routes in conquering these obstructions and end up creative simultaneously.

(Alcantar & Ngwenyama, 2015; Allart, 2015; Deegan et al., 2015; Dhaoui, 2015; “Digital Capabilities for SMEs’ Innovation in Collaborative Networks: A Literature Review,” 2015;

Garrido, 2016; GPFI, 2015; Harvie, 2015; Hashim, 2015; Heimann & Lehmann, 2015; Willie Krause & Schutte, 2015; Manhart et al., 2015; Mbuyisa & Leonard, 2015; Otejere et al., 2015; Rahim et al., 2016; N. A. Rahman et al., 2015; Schuurman et al., 2015; Sulastri & Dilastri, 2015; Yew & Goh, 2015; Zieba & Schivinski, 2015) found that in the group level, various aptitudes and bits of knowledge enhance beneficially, however the colleagues' extraordinary authoritative foundations may repress group execution. Financial vicinity positively affects the open innovation process, and it very well may be encouraged by a third party by starting contact between improvement accomplices and key clients. They found that economic well-being causes wandering firms to beat advertise defect furthermore, data asymmetry. They examined and displayed as a system and proposed a worldwide open innovation demonstrate as an option way to deal with innovation Mazzola et al. (2015) investigated bio-pharmaceutical firms and found that on the off chance that a firm is halfway situated in a system, this emphatically influences the association's new item innovation process. Studies discovered that both inside and outside scholarly capitals have a noteworthy positive effect on execution among Chinese organizations. The exposure of information causes firms to enhance existing arrangement approaches at the cost of constraining experimentation and narrowing mechanical hunt. Open innovation is helping numerous famous associations to altogether lessen their R&D spending plans. NASA, for instance, figured out how to lessen 45 percent of its R&D spending plan by receiving open innovation, including publicly supporting and innovation arrangement sourcing administrations (Davis et al., 2015).Lazzarotti and Pellegrini (2015) stretched out open advancement research to key basic leadership of family firms. They found that family firms overseen by non-family chiefs receive increasingly forceful development systems and progressively extreme advancements when contrasted with family firms overseen by family supervisors.

At that time family owned business based researches conducted in SME. The Studies demonstrated that most by a wide margin of privately owned businesses were genuinely impacted by the cash related crisis and the Great Recession, including going up against tight credit restrictions.

(S. Ahuja et al., 2016; Aisha et al., 2016; Al-Isma'ili et al., 2016; Basco & Calabrò, 2016; Bley et al., 2016; Bouwman et al., 2016; de Reuver et al., 2016; Enjolras et al., 2016; Fakieh et al., 2016; Galeano & Gaviria, 2016; Giesecke et al., 2016; M. Heikkilä et al., 2016; KRSTEVSKI, D., & MANCHESKI, 2016; Kurniawati et al., 2016; Madrid-Guijarro et al.,

2016; Marín-Idárraga & Cuartas, 2016; Masocha & Dzomonda, 2016; Monge-González et al., 2016; Pucihar et al., 2016; Rezk et al., 2016; Rodríguez-Ferradas & Alfaro-Tanco, 2016; SME Corporation Malaysia, 2016; Vatamanescu et al., 2016; Zakaria, 2016) revealed that First, open innovations in small and medium-sized undertakings are connected to six critical perspectives: looking systems and systems administration; Collaboration; Transforming SMEs from a shut to an open methodology; Innovation and innovation the executives; Open development execution of SMEs; and difficulties of SMEs in open innovation and how to conquer the difficulties. Tanaka et al. (2016) On the other hand, absence of revelation and straightforwardness makes it unthinkable for money related markets to recognize speculation chances to move capital into green ventures. As atmosphere related budgetary revelation expands, speculators will recognize three sorts of hazard: (1) Physical dangers (i.e., dangers of monetary and money related misfortunes because of atmosphere related perils); (2) Transition dangers (i.e., dangers of budgetary misfortunes identified with administrative and financial alterations in a progress to a lower-carbon economy; and (3) Liability dangers (i.e., dangers that obligation protection suppliers need to cover claims for misfortunes emerging from physical or change chance from environmental change).

(Bauer et al., 2017; Thomas V. Edwards, 2017; J. Heikkilä & Heikkilä, 2017; Kotturu & Mahanty, 2017; et al., 2017; Wu, 2017) found that due to intense competition, small and medium-sized enterprises (SMEs) are unable to meet performance expectations and find difficulty in fulfilling the needs of the original equipment manufacturers (OEMs). Consequently, the growth of the SMEs has slowed down considerably. Constrained by their infrastructural resources, SMEs' participation in global value chains (GVCs) has the potential to bring significant benefits, such as enhancing technological learning and innovation and generating positive contributions to the development of the SMEs. To survive in the growing competition hoteliers has to work on innovation and creativity.

(Ahmad et al., 2018; Babic & Golob, 2018; Blatz et al., 2018a, 2018b; Cunha et al., 2018; Ericson et al., 2018; M. Heikkilä & Bouwman, 2018; Hongsaprabhas et al., 2018; Małecka, 2018; Marolt et al., 2018; Maurer & Fritzsche, 2018; Mokwena & Hlebela, 2018; Nyuur et al., 2018; OECD, 2018; Paiola, 2018; Saeidi et al., 2018; Saqib et al., 2018; Sari et al., 2018; Sezer et al., 2018; Shah & Mattiuzza, 2018; Sheen & Yang, 2018; Yosoenarto et al., 2018; Zhang et al., 2018) focused on digital marketing and service sectors for sustainable development in SMEs. Service innovation plays an important role in the organizational performance in this industry; therefore it is relevant here to understand the concept of service

innovation. explores the impact of service innovations (Organization Innovation, Process Innovation, Management Innovation, Marketing Innovation, IT Innovation) on Organizational Performance.

SME has been considered as the pushed division in the financial improvement of the nation with developing significance from varying backgrounds. It is apparent that, generous increment in SME and Retail Credit portfolios alongside business, corporate and institutional loaning, would lead the banks to its higher direction of development, limiting the danger of loaning through portfolio enhancement. In that capacity, the majority of the banks have taken up forceful advertising strategy to enlarge their introduction in SME and Retail Credit. Despite the fact that SME idea is just the same old thing new, as apparent from the foundation of Bangladesh Small and Cottage Industries Corporation (BSCIC), yet a new investigate and try to boosting the division is as yet basic. Bangladesh Bank re-fund plot for SME is excellent.

Naeem Chowdhury, Ph.D told that SME Policy Expert ADB's TA Grant Team Ministry of Industry Government of Bangladesh clarified that SMEs empower enterprising advancement and dispersal of the businesses all through the length and broadness of the nation. It likewise creates a great deal of work openings and the capital expense per worker is low. With the administration segment contributing a noteworthy offer to the GDP and as this segment depends on the SMEs, the degree for SME fund by the business banks has expanded immensely. The legislature is additionally dedicated to give a fillip to the part through infrastructural improvement, expertise formative exertion, and mechanical up degree and by extending the job of Small Industries Development Bank of India in SME advancement. Bangladesh Better Business Forum (BBBF)

Naima Nazneen Rikta, Assistant Director, Policy Analysis Unit (PAU), Bangladesh Bank watched that The development of small and medium ventures (SMEs) regarding size and number has a multiplier impact on the national economy, explicitly on business, GDP development, and destitution decrease in Bangladesh. Previously, the administration endeavored to give SMEs access to back by focused loaning, for example, through mandates that a specific offer (for example 5 percent) of a bank's advance portfolio was to be put aside for small and bungalow industry financing.

### **2.2.9 Importance of Applying Open Innovation in SMEs:**

The newly evolved trends of transformation in the entrepreneurships, their establishment, operation and management, and subsequent alterations in the entrepreneurship's knowledge arena has brought out the idea of open innovation, suggesting that ideas for innovations can transpire or go to market from outside the company as well as inside. Leaders among the global entrepreneurships, among others including researchers, academics and agencies acting as intermediaries are thriving to achieve success in accommodating open innovation (OI) strategies in their business processes or researches or activities leading to additional value gain.(Rahman & Ramos, 2011b)

We believe that, due to the common lack of resources for innovation in these companies, a service capable of involving them in large networks filled with useful and reachable knowledge, and capable of supporting these companies through all the innovation process, is crucial to the future competitiveness of the European SMEs. (Oliveira et al., 2010)

SMEs embrace OI in a different way than the large firms. Hence, overall performance measurement scales for SMEs are additionally different. SMEs use much less formalized R&D procedures, and their networks have distinct characteristics (Spithoven et al., 2013).

Hence, focusing innovation for SMEs would lead to a newer dimension of innovation research for better business and economic growth. The research emphasizes on various open innovation strategies for SMEs at the outset by focusing transformation of innovation processes from a closed boundary leading to a networked paradigm, try to provide some overview on a few innovation strategies, and develop a business mode(Rahman & Ramos, 2010)

Huang et al. (2013) studied over 141 SMEs in Taiwan and observed that OI has a significant mediating impact on the relationship between organizational inertia and business-model innovation, and the relationship between organizational inertia and company performance. They additionally observed that business-model innovation has an effective impact on firm performance. Parida et al. (2012) located that technology sourcing is positively associated to overall performance with regard to radical innovation, and technology scouting is positively associated to overall performance with regard to incremental innovation. However, Kim and Park (2010) observed that exterior R&D has an effective and significant impact on innovation output, but exterior thoughts have a negative effect, and exterior understanding has no influence on innovation overall performance of SMEs. They additionally observed that

exterior innovation activities do no longer appear to enhance the innovation overall performance of SMEs. Suh and Kim (2012) demonstrated that in-house R&D, technology acquisition, and R&D collaboration are positively related to product/service innovation, patenting activity, and process innovation, respectively. Teirlinck and Spithoven (2013) argue that SMEs' engagement in R&D cooperation and outsourcing has a positive impact on the inside R&D personnel of the companies to assimilate exterior ideas. According to Pullen et al. (2012), a closed, focused, and consistent new product improvement networking method has resulted in high-innovation performance. Zeng et al. (2010) have proven that innovation overall performance of Chinese SMEs has been notably positively associated to inter-firm cooperation, cooperation with intermediary institutes, and government agencies. Spithoven et al. (2013) revealed that SMEs possess a great deal of greater depth – ratio of OI activities over employment – for all kinds of OI activities than large firms. Fu (2012) and Parida et al. (2012) have proved that the adoption of OI has an overall positive impact on the innovation overall performance of SMEs.

Open innovation has been widely implemented in small and medium enterprises (SMEs) with the aim of influencing business promotion, value gain, and economic empowerment. However, little is known about the processes used to implement open innovation in SMEs and the associated challenges and benefits. *SMEs and Open Innovation: Global Cases and Initiatives* unites knowledge on how SMEs can apply open innovation strategies to development by incorporating academic, entrepreneurial, institutional, research, and empirical cases. (Rahman & Ramos, 2011c)

According to Spithoven et al. (2013), OI has a positive impact on SMEs' new offerings. Laursen and Salter (2006) located that openness to exterior sources permits SMEs to carry thoughts from outdoor to deepen their knowledge of the technological opportunities reachable to them. Furthermore, Laursen and Salter (2006) argue that over-searching can also negatively affect progressive performances; therefore, exterior looking out must be performed cautiously given that too many search channels may also restrict the major purpose of searching. OI is a difficult choice when business-to-business relations and formal contractual agreements to protect IPs are prevalent (Oakey, 2013). Spithoven et al. (2013) located that SMEs had extra benefits than large companies from the use of IPR protection mechanisms and that the appropriability of the innovation is extra applicable for SMEs. Unlike large firms, SMEs want aid from a broad range of organizations. Theyel (2013) argues that the broader adoption of OI may also provide only few measurable benefits; however it brings some indirect benefits, such as connectivity, awareness, and reputation.

### **2.2.10 Benefits of Open Innovation in SMEs:**

A fairly massive quantity of research in our sample of 126 publications has analyzed the benefits of OI adoption accruing to SMEs. In distinct types of industries, SMEs have been found to generate value from OI (Chesbrough and Crowther, 2006; Van de Vrande et al., 2009) and, even extra so, they are frequently extra advantageous at benefiting from their openness than large organizations (Spithoven et al., 2013). SMEs that are successful at OI initiatives have a longer history of intensely experimenting with and adopting OI practices both at the firm level and at the project level than their unsuccessful counterparts (Yoon et al., 2016). Furthermore, successful SMEs make greater positive use of the assisting tools (e.g., living labs) that are accessible to them (Schuurman et al., 2016). Studies have additionally pointed out that organizational factors assist in developing OI culture and growing innovation overall performance of SMEs (Popa et al., 2017; Pustovrh et al., 2017). The SMEs concerned in OI are commonly first in introducing innovation in the market as a substitute than being a follower (Hochleitner et al., 2017).

Various authors have focused on studying the effects of distinct types of inbound OI approaches on innovation overall performance inside samples of SMEs (Oke and Kach, 2012; Tranekjer and Sondergaard, 2013). Parida et al. (2012), for example, analyze the innovation overall performance of over 250 high-tech SMEs in relation to four inbound OI practices, that is, technology sourcing, horizontal technology collaboration, vertical technology collaboration, and technology scouting. Technology sourcing and vertical technology collaboration have an effective influence on radical innovation; horizontal technology collaboration and technology scouting positively affect incremental innovation inside SMEs. Bjerke and Johansson (2015) find that the innovation overall performance of SMEs is specifically prompted by means of taking part with dissimilar technology partners that are geographically located at large distances from the focal firms. Pustovrh et al. (2017) exhibit that OI things to do involving collaboration and knowledge exchange with the partners appreciably impact on overall performance of the SMEs. Theyel (2013) studied the consequences on the innovation overall performance of 293 US-based SMEs of a number of OI practices along the value chain. This study concluded that SMEs are most possibly to collaborate with OI partners in the commercialization stage of new product/service

improvement and that collaboration in this segment commonly outcomes in effective manner innovations. Though SMEs opt for OI relationships at commercialization stage, the extent and mode of involvement in OI things to do at this stage relies upon on the firm's abilities and method for OI (Henttonen and Lehtimäki, 2017).

A study by Minguela-Rata et al. (2014) inside the context of Spanish SMEs indicates that collaborative family members with suppliers end result in greater innovation performance. The authors additionally locate that the large organizations in their sample of SMEs are extra likely to benefit from OI than their smaller counterparts due to greater absorptive ability and improved management skills. In addition, large organizations inside the SME category are greater likely to generate radical improvements based on their OI practices, while the smallest of SMEs tend to understand commonly incremental innovations.

### **2.2.11 Challenges of Open Innovation in SMEs:**

In spite of being a major economic contributor in many countries, SMEs suffer from various challenges, of inherited nature, often controlled by the social, economic, geographical or cultural grounds and reasons beyond control.(Rahman & Ramos, 2014)

Today's complex and traumatic surroundings impacts especially small innovative firms because they tend to rely more closely than large firms on technological tendencies outside the firm to achieve new expertise (Hicks & Hedge, 2005; Porter, 2000). Since they have a lack of economies of scale and scope (Nooteboom, 1994), small companies have a tendency to preserve a smaller phase of R&D in-house than massive firms. In addition, SMEs' possibilities to unfold hazard amongst their small portfolios are regularly confined (van de Vrande et al. 2009). Especially finance-related issues are boundaries to firms (Madrid-Guijarro et al. 2009). Their confined interior assets minimize the capability to have interaction in modern efforts as nicely as access to new technologies (European Commission, 2005; Pittaway et al. 2004).

A two related complication for SMEs is the growing force in the direction of specialization. Increased international competition leads to amplify in specialization; uncertainty and market fragmentation pressure organizations, especially SMEs, to enhance flexibility and search for new methods to differentiate (Acs et al. 1996). Strategic administration literature emphasizes the want to focal point on a certain value discipline to create fee (Treacy & Wiersema, 1993; Porter, 1980). No enterprise can be triumphant now-a-days by means of making an attempt to



be all matters to all people. The want to focus on a special fee that the company alone can deliver to a chosen market will influence their mix of in-house assets and capability; more specialization is created. As a result, organizations have increasingly fewer understanding bases in common, and therefore lack a basis on which they can communicate with each other. Due to the differentiated technological information and large cognitive distance between the parties (Nooteboom et al. 2007), it becomes greater difficult to speak with businesses outdoor their own industry and also take in the received novel knowledge. When open innovation is preferred, the absorptive potential of groups is challenged (Cohen & Levinthal, 1990; Nooteboom, 2000; Zahra & George, 2002). Moreover, particularly SMEs are affected by means of this problem. For example, they count on fewer human resources (Hausman, 2005) and consequently have to deal with the lack of a large multidisciplinary competence base (De Toni/Nassimbeni 2003).

One crucial assignment to implementing the open innovation method in SMEs in this context is inadequate know-how and consciousness of managers or proprietors (Parida et al. 2012), the traditional selection makers in SMEs, who frequently have a technological history (Bougrain& Haudeville, 2002). Thus, before SMEs contain external knowledge, they want to strengthen and shape their very own capacities (Bougrain& Haudeville, 2002). Previous studies have also shown that SMEs lag behind in the implementation of open innovation (Narula 2004; Lee, 2007; Lee et al. 2010), specifically when it includes collaboration with more effective partners (Narula, 2004).

Once novel knowledge is in-house, SMEs regularly lack structured interior knowledge sharing, gathering and utilization (Varis& Littunen, 2010), and structural fostering of an innovation way of life (Terziovski, 2010) to make the most the novel knowledge. Also, innovation overall performance is negatively affected through the absence of state-of-the-art hierarchical structures (Jones & Tilley, 2003). SMEs experience more difficulty in successful implementation of the innovation process, along with profitable commercialization, than in the invention or thinking technology phase itself (Hutter et al. 2013; Gans& Stern, 2003; Bianchi et al. 2010; Hotho& Champion, 2011). According to O'Dwyer et al. (2009), this lack of commercial competences frequently leads to spontaneous, unstructured and ineffective market introductions and activities.

In general, SMEs have less time and fewer resources to spend on learning, and to acquire and exploit novel expertise outdoor their personal enterprise (Lavie&Rosenkopf, 2006; European

Commission, 2005; Edwards et al. 2005; Mac Gregor, 2004; Narula, 2004; Powell et al. 1996). The open innovation strategy can provide promising ways for small firms to overcome their difficulties (Gassmann et al. 2010; Hotho& Champion, 2011). It can also decrease their time-to-market, their prices and risk, and extend the acquisition of missing information (van de Vrande et al. 2009).

SMEs are more fragile than large firms in conquering difficulties for OI. Resource scarcity for R&D, unsystematic innovation operation, multifaceted nature of logical fields, deficient coordination of innovation activities with operational capacities, and absence of adequate access to logical magnificence are considered as the main difficulties of SMEs for OI (Kim and Park, 2010; Abouzeedan et al., 2013). SMEs should be exceptionally cautious, watch advertises intently, and build up their inside R&D abilities to fulfill clients (Kim and Park, 2010). Padilla-Melendez et al. (2013) contend that exchange and trade of information are two essential pieces of OI, and these issues include acknowledgment of scientists, making IP contracts, and characterizing timescales of undertakings. They found that SMEs give not exactly fundamental accentuation on these issues.

Padilla-Melendez et al. (2013) confide that social capital assumes a critical role for SMEs in exchanging and trading learning. Creating formal, precise, multidisciplinary, and inventive learning identified with the outside condition is likewise basic for SMEs (Bocken et al., 2014). The extent of a SME, its hierarchical stage, its ability to create organization, and its ability to distinguish accomplices with corresponding assets impact the capacity of the SME to actualize OI frameworks (Lichtenthaler, 2008; Gurau and Lasch, 2011). Despite the fact that innovative SMEs realize how to interface with outside sources, Kim and Park (2010) found that their accomplishments as far as OI are as yet not agreeable. Cutting edge SMEs face two noteworthy difficulties: first, building up a profound innovation base that can be shielded from quick impersonation and replication; and second, making innovation based necessities appealing to integral works (Christensen et al., 2005).

SMEs need to grasp new administration ideal models to address the difficulties of OI (Abouzeedan et al., 2013). Laursen and Salter (2006) contend that administrators may overemphasize inward sources and underemphasize outer sources because of the absence of receptiveness to the outside condition. The Web 2.0 innovation has brought another approach to conquer numerous difficulties that SMEs face (Bell and Loane, 2010). For instance, with the assistance of Web 2.0 innovation, SMEs can without much of a stretch speak with outside

associations and people to gain new advancements and learning. Tranekjer and Sondergaard (2013) found that, at venture level, the utilization of market sources associates with greater expenses and that the utilization of science sources with lengthier tasks. Be that as it may, the creators contend that the blend of market and science sources results in lower venture costs. Between firms R&D joint effort is a key to advancement because of the multifaceted nature, staggering expenses, and dangers of item improvement (Braun et al., 2012). Aside from thinking about the potential advantages of cooperation with outer sources, firms ought to likewise think about the comparing drawbacks, for example, mind-boggling expenses and protracted procedures (Tranekjer and Sondergaard, 2013).

In their effort to live to tell the tale and overcome their liability of smallness (Chesbrough, 2010) SMEs are an increasing number of searching for ready companions that can grant them with complementary belongings and resources (Almeida &Kogut, 1997; Audretsch& Lehmann, 2005; Hite &Hesterly, 2001; Mc Evily& Zaheer, 1999; Narula, 2004). However, the complicated surroundings and the confined resources and scanning capabilities make it again difficult for SMEs to find competent partners.

Small and medium-sized corporations are faced by way of a dilemma. On one hand, SMEs want to cooperate with others in order to collect knowledge and other competencies, on the other hand they frequently face difficulties in finding companions and lack the information base and internal shape to accumulate and soak up the required expertise (Kirkels&Duysters, 2010). Fortunately, SMEs have also advantages in distinction to large firms with admire to how they innovate and engage with others. The subsequent paragraph will go into extra element with regard to how SMEs can overcome their challenges.

#### **2.2.12 Strategies for Open Innovation Management:**

Open innovation in entrepreneurships already finds its acceptance at all levels of the business industry for adding value to the business. The value could be in the form of economic gain or enhancement of knowledge leading to a sustained financial base. Open innovation adopts various strategies to accomplish the task for enhancing the value gain. Varying by size, nature, pattern, or characteristics of the firm various strategies are being adopted by enterprises. Though largely known to be familiar in corporate business houses, in recent years open innovation is also becoming increasingly familiar in small and medium enterprises (SMEs) and the trend is rapidly increasing. However, despite the potency of open innovation strategies, most of the enterprises are yet to find a sustained business model, especially for

the SMEs working at the periphery of that value chain. This forms the basis of the current study. This chapter is trying to formulate a business model incorporating partnership approach from academia, research houses, intermediaries, and other stakeholders. (Rahman & Ramos, 2013c)

The thought “strategic management” deals with how corporations boost sustainable aggressive benefits resulting in the introduction of price (Ramachandran, Mukherji & Sud, 2006). Ireland, Hitt et al. (2001) opined that strategic administration can be viewed as putting the context for owners-manager behavior, i.e. the exploitation of opportunities. These include sources for consideration and implementation of key dreams and initiatives adopted by a company's final administration on behalf of its owners based on the evaluation of the competitive internal and external environment (Nag, Hambrick and Chen, 2007).

More importantly, strategic administration affords normal course to the organization and involves specifying the organization's objectives, creating long-term policies and plans designed to reap these objectives, and then allocating assets to enforce the plans. Educators and organizations have created a number of frameworks to support strategic selection in the context of complex environments and competitive dynamics (Ghemawat, 2002).

The concept “strategic management” is not static in nature; the fashions frequently encompass a comments loop to display execution and inform the subsequent round of planning (Lamb, 1984; and Hill & Gareth, 2012). Moreover, it assists companies to make fine selections and techniques with the aid of staying alert to the threats and possibilities in an unsure and dynamic environment.

Furthermore, strategic management includes the associated standards of strategic planning and strategic thinking. Strategic planning refers to the nature of the analytical and formal processes for producing data, and the analysis used as input for strategic thinking, which involves the synthesis of data as a result of the strategy.

Strategic planning may additionally refer to manipulate mechanisms used to put in force the method as soon as it is determined. In other words, strategic planning takes place around the strategic questioning or strategy making recreation (Mintzberg and Quinn, 1995). They similarly noted that strategic management is regularly described as involving two predominant processes: formula and implementation of strategy.

Consequently, the method involves analyzing the surroundings in which the employer operates, then making a collection of strategic choices about how the company will compete. However, formulation ends with a sequence of desires or goals and measures for the organization to pursue.

Moreover, the 2nd principal system of strategic administration “implementation” involves decisions related to how the organization’s assets (i.e., people, technique and IT systems) will be aligned and mobilized in the direction of the objectives. As a result, the implementation outcomes in how the organization’s assets are structured (such as by means of product or provider or geography), management arrangements, communication, incentives, and monitoring mechanisms to song development towards objectives, etc.(Mintzberg & Quinn, 1995). Past research have argued that strategic management research is radically concerned with figuring out variations amongst enterprises” performance by means of analyzing their efforts to advance sustainable competitive advantages as determinants of their capability to create value (Ireland, Hitt& Simon, 2003) and identifying the report retaining thing that make a contribution to a profitable monetary administration (Osotimehinet al., 2012).

Table 2.6: Experimental Reviews of Strategic Management in SMEs

S/N	Name	Methodology	Objective	Results
1.	Verbano and Venturini (2013)	Survey, 1999 to 2009	The study analyzed available literature on the subject of risk management for small and medium sized enterprises from 1999 to 2009	Findings revealed that most studies highlighted greater concern about the financial aspect. They want further that the problem most dealt with is not obtaining a bank credit, but developing and instrument to evaluate the financial solidity of the small enterprise and therefore avoiding the problem of insolvency.
2.	Rahman And Ramos (2013).	Survey monkey where few Selected companies were approached in the web based	The study highlighted the parameters of challenges that are being faced by the SMEs.	This study found that high wage level is creating scarcity of skilled manpower, which is in effect creating lack of skilled resources and at the same time creating problems in enabling purchasing power due to the

		survey, Portugal.		prevailing economic crisis; and high cost of open innovation (IO) including Knowledge about OI strategies remain as other challenges to the SMEs.
3.	Bourletidis (2013).	Interviews - Greek SMEs of different sectors.	The study focused on factor that matters in the handling of the information as a strategic means of handling crisis of the SMEs.	Finding revealed that the strategic management of market Information has an important influence on the SMEs performance. This provided a wide variety of tools and conceptual Frame works to aid crisis anticipation. The study identified Market information available for Effective management of the operations of small and medium scale enterprises.
4.	Lima and Filion (2011).	Descriptive model based on Checkland's (1999) soft	The study intends to present a more realistic picture of SME environment than the more limited concept of a	The study highlighted the usefulness of soft system methodology (SSM) in describing organizational Learning and strategic management in SMEs.
		Systems Methodology (SSM).	"single-headed" organization often seen in studies.	It addressed the situation of SMEs by two systemic models in the organizational learning as A determinant of application in a much more specific way of identifying ways of improving processes in the organizations.
5.	Wang,	Descriptive	They questioned the	Findings revealed that Ownership

	Walker And Redmond (2011).	Analysis	Common approach to understanding this problem Based on identifying Business barriers to planning.	Motivations are central To understanding the planning practices in SMEs and these are an alternative explanation to the common focus on barriers to strategic planning to account for the lack or low levels of such planning in many SMEs. It was however argued that levels of strategic planning are higher in SMEs which have owner-managers who are growth orientated and lower in those which have owner-managers who pursue non-economic personal agendas.
6.	Pushpakum Ari And Watanabe (2010).	Data for the Research were Obtained From a survey of SMEs in Manufacturing Industry in Japan and Sri Lanka	The study investigated the performance differences And business strategy Orientation of small and Medium sized enterprises (SMEs) in two Asian economies.	Results indicated that the performance of SMEs varies with the choice of strategy orientation that owner-managers adopt. The study reinforced the usefulness of business Strategy orientation to managers/ owner-managers of small and medium scale enterprises.
7.	Ahiawodzi and Adade (2012).	Survey and Econometric analysis; Ghana	They examined the effect of access to credit on the growth of Small and Medium Scale Enterprises	The study found a positive relationship between access to credit and SMEs growth in Ghana. Any additional access to credit, increase

			(SMEs) in the Ho Municipality of Volta Region of Ghana	in total current investment, start-up capital, and annual turnover had positive relationship with growth of SMEs.
8.	Amoah-Mensah (2011).	Ordinary Least Square method; 101 firms in Ghana	They studied the strategic Resources that have Influence on the performance of SMEs.	Findings Suggested that firms' internal and external resources are important Strategic resources and depending on the type of firm and industry.
9.	Agwu And Emeti (2014).	Descriptive Research design using 120 SMEs operators.	They discussed issues, challenges and prospects of Small and Medium Scale Enterprises (SMEs).	The result indicated that poor financing, inadequate social infrastructures, Lack of managerial skills and multiple taxation were major challenges confronting SMEs in Port-Harcourt City.
10.	Etut, Etuk And Baghebo (2014).	Descriptive	They examined the impact Of SMEs on the development of the Nigerian economy.	Findings revealed that the prevailing economic And political conditions had not given room for SMEs to thrive in the Nigerian economy.
11.	Abubakar and Yahya (2013).	Questionnaire from a sample of 400 SMEs in Sokoto and Zamfara states.	They examined how strengthening the Small and Medium Enterprises (SMEs) contributes to poverty reduction in north western Nigeria.	Major findings revealed that large enterprises contributed more in the area of employment provision than the SMEs going by the country – Wide data. However, this contradicted the a priori assumption that small and medium enterprises do contribute to employment generation



				and use more indigenous technology than large corporations.
12.	Ogundele, Akingbe, Saka, Elegunde & Aliu (2013).	Nigeria	The study focused on marketing practice of SMEs in Nigeria	They noted various marketing practice used by Nigerian Small Business Enterprises owners which Ranges from, new product development, process development, Process adjustment, segmentation, Price discrimination, direct distribution, personal selling, sales promotion, Relationship marketing, electronic Advertisement and other uses of IT, among the marketing practice.
13.	Ogunsiji (2012).	Survey, 280 SMEs surveyed With 52 questions, 267 questionnaires Were returned, Nigeria.	The study investigates the Influence of demographic Factors on small scale enterprises.	The study affirmed that there was a substantial Level of strategic Management Approach practiced, though at varying degree, in small scale industries. He also found that There Was significant incidence between the level of strategic management practiced and the level of corporate performance of small scale industries.
14.	Safiiyu and Njogo (2012).	Percentage Ranking and Chi-square,	It examined the impact of SMEs in employment generation.	Findings revealed that small and Medium Scale enterprises and Sustainable development of the

		Survey – 120 surveys, Nigeria.		Nigerian economy are related, just as promotion Of SMEs and Improvement In employment generation are related.
15.	Muogbo (2012).	Descriptive analysis; Survey, 120 Workers - Nigeria.	He investigated the impact Of Strategic Human Resource management (SHRM) on small and medium enterprises.	Results showed that SHRM is an important and indispensable tool for any Organizations performance and for any organization that wants to Gain Competitive advantage over others.
16.	Akande (2012).	Chi-square and ANOVA; Survey of 240 Block making enterprises.	He examined the influence of strategic entrepreneurial skills o SMEs in Nigeria.	Findings Revealed that strategic entrepreneurship is a new concept in the country that requires much attention.
17.	Tiemo (2012).	72 SMSE in Delta State, Nigeria with Quantitative Analysis (Chi - square)	He examined the existing Strategies of small and medium sized enterprises in Nigeria to know if they adopt more of unconscious Action or deliberately Planned patterned behaviour.	SMSE did not adopt more emergent strategies than planned but they reacted to issues and challenges as they occur.

Enterprises are day by day adopting newly developed ideas, concepts, and perceptions to fit into the scenery of business dimension from within and outside the boundaries of their entities, thus channeling the entrepreneurships through the paradigm of open innovation. By far, the majority of the corporate businesses and multi-national enterprises are competing or collaborating with a consensus to promote value-added products, processes, or services.

Notwithstanding, they are transforming the entire entrepreneurship infrastructure to face the reality and move ahead. A major portion of the business community, despite their justified contribution to economic growth and generation of employment, the sector belonging to the small and medium enterprises (SMEs), however, are not always in advantageous situations in the arena of open innovation due to many factors, seen, unseen, attended, un-attended, researched, and deserving of further research. To move further into the context of this research, it has been observed that countries ranking as developed economies are ahead in the race, adopting open innovation in their business development, while countries within the developing and transitional economies are struggling to fit into the race of the champions.(Rahman & Ramos, 2013e). This research proposes a general framework to categorize the existing views of innovation and show that innovation as an outcome has not been clearly defined from a knowledge perspective. To address this gap, it is developed a new definition of an innovation and open innovation outcome based on knowledge elements and its applicability into SMEs in Bangladesh.

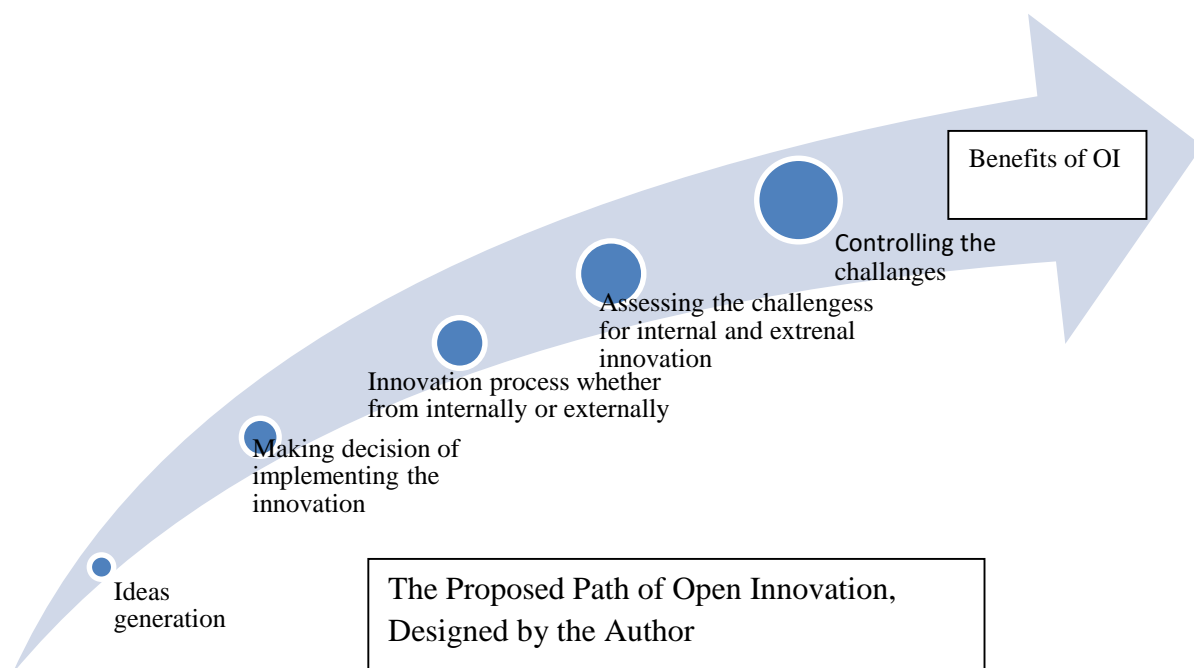


FIGURE 2.2 the Proposed Path of Open Innovation

## 2.2 Research Gap

The reviewing of previous Literatures, it is found that large industries are more intended to adopt open innovation for their betterment, although they have strong research and

development teams. However, For SMEs due to having limited income to expand their internal research and development works, it is a good avenue for them to go for outside. The previous literatures suggest that the SMEs need to go for external sourcing and most of those studies were found in the developed countries. However, in Bangladesh perspective , a very little studies are found to research on this. As SMEs are contributing significantly to the economic growth of the country significantly, it is high time to promote them to be innovative and cooperative towards them for their survival in the fourth industrial revolution. Many of the SMEs will be disappear within very short period of time, if they are not be well prepared for the massive changes in technologies and industrial sectors. It is also the responsibilities for the government to take initiative to provide well planned guidelines and support to the SMEs in this difficult situation. Therefore, this studies aim to find out the priorities sectors in SMEs and preparedness for adopting open innovation, being collaborative and increasing worldwide connectivity in this sectors. From the existing literature background, it is noticed that SMEs are involved in various types of constraints. It is generally assumed by the SMEs in Bangladesh that, if they adopt and exploit external ideas and technologies, they will not be able to make much profit as earlier. Their profits will turn in as cost of money and time, which will increase the risk for them. Nonetheless, SMEs can receive some unique benefits for adopting open innovation than from the large organizations for their specific criteria which will help to consolidate their position in this competitive market. Through collaboration with large organizations, they can apply their technology and business ideas to their own institutions. **The focus has been on how to get business benefits through the application of open innovation in SMEs.**

SMEs need innovation, adaptability and management strategy. From the proper guidance of new thought, SMEs can apply Market planning, Training for workers, Utilize modern technology, Resource management and mobilization, Customized product quality, and Risk management. Networking is an effective way to facilitate open innovation among SMEs. Intermediaries play an important role in establishing external knowledge sourcing and collaboration networks/works.

As seen from the above literature review, no one has identified on motivating reasons and strategies for adopting open innovation in SMEs. The following objectives are highlighted to address the gaps in this research paper:

- i. What are the strategies factors for adopting open innovation in SMEs in Bangladesh?
- ii. What are the characteristics of firms for adopting open innovation in SMEs?
- iii. What are the project level characteristics for adopting open innovation into the firms?
- iv. What are the benefits to adopt open innovation?
- v. What are the challenges for adopting open innovation in SMEs?

## **2.4 Summary**

This study is an extensive survey of open innovation literature. The substance investigation uncovered commitments of major theoretical, experimental and audit articles. A structure of open innovation investigate was made. It features the advancement of existing exploration on open innovation and recommends roads for future research. The investigations looked into above have demonstrated that the progress of SMEs in Bangladesh has given different offices to the shoppers amid the previous ten years. A few variables have helped the SMEs business. Not many examinations have been finished up so far on SMEs industry in Bangladesh.

Based on collected information and discussion of all aspects, it is apparently clarified that the other researchers' focus on national quality policy and adequate support, failed to ensure the quality of products and service, lack of investing and operating funds, banks usually disinterested towards SME financing, lack of veteran academia, all are conducted as a lacking tools which are deeply concern on the point of view almost all of the papers.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter intends to discuss the research methodology that has been used to conduct this study. The thesis first identified the layer of research method to advantageous comprehension of the whole research configuration process. In the wake of considering the significance of the philosophical ideal models planning an exploration, this thesis has adopted a positivistic philosophical approach alongside qualitative research method. A qualitative survey methodology using self-administered questionnaires has been adopted to collect data about the underlying constructs proposed in the theoretical model. These constructs are SMEs dimensions- organizational type, experience, technology adoption, collaboration, reliability and SMEs behavior pattern based SMEs performance. These constructs were operationalized by multi-item measures using 5-point Likert scales, as well as categorical scale, and the items used to measure them were adopted from previously tested scales. Before the final survey a pilot survey was conducted on the actual respondents to discover if there is any problem in the instruments regarding wording, and face validity of the measures. After collecting data from the final survey total 80 usable data were retained for the analysis. To analyze the data two statistical package tools were used; one is Microsoft Excel and the other is SPSS 22.0. After collecting data reliability and validity were verified and then multiple regressions (MR) were used to examine the developed hypotheses for this study.

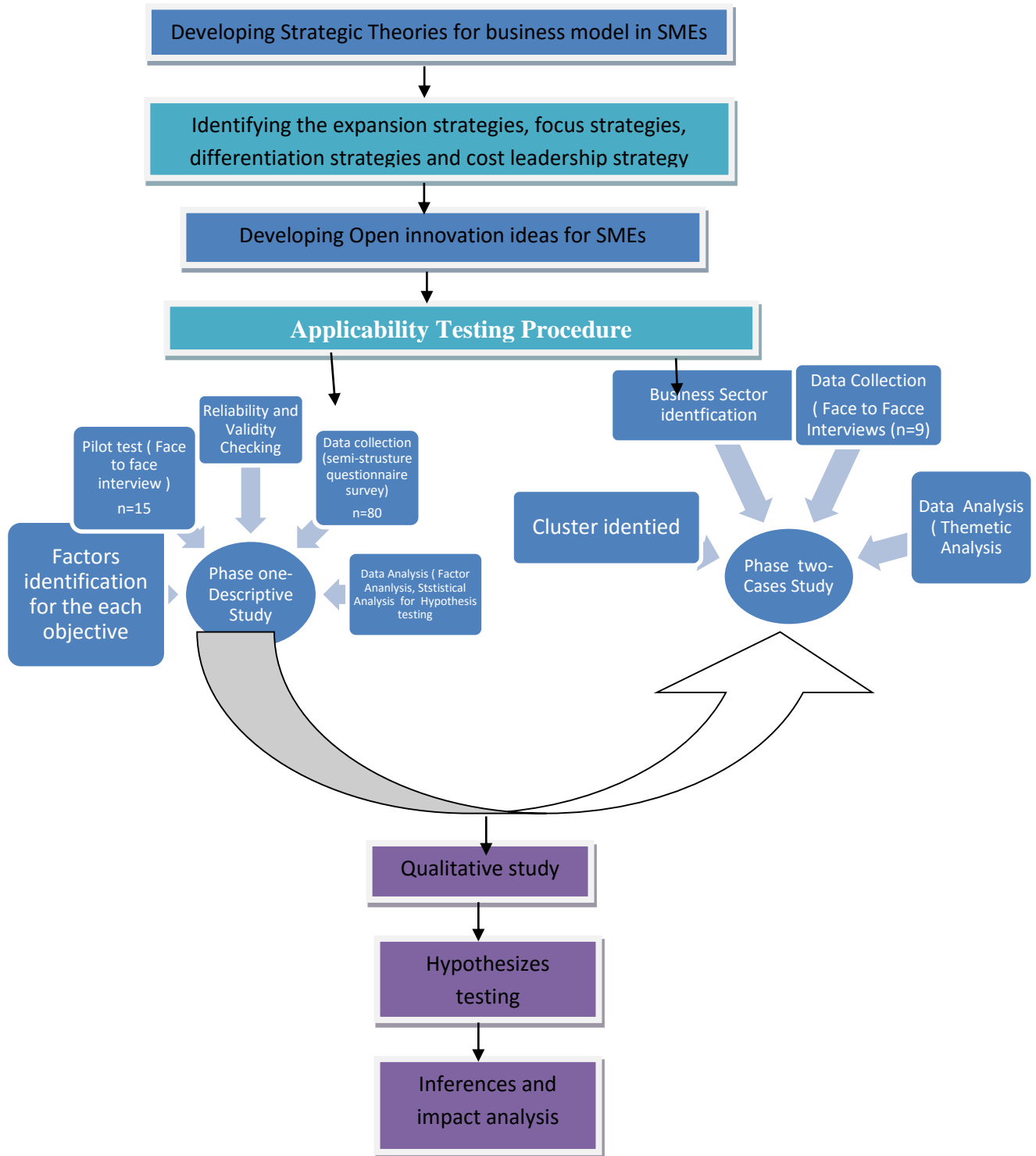
#### **3.2 Research Approaches**

This study is an exploratory research in nature, as such no study is found in Bangladesh. In the developed countries Like Japan, the USA and the many European countries are following open innovation for the SMEs which has been enumerated in literature review. Basically this study is qualitative in nature due to having the characteristics of data. Innovation and open innovation is defined in different ways that has been shown in literature reviews. For this study, open innovation means sharing and collaborating (the any kind of development/ changing in product, process, design marketing, distribution etc) with others outside the firms has been taken. To find out the strategies which motivate the SMEs to adopt Open Innovation can be focused by considering those factors/ strategies Such as: Expansion Strategies (Blue Ocean Strategies), Cost leadership, Focus Strategies (Special focus on goods/ service/market

/network/customer relationship) and competitive Strategies (special focus on management expertise and level of core competitiveness). To find out the relationship between the firms' characteristics and level of open innovation adoption is considered by the factors as: clusters of SMEs/ nature of business, variation of genders in ownership, styles of ownership, age of business operation, target products, strength of R&D, profitability, and target market(domestic/international). To assess the relationship between the project level characteristics and open innovation, the networking with outside consultation and specialization, licensing, joint venture, financing, future plan( specially for next five years) and internal/external attitudes. This objective is chosen for identifying the changing patterns of the business organizations {how the SMEs are going to change within the next 5years and are thinking to survive in the period of 4R(Fourth Industrial revolution)}. To find out the major challenges for adopting open innovation 15 factors are considered from the literatures and they are basically categorized in two different classes. They are administrative/ operational and financial. To find out the major benefits for adopting open innovation 15 factors are identified and they are ranked on the basis of the weight the respondents provided.

### **3.3. Research Design**

As it is mentioned that this research is an exploratory and descriptive in nature, the data was collected very purposefully although in deeply to delineate the inner characteristics of the firms and their readiness to adopt the open innovation. Therefore, two phases of the research are as: questionnaires survey and cases study. Figure 3.1 take the steps a designed deputation of the research design.



**Figure 3.1: The Diagram of Research Design**

As pictorial in Figure 3.1, this study was conducted in two distinct phases. Phase-I consists of five components, identifying factors for each objective, pilot test, reliability and validity checking, data collection, and data analysis. On the other hand, phase-II consist of four components, cluster identified, business sector identification, data collection, data analysis (Thematic Analysis). Related to this study, realizing the significance of the context and the



expectation of innovation of new factors relevant to the adoption of open innovation by SMEs and considering the complexity and evolving nature of the concept of open innovation became essential for this research at the qualitative level.

For these reasons, the research design includes an initial inductive, qualitative phase comprising in-depth interviews with key informants (business owners/managers) in SMEs. The qualitative phase offers the opportunity for participants' perspectives to emerge, which consequently helps in manifesting a perception of the causes behind the judgment to adopt or not to adopt open innovation idea in their enterprises. First, it allows the research phenomenon to be explored when there is limited existing knowledge about the phenomenon. Second, it is a useful approach where less is known about the significant variables to be examined. Third, it is also useful as an approach to benefit more insights before starting a large and costly survey.

The outcomes of this phase then distribute as a good base for formulating research hypotheses from which to develop a model. Finally, it can lead to hypotheses generation.

### **3.3.1 Target Population**

In Bangladesh the total SMEs entrepreneurs are very large and this amount increasing day by day. According to economic census 2013, total number of establishments/firms are 78,18,565 among them 8,66,424 firms are SMEs (859,318 small and 7106 medium) and they are owned by sole ownership, partnership, private, company, government foreign, co-operative, non-profit organization and expatriate type forms. Of them, 93.6 percent are small and 6.4 percent are medium. Hence, target population is 866,424, some selection a criterion has been taken for getting more relevant information. Purposefully only the VAT registration firms have been taken into consideration for addressing them easily so the number of firms are 4,56,537. Among these numbers of firms, researcher has intention to exclude the rural firms because of not having much familiarity to open innovation and non-availability of external knowledge sourcing system.

The 2016 Private Sector Survey estimated that there are about 6million micro, small and medium enterprises, with fewer than 100 employees. About 60 to 65 percent of all SMEs are located outside the metropolitan area of Dhaka and Chittagong. SME Foundation has taken an initiative to evaluate the problems and possibilities of industrial cluster; its speed is very slow. It is necessary to take necessary steps to speed up the evaluation survey. The National

SME policy will emphasize the cluster-based SME development policy which will accelerate the development of SME sector of Bangladesh.

**Table 3.1: SME cluster details in Bangladesh**

<b>Number of clusters in Bangladesh</b>	<b>177</b>
<b>Number of clusters under SME booster sectors</b>	129
<b>Booster SME Out-Of-Area Clusters Number</b>	48
<b>Institution / Venture Total number (estimated)</b>	69,902
<b>Total turnover (million TK) [approx.]</b>	295,150.66
<b>Total employee number (estimated)</b>	1,937,809
<b>Male</b>	1,433,979 (74%)
<b>Female</b>	503,830 (26%)
<b>Number of workers per organization</b>	28
<b>Number of employees per cluster</b>	10,948
<b>Average number of organizations per cluster</b>	394

Source: SME Foundation

According to the information of SME foundation, the major SME clusters of Dhaka division are mentioned below:

**Table 3.2: Major SMEs Cluster**

<b>Division</b>	<b>District</b>	<b>Upazila</b>	<b>Enterprise</b>	<b>Sector</b>
<b>Dhaka</b>	Dhaka	Lalbag	3000	Leather Marking and Leather Goods
<b>Dhaka</b>	Gazipur	Gazipur Sadar	130	Knitwear and Readymade Garments
<b>Dhaka</b>	Narsingdi	Narsingdisadar	300	Knitwear and Readymade Garments
<b>Dhaka</b>	Dhaka	Sutrapur	500	Light Engineering and Metal Working
<b>Dhaka</b>	Narayanganj	Narayanganj sadar	2500	Knitwear and Readymade Garments
<b>Dhaka</b>	Tangail	Deldur	2000	Knitwear and Readymade Garments
<b>Dhaka</b>	Sherpur	Sherpur	60	Agro-Processing
<b>Dhaka</b>	Mymensingh	Mymensingh Sadar	100	Handicrafts and Miscellaneous sector
<b>Dhaka</b>	Munshiganj	MunshiganjSadar	70	Plastics and Other Synthetics
<b>Dhaka</b>	Manikganj	Gheor	100	Handicrafts and Miscellaneous sector
<b>Dhaka</b>	Madaripur	Madaripur Sadar	70	Handicrafts and Miscellaneous sector
<b>Dhaka</b>	Kishoregonj	Kishoregonj	180	Light Engineering and Metal Working

Source: SME Foundation

### 3.3.2 Sample Size

According to the SME foundation, the listed numbers of SMEs institutions are 69,902 which represent the target population for the study. However, the micro firms and rural areas firms are excluded from this study purposefully due to having little or no capability to adopt open innovation which is defined to conduct the research. The Selection Criteria of SMEs in this study is based on number of Employees as not above 300 and not below 10. Since the small and medium industries of Bangladesh are scattered, the research has been selected only from the seven major clusters for the better understanding the suitability to adopt open innovation for each cluster and convenience to handle the variation of the clusters.

Open innovation is not very used concept for small and medium enterprises in Bangladesh. Many people involved in the SME industry in Bangladesh do not have a theoretical idea about this concept, but they do apply it in their business practically. That is why it takes a lot of time to find respondents who are familiar with this concept and apply it in business, which is a limitation of this study. Again no one has done this kind of work in Bangladesh before due to which secondary information is not available. Therefore, the researcher selected only 80 small and medium firms/institutions with having depth interview for the detailed case studies. Therefore, a sample size of 80 respondents was selected in this study as a sample.

**Table 3.3: Sample Allocation**

S.L	Sample Unit	Sample Size
01	Dhaka City	72
02	Gazipur City	05
03	Narsingdi City	03

The 80 SMEs were selected from the seven different sectors and three different regions and were expected to meet the following sampling criteria:

They should be registered and classified as SMEs with the government authority for SMEs Development (SME Foundation).

- i. They should be located in Dhaka division, the capital of Bangladesh. This choice was made for two reasons.
  - (a) First, Dhaka is the commercial hub of Bangladesh, where most of its SMEs are concentrated.

(b) Secondly, it is located in the most economical and industrialized as well as high-tech infrastructure region.

- ii. The selected enterprises will belong to different sectors as different types of industries develop in the region. This condition was considered important because even companies operating in different sectors would in many cases carry more rich data without limiting the sample.

Table 3.4 below shows the types of SMEs in which participants. In this three cluster, research of selected type of SMEs are as manufacturing, services, software development, pharmaceutical and chemical, knowledge Intensive Services textile, leather and leather goods and other. These sectors represent the main businesses sectors in Bangladesh.

**Table 3.4: Types of SMEs**

<b>S.L</b>	<b>Types of Business</b>	<b>Frequency</b>
01	Manufacturing	35
02	Services	18
03	Software and Development	1
04	Knowledge Intensive Services	4
05	Pharmaceutical & Chemical	7
06	Textile	6
07	Leather & Leather goods	3
08	Other	6
	<b>Total</b>	<b>80</b>

### **3.3.3 Data Collection Methods**

Data was collected via targeted individual face to face interviews. This type of interview was regarded to be appropriate for three reasons: the respondents were recognized to have been worried in a concrete situation, the factors and structure of this state of affairs had previously been analyzed by using the researchers, and the interview was once targeted on subjective experiences of participants exposed to the pre-analyzed situation.

The method of data collection for this study was conversation or interrogation. The study collected data from SME entrepreneurs from three different regions of Bangladesh. SMEs were selected using the simple random sampling method. Information has been collected from SMEs listed organization in all these regions. The data collection has been done with

the use of structured questionnaires. The questions of the questionnaires include open-ended questions, close-ended questions, multiple-choice questions and questions based on five point Likert scale. This method can generate less missed information compared with online survey, telephone surveys, and mail surveys. Moreover, the researcher or the research assistant ensures whether the respondents properly completed the questionnaire or not which reduces time consumption in rechecking of the data.

In this study, a combination of each open-ended and closed-ended question was once used. However, it is really worth bringing up that, in practice, open-ended questions were confined to the final part of the survey as the responses to this type of question are difficult to analyze and interpret. Also, various authors have found that the use of open-ended questions play a function in the abandonment of survey completion, suggesting that limiting their use may also be a smart strategy. The closing sections in the survey used solely closed-ended questions, which is a commonly used query type in survey research as they provide rapid and easy-to-handle data.

In particular, four sorts of closed-ended questions had been included: category; list; scale; and dichotomous. The types of question that have been used in the study survey instrument are summarized in Table 3.5.

**Table 3.5: Questions types in the survey**

Question Type		Explanation	Examples
<b>Closed-ended</b>	Category	Respondents are provided with many options from which they need to select a single option.	<i>The degree of competition:</i> “High”, “Low”, “Medium”, “Other”
	List	Respondents are offered a list of options from which they may select one or more applicable option.	<i>The project level characteristics for adopting open innovation in SMEs in Bangladesh:</i> “Networking for intelligence and consulting”, “Licensing”, “Outsourcing”, “Collaborative R&D”, “ Product Development”, “ Market Discovery/Planning”, “ Seles/Distribution/Marketing/Services”

	Likert Scale		
	Dichotomous	Respondents are provided with only two options for a particular question.	Do you have any R & D activities: “Yes” / “No”
	Open- ended	Respondents are asked to express their opinions in free text comments.	In section C: “What do you mean by innovation?”  Respondents were asked to provide additional comments about the research topic.

Alongside the preference of the types of question, query formulation is some other necessary part of the design process. In writing survey questions, it is critical to make certain that every question is associated to the research objectives. Also, it is essential that every question can be without difficulty study and definitely understood as meant by means of all respondents. In recognize of this issue, author has cautioned common guidelines that need to be used to assist assemble easy and clear questions and avoid doable problems.

Consideration of two further issues when developing a survey instrument: (i) planning the content material of the instrument; and (ii) survey layout. With recognize to the first issue, encouraged the researcher to conduct a literature search to ‘adopt’ questions that have been used in existing, examined surveys. Instruments may also make survey administration convenient and make sure content material validity and reliability of the instrument items. In the case of the instrument of this study, the researcher carried out an enormous evaluation of the survey contraptions used in preceding open innovation studies. Therefore, based totally on the data bought from the pre-test, the following factors are highlighted in the fabric:

Table 3.6: General guidelines associated to query formulation that had been used in the improvement of the survey

No.	Guideline	Explanation
01	Avoid long questions	Asking lengthy questions may also lead respondents to ignore answering them and hence may additionally result in incomplete data and/or may additionally lead to respondents discontinuing to reply the survey, affecting the response rate. Keeping questions brief and easy helps to prevent

		reducing the response rate.
02	Avoid use of abbreviations, jargon and colloquial expressions.	Jargon (e.g., technical terms) are tough to apprehend and may cause confusion, lead to missing information and produce low response rates. To avoid this issue, in this study, the researcher supplied a thesaurus of relevant open innovation and SMEs-related terms.
03	Avoid doubled barreled questions, asking about two variables or more in one question.	This type of question incorporates two distinct questions however permits one answer. This leads to a non-response or renders data not possible to analyze and interpret. To keep away from this issue, the question must be cut up into two distinct questions.
04	Avoid very general questions (simple language questions).	The researcher is encouraged no longer to use questions that are too vague or too general; instead, the questions used need to be particular and to the point.
05	Avoid leading questions	A main query is any question that directs respondents in the direction of a particular reply or implies a positive answer. This type of query need to be avoided.
06	Avoid questions that include negatives.	This type of query may additionally lead to confusion and misinterpretation of the question. As such, this type of query needs to be avoided.

With respect to the second issue, survey diagram is any other significant element that needs to be viewed in order to make sure a clear and well-presented instrument, helping respondents in navigating and finishing the survey in an easy manner. In designing the instrument for this phase of the study, clear guidelines have been given in relation to every section, suitable titles and headings have been used, and item groupings had been regarded as they characterize good indicators of a well-designed survey layout. In addition, the format used to be expanded by using standardizing responses to ensure a consistent format, with comparable question formats being used for associated questions. For instance, the use of scaling measures was once constantly utilized all through the survey, with scales aligned in the equal direction (1 intended strongly disagree, and 5 meant strongly agree). This used to be vital as it has been observed to yield two benefits; first, it reduces the time taken to entire the survey; second, it enhances the reliability of the instrument

Another two fundamental design issues that want to be cautiously viewed when designing a survey are question sequencing and area ordering. With regards to these two issues, the researcher adhered to the two regulations recommended in the literature. The first rule is to begin with general and effortless to reply questions earlier than transferring on to extra centered questions. This method helps to set up rapport with respondents and raises their interest in participating in the study. In this study, the survey consequently started out with questions associated to demographic information and general open innovation. The second rule relates to constructing a sense of flow and logical relationships between questions and sections with the aid of grouping questions into sections and clustering items that belong to a precise theme. In the survey instrument for this study, all items associated to organizational characteristics of SMEs had been requested in one section, so the respondents had been greater likely to find the questions effortless to understand as they had a logical sequence. Also, and in a tandem with the logical structure, the instrument was once structured into logically-ordered pages where applicable topics have been introduced on the same page. For instance, pages 5, 8, 10, 11, and 12 of the survey had been aligned to ask questions related to open innovation, project level characteristics, motivating factor, Benefits of adopting open innovation, and Challenges of adopting open innovation variables, respectively (see appendix B).

The language used is every other primary element of the design a good survey instrument. Surveys have to be worded in language that can be understood through the goal respondents. Having a prior perception of the characteristics of the populace of the study would consequently assist to decide the language that must be used inside the instrument. Given that this survey aimed to gather information from SMEs owner-managers whose local language was once Bangla, the ultimate survey instrument was once ‘back-translated’ into Bangla. This was once felt to be quintessential in order to categorical the questions in a way that the goal respondents would recognize and to keep away from misinterpretation and confusion.

The size of the survey is every other essential trouble that requires cautious interest when designing a traditional survey. With this in mind, and primarily based on estimated survey completion instances in research in comparable contexts, it used to be determined that a survey length that should be done within 45-50 minutes would be the most appropriate in order to acquire a reasonable response rate and response quality. Having mentioned applicable survey design issues and indicated steps taken to address them in this study.



In addition, respondents were briefly provided with statements indicating the rationale behind their selection as candidates, as well as an estimate of the time it would take to complete the survey. The introductory pages also presented information on the code of conduct followed in this research phase and briefly explained how confidentiality and anonymity of the responses would be guaranteed. Overall, the final version of the survey had five sections and was comprised of 54 questions. Table 5.3 presents an overview of the structure of the survey instrument. Each section will now be briefly introduced and explained.

**Table 3.7 Overview of the survey structure**

<b>Section</b>	<b>Area</b>	<b>No. of items</b>
<b>A</b>	Personal Characteristics of owner/entrepreneur	06
<b>B</b>	Organization's Characteristics	18
<b>C</b>	Basic Ideas for Open Innovation	12
<b>D</b>	Management of R&D Innovation Activities	10
<b>E</b>	General Questions	03

### **Part A: Personal Characteristics of owner/entrepreneur**

Including background information about respondents is common practice in survey research. Part A was therefore designed to capture demographic information from the respondents, and elicit information on their enterprises/businesses, including firms characteristics. The section was divided into three areas: A.1 (Respondents demographic information), and A.2 (Enterprise demographic information). The overwhelming majority of the measures for items in the three sections were adopted from previously validated studies in the open innovation literature and more specifically from studies that have been conducted to examine the adoption of various technologies or concept in the organization context of SMEs.

In the first area, four questions (Q1-Q3) were used to measure respondents' demographics characteristics. All questions were measured using a nominal scale and were included in the main analysis and as the basis for the descriptive analysis. Table 3.8 summarizes the questions included in this section, the categories and how each question was coded.

**Table 3.8: Questions on Respondents' Demographic Information**

Question (No.)	Demographic Information Included	Categories
Q1	Gender	“Male” and “Female”
Q2	Age	“Up to 30”, “31 – 40 years”, “41 – 50 years and “Above 51years”
Q3	Level of education	“Up to SSC”, “Up to HSC”, “Up to Graduation (Hons./Degree)”, “Masters”, “Other”,

The second area (A.2) comprised two questions to elicit background information about the enterprise. The included questions were about the enterprise's age, size, annual sales, business activity and scope. These items also were measured using a nominal scale and included in the main analysis and as the basis for the descriptive analysis, mainly cross-tabulation. Similarly, the measurement of size was based on the definition of SMEs by SME foundation and the Ministry of Commerce and Industry in Bangladesh, as illustrated in Table 3.9. Table 3.9 summarizes the question included in this area of the survey, the categories and how each question was coded.

**Table 3.9: Questions on SMEs' Characteristics**

Question (No.)	Demographic Information Included	Categories
Q4	Types of Ownership	“Sole Proprietorship”, “Government Partnership”, “Co-operative Company”, “Other”
Q5	Type of Business	“Manufacturing”, “Pharmaceutical & Chemical”, “Services”, “Textile”, “Software Development”, “Leather & Leather goods”, “Knowledge Intensive Services (Education, Health care, Consultancy)”, “Other”
Q6	Age	“Less than five years”, “Between 5-15 years”, “Between 15-30 years”, “More than 30 years”
Q7	Location of	“Dhaka”, “Gazipur”, and “Narshingdi”

	Organization	
Q8	Focuses of Business Activity	“Domestic-Specific Region”, “Domestic-Whole Country”, and “International”
Q9	No. of employees in the organization	“16-30 persons employed”, “31-50 persons employed”, “51-120 person employed”, “121-300 persons employed”, and “300+ persons employed”

The next area comprised a series of questions about adoption and rejection of open innovation in SMEs to categories respondents into adopters. The set of question in this part was once schematic to characterize the dependent variable, response outcome: adopt or not adopt. In addition to this question, the respondents of adopting enterprises were asked about what open innovation concept or technological platforms their enterprises use and the purposes of use. Table 3.10 summarizes the question included in this area of the survey, the categories and how each question was coded.

**Table 3.10: A summary of the open innovation context factors**

	Construct Name	Operational measure (items)
<b>Open Innovation</b>	Collecting new developmental ideas	5 Point Likert Scale
	To have a better understanding of customer needs & expectations	5 Point Likert Scale
	Access to new technologies or technical knowledge used in the firm	5 Point Likert Scale
	Improving the efficiency of the organization	5 Point Likert Scale
	Strengthen relationships with suppliers/customers/distributors	5 Point Likert Scale
	Acquiring new sources of knowledge & technology from external partners to incorporate those developed internally.	5 Point Likert Scale

	Sharing internal technology & knowledge to others.	5 Point Likert Scale
	Combining internal and external knowledge & technology to make a new path of development	5 Point Likert Scale

Firms' Strategy factors associated with open innovation adoption in SMEs. This part of the survey included nine multi-item factors (variables) that were identified during the qualitative phase of this research. Regarding the factors that emerged from the study (Expansion strategy, Cost leadership, Focus strategy, and Competitive strategy), the researcher searched the open innovation adoption literature for relevant operational measures for the three constructs. A précis of the elements that signify symbolize significant in the context of firms' strategy is presented.

**Table 3.11: A summary of the firms' strategy context factors**

SFP Context	Construct Name	Operational measure (items)
<b>Firms' Strategies</b>	<b>Expansion strategy (Blue Ocean )</b>	5 Point Likert Scale
	<b>Cost leadership</b>	5 Point Likert Scale
	<b>Focus strategy (product/service/market/network/customer)</b>	5 Point Likert Scale
	<b>Competitive strategy (level of Competition and Management expertise)</b>	5 Point Likert Scale

This part was designed to recognize the perception of SME enterprise owner-managers in relation to a collection of statements indicating the influence of firm's characteristics factors on the adoption decision of open innovation in their enterprises. The enterprise size used to be decided by means of two measurements, in accordance with the definition of SMEs by means of SME foundation and Ministry of Commerce and Industry. This area of the survey also included questions about target product, strength of R&D, domestic market, and international market. The last two factors, type of ownership and type of business, were operationalized using categorical variables. This study measures the operationalization of the

residences of the entities used in the firms and highlights the value of the current variables in making use of or adopting the open innovation idea in firms.

**Table 3.12: Firms Level Characteristics**

SFP Context	Construct Name	Operational measure (items)
<b>Firms' Characteristics</b>	<b>Target Product</b>	5 Point Likert Scale
	<b>Strength of R&amp;D</b>	5 Point Likert Scale
	<b>Domestic Market</b>	5 Point Likert Scale
	<b>International Market</b>	5 Point Likert Scale

This part was designed to express the views of business owner-managers towards the potential influence of seventh project level characteristics factors: networking for intelligence and consulting, licensing, collaboration with others, outsourcing, financing, market discovery/planning, and product development in the decision to adopt or not to adopt open innovation in their enterprises. The items used to measure these variables are presented in Table 3.13.

**Table 3.13: Project Level Characteristics**

SFP Context	Construct Name	Operational measure(items)
<b>Project Level Characteristics</b>	<b>Networking for Intelligence and Consulting</b>	5 Point Likert Scale
	<b>Licensing</b>	5 Point Likert Scale
	<b>Collaboration with others</b>	5 Point Likert Scale
	<b>Outsourcing</b>	5 Point Likert Scale
	<b>Financing</b>	5 Point Likert Scale
	<b>Market Discovery/Planning</b>	5 Point Likert Scale
	<b>Product Development</b>	4 Point Likert Scale

### 3.3.4 Pilot Studies

As this study is exploratory research, the Piloting Methods has been implemented to move the research forward and ensure the integrity of the research. Pilot studies, specifically known as research feasibility studies, can be used equally for both qualitative and quantitative research methods. Some of the benefits of piloting are that prompting / probing can greatly help a researcher to gain research skills, especially if the researcher is inexperienced in interviewing techniques (Bell, 2014) and to ensure the clarity of the question asked, to remove any ambiguity and improve the flow, increase the reliability and help to increase the validity of the question paper based on the feedback of the participants (Bulearca and Bulearca, 2010).

Before starting the formal questionnaires survey, the invitation of fifteen owners / directors / peers / experts to attend private sessions to incorporate the different views on this new concept to study was arranged. This survey was conducted to pilot study dividing into three main parts : (i) peers (five participants); (ii) context experts (three participants); and (iii) SME business owners (seven participants). In total, the pilot study was conducted with 15 participants. Participants in the first group were given a copy of the question script to test the validity and clarity of the questionnaire designed to conduct the study. Other valuable insights were obtained from contextual experts, all three of whom were Bangladeshi nationals and were aware of the open innovation concepts in SMEs in Bangladesh. The researchers contacted the group via email and received their important feedback. The third and most important group was SME owners or individuals involved in the management of the SME industry, who were important participants in this study. They were interviewed by telephone and asked participants about three relevant topics: (i) the time/duration of the interviews; (ii) the participants' perception of the clarity of the structured interview questions; and (iii) the participants' familiarity with, and reaction to, structured interviews. The SME owners of the pilot study helped to develop a preliminary idea of the type of organizational target and to inform the researcher about the response to the type of question that might arise. Also, the piloting method has played an effective role in estimating the time required for a single interview. More importantly, it provides the research with a clear idea of how to gather information from participants, whether the questions are comprehensible to participants, and to ensure smooth-flowing conversations. Table 3.14 highlights the characteristics and summarizes the areas of useful insight gained from the pilot study.

**Table 3.14: Participants Main Characteristics**

No.	Group	No. of Participants	Targeted area(s)
1	Peer	5	Clarity, syntax issues and validity
2	Experts	3	Comprehensiveness, clarity and validity
3	SME owner-managers	7	Clarity, estimated time of interviews, familiarity with interviews and any other concerns.

### 3.3.4.1 Reliability Test Results

As can be seen in Table 3.15, Cronbach's alpha coefficients for first three of the constructs in the model exceeded 0.80, with the coefficients' scores ranging between 0.08 and 0.90, and list item fall in the given 0.90 to 1.0 which indicating good and excellent internal consistency and hence reliable constructs.

**Table 3.15: Reliability Result**

Constructs	Cronbach's Coefficient Alpha
Open Innovation	0.890
Firms' Strategies Factor	0.844
Firms' Level Characteristics	0.834
Project Level Characteristics	0.933

### 3.3.4.2 Validity Test Results

Analysis of the KMO index and the BTS indicates that the results achieved on both indices fall within the acceptable range. As can be seen in Table 3.18, the analysis indicates that the value found in the KMO index of the variables involved in the six factors indicates better results than the suggested minimum value of 0.6. The available significance of BTS related to the four factors is much less than the suggested values of 0.05. The results obtained from the two indicators suggest that the data collected during the study provide support for FA management.

**Table 3.16 KMO and BTS values in the Factor context**

Context	Measure	
	Kaiser-Meyer-Olkin (KMO) measure of Sampling Adequacy	Bartlett's Test of Sphericity (BTS)
Open Innovation	0.689	72.725 (p = 0.000, < 0.05)
Firms' Strategies Factor	0.688	27.948 (p = 0.000, < 0.05)
Firm's Level Characteristics	0.678	26.716 (p = 0.000, < 0.05)
Project Level Characteristics	0.719	88.173 = 0.000, < 0.05)

### 3.3.5 Interview processes

All respondents were re-explained about the research code of conduct and any concern before to starting the question session. All respondents are informed of their rights prior to the start of the interview and can withdraw from the process at any time if they wish. They were secured that the ingredients gathered during the interview process would only be used for this study and would be rejected after analysis. This seemed to aid alleviate tension, particularly as the majority of the interviewees had no previous expertise with the process. It is noticeable that all of the participants avowed and expressly stated their maximum interest to participate in the study.

The method of data collection for this study was conversation or interrogation where data used to be collected the use of an aggregate of personal interviews, Smartphone interviews and self-administered questionnaires. There are many magnificent advantages that made conversation or interrogation surveying a greater doable and appropriate way in which to gather quantitative data way than different survey modes/types. First, conversation surveying affords a large vary of interactive points and visible factors which may additionally appeal to greater responses and maximize the readability of survey objects. Second, it helps speedy response quotes and, third, anonymity of respondents. Fourth, it permits convenient follow-up and reminders to be dispatched to enhance the response fee. Finally, it provides an effortless manner thru which to collect, smooth and manipulate the information for subsequent evaluation.

Most of the interviews have been carried out throughout the period August-September 2018. In total 10 interviewers (students) had been recruited to aid with the collection of data. All



had been trained before and a tenet document given to them. Data had been gathered from 100 small and medium enterprises that practice open innovation to their organizations. Some SMEs asked for the questionnaire to be both mailed and left at their premises for later collection. Follow-up phone reminders after 15 days contributed a excessive response rate. Finally, 80 out of 100 SME entrepreneurs have been involved in the study and the required information used to be amassed from them through pre-designed questionnaires for the study. In total, 80 interviews were conducted with SME owner-managers operating in a wide range of business sectors. Interviews took place at the sites of the enterprises to ‘create a productive atmosphere’ that is a ‘more informal and quieter setting’. The interview took forty five to 50 minutes to complete. All the interviews had been performed in Bengali (local language) at the area given by means of the respondents. With the authorization of the participants, the interview was once reserved for the future and copied for similarly analysis.

Once the data was once captured in the questionnaires, a sub-sample of a practical number of SMEs and tasks used to be recognized for a carefully matched assessment of respondents from an extensive range of personal backgrounds such as: age, gender, ethnic origin, instructional achievements, as properly as organizational traits that included, amongst others, size, location, market orientation and economic activity. These in-depth interviews solicited qualitative data (case study) that allowed for a comparative analysis.

### **3.3.6 Multiple Case Studies**

Case study is a qualitative research method that is used to examine contemporary real-life situations and apply the findings of the case to the problem under study. In this study, a limited number of conditions were analyzed through case studies to validate the adoption of open innovation concepts applied in small and medium industries. It provides the basis for the application of open innovation ideas and extension of methods. It helps to understand the process of open innovation adoption in SMEs which we have already got numerical grasp through the analysis part. The interview method was used for the data collected for the case study in this study. Interviews were conducted through a semi-structured questionnaire from a pre-arranged institution. Several factors have been considered in the selection of institutions. For example, whether the organization is aware of age, SME listed, open innovation concept, what kind of production is involved in the organization, whether there are any collaborative activities, etc.

In order to explore the adoption of open innovation practices of SMEs, nine (n=09) cases studies were interviewed. These four SMEs were monitored for three months, and various activities of SMEs were observed during this period. All four of these SME cases were purposefully selected; in all SMEs, open innovation has been applied to their production stage for a long time. They were also based in the same technology/concept/idea incubator building in the Dhaka city and all were of similar size in terms of employees and application process. The research framework used was a combination of case study design. Its flexibility thus adjustments were sometimes made to data collection depending on company operations or to take advantage of special opportunities in a given situation. Throughout the case study process, a consistent focus was placed on the search for cross-case patterns within the four SMEs.

### **3.4 Data Analysis**

Using structured interviews, data were collected from 80 SMEs belonging to different sectors and operating in the three different divisions. The purpose of this section is to record and analyze the responses of respondents through interviews. The interviews were exploratory in nature and aimed at in-depth understanding of the factors that are perceived to influence the adoption of open innovation by SMEs in Bangladesh. More specifically, this exploratory stage aimed at illustrating the main reasons that derive the SMEs determinations to adopt or not to adopt open innovation based on the understanding and views of SMEs' owner-managers.

For ease of perception, this part of the section is consist only one segment. Section 3.4.1 provides a common overview of the thematic analysis, as a data analysis technique.

#### **3.4.1 Data Analysis: Thematic Analysis Technique**

There are numerous several types of data analysis methods used to analyze qualitative research, including narrative analysis, discourse analysis, semiotic analysis, content analysis, and TA (Braun, Clarke and Terry, 2014a; Liamputtong, 2009). Among these types, content analysis (CA) and TA are the two mostly applied methods in qualitative research investigation across a length of fields. The two approaches have some uniformity and some distinction. One of the key distinctions is that CA outcomes tend to be quantitative in nature whereas TA outcomes focus on determining and recounting both explicit and implicit concepts (Guest, Mac Queen and Namey, 2011; Joffe and Yardley, 2004)., TA is used to analyze the qualitative data collected via a semi-structured interview instrument. The TA

approach was approved to underpin data analysis of this study for various reasons, primarily based on the advantages determined by several researchers concerning the expansion of TA to analyze qualitative data when compared with other available approaches (see Braun et al., 2014a; Alhojailan, 2012; Guest et al., 2011; Boyatzis, 1998). First, it is a flexible approach. It can be used throughout a size of lookup questions, theoretical frameworks, and distinct sizes of statistics sets, small or large. In light of this, Braun, Clarke and Terry (2014a) stated that TA enables the researcher to answer different types of research questions, including those involved to determined influencing factors, as is the case of this study.

Therefore, in this study, TA would enable the researcher to detect, identify, and explain definition of open innovation, challenges for adopting open innovation, benefits for adopting open innovation and changing pattern of the SMEs (from the case study) in adopting open innovation in Bangladesh.

### **3.4.2 Tools Used for Analysis:**

The analysis part of the present thesis was made by using the various parametric statistical tests namely, Frequency Analysis, Percentage Analysis, and correlation among the factors, ANOVA, t-Test, and Multiple Regression Analysis. In case of a small sample size with large number of variables data calculation can be done by computerized. In the present research Microsoft Excel and Statistical software's SPSS were used for analyzing data. Microsoft excel is used for preparing the base tables, some normal calculation, and draw bar/pie charts for graphical data representation. IBM SPSS version 21.0 is used for statistical analysis. The validity of hypothesis is assessed through ANOVA. The data are analyzed at 95% significance level. For reliability test Cronbach Alpha scores are calculated. For model creation and validation Multiple Regression (MR) has been done along with omnibus test of model coefficients (R-square, Adjusted R-square, Standard error).

In this study we used percentage analysis. Percentage refers to a special kind of ratio. Percentages are used in making comparison of two or more series of data. Percentages are used to describe relationships. Percentage can also be used to compare the relative term, the distribution of two or more series of data.

ANOVA is used as a statistical tool in this study. It is the most commonly quoted advanced research method in the professional business and economic literature. it is a statistical procedure concerned with comparing means of several samples. It can be thought of as an extension of the t-test for two independent samples to more than two groups. The purpose is

to test for significant differences between class means, and this is done by analysis the variances. This technique is very useful in revealing important information particularly in interpreting experimental outcomes and in determining the influence of some factors on other processing parameters.

Cross tabulation is a statistical process that consolidates categorical data and tabulates the frequency of variables. These tables are used to illustrate the association of categorical data. Chi-square tables are also calculated bases on cross tab tables. Chis-square is used for data analysis between a categorical independent variable and a categorical dependent variable. However, the type of dependent variable in this study is continuous, which violates the assumption of Chi-square test. As a result, the Chi-square test cannot be used as a statistical tool in this study.

### 3.5 Research Hypotheses

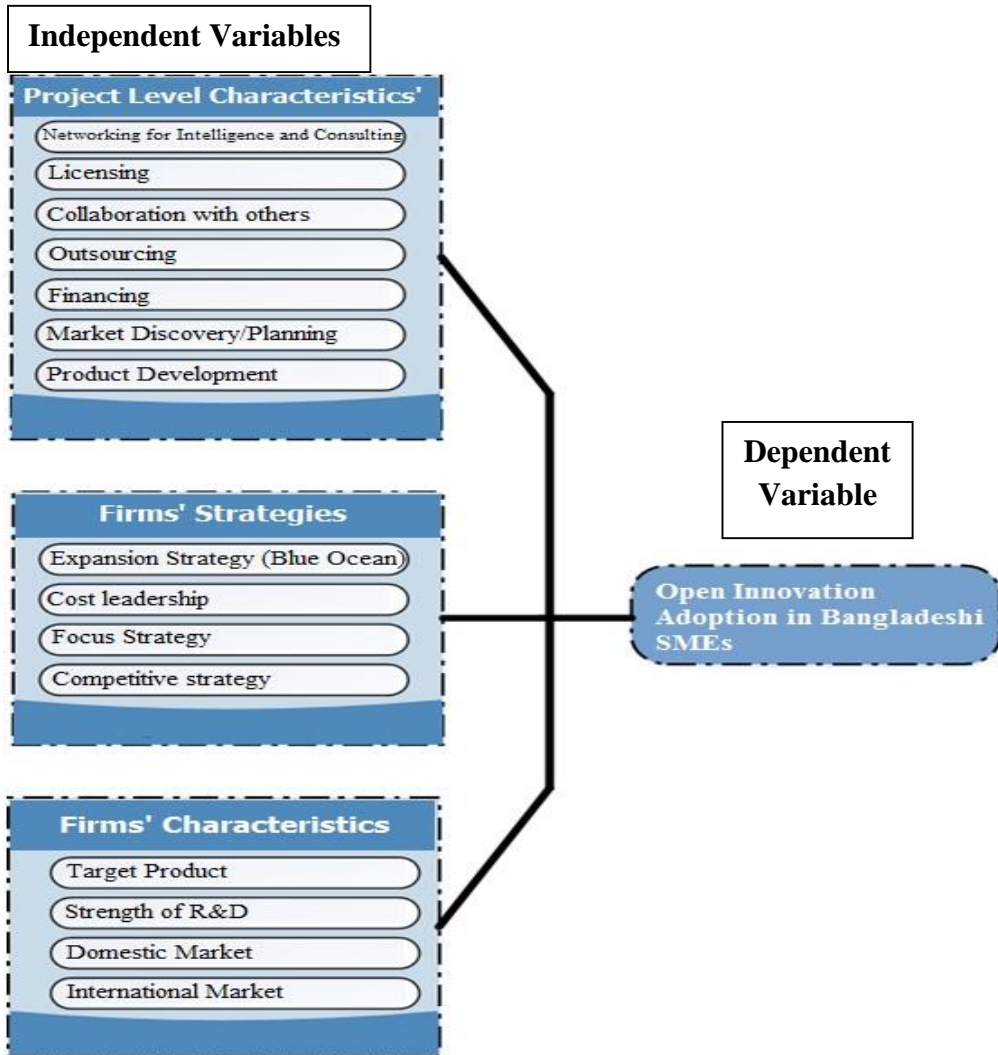
The following hypotheses have been posed to achieve the objective that has been raised in the third chapter to solve the research gap from Literature. The proposed hypotheses under each context are presented in Table 3.17 based on the discussion of the analysis of the interview data concerning the impact of the factors of the SFP.

**Table 3.17: SFP Proposed Hypotheses**

<b>Context</b>	<b>Hypothesis</b>	<b>Hypothesis Statement</b>
<b>Firms Strategies</b>	H1	There is a positive relation between firms’ Strategies and open innovation in SMEs of Bangladesh
<b>Firms Characteristics</b>	H2	There is positive relation between Firms’ Characteristics and open innovation in SMEs
<b>Project Level Characteristics</b>	H3	There is positive relation between Project Level Characteristics’ and open innovation in SMEs

**Factor Based on the SFP Framework**

Figure 3.2 provides a schematic representation of the preliminary SFP model that has resulted from the data analysis of the qualitative data accumulated in phase one. As can be considered from the figure, the preliminary model consists of 15 SFP factors, which are to be validated through a survey administered to a massive sample. More important points on the validation of this model are provided in the next chapter, Quantitative Study.



**Figure 3.2:** The Model of Open Innovation Adoption by Bangladeshi SMEs

Mathematically, the model is expressed for the **1<sup>st</sup> hypothesis** as:

$$OI = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon \dots \dots \dots (i)$$

Where;

- OI= Open Innovation;
- $X_1$  = Cost Leadership;
- $X_2$  = Focus Strategy;
- $X_3$  = Competitive Strategy;
- $\beta_0$  = Regression constant (intercept);
- $\beta_1$ ---  $\beta_3$ = Regression coefficients,
- $\epsilon$  = Error term

The model for the 2<sup>nd</sup> hypothesis is expressed as follows:

$$\text{Open Innovation (OI)} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon \dots\dots(ii)$$

Where;

OI= Open Innovation;

$X_1$  = International Market;

$X_2$  = *Target Product*;

$X_3$  = Domestic Market;

$X_4$  = Strength of R&D;

$\beta_0$  = *Regression constant (intercept)*;

$\beta_1$ ---  $\beta_4$ = Regression coefficients,

$\epsilon$  = Error term

Mathematically, the model for **3<sup>rd</sup> hypothesis** is expressed as follows:

$$\text{OI} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \epsilon \dots\dots(iii)$$

Where;

OI= Open Innovation;

$X_1$  = Product Development;

$X_2$  = Market Discovery/Planning;

$X_3$  = Collaboration with others;

$X_4$  = Licensing;

$X_5$  = Networking for Intelligence and Consulting;

$X_6$  = Financing;

$X_7$  = Outsourcing;

$\beta_0$  = *Regression constant (intercept)*;

$\beta_1$ ---  $\beta_7$ = Regression coefficients,

$\epsilon$  = Error term

### **3.6 Summary**

In summary, this chapter has discussed the outcomes of the qualitative section of the research. It has reported associated research things to do consisting of data collection and data analysis. It has provided the justification for the desire of structured interviews to accumulate data from the research concern as properly as highlighted the methods accompanied to behavior the interviews.

In addition, data collection things to do consisting of sampling, piloting and the authentic interviewing method have been described. This chapter has also justified the use of thematic evaluation to analyze the interview data and has reported the undertaken data evaluation process. Further, this chapter introduced a thorough discussion of the research findings at this stage. Thus, drawing on the evaluation of the interview data, a SFP primarily based framework used to be developed for predicting open innovation adoption, incorporating three factors related to the three contexts of the framework.

## **CHAPTER FOUR**

### **PRESENT SCENARIOS OF SMEs IN BANGLADESH**

#### **4.1 Introduction:**

Quickening development and decreasing neediness, income imbalance and regional dissimilarity are the all-encompassing objectives of the present development worldview in Bangladesh. The primary technique for accomplishing these objectives incorporate formation of profitable work in the assembling and sorted out administration segment and withdrawal of work constrain out of the low skilled and low return agricultural sector and casual activities.

Improvement of small and medium enterprises (SMEs) is imagined as a key component in this development technique. For accomplishing twofold digit development in assembling, coordinating improvement of SMEs is viewed as basic. Improved miniaturized scale, small and medium enterprise exercises in the rural and in reverse areas establish a key part of the system for rustic development and decrease of destitution and territorial dissimilarity (GOB 2011).

The reason for the present examination is to survey the present circumstance of SMEs in Bangladesh economy and assess the way to coordinate the SMEs as a dynamic segment in the economy by conquering the current imperatives and by articulating legitimate procedure for encouraging the improvement of the SME area in assembling to contribute adequately to the target of development and value in the forthcoming 7<sup>th</sup> Five Year Plan.

#### **4.2 History and Growing Development of Small and Medium Enterprises in Bangladesh**

The small and medium industries of Bangladesh have a glorious history. Once upon a time the famous muslin cloth was made in this country. Traditional Jamdani, Nakshikantha, Shitalpati, Bamboo and cane materials are still carrying the tradition of small and medium industry, even if the muslin extinction is extinct. There is no panic if there is a silent revolution between the small and medium industries in the country now. This has been possible through the development of various types of farms, handicrafts, package industries,



starting from poultry industry. At present, this industry has spread across the country. Economy scenario has changed to innovate, manufacture and market small parts of domestic technology.

Machineries made in Bangladesh are now competing with China and India, making the world market place. A few days ago, the essential machinery and machinery were 100% imported, and they are being manufactured here and exported to meet the needs of the country. There is no way to deny the role of this sector in Bangladesh that has been promoted in the middle-income country today. If there is a government sponsorship, it is likely to develop further in the small and medium industries, which will lead the overall economy of the country.

### **4.3 Present Scenarios of SMEs:**

In the last decade, Bangladesh's economy has achieved an annual growth rate of around 7 percent. Bangladesh achieved the status of middle-income country in 2018. In the last year of the seventh Five-Year Plan, the target of achieving 8 percent GDP growth in the year 2019 has been set. Bangladesh wants to be promoted to middle-income countries by 2021 and therefore requires an environmentally friendly environment capable of achieving inclusive, sustainable and adaptable growth. Industrialization is the key tool for achieving higher economic growth and creating jobs. According to many, Bangladesh's growing economic growth is at the root of growing non-agricultural activities.

In the last decade, the manufacturing sector has grown at 7.74 percent and the service sector has been 7 percent. Currently, 33.66 percent of the contribution of industry sector to GDP, which was 21.4 percent in 1990, On the other hand, the contribution of service sector to the country's total GDP is 52.11 percent. The contribution of agriculture to the GDP in the last two years has been drastically reduced. Falling from 29.23 percent in 1990 to 14.23 percent in 2017-18 Even though agricultural contributions are reduced in GDP, agriculture is still the biggest source of employment (about 48 percent). Although a major source of agricultural employment, the main driving force of growth is the industrial sector. The contribution of the industrial sector to the country's total GDP is 33.66 percent. But the industry sector has not yet been able to utilize its potential in organizing surplus labor force for the country's huge agricultural sector. In the developing countries like Bangladesh, SME sector is expected to have the potential to become the main tool of supporting the development and growth of the manufacturing sector as well as in addition to the work of surplus labor force in agricultural sector.

Table 4.1: Average growth rate of major sectors of GDP and economy (%)

Year	Total	Sector wise GDP growth		
	GDP growth	Agricultural	Industry	Services
2010/11	6.64	4.46	9.02	6.22
2013/14	6.15	5.37	8.16	5.62
2014/15	6.54	3.33	9.67	5.80
2015/16	7.11	2.79	11.09	6.25
2016/17	7.28	2.97	10.22	6.69
2017/18	7.86	4.19	12.06	6.39

Source: Bangladesh Bureau of Statistics (BBS)

Table 4.2: Dedicated contribution to GDP (%)

Sector	Share (in percent)							
	1990/9	2000/0	2010/1	2013/1	2014/1	2015/1	2016/17	2017/18
	1	1	1	4	5	6		
Agriculture	29.23	25.03	18.01	16.50	16.00	15.35	14.74	14.23
Industry	21.04	26.20	27.38	29.55	30.42	31.54	32.42	33.66
Service	49.73	48.77	54.61	53.15	53.58	53.12	52.85	52.11

Source: Bangladesh Economic Review 2018

Another aspect of Bangladesh's economy is remittance which can play an important role in SME sector investment. The remarkable flow of remittances sent to expatriates in the country is being noticed. About 8.80 lakh laborers went abroad in FY2017-18, which was 2.70 percent lower than the past monetary year. Be that as it may, Bangladesh earned settlements of US\$14,981.69 million in FY2017-18 which was 17 percent higher than settlement inflows of US\$12,769.45 million in FY2016-17. Year-wise information of internal settlements sent by Bangladeshi ostracizes is appeared Table 4.2. Most of the country's 8-10 million migrant workers live in rural areas and they are interested in investing in productive activities.

However, how remittance can be converted into productive investment is a policy decision-making.

Exemption from remittance sent by the expatriates is expected to be swayed in SME sector investment if the appropriate policy is provided and appropriate incentives.

Table 4.3: Number of Expatriate Employees and Amount of Remittance

FY	No of Employment Abroad'000	Amount of Remittance			
		In Million US(\$)	Percentage change (%)	TK. In Crore	Percentage change
2008-09	650	9689.16	22.42	66674.87	22.81
2009-10	427	10987.40	13.40	76109.60	14.15
2010-11	439	11650.32	6.03	82992.89	9.04
2011-12	691	12843.40	10.24	101882.78	22.76
2012-13	441	14461.15	12.60	115646.16	13.51
2013-14	409	14228.30	-1.61	110582.37	- 4.38
2014-15	461	15316.91	7.65	118993.00	7.60
2015-16	685	14931.14	-2.52	116856.00	-1.79
2016-17*	905	12769.45	-14.48	101099.00	-13.48
2017-18**	880	14981.69	17.32	123156.00	21.82

Source: BMET, Bangladesh Bank.. \*Revised. \*\*Provisional.

#### 4.4 SMEs Development in Bangladesh:

The importance of Small and Medium Enterprises (SME) sector is immense. Economic growth in this sector plays an important role in forming equality based society and empowering women. To achieve Sustainable Development Goals (SDG), there is no alternative to creating huge employment opportunities in the SME sector. Special emphasis

has been laid on empowering women in the United Nations-approved SDG and Global Road Map 2030. Apart from providing guarantees to the women entrepreneurs, providing loans up to 10 lakhs against private guarantees, taking steps for refinance of small interest for women entrepreneurs, giving group-based loan facility, processing loans and processing for short-term different steps have been taken. About half of our population is women. However, the number of entrepreneurs in these women is very small. Women's participation in institutional economic sector is much lower than men. Women's participation in the main stream of economics is essential for sustainable economic growth of the country.

Significant role of small and medium enterprises in the overall economic development of developing countries like Bangladesh is undeniable. Because of this shortage of labor and the production time is short, it is able to contribute rapidly to increase national income and create jobs. This sector can play a pivotal role especially in the development of sustainable development goals, eliminating extreme poverty and hunger and empowering men and women and empowering women. SME sector plays an important role in the economic development of several rich Asian countries. Besides, other countries in the world are also focusing heavily on SMEs. In their view, SMEs are the Employment Generating Machine and that is why they have selected the development of small and medium industries as a tool to achieve economic growth, reducing income-based discrimination and poverty reduction. The present government has identified this sector as a priority sector by adopting SME sector as the driving force of industrialization.

Generally, Bangladesh pursued a development strategy in which private investment was controlled through a large group of directions including speculation authorizing, credit dispensing, import permitting, remote trade distribution, and so forth while these administrative hindrances impeded private interest as a rule; the effect fell unevenly on SMEs. This was a result of the overall powerlessness of the SMEs to adapt to the directions contrasted with their huge scale partners. Along these lines, the arrangement routine was to a great extent one-sided against the SMEs albeit, incomprehensibly, advancing SME improvement was an expressed goal of progressive governments.

In an effort to render its industrial sector universally focused and to move towards more noteworthy proficiency in its creation structure, Bangladesh executed various monetary changes amid the 1980's, guaranteed by the natural auxiliary alteration arrangement. This included deregulation of endorsing methodology and unwinding of other administrative

obstructions, facilitating of import technique, decreasing exchange boundaries, following a market situated conversion scale strategy, and usage of financial, money related and public enterprise changes.

These changes helped evacuate a large piece of the strategy predisposition against SMEs that won before. Ongoing investigations affirm that these changes had positive effects reflected in a genuinely quick development of the part amid the previous decade. Notwithstanding, on account of their auxiliary shortcomings, the SMEs may require all the more expert dynamic arrangements for their improvement notwithstanding the further evacuation of the strategy inclinations.

#### **4.4.1 SME Foundation for Small and Medium Industrial Development:**

The government established SME Foundation in 2006 for sustainable industrialization by creating national economic growth and creating more employment. This foundation has been formed to help overall implementation of the SME Development Policy strategy. Besides, the Foundation is working to provide policy-oriented policy advocacy support for SME sector development. One of the main objectives of the Foundation is to provide updated information and data support to the government, planners, policy makers, executive heads, researchers, professionals, investors, policy makers, establishment of new SMEs and to manage SME institutions in a profitable manner. SME Foundation is working on SME entrepreneurs with SME entrepreneurship in industries, encouraging and motivating SME entrepreneurs on various activities including organizing and organizing national level. One of the functions of the SME Foundation is to involve the general population of the country in the main stream of economic development by creating massive employment at grassroots, local and national levels, eliminating social discrimination and poverty reduction. SME Foundation operates the loan program for entrepreneurs through banks and financial institutions. Due to demand and utility, it is doing various tasks including efficient human resources development.

#### **4.4.2 Bangladesh Bank for SME Development:**

At present, the government is giving priority to the development of SMEs, small and medium industries. Governor of Bangladesh Bank has been playing a leading role in the development of this industry. Bangladesh Bank has taken different loan policy and programs with priority to SME sector. In order to implement loan policies and programs, the Bangladesh Bank

introduced separate SME division in 2010. After launching separate divisions, the Bangladesh Bank took effective steps to implement their loan policies and programs. In order to provide adequate investment support to the entrepreneurs of SME sector from this division of Bangladesh Bank, the country has set the target for the first time SME loan distribution of banks and financial institutions.

Bangladesh Bank governor thinks SME sector is the vitality of our economy. Bangladesh's economic development is not possible without the development of SME sector. As a result, in 2010, the banks were set to invest Tk 23,999 crore in SME sector. Do not be afraid that the increase in credit flow due to the Bangladesh Bank's initiative and surveillance in the SME sector. Entrepreneurs' income and employment also increased. The Bangladesh Bank has defined the SME portfolio for all commercial banks. Each bank has been instructed to invest 40 percent of its total debt to SMEs. How the government promotes industrial policy for the development of SME sector; in the same way, Bangladesh Bank and SME have taken various steps by identifying as the most important sectors. Dr. Atiur Rahman started the division after taking charge of Bangladesh Bank. He started the program with greater importance to SMEs and agriculture. Prior to this division, banks had no separate activities in SMEs. According to the policy of Bangladesh Bank, guidelines are given to each bank to renew the policy. For example, to set up separate divisions for SMEs in each bank, to behave well with women entrepreneurs, to invest in cluster-based investments, to increase the debt distribution, to invest more in manufacturing than trading, the banks are required to contact the concerned chambers, including the various chambers, women entrepreneurs, women chambers and Going to the field level, SME activists by selecting entrepreneurs Remake provide advice to move forward. Bangladesh Bank has fixed the loan limit of small entrepreneurs from Tk 50,000 to Tk 50 lakh. Priority in the distribution of SME loan to women entrepreneurs, each bank has been given the importance of establishing a separate dedicated and dedicated Enterprises Desk. Considering the personal guarantees of women entrepreneurs as collateral, it has been suggested to provide maximum loan up to 2.5 lacs. Bangladesh Bank offers 10 percent interest to women entrepreneurs from the funding fund. By defining the different definitions of the Bangladesh Bank Small and Medium Enterprises, he provides guidance on the light of light. Earlier, people did not know much about SME; now people of all walks of life know about SME Bangladesh Bank has organized fair, seminars, workshops and views on various SMEs in the country.

Bankers and entrepreneurs sit together in a question-and-answer session and publicly organized banks to distribute credit in remote areas of the village. Because of this kind of program, there have been good relations between bankers and individual entrepreneurs and the product is being developed.

#### 4.5 Growth Trend of SMEs

SME sector dominates in Bangladesh's industrial structure. According to Economic Census 2013, more than 97 percent of all economic units of the country are small and medium (including cottage industries and small enterprises) sized industries unit. The number of country's manufacturing units is 8 lakh 68 thousand (2013), which is 75 percent more than the number mentioned in 2001 and 2003 census. The number of SME units in the country's total manufacturing unit is 34 thousand and in these units SME sector dominates in Bangladesh's industrial structure. According to the Economic Summary 2013, more than 97 percent of all economic units of the country are small and medium (including cottage industries and small enterprises) sized industries unit. The number of country's manufacturing units is 8 lakh 68 thousand (2013), which is 75 percent more than the number mentioned in 2001 and 2003 census. There are 34 thousand SME units in the country's total manufacturing unit and about 70 lakh manpower is engaged in these units. According to the Economic Summary 2013, the contribution of vary small, small and medium in the manufacturing sector was 7.8, 16.2 and 6.5 percent respectively, but due to the fact that the information related to the value added data in the financial census is not included in the overall value addition of the manufacturing sector SME sector contribution is not measurable.

However, the contribution of vary small, small and medium financial units to the total value addition of the manufacturing sector using SME survey 2012 data was calculated in 5.9, 23.7 and 23.3 percent respectively. From this, it is understood that the medium size the growth of the industrial unit was not as fast as any other unit of size, which indicates the problem or complexity of transformation in the large institution of small organization.

Table 4.4: Present scenario of SME sector

	Very small (10-24 employees)	Small (25-99 employees)	Medium (100-249 employees)	Large (250 or Above)	SME	Total

Number of Financial Institutions	104007	859318	7106	5250	866424	7818565
Ratio of the total organization (%)	1.33	10.99	0.09	0.07	11.08	100.00
Number of Manufacturing Companies	104007	30890	29991	3123	33881	8684444
Ratio to manufacturing company (%)	11.98	3.56	0.34	0.36	3.9	100.00
Total Deployed Worker	558870	6600685	706112	3466856	7306797	244500850
Deployed employees ratio (%)	2.28	26.94	2.88	14.15	29.82	100.00

Source: BBS, Economic Census Report 2013

The SME sector's growth trend shows some special features of SME sector of Bangladesh. In 2013, the number of non-agricultural finance units in the country was 7.82 million, which was 3.71 million and 2.17 million respectively in 2001/3 and 1986. The increase in the economic unit from 1986 to 2001/3 was 3.4 percent, which rose rapidly to 32 percent from 2001/3 in 2013. The number of manufacturing units in 2001/3 census was 450,000, which increased to 868 thousand in census of 2013, i.e the annual growth rate of the manufacturing unit was about 8.2 percent. The share of the manufacturing unit of total number of non-agricultural finance units decreased from 24.5 percent in 1986 to 12.1 percent in 2001/3 and 11.1 percent in 2013.

From this it is understood that SMEs are promoting non-business and non-marketing activities, although manufacturing activities are increasing at a very fast rate (8.2 vs 7.9 percent) compared to other activities.



#### 4.6 SMEs Contributions to the National Economy:

It is very difficult to quantify the real contribution of the SME sector to the national economy, because there is a lack of necessary data on the SME industry and the definition of SME is different. Based on the data received from various sample surveys, the contribution of SME sector in the national economy has been calculated.

According to a study conducted by ADB (2015), SME sector contributes 25 percent to GDP. On the other hand, according to IFC-McKinsey (2011), SME's contribution to the sector is 22.5 percent. BBS or any other government definition has not yet attempted to calculate the contribution of SME sector to GDP. The IFC-McKinsey survey has calculated that SME's contribution to the country's total exports is 11 percent. The latest financial statements conducted by BBS in 2013 did not include data related to the organization's value additions and outputs. Using SME 2012 survey data, it is said that SME sector contributed 52.9% to manufacturing value addition and 40.9% in manufacturing employment, which means SME is a skilled labor user (Bukht and Home 2014). SMEs have more value added value to workers than small and large organizations. Ahmed (2001) Based on sample-based survey conducted on 18 manufacturing industries, 15 out of 18 organizations have shown positive and more than their TFP1, which indicates the effective use of resources and high productivity. Due to the lack of information, it is difficult to determine the latest trends of productivity in the form of organization.

Table 4.5: Condition of Manufacturing Unit, 2013

	Very small (10-24 employees)	Small (25-99 employees)	Medium (100- 249 employees)	Large (250 or Above)	Total SME	Total
Number of organizations	104007	30890	2991	3123	3388	868244
Ratio of the total organization (%)	11.98	3.56	0.34	0.36	3.90	100.00
Total Deployed Worker	558870	1165564	470343	2916360	1635907	7183446
Total Deployed Staff Ratio (%)	7.78	16.23	6.55	40.60	22.77	100.00

Overall Value Addition (Million TK)	92,092	369,974	363,646		737,235	1562,947
Value added to the worker ('000 TK)	339	501	349		249	312

Source: BBS, Economic Census Report 2013

SME sector is a major source of employment in Bangladesh. Approximately 24 million people are employed here. Approximately 23 percent of them are employed in manufacturing SMEs. It has been found that the employment generation is mainly in those institutions where there are 10-49 people and 50-99 workers. So these two groups have brought the dynamism of the manufacturing sector more than the other groups.

#### **4.7 SME Clusters**

A large number of SME-based industry clusters have been developed in SME sector of Bangladesh. A survey conducted by the SME Foundation is being analyzed around 177 SME clusters in 51 districts of Bangladesh, which has more than 69 thousand industries. These clusters provide various benefits to the SMEs. Various research studies on cluster have found that, in collaboration with clustering and networking organizations, small organizations compete with their organizations to increase their competitiveness and cooperation. Organizations work together and get the benefit of collective efficiencies as well as being associated with large organizations. It also helps in achieving the ability to enter domestic and international markets. So, after identifying the clusters, it is important to determine their current state and consequences.

Although SME Foundation has taken an initiative to evaluate the problems and possibilities of industrial cluster, its speed is very slow. It is necessary to take necessary steps to speed up the evaluation survey. The National SME policy will emphasize the cluster-based SME development policy which will accelerate the development of SME sector of Bangladesh.

Table 4.6: SME cluster details in Bangladesh

Number of clusters in Bangladesh	177
Number of clusters under SME booster sectors	129
Booster SME Out-Of-Area Clusters Number	48
Institution / Venture Total number (estimated)	69,902
Total turnover (million TK) [approx.]	295,150.66
Total employee number (estimated)	1,937,809
Male	1,433,979 (74%)
Female	503,830 (26%)
Number of workers per organization	28
Number of employees per cluster	10,948
Average number of organizations per cluster	394

Source: SME Foundation

## 4.8 Summary

SMEs are more than 90 percent of Bangladesh's industries. Therefore, it is undeniable that SME's role in the industrialization of the country is large. Disagreeing, everyone admits that there is no reason to think of SMEs except for huge employment and industrialized Bangladesh. To take this SME sector at a healthy level, one of the other tasks will be the use of ICT in SMEs. And this requires funding. The government can make a special allocation in this budget. Bank and financial institutions can also be forced by the government to lend to SMEs. In this case, the desired success will not come.

## **CHAPTER FIVE**

### **ANALYTICAL FRAMEWORK FOR ADOPTING OPEN INNOVATION IN SME ENTERPRISES**

#### **5.1 Introduction**

The conceptual framework is a congruence of two bodies of literature, dynamic capabilities approach and open innovation. The focus of the study is to understand the influence of firm position in pushing firms to follow open innovation strategies (collaborative R&D) in changing contextual conditions. The scope of the study is new idea/product innovation in the Bangladesh SMEs industry.

This chapter is the premise of this thesis and looks at the significant writing on subjects like innovation, kinds of innovation, innovation process and open innovation. Six ages of development forms are given together their verifiable rise and portrayal of the procedures themselves in addition to qualities and shortcomings. Besides, firm-level difficulties in open innovation are exhibited. What's more, this part gives better outline of the analyzed wonder and fills in as the reason for the development of the examination inquiries of this thesis.

#### **5.2 Ideas Generation and Mobilization:**

New thoughts are made amid thought age. Preparation happens when the thought is moved to an alternate physical or sensible area, for example, an outside firm or another office.

Motivation for another thought can begin from an improvement of a current thought, or something without any preparation. The Atlantic opens in new window clarifies how Apple held up three years after MP3 players were acquainted with make the iPod, which was alluring, natural and offered limit with regards to up to 1,000 melodies. On the other hand, the development of Scotch tape was a fresh out of the box new thought. Price economics opens in new window recounts to the narrative of Richard Drew, a school dropout who joined 3M, saw a requirement for a sort of tape that wouldn't destroy paint on vehicles and conquered obstacles to finish his innovation.

Because of Drew's hard working attitude, 3M furnishes representatives with time (15 percent of their workday) to investigate thoughts outside of their work assignments. Different associations have pursued this model, and powerful associations all in all furnish representatives with the time and assets to develop.

In this investigation, business visionaries must accentuate innovation to the correct degree "overemphasizing need will make a few workers leave for progressively stable occupations," while "not underlining it enough will diminish desperation and thought age no matter how you look at it."

## **5.3 Innovation and Innovation Processes:**

### **5.3.1 Innovation**

There is a long discussion about how innovation and innovation work in the SME sector of Bangladesh. Although innovation is not a new concept, innovation has begun long ago in small and medium industries in Bangladesh. There are various types of literature on innovation that provide ideas about different definitions and methods of innovation. In its broadest sense, the word comes from Latin "Innovare", meaning 'to create new things or to develop new ideas' (Tid and Besent, 2009, page 16). When we talk about innovation, we cannot ignore the "father's" view of innovation research - Joseph Schumpeter. According to him, the innovation is to develop new or significant advanced products or services, to introduce new manufacturing methods, to open new markets, to identify new sources of raw material supply or to create new industrial structures (Sledzik, 2013, p. 90).

However, at different times, other scholars tried to explain different aspects of innovation. Ted and Bentant (2009, p.16) argues that innovation is "a process of "turning opportunities for new ideas and entering into this widely used practice. According to Thompson, (Bergeh et al., 1965, 2009, p. 1325) defines innovation as "the generation, acceptance and implementation of new ideas," the process of products or services. The UK trade and industry thinks that innovation is "the successful exploitation of new ideas" (Adams et al., 2006, p.22).Trott believes that (Nov 2008, p. 14) "Innovation is a new concept, new technology creation that manages new or improved products in production, production processes or tools involved in marketing process". This definition gives an example that innovation is a complex process that brings together many activities and does not end the process with a new invention. Innovation, being inactive inside the item, procedure and service in an enterprise as it develops normally, and if these three could be intermixed further, for example, consolidating new thought and changes through item, process as well as administration improvement, obligation of development expands (Rahman and Ramos, 2012a). In comprehensive intuition, there are many methods in the writing that help innovation in associations (Caetano and Amaral, 2011).Notwithstanding the over three acquired parameters

of an association, because of the overall idea of innovation, frequently the whole association may should be controlled, for example, hierarchical changes or authoritative foundation the executives, and these would include apparatuses a long ways outside the ability to control of the administration of a solitary substance. They request communitarian endeavors of substances in general or people from various elements to act towards accomplishing the objective. However, in this way coming, forms stay dubious, particularly investigating the unpredictable idea of the business, and particularly when the issue goes to the small and medium enterprises, where the basic leadership is exceptionally thin as the proprietor director in nearly in larger part of the cases needs to deal with every single choice. Hence, comprehension of innovation instruments is critical while inquiring about to assist the small scale enterprises.

Furthermore, innovation can be partitioned into two classifications depending of the dimension of originality- incremental and radical. Incremental alludes to “improve” while radical alludes to “accomplish something other than what’s expected” (Tidd and Bessant, 2009, p.23).

**Table 5.1: Innovations mapped on the 4Ps model.**

<b>Innovation Types</b>	<b>Incremental</b>	<b>Radical</b>
PRODUCT	Windows Vista replacing XP	New to the world software
PROCESS	Improved factory operations efficiency through upgraded equipment	Toyota production system and other ‘lean approaches’
POSITION	Banking services targeted at key segments- students, retired people and etc.	Microfinance
PARADIGM	IBM moving from being a machine maker to service and solution company	iTunes platform - a complete system of personalized entertainment

*Source (Tidd & Bessant, 2009, pp. 23-25)*

### 5.3.2 Innovation Processes

Most of the entrepreneurs perceive the estimation of innovation. In this study, 96 percent of administrators surveyed said that their association's long-term success relies upon growing new thoughts opens in new window. What's more, 87 percent of pioneers trusted their organizations' innovation brought about a decent degree of profitability; be that as it may, 82 percent of respondents didn't make an important refinement between huge innovation and accomplishing steady execution gains .In Tidd et al. (1997 in Dooley & O'Sullivan, 2001, p. 180), the success of innovation is a continuous process that can repeat the strategy to maintain the continuity, so that success is unlikely to be guaranteed”.

The process of innovation in the field of economic, knowledge, field of innovation, historical time and the density of the country can be different from the different aspects. In addition, the innovation process in small and medium industries depends on the size of firm, corporate strategies and previous experience in the field of innovation. There is no innovative process that is capable of making every company's demand. Literary gives different definitions for the innovation process. Here are some important texts about them:

- i. The innovation process can be identified as an innovative solution and any initiative for the development and implementation of it (Kosala, 2015, p. 70);
- ii. The innovation process is the impression of an unsatisfied need, setting the stage following the essential demonstration of knowledge, basic update and improvement (Usher 1954 in Meissner & Kotsemir, 2016, p. 17);

Inability to enhance or adjust to new innovations in the market can prompt the death of an association. Innovation can be as different sorts, for example, "products, services, processes, technique, plans of action, business models, marketing and esteem" (Gous 2014). Inside the area of innovation, we can recognize closed and open innovation. Closed innovation is inside centered with control dwelling inside the association (Chesbrough, 2006). In the last decade, open innovation and its demand have brought many changes in the SME industry in Bangladesh. Basically, the research and development section of the small and medium industries in our country is the main source of innovation, but by opening the outside world, often the increased needs are more appropriate, which compete with classical comprehension.

Here we see two methods: open innovation and close innovation, but open innovation is more likely to apply in the SME sector. Call the robust organizations in management, policy and practice study call fields that can help create a new idea for innovation by an effective innovation process. In this study, "A recipe has been found to innovation sustainable innovation rather than the levels of innovation" and specific stages in the study, which define the most common for successful innovation. Keep in mind that it is very important for every SMEs entrepreneur to understand the process of innovation well, but it has the ability to handle equally well and well from first to last. Let us discuss five step in innovation process.

#### **5.4 Open Innovation and Open Innovation Processes:**

As open innovation is anything but an obvious idea, it can come in numerous structures (Huizingh, 2011) and the definitions utilized may be considerably not the same as our own. In our understanding, open development envelops different inbound, outbound, and coupled exercises, as characterized by Gassmann and Enkel (2004) and Chesbrough (2003a, 2006a). Consequently we just chosen investigations that spread all or an impressive extent of these exercises, and don't concentrate on specific subjects, for example, client development or open source. For each examination, we broke down how the term 'open innovation' was utilized in the article and whether it relates to our meaning of open development.

Since 2003, the open innovation model was popularized and was proposed for innovation and it is based on organization requirements for publication of the organization's innovation and joins external and internal technology to improve business standards. Chesbrough (2003a, 2003b) that introduced the concept of open innovation for the first time, and then became one of the main interests of fast-growing institutions and researchers, which included many dedicated conferences, special issue publishing and rapidly expanding literature (Elmquist, Fredberg, & Ollila, 2009).

The open development worldview (Chesbrough, 2003a, 2006a) remains as opposed to the vertical coordinated innovation worldview; where all information is disguised and exclusively constrained by the firm (Chandler, 1977, 1990). The essential suspicion of the open innovation idea is that the commercialization of outer wellsprings of innovation and finding of outside ways for commercializing inside sourced innovation is beneficial for the firm (West and Bogers, 2013). Gassmann and Enkel (2004) recognized three center open innovation forms. To begin with, the outside-in procedure of open innovation incorporates



various specialists and partners into the development procedure and sources developments from outside the organization (for example inbound open advancement). Outside-in co-task open innovation exercises incorporate the joint effort with outer wellsprings of advancement, e.g., clients and lead clients (E. Von Hippel, 1988), online networks (Christensen et al., 2005) or some other outside master (West and Bogers 2013). And furthermore securing exercises that incorporate the disguise of outer protected innovation through authorizing or obtaining the IPs (Gassmann and Enkel, 2004; Laursen and Salter, 2006; Schroll and Mild, 2011). The second procedure is back to front, open innovation urges firms to use unused inward protected innovation (for example outbound open development) through selling licenses, direct permitting or on middle of the road markets (Arora, Fosfuri, and Gambardella, 2001; Chesbrough, 2003a, 2007). This procedure makes benefit by offering thoughts for sale to the public, selling Intellectual Property and duplicating innovation by means of exchanging thoughts to the outside condition (Gassmann and Enkel, 2004). Lastly, the third procedure is coupled procedure; coupling the outside-in and back to front procedures by working in unions with reciprocal accomplices in which give and take is pivotal for progress (Fey and Birkinshaw, 2005; Gassmann and Enkel, 2004; van de Vrande et al., 2009).

Researchers have proposed ways to classify and categorize this industry. Rahman and Ramos (2010) think that "SMEs play an important role in supplying innovative services or products to the external periphery of the customer chain" and "the focus of SME innovation will result in the new level of innovation research for SME business growth and be May have economic growth".

Studies have shown that open inventions in Bangladesh are becoming increasingly popular among SMEs, opening their innovative processes (Van de Vrande et al., 2008; Gassmann et al., 2010). However, it is important for SMEs to understand the reasons and results of the use of open inventions. It will provide a reasonable idea of why SMEs will use open inventions in their organizations and why it will provide support in related research.

Bianchi et al. (2010) expressed that open development "can be especially trying for small and medium-sized ventures, in view of their engaged business portfolio, specific learning premise, and restricted budgetary assets that can be dedicated to advancement exercises" and further refer to the accompanying difficulties for SMEs:

- i. Coming up short on the assets and capacities in assembling, conveyance and promoting, which are the key for changing innovations into new items and procedures.
- ii. Recognizable proof of promising applications where to industrially misuse restrictive innovations, which are generally in totally unique enterprises from the association's own item business.

Van de Vrande et al. (2008) and Vanhaverbeke (2012) additionally underlined the absence of inward assets and market reach of SMEs to popularize new items, expecting them to team up with outer, frequently bigger accomplices for development achievement. Huizingh (2011) states that having less assets represents a test to SMEs to "construct and keep up community systems and to make and uphold licensed innovation rights".

## **5.5 Strategies Applied in SMEs:**

At present the business world is too much competitive. SME entrepreneurs' decision makers are changing their strategy to survive in the competitive business world. In the last decade, some popular strategic structures have been created to create a new business model and its application has been applied in the small and medium industries of Bangladesh. Thus, a new business model called the "Blue Ocean Strategy" launched by Kim and Mauborge (2004a) creates a stir that quickly gains worldwide publicity and acceptance.

In this segment, we will discuss how to use these techniques in small and medium industries in Bangladesh. Whether there is a significant difference between the strategies, if any, which results are good results in a given case? In this part, I want to show that in Bangladesh, Blue Ocean Strategy (BOS) was following the SME sector in a very long time after using the open innovation.

### **5.5.1 Competitive Strategy**

Competitive Strategy Competitive strategy is a long-term action layout of a organization which is directed to acquire aggressive benefit over its opponents after evaluating their strengths, weaknesses, opportunities and threats in the organization and evaluate it with your own. Michael Porter, a professor at Harvard introduced competitive method concept. This method is focused to acquire above average position and generate a most beneficial Return on Investment (ROI). This approach is very necessary when organizations having a competitive

market and various comparable products reachable for consumers. This strategy mainly focuses on 1. Identifying the present business strategy (implicit or explicit) and defining the industry structure and company position that this strategy assumes. 2. Analyze the actual structure of the target industry and the position of the company relative to this and its competitors. 3. Compare strategic assumptions with reality, evaluate the current strategy along with feasible alternatives and choose the strategy that best reflects the industry structure and the position of the company within it (Belton, 2017; Porter, 1997). According to them only the growth and expansion are not the success of the company, industries can be fragmented, with different firms serving different parts of the market (the low-price mass market, and the expensive high-end market in clothing, for example) and examines strategies that businesses can follow in emerging, mature, and declined market. (Belton, 2017; Porter, 1997).

#### **5.5.1.1 Why Is Competitive Strategy and How Does It Work?**

Competitive strategy includes consistently collecting and analyzing facts about a business's competitors, clients and enterprise in a legal and moral manner so as to obtain an enterprise aspect over the competitors. As the information series must be done lawfully, it ought to be taken solely from publicly reachable sources. The method gained can consist of the competitors' strengths and weaknesses, their aggressive strategy, their response to modifications in the exterior environment and any new moves they would perhaps make. By becoming conscious of such matters as what the rivals are doing or may also do in future and the areas where they are weak, an enterprise can countervail the latter's development by devising a appropriate competitive strategy and making calculated enterprise choices primarily based on the information gathered.

#### **5.5.2 Cost Leadership Strategy**

Cost leadership strategy is challenging to enforce for small scale organizations as it includes making lengthy term dedication for offering products and offerings at lower costs in the market. For this reason, companies want to produce products at low price in any other case it will no longer make profit.

Since the cost leadership means to become low price producer or provider in the industry, Any large-scale enterprise which can supply and manufacture products at low price by means

of achieving economies of scale. There are many cost leadership factors such as efficient operation, massive distribution channels, technological advancement and bargaining power.

#### **5.5.2.1 Why Is Cost Leadership Strategy and How Does It Work?**

Cost leadership happens when an organization is the category leader for low pricing. In order to effectively acquire this except significantly reducing revenue, an enterprise needs to decrease costs in all different areas of the business, such as marketing, distribution and packaging. A cost leadership strategy is a company's layout to turn out to be a cost leader in its category or market.

Developing an effective cost leadership strategy takes some time, lookup and persistence. Officials at an organization will probably want to update its cost leadership strategy frequently to account for charge increases in labor and raw materials, modifications in the market and for new competitors. Here is a how-to guide for developing a cost leadership strategy:

- i. Analyze present operations
- ii. Research competitors
- iii. Identify strategies to decrease costs
- iv. Keep track of progress

#### **5.5.3 Differentiation Leadership Strategy**

Identifying attribute of a product which is special from opponents in the enterprise is the riding component in the differentiation leadership strategy. When a product is in a position to differentiate itself from different comparable products or services in the market through most beneficial manufacturer nice and cost added points it will be capable to charge top rate expenses to cover the excessive cost.

##### **5.5.3.1 Why Is Differentiation Leadership Strategy and How Does It Work?**

Businesses looking to build a differentiation strategy will need to produce or plan extraordinarily unique or specific products or services that create extended value for the consumer. There are various approaches an enterprise can create a differentiation-based

competitive benefit for a single product or the organization as a whole. Here are some steps to create a differentiation strategy:

- i. Decide what you prefer to be recognized for
- ii. Research your goal audience
- iii. Develop differentiators
- iv. Tell your story
- v. Create a manufacturer image

There are two major types of differentiation strategies that an enterprise may additionally carry out:

- i. **Broad differentiation strategy:**

A broad differentiation strategy consists of constructing a manufacturer or enterprise that is one of a kind in some way from its competition. It is utilized to the enterprise and will attract a large variety of consumers.

- ii. **Focused differentiation strategy:**

A focused differentiation strategy requires the enterprise to provide special aspects to a product or service, and it must fulfill the necessities of a specific area of interest or narrow market.

Differentiation strategies have various benefits that may assist you enhance a special area of interest inside your industry. Here are the feasible benefits of growing a differentiation strategy:

- i. Reduced charge competition
- ii. Unique products
- iii. Better earnings margins
- iv. Consumer manufacturer loyalty

**5.5.4 Focus Strategy:** A focus strategy includes offering the niche-customers a product custom-made to their tastes and requirements. It is directed in the direction of serving the desires of a confined consumer group.

According to Hitt, Ireland, and Hoskisson, a niche strategy/focus strategy is an integrated set of actions designed to produce or supply items and offerings that serve the wants of a precise competitive segment. A business enterprise typically follows a focal point approach when it can serve a narrow piece of the market better than competitors.

#### **5.5.4.1 Why Is Focus Strategy and How Does It Work?**

The approach is the determinations of goals and the long-term goals, and the adaptation of movements and the allocation of resources essential for carrying out this goals-chandler. A strategy is quintessential about the future which there is uncertainty. Strategy is all about planning executed for the subsequent day or future and is expected to get the quality outcomes out of the strategy, it is essential for us to cope up for the unsure the following day and be prepared through making ready nowadays against future possibilities. Strategy choices are no longer effortless but complex, the predicted future may additionally occur from complex, social, technical and different interactions and method made the preceding day can retailer in the situation.

The strategic intent and stakeholder analysis are carried out the get the precise expertise of mission and vision statements, a declaration of strategic intent, and an evaluation of stakeholders and stakeholders. It describes the scope of the enterprise in which the market they are searching to compete. It is essential for the employer to make the proper choices; the options can be on the equal channel however ought to no longer go past knowledge. The preferences are additionally made if the organization's center of attention is simply the domestic market or it will go multinational, which can be product-market diversification.

#### **5.5.5 Blue Ocean Strategy (BOS):**

Blue Ocean Strategy is a business strategy that creates new uncontested market places and captures new needs and closes the market competition. The concept of this strategy has recently emerged, though its practice is not so new. Many successful SMEs, organizations and organizations of Bangladesh are in competition, where they have applied these techniques to market place. The idea is to move away from the traditional competition through certain strategic framework that stops trading valuation.

**5.5.5.1 Why Is Blue Ocean Strategy?** In most cases, traders have seen different types of plans and efforts to meet the needs of the buyers and to strengthen their business status in the

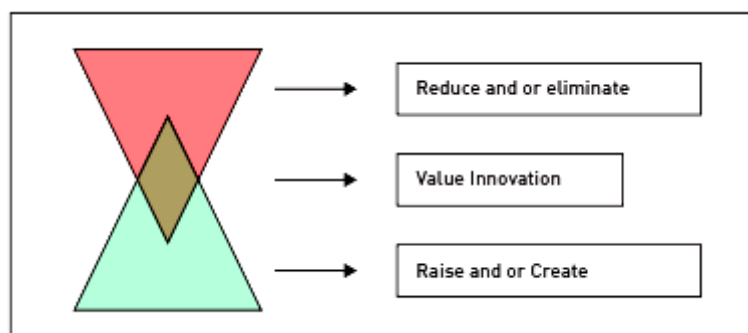
market. It's a dangerous place to be. If you take any wrong decision in those cases you may lose the competition and in the worst case even the whole market place of a product replaced by others company. Blue Ocean Strategy will help you to create new demand among the consumers and create new market place to your product so that you do not get out of competition and others may not compete with your business products. It is not so important to create a new business, but to transform the existing business in such a way so that your product can be added among the customers to add new values to create new needs. Thus, applying a successful blue ocean strategy will improve your business overnight and you can expand your business environment day by day.



**Figure 5.1: Non-customer target areas to formulate Blue Ocean Strategy**

### 5.5.5.2 How Does It Work?

A blue ocean strategy is formulated and implemented by some strategic structures. It basically reduces some of the things provided by the industry and creates some components that do not reduce or provide the industry, and thus capture the market place outside the existing competitive areas.



**Figure 5.2: Formulation of Value Innovation**

### 5.5.5.2.1 Creating New Market Space:

It was contemplated how inventive organizations break free from the focused pack by staking out in a general sense new market space (Kim and Mauborgne, 1999). It was a lot of standards including apparatuses and strategies to help organizations gain an aggressive edge by making uncontested market space or blue oceans. It is tied in with structure a business around a market request that other individuals have not recognized and if an organization can progress nicely, it won't have genuine challenge.

### 5.5.5.2.2 Value Innovation

The foundation of BOS is an idea called value innovation that is to adjust its cost structure and its offer to its clients. Here I allude Kim and Mauborgne (1999) that depicted how organizations can efficiently seek after value innovation by looking over the routinely characterized limits of rivalry furthermore, how value innovation is made, where it influence the two its cost structure and its offer to purchasers. Indeed value innovation is conceivable just when an organization progresses in the direction of accomplishing parity among utility, cost and cost structures of the item and administrations. This entire framework approach makes the production of Blue Ocean economical on the grounds that it incorporates all the company's practical and operational exercises. In this way, value innovation positively affects organizations' cost structure what's more, its offer.

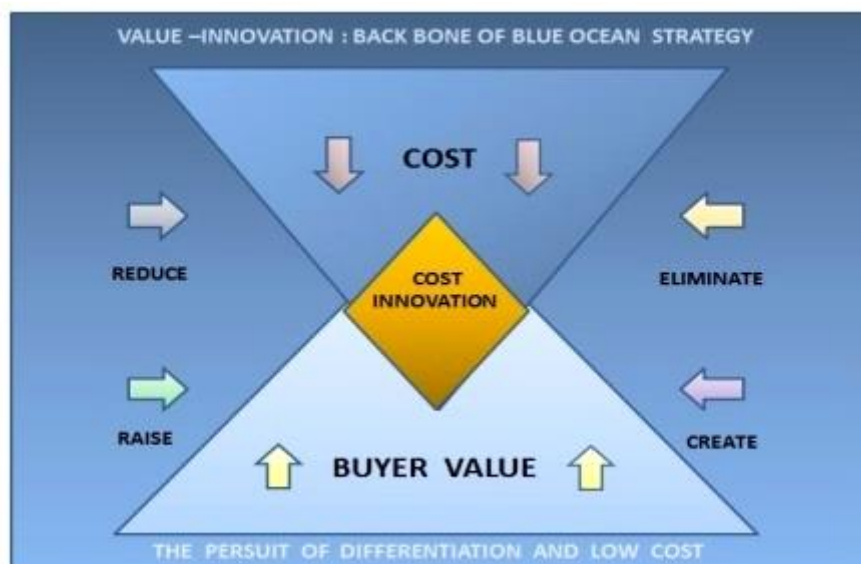


Figure 5.3: Blue Ocean Strategy



Characteristics of a good value innovation strategy:

**Focus:** Not to diffuse efforts across all key factors of competition.

**Divergence:** The shape of the value curve diverges from those of other players

**Compelling Tag Line:** The value curve can be translated into a clear, strong, truthful and compelling tag line.

#### **5.5.5.2.3 Reduction and or Elimination:**

To find a tricky Blue Ocean, Kim and Mauborgne prescribe that organizations think about what they call the Four Actions Framework to recreate purchaser value components in creating another value bend. The system offers four key conversation starters:

**Raise:** What variables ought to be raised well over the business' standard?

**Reduce:** What factors were an aftereffect of contending with different ventures and can be decreased?

**Eliminate:** Which factors that the business has since a long time ago contended on ought to be disposed of?

**Create:** Which components ought to be made that the business has never advertised? Created that the industry has never offered?

#### **5.5.6 Red Ocean Strategy (ROS):**

Then again, Red Ocean implies the typical streamline of business, replicated from the conventional market and is much of the time polished and executed by basic specialists. The individual who wishes to be a fruitful business entrepreneur, it is prescribed to them to dependably attempt to make and actualize Blue Ocean Strategy yet in addition remember that you can't disregard Red Ocean as it incredibly impacts your organization's survival.

##### **5.5.6.1 Comparison between ROS and BOS**

(Kim and Mauborgne, 2015; W. C. Kim & Mauborgne, 2005) studied business launches in 150 companies in 30 industries and discovered a dramatic imbalance in favor of red oceans.

Only 14% of these companies created new markets but in doing so they achieved significantly greater profits than the others. They argue that these companies created a blue ocean -an unknown market space where competition is irrelevant, where demand is created rather than fought over and growth is both rapid and profitable. The logic behind the Blue Ocean Strategy is counter-intuitive. Kim and Mauborgne (2005) make it clear that it's not about technology innovation -blue oceans seldom result from technological innovation. Often the underlying technology already exists with blue ocean creators linking it to what buyers' value. And, there's no need to venture into distant waters to create blue oceans. Most blue oceans are created from within, not beyond, the red oceans of existing industries. Incumbents often create blue oceans within their core businesses. In the Blue Ocean Strategy, Value Innovation plays a dominant role in strategy formulation. Although Kim and Mauborgne (2005) stress that techno-logical innovation is not a defining feature in the creation of blue oceans nonetheless some form of innovation is required.

There are two sorts of structuralism (red ocean); suspicion that working condition is given and reconstructions (blue ocean); with the supposition to shape the earth – between which ought to be suitable relies upon the natural allure, the abilities of the associations have, and whether it has a vital introduction for contending or for advancing. Structuralism technique requires individuals, value, and benefit centering minimal effort or separation where reconstructionist procedure centers on the both (Kim, 2010).

There are two unmistakable procedures for business world - ROS and BOS with the reasoning that red ocean is the customary stuffed realized market space where industry is in a particular limit and there is an aggressive strategy for organizations including a challenge to beat opponents for catching business sector request that limit elite just as make expanding rivalry a bloody ocean; and on opposite, blue ocean is an inconspicuous market field of uncontested market space without accepting contender as an adversary or making rivalry unessential accomplish request and breaking the conventional business limit make new industry inside the current ventures past red sea that is the idea of this new industry is in profound waters.

In Blue Ocean, there are various open doors for organizations to a gainfully quick growth. Whether organizations are aware of the reality, constantly blue ocean has a gigantic application in business space since prior days. The two techniques are existed together and furthermore will dependably in future (Kim and Mauborgne, 2005a). BOS is the strategy for

making esteem and investigating non-clients which make the plan of action canvas appearing total picture of reliable variables for guaranteeing arrangement. The noncustomers for this new market can even be segregated in a Business Model Canvas together with the advancement of a compassion map so as to pick up a more profound understanding (Berry, 2015). BOS is the idea of seeking after separation and ease all the while. It stresses on advancement for both new participant and officeholder by offering an efficient and reproducible strategies and procedures. It is tied in with decreasing expenses while in the meantime expanding client esteem. It is intended to be visual with the goal that it turns out to be anything but difficult to viably execute aggregate insight of organizations (Kim and Mauborgne, 2004a).

Highlights of ROS incorporate the customary method for accomplishing association execution through extreme challenge in existing business sector, beat the opponents, misuse existing interest, make the value or cost exchange off, adjust the organization's useful procedure exercises to its vital decision of ease or separation. Then again, BOS has the significant contemporary highlights to accomplishing authoritative execution however having plainly solid center, disparity, convincing slogan, making uncontested market space, making competition irrelevant, making and catching new interest, severing worth or cost exchange, adjusting entire arrangement of hierarchical practical exercises in quest for separation and cost.

Table 5.2: Strategy focus from traditional competition to creating new market space

<b>Competition in Conventional Boundaries</b>	<b>Head-to-Head Competition</b>	<b>Creating New Market Space</b>
<b>Industry</b>	Concentration on industry competitor	Industry exchange concentration
<b>Strategic group</b>	Concentration on competitive position within strategic group	Industry strategic group focus
<b>Customer group</b>	Focus on adoration better the customer group	Industry customer group redefined

<b>Product and service offerings</b>	Focus on items and service value maximization within industry boundaries	Look across complementary products and service offerings beyond industry boundaries
<b>Industry operational and emotional impulse</b>	Focus on improved price performance with operational and emotional impulse of industry	Industry operational and emotional impulse rethinking
<b>Time</b>	Focus on accommodate to exterior aptitude as they happen	Participation in shaping external trends over time

Adapted from Kim & Mauborgne (1999, January-February)

### 5.5.7 Applying BOS in Organization

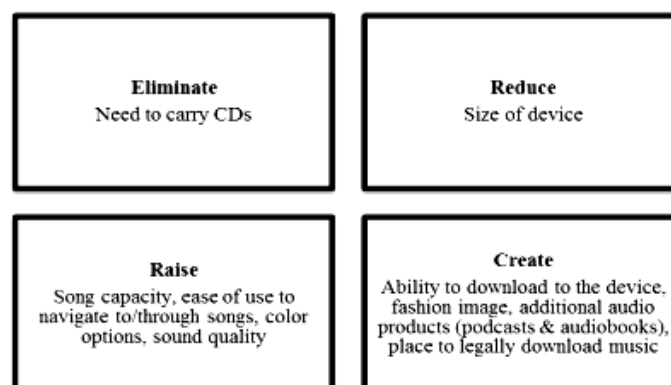
The most ideal approach to depict the engaging quality of the blue seas is to investigate the Blue Ocean Paradox, appeared by Kim and Mauborgne amid an examination in 2005. The consequence of the examination demonstrated that just 14% of all considered business dispatches were made inside the Blue Ocean markets; however these 14% accomplished 38% incomes way and about 62% of benefits way. Contrasted with most of 86% business dispatches in Red Ocean, which had the capacity to get 39% of the all-out benefits way (Kim and Mauborgne, 2004a)? This Catch 22 is by all accounts extremely engaging particularly on specialists, who are continually searching for approaches to build their incomes and benefits. Organizations should quit rivaling one another. The explanation behind this is at the present innovative stages are the contracting market spaces, and the supply is surpassing interest because of globalization. An ever increasing number of organizations join the current markets, the challenge is made on limiting cost premise with falling costs accordingly, yet contending on cost can't be a long haul arrangement (Kim and Mauborgne, 2004a). Different analysts notice that the BOS is best when markets are immersed or in decrease. Accordingly an organization should target totally new client gatherings to expand their client base (Agadoni and Agadoni, 2016). Kim and Mauborgne (2004a) called attention to those organizations need to beat their opposition, yet besides totally disregard them via seeking and entering new and uncontested markets. The principle key accordingly is to discover 1) what clients look for when they purchase an item or administration and after that 2) characterize a complete arrangement. Other than that, the way toward making and finding blue sea markets

isn't tied in with anticipating and additionally pre-distributing business patterns. It is tied in with driving directors who can reorder market substances in an in a general sense new way. BOS makes uncontested market space, makes rivalry insignificant, makes and catches new interest, sever the esteem cost exchange, seeks after separation and minimal effort that demand adventures apply and actualize this system for their improved execution. From their explores, Kim and Mauborgne (2004a) built up their BOS model, which gives a progression of instruments and structures as direction for organizations to make remarkable methodologies to make and create their very own uncontested markets. Blue Ocean has been effectively connected to associations like VIAT (Value Innovation Action Tank) of Singaporean non-benefit association, IKEA-furniture industry, Starbucks, Phillips that observed to be great hierarchical execution (Basri, Ghadzali, and Ismail, 2011).

There are numerous models that are currently accessible for Blue Ocean Strategy as it is getting to be well known quickly. A large number of the native and foreign organizations like Cirque du Soleil, Nintendo, Apple has connected the strategy and made uncontested market field for their own.

In Bangladesh likewise these technique is utilized however it is preferably arbitrary over purposeful. For instance Azad items going to the market with gift vouchers relying upon various events and occasions and request, a thought nobody in Bangladesh at any point thought previously. It devoured its very own market where they had no challenge.

Macintosh The organization was established in 1976 by Steve Jobs and Steve Wozniak. It is the biggest organization on the planet by market capitalization. For very nearly two decades, Apple concentrated on assembling PC programming frameworks until 2001 when it actualized a BOS and propelled the iPod music player (See figure 5), which upset how individuals tuned in to music.



### **Figure 5.4: Product changes (iPad) using ERRC grid**

Organization accomplished ROI of 28.6% every year (given propelled in 2001 and deals information starting at 2012) where venture was US \$3.3 Billion (advancement costs assessed at US \$150 Million, and US \$285 million in promoting every year) and benefit US \$52.5 Billion (As of September 2012, Apple had sold US \$350 Million iPods, expecting a normal income for every unit of US \$150).

### **5.6 Summary:**

Adopting the Blue ocean approach does not mean that your goals outweigh the competition. Instead, your goal is to redefine the boundaries of the industry and manage the competition in that new space that makes competition inevitable.

There was no such business before Uber came up with the idea of ride sharing in Bangladesh. Uber first created the demand for this business among service recipients. That was the first characteristic of the Blue Ocean approach.

The investigation found that the BOS gives benefits in incredible degree to the business. The BOS can be utilized in revenue driven enterprises, not revenue driven enterprises and notwithstanding for the open part. The business needs to pursue the some essential contemplation while receiving the BOS. Blue Ocean Strategy additionally qualifies for certain impediments and dangers. The industries should think the existed dangers and impediments while executing the BOS. The industries ought to have the believability and legitimacy for the acknowledgment of the BOS influencing numerous suppositions about how organizations at present to work which are questionable. Its establishment is poor to the point that its validity is in genuine inquiry. The associations ought to rethink the trustworthiness of the explanatory device existed in the BOS, counsel with the business specialists to receive the BOS, perform SWOT (Strengths, Weakness, Opportunity, Threats) examination to choose whether it will embrace BOS or not, at long last the BOS ought to be supported again for its incredible intrigue in the present aggressive business world.

# **CHAPTER SIX**

## **CHALLENGES AND BENEFITS TO ADOPT OPEN INNOVATION MANAGEMENT**

### **6.1 Introduction**

The contribution of Micro-Small and Medium Enterprises (MSMEs) in the whole economy of the country like India, Bangladesh is tremendous. In the last few years both countries are observing an accelerating growth rate of MSMEs rather than other industrial zone. The SME showing growth in most of the field like Manufacturing, Precision Engineering Design, Food Processing, Pharmaceutical, Textile & Garments, Retail, Agro and Service sector. On one hand MSMEs contribute enormously to the socioeconomic development of the country but they are facing intense pressure and constraints to sustain their competitiveness in a globalized world..(Mulani et al., 2017)As the numbers of small and medium enterprises in Bangladesh are growing rapidly and after starts up many of the organizations are suffering for their survival, the open innovation process can play a vital role in this situation. SMEs are confronting various challenges that are very reasonable because of their size and capabilities in contrast for large companies those are not a trouble.

In Portugal it is found four types of constrains in adopting open innovation Human aspects, general constraints, policy constraints and competition(Rahman & Ramos, 2013b)

In Bangladesh the SMEs are facing challenges of competitive knowledge gap, lack of strategic management, lack of linkage with modern technologies, lack of fund management in term of accessibility, availability and affordability as well as lower market demand etc. These difficulties can be overwhelmed by rehearsing OI successfully. In this specific situation, the practicability and usefulness of adopting open innovation seen from the individual organizational perspective and overall country perspective. It is also important to identify the challenges faced by SMEs to adopt open innovation and to solve those problems. In this chapter, the challenges faced by SMEs, how the challenges are overcome and the benefits the SMEs will receive if the adopt open innovation will move forward in this chapter.

## **6.2 Challenges to Adopt Open Innovation from Individual SMEs Context**

SMEs confront remarkable difficulties for innovation. Abouzeedan et al. (2013) argue that these difficulties incorporate shortage of assets, unpredictability of logical field, coordination of the agent elements of the firm, and access to cutting-edge logical magnificence. Despite the fact that permitting out the learning of SMEs to outside gatherings is gainful for them, it isn't suitable for momentary advantages (Andries and Faems 2013). Christensen et al. (2005) featured that the intricacy of exchange between innovation business visionaries and occupants. They demonstrated that open development here and there acquires high exchange costs. Utilizing information from the European vehicle industry, Dodourova and Bevis (2014) found that SMEs have frail ties with different associations and bigger occupants. SMEs practice open advancement exercises broadly despite the fact that they confront various hindrances while endeavoring to apply open development (Pullen et al. 2012). van de Vrande et al. (2009) contend that most SMEs confront difficulties that are connected with hierarchical and social issues to manage the expanded outside contacts.

These difficulties incorporate wandering, client contribution, outside systems administration, innovative work (R&D) redistributing, and outer participation's. Besides, SMEs in creating nations confront diverse difficulties from the SMEs in created nations. Vrgovic et al. (2012) propose that, in creating nations, an administration office utilizing advancement centers, could help SMEs to interface, impart and work together with free designers and different gatherings to kick off development rehearses. In any case, Wynarczyk (2013) contend that in the worldwide intensity, SMEs are exceptionally subject to two key inward segments – R&D limit, and administrative structure and capabilities, and two outer variables – open innovation rehearses and the capacity of the firm to draw in government stipends for R&D and innovative improvement. The major challenges that the SMEs are facing to adopt open innovation from the literature are:

### **6.2.1 Ambiguous Strategies and Planning of the Individual Organization**

The success of the business operation depends on how clear the business strategies and objectives are and how they are being applied into the organization. Due having unclear and without proper assessing the setting of strategies and planning most of the organizations suffer much. During team work, if the organizations can clearly express their own mission then the combined works bring fruitfulness otherwise ambiguous planning fail to attain the target. So from the initial stage, every start up organization needs to clearly mention its



vision, mission, strategies, core values and competitiveness. Otherwise the absence of those things might be the cause for business failure and facing difficulties in getting finance or supports.

### **6.2.2 Lacking Collateral to Secure Loans in Case of Getting Fund**

A significant part of the SME financing is furnished principally by manages an account with advances being upheld by credit assurances or insurances (Park (2006). The theory of social capital puts accentuation on informal organizations and correspondence emerging from such systems (Putman, 1995; Lin, 1999). Without informal organizations, SMEs keep on thinking about shortage of guarantee to anchor bank credits. However, there is proof that deficient security keeps on devastating the budgetary needs of these SMEs (Apire 2003; Griffiths, 2003; UNEP, 2007). This isn't to suggest that SMEs don't anchor credits from banks. In fact money related experts like Kasekende and Opondo (2003) clarify that some SMEs get credits from monetary establishments. In any case, they uncover that when banks loan to SMEs, they will in general charge them a commission for expecting hazard and apply harder screening measures, which drives up expenses for SMEs.

Notwithstanding security, SMEs are required to show that they have adequate value to add to their organizations, which a significant number of them need (Kiiru, 1991; Tomecko and Dondo, 1992; Oketch, 2000; UIA, 2008). Proof from the Uganda Securities Exchange (USE) Brochure (2013) shows that banks consider absence of guarantee as high credit chance in view of the exchange costs related with profiting credit to such SME organizations. A similar view is held by Kurokawa, Tembo, and Velde, (2008) and Ruffing (2003). There is no single clarification for absence of security by SMEs. What is clear is that restricted interpersonal organizations hinder the capacity of SMEs to secure non-guarantee securities.

### **6.2.2 Limited Access to the Informational Database**

No business enterprise can survive without correspondence and powerful information management (Adler and Rodman, 1997; Defleur and Everette, 1999; Maicibi, 2003). What's more, there is no most ideal way a business enterprise can drive to more prominent statures if information management isn't diverted through informal organizations in which social capital is inferred (Putman, 1995; Lin, 1999; Davidsson and Honig, 2003). Truth be told Petersen (2004) draws a qualification among hard and delicate data, with hard information being progressively numerical and incorporating such things as fiscal reports, installment history

and yield numbers. While delicate information is increasingly subjective and incorporates suppositions, thoughts, bits of gossip, and proclamations of feasible arrangements. A lot of what banks use in relationship loaning and loaning to progressively misty independent companies would be portrayed as delicate information. Nonetheless, SMEs have dependably been powerless to information asymmetries (Zavatta, 2008; Oteh, 2010) or data haziness (Torre, Soledad, Periaand Schmukler, 2010). Haziness makes it is troublesome for banks to learn if SMEs have the ability to pay or eagerness to pay if credit is stretched out to them. This is exacerbated by absence of set up information system, for example, a credit reference authority for following defaulters (Apire, 2003) and mysterious history of past credits and absence of sufficient verifiable records of the association's exchange (Oteh, 2010). As Ruffing (2003) clarifies, absence of budgetary data builds the exchange expenses of banks, or far more terrible makes it difficult to assess the odds of recovering their cash on the off chance that they loan SMEs. Owners or managers of SMEs once in a while keep three arrangements of books: one for the income expert, one for themselves and one for their exes (Kasekende and Opondo, 2003). By the day's end they don't know where their benefit focuses are (Namisango and Lubega, 2014). Different researchers DeYoung, Glennon, Nigro and Spong, (2012) contend that instructive asymmetries among borrower and moneylender may constrain the kinds of loan specialists and the loaning advancements that might be utilized. In a similar accord, Petersen (2004) fights that the sum data accessible on firms will impact their entrance to capital and the structure of budgetary markets and money related organizations.

### **6.2.3 Low Level Technical and Managerial Skills**

There is a strong inter-dependence between human capital, social capital and monetary capital. Specialized and management abilities will decide the measure of social and monetary capital produced for the SMEs. In human asset the executives thinks about, more prominent consideration has focused on the significance of human capital as a pre-requisite for the survival of associations including SMEs(Byars, and Leslie, 2000; Bernardin, 2003; Maicibi, 2003; Armstrong, 2006). Deficient human capital obstructs the capacity of SMEs to fortify their ability to get financing (Longenecker,Petty, Moore, and Palich,2006). This is on the grounds that human capital gives management aptitudes (Kasekende and Opondo, 2003; Tusubira and Nabeta, 2013), enterprising abilities (UIA, 2008) and learning of business opportunities (Tushabomwe, 2006).

In that capacity, SMEs need great quality human capital which additionally implies constrained showcasing and money related arranging, absence of good marketable strategies; poor business records and insufficient corporate administration (Apire, 2003, UNEP, 2007). Likewise, because of their small size, a straightforward administration botch is probably going to prompt crumple of SMEs henceforth no chance to gain from its past slip-ups (Bowen, Morara and Mureithi, 2009).

#### **6.2.4 Lack of Professionalism in both Internal and External Environment**

Morals in business are an essential component for the survival of enterprises paying small heed to measure. A standout amongst the most important elements of morals is trust. A moral is firmly identified with demonstrable skill. The theory of social capital underscores the significance of trust in informal communities at both individual and authoritative dimension (Bourdieu and Wacquant, 1992; Putman, 1995; Portes, 1998; Lin, 1999). In any case, there is proof such that SMEs in Bangladesh need polished skill (Apire, 2003; Tushabomwe, 2006). This is displayed in degenerate inclinations (Kurokawa, Tembo and Velde, 2008), affronting business contracts (UIA, 2008) and conscious hiding of business records on exchanges (Kasekende and Opondo, 2003). Other moral issues incorporate unjustifiable treatment of partners and control of authoritative structure (Tushabomwe, 2006; Ndagu and Obuobi, 2010). There are additionally worries of absence of polished skill outside the control of SMEs, for example, questionable lawful frameworks (Kauffmann, 2005). These moral concerns have debilitated banks from loaning to SMEs. Without moral condition and trust, SMEs miss out on capital financing just as hardship of social capital supported for by the theory of social capital.

#### **6.2.5 Competition with the Large Enterprises**

SMEs dependably confront rivalry in getting to back and advertise (Griffiths, 2003). Various study level studies have discovered that SMEs confront more noteworthy deterrents than extensive firms both as far as getting to back and the fundamental expense of credit (Leo, 2011). However, restricted availability to business sectors compels SMEs from creating capital expected to run every day business tasks. Contrasted with extensive enterprises, SMEs are less effective and cause mind-boggling expenses per unit of income (Ishengoma& Kappel, 2008). They use work intensive technologies compared to larger firms which are progressively capital -intensive. Also, Bangladesh SMEs confront rivalry from the worldwide economy. With poor innovation, rivalry for business sectors and deficient fund, SMEs can't

grow to serve worldwide markets or even build up business linkages with bigger firms. SMEs are regularly required to exhibit that they have adequate value to add to their organizations, which numerous entrepreneurs normally need (Kasekende and Opondo, 2003).

Notwithstanding, larger, older, and foreign firms have an a lot simpler time getting to extension and development capital than SMEs (Leo, 2011). Subsequently, numerous SMEs remain small and casual and utilize straightforward innovation (Kauffmann, 2005). The non-advantageous connection between expansive firms and SMEs because of rivalry suggests that the couple may not create informal organizations from which to infer social capital. This keeps on influencing the capacity of SMEs to get to back.

### **6.2.6 Inadequate Capacity to Afford Long Term Financing**

There are four major wellsprings of long term financing in Bangladesh. These are; capital markets, long term bank credits, renting and held income. Albeit long term financing favors undertakings in immaculate markets, SMEs will in general endure incredibly because of their failure to anchor long term financing even in such markets (Park, 2006). This is valid with Bangladesh where shortage of long term fund is a key hindrance to more noteworthy speculation and development of SMEs. Also, Bangladesh SMEs will in general have momentary business standpoint and work under extremely troublesome business conditions (Mensah, 2004; Kauffmann, 2005; Ishengoma& Kappel, 2008).

Moreover, SMEs will in general depend on casual wellsprings of assets, for example, family, companions and client propels as opposed to depending on bank credits (Ruffing, 2003). All things considered, SMEs keep on working in the endless loop of lacking financing.

### **6.2.7 Low level of Investment in Research and Development of the Organization**

Educated residents will be progressively ready to take an interest in R&D which is essential for development headway and strengthening national power. In light of available information crossing the period from the mid-1990s to 2016, hard and fast interests in R&D extended certainly transversely over Bangladesh and the pacific region. For instance, the proportion of such hypothesis drastically expanded in Australia and the Russian Federation and significantly increased in India, Republic of Korea, Singapore and Turkey. Regardless, open spending on R&D in most Asian-Pacific making countries remains well more regrettable than normal differentiated and made countries around the globe. Addition in R&D utilization

without national R&D strategies and need zones, openness of significant worth researchers and workplaces will do small yet simply realize misusing open assets. The greatest spenders on R&D in the area are moreover among the most made or most rapidly making countries (for instance China, Japan, Republic of Korea, and Singapore) yet unmistakably these countries could make a translation of higher spending into wonderful results. The legislature could cultivate SME driven reasonable improvement in the district by upgrading limit of States through a multi-pronged procedure including.

### **6.2.8 Limited Inclination and ability to Promote Collaboration and Connectivity with the Partners**

Collaboration of SMEs depends on what they are expecting to accomplish. Spithoven et al. (2013) found that SMEs' collaboration effort with outer offices builds their odds of propelling items and services. An investigation by Parida et al. (2012) called attention to that for SMEs, vertical collaboration is important for radical development, and even collaboration is suitable for steady innovation. In any case, under an industry's open system, vertical specialization may result in a decline in the extent of SMEs (Lecocq and Demil 2006). Collaboration of SMEs goes past science and innovation and incorporates esteem chain organizations that bring new information bases which they can retain effectively (Spithoven et al. 2013). Wynarczyk (2013) trusts that open innovation SMEs will in general work together for item presentations though closed innovation SMEs will in general team up for gradual changes of their current items. Concentrates have over and over affirmed that Collaboration for SMEs is more critical in the commercialization arrange than in the beginning times of innovation (van de Vrande et al. 2009; Hemert et al. 2013). The size of the firm is connected with the level of coordinated effort. For instance, examines found that small the extent of a SME less the level of Collaboration (van de Vrande et al. 2009; Teirlinck and Spithoven 2013).

### **6.2.9 Difficulty in Processing the Innovation into Commercialization**

An study by van de Vrande et al. (2009) found that SMEs seek after open innovation chiefly for business exercises, for example, taking care of client demand and staying aware of contenders. Hemert et al. (2013) showed that SMEs' collaboration with wellsprings of innovation is essential not just in the acknowledgment period of the innovation procedure yet in addition toward the end phase of the innovation procedure for the fruitful commercialization of an item or a service. In Korea, Kang et al. (2013) found that the firm

size and the level of government bolster have noteworthy effect on commercialization of SMEs. They additionally discovered that appropriability, imaginative abilities and interest in outer R&D have exceptionally positive effects on SMEs' commercialization. Lee et al. (2010) contend that SMEs are great at developments however need important assets for commercialization.

Hence, they propose that collaboration with different accomplices including middle people at the business stage may assist them with overcoming their constraints for commercialization. Collaboration for SMEs is more imperative in the commercialization organize than different stages such ideation, and R&D (van de Vrande et al. 2009; Hemert et al. 2013; Theyel 2013). For SMEs, open innovation is less successful for developments than for deals (Chaston and Scott 2012; Spithoven et al. 2013). Nonetheless, collaboration with industry occupants beats difficulties SMEs experience (van de Vrande et al. 2009). Given the critical pretended by SMEs in the Bangladesh economy, it is fundamental to relieve these difficulties by concentrating on systems that improve great financing conditions. Such techniques are examined beneath.

#### **6.2.10. Limited Scope to Adopt Advanced Technologies and cover the Technological Challenges:**

There is no substitute for the proper excellence of technology to build a technology dependent economy. There is a lack of skilled manpower to apply open innovation in small and medium industries in Bangladesh. In every industry, the advances in technology move to business through organizations. Specially in SMEs, having the right technology for the right job can mean the difference between success and failure. Here are five of the biggest technology challenges faced by SMEs at present are: Scalability, Choice, Cost, Security and Time. For example, . SMEs often start with a basic IT capability and outgrow it quickly, leaving the business with an urgent need for new software and systems. This results in quick fixes and bolt-ons being added to existing infrastructure when sometimes a clean slate is needed. As with many aspects of business, if you can get it right when you're small then it's easier to scale up when you grow. Another aspect is business does not need to be a large corporation with thousands of staff and clients to be an attractive target to cyber criminals. SMEs are often more attractive to hackers because they have less mature security systems and less resource to dedicate to security. This means that ensuring data is secure is vital to the SME, but knowing what to choose from a huge range of products and how much to spend can

be a significant challenge to business owners. Therefore, knowing the upgrading time is significantly crucial for the organizations.

Research by the Enterprise Research Centre found that the most common technologies used by small businesses are cloud computing, customer relationship management software (CRM), and e-commerce. There are, however, a multitude of different apps that can be used in business from time management software to apps that allocate bonuses to staff for good work. The challenge is having the right amount of technology to help you and your team save time and money without being overloaded with software to maintain. A recent report by You Gov on behalf of Telegraph Spark and Yorkshire Bank found that the biggest barrier to adopting new technology amongst SMEs was, unsurprisingly, cost. The reality for many small and medium sized businesses is that a decision on whether to upgrade or purchase technology comes down to margins and the strength of the business case.

## **6.3 Challenges to Adopt Open Innovation from Country Context**

### **6.3.1 Lengthy Legal Administrative procedure to Share Innovation**

At this 21st century knowledge is the main key to organizational success resources. It can bring strategically changes to acquire competitive advantages by the transfer of knowledge across individuals, groups and organization units using information technologies sharing, for this individuals do not have to rely on their personal or shared experiences to identify better practices, but can learn from the codified lessons of others in IT systems. More importantly, the characteristics of knowledge – that knowledge is distributed, ambiguous and disruptive – that makes its transfer highly problematic, time consuming, conflicting and less trustworthy (Newell et al., 2006).

### **6.3.2 Problems with infrastructural Facilities**

Infrastructure is the basic technique for executing any strategy. Demand for infrastructural development is higher to utilize the resources and investment. Infrastructure enable people to enter into markets reduce costs of doing business and create investment climate. Sustainable infrastructure development is the prerequisite of developing any nation's economy. Primarily, infrastructure promotes trade and integration into world markets, and is key to human development Lack of proper knowledge of handling mega infrastructure projects is seriously hampering the quality of r infrastructure development works as well as overall constructions work(Oyedeley,O.A.2016). in Brazil it was found that, Metrology, standardization, technical regulation and conformity assessment (MSTC) activities are inherent elements of a sectoral

scientific-technological system capable of promoting innovation, technology transfer, economic competitiveness, and sustainability of firms, in a broader perspective(Justen et al., 2016).

In Bangladesh, economy is going to be seriously affected and is underperforming due some limitations in infrastructure development, deficit of energy sectors, transportations problem. If Bangladesh wants to attract foreign direct investment and remain competitive, it would have to raise investment in infrastructure and to adopt adequate steps to overcome these bottlenecks (The Financial Express on November 14, 2017).

### **6.3.3 Lower Domestic Market Demand and Internet Accessibility**

Most of the SMEs in Bangladesh are formed in few specific areas like food arena, manufacturing, ceramic's, garments etc where existing competition cannot welcome the new comers with their new features of products. Due to failure in creating demand both national and international market most of the SMEs should give emphasized on research the market thoroughly, create need of the in the market, brings especial quality featured, most demanded customer oriented product/services etc. According to the Daily star report, the internet users in Bangladesh were 88million in 2018, whereas, "The World Development Report 2016: Digital Dividends" by the World Bank indicates that 141.5 million Bangladeshis are offline. According to ICT Development Index (IDI),report titled "Measuring the Information Society Report 2015" Bangladesh's score was low 2.2 out of 10 and 144th position out of 167(The Daily Star, June 27,2018).

### **6.3.4 Lower Rate of Customer Responsiveness**

The Customer responsiveness measures the speed and quality at which the company provides customer service and communication. In modern internet based world, the customers are more informed, more vocal more willing to share their experiences with other customers. So online and offline can help to create more customers responsiveness as well as loyal customers as it is expected that about 30percent of the customers want to have respond by the companies within 30 minutes. Organizations can improve it in many ways like analyzing the current service process and identify the main issues, providing on line and off line customers suggestions about their wants, create customers trust through social media, technological up gradation etc. To eradicate the lower rate of customer responsiveness, organizations need to provide customer oriented products/services.



### **6.3.5 Limited numbers of skilled and Experienced Manpower**

To sustain into competitive global age there is no alternate of skilled and experienced manpower. Due to having limited numbers of skilled manpower the SMEs of Bangladesh are suffering tremendously. Most of the startup organizations are dropping out due to limited numbers of skilled and experienced employees. Limited skill and experience of employees may provide hindrance to implement the proper strategies for growth, development and profitability. By emphasizing on the need that appropriate skilled and diligent human power development schemes has to be initiated and implemented for sustainability of SME sector and economic development by the government of the country of Bangladesh. As the future prosperity of any country depends ultimately on the number of persons in employment and how productive they are at work so every organization should remove the difficulties of skill labor forces.

### **6.3.6 Limited Combined policies by the Government, SME Foundation and Central Bank**

According the SME Policy (2019), the target of the government is to increase the contribution of SMEs in GDP to be increased from 25% to 32%. To achieve this target the government has taken strategies to access finance, access to technology and innovation, access to market, access to business support service, access to information and access to training. SMEs Foundation is trying to implement the training program and the central bank provided guideline for SMEs loan Schemes. These three bodies are working for the betterment of the SMEs. However, their planning and strategies are need to be harmonized and feasible so that each and every end user is benefited. The coordination among government, central bank and SME foundation is urgent for the betterment of SMEs as well as overall economic development of Bangladesh. The proper combined policies can provide more and more new thoughts for the welfare of whole SME sectors to sustainable competitive strategies which can create global position and able to compete internationally. The coordination can safeguard against all hazards of the sectors. As the government is providing different fiscal and financial supports to the industrial sectors besides their institutional and policy supports, the proper coordination among them can provide different strategies policies regulations to lead the sectors in a sustained one.

## **6.4 Strategies to overcome the Challenges for Adopting Open Innovation**

Generally organizations use open innovation to gather vast sources of ideas beyond their capabilities from the shared partners rather they have to face some common challenges like strategic, operational, legal and cultural challenges. It's very difficult to manage external partners through collaborative process. It's also difficult to find appropriate partners. Internal team may face to job uncertainty. Initiating appropriate measures organizations can remove the strategic, operational, legal and cultural challenges into benefits. To get the benefits they have to set specific objective, prioritize them, stay focused, communicate clearly to everyone, engage more stakeholders in decision making system where internal-external stakeholders can participate in ideation and open collaboration, reward and motivate the participants, invite participants to the idea development process etc. Thus, engaging, easy-to-use, transparent, flexible, adaptable and customizable tools can easily overcome the open innovation challenges to get the benefits. So organization should give priority on people first, processes next and then ideas. So technology selection, identifying future customer needs and scanning for disruptions is also important.

### **6.4.1 To Overcome the Strategic Challenges:**

Generally organizations set missions and visions and business unit specific strategies to operate the business successfully. However, many of the startups could not be successful due to having poor strategies. To avoid unclear goals SMEs need to apply the strategy as organizational goals must be clear or understandable to every stakeholder. They need to find the appropriate partners imply that right audience can provide more accessible information than before. To meet the challenges, SMEs need to consider opportunity cost implies that without a strategic approach the risks are higher and failed opportunities which may bring wasted ideas and time as well as extra costs. Hence, fit the strategies, as well as goals and audience of open innovation should be more emphasized.

### **6.4.2 To Overcome Operational and Structural Challenges:**

According to Global Startup Ecosystem Report (2019) claimed that 11 out of 12 startups fail that means almost 90 percent fails. There are 2 organizations out of 10 during the first year become fails though they have a strong prosperity of growth, expansion and innovation still they are becoming failure due to not properly applying strategic plans and having limited connection with suppliers (source Bureau of Labor). The study also found that the most common startup failure rate are: 16% for financial problems, 6% technical problems, 2% for

operation problems, 2% for legal problems, 18% for team problems, 22% for marketing problems and 34% for lack of product market fit. The Employment Dynamic report coming from the Bureau of Labor shows that 20% failure rate at their 1<sup>st</sup> year of operations, 30% becomes fails at their 2<sup>nd</sup> year of startup, 50% become fails at the end of 5<sup>th</sup> year and 70% become failure at the end of 10<sup>th</sup> year. Therefore to overcome the failure rate there should be needed develop strategic plans in a such way which can be executed in a collaborative way of the industry as team player.

To build an effective process implies that effective open innovation process develops own R&D, finance, manufacturing and marketing system in to an eco-collaborating system. To create an appropriate platform implies that dedicated internal and external stakeholders collaboration and participation brings more ideation, technology up gradation regardless of time and place. To Develop and implement ideas implies that an effective collaborative system can make sure to move ideas in a timely and structured manner.

#### **6.4.3 To Overcome the Legal Challenges:**

To confirm the Intellectual Property Right (IPR) implies that the purpose of IPR is to ensure the inventor has the right to be recognized and profit from their innovations. Successful open innovation benefits both parties and is fair for everyone. Therefore, to ensure the term and conditions implies that mutual trust, carefully developed term and conditions can help eliminating unnecessary uncertainty. Through mutual trust and believe as well as honoring the legal aspects legal challenges can be removed easily to get the benefits of open innovation.

#### **6.4.4 To overcome cultural challenges:**

To eliminate negative attitudes towards open innovation it means that truly aware the employees of real benefits of co-creation, convey positive examples of real life success stories and inspired them through convincing to embrace new knowledge. To reduce lack of commitment means that to avoid or cure demonization and lack of commitment, make it interesting to commit to it, show the progress of their ideas and feel them that every body's commitment is the best effort. It can be effective that reward and motivate the participants' means that not only monetary value but also recognition is important to all employees, invite participants to the idea development process and engage them to the project. Thus, taking

proper attention organizations can easily overcome the challenges and enjoy the benefits of open innovations.

#### **6.4.5 To Overcome the Limited Access to Information**

The “Digital Bangladesh” policy has achieved a remarkable success for the country the ICT Adviser’s ambitious plan of commencing 5G mobile broadband technology and to be among the first few adopters need to implement. Before introducing new generation of mobile access technology, need to make sure that nationwide transmission backbone are robust and ready for handling the explosive growth of traffic that will be coming along, the national transmission backbone is the weakest link in quest for graduating to the next level of “Digital Bangladesh” and we can only hope that this issue will catch the attention of policymakers sooner rather than later(The Daily Star, *June 27,2018 Abul K Shamsuddin is a telecom analyst*). *Therefore*, utilizing the information technology could be the best way to overcome this problem. In addition to, the development of SMEs database and credit risk analysis can be a great source to handle the limited access into information and finance. (Yoshino, K.,et al,2016)

#### **6.4.6 To Overcome the Customers Related Problems**

From a company’s point of view, one way of stimulating open-innovation is by involving consumers or customers in the company’s innovating processes. An example in this case can be for the Game Software Company is the use of online contests which can be developed in the form of a social online gaming application. In all environments, new ideas have been the drive for progress. But in order for an idea to transform into an implementable innovation, some requirements have to be met (Armisen & Majchrzak, 2015). Open innovation ideas and creativity comes from the demand of the customers’ perspective.

### **6.5 Benefits to Adopt Open Innovation in Individual SMEs Context**

While SMEs face many challenges, they additionally reveal in some structural advantages, relative to the large organizations. The structural benefits of SMEs have enabled them to play the central function in an industrial economic innovation system and endow smaller firms with special possibilities to prosper in an open innovation context. SMEs have at least 5 structural benefits in common over large firms. They are: Increasing self-determination, Increasing creativity, Consumer involvement into the process, Employees participation,

Encouraging teamwork, creating competitive environment and Simplify understanding the process (Alexy et al., 2013; Ma & Lee, 2019; Narayanasamy & Velmurugan, 2009; Procopie et al., 2015; Radziwon et al., 2014; Rahman & Ramos, 2011a, 2013a; Tekic & Willoughby, 2020; Van Echtelt et al., 2008) .

#### **6.5.1 Special Focus on the Objectives:**

The center attention of the SMEs to adopt innovation lets them execute very efficiently focus on the special products, services, designs, process, and markets customers than towards larger, diverse companies with more diffuse objectives. The sharp center of attention on a precise market, purchaser type, expertise or technology might also generate a sustainable competitive benefit in industries where customers value the expertise, knowledge or service that this kind of SME offers.

#### **6.5.2 Employees Motivation and Scope of Changing a Wide Variety of Jobs**

In the motivational theories, the common motivational factors for the employees are to participate into decisions, fairness and equity into the organizations, fulfilling the need and demands, and autonomy into the organizations. The financial and non-financial benefits bring the employee motivation. The Y generations are highly motivated, if they get opportunity to develop innovation and creativity and implement those into commercialization. Hence the innovation has to bring an advantage to the existing situation, if it has compatibility with the current values and practices, is simple, easy to use and accessible, trial ability and observe ability. By bringing an open innovation initiative to the workplace, it can bring the dreams of the organization, to make them greater excitement to involve those dreams to be true.

#### **6.5.3 Business Specialization and Entrepreneurial Sprits**

SMEs promote the specialization in specific industries or sectors with entrepreneurial sprits having research and development focused. Product and market orientation is higher than in large research departments of massive firms. This creates a bias to motion in smaller companies and promotes extensive experimentation with alternative enterprise models. In many revolutionary situations, identifying and executing an effective enterprise model is as important as or extra essential than developing a new technology. For example, in Bangladesh most SMEs are found in specific categories like food, textile, light engineering, agent business, food and agro based processed food etc. Their commercial enterprises are extra deeply in slender fields. One thing of open innovation is the developing function that markets are enjoying in organizing and coordinating progressive activities. The increase of these innovation markets offers higher rewards for specialization due to the fact these

specialized firms can regularly promote their competencies to a wider range of customers and markets.

#### **6.5.4 Time, Cost and Innovation Risk Reduction**

Smaller corporations can react extra rapidly to enter to customers or challenges from competitors, and evolve their enterprise fashions more rapidly. In many cases they can analyze quicker than large firms and they are faster in decision-making so they doubtlessly have a aggressive gain in speedy changing markets. Instead of figuring out how to make a preferred product, instructing the employees, purchasing equipment and going to production or process quickly with a short notice. Simply it begins collaboration with employers that already has all this, that approves to convey product to market faster.

The Synergy Effects of combining Innovation and Capacity reduce the cost of production, or marketing, as same activities are shared among different organizations. Moreover, it brings extra environment friendly environment among competitors as every member works on what is right. In addition to, working with specialists it might be possible to decrease the chance of failure, although each innovation has risk to implement into the business.

It has been observed that small and medium enterprises (SMEs) are faced with the ever increasing stress of intensive competition and limited by their resources (for example, managerial capabilities, financial, and others) in their abilities to deal with the transaction cost, and thus effectively turn to collaboration as a solution. The study synthesizes aspects of open innovation based on a theoretical model and a case study of the User Association of Advanced Technologies program in Israel, and emphasizes on collaboration as an open innovation activity within the Resource Based Theory. Thereafter, it concludes that collaborative research reduced the transaction cost in terms of utilizing open innovation in entrepreneurs, especially in case of SMEs, before providing a few research hints.(Porath et al., 2015).

#### **6.5.5 Innovating New or Existing Products and Services in Staying Ahead of the Competition**

Especially, in case of startup, there's nothing extra thrilling than getting the impression of bringing out the first product into the market. However, it would be effortless to get stuck in focusing all efforts on promoting the products to reach to the consumers. It can be frightening to invest time and resources into developing a new product to achieve customer satisfaction

and loyalty due to having limited budget of startups. Hence by combining of the third parties resources involved into developing something new, that will bring add value for all. This process not only works for new products but also for the existing old products, as the one of the advantages of open innovation is that no procedure has no means of ending. This move may additionally assist to increase profits and growth, heading towards the competitive advantages.

### **6.5.6 Building up a Strong Connectivity and New Revenue Stream**

Lego is a notable instance of how an enterprise can have interaction their followers on an extensive scale by way of the usage of open innovation. No dependency on the dimension of organization itself, a brilliant gain of open innovation can be taken place by getting in contact with the followers and the soul mates, informed talents. This will comprehend the expectation of customers and then provide it to them. The enthusiastic neighborhood contributors in businesses are inclined to commit their time and thoughts to cooperate among the business group for the betterment of all in the business group or same industry. Ultimately, these types of connectivity improve the industry standard and performance.

## **6.6 Benefits of Adopting Open Innovation from the Country Context**

### **6.6.1 Economic Growth**

Bangladesh is the 39<sup>th</sup> largest country in the world in nominal terms and 29<sup>th</sup> largest country in term of PPP and 3<sup>rd</sup> fastest growing country all over the world. At present the contribution of SMEs to 25%, whereas, in India, Singapore and Malaysia it is 40%-50 % (The Financial Express, 2019). According to the government of Bangladesh, the Planning Division provided the report title a on,” Study on Future Direction of SMEs in Bangladesh (2019) SMEs now occupy an important position in the national economy. They account for about 45 percent of manufacturing value addition, about 80 percent of industrial employment, about 90 percent of total industrial units and about 25 percent of the labor force. Their total contribution to export earnings varies from 75 percent to 80 percent. The industrial sector makes up 31 percent of the country's gross domestic product (GDP), most of which is coming from SMEs. Hence, there is huge scope for SMEs to contribute more profusely to GDP of Bangladesh. Therefore, the benefits from SMEs can be more significant for the country, if this sector can work properly.

### **6.6.2 Skilled Employment Generation**

SMEs play a vital role in creating employment generation of Bangladesh. Qamruzzaman ACMA 2015, SMEs are the driving force for economic development of any country because of generating employment, improving local technology, output diversification, developing entrepreneurship (Qamruzzaman, 2015). SMEs are the engine of economic growth and employment generation for sustainable industrialization. Thus the contributions of SMEs are undeterminable for the employment generation as well as building the economic growth. With the face of industrial revolution the growth of job opportunities will continue through adopting open innovation in SMEs, where people have the scope to improve their skill in technology and big data source.

### **6.6.3 Poverty Alleviation and Uplifting of the Living Standard**

To build poverty free Bangladesh, and ensure employment generation, Bangladesh Bank policy stipulate 25% of credit portfolio of the banks should be in SMEs as per vision of Bangladesh Bank in 2024(Uddin,2019). SMEs provide significant role to eradicate poverty and improve the living standard through implementing new strategies for new business ideas, customers oriented products/services. Though a large number of SMEs are dropping out still some are performing excellent results by showing growth, innovation and sustainability.

### **6.6.4 Entrepreneurship and New Venture Creation**

The focus on poverty reduction in through entrepreneurship and new venture creation has been highly considered in research recently. However, the link the issues on the current platform, network/digital and sharing economies, find new ways and new solutions to effectively reduce poverty in now political, economic and global contexts still needs to be better understood. It builds the knowledge about the nature of poverty reduction and business, entrepreneurship and innovation activities in both developed and developing economies (Steven Sia,b, David Ahlstromc , Jiang Weia and John Cullend,2019).

### **6.6.5 Sharing Knowledge and Business Techniques**

Through organization to organization knowledge and other resource collaboration, team members in those organizations can easily share their knowledge and techniques , be the trusted parties and this can improve the technical, strategic, cultural, experimental as well as overall sharing can build the businesses environment in a new modified step. Adopting open innovation and sharing knowledge provide the organizations the best problem solving experience, better and faster decision making capacity, innovation and growth opportunities, improve delivery system to customers, reduce the loss and increase the competitive



advantages. Ultimately, open sharing reduce the problems of customizing, environmental hazards, testing external technology, dealing with security restrictions, regulations cost, easy enter into market, innovation through change perspective, provide better, faster and cheaper solutions than others.

## **6.7Summary**

SMEs have been perceived as imperative supporters of the economy. All things considered a several financial institutions particularly banks are concentrating on SMEs and are concocting uncommon bundles to back SMEs. In many banks there are presently offices to cook for the frequently extraordinary keeping money necessities of these elements. Be that as it may, the significant point of banks isn't to elevate SMEs' money related status yet to utilize them in extending their business keenness. In addition, bank advances are as yet a noteworthy wellspring of financing for SMEs yet the loan fees are high. It is imperative that administration hears the objection of SMEs with respect to decrease of loan fees. Through interpersonal organizations and linkages, SMEs will most likely grow their social capital and later monetary capital.

## **CHAPTER SEVEN**

### **ANALYSIS AND FINDINGS**

#### **7.1 Introduction:**

The preceding chapter detailed the research methodology adopted to examine the proposed hypothesis and to answer the research questions of the study. The core objective of this chapter is to present the results of the data analysis and to test the hypotheses. Specifically, this chapter starts with data preparation for the analysis and then discussed the demographic information of the respondents and ends with the finding.

#### **7.2 Research Data**

##### **7.2.1 Data Editing and Coding**

After the data collection from the SMEs entrepreneurs, modifying of the data was undertaken in order to make certain the omission, completeness, and consistency of the data. Editing is viewed as a section of the data processing and analysis stage. According to the recommendation of Sekaran (2000), this thesis includes all respondents in the analysis who finished at least 99% of questionnaire answers; at the same time as those with extra than 1% unanswered questions are excluded (i.e. 20 surveys were excluded). Any lacking statistics has been considered as missing values (Kinner and Taylor, 1996; Sekaran, 2000), and mentioned below.

Coding was used to assign numbers to every answer and permits the transference of facts from the questionnaire to SPSS. Such procedures can be undertaken either earlier than the questionnaire is answered (pre-coding), or after (post-coding) (De Vaus, 1999). In this research, the coding system was once performed by way of setting up a records file in SPSS, and all query objects had been all pre-coded with numerical values (see questionnaire in Appendix B). Data editing techniques were undertaken after facts have been entered into the information file in order to detect any mistakes in data entry. Out of range values in the information file had been corrected by way of referring to the original questionnaire.

##### **7.2.2 Data Screening**

As the first stage in the data analysis, screening for missing data, outliers, and normality was once conducted. Data screening is beneficial in making sure that data have been efficaciously

entered and that the distributions of variables, that are to be used in the analysis, are normal. These preliminary analyses are mentioned next.

### **7.2.3 Treatment of Missing Data**

Missing data usually occurs when a respondent fails to reply one or more survey questions. In the ultimate survey it used to be located that 20 respondents (Out of 100) failed to reply the questionnaire as it should be and the missing data were more than 20%. Then, those responses had been deleted from the actual records set. Since much less than 2% of missing data is regarded appropriate (Churchill, 1995), there was no requirement to check the pattern of lacking data. In this research lacking facts have been dealt with through replacing missing response with the variable mean responses for each variable. It used to be important to ensure that replacing lacking values with the variable suggest did now not extensively alter the potential and distribution of variables (pre and put up replacement). A paired pattern t-test was once conducted to take a look at if there were any suggest variations between original and adjusted variables. Therefore it can be confidently assumed that suggest replacement did now not alter the usual mean and distribution of variables.

### **7.2.4 Treatment of Outliers**

Hair et al., (1995, p.57) defined outliers as “observations with a unique combination of characteristics identifiable as quite from the other observation” (These outliers would possibly be very excessive or very low rankings (extreme values), and should end result in non-normality facts and distorted records (Hair et al., 1995; Tabachnick and Fidell, 2001). According to Barnett and Lewis (1985) and outlier is described as an commentary that “appears” to be inconsistent with different observations in the information set. Outliners can have an impact on the results of analyses and may additionally lead to incorrect selections about the analyses, such as Type-I and Type-II blunders (Tabacknick& Fidell, 2007). Type-I error refers to rejecting the null hypothesis when it is true, and is many times acknowledged as the significance of a take a look at ( $\alpha$ ). A type-II error, that is accepting the null hypothesis when it is false, is related to the electricity of an analysis ( $\beta$ ). Both of these errors are important and a balance needs to be struck between them (Weiss, 2008). Detecting univariate outliers was achieved on the observations of each variable (Hair et al., 1998). Finally the information set discovered fifty outliers due to the zero variance of their rating response and as the scale object used 5 factor Likert scales; this research deleted these

responses that had variance of responses less than 0.7. Response from a whole of 80 respondents used to be left for last analysis.

### **7.3 Reliability and Validity Analysis**

It is well recognized that reliability and validity are two important dimensions of data quality in any research, whether qualitative or quantitative. In quantitative research, however, each term represents an element that is crucial in ensuring the rigour and robustness (Heale and Twycross, 2015), as well as the quality of the data (Pallant, 2013). It was therefore important to consider both concepts when conducting the second phase of this research study in order to communicate the rigour, and enhance the accuracy, of the instrument (Onsman *et al.*, 2010; Kimberlin and Winterstein, 2008). Although the two concepts are separate, it is worth noting that reliability and validity tests are interlinked and are associated with each other (Tavakol, Dennick 2011). However, as the literature suggests, it is possible to have a measure which had a high reliability score but which is not valid, and vice-versa (Jackson, 2014; Zeller and Carmines 1980).

Adopting questions from previous studies is an acceptable and encouraged practice (Blair, Czaja and Blair, 2013; Hyman, Lamb and Bulmer, 2006). It is, therefore, always important to review the literature when drafting a survey instrument as the instruments employed in previous studies are likely to have been tested for validity and reliability (Sue and Ritter, 2012; Marshall, 2005), meaning that some time and effort may be saved where either whole instruments or items within them can be used a part of a new study (Hyman, Lamb and Bulmer, 2006; Boynton and Greenhalgh, 2004). Kimberlin and Winterstein (2008) and Boynton and Greenhalgh (2004) and Albaili (1995) have, though, argued that validity and reliability of research instruments are prone to changes when used in different research contexts or different cultural groups, suggesting that these issues should be addressed for each new research study when existing instruments or items are adopted.

In line with common practice, then, the research instrument developed for the second phase of this research incorporated items from previously-published and -validated studies but steps were taken to ensure that the adopted survey items reached suitable levels of reliability and validity before their inclusion in the final instrument (Blair, Czaja and Blair, 2013). The following subsections describe these steps.

### 7.3.1 Reliability Test:

Reliability, is sometimes referred to, explained “how far the research may produce similar results in different circumstances assuming others constant” (Roberts and Priest, 2006, p.41). Simply, it implies to the repeatability of the study and is concerned with the level of internal consistency of each factor in the measurement tools (Heale and Twycross, 2015; Tavakol and Dennick, 2011; Williams, 2014; Roberts and Priest, 2006; Litwin 1995; Walopet *et al.*, 1987). According to Crowther and Lancaster (2012), Pennypacker *et al.* (2010) and Carmines and Zeller (1979), a reliable survey is one that brings consistent results through times, if used different samples or by different researchers.

To ensure the reliability of the research, Cronbach’s alpha (Cronbach’s  $\alpha$ ) is one of the most popular statistical tools used (Heale and Twycross, 2015; Tavakol and Dennick, 2011; Santos, 1999). It is calculated using a coefficient which ranges between 0 and 1 (Tavakol and Dennick 2011; Gliem and Gliem, 2003), with a coefficient of 0.7 being the mentioned threshold to indicate an acceptable level of reliability (Pallant, 2013; Drost, 2011; Cortina, 1993; Nunnally, 1978). It is argued that measuring reliability is imperative in studies that employ Likert-type scales (Gliem and Gliem, 2003). For, this study, the reliability of each construct, sometimes referred to as the latent variable (Brewerton and Millward, 2001), included in the model is examined by coefficient alpha scores and item-scale correlation, and find to be reliable. As shown in table 7.3.1, Cronbach’s alpha coefficients for all of the constructs in the model exceeded 0.7, with the coefficients’ scores ranging between 0.70 and 0.80, indicating good internal consistency and hence reliable constructs.

**Table 7.3.1: Constructs Reliability Result**

No	Context	Cronbach’s Coefficient Alpha
1	Open Innovation	0.702
2	Strategic Factors	0.737
3	Firm Characteristics	0.733
4	Project Level Characteristics	0.736

### 7.3.2 Validity Test:

Validity is another important element that shows the quality of the resulting data (Crowther and Lancaster 2012; Tavakol and Dennick, 2011), and the overall value of the research

(Hartas, 2015). The term is used to explain the extent of “whether the operationalization is rightly indicating what it’s supposed to” (Nardi, 2015, p.62). It is used to reflect the accuracy of the variables in finding what the researcher sets out to measure (Drost, 2011; Kimberlin and Winterstein, 2008) and it should “express the reality of its intentions” (Mashaw, 2012, p.199). The several forms of validity for a research instrument-the most common of which are: content validity; convergent validity; and divergent, sometimes known as discriminant, validity (Hartas, 2015; Brewerton and Millward, 2001; Litwin, 1995).

Content validity may be accessed through an iterative process of selection and refinement of the constructs. Like the other validity, content validity is received by inspecting the contents of the measurement and “usually depends on the judgment of experts in the field” (Kimberlin and Winterstein, 2008, p.2279), and not by conducting an empirical test or by pointing statistical significance. Hence, Morgan *et al.* (2012) argued, it is the easiest type of validity to be measured.

For this study, content validity is established by two approaches. The first is by pre-testing the research instrument to ensure that each item related to the concept is aiming to measure. The instrument has pre-tested by three groups of individuals, one is an expert group, which offered a scope to improve the instrument’s design and adjust the structure of the instrument and the sequence of the items in it. This approach is recommended to ensure the content validity of the research constructs (Forza, 2002; Wallen *et al.*, 1993).

Convergent validity and divergent validity are both sub-types of construct validity, used to measure types of correlation. Generally, the convergent validity is used to calculate the intra-correlations of a construct (i.e., between items of the same construct), while divergent validity measures the inter-correlation of constructs (i.e., between different constructs) (Kimberlin and Winterstein, 2008). The common concept is that the correlation between items of the same construct should be high, while lower levels of correlation should exist between two constructs, in order to find out distinct from one to another.

In this study, construct validity has validated using Factors Analysis (FA). According to Matsunaga (2015) and Onsmann *et al.* (2010), FA is an important tool to develop, refine and evaluate the measures of the instrument. For reduction of data, FA aims to rationalize the variables that may initially be thought to be relevant in an area to a more manageable number by removing any redundancy from the initial set of correlated variables (Brown, 2015).

However, prior to deciding whether to use FA or not, screening procedures must be applied. For this study, using SPSS (2021), and following the approach suggested in the literature, two indicators were used to determine the factorability, or correlations, among variables: the Kaiser-Meyer-Olkin (KMO) index and Bartlett's Test for Sphericity (BTS) (Field, 2013; Child 2006). The scores of the two tests were used to indicate the suitability of the dataset for conducting FA, and hence determining the appropriateness of the SFP variables to be factorized. With regards to the accepted values of the KMO index and BTS, a KMO value of 0.6 and a large value of BTS with significance level of less than 0.05 are recommended as the relevant cut-off points (Barrett *et al.*, 2014; Field, 2013; Child, 2006; Kaiser 1974).

Analysis of the KMO index and the BTS indicates that the results achieved on both indices fall within the acceptable range. As can be seen in Table 7.3.2, the analysis indicates that the value found in the KMO index of the variables involved in the four factors indicates better results than the suggested minimum value of 0.706. The available significance of BTS related to the four factors is much less than the suggested value of 0.05. The results obtained from the two indicators suggest that the data collected during the study provide support for FA management.

**Table 7.3.2 KMO and BTS values in the Factor context**

Context	Measure	
	Kaiser-Meyer-Olkin (KMO) measure of Sampling Adequacy	Bartlett's Test of Sphericity (BTS)
Open Innovation	0.714	90.045 (p = 0.000, < 0.05)
Strategies Factors	0.706	66.099 (p = 0.000, < 0.05)
Firm's Characteristics	0.761	60.668 (p = 0.000, < 0.05)
Project Level Characteristics	0.727	105.342 (p = 0.000, < 0.05)

Having checked the suitability of the dataset for the use of FA, it was then important to decide on the method of FA to apply. There are various ways to conduct FA using state-of-the-art statistical tools, of which SPSS is viewed as the most favored and widely-available (Child, 2006). For instance, in SPSS, researchers can utilize different methods to conduct FA, such as Principal Component Analysis (PCA), Generalized Least Square (GLS) and Alpha factoring methods. As a commonly-used, effective method (Osborne and Costello, 2009;

Kuanget *al.*, 2003), PCA, or Common Factor Analysis as it sometimes referred to, was applied as an extraction method for conducting FA in this study. PCA was used to simplify the analysis process by clustering together highly- correlated variables into a manageable set of factors (Matsunaga 2015), providing evidence for construct validity (Field, 2013; Yong and Pearce2013).

A separate FA was conducted for each SFP context. This has been argued by Thi (2006) to warrant a stability of factor loadings, which is a statistical method used to determine the effect of each factor on the variable (De Coster, 1998). As a suggested cut- off point, each item of the construct should have a minimum factor loading of 0.5 so that the construct passes validation conditions (Hair *et al.*, 2006; Nunnally, 1978). In addition, Hair *et al.* (2006) have suggested that no cross-loading should be greater than 0.3 between items belonging to different constructs.

The results indicate that no items significant cross-loadings and that the factor loading scores exceeded 0.5 in all cases, suggesting that the items associated with the SFP variables in this study had factor loadings that were considered significant.

Table 7.3.3 presents the results of the FA for the variables related to the three SFP contexts. As can be seen from the table, for the firms’ strategy, three factors were identified that accounted for a cumulative variance of 66.94% of the total variability in the original variables. For the firms’ characteristics’ and project level characteristics’ contexts, respectively, four factors accounted for 55.66% and seventh factor accounted for 55.02% of the cumulative variance. Also reports the eigenvalues; factors with eigenvalues greater than 1.0 were extracted, as suggested by Hair *et al.* (1998). The remaining factors with eigenvalues of less than 1.0 were excluded, as a minimum eigenvalue of 1.0 was used a cut-off point (Molla and Licker 2005).

**Table 7.3.3 Summary results of the Factor Analysis**

No	Context	No. of Extracted factors
1	Open Innovation	07
2	Strategies	03
3	Firm’s Characteristics	04
4	Project Level Characteristics	07



## 7.4 Demographic Parts of the SMEs

### 7.4.1 SMEs Owner-Managers' Demographic Characteristics

This section presents a descriptive analysis of the responses to the first set of questions presented in the survey instrument. This type of analysis forms the basis of every quantitative study and provides a simple description of the basic features of the collected data. For this study, this includes analyses of: owner- managers' demographic characteristics; SMEs' and demographic characteristics; in the surveyed SMEs. In respect of the demographic characteristics of the owner-managers of the SMEs that participated in this survey, the examined characteristics include gender, age, and educational level. Table 7.4.1 presents a summary of these data and provides analysis of adopter of open innovation.

**Table 7.4.1 SMEs owner-managers' demographic characteristics**

Context	Demographics	Frequency	%
Gender of Respondents'	Male	67	83.75
	Female	13	16.25
Age of Respondents'	Up to 30	24	30
	31 to 40	30	37.5
	41 to 50	18	22.5
	Above 50	8	10
Education Level of Respondents'	Up to SSC	9	11.25
	Up to HSC	16	20
	Up to Graduation (Hons./Degree)	25	31.25
	Masters	30	37.5
Designation/ Position/ Job Title	Entrepreneur	29	36.25 %
	CEO	15	18.75 %
	Salesman/Sales Representative	25	31.25 %
	Product and Innovation Manager	7	8.75 %
	Executive Marketing and Product	4	5.00 %
Management Level	Junior Level	24	30%
	Middle Level	30	37.5%
	Senior Level	26	32.5%

With respect to gender, the overwhelming majority of the respondents were male (about 83.75%). The survey data shows that females were under-represented when compared to their male counterparts. This might be owing to the characteristics of the cultural setting of Bangladesh and traditions associated with the concept of women at work. With the expansion of new policies and support programs for small and medium enterprises (SMEs) provided by the government, the participation of women in small and medium enterprises (SMEs) in Bangladesh today has increased exponentially and continues to grow.

The survey data also indicated that the majority of the female participants operated micro-businesses, with fewer than thirty employees. The survey indicates that women entrepreneurs have 30 or fewer employees in the organization and have invested Tk 2-10 million in capital at the start of the business. The data also show that about two-thirds (38.46%) of the female business owners sampled operated in the manufacturing sector. This means that the majority of female entrepreneurs in Bangladesh were concentrated in the manufacturing sector.

In terms of age group, the results show that respondents aged 31 to 40 years old was the highest age group (37.5%) of the total respondents, and those aged below 30 years was the second largest age group (with 30%). The percentage of samples from the other two groups was 32.5.

On the question of educational achievement, the data show that the educational level of those sampled is generally high level. About 37.5% of the respondents' highest qualification was at masters level, which was also close to the proportion of respondents with a graduation (Hons./Degree) as their highest qualification (31.25%). The percentage of education level of samples from the other two levels was 21.25. Overall, the data show that about three-quarters of respondents had a minimum of some kind of university-level qualification. Interestingly, of the women in the sample, slightly more than 84.62% had completed at least a university qualification. This may imply that women tend to start businesses after the completion of their studies compared to men who the data may suggest are more likely to run a business before the completion of university level qualification.

The participants were asked for their current job title to determine the context of their job from an open innovation and technology perspective however there was no general consistency or classification of the job titles from an open innovation perspective. The SMEs surveyed by the interviewer, participants were divided in their opinion about their job

titles/Current position. The most of the respondent amounting 29 respondents out of 80 are entrepreneur, 15 respondents out of 80 are CEO, 25 respondents out of 80 are Salesman/Sales representative, 7 participants out of 80 are product and innovation manager and 4 respondents out of 80 are executive marketing and product.

During the interview, participants were asked to select their management level as their junior, middle or senior management. In interview 80 participants, the participant who is an entrepreneur when asked on his management level referred to himself as the founder. For the purposes of grouping the data the participant has been classified under senior management, this classification was made also the basis of the 10 years of experience the participant had with the company. The management level of the various participants of whom the majorities were on the mid-level (37.5%). The table shows that among the respondents, the highest level of employment at the middle level of the management level. The 2<sup>nd</sup> highest level of employment at the senior level of the management level (32.5%). And rest of the amount is junior level which is 30% of the total respondents’.

#### 7.4.2 SMEs Demographic Characteristics

The demographic information related to the SMEs, the survey also explored demographic characteristics of the sampled SMEs, including their type of ownership, type of business, age of organization, location of organization, size of organization (number of employees), and focuses of business activity. Table 7.4.2 presents the relevant summary data.

**Table 7.4.2: SMEs Demographic Characteristics**

Context	Demographics	Frequency	%
<b>Types of Ownership</b>	Sole Proprietorship	57	71.3
	Partnership	14	17.5
	Company	7	8.8
	Co-operative	1	1.3
	Other	1	1.3
	Manufacturing	35	43.75
	Services	18	22.5
	Software Development	1	1.25
	Knowledge intensive services	4	5

<b>Types of Businesses</b>	(Education, Health Care, and Consultancy)		
	Pharmaceutical & Chemical	7	8.75
	Textile	6	7.5
	Leather & Leather goods	3	3.75
	Other	6	7.5
<b>Ages of Organizations</b>	Less than five years	22	27.5
	Between 5-15 years	36	45
	Between 15-30 years	21	26.25
	More than 30 years	1	1.25
<b>Locations of Organizations</b>	Dhaka	72	90
	Gazipur	5	6.25
	Narshingdi	3	3.75
<b>Size of Organizations</b>	16-30 persons employed	43	53.8
	31-50 persons employed	24	30.0
	51-120 persons employed	7	8.8
	121-300 persons employed	3	3.8
	300+ persons employed	3	3.8
<b>Focuses of Business Activities</b>	Domestic	61	76.3
	International	19	23.8

These are sole proprietorship, partnership, company, government, and co-operative. It provides perspective in terms of the context from which the participants responded to questions from the ownership types. The above table shows that the business type of the largest SME entrepreneurs is a solo proprietorship. The information above shows the categories of business ownership as well as the number of businesses in each category from the sample. The SMEs surveyed by the interviewer, participants were divided in their opinion about their types of ownership. The most of the respondent amounting 57 respondents out of 80 are sole proprietorship, 14 respondents out of 80 are partnership, 7 respondents out of 80 are company, 1 participant out of 80 are co-operative and 1 respondent out of 80 are other types of ownership. The data obtained shows that a total 71.30% of the firms fell in the sole proprietorship.

These are manufacturing, services, software development, pharmaceutical and chemical, textile, leather and leather goods and other. Bangladesh is moving forward at rapidly. The time is now Bangladesh. GDP growth is calculated based mainly on the growth of three sectors. These are Agriculture, Industry and Services. Service sector contribution to GDP is 56% and the contribution of the industrial sector to 30.17%. The above table also shows that most of the business type is manufacturing and services related. The SMEs surveyed by the interviewer, participants were divided in their opinion about their types of ownership. The most of the respondent amounting 35 respondents out of 80 are manufacturing, 18 respondents out of 80 are services, 1 respondents out of 80 is software development, 4 participant out of 80 are knowledge intensive services (Education, Health care, Consultancy), 7 respondent out of 80 are pharmaceutical & chemical, 3 respondent out of 80 are leather and leather goods and 6 respondent out of 80 are other types of business.

Age categories can be defined in several ways depending on the purposes for which these age groups are utilized. There are generally 4 age groups that are frequently illustrated in articles of entrepreneurship: less than five years, between 5 to 15 years, between 15 to 30 years and more than 30 years. The number of years that each business has been in operation is described above. The length of time that the business had been paying salaries and wages for was used to find out how long the business had been in operation. The data shows that 45 % of the businesses had been in operation for between 5 to 15 years, 27.5 % had been in operation for a period of less than 5 years, 26.3 % of the businesses had been in operation for between 15 to 30 years, and few number of businesses had been in operation for a period of more than 30 years as 1.3 % of respondents show.

The location of organization composition of the sector reveals imbalances among Dhaka, Gazipur and Narshingdi with 90% respondents are taken from Dhaka city, 6.3% respondents are taken from Gazipur and 3.8% respondents are taken from Narshingdi respondents.

The firm size was measured by looking at the total number of people that work for the organization while excluding the owners of the organization from the tally. A majority of the firm at 53.8% had between 16 to 30 people working for them excluding the founders, 30% of the firms employed 31 to 50 people. The remaining 16.2% of firms employed more than 51 people.

The above table shows that 76.2% of small and medium industries are operating in Bangladesh. The remaining 23.8% of the organizations manage their businesses with outside countries.

## 7.5. Motivational Factors for Adopting Open Innovation

Table 7.5: Motivational Factors for Adopting Open Innovation

Stimulating Factors for adopting open innovation	Rate of percentage	Rank position
Cost Reduction	70%	2
Technological Development	75%	1
Business Sustainability	55%	8
Profitability	67%	3
Operational Efficiency	50%	9
Product Development	65%	4
Customer Satisfaction	60%	6
Customer Loyalty	62%	5
Market leader	58%	7

**Note:1 means first priority and 9 means least priority**

Rank of motivational factor for adopting open innovation idea/technology in SMEs are technological development (Rank-1), cost reduction (Rank-2), profitability (Rank-3), product development (Rank-4), customer loyalty (Rank-5), customer satisfaction (Rank-6), market leader (Rank-7), business sustainability (Rank-8), and operational efficiency (Rank-9).

## 7.6 Factors Analysis

Having checked the suitability of the dataset for the use of FA, it was once then necessary to determine on the technique of FA to apply. There are a range of approaches to habits FA the usage of nation of-the-art statistical tools, of which SPSS is seen as the most preferred and extensively handy (Child, 2006). For instance, in SPSS, researchers can utilize distinct strategies to habits FA, such as Principal Component Analysis (PCA), Generalized Least Square (GLS) and Alpha factoring methods. As a commonly-used, superb approach (Osborne and Costello, 2009; Kuang et al., 2003), PCA, or Common Factor Analysis as it now and again referred to, used to be utilized as an extraction technique for conducting FA in this

study. PCA was once used to simplify the evaluation manner by means of clustering collectively tremendously correlated variables into a manageable set of elements (Matsunaga 2015), offering proof for assemble validity (Field, 2013; Yong and Pearce 2013).

A separate FA was once carried out for everything context. This has been argued by using Thi (2006) to warrant a balance of element loadings, which is a statistical approach used to decide the impact of everything on the variable (De Coster, 1998). As a recommended cutoff point, every object of assembling ought to have a minimal issue loading of 0.5 so that the assemble passes validation prerequisites (Hair et al., 2006; Nunnally, 1978). In addition, Hair et al. (2006) have cautioned that no cross-loading ought to be higher than 0.3 between objects belonging to exclusive constructs.

The effects point out that no gadgets big cross-loadings and that the element loading ratings handed 0.5 in all cases, suggesting that the objects related with the issue variables in this find out about had element loadings that had been regarded significant.

As indicated in Table 7.6, all factors included high loading (greater than 0.50) and were statistically significant ( $p < 0.001$ ).

**Table 7.6: Construct Factors Loading Results**

<b>Open Innovation (OI)</b>	<b>Factors Loading</b>
To have a better understanding of customer needs & expectations	0.626
Access to new technologies or technical knowledge used in the firm	0.681
Improving the efficiency of the organization	0.722
Strengthen relationships with suppliers/customers/distributors	0.736
Acquiring new sources of knowledge & technology from external partners to incorporate those developed internally.	0.553
Sharing internal technology & knowledge to others.	0.580
Combining internal and external knowledge & technology to make a new path of development	0.692

<b>Strategies Factors</b>	
Cost Leadership Strategy	0.516
Focus Strategy	0.680
Competitive Strategy	0.712
<b>Firms Level Characteristics</b>	
Target Product	0.504
Strength of R&D	0.602
Domestic Market	0.529
International Market	0.591
<b>Project Level Characteristics</b>	
Networking for Intelligence and Consulting	0.590
Licensing	0.517
Collaboration with others	0.501
Outsourcing	0.505
Financing	0.522
Market Discovery/Planning	0.540
Product Development	0.677

Source: Extracted from field survey

## 7.7 Descriptive Statistics

Following the alternative of lacking records with variable capability, the scale information was once assessed to determine normality of distribution. In order to test any real deviation from normality, a number of methods can be used. One method is to skewness and kurtosis. By the usage of this method, values for skewness and kurtosis now not are extensive if the observation distribution is precisely normal. A variable with an absolute value of kurtosis



index increased than 10.00 can also advise a problem and values higher than 20.00 can also indicate a extra serious one (Kline, 2005).

Bentler and Chou (1987) advocate that absolute values of skewness indices greater than 3 appear to describe extremely skewed facts sets. Therefore, it used to be recommended that absolute value of skewness and kurtosis must not be larger than three and ten. Using SPSS, an inspection of each skewness and kurtosis indicated that the absolute values have been inside the encouraged degrees (see Table 7.7), suggesting univariate normality.

**Table 7.7: Descriptive Statistics**

<b>Open Innovation (OI)</b>	<b>Mean</b>	<b>SD</b>	<b>Skewness</b>	<b>Kurtosis</b>
To have a better understanding of customer needs & expectations	4.64	0.48	-0.583	-1.703
Access to new technologies or technical knowledge used in the firm	4.58	0.50	-0.309	-1.954
Improving the efficiency of the organization	4.63	0.49	-0.526	-1.768
Strengthen relationships with suppliers/customers/distributors	4.60	0.49	-0.416	-1.874
Acquiring new sources of knowledge & technology from external partners to incorporate those developed internally.	4.61	0.49	-0.471	-1.825
Sharing internal technology & knowledge to others.	4.65	0.48	-0.641	-1.630
Combining internal and external knowledge & technology to make a new path of development	4.69	.47	-.825	-1.355
<b>Strategies Factors</b>				
Cost Leadership Strategy	4.58	0.50	-0.31	-1.95
Focus Strategy	4.61	0.35	-0.49	-1.23
Competitive Strategy	4.61	0.41	-0.44	-1.34

<b>Firm's Level Characteristics</b>				
Target Product	4.60	0.49	-0.416	-1.874
Strength of R&D	4.73	0.45	-1.027	-0.970
Domestic Market	4.69	0.47	-0.825	-1.355
International Market	4.59	0.50	-0.362	-1.917
<b>Project Level Characteristics</b>				
Networking for Intelligence and Consulting	4.55	0.53	-0.473	-1.193
Licensing	4.45	0.53	-0.064	-1.408
Collaboration with others	4.66	0.50	-1.006	-0.282
Outsourcing	4.64	0.51	-0.876	-0.569
Financing	4.60	0.52	-0.695	-0.899
Market Discovery/Planning	4.54	0.53	-0.420	-1.245
Product Development	4.56	0.55	-0.728	-0.573

## 7.8 Organizational Characteristics

### 7.8.1 Organization Formed

Table 7.8.1: Organization Formed

<b>Category</b>	<b>Frequency</b>	<b>Percent (%)</b>
Start up	69	86.3
Purchased	3	3.8
Inherited	2	2.5
Joint Venture	1	1.3
Partnership	4	5.0
Other	1	1.3
<b>Total</b>	<b>80</b>	<b>100.0</b>

There are many types of organization formed in small and medium industries in Bangladesh. Among those classifications, the above-mentioned classifications have been observed in small and medium industries of Bangladesh more. It seems that 86.3% of the business organizations are start up type. The rest of the classifications, only Purchased and Partnership percentage is significant, which is 3.8% and 5%.

### 7.8.2 Next Five Years Organization Plan

Table 7.8.2: Next five years organization plan

Category	Frequency	Percent (%)
<b>Expansion</b>	67	83.8
<b>Shut down</b>	2	2.5
<b>Extension of Territory</b>	10	12.5
<b>Others</b>	1	1.3
<b>Total</b>	80	100.0

The next 5-year business plan shows that most organizations want to expand their business coverage, which is 83.8%. Among the others, 12.5% of their business expansion of Territory type of business.

### 7.8.3 To Keep Remains the Existing Ownership Structure or Want to Change of Ownership in Next Five Years

Table 7.8.3: Want to change or not of ownership in next five years

Category	Frequency	Percent (%)
<b>Yes</b>	52	65.0
<b>No</b>	28	35.0
<b>Total</b>	80	100.0

In the survey, 65 percent of the owners of the company do not want to change their business. They want to move their current business to a larger extent. Out of the remaining 35% of the

company's owners, they want to change their current business. Most of them want to go back to the Sole Proprietorship business.

#### 7.8.4 Type of Ownership after Change

Table 7.8.4: Type of ownership after change

Category	Percent (%)
<b>Sole Proprietorship</b>	61.54
<b>Partnership</b>	30.77
<b>Joint Venture</b>	7.69
<b>Total</b>	<b>100.0</b>

According to the survey, 35 percent of the owners wanted to change their business, among them 61.54 percent would like to go back to Sole Proprietorship, 30.77 percent in partnership and 7.69 percent joint venture business.

#### 7.8.5 Total Assets of Your Organization during the Establishment

Table 7.8.5: Total assets of your organization during the establishment

Category	Frequency	Percent (%)
<b>2-10 million taka</b>	52	65.0
<b>10-25 million taka</b>	19	23.8
<b>25-50 million taka</b>	7	8.8
<b>Other</b>	2	2.5
<b>Total</b>	<b>80</b>	<b>100.0</b>

Owners of 65 percent of the companies had their capital to start their business, between 2 million and 1 crore, 23.8 percent of owners were between 1 million and 2.5 million, and the remaining 11.3 percent was owned by the owners of about 2.5 to 5 million.

#### 7.8.6 Total Assets of Your Organization at Present

Table 7.8.6: Total assets of your organization is at present

Category	Frequency	Percent (%)
<b>2-10 million taka</b>	31	38.8

<b>10-25 million taka</b>	32	40.0
<b>25-50 million taka</b>	16	20.0
<b>Other</b>	1	1.3
<b>Total</b>	<b>80</b>	<b>100.0</b>

31 percent of the company's present capital is 2 million to 1 crore, 32 percent is the current capital of the company from 1 million to 25 million, and 21.3 percent is the present capital of the company 2.5 million to 5 million. This information shows that most companies have gained business profit since the beginning to the present. Their current capital has risen more than the previous.

### 7.8.7 Organization's Economic Activity

Table 7.8.7: Organization's Economic Activity

<b>Category</b>	<b>Frequency</b>	<b>Percent (%)</b>
<b>Products</b>	36	45.0
<b>Services</b>	24	30.0
<b>Production</b>	13	16.3
<b>Distribution</b>	4	5.0
<b>Others</b>	3	3.8
<b>Total</b>	<b>80</b>	<b>100.0</b>

45 percent of the business economic activity of the business organization is products oriented, 30 percent is services oriented, and 16.3 percent is production oriented and rest of the amount distribution and others. So, most SMEs are associated with product production and service activities.

### 7.8.8 Average Rate of Return

Table 7.8.8: Average Rate of Return

<b>Category</b>	<b>Frequency</b>	<b>Percent (%)</b>
<b>Between 1% - 5%</b>	41	51.3
<b>Between 6% - 10%</b>	27	33.8
<b>Between 11% - 15%</b>	2	2.5
<b>Between 16% - 20%</b>	2	2.5
<b>No</b>	8	10.0
<b>Total</b>	<b>80</b>	<b>100.0</b>

51.3 percent of the organizations earn on an average profit of 1 percent to 5 percent annually. The number of such business organization is 41. 33.8 percent of the organizations earn on an average profit of 6 percent to 10 percent annually. The number of such business organization is 27. There are 10 percent business organizations that make no profit in annually. Apart from these eight organizations, all the organizations have achieved profits at the end of the year and are strengthening their business economic situation.

### 7.8.9 Investment on New Products

Table 7.8.9: Investment on new products

Category	Frequency	Percent (%)
<b>Between 1% - 5%</b>	47	58.8
<b>Between 6% - 10%</b>	20	25.0
<b>Between 11% - 15%</b>	4	5.0
<b>Between 16% - 20%</b>	3	3.8
<b>No new or improved products</b>	6	7.5
<b>Total</b>	<b>80</b>	<b>100.0</b>

58.8% of the organizations invested 1% to 5% of their profits for the innovation of new products. 25% of the organizations invested 6% to 10% of their profits for the innovation of new products and there are 7.5 percent of the organizations who do not spend any part of their profits on innovating new products. From this, it is understood that free innovation in small and medium industries is prevailing in Bangladesh. Organizations conduct research and development activities through a joint venture.

### 7.8.10 Income Spend on Innovation Activities

Table 7.8.10: Income spend on innovation activities

Category	Frequency	Percent (%)
<b>1% - 2%</b>	45	56.2
<b>3% - 5%</b>	17	21.2
<b>6% - 8%</b>	9	11.3
<b>9% - 11%</b>	7	8.8

<b>12% - 14%</b>	2	2.5
<b>Total</b>	<b>80</b>	<b>100.0</b>

56.2 percent of the companies spend 1 percent to 2 percent, 21.2 percent of the company spends 3 percent to 5 percent, 11.3 percent of the companies spend 6 percent to 8 percent, 8.8 percent of the companies spend 9 percent to 11 percent, and only 2.5 percent of their institutions From 1 percent to 14 percent of their income in innovative activities.

## 7.9 Basic Concepts of Open Innovation Holding By the Respondents

### 7.9.1 Meaning of Innovation of SMEs in Bangladesh

The assigned scores to the scales are as follows:

Sl. No.	Scale	Score
1	Strongly Disagree	1
2	Disagree	2
3	Neutral	3
4	Agree	4
5	Strongly Agree	5

Consider the mean values obtained for the minimum and maximum of each combination and calculate the range for each combination as

$$\text{Range} = \text{Maximum Value} - \text{Minimum Value}$$

The measure of importance for each combination is calculated as follows:

Measure of importance for a combination of attributes

$$= \frac{\text{Range for that combination}}{\text{Sum of the ranges for all the combinations}} \times 100$$

The scores for the six combinations are calculated as follows:

Combination	Total Score	Measure of Importance
1. Think a totally new design	271	11.93

2. Create new design	297	19.89
3. Get new idea in discussion with suppliers/customers/ distributors	288	15.34
4. The implementation of new or significantly improved product/process	290	17.61
5. The implementation of new marketing method or a new organizational method in business practices	293	19.32
6. The implementation of new external relations	302	15.91

The larger the value of the third column in the table will be more important to the meaning of innovation. The highest value of the table is create new design whose value is 19.89; the second highest value in the table is the implementation of new marketing method or a new organizational method in business practices, whose value is 19.32; the third lowest value in the table is The implementation of new or significantly improved product/process, whose value is 17.61 and think a totally new design as the least important.

For illustrating the concepts of innovation, we have taken up 80 respondents in the above problem. It is concluded that create new design as the most important, think a totally new design as the least important to the meaning of innovation.

### 7.9.2 Meanings of Open Innovation

The scores for the 10 combinations are calculated as follows:

S.L	Combination	Total Score	Measure of Importance
1	Collecting new developmental ideas	284	12.06
2	To have a better understanding of customer needs & expectations	286	9.22



3	Access to new technologies or technical knowledge used in the firm	285	14.18
4	Improving the efficiency of the organization	278	10.28
5	Removal of complex investment risk	238	7.80
6	Strengthen relationships with suppliers/customers/distributors	293	8.87
7	Recovery of intellectual property & patents.	267	10.28
8	Acquiring new sources of knowledge & technology from external partners to incorporate those developed internally.	265	9.57
9	Sharing internal technology & knowledge to others.	285	9.57
10	Combining internal and external knowledge & technology to make a new path of development	314	8.16

The larger the value of the third column in the table will be more important to the meaning of innovation. The highest value of the table is access to new technologies or technical knowledge used in the firm whose value is 14.18; the second highest value in the table is collecting new developmental ideas, whose value is 12.06; the third and fourth lowest value in the table are improving the efficiency of the organization and recovery of intellectual property & patents, whose value is 10.28 and combining internal and removal of complex investment risk as the least important. From the above measurement table, it is concluded that access to new technologies or technical knowledge used in the firm as the most important and removal of complex investment risk as the least important to the meaning of open innovation.

### 7.9.3 Taken any Technology in your Organization to adopt Open Innovations

Table 7.9.3: Taken any technology in your organization to adopt open innovations

Category	Frequency	Percent
Yes	79	98.7
No	1	1.3
<b>Total</b>	<b>80</b>	<b>100.0</b>

98.7 percent of SMEs want to take new technology in the organization for adopting open innovation and the remaining 1.3 percent SME does not want to take new technology to adopt open innovation. So, SMEs of Bangladesh are ready to adopt open innovation in the business organization.

#### 7.9.4 Prioritized the Functional Areas for Applying Open Innovation in the Organization

Table 7.9.4: Open innovation needed in the Sector

Category	Percent
<b>Product Development</b>	36.3
<b>Service</b>	18.8
<b>Marketing</b>	27.5
<b>Process</b>	6.3
<b>Distribution</b>	3.8
<b>Business Model</b>	2.5
<b>Innovation</b>	
<b>Organization Innovation</b>	1.3
<b>Other</b>	3.8
<b>Total</b>	<b>100.0</b>

36.3% of the companies think that the demand for open innovation needs in the product development sector, 18.8 percent of the service sector, 27.5 percent marketing sector and 6.3 percent are in the process of production.

#### 7.9.5 Strategies for Adopting Open Innovation in the Organization

Table 7.9.5: Strategies for Adopting Open Innovation

Category	Frequency	Percent
<b>Competitive Strategy</b>	30	37.5
<b>Growth Strategy</b>	44	55.0
<b>Cost Leadership Strategy</b>	3	3.8
<b>Acquisition Strategy</b>	0	0.0
<b>Other</b>	3	3.8
<b>Total</b>	<b>80</b>	<b>100.0</b>

55 percent of the companies follow the growth strategy to apply open innovation. Besides, 37.5 percent competitive strategy and 3 percent cost leadership strategy follow to apply open innovation in the organization. So, the organizations that have taken new technology to adopt open innovation, most of those organizations follow the growth strategy for product development.

### 7.9.6 Internal and External Factor of the Organization for Adopting Open Innovation

These are the important internal and external factor of the organization for adopting open innovation.

<b>Internal Factors</b>	<b>Percent</b>
Owner/Management attitude	98.8
Employee attitude	77.5
Capabilities	66.3
Existing corporate culture & idea sharing within organization	52.5
<b>External Factors</b>	<b>Percent</b>
Whether the product/service is customized	78.8
Market worthiness	62.5
Existence of systematic and organized approach for acceptance of external ideas	60.0

The management attitude of SME owners in Bangladesh is very important to adopt open innovation in the organization. If the owner of the organization does not want to get this opportunity, then there is no scope to implement this process, and if the employees working in the organization do not want to do something new then it is not possible. Therefore, it requires good work environment in the workplace. Only employers and employees will be able to engage themselves in the new innovation if they get a good working environment.

## 7.10 Findings Related to the Business Strategies, Firms Characteristics and Projects Characteristics (SFP) Context:

### 7.10.1 (a) :Findings Related to the Firms' Strategies Factors Context:

Start-ups and small and medium organizations are typically influenced by way of a lot of enthusiasm and positivity in their preferred markets. This can lead their enterprise to similarly enterprise improvement; however it is smart to plan for sustainable long-term business growth in order to truly survive / succeed in competitive markets.

Table 7.10.1(a): Frequency Analysis of Firms' Strategies Factors

Context	Frequency	%
<b>Expansion Strategy (Blue Ocean )</b>		
Agree	32	40.0
Strongly Agree	48	60.0
<b>Cost Leadership Strategy</b>		
Agree	34	42.5
Strongly Agree	46	57.5
<b>Focus strategy on Product</b>		
Agree	33	41.3
Strongly Agree	47	58.8
<b>Focus Strategy on Service</b>		
Agree	32	40.0
Strongly Agree	48	60.0
<b>Focus Strategy on Market</b>		
Agree	32	40.0
Strongly Agree	48	60.0
<b>Focus Strategy on Network</b>		
Agree	26	32.5
Strongly Agree	54	67.5
<b>Focus Strategy on Customer</b>		
Agree	34	42.5
Strongly Agree	46	57.5

<b>Focus Strategy (weighted Average)</b>		
Agree	31	39.25
Strongly Agree	49	60.75
<b>Competitive Strategy on Level of Competition</b>		
Agree	36	45.0
Strongly Agree	44	55.0
<b>Competitive Strategy on Management Expertise</b>		
Agree	26	32.5
Strongly Agree	54	67.5
<b>Competitive Strategy</b>		
Agree	31	38.75
Strongly Agree	49	61.25

Expansion strategy (Blue Ocean) is an extensively used approach for business enlargement of small and medium industries in Bangladesh. From the findings 60 % of the respondents strongly agree that their enterprises focus on expansion strategy, as compared to only 40% of the respondents agree that their firms focus on expansion strategy. From the findings 57.5 % of the respondents strongly agree that their enterprises focus on cost leadership strategy, as compared to only 42.5% of the respondents agree that their firms focus on cost leadership strategy.

Product development is a tremendous approach for innovating enterprise models in small and medium industries. The researcher requested the respondents to point out their degree of agreement on the statements concerning to focus on product development strategies adopted by their business. As such, the researcher requested respondents whether or not their initiatives focus on product development strategy. From the findings 58.8 % of the respondents strongly agree that their businesses focus on product development strategy, as compared to only 41.2% of the respondents agree that their firms focus on product development strategy. Bangladeshi SMEs follow product development strategies in emerging markets.

Service is a business strategy that focuses on long-term involvement of existing customers with the organization rather than attracting new customers. In small and medium enterprises,

the service is to compare the customer's expectations about the service and the idea of how the customer will benefit more if the service is implemented. Customer satisfaction and loyalty are maintained through product quality and service. As such, the researcher requested respondents whether or not their initiatives focus on service strategy. From the findings 60% of the respondents strongly agree that their businesses focus on service strategy, as compared to only 40% of the respondents agree that their firms focus on service strategy.

Market is a focus strategy based on growing the firms' current share of products and markets. This approach targets at growing the sale of current product in the current market through aggressive promotion. The firm penetrates deeper into the market to seize a large share of the market. The findings on respondent degree of agreement on the factors concerning to market focus strategy and their influence on the boom of enterprises. From the findings 60 % of the respondents strongly agree that their firms focus on market strategy, as compared to only 40% of the respondents agree that their firms focus on market strategy.

Network development is a tremendous approach for innovating enterprise models in small and medium industries. The researcher requested the respondents to point out their degree of agreement on the statements concerning to focus on network development strategy adopted by their business. As such, the researcher requested respondents whether or not their initiatives focus on network strategy. From the findings 67.5 % of the respondents strongly agree that their businesses focus on network strategy, as compared to only 32.5% of the respondents agree that their firms focus on network strategy.

The researcher requested the respondents to point out their degree of agreement on the statements concerning to focus on customer strategy adopted by their business. As such, the researcher requested respondents whether or not their initiatives focus on customer strategy. From the findings 57.5 % of the respondents strongly agree that their businesses focus on customer strategy, as compared to only 42.5% of the respondents agree that their firms focus on customer strategy.

The researcher requested the respondents to point out their degree of agreement on the statements concerning to competitive strategy on competition adopted by their business. As such, the researcher requested respondents whether or not their initiatives competitive strategy on competition. From the findings 55 % of the respondents strongly agree that their businesses competitive strategy on competition, as compared to only 45% of the respondents agree that their firms competitive strategy on competition. And From the findings 67.5 % of

the respondents strongly agree that their businesses competitive strategy on management expertise, as compared to only 32.5% of the respondents agree that their firms competitive strategy on management expertise.

**7.10.1 (b): Correlation Analysis between Firms’ Strategies Factors and Open Innovation:**

**Table 7.10.1(b): Correlation Analysis between Firms’ Strategies Factors and OI**

Firms’ Strategies Factors		Open Innovation (OI)
Expansion Strategy (Blue Ocean )	Pearson Correlation	0.396
	Sig. (2-tailed)	0.000
Cost Leadership Strategy	Pearson Correlation	0.689
	Sig. (2-tailed)	0.000
Focus Strategy	Pearson Correlation	0.699
	Sig. (2-tailed)	0.000
Competitive Strategy	Pearson Correlation	0.728
	Sig. (2-tailed)	0.000

From the above table, the correlation between open innovation and expansion strategy (Blue Ocean), cost leadership strategy, focus strategy, competitive strategy are positively related and significant.

There is a positive but weak correlation between expansion strategy (Blue Ocean) and open innovation ( $r=0.396$ ) which is statistically significant at a 95% confidence level. Therefore it can be concluded that the items in expansion strategy is positively correlated with open innovation adoption in Bangladeshi SMEs.

There is a positive and strongly correlated between cost leadership strategy and open innovation ( $r=0.689$ ) which is statistically significant at a 95% confidence level.

There is a positive and strongly correlated between focus strategy and open innovation ( $r=0.699$ ) which is statistically significant at a 95% confidence level.

There is a positive and strongly correlated between competitive strategy and open innovation ( $r=0.728$ ) which is statistically significant at a 95% confidence level.

### 7.10.2 (a): Findings Related to the Firms' Characteristic Context:

Table 7.10.2 (a): Frequency Analysis of Firms' Characteristics

Context	Frequency	%
<b>Target Product</b>		
Agree	32	40
Strongly Agree	48	60
<b>Strength of R&amp;D</b>		
Agree	22	27.5
Strongly Agree	58	72.5
<b>Domestic Market</b>		
Agree	25	31.2
Strongly Agree	55	68.8
<b>International Market</b>		
Agree	33	41.2
Strongly Agree	47	58.8

The researcher requested the respondents to point out their degree of agreement on the statements concerning to firms' characteristics' on target product, strength of R&D, domestic market, and international market adopted by their business. As such, the researcher requested respondents whether or not their initiatives firms' characteristics' on target product. From the findings 50 % of the respondents strongly agree that their businesses competitive strategy on competition, as compared to only 40% of the respondents agree that their firms competitive strategy on competition.

As such, the researcher requested respondents whether or not their initiatives firms' characteristics' on strength of R&D. From the findings 72.5 % of the respondents strongly agree that their businesses competitive strategy on competition, as compared to only 27.5% of the respondents agree that their firms 'characteristics' on strength of R&D.

As such, the researcher requested respondents whether or not their initiatives firms' characteristics' on domestic market. From the findings 68.8 % of the respondents strongly



agree that their businesses competitive strategy on competition, as compared to only 31.2% of the respondents agree that their firms ‘characteristics’ on domestic market.

As such, the researcher requested respondents whether or not their initiatives firms’ characteristics’ on international market. From the findings 58.8 % of the respondents strongly agree that their businesses competitive strategy on competition, as compared to only 41.2% of the respondents agree that their firms ‘characteristics’ on international.

**7.10.2 (b): Correlation Analysis between Firms Characteristics and Open Innovation:**

Table 7.10.2 (b): Correlation Analysis between Firms’ Characteristics’ and OI

Firms’ Characteristics’		Open Innovation (OI)
Target Product	Pearson Correlation	0.624
	Sig. (2-tailed)	0.000
Strength of R&D	Pearson Correlation	0.670
	Sig. (2-tailed)	0.000
Domestic Market	Pearson Correlation	0.622
	Sig. (2-tailed)	0.000
International Market	Pearson Correlation	0.722
	Sig. (2-tailed)	0.000

From the above table, the correlation between open innovation and target product, cost strength of R&D, domestic market, and international market are positively related and significant.

There is a positive and also strong correlation between target product and open innovation ( $r=0.624$ ) which is statistically significant at a 95% confidence level. This means that the target product has a relationship with the application of the concept of open innovation in small and medium industries in Bangladesh. Therefore it can be concluded that the items in target product is positively correlated with open innovation adoption in Bangladeshi SMEs.

On the other hand, there are a positive as well as strong correlation between strength of R&D ( $r=0.670$ ), domestic market ( $r=0.622$ ), international market ( $r=0.722$ ) and open innovation which are statistically significant at a 95% confidence level.

### 7.10.3 (a): Findings Related to the Project Level Characteristics Context:

Table 7.10.3 (a): Frequency Analysis of Project Level Characteristics'

Context	Frequency	%
<b>Networking for Intelligence and Consulting</b>		
Neutral	1	1.3
Agree	34	42.5
Strongly Agree	45	56.2
<b>Licensing</b>		
Neutral	1	1.3
Agree	42	52.5
Strongly Agree	37	46.2
<b>Collaboration with others</b>		
Neutral	1	1.3
Agree	25	31.2
Strongly Agree	54	67.5
<b>Outsourcing</b>		
Neutral	1	1.3
Agree	27	33.7
Strongly Agree	52	65.0
<b>Financing</b>		
Neutral	1	1.3
Agree	30	37.5
Strongly Agree	49	61.2
<b>Market Discovery/Planning</b>		
Neutral	1	1.3
Agree	35	43.7
Strongly Agree	44	55.0
<b>Product Development</b>		
Neutral	2	2.50
Agree	31	38.75
Strongly Agree	47	58.75

The researcher requested the respondents to point out their degree of agreement on the statements concerning to project level characteristics' on networking for intelligence and consulting, licensing, collaboration with others, outsourcing and financing adopted by their business. As such, the researcher requested respondents whether or not their initiatives project level characteristics' on networking for intelligence and consulting. From the findings 56.2 % of the respondents strongly agree that their businesses project level characteristics on networking for intelligence and consulting, as compared to only 42.5% of the respondents agree that their firms project level characteristics on networking for intelligence and consulting. On the other hand, only 1.3% of respondents put themselves in a neutral position.

From the findings 46.2 % of the respondents strongly agree that their businesses project level characteristics on licensing, as compared to only 52.5% of the respondents agree that their firms project level characteristics on licensing. On the other hand, only 1.3% of respondents put themselves in a neutral position.

From the findings 67.5 % of the respondents strongly agree that their businesses project level characteristics on collaboration with others, as compared to only 31.2% of the respondents agree that their firms project level characteristics on collaboration with others. On the other hand, only 1.3% of respondents put themselves in a neutral position.

From the findings 65.0% of the respondents strongly agree that their businesses project level characteristics on outsourcing, as compared to only 33.7% of the respondents agree that their firms project level characteristics on outsourcing. On the other hand, only 1.3% of respondents put themselves in a neutral position.

From the findings 61.2% of the respondents strongly agree that their businesses project level characteristics on financing, as compared to only 37.5% of the respondents agree that their firms project level characteristics on financing. On the other hand, only 1.3% of respondents put themselves in a neutral position

From the findings 55.0% of the respondents strongly agree that their businesses project level characteristics on market discovery/planning, as compared to only 43.7% of the respondents agree that their firms project level characteristics on market discovery/planning. On the other hand, only 1.3% of respondents put themselves in a neutral position

From the findings 58.75% of the respondents strongly agree that their businesses project level characteristics on product development, as compared to only 38.75% of the respondents agree that their firms project level characteristics on product development. On the other hand, only 2.50% of respondents put themselves in a neutral position.

### 7.10.3 (b): Correlation Analysis between Project Level Characteristics' and OI:

Table 7.10.3 (b): Correlation Analysis between Project Level Characteristics' and OI

Project Level Characteristics		Open Innovation (OI)
Networking for Intelligence and Consulting	Pearson Correlation	0.213
	Sig. (2-tailed)	0.057
Licensing	Pearson Correlation	0.106
	Sig. (2-tailed)	0.348
Collaboration with others	Pearson Correlation	0.140
	Sig. (2-tailed)	0.217
Outsourcing	Pearson Correlation	0.417
	Sig. (2-tailed)	0.000
Financing	Pearson Correlation	0.039
	Sig. (2-tailed)	0.730
Market Discovery/Planning	Pearson Correlation	0.323
	Sig. (2-tailed)	0.003
Product Development	Pearson Correlation	0.323
	Sig. (2-tailed)	0.003

From the above table, the correlation between open innovation and networking for outsourcing, market discovery/planning and product development are positively related and significant. On the other hand, the correlation between open innovation and networking for intelligence and consulting, licensing, collaboration with others, and financing are positively related but not significant.

There are a weak positive correlation between out sourcing ( $r= 0.417$ ), market discovery/planning ( $r= 0.323$ ), product development ( $r= 0.323$ ) and open innovation which is statistically significant at a 95% confidence level.

On the other hand, there are a weak positive correlation exists between networking for intelligence and consulting( $r=0.213$ ), licensing ( $r=0.106$ ), collaboration with others ( $r=0.140$ )and open innovation which are not statistically significant at a 95% confidence level. Again, there is a positive and also strong correlation exist between financing and open innovation ( $r=0.624$ ) which is not statistically significant at a 95% confidence level.

## 7.11 Hypotheses Analysis

### 7.11.1 Firms Level Strategic Factors for Adopting Open Innovation

This scale was used to measure firms' strategies factors and the responses were rated on the Likert-scale format, with answers ranging from 1-5 (1= strongly disagree and 5= strongly agree). The psychometric properties of the instrument were evaluated in terms of reliability. Cronbach's alpha values were calculated for all multi-item variables. The entire instrument as well as the individual variables exceeded the minimum alpha of 0.737 which is equivalent to 0.74 and According to Van Der Wal, achieved the acceptable reliability levels ranged from 0.7 to 0.80 (van der Wal, 2001).

#### **Hypothesis 01: Firms' Strategies Factors for Adopting Open Innovation in SMEs of Bangladesh**

Hypothesis one states that "There is no significant relationship between firms' strategies factors for adopting open innovation in SMEs of Bangladesh". This hypothesis objective was to determine if firms' strategies factors is significantly related to adopted open innovation in SMEs of Bangladesh. The result in table 7.11.1(c) exposed to view that firms' strategies factors is significantly ( $F\text{-ratio} = 73.910; 0.00$ ) related to adopted open innovation in SMEs in Bangladesh.

#### i. Model Specification

Mathematically, the model is expressed as follows:

$$OI = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon$$

Where;

OI= Open Innovation;

$X_1$  = Cost Leadership;

$X_2$  = Focus Strategy;

$X_3$  = Competitive Strategy;

$\beta_0$  = Regression constant (intercept);

$\beta_1$ ---  $\beta_3$ = Regression coefficients,

$\epsilon$  = Error term

ii. Data Analysis and Discussion:

a) Descriptive Statistics

Descriptive statistics was conducted to observe the distribution between motivating factors and strategies and open innovation data. Table 7.11.1(a) shows the summary of the descriptive statistics.

**Table 7.11.1(a): Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
Firms' Strategy Factor	80	4.00	5.00	4.61	0.34
Open Innovation	80	4.00	5.00	4.63	0.29
Valid N (listwise)	80				

Source: Survey Data, 2019

The study sample consisted of 80 participants. The independent variable, firms' strategies factors ranged from 4.00 to 5.00 with a mean of 4.61 and a standard deviation of 0.34. The dependent variable, open innovation ranged from 4.00 to 5.00 with a mean of 4.63 and a standard deviation of 0.29.

**Table 7.11.1(b): Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.863 <sup>a</sup>	0.745	0.735	0.14945

a. Predictors: (Constant), Competitive Strategy, Cost Leadership Strategy, Focus Strategy

b. Dependent Variable: Open Innovation

Source: Survey Data, 2019

The coefficient of determination is 0.745 which means that the independent variable can explain 74.5% of the variation of the dependent variable. Therefore, about 74.5% of the total variation in the open innovation data is explained by motivating factors and strategies. The regression equation appears to be very useful for making predictions since the value of  $R^2$  is greater than 0.5.

**b) Hypothesis Testing: ANOVA**

**Table 7.11.1(c): Analysis of Variance (ANOVA)**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.953	3	1.651	73.910	.000 <sup>a</sup>
	Residual	1.698	76	.022		
	Total	6.650	79			

- a. Dependent Variable: Open Innovation. Statistical Significance at 5%
- b. Predictors: (Constant), Competitive Strategy, Cost Leadership Strategy, Focus Strategy

**Source:** Researcher’s Field Survey, 2019. Statistical Significance at 5%

From the table 7.11.1(c), it was identified that the model was confirmed with an F value of (3, 76) = 73.910 which was significant at 5% ( $p < 0.05$ ) level of significance meaning that the model had the ability of capturing the contribution. This indicated that there is statistically significant association between independent variables (3 Factors) and dependent variable (Open Innovation). This also indicated that alternative hypothesis was accepted and the null hypothesis was rejected. This implies that, firms’ strategies factors influence to adopt open innovation in SMEs in Bangladesh at 5% level of significant. Therefore, it can be concluded that firms’ strategies factors are significant factors to influence the adoption open innovation in SMEs of Bangladesh.

**Table 7.11.1(d): Multiple Regression showing the Motivating Factors and Strategies for Adopting Open Innovation in SMEs of Bangladesh**

Model	Un-standardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		

1	(Constant)	1.221	0.237		5.160	.000
	Cost Leadership Strategy	0.217	0.040	0.372	5.475	.000
	Focus Strategy	0.272	0.060	0.333	4.561	.000
	Competitive Strategy	0.251	0.054	0.351	4.651	.000

**a. Dependent Variable:** Open Innovation. Statistical Significance at 5%

**Source:** Researcher's Field Survey, 2019.

From the table 7.10.1(d), Un-standardized coefficients indicated how much the dependent variable (Open Innovation) varies with independent variable (3 factors), when all other independent variables are held constant. The beta coefficients indicated that how and to what extent the factors such as cost leadership strategy, focus strategy, and competitive strategy influence open innovation.

In determining the effect of cost leadership strategy on adopting open innovation, while holding other factors constant, was the study observed to be positive that cost leadership strategy accounted for a variation of 0.372 of the adopting open innovation and this was the highest among other at 5% level of significance with t-value is 5.475.

The effect of focus strategy on adopting open innovation, while holding other factors constant, was the study observed to be positive that competition accounted for a variation of 0.333 of the adopting open innovation and this was the 3<sup>rd</sup> highest among other at 5% level of significance with t-value is 4.561.

The effect of competitive strategy on adopting open innovation, while holding other factors constant, was the study observed to be positive that competition accounted for a variation of 0.351 of the adopting open innovation and this was the 2<sup>nd</sup> highest among other at 5% level of significance with t-value is 4.651.

### 7.11.2 Firms Level Characteristics to Adopt Open Innovation in SMEs

This scale was used to measure firms' characteristics and the responses were rated on the Likert-scale format, with answers ranging from 1-5 (1= strongly disagree and 5= strongly agree). The psychometric properties of the instrument were evaluated in terms of reliability. Cronbach's alpha values were calculated for all multi-item variables. The entire instrument as well as the individual variables exceeded the minimum alpha of 0.733 which is equivalent



to 0.73 and According to Van Der Wal, achieved the acceptable reliability levels ranged from 0.7 to 0.80 (van der Wal, 2001).

## **Hypothesis 02: Firms' Characteristics to Adopt Open Innovation in SMEs of Bangladesh**

Hypothesis one states that “There is no significant relationship between firms’ characteristics to adopt open innovation in SMEs of Bangladesh”. This hypothesis objective was to determine if firms’ characteristics is significantly related to adopted open innovation in SMEs in Bangladesh. The result in table 7.11.2(c) exposed to view that firms’ characteristics is significantly (F-ratio = 66.589; 0.00) related to adopted open innovation in SMEs in Bangladesh.

### **i. Model Specification**

Mathematically, the model is expressed as follows:

$$\text{Open Innovation (OI)} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

Where;

OI= Open Innovation;

$X_1$  = International Market;

$X_2$  = *Target Product*;

$X_3$  = Domestic Market;

$X_4$  = Strength of R&D;

$\beta_0$  = *Regression constant (intercept)*;

$\beta_1$ ---  $\beta_4$ = Regression coefficients,

$\epsilon$  = Error term

### **ii. Data Analysis and Discussion:**

#### **a) Descriptive Statistics**

Descriptive statistics was conducted to observe the distribution between firms’ characteristics and open innovation data. Table 7.11.2(a) shows the summary of the descriptive statistics.

**Table 7.11.2(a): Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
Firms' Characteristic	80	4.00	5.00	4.65	0.36
Open Innovation	80	4.00	5.00	4.63	0.29
Valid N (listwise)	80				

**Source:** Survey Data, 2019

The study sample consisted of 80 participants. The independent variable, firms' characteristics ranged from 4.00 to 5.00 with a mean of 4.65 and as standard deviation of 0.32. The dependent variable, open innovation ranged from 4.00 to 5.00 with a mean of 4.63 and a standard deviation of 0.29.

**Table 7.11.2(b): Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.883 <sup>a</sup>	0.780	0.769	0.14

- a. Predictors: (Constant), International Market, Target Product, Domestic Market, Strength of R&D
- b. Dependent Variable: Open Innovation

**Source:** Survey Data, 2019

The coefficient of determination is 0.78 which means that the independent variable can explain 69% of the variation of the dependent variable. Therefore, about 78% of the total variation in the open innovation data is explained by firms' characteristics. The regression equation appears to be very useful for making predictions since the value of  $R^2$  is greater than 0.5.

#### b) Hypothesis Testing: ANOVA

**Table 7.11.2(c): Analysis of Variance (ANOVA)**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.189	4	1.297	66.589	0.000 <sup>a</sup>
	Residual	1.461	75	0.019		
	Total	6.650	79			

**Table 7.11.2(c): Analysis of Variance (ANOVA)**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.189	4	1.297	66.589	0.000 <sup>a</sup>
	Residual	1.461	75	0.019		
	Total	6.650	79			

a. Dependent Variable: Open Innovation. Statistical Significance at 5%

b. Predictors: (Constant), International Market, Target Product, Domestic Market, Strength of R&D

**Source:** Researcher's Field Survey, 2019.

From the table 7.11.2(c), it was identified that the model was confirmed with an F value of (4, 75) = 66.589 which was significant at 5% ( $p < 0.05$ ) level of significance meaning that the model had the ability of capturing the contribution. This indicated that there is statistically significant association between independent variables (4 Factors) and dependent variable (Open Innovation). This also indicated that alternative hypothesis was accepted and the null hypothesis was rejected. This implies that, firms' characteristics' influence to adopt open innovation in SMEs of Bangladesh at 5% level of significant. Therefore, it can be concluded that firms' characteristics are significant factors to influence the adoption open innovation in SMEs of Bangladesh.

**Table 7.11.2(d): Multiple Regression showing the Firms' Characteristics for Adopting Open Innovation in SMEs of Bangladesh**

Model		Un-standardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.291	0.208		6.216	0.000
	Target Product	0.162	0.037	0.275	4.429	0.000
	Strength of R&D	0.182	0.042	0.282	4.318	0.000
	Domestic Market	0.159	0.039	0.256	4.067	0.000
	International Market	0.214	0.038	0.366	5.629	0.000

a. **Dependent Variable:** Open Innovation. Statistical Significance at 5%

**Source:** Researcher's Field Survey, 2019.

From the table 8.11.2(d), Un-standardized coefficients indicated how much the dependent variable (Open Innovation) varies with independent variable (4 factors), when all other independent variables are held constant. The beta coefficients indicated that how and to what extent the factors such as target product, strength of R&D, domestic market and international market influence open innovation.

In determining the effect of target product while holding the others constant, the study observed that target product accounted for a variation of 0.275 of the adopting open innovation and this was the 3<sup>rd</sup> highest among other at 5% level of significance with t-value of 4.429 which means that target product is an important factor to adopt open innovation in SMEs. The result suggested that the target product effect was not new to the respondents. Observations show that small and medium enterprises already had an idea of how to use target product in open innovation. This study advises SME entrepreneurs to increase their efficiency in the proper application of target product to open innovation before starting a business.

The effect of strength of R&D on adopting open innovation, while holding other factors constant, was the study observed to be positive that competition accounted for a variation of 0.282 of the adopting open innovation and this was the 2<sup>nd</sup> highest among other at 5% level of significance with t-value is 4.318.

The effect of domestic market on adopting open innovation, while holding other factors constant, was the study observed to be positive that the domestic market accounted for a variation of 0.256 of the adopting open innovation and this was the lowest among other at 5% level of significance with t-value is 4.067.

The effect of international market on adopting open innovation, while holding other factors constant, was the study observed to be positive that the international market accounted for a variation of 0.366 of the adopting open innovation and this was the highest among other at 5% level of significance with t-value is 5.629.

### **7.11.3 Project Level Characteristics for Adopting Open Innovation into the Firms**

This scale was used to project level characteristics and the responses were rated on the Likert-scale format, with answers ranging from 1-5 (1= strongly disagree and 5= strongly agree). The psychometric properties of the instrument were evaluated in terms of reliability. Cronbach's alpha values were calculated for all multi-item variables. The entire instrument

as well as the individual variables exceeded the minimum alpha of 0.736 which is equivalent to 0.74 and According to Van Der Wal, achieved the acceptable reliability levels ranged from 0.7 to 0.80 (van der Wal, 2001).

### **Hypothesis 03: Project Level Characteristics for Adopting Open Innovation into the Firms**

Hypothesis one states that “There is no significant relationship between project level characteristics for adopting open innovation into the firms in Bangladesh”. This hypothesis objective was to determine if project level characteristics is significantly related to adopted open innovation in SMEs in Bangladesh. The result in table 7.11.3 (c) exposed to view that project level characteristics is significantly (F-ratio = 3.697; 0.002) related to adopted open innovation in SMEs in Bangladesh.

#### **i. Model Specification**

Mathematically, the model is expressed as follows:

$$OI = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \epsilon$$

Where;

OI= Open Innovation;

$X_1$  = Product Development;

$X_2$  = Market Discovery/Planning;

$X_3$  = Collaboration with others;

$X_4$  = Licensing;

$X_5$  = Networking for Intelligence and Consulting;

$X_6$  = Financing;

$X_7$  = Outsourcing;

$\beta_0$  = Regression constant (intercept);

$\beta_1$ ---  $\beta_7$ = Regression coefficients,

$\epsilon$  = Error term

ii. Data Analysis and Discussion:

a) Descriptive Statistics

Descriptive statistics was conducted to observe the distribution between project level characteristics and open innovation data. Table 7.11.3(a) shows the summary of the descriptive statistics.

**Table 7.11.3(a): Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
Project Level Characteristics	80	3.00	5.00	4.57	0.33
Open Innovation	80	4.00	5.00	4.63	0.29
Valid N (listwise)	80				

**Source:** Survey Data, 2018

The study sample consisted of 80 participants. The independent variables, project-level characteristics spread from 3.00 to 5.00 with a mean of 4.57 and those with standard deviation 0.33. The dependent variable, open innovation ranged from 4.00 to 5.00 with a mean of 4.63 and a standard deviation of 0.29.

**Table 7.11.3.(b): Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.514 <sup>a</sup>	0.264	0.193	0.26

- a. Predictors: (Constant), Product Development, Market Discovery/Planning, Collaboration with others, Licensing, Networking for Intelligence and Consulting, Financing, Outsourcing
- b. Dependent Variable: Open Innovation

**Source:** Survey Data, 2018

The coefficient of determination is 0.264 which means that the independent variable can explain 26.4% of the variation of the dependent variable. Therefore, about 26.4% of the total variation in the open innovation data is explained by project level characteristics. The regression equation appears to be very useful for making predictions since the value of  $R^2$  is greater than 0.5.

**iii. Hypothesis Testing: ANOVA**

**Table 7.11.3(c): Analysis of Variance (ANOVA)**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.758	7	0.251	3.697	0.002 <sup>a</sup>
	Residual	4.892	72	0.068		
	Total	6.650	79			

- a. Dependent Variable: Open Innovation
- b. Predictors: (Constant), Market Discovery/Planning, Outsourcing, Networking for intelligence and consulting, Collaborative R&D, Sales, Distribution, Marketing, Services, Licensing, Product Development

**Source:** Researcher’s Field Survey, 2019. Statistical Significance at 5%

From the table 7.11.3(c), it was identified that the model was confirmed with an F value of (7, 72) = 3.697 which was significant at 5% ( $p < 0.05$ ) level of significance meaning that the model had the ability of capturing the contribution. This indicated that there is statistically significant association between independent variables (7 Factors) and dependent variable (Open Innovation). This also indicated that alternative hypothesis was accepted and the null hypothesis was rejected. This implies that, project level characteristics’ influence to adopt open innovation in SMEs of Bangladesh at 5% level of significant. Therefore, it can be concluded that project level characteristics’ are significant factors to influence the adoption open innovation in SMEs of Bangladesh.

**Table 7.11.3(d): Multiple Regression showing the Project Level Characteristics Adopting Open Innovation into the Firms**

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.210	0.416		7.719	.000

Networking for Intelligence and Consulting	-0.003	0.065	-0.005	-.041	.968
Licensing	-0.027	0.063	-0.049	-.430	.669
Collaboration with others	0.028	0.069	0.049	.410	.683
Outsourcing	0.157	0.072	0.276	2.197	.031
Financing	-0.109	0.068	-0.195	-1.600	.114
Market Discovery/Planning	0.125	0.063	0.227	1.978	.052
Product Development	0.136	0.067	0.257	2.037	.045

a. **Dependent Variable:** Open Innovation. Statistical Significance at 5%

**Source:** Researcher's Field Survey, 2019.

In determining the effect of outsourcing on adopting open innovation, while holding other factors constant, was observed to be positive. Outsourcing accounted for a variation of 0.276, while the t-value is 2.197 and is significant at 5% level. This result showed that outsourcing such as knowledge; skillful manpower, technology, and machinery equipment relation among others have effect on the adopting open innovation.

The effect of product development on adopting open innovation, while holding other factors constant, was observed to be positive. Product development accounted for a variation of 0.257, while the t-value is 2.037 and is significant at 5% level.

### 7.12 Benefits for Adopting Open Innovation in SMEs Specific Firm:

Consider the mean values obtained for the minimum and maximum of each combination and calculate the range for each combination as

$$\text{Range} = \text{Maximum Value} - \text{Minimum Value}$$

The measure of importance for each combination is calculated as follows:



Measure of importance for a combination of attributes

$$= \frac{\text{Range for that combination}}{\text{Sum of the ranges for all the combinations}} \times 100$$

Table 7.12: Benefits for Adopting Open Innovation (Rank Type)

S.L	Combination	Total Score	Measure of Importance	Rank
1	Reduce time & cost	274	2.73	1
2	Competitive advantages	536	4.34	3
3	Specialized product/services	591	7.12	10
4	Adoption of technology	509	3.16	2
5	Networking/collaboration with similar or same firms/competitors	638	6.48	8
6	Improvement of industry standard	689	6.32	7
7	Synergy created by combining knowledge among participating firms	813	11.03	15
8	Introduce new or significantly improved products or services or process of producing our products or services	637	7.34	11
9	Opening up of new markets	623	9.32	13
10	Increase quality of products/services	721	5.52	5
11	Attracting skilled workers	753	10.34	14
12	Bring expertise into R&D team or organization	770	8.19	12
13	External paths to market	711	6.80	9
14	Increase capability	665	5.03	4
15	Meet current & future market requirements	662	6.27	6

The lower the value of the items in the third column of the table, the more important the item will be considered. On the other hand, the higher the value of the item, the less important it is. This means that we can understand through the above logic which industrial entrepreneurs will benefit from the open innovation application in the SME industry.

From the above measurement table, it is concluded that, applying of open innovation concepts / technologies in the SME industry has led industry entrepreneurs to consider the most important component in this regard, especially the "reduce time and cost". Most of the SME entrepreneurs who participated in the study felt that the application of open innovative ideas / technologies in the field of industry has significantly reduced the production time and production cost in their industrial establishments. For which the entrepreneurs of this industry are making more profit than before. **Secondly**, the advantage of applying open innovation ideas/technologies in the SME industry is the "adoption of technology". Many industry entrepreneurs think that application of technologies (social networking, computerized records and online marketing) is important for the expansion of the SME sector, which has led to radical changes in SMEs. **Third** benefit for adopting open innovation idea/technology in SMEs is competitive advantage. Competitive advantage refers to elements that permit a business enterprise to produce items or services better or more cheaply than its rivals. These elements permit the productive entity to generate extra income or most effective margins in contrast to its market rivals. **Fourth** benefit for adopting open innovation idea/technology in SMEs is increase capability. Respondents feel that the application of open innovation concepts or various technologies using in small and medium enterprises has made it possible to increase business capability.

Rank of benefit for adopting open innovation idea/technology in SMEs are increase quality of products/services (Rank-5), meet current & future market requirements (Rank-6), Improvement of industry standard (Rank-7), Networking/collaboration with similar or same firms/competitors (Rank-8), external paths to market (Rank-9), specialized product/services (Rank-10), Introduce new or significantly improved products or services or process of producing our products or services (Rank-11), Bring expertise into R&D team or organization (Rank-12), Opening up of new markets (Rank-13), Attracting skilled workers (Rank-14), and Synergy created by combining knowledge among participating firms (Rank-15).

### 7.13 Challenges for Adopting Open Innovation in SMEs Specific Firm:

Table 7.13: Challenges for Adopting Open Innovation (Rank Type)

S.L	Combination	Total Score	Measure of Importance	Rank
1	Lack of expertise to handle/manage the innovation—	334	2.69	1

	In/Out			
2	Difficult in transferring knowledge from organization to organization	703	10.29	13
3	Difficult in collaborative partners	636	5.15	4
4	Requirement in large amount of investment	707	10.41	14
5	Lengthy process	551	6.37	7
6	Legal difficulties	546	5.73	5
7	Time consuming	523	4.21	3
8	Higher unsuccessful project rate	546	11.29	15
9	Lack of market demand (Low purchasing power of customer)	787	8.25	11
10	Problems with infrastructure (e.g. electricity, gas, communication etc)	845	8.13	10
11	Lack of customers responsiveness	605	7.78	9
12	Hard to find partners	767	9.65	12
13	High cost of open innovation	705	5.91	6
14	High cost of open innovation	567	7.43	8
15	Too expensive manpower	395	4.15	2

From the table of measurements above, it is concluded that lack of skills is the most important for challenges for adopting open innovation and higher failure project rate is the least important for challenges for adopting open innovation.

## **7.14 Major Constraints for SME Industries in Bangladesh**

### **7.14.1 General Constraints for SMEs in Bangladesh:**

The information collected by the researchers themselves through structural questionnaire and answers has been grouped according to different categories. The information of 80 SMEs has been separated from that group, where there is information on small and medium enterprises of Dhaka City, Gazipur City, and Narsingdi City. This information was used to identify the problems of SMEs in three regions. When respondents are asked to respond to SME problem in these three areas, they have recorded the most important limitation mentioned below, as shown in the table below.

Table 7.14.1: Constraints in terms of Finance and Regulation

<b>Constraints</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Access to finance</b>	22	27.5
<b>Transport</b>	18	22.5
<b>Business Licensing and Permits</b>	34	42.5
<b>Customs and trade regulations</b>	6	7.5
<b>Total</b>	<b>80</b>	<b>100</b>

Table 7.14.1 show that most of the respondents of these three regions ranked business licensing and permits as the number one constraint they face, access to finance as the 2<sup>nd</sup> number constraint they face, and customs and trade regulations was ranked as the less severe constraint by the 4<sup>th</sup> largest number of respondents. This means that the SME owners, who would be identified as small business owners according to the Bangladeshi definition of SMEs, find business licensing and permits to be their biggest hurdle.

#### **7.14.2 General Constraints of Open Innovation in SMEs in Bangladesh:**

From below table 7.14.2, you can say, the skilled manpower for expanding SMEs in Bangladesh, the demand for products in the domestic and international markets and the infrastructure of these industries are limited. Bangladeshi SMEs face different types of obstacles in entering the domestic and international market. Due to inadequate export expansion programs, inadequate consultation, and lacking adequate information, etc., there is a lack of institutional capacity in the organizations to support SME products in the international market.

Table 7.14.2: General Constraints of Open Innovation in SMEs in Bangladesh

<b>General Constraints</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Lack of quality management personnel	40	50
Lack of market demand	27	33.75
Problems with infrastructure (e.g. Gas, Electricity)	13	16.25
<b>Total</b>	<b>80</b>	<b>100</b>

This table shows details of constraints in SME in Bangladesh. Most of the respondents of these three regions ranked lack of quality management personnel as the number one

constraint they face, lack of market demand as the 2<sup>nd</sup> number constraint they face, and problems with infrastructure was ranked as the less severe constraint by the 3<sup>rd</sup> largest number of respondents. This means that the SME owners, who would be identified as small business owners according to the Bangladeshi definition of SMEs, find lack of quality management personnel to be their biggest hurdle.

Above bar chart shows the general Constraints of Open Innovation in SMEs in Bangladesh. Since 50 % respondents are considers lack of quality management personnel to be a major obstacle in SME in Bangladesh and 33.75% respondents are considers lack of market demand a moderate obstacle respectively, while 16.25 % respondents consider problems with infrastructure it to be a less obstacle at all.

### **7.14.3 Constraints in Terms of Access to Finance:**

In 2013, INSPIRED conducted a survey on 1,200 of manufacturing SMEs. According to the survey, 68.6 percent of small and 44.7 percent of medium enterprises face financial problems. Inadequate financing facilities are more pronounced due to high interest rates, strict regulations providing security, insufficient protection of borrowers' rights etc. Credit risk assurance schemes (essential for unprotected financing) are not effective. There is a significant shortage of legal framework or policy steps for increasing alternative funding and diversifying financial markets (from small loans to leasing, factoring, venture capital, equity funds etc). Currently, 19 percent of country's total credit portfolio is owned by SMEs. SMEs are now being given loan facilities mainly because of the initiatives and special instructions of the Bangladesh Bank. It is essential that SME loan flow continues through sustainable institutional framework for a long period of time. Although the Basic Bank was established in 1988 to provide funding to the SME sector, the bank failed to fulfill that objective. Due to this SME funding is being widely emphasized on the establishment of separate banks.

**Table 7.14.3: Access to Finance in SME in Bangladesh**

	<b>Frequency</b>	<b>Percentage (%)</b>
Very Severe Obstacle	10	12.5
Major Obstacle	13	16.25
Moderate Obstacle	30	37.5
Minor Obstacle	18	22.5
No Obstacle	9	11.25

<b>Total</b>	<b>80</b>	<b>100</b>
--------------	-----------	------------

The respondents in Bangladesh seem to be divided regarding their perception of the nature of access to finance as an obstacle. A small less than 22.5 %, 11.25 % to be exact regard it as a minor obstacle or a moderate obstacle. Only 11.25 % considered it to be a no obstacle and only 16.25%, 12.5 % to be exact regard it as a major obstacle or a very severe obstacle.

#### 7.14.4 Constraints in Terms of Transportation System:

The respondents did not consider transport to be a very important obstacle, since 28.75 % and 33.75 % of them considered it to be a minor obstacle and a moderate obstacle respectively, while 3.75 % respondents did not consider it to be an obstacle at all. Only 15 % considered it to be a major obstacle and only 18.75 % considered it to be a very severe obstacle.

**Table 7.14.4: Transportation System in SME in Bangladesh**

	<b>Frequency</b>	<b>Percentage (%)</b>
Very Severe Obstacle	15	18.75
Major Obstacle	12	15
Moderate Obstacle	27	33.75
Minor Obstacle	23	28.75
No Obstacle	3	3.75
<b>Total</b>	<b>80</b>	<b>100</b>

#### 7.14.5 Constraints in terms of Human Aspect:

Table 7.14.5 shows that the Constraints of human aspect of Open Innovation in SMEs in Bangladesh. Since 43.75 % respondents are considers scarcity of skilled manpower to be a major obstacle in SME in Bangladesh and 27.5% respondents are considers low image of the profession a minor obstacle respectively, while 10 % respondents low image of the type of enterprise to be a less obstacle at all.

**Table 7.14.5: Human Aspect in SME in Bangladesh**

	<b>Frequency</b>	<b>Percentage (%)</b>
Scarcity of skilled manpower	35	43.75

Low image of the profession	22	27.5
Unpleasant work	15	18.75
Low image of the type of enterprise	8	10
<b>Total</b>	<b>80</b>	<b>100</b>

### 7.15 Major Findings of the Analysis:

- i. The first finding of the study is that about 50% of the respondent firms think that open innovation means new product design and access to the new technology. However the sharing of technology or knowledge to the external parties can enhance the strength of business position of the firms is ignored in many cases. The main reasons for this can be due to having negative attitude of manager, owner in existing corporate culture in Bangladesh.
- ii. The study reveals that most of the companies (about 86.3%) are startups. That means they are creating innovative entrepreneurial business rather than inherited or joint venture in SMEs. Hence it is crucial for them to collaborate their invention with other type of organizations for funding and sharing experience.
- iii. Another finding is that most of the interviewed firms (approximate 67%) want to expand their business line having the same ownership structure. It means they want to grow their business having limited use of innovation and technology. Although they want to adopt new technology, and new innovation, they want to remain as sole proprietor type business. However, the average rate of return for the 68% of the studied firms is only 1 to 10 %. It is clear that majority of the firms are very conservative to spend their profits on innovative activities or research and development. Therefore, they have lower competitive position and limited capability to generate higher rate of return. Hence it may be the great opportunity for those firms to adopt open innovation ideas and collaborate with other competitors or integrate vertically to enhance their capabilities.
- iv. It is interesting that about 100% of the firms claim that they have expansion strategy, cost leadership strategy, focus strategy on product, customer, networking and marketing and differentiation strategy. If their claim is right, they might need to adopt innovation internally or externally. As most of the firms have limited scope for

utilizing their lower return on internal research and development, the single solution for them could be adopting open innovation.

- v. The three hypothesizes result show differently. The firms’ strategic factors attributes were included in the Multi-Level (ML) analysis to determine the factors that influence the adoption of open innovation by SMEs in Bangladesh: cost leadership strategy, expansion strategy, and competitive strategy. Table 7.15.1 presents the hypotheses associated with the factors examined in relation to the firms’ strategies factors context.

Table 7.15.1: Firms Level Strategic Factors Context-Related Hypotheses

No	Hypothesis	
<b>H1</b>	Firms’ Strategies Factors for Adopting Open Innovation in SMEs of Bangladesh	<b>Accepted</b>

The revised model of open innovation adoption helps the significance of four firms’ strategies factors on the adoption decision: cost leadership strategy, focus strategy, and competitive strategy. With regards to firms’ strategies factors, however, three factors were examined and three out of three regarded to impact the decision to undertake open innovation by way of the sampled SMEs. The model, therefore, has been revised to recommend that factors of the firms’ strategies factors have greater significance on the adoption decision.

Table 7.15.2: Summary of the acceptance or rejection of the corresponding variable arising from the ML analysis

Context	Corresponding variable	Decision
<b>Firms Strategies Factors</b>	Cost Leadership Strategy	Supported
	Expansion Strategy	Supported
	Focus Strategy	Supported
	Competitive Strategy	Supported



Out of the four variables tested, four – cost leadership strategy, expansion strategy, and competitive strategy – were found to be significantly associated with the adoption of open innovation as each yielded a *p*-value of less than 0.05.

**Firms Level Characteristics Context:**

The firms’ characteristics’ attributes were included in the ML analysis to determine the factors that influence the adoption of open innovation by SMEs in Bangladesh::target product, strength of R&D, domestic market, and international market. Table 7.15.3 presents the hypotheses associated with the factors examined in relation to the firms’ strategies factors context.

Table 7.15.3: Firms’ Characteristics’ Context-Related Hypotheses

No	Hypothesis	
<b>H1</b>	Firms’ Characteristics’ to Adopt Open Innovation in SMEs of Bangladesh	<b>Accepted</b>

The revised model of open innovation adoption helps the significance of 4 firms’ characteristics on the adoption decision: target product, strength of R&D, domestic market, and international market. With regards to firms’ characteristics, however, 4 factors were examined and four out of four regarded to impact the decision to undertake open innovation by means of the sampled SMEs. The model, therefore, has been revised to recommend that factors of the firms’ characteristics have greater significance on the adoption decision.

Table 7.15.4: Summary of the acceptance or rejection of the corresponding variable arising from the ML analysis

Context	Corresponding variable	Decision
<b>Firms Level Characteristics</b>	Target Product	Supported
	Strength of R&D	Supported
	Domestic Market	Supported
	International Market	Supported

Out of the four variables tested, four – target product, strength of R&D, domestic market, and international market – were found to be significantly associated with the adoption of open innovation as each yielded a *p*-value of less than 0.05.

**Project Level Characteristics Context:**

As noted earlier, seven project level characteristics’ attributes were included in the ML analysis to determine the factors that influence the adoption of open innovation by SMEs in Bangladesh: market discovery/planning, outsourcing, networking for intelligence and consulting, collaborative R&D, sales/ distribution/ marketing/ services, licensing, and product development. Table 7.15.5 presents the hypotheses associated with the factors examined in relation to the project level characteristics’ context.

Table 7.15.5: Project Level Characteristics’ Context-Related Hypotheses

No	Hypothesis	
H1	Project Level Characteristics for Adopting Open Innovation into the Firms	Accepted

Again the revised model of open innovation adoption supports the significance of seven project level characteristics on the adoption decision: market discovery/planning, outsourcing, networking for intelligence and consulting, collaborative R&D, sales/ distribution/ marketing/ services, licensing, and product development. With regards to project level characteristics, however, seven factors were examined and two out of seven regarded to impact the decision to undertake open innovation with the aid of the sampled SMEs. The model, therefore, has been revised to recommend that factors of the project level characteristics have greater significance on the adoption decision.

Table 7.15.6: Summary of the acceptance or rejection of the corresponding variable arising from the ML analysis

Context	Corresponding variable	Decision
Project Level	Market Discovery/Planning	Not supported
	Outsourcing	Supported
	Networking for Intelligence and Consulting	Not supported

<b>Characteristics</b>	Collaborative R&D	Not supported
	Sales/Distribution/Marketing/Services	Not supported
	Licensing	Not supported
	Product Development	Supported

Out of the seven variables tested, two – outsourcing, and product development – were found to be significantly associated with the adoption of open innovation as each yielded a *p*-value of less than 0.05.

### **7.16 Summary**

This chapter has discussed the qualitative study, of the research. It has reported the related research activities including data analysis. This study shows that, there is a positive and statistically significant relationship between independent variables, such as firms’ strategies factors, firms' level characteristics, project level characteristics, benefits, challenges, and dependent variables, such as open innovation. Also, it has reported and justified the use of multiple regressions (MR) to identify factors influencing the adoption of open innovation by the investigated SMEs.

## CHAPTER EIGHT

### MULTIPLE CASES ANALYSIS (THEMATIC ANALYSIS)

#### 8.1 Introduction

In order to explore the concepts of open innovation, identifying the scope and levels of applying open innovation into different SMEs clusters, in total nine cases have been taken into account to fulfill the selected seven groups of clusters of SMEs in this research. The first case in SMEs is Advanced Equipment Limited(AEL) is grouped as light engineering business cluster, the 2<sup>nd</sup> one is Comfort Leather(CL) ,is leather business clusters, the 3<sup>rd</sup> one is Ahmed Food Products (Pvt) Limited which is grouped as food and agro processes food business cluster, the 4<sup>th</sup> one is TEDFO Bangladesh Limited which is grouped as software business cluster, the fifth one is KPC Industries which is group as manufacturer business cluster, the 6<sup>th</sup> one is FM Plastic Industries Limited which is grouped as plastic business cluster, the 7<sup>th</sup> one is Soma Consultancy Firm(SOF) which represents the group as knowledge intensive business cluster, the 8<sup>th</sup> one is Soundrojo Kotha Beauty Plauour and Boutique Fashion which is representative of other business cluster and the 9<sup>th</sup> one is Annex Bangladesh which is grouped as Leather business cluster. Although the SMEs selected cases belong to three different geographical regions namely Dhaka, Tongi, and Gazipur City, there is a strong correlation in their business focus on those sectors. Therefore, it is interesting to study whether they have any similarities in using the open innovation approaches or any differences in outcomes due to being geographically different.

These multiple cases studies will be helpful to identify the essential processes to explain the steps required for an entrepreneur to start the business in SME being influenced by the new innovative ideas and commercialized them successfully by sharing their innovation with other partners or not. In this chapter, all the cases are analyzed in thematically, as they are not same in a single cluster and they have different characteristics in operating the businesses. The chapter also highlights the challenges faced by the entrepreneurs and how they overcame these challenges by using the open innovation processes.

## 8.2. Multiple Case Studies of SMEs in Bangladesh

### 8.2. 1 Case 01- Advanced Equipment Limited (AEL): Light Engineering Business Based Cluster

**Name of Entrepreneur:** Mohammad Saidul Islam

**Part-1**

**Address:** Hasan Plaza(5<sup>th</sup> floor)53, Karwan Bazar C/A Teggaon, Dhaka-1215 Phone:02-8142143, Mobile- 01936019497

**Background of the Company:** Advanced Equipment Limited started business in October, 2016 in Bangladesh with some visionary entrepreneurs who have been working in the LPG sector for more than a decade. It is an agent of Siamgas & Petrochemical Public Co., Ltd. which is one of the largest LPG trading companies in Thailand. This company also has overseas operation in China, Vietnam, Singapore and Malaysia. They distribute LPG in the form of cargo to customer in most countries in East Asia. The strength of this company is in LPG business consultancy is particularly strong in Bangladesh. Many of the current local companies have worked with them to complete their LPG project. They are currently working with Parlym International, a French engineering company for the supply, erection & commissioning of turn-key projects in Bangladesh.

**Technical Partners:** Anil Engineering Pvt Ltd is the only Technical Partner, Established in 1970, a Technocrat Organization engaged in manufacturing high quality products required for storage and handling of *liquefied petroleum gas* (LPG).

#### **Business Strategies**

The missions of that company are providing safe and high quality end products to our customers with continuous after sales service till their satisfaction, continuing the business with customers giving them complete confidence in our products and services and ensuring the employees the opportunity for professional growth.

Visions are to be the premium equipment and solutions provider to their customers by understanding the needs of customers through reputed suppliers and workforce.

Core values of Advanced Equipment Limited will be the number one solutions provider in the LPG equipment industry. In addition to supplying equipment, this company will remain customer orientated and provide engineering solutions by having the right product range suitable to customer requirements. Ensuring safety through our products and services ,Performing with honesty and integrity, Treating all people with respect, Accepting individual and corporate responsibility, Striving for customer satisfaction, Improving and innovate continuously, Taking responsibility of the work and complete task as a team.

**Products and Services:** LPG consultancy services, LPG trader, Reticulation of LPG,LPG auto gas station installation, LPG carousal and satellite station installation, Turnkey project supply, LPG ERP software services are the common form of services they provide to their customers. Burner, Commercial Burner, Regulator and Automated Fisheries are sold to the customers .The major Clients are Navana LPG, Basundhara LP Gas ltd,Orion Gas limited, G gas and Jamuna Gas

**Firm's Level Characteristics:** this firm work as a software engineering, an agent of equipment solution provider. They said, we have successfully completed consultancy work mainly related to investment opportunity on LPG field of Bangladesh for International business conglomerate from Japan, Thailand, Malaysia and Oman etc.Besides we have also provided our engineering and consultancy services to many of the local LPG companies.

**Project Level Characteristics:** AEL executes the Turkey projects. A turnkey or a turnkey project (also spelled turn-key) is a type of project which constructed for selling to any buyer as a completed product. They contrasted after getting an order, the constructor builds an item according to the buyer's exact specifications, or for an incomplete product selling it is assume that the buyer would complete it. An advantage of the Turnkey Project is that it is a way of obtaining a substantial economic profit from an asset.

**Competitive Advantages:****Part-3**

**LPG Reticulation Systems** LPG Reticulation Systems are also known as Piped Gas Systems. For the improving of infrastructure of new age homes, the LPG Reticulation systems are gaining popularity. The LPG Reticulation system provides connecting gas pipes to a number of homes with high-quality piping systems. These systems have round-the-clock connectivity to a centralized LPG Cylinder bank nearby. The gas pipes are connected to a gas meter for each household, where the gas consumption can be easily found. The consumers are happy with the LPG Reticulation systems because they do not have to keep buying or changing LPG tanks. Also there is no hassle of contacting a distributor or trying to install the cylinder personally every time. Instead, the gas service can be used directly through the advanced piped gas systems. As the gas pipes go directly to residential areas where hundreds or thousands of people reside, there is no scope for error in the entire system. Experts of the company or technical partners follow their stringent safety testing procedures to make sure that each component gives accurate results and are safety-compliant. They also may design and erect the LPG Cylinder Filling Station based on the scale of projects, as per client specifications, and at reasonable costs. Also, as an optional add-on, they provide superior-quality maintenance services by highly experienced service engineers and technicians. After installation is completed, they conduct safety and operations training programs for LPG Auto Gas Station users. Ordinarily, LPG filling stations installations are needed by small companies for usage by consumers, and by large companies mainly for industrial use. Filling caroused can be provided with equipment for automatic introduction and automatic filling scales with ejection of cylinders.

AEL Presents Highly customized and easy to use ERP Systems including Inventory, Sales, Accounts with Dashboard. By using this ERP System, the Company's total business flow will be much easier than usual and customized reports will help the user to make a business decision at the right time. Some of the businesses like LPG (Liquefied Petroleum Gas), Rod & Cement, Tiles, FMCG products, Mobile shops and Distributor or Dealer of different products need special features to run their daily business needs. This is the unique strength of amarbebsha.com where the mini-ERP gives priority to the specific solution of the Bangladeshi companies.

If you are a small to medium enterprise with your office in Bangladesh you need a proper business software which is easy to understand, affordable and importantly have a good after sales support. **Amarbebsha.com** brings you the best business software in Bangladesh with affordable price, simplicity and easy to use. When businessmen look for suitable ERP or business software in Bangladesh, they face a real challenge. With 20 years of experience in conducting business in Bangladesh, the team of Amarbebsha.com is bringing you the best Business Software for Bangladeshi businessmen. The software consists of all basic modules like **Accounting, HR, Sales, Purchase, Inventory, School, hospital management and the product is smart ERP (Enterprise Resource Planning)** software for the users. Businessmen do not need to use any other module from elsewhere and instead only one product solves all their requirements.



## 8.2. 2 Case 02: Comfort Leather (CF): Leather Business Based Cluster

**Name of Entrepreneur:** Momotaz Yesmin and Tahmina Akter

**Part-1**

**Address:** 51 Sher -a Bangla Road, Hazaribag, Dhaka-1209,

**Mobile-01627322374, 01712008510, Email-comfortleatherbd@gmail.com**

**Background of the Company:** Comfort Leather is Leather products supplier in Bangladesh.

Comfort Leather represents as a renowned leather exporting house of Bangladesh. It has a good relation with the tannery industries in Bangladesh. They are exporting all kinds of leather such as Crust, Lining and Finished leather last eight years and supplying leather all over the world such as USA, Japan, Hong Kong, Italy, Korea, China, Czech Republic, Norway and also Germany. Their leather items are Full Chrome, Semi-Chrome, Full Vegetable etc with in a different color Black, White, Red, Camel, Brown, Beige and Tan or any other colors which you want other than as like as your swatch. They have an excellent good relation with all well related leather factories in Bangladesh and one group of highly experienced Technician. You may be known that the leather of Bangladesh is world famous.

**Products of the Company:** Leather gens office bags, leather side bags, leather massager cross bags, leather ladies bags, leather ladies parse, leather laptop bags, leather belt and money bags.

**Firm Level Characteristics:** It is an Agent Business having partnership ownership. It works as manufacturer and supplier. It has international business.

**Business Strategies:** They provide an open proposal as if you want to develop your business in Bangladesh or want to appoint anybody or your representative for importing leather, please contact with us.

### 8.2. 3 Case 03: Ahmed Food Products (Private) Limited: Food and Agro Processed Food

**Name of the Owner:****Part-1**

**Address:** Corporate Office: Ahmed Food Bhaban, M/4/4, Road#07, Section#07, Mirpur, Dhaka-1216, Bangladesh Phone: +8801987877877

Email: [ahmedfd@dhakanet.info@ahmedfood.com](mailto:ahmedfd@dhakanet.info@ahmedfood.com)

**Background of the Company:** Ahmed Food Product(Private) Limited established in 1960 and dedicated its business life to serve the customers by providing them with the best possible quality food assisting the primary necessity of the people. With a vision to not only leading the market but also ensuring a place in every consumer's heart with providing best quality hygiene foods, Ahmed Food Products is expanding its business since the beginning. The most popular name for food products in Bangladesh is Ahmed Food. The company is leading the sector since the beginning and hence been awarded with many achievements. Ahmed Food has been awarded with The BIZZ award for Excellence in quality management from World Confederation of Business, Texas, USA constantly from 2012 to 2019; Excellence in Business Management 2013 from Global Business Corporation, USA; Business awards (2014-2015) for Best Food Company. Product quality is assured by manufacturing according to BSS (British Standard Specification) and BSTI (Bangladesh Standards and Testing Institution); it also follows Good Agriculture Practice (GAP), Good Manufacture Product (GMP), Good Hygienic Practices (GHP), ISO standards. Ahmed Food has always been trying to ensure customer satisfaction with its best quality production. Apart from its business activities Ahmed Food also ensures its Corporate Social Responsibilities; individual and aligned with Governmental associations.

## **Business Strategies**

## **Part-2**

The **mission** of Ahmed Food Products is maintaining the position of market leader and sustaining it and then reach to the global market and the **vision** is to never compromise with quality. The **core values** are **organic flavor** that provides its clients only the freshest products from around the world, the **quality products** that the taste, the aroma and the natural ingredients of products are kept unaltered, **health benefits** that olive oil are unrivaled, and its research team reveals new every day for its customers and **extraordinary** that they produce the just-pressed organic olive oil.

Products: Diabetic Products, Jam, Jelly, Sauce, Pickles, Beverage, Paste, Spices, Snacks, Chanachur, Puffed rice and other products.

### **Competitive Advantages**

The journey of Ahmed Food Products began in early 1960s. Since the beginning Ahmed Food had to go through several ups and downs. Apart from all of its complications and competitors Ahmed Food is standing apart strongly in the market. With the support of his innovative ideas and constant effort, the company has met a new era with aggressive.

**Firm Characteristics** It is a private company. The number of employees more than 200 plus. Its research and development team is focusing on the innovation and implementing into the products.

#### 8.2.4 Case 04 : TEDFO Bangladesh Limited :Software Based Business Cluster

**Name of Entrepreneur:** Tareq Hasan Founder & CTO

**Part-1**

**Address:** Level # 01, House # 1005, Avenue # 11, Road # 09 Mirpur DOHS Dhaka, Dhaka 1216, BD

**Background of the company:** TEDFO Bangladesh Limited, a trade facilitation company based in Bangladesh, provides online product showcasing, cloud-based trade documentation and notification enabled sales ledgering for the Bangladesh suppliers through its trade facilitation platform, tedfo.com. It also offers all-inclusive shipping and collateral-free trade finance for the eligible suppliers and/or exporters of the platform. Using the TEDFO platform, the suppliers from Bangladesh can showcase their products/services in the B2B marketplace, prepare trade documents, maintain sales ledger, book logistics and obtain trade finances from the single dashboard. It was founded in 2015. They introduced 1st ever B2B marketplace website in name of tedfo.com to connect Bangladesh manufacturers, exporters, suppliers with buyers around the world on 1st February 2016. They are helping those buyers who are looking for good quality Bangladesh origin suppliers in shortest period of time. In addition to supplier selection, they provide ‘Trade Insurance’ to protect buyers interest in quality, quantity and shipment time when they source from Bangladesh. They also provide necessary assistance to buyers when they visit Bangladesh for the purpose of business travelling.

They help Bangladesh suppliers to showcase their products easily, to receive quotation quickly and to trade confidently with global buyers. They provide product showcasing solutions, buying enquiry solutions, learning solutions, export management and facilitation solutions to expedite their export marketing and management process. In Tedfo marketplace, each supplier gets an individual online showroom with unlimited product posting facilities to showcase their products with detail information and photos and to access to buying enquiries/RFQs provided by global buyers.

**Technical Partners:****Part-2**

Privately owned Business but both national and international producers and suppliers are their business customer.

**Business Strategies:** They want to expand more products/services to the global customers. Best quality providing is their first priority. They mainly focus on their quality-oriented services to attract the world -wide customers. Differentiation strategies make their capacity in a wide range.

**Products and Services:** They deals with varieties of products/services like Agriculture& Agro Processed Goods, Building Materials & Construction, Cosmetic & Toiletries, Engineering Goods- Electronic, Engineering Goods & Products, Footwear—Leather Footwear, Synthetic Footwear, Frozen & Live Fish Foods, Furniture, Garment Accessories and Waste, Handcrafts/Handmade Products, Harbs & Harbel Products, Jute & Jute Goods, Leather& Leather Goods, Miscellaneous

**Firms Level Characteristics:** It is a company which has employees 11-50, co-founder & CEO, Associate Market Operations, Experienced Trade Professional members. The company earns a satisfactory level of profit. They use different web pages for different product/services. The owner is an educated person who has appropriate digital knowledge which is necessary for doing online business. As it is an export-import business so he possessed vast communication skills which help him to attract both domestic and international customers.

**Project Level Characteristics:** They deal with different projects like engineering, furniture, shrimps, agro processed goods etc which has different natures. So, they have to spend much on their R&D work. They have different departments like marketing, sales, software etc which need regular up gradation. For this they spend much to improve their quality through regular research works to provide customer-oriented product/services.

## 8.2.5 Case 05 KPC Industries: Disposables Paper Products Manufacturer Business Based Cluster

**Name of the Entrepreneur:** Mr. KaziSajedur Rahman

**Part-1**

**Address:** House#75, Flat#A2, Road#04, Block#B, Niketan, Gulshan, Dhaka 1212. Mobile: +8801766 56 93 76, Land line: +8802 9857026 E-mail: [kpcindustry@yahoo.com](mailto:kpcindustry@yahoo.com)

**Background of the Company** In Ramadan in 2010, while in Saudi Arabia, I got a palm in a plastic cup during Iftar. I noticed that the palm was in the pocket of Punjabi for a long time but it was not wasted. From then on I started to become interested in it. After reviewing the market for two years, I started working with 3 workers and 3 machines in 2012. From that day, the company started the journey of making cups, plates, muffin cups, Tulip cups, food boxes with paper in Bangladesh market. Welcome to the world of smart disposable paper cups. KPC Industry designs disposable paper cups that are attractive outside and of the highest quality inside. Nowadays we all think about our very own profit in every place. Even I am not any exception from that.

Yes, we are talking about environment and we know that day by day our environment is being polluted by us. We can at least try to reduce this pollution by using environment friendly products, and KPC paper product is a small step toward this. We have a production capacity of 1 crore 50 lac cups and plates monthly and can assure that any large requirements can be catered to. We herewith commit that we are in a position to cater to an entire yearly consumption of a major international food division and provide excellent service in addition to consistent food grade biodegradable product.

**The Products of the Company:****Part-2**

**Paper Cup & Plate:** Our company is specialized and engaged in food service packaging. Current range of major products includes disposable paper cup and plate in various sizes which are used for both hot and cold beverages apart from other food service packaging products. At present, the company is engaged in the manufacture and supply of disposable paper cups and plates for serving beverages. The size range varies from 80 ml to 350 ml for cup and 7 inch to 10 inch for plate currently available.

**Specialties of the Products:** Biodegradable and Environment friendly, Base used is 100% food grade with food grade poly lamination, Dimensional stability assured , Hygienic , Comfort in handling , Cup rigidity to contain liquid for longer period and Excellent Micro-biological levels .

**Business Partners:** Considering the global market, Mr. Kazi Sajedur Rahman has taken the basic idea about the domestic market. We have made many inquiries in and out of the country for the cheapness and availability of raw materials and machinery. Then we have brought the products of our company to the local companies that need this kind of product and have established a good relationship with them.

**International Supplier Partner:** Through partnerships with two international supplier companies, KPC is leading their business forward.

**Research and Development Partner:** In the early years, the chief himself used to do this. At present, the company has its own R&D department, whereby the company assesses market and demand and creates new innovative products.

**Local Manufacturing partner:** Olympia has been working closely with Packaging as a manufacturing partner for the cartoon.

**Business Strategies:****Part-3**

The company use focus strategy to show their uniqueness which separate their quality from other competitors for this they focus on the R&D strategy to identify the actual needs of customers. Through R&D they use value proposition to increase quality. For this they segment the customers specially targeting corporate clients by targeting Nestlé, use recall system if for lower product maintaining the good relationship with customers. They always try to enhance and ensure product quality by creating loyal customer for expanding the market and differentiating product/service varieties. Initially the plan was to sell 30-40 lac per month, for which the cost was 25-30 lac. They use the attractive slogan like “Let the environment live, if you want to live.”

**Firm Level characteristics:** The CEO of the KPC industry, Mr. KaziSajedur Rahman, is a Computer Engineer by profession and served in the KPC industry in Bangladesh for an extensive period of nine years starting 2010. He graduated from IUB in 2007 with a degree in Computer Science and Engineering. **Revenue:** 12 Billions and **Cost:** 9 Billions. Target customer is corporate client.

**Project level characteristics:** They maintain different projects to expanding the market, enhancing the quality of product/services through R&D activities. They treat machine, raw materials, and employees all are valuable assets to the organization. At present they have revenue twelve billions and cost nine billions.

**The Level of Business Competition:** In Bangladesh, as the business is expanding day by day, competition in the market is increasing. The closest rivals to this business are India, China, and Korea. Try to tackle the competition they always try to maintain good relation with suppliers.



### **Constraints to Operate the Business:**

### **Part-4**

**Limited Financial Resources:** There were many problems with getting an SME loan that was not supposed to happen. It is hard for a young entrepreneur.

**Shortage of Skilled Human Resource:** Since there was an economical problem, first I did the basic tasks myself, without hiring staff so that the costs could be reduced. Initially I started working with 3 people. Early on I encountered problems of skilled manpower. Now the establishment employs 40 employees whose training is occasionally arranged by the institution to improve their skills.

**Government Regulation:** There are many problems in applying the regulation systems in Bangladesh. As a result, the competitors from another country can enter the country very easily and the government could not create a system like that.

### **Entrepreneur's Role in Organizing & Managing the Open Innovation Processes**

**Knowledge:** At first there was no clear idea about many things, but he tried to know the things he did not know.

**Experience:** There was no previous experience in this regard. Later, I did 6 months training outside the country.

**Networking:** No organization can improve without communication skills. At first I used to do this myself. But communication and networking team have been created to keep the business going and keep regular contact with customers.

**Management Skills:** As the head of an organization, prioritizing multiple projects requires that all employees keep in mind their strengths and weaknesses that I do in my organization. It is important to find the areas where the organization can be improved by improving the methods.

### 8.2.6 Case06: F.M Plastic Industry Ltd: Plastics Business Based Cluster

**Name of Entrepreneur:**Md. Gazi Tahudur Rahman

**Part-1**

**Address:** House#09, Road#29, Gulshan-1, Dhaka- 1212, Mobile: +[880-1999045630](tel:880-1999045630) E-mail: [fmplasticbd@gmail.com](mailto:fmplasticbd@gmail.com)

**The Background of the Company:** The Managing Director of the F.M Plastic Industry Ltd, Md. Gazi Tauhidur Rahman, as a profession and served in the F.M Plastic Industry Ltd in Bangladesh for an extensive period of eleven years starting 2008. He post graduated from DU in 1995. In his career he initially worked at various companies, and then he gave himself to the travel agency. Due to lack of trust, he closed the business. Then in 2008 he joined Mutual trust bank. One morning, after watching a tray with breakfast biscuits, he was astonished to see his products on top. Then, target the biscuit company and find out who made this biscuit tray. It was only in his mind that the demand would increase in the coming years, or how the demand could be increased in the market. After that, he purchased two machines (made in local technology) with the help of two employees of the tray company and started making trays. At present FM Plastic Industries is the leading manufacturer of disposable plastic glasses, cups, spoons, containers, biscuit trays, food trays, blister packaging etc in Bangladesh.

**Business Strategies:** an entrepreneur with vision and far sight spotted the need of diversified disposable plastic products in various industries, especially in the food industry. In same year, the organization sent its products to the UAE, to be used by the Hon'ble Royal Family of the UAE. It can be said without the fear of exaggeration that is the one who popularized the use of disposable plastic trays in packing of biscuits in Bangladesh. Since this firm did not have a large factory, the owner used to get help from other factories on demand. Initially, the plan was to move forward in the same way as there is a 20% profit from all production costs. To maintain the quality of his company's product, he applied for a loan of Tk 2 crore to build a large factory.

The USA-based venture firm (SEAF) agreed to pay the machinery-based loan after seeing the FM plastics industry. This is how the FM plastic industry began its journey to Bangladesh. The starting of the journey of business was difficult to survive in the market without getting any work order. This is why the target buyer chose different food packets, mobile battery Cover Company, but the target was mainly the biscuit company. By doing such small things, he made known the company to his target companies. One time he gave a workshop near the target business establishment. He started distributing samples of his products for free to target companies. In this way, he got acquainted with various companies and started getting orders. In Bangladesh, as the business is expanding day by day, competition in the market is increasing. The company still holds a large market share when it comes about this product for the quality, commitment, competitive price, and the company has established itself strongly in the market with new products launching time to time. It supplies its products to the most popular brands of the country, and the list of the esteemed clients continues to grow.

**Business Partners: International Supplier Partner:** There is currently no international supplier partner. However, we export our products abroad from Cumilla EPZ. **Research and Development Partner:** I do it myself. For this there is a R&D sector in the establishment. Since the foreign company is a partner, there is no need to partner with any other organization. **Local Manufacturing partner:** Only polythene is collected from the retail market. For this, some business organizations have to contract. Business buyers are Danish, Olympic, Haque, and Romania, Dekko, Fu-Wang and Globe Biscuit, and Pran RFL.

**Products of the Company:** The six types of products are: Bakery, Container, Cup and Glass, Film, and Food Packaging.

**Competitive Advantages:** As this high competition age they try to show their level best honesty, provide quality full products/services and one stop service. They segment their customers particularly target biscuit factory, ice-cream and pharmaceutical company.

**Competitive Advantage:****Part-3**

To maintain good customer relationship they provide free sample, recall system for lower products if necessary as well as provide best service priority. They feel all employees, machine, raw materials, quality goods, loyal customers etc are their resources. By investing ten to twelve billions money they have earned revenue as fifteen to eighteen billions money, so they feel competition level is very high.

**Firm Level Characteristics:** This organization is sole proprietorship. Its owner is Md. Gazi Tauhidur Rahman, who took it as a profession and served in the F.M Plastic Industry Ltd in Bangladesh for an extensive period of eleven years starting 2008. He post graduated from DU in 1995 and gathered a wide variety of experiences being employed into different organizations. By forecasting his target market demand started business with having two employees and taking two machines. At present, the organization has more than 25 employees.

**Project Level Characteristics:** To be sustained there are some projects they have to deal implies that they participate in R&D tasks for enhancing the better-quality oriented products. They maintained the suppliers of raw materials as well as different food industries.

**Limitations to Operate the Business:**

**Limited Financial Resources:** As the capital of any kind of business is important, entrepreneurs have to face many difficulties in obtaining loans in Bangladesh. This discourages the entrepreneurs from being entrepreneurs in many areas. Many banks or financial institutions do not want to provide loan proportional to the start of business.

**Limited Numbers of Skilled Human Resource:** Starting with 3 employees, there are now about 20 employees working at the organization regularly. It is difficult to get skilled manpower in this sector. This is a major problem for the sector.

**Government Regulation:** The biggest challenge is the lack of rules and regulations in terms of VAT, Tax. Speaking of government assistance, the reality is different.

## 8.2.7 Case 07: Soma Consultancy Firm (SOF): Knowledge intensive Business Based Cluster

**Name of Entrepreneur:** Mr. Suralya Alam

**Part-1**

**Address:** Kawran Bazar, 1 No. Road, E-mail: [somaconsultancy@gmail.com](mailto:somaconsultancy@gmail.com)

**Background of the Company:** The CEO of the Soma Consultancy firm, Mr. Suralya Alam, is a Civil Engineer by way of profession and served in the Planning Ministry in Bangladesh for a substantial duration of 30+ years starting 1978. During his tenure, he travelled all over the USA and served in quite number managerial roles. At the stop of his career, Alam was once searching for some new task after his retirement. Alam's journey was once normally associated to the authorities sector; therefore he determined to take up some expert oriented administration direction to get acquainted with the present day strategies of conducting a enterprise in the an increasing number of aggressive and world business environment.

In 2009 at some point of his MBA studies in Sweden, Alam met the CEO of GT Software, the Indian in a casual gathering. During this informal meeting each of them shared their experiences and knowledge. At that time, GT Software used to be a new company established on the Indian market, focusing on using high-tech options to tackle traffic protection problems. Alam immediately realized the doable of having such solutions deployed in an under-developed market such as Bangladesh. In Bangladesh, visitors administration and avenue security troubles are actual issues that want serious attention. The number of road visitors' accidents and the expenses associated with them in Bangladesh are way above the global average. On one hand, the government was spending giant sums on urban planning and infrastructure expansions in order to handle this problem. On the different hand, the developed section of the world is using controlled simulated environments to desirable analyze this hassle and advocate countermeasures.

## **Background of the Study**

## **Part-2**

In the end, this informal dialogue between Alam and the CEO of GT Software, the Indian led to the introduction of a new partnership ensuing into the institution of a new assignment in Bangladesh proper after Alam retired from his 30+ year government career. His heritage and enormous experience pursued and encourage him to take up this mission and to be an entrepreneur. The new venture was once named as Soma Consultancy Firm (SCF).

Soma consultancy association (SCF) was installed in 2013 in Bangladesh. It is one of the first agencies in Bangladesh that presents traffic administration solutions, street protection simulators. It offers progressive merchandise and services related to the smart transport system solutions to a number consumer segments. The soma consultancy firm is emerging as the quickest developing consultancy services agency in the transportation region the use of high-tech driving simulators. In addition, the employer develops partnerships in the sphere of deploying these sophisticated technological know-how systems stated above.

SCF currently has a small group of seven full-time employees. Out of these, there are 4 software developers with information in C++ / Java and a number of scripting languages, and 1 full-time QA & checking out engineer to enable the customization of the simulators in Bangladesh. The closing 2 workforce individuals are carrying out aid and operational obligations at the company. The company also has a qualified board of advisors, which is helping the enterprise to align its focal point and market segments. The board of advisors is consisted of the founders of the company, a consultant from its associate network, and a representative of the Ministry of Planning and Transport.

**Business Strategies:** The product added through the enterprise was once new in the business environment in Bangladesh and as a result the corporation experienced a lot of challenges. In this context, the CEO decided to use the open innovation method to deliver in and build exterior networks. Both the challenges and the countermeasures are explained in the previous section. This used to be carried out via participating with a community of companions together with GT Software in the India, the Transportation Informatics lab at the State University of New York (SUNY) USA, and a neighborhood manufacturing partner in Bangladesh.

**Business Strategies:****Part-3**

This firm has the strategy to reduce the cost and time but promote the business to business (B2B) or Business to Government (B2G) by offering traffic safety solutions. The CEO, Soma Consultancy Firm, with his entrepreneurial vision, was once capable to see the hole in the market and added a new idea into the country. His probability recognition and chance taking capacity mainly grew to become his strong points, which drove his new assignment in the direction of success.

**Firm Level Characteristics:** entrepreneurial capabilities and skills helped the CEO in organizing and managing the complete open innovation process. The competence of the CEO promotes to introduce new workable technologies. The previous job trip of over 30 years helped him in grasp the commercial enterprise and work round the problems smoothly and to create worldwide network.

**Projects Level Characteristics:** The software provided by Soma consultancy helps the employer no longer supplies the commodity in offline but by online; consequently the CEO of soma consultancy company International utilized his non-public community to set up links with quite a number governmental companies which can be its largest client segment, as nicely as a associate channel to sell these products to different personal and public sectors in the future. This will not solely save marketing fees for the employer however also help in increasing quickly.

**Competitive Advantages:** Due to the special nature of the business, so a ways the company has now not confronted any competition. At the second in Bangladesh, all transportation-consulting agencies are targeted on presenting infrastructural solutions, whereas, Soma Consultancy Firm determined to opt for a new high-tech solution ensuring in a lock-in strategy. The chance of on the spot competition at the moment does not exist due to the company's exceptional licensing, domestically trained expertise, and special accomplice networks.

Soma consultancy association identified an area of interest market consisting of a variety of governmental agencies as its major clients due to the nature of the solution being offered. The product added through the enterprise was new in the business environment in Bangladesh at once. As a result the corporation experienced a lot of challenges. In this context, the CEO decided to use the open innovation method to deliver in and build exterior networks. Both the challenges and the countermeasures are explained in the previous section. This used to be carried out via participating with a community of companions together with GT Software in the India, the Transportation Informatics lab at the State University of New York (SUNY) USA, and a neighborhood manufacturing partner in Bangladesh.

**Technical Partners:** **International Partner:** Transportation Informatics Lab USA combined works with soma consultancy in its international R& D group located at the Transportation Informatics lab in SUNY USA. This worldwide R& D crew skilled the local R& D group in Bangladesh whose job was once to personalize the Indian driving simulator's software and the hardware to the neighborhood needs. **Local Partner:** Exporting the hardware from the Indian was too high-priced for the small agency due to Governmental regulations; therefore the CEO persevered with his open innovation method of partnering with a local manufacturing corporation inside Bangladesh. They would construct the custom-made hardware (driving platform) of the simulator in accordance to the layout requirements set by GT Software in the Indians with the customizations for the neighborhood needs. He adopted this strategy due to the fact of three reasons such as- Cheap production, Capacity Building and Quality Control.



## 8.2.8 Case 08 Soundrojo Kotha Beauty Parlour and Boutique Fashion- Other Business

### Based Cluster:

**Name of the Entrepreneur:**Rebeka Sultana Kona

**Part-1**

**Address:** Ershad Nogor, Block-08, Tongi, Gazipur-1712

**Background of the Company:** The beauty care enterprise is one of the fastest growing industries of our country. Lifestyles have changed; people are realizing the significance of good health and presentation and for that reason becoming extra and extra involved about their fitness and beauty. People have access to information and social media, which makes them more aware about their well-being, leading to a exchange in perception. Thus beautification is no longer viewed a luxurious anymore; it has come to be a necessity. Soundrojo kotha is the impression of Rebeka sultana kona, the managing director of Soundrojo kotha, committed to give world class beauty care services and solutions. Long term vision, professionalism and sheer diligent work have made Soundrojo kotha what it is today. In 2013, Rebeka Sultana Kona, the beauty agent of the country began her fantasy with an unobtrusive set up. Today Soundrojo Kotha is a one thousand square feet beauty parlour and growing; more than 30 employees are successfully servicing over 200 hundred customers on average per day. The Soundrojo kotha team, which includes our management, executives, provider carriers and many stakeholders, is now a family who are constantly setting incredible examples of beauty care offerings that no one has ever skilled before and has indeed set a milestone in splendor care industry.

**Business Strategies:** Our vision is to be the most preferred Beauty service provider in Bangladesh and our missions are to add value to the client, developing learning culture that foster creativity, and to develop sustainable working environment for the employees and the customers. To functionalize theses missions this organization plans for marketing products mixes.

**Products of the organization:****Part-2**

Providing cosmetics and Skin,Nail and hair treatment, Beauty salon, beauty look makeover, pedicure, manicure and spa.

**Market development:** SoundrojoKotha is attempting to convert non-customer to carrier users, stressing the gain of beauty services, and with the provider benefit of SoundrojoKotha that will make their life easier. To serve the market extra accurately their goal market will be in addition segmented based on psychographics and commercial enterprise size.

Their psycho graphic profile shows	They are educated, trendy, concerned about health and beauty, socially responsible, able and willing to spend for lifestyle products and services.
SEC (Socio-Economic Classification) reflects	<b>A+</b> segment reflects the <b>upper</b> ; <b>A</b> segment reflects the <b>upper-middle</b> and <b>B+</b> segment reflect the <b>middle class</b> income group.

**Product Development**

They strive to develop a better service will be a continuous process. Conducting of market research will be in every three months through web sites and social media. They will use the input to develop new service based on data they will get from survey. Thus the service will be designed to meet the customers need.

**Value Added Services**

**For the customers:** Membership card offers with discount for 2<sup>nd</sup> time taking service, selling Jewelries and cosmetics, and offering free Nescafe are provided.

**For the community:** Soundrojo Kotha took its step in social awareness with local people against sexual harassment. Soundrojo Kotha also distributes new clothing among the street children to different religious programs in different areas of Dhaka city.

### 8.2.9 Case 09: Annex Bangladesh: Leather Business Based Cluster

**Address** AnnexBd online, 62/1 Sher –E-Bangla Road, Rayer Bazar, ModinaMoshjid, Dhanmondi, Dhaka-1209.

Phone: 01639-111444, 01630-225790, Email: [annexbdltd@gmail.com](mailto:annexbdltd@gmail.com)

Background of the company: Annex Leather is a quality and environment friendly Bangladesh leather goods producer, supplier and exporter company based in Dhaka, Bangladesh. Presently Annex exporting Bangladeshi leather goods and footwear from Bangladesh to London, China, Canada, France & Italy. Annex BD Online is a service oriented e-commerce business that provides the authority to unleash your shopaholic attitude from home with quality products and world class customer support. At annexbdonline.com, they try their best to utilize the power of internet at the highest peak to fulfill the needs of human busy lives. They are able to supply their best products to all over Bangladesh if any one wishes to buy. They have also the capacity to supply outside of Bangladesh through online providing a Bangladeshi shipping address. Their noted mark is be comfy to experience the best shopping experience from us.

Products of Annex Bangladesh: Annex Leather ‘s 100% genuine leather products are gents and ladies bags, office bags, laptop bags, travel bags, messenger bags, waist bags, wallet, belt, jacket, key ring, garments leather accessories, corporate gift items, leather shoe, sandal, ladies purses, side bags of ladies and gents, leather sock, hand gloves, industrial gloves, hazi belt and all leather gift items etc.

Business Strategies: Annex BD online desires to continuously shape the Bangladeshi Internet rotation by building the largest person-to-person trading community in the country. By offering the best consumer experience in an environment friendly high performance, regular innovation, team work and opportunity for wealth creation they are able to do the best for their customers. The mission of Annex BD online is to ensure an e-trading platform for Bangladesh where practically anyone can trade practically anything. The organization is creating a place where people can offer goods for sale and anyone in the world can buy at a fair price. It will be such a market where the next-door neighbor can compete with a large corporation and may have same position or an equal chance of success. It will be a market that regularly adapts and improves to meet the needs of buyers and sellers. Trust, honesty and efficiency will be rewarded. Finally, the market will be such large and open that anyone will be able to find almost anything that anyone can imagine and other way to buy and sell things will seem inferior.

### 8.3 Discussions

**Case 01:** The Advanced Equipment Limited is the technology based SME which has diversified businesses, as it works as an agent LPG gas company (foreign company) and on the other hand provides ERP software, LPG solution providers in light engineering sectors. It has strength enough to compete with the other competitors having technological expertise both in by forming internal and external networks. The strategies for the market sharing, target customers and overall competitiveness are very clear and transparent.

**Case 02 :** Comfort leather is renowned agent and manufacturer for exporting the leather outside Bangladesh. However, their Business strategies provide the direct competitive position without having clearly specification of the strategies.

**Case03:** Ahemed Food Products (Pvt) Limited has a long history to survive into the markets. Its strategies are mainly based on differentiation and focused strategies to bet its likely competitors. Based on the products, market and customers focusing, they have research and development teams to overcome the problems the faced from the beginning, although they do not have collaborative parties.

**Case04:** TEDFO Bangladesh Limited is the software based trade facilitator. This organization is following good relationship with the national and international producers and customers. Hence open innovation process is highly appreciated applied by these organizations. Therefore other SMEs have the opportunities to build network with this software based enterprise by investing lower cost in open innovation.

**Case 05:** KPC Industries started its business as a startup entrepreneur brings the new business idea into the market. With the passage of time, this SME expanded its business through international and national suppliers and customers. This organization has a good differentiation leadership strategy in disposable paper manufactured business.

**Case06:** F M Plastic Industry Ltd is also a new startup business bringing the vision of saving the world more sophisticated business way, as this organization recycles the disposable plastics. This organization depends on its own research and development team although they have major limitations on financing and human resources. Hence, there is a great opportunities of this firm to create network partners for improving the better products and

creating positive image by being environmental friendly organization with the support of government or other international environmental protecting agencies.

**Case 07:** Soma Consultancy is knowledge intensive based business organization, which brings first GT software for traffic controlling in Bangladesh market targeting the Business to Business (B2B) and Business to Government (B2G) strategies. It has very customized products so it faced difficulties at the beginning of its businesses in Bangladesh. However, with the international research team, it was able to develop its products having better quality by offering cheap products.

**Case08:** Sondrojo Kotha Beauty Parlour and Butique Fasion is products and services providing organization for the targeted customers. Although it is not a prioritized type sector in SMEs, it has market demand in terms of specific customers. This type of organization has the strategy to be diversified but for specific customers by offering services and products at the same time.

**Case 09:** Annex Bangladesh is operating a leather based business in Bangladesh by offering better quality products. It has a good business strategies and adaptation ability as it is continuing the business by offline and online simultaneously.

## CHAPTER NINE

### RECOMMENDATIONS AND CONCLUSION

#### 9.1 Introduction

Chapter Seven, Provides a detailed analysis and results of the research on open innovation adoption ability of SMEs. Chapter Eight highlights the multiple cases studies to reach the findings. In this final chapter, the aim is to present an overall summary of the research desires. The significance of this chapter is in introducing, applying and the contributions of the research findings in Bangladesh, especially in SMEs sectors. Although it highlights the limitations, this study is proposing new avenues for future research.

The chapter is divided into eight sections. Section 9.2 emphases on the contributions of the research. Section 9.3 aims to describe the contributions to the stakeholders. This section is classified into three subsections: section 9.3.1 examines implications for academicians; section 9.3.2 represents implications for SMEs employees -managers as well as entrepreneurs; and section 9.3.3 briefly explain the implications of the findings for the polices makers in Bangladesh. This is then followed by section 9.4, which aims to discuss the limitations of the research. Section 9.5, the researcher has made some recommendations for the development of small and medium industries. Section 9.6 follows on from these proposing aspects for future research. Section 9.7 provides a conclusion of the chapter and its overall position in the thesis.

#### 9.2 Contributions of the Research

This study contributes to develop the factors those are more influential for emerging the concepts of open innovation and taking decisions in applying to SMEs. The study expresses to the contemporary body of understanding regarding the adoption of open innovations in SMEs. In this respect, the study has been designed as the MFCBP framework through including five aspects of the applicability to SMEs. This research is developed a statistically-validated the Strategies, Firm Characteristics and Projects Characteristics (SFP) based framework for open innovation adoption among SMEs in Bangladesh. It can be consequently stated that this study has decorated a high appreciation of the factors that significantly impact the open innovation adoption in SMEs sectors. In this study, the two factors : **Business Strategies and Firm Characteristics** had been acknowledged as important factors for

SMEs to think about adopting open innovation concept as, **collaborating or sharing the Business Knowledge and Physical resources** to the networking partners of the organizations. However, through multiple cases analysis revealed that out of nine only one organization which is Light engineering technology business cluster has the specific projects for developing open innovation. On the other hand, the eight cases firms have the business strategies to be competitive and expand the business more rigorously, though all of them were startups.

Therefore, this research significantly categorized the business clusters in such a prioritized organizations which are doing startups business and surviving through their clear business strategies in business operation, marketing, products and network management by applying their previous job experiences and technology based networking. This finding will definitely help the SME foundation to rethink about the existing SMEs clusters, the applicability of one policy for all sectors in SMEs. Hence, the policies for SMEs loan financing Schemes taken by Bangladesh bank will be more effective by identifying the potential startups those who have innovative mind with clear business strategies and works to work in a coordinated way like team players of SMEs. This strategy will help the real entrepreneurs to get finance and opportunities for surviving and growth. On the other hand the failure rate of startups will reduce as the number of quick fix mentality entrepreneurs will not come to the markets and create complexity in financing for all types organizations in SMES.

However, some barriers of this study have been observed. In addition to being descriptive study in nature, the research was confined to a small sample size. Therefore, the overall findings may be different if the sample size is large enough. However, this study might contribute in developing the confined literature on adopting open innovation in SMEs in Bangladesh, it is believed the first study of open innovation adoption in SMEs in Bangladesh context.

### **9.3 Research Implications**

The research findings explore the important contributions to all other groups involved in the SMEs industries of the country: academic researchers; the government, the corporations responsible for the typical improvement of SMEs, especially those who are involved in promoting the concepts for the enterprise owner-managers. The subsequent three parts provide a thorough explanation on the implications applicable to each group.

### 9.3.1 Implication to Academics

The findings of this study have a remarkable value, and have significant implications to the research communities. These implications can be categorized into three perspectives: “literature/context related”, “Methodology related” and “research-findings related”.

**From a literature/context-related perspective:** First of all, the main parts of open innovation adoption literatures have a tendency to pay attention usually on the adoption of sophisticated ideas such collaboration and sharing of inside or exterior useful resource share, technology, with noticeably a small proportion of research on open innovation adoption in organizations. In the existing studies, it prolonged the restricted body of academic expertise to moot the open innovation adoption in SMEs, generally in recognize to open innovation concepts It can be, therefore, stated that this study serves as a beginning point for researchers to elevate out and proceed the open innovation adoption researches in the developing countries especially in Bangladesh. However, it could be additionally beneficial to these involved to recognize the standards in the different components of the world. In fact, this would yield twofold benefits. First, it would allow the researchers to have a better grasp of open innovation adoption among the SMEs in the these share with comparable cultural and monetary conditions. Second, it would enable the researchers to evaluate the adoption tendencies among regional contexts and evaluate it with the different regions.

Thus, it is hoped that this finds will motivate lecturers in each contexts to discover and apprehend factors that have an effects on the adoption of open innovation in country context and SMEs context.

**From a methodological perspective:** Firstly, it has effectively used a two-phase research design, sequential exploratory techniques approach, to study open improvements adoption, in an enterprise context. It is, therefore, expected that researchers are motivated to appoint more than a few research techniques to generate a richer and reliable impacts and provide an insightful point of view on open innovation adoption in organization context.

The second implication is by exploring the interests on open innovation adoption, a qualitative method, structured interviews conducted to analyze the multiple cases, a questionnaire survey, to verify the findings of the qualitative method. In doing so, the



researchers would make certain uncovering new issues deeply.

**From a research-findings perspective:** The first empirical findings of this study highlighted the significance of assessing certain firms' characteristics' factors related to the adoption decision of new ideas in SMEs based on ownership structure, profitability, types of business operations, abilities to produce the quality goods etc. which have a great implication for the improvement of employees and managers into the organizations. In contrary, the findings indicated massive functional helps from the clients and, family and friends on the decisions making and creating network to adopt open innovation. Thus, academic researchers might also have a stake to take a look at the influence of such factors. This is, thereby encouraging academics, especially these involved to study the adoption of ideas in SMEs, to pay attention to the conceivable influences of the strategies factors.

### **9.3.2 Implication of SMEs Owner-Managers**

The empirical research can have the impact on SMEs in four ways: General; Technical; Organizational and Socio-economical context. The overall effects are as follows:

The two common implications rose from the empirical findings. The most apparent is the improvement of internal factors of the organizations in Bangladesh, if SMEs want to adopt open innovation. first of all, there should have clear business strategies to pave the ways of adopting innovation, then there should have open minded to share in cooperative ways. Therefore the mentality and skills of employees, mangers and overall owners' would focus widely.

Another essential common implication, raised in using some of the interviewees is that SMEs must think about adoption of open innovation at an early stage instead than following a 'wait and see' strategy because at this business world, the technologies and innovations are the prerequisites for the growing and surviving of specific types of SMEs. Being a first adopter of open innovation in those sections have been highly recommended for effective application to the SMEs that will enhance the capabilities to attain clients and extend their market share.

### **9.3.3 Implication for Policy Makers**

SME foundation is one of the main authorities for making policies and is accountable for the improvement of SMEs in Bangladesh. One of the objectives in five goals is to make clear about accountability of SME foundation is to aid innovation and the use of contemporary

technologies among Bangladesh SMEs. In compiling with this objective and the study findings implications, it is indispensable for SME foundation to grasp the benefits from the outcomes of this study to exacerbate and enhance the adoption of open innovation policies among the SMEs in Bangladesh.

In particular, this study proposed five models to be clear the influence of five factors such as motivational factor (Competition, Entry into international market, Technology), firms' level characteristics' (Competitive Strategy, Domestic Market, International Market, R&D , Target Product), project level characteristics' (Market Discovery/Planning, Outsourcing, Networking for intelligence and consulting, Collaborative R&D, Seles/Distribution/Marketing/Services, Licensing, Product Development), benefits (Competitive advantage of adopting technology in specialized products/services, Creating linkages with current and future markets through increased efficiency in research and development teams to adopt open innovation in the market, Reduce time & cost), and challenges (Lack of expertise to handle/manage the innovation—In/Out, Lengthy process, Problems with infrastructure, Government regulations, Too expensive manpower) factors on the decision to adopt open innovation in SMEs in Bangladesh.

This model can assist the SME foundation to analyze the present conditions of SMEs thoroughly and formulate strategies to enlarge its appreciation towards SMEs in the Bangladesh. In addition to this, they need to rethink about the existing SMEs clusters to give financial and nonfinancial benefits by identifying most prioritized, medium prioritized and less prioritized SMEs. To reduce the failure rate of startups, the Foundation also needs to critically asses the capabilities of the entrepreneurs and the potentialities of the intended business sectors in case of commencing the entrepreneurial sprits.

Furthermore, this study might give some insights to implement the schemes taken by the central banks that all the commercial banks need to raise 32% of credit loan from 25% for SMEs by 2024. This visionary scheme will be fruitful by assessing entrepreneurs' the business plans and potentialities of the sectors to grow, the findings of the multiple cases studies reveal that the some of the organizations (about 3of 9 cases) don't have clear business strategies and competitiveness.

#### **9.4 Limitations of the Research**

This study seeks to further understanding the influencing factors for open innovation decision making among SMEs in Bangladesh. This study effectively accomplished its goals and

objectives and answered the research questions recognized in Section 9.2. On the other hand, in light of the limitations of the study, this study enumerates in total, six limitations, although its results might not be affected by those significantly. For readability and ease of discussion, the limitations are categorized and structured into two themes: methodological and general limitations. The subsequent paragraphs focus the barriers associated to every theme in more detail.

#### **9.4.1 Methodological Limitations**

There are three impediments that are applicable to this theme. The first drawback concerns the selection of the sample frame of this research. Samples representing the total population were not sufficient to manifest the information for all the targeted population. However, efforts were made to make sure a cautious evaluation of the study's sample.

The second drawback underneath this study is associated to the degrees of relationship examined between the variables. Some are not from the literature reviews, although this study was highly ambitious to point out the relative importance of every independent variable in relation to the dependent variable, assessing the intra-relationships among the independent variables was outside the scope of this study. Undoubtedly the study investigated to find the kinship between the factors related with the independent fifteen (15) variables with the dependent one variable mentioned in **Figure 3.2**. The influence of the SFP factors on every different inside the same context or with factors contained inside different contexts was not, therefore, no longer regarded in this study that was the limitation.

The third problem of observing under the methodological theme is that this study only centered on factors that influence the adoption decision of open innovation and not its subsequent implementation. This is due to the fact it used to be felt that it was once essential first to understand issues associated to adoption.

#### **9.4.2 General Limitations**

Finally, three regularly occurring barriers had been identified. The first drawback is that, in each phase of the existing research, data were collected confined to the seven major clusters identified through literature reviews. It would be better if the data were collected from more than that clusters.

A single source for each SME was the SMEs owner-manager, as he/she represented the key decision maker in the enterprise. Thus, this method of data collection has appeared mostly through reviews in the SME literature of open innovation. SME owner-managers have been chosen as the essential source of data collection owing to their dominant function with regards to the adoption of open innovation in their enterprises. However, the faith on a single origin of data might also guidance to some factors not being raised and hence their influence being not considered.

The third barrier was as considering as only one geographical area (Dhaka Division) in Bangladesh. This region had been taken into consideration due to having the most opportunities of the SMEs can take are in between this territory.

## **9.5 Recommendations**

The findings of the analysis discussed in the previous section lead to some recommendations that can be provided.

**First**, not distinguishing from the number of barriers in the prosperity of small and medium industries, there is a brilliant prospect in SME development and improvement in Bangladesh. SME entrepreneurs will have to make easy and temporary or single-digit debt preparations and SMEs will have to provide sufficient SME loan only for SME entrepreneurs.

**Second**, women entrepreneurs will be concerned in women policies and implementation activities. Training will be required for women entrepreneur uplift. In order to enlarge the participation of women entrepreneurs and to make sure the availability of loans for the operation of a giant wide variety of women entrepreneurs, their SME loans will be preferred.

**Third**, infrastructural improvement is indispensable for the improvement of small and medium industries. For this, we have to formulate and set on the proper policy. To make certain appropriate fantastic of the products produced by way of the entrepreneurs. The quality assurance enterprise will be timid and dirty. Need to assist in the certification procedure of SME products. The critical registration methods will be made simpler with tax or VAT registration. New SME entrepreneurs will have to pay tax holiday.

**Fourth**, in the industrial sector, there will be a greater priority for the domestic enterprise and the safety of the local industry. The manufacturing substitute products in that industrial sector need to be saved at the lowest level of duty, customs duty. In order to import the product,

there must be prevention of invoicing. Entrepreneurs must be inspired to use information technology.

**Fifth**, sensible ideas about e-commerce and e-market have to be given. Entrepreneurs must be trained in technology-based, ability based and management development. SME industrial park will be set up.

**Sixth**, in order to choose the proper partners, organizations have to perceive the areas that they want to enhance in first place. This would facilitate the technique and would provide information where to search for partners. Moreover, it is vital to have decision criteria as described both in the literature evaluation and the evaluation of the both case studies.

**Seventh**, when designing IPR agreements it is vital to be designed in a fare way for each party. This would shorten the duration for setting up partnership and would keep much time and resources. In addition, “top-to-top” conferences as properly as joint improvement projects enhance the trust in cooperation and create a proper image for the company. More exactly it would make certain a right cooperation and would provide environment for impenetrable sharing of intellectual property.

**Eighth**, in order to overcome the not-invented-here syndrome, organizations have to regulate their reward and consciousness systems. This would make certain the interior aid for external ideas. To further ensure the alternate of the way of life is required also enhancement in the intra-organizational communication.

**Ninth**, the products produced by open innovation SMEs need to be sophisticated to enhance the branding and marketing strategy in order to survive in a competitive market.

**Finally**, above all, research and improvement activities want to be reinforced to speed up the improvement of this enterprise sector. Besides, the small and medium industries will have to take sophisticated initiatives to work as backward and forward linkage of the large industries. The patronage of the government will help go ahead with the improvement of small and medium industries as properly as massive industries to survive in the fourth industrial revolution and the achievement of “Digital Bangladesh”.

## **9.6 Direction of Future Research**

This empirical research is built on the research findings and to tackle the fundamental barriers of SME sector in Bangladesh. To better understand the directions for future research, the

suggested areas are classified into three key areas, like generalizability and replicability; focus/scope.

The first issues come in this research, as it has examined the adoption of open innovation among SMEs in only three regions in Bangladesh. The future research is needed to replicate the study in different areas of the country to assist to investigate the generalizability of the outcomes and to recognize workable variations between SMEs in rural and urban areas.

The second issue may be to research out cross- national/cross-regional studies. Conducting cross-national/cross-regional research would deepen expertise on adopting OI in SME settings, providing opportunities to more deeply think about the function of cultural variations in adoption decisions.

The third strand of future research would be fascinating to repeat the study in order to observe the adoption of open innovation in a single industry area (e.g., manufacturing, wholesale and retail, or tourism). The purpose would be to attain deeper insights into the industry-specific factors that impact the decision to adopt open innovation.

The third strand of future study in this place would center of attention on exploring the interaction/interrelationship between the independent variables to take a look at the impact of each variable on the others. It would also be useful to recognize how the factors associated to one context engage with factors from other contexts, and also to observe the impact on factors inside the identical context (for example, the effect of complexity on the level of believe or the impact of trial ability on complexity).

Finally, as the outcomes of the research show up the contradictions in preceding studies, figuring out that open innovation is not only essential to the large industries, but also for SMEs due to socio economic and environmental and technological backgrounds of the modern trade world economy. Hence to check out whether or not this trend continues or modifications over time is crucial..

## **9.7 Conclusion**

The SME sector wants to maintain track of the growth made so far. This is due to the fact SMEs continue to make massive contributions to the economic growth and the socio-economic improvement of Bangladesh. The improvement of the SME sector will play a vital role in reaching the several policies and planning documents of the country, such as the

Strategic Plan 2020, the Seventh Five Year Plan, the increase goal set for excessive growth in industrial policy 2016. There is massive scope and workable for development of SMEs in Bangladesh due to adequate human resources and intellectual capacity. However, there is also a large deficiency of favorable and tailor-made policy situation to mobilize the sector. So that the prosperity of SME sector in Bangladesh is accelerated, it is indispensable to take appropriate techniques and steps to improve the business enterprise of this sector.

This study has contributed to the perception as properly as to the confined understanding on open innovation adoption, as it has examined the adoption of these ideas the usage of a mixed technique approach, in a surprisingly vital type of businesses, SMEs in a context with confined studies, specifically developing countries context.

This study has employed a mixed technique method in order to have a higher appreciation of the strategies factors, firms' characteristics', Project level characteristics', benefits and challenges factors that have an effect on the adoption of open innovation by means of SMEs. As these new ideas are gaining recognition and broad acceptance among businesses, it is common trust that, the research into the adoption and implementation of these ideas will become more and more significant. It can be said, therefore, that this study is a step in that path as it had an exploratory goal to generate a comprehensive picture about open innovation adoption among SMEs in Bangladesh.

## References

- Agapitova, N. (2003). The impact of social networks on innovation and industrial development: social dimensions of industrial dynamics in Russia. *DRUID Summer Conference 2003 on "Creating, Sharing and Transferring Knowledge: The Role of Geographical Configurations, Institutional Settings and Organizational Contexts."*
- Ahmad, M. I., Malik, M., Ul Hassan, M., & Iqbal, Z. (2018). Exploring the role of technological developments and open innovation in the survival of SMEs: an empirical study of Pakistan. *International Journal of Business Forecasting and Marketing Intelligence*. <https://doi.org/10.1504/ijbfmi.2018.10009311>
- Ahuja, S., Chan, Y. E., & Denford, J. S. (2016). IT-enabled innovation and improvisation in Canadian SMEs: A Qualitative Comparative Analysis. *AMCIS 2016: Surfing the IT Innovation Wave - 22nd Americas Conference on Information Systems*.
- Ahuja, V., Yang, J., Skitmore, M., & Shankar, R. (2010). An empirical test of causal relationships of factors affecting ICT adoption for building project management: An Indian SME case study. *Construction Innovation*. <https://doi.org/10.1108/14714171011037174>
- Aisha, A. N., Sudirman, I., Siswanto, J., & Yassierli. (2016). Conceptual model of entrepreneurial, managerial and technical software competencies towards SME performance in subsector software industries. *2016 IEEE International Conference on Management of Innovation and Technology, ICMIT 2016*. <https://doi.org/10.1109/ICMIT.2016.7605040>
- Al-Ansari, Y., Xu, J., & Pervan, S. (2014). A study of organisational determinants and innovation practices in Dubai SMEs. *International Journal of Innovation Management*. <https://doi.org/10.1142/S1363919614500030>
- Al-Isma'ili, S., Li, M., Shen, J., & He, Q. (2016). Cloud computing adoption determinants: An analysis of Australian SMEs. *Pacific Asia Conference on Information Systems, PACIS 2016 - Proceedings*.
- Al-Sayed, M., & Dugdale, D. (2016). Activity-based innovations in the UK manufacturing sector: Extent, adoption process patterns and contingency factors. *British Accounting Review*. <https://doi.org/10.1016/j.bar.2015.03.004>
- Alba, M., Díez, L., Olmos, E., & Rodríguez, R. (2005). Global Performance Management for Small and Medium-sized Enterprises (GPM-SME). *IFIP Advances in Information and Communication Technology*. [https://doi.org/10.1007/0-387-29360-4\\_32](https://doi.org/10.1007/0-387-29360-4_32)
- Albors-Garrigós, J., Etxebarria, N. Z., Hervás-Oliver, J. L., & Epelde, J. G. (2011). Outsourced innovation in SMES: A field study of R&D units in Spain. *International Journal of Technology Management*. <https://doi.org/10.1504/IJTM.2011.041684>
- Albors-Garrigós, J., Zabaleta, N., & Ganzarain, J. (2010). New R and D management paradigms: Rethinking research and technology organizations strategies in regions. *R and D Management*. <https://doi.org/10.1111/j.1467-9310.2010.00611.x>
- Alcantar, J., & Ngwenyama, O. (2015). Top management capabilities for Sme's market entry decisions. *IAMOT 2015 - 24th International Association for Management of Technology Conference: Technology, Innovation and Management for Sustainable Growth, Proceedings*.
- Alexy, O., Henkel, J., & Wallin, M. W. (2013). From closed to open: Job role changes, individual predispositions, and the adoption of commercial open source software development. *Research Policy*. <https://doi.org/10.1016/j.respol.2013.04.007>
- Allart, H. (2015). Adoption factors and implementation strategies of on-premise and cloud based ERP systems by SMEs in Thailand. *ASEAN Journal of Management & Innovation*. <https://doi.org/0.14456/ajmi.2014.12>



- Allio, R. J. (2005). Interview with Henry Chesbrough: Innovating innovation. *Strategy and Leadership*. <https://doi.org/10.1108/10878570510572617>
- Ampantzi, C., Psyllou, M., Diagkou, E., & Glykas, M. (2013). Managing the SME clustering process life-cycle. *Studies in Computational Intelligence*. [https://doi.org/10.1007/978-3-642-28409-0\\_16](https://doi.org/10.1007/978-3-642-28409-0_16)
- Andersson, T., Gleadle, P., Haslam, C., & Tsitsianis, N. (2010). Bio-pharma: A financialized business model. *Critical Perspectives on Accounting*. <https://doi.org/10.1016/j.cpa.2010.06.006>
- Antonioli, D., Mazzanti, M., & Pini, P. (2010). Productivity, innovation strategies and industrial relations in SMEs. Empirical evidence for a local production system in northern Italy. *International Review of Applied Economics*. <https://doi.org/10.1080/02692171.2010.483790>
- Armisen, A., & Majchrzak, A. (2015). Tapping the innovative business potential of innovation contests. *Business Horizons*. <https://doi.org/10.1016/j.bushor.2015.03.004>
- Aziz, N. A., & Omar, N. A. (2013). Exploring the effect of Internet marketing orientation, Learning Orientation and Market Orientation on innovativeness and performance: SME (exporters) perspectives. *Journal of Business Economics and Management*. <https://doi.org/10.3846/16111699.2011.645865>
- Babic, S., & Golob, M. (2018). Investigating attitudes of entrepreneurs towards the use of information and communication technologies in Croatian SMEs in two Northern Adriatic counties. *2018 41st International Convention on Information and Communication Technology, Electronics and Microelectronics, MIPRO 2018 - Proceedings*. <https://doi.org/10.23919/MIPRO.2018.8400248>
- Bala Subrahmanya, M. H. (2013). Why do only some SMEs achieve external support for better innovation performance: Empirical evidence from Bangalore, India. *Asian Journal of Technology Innovation*. <https://doi.org/10.1080/19761597.2013.810953>
- Barclay, I., & Porter, K. (2005). Facilitating innovation across SME networks. *International Journal of Entrepreneurship and Innovation Management*. <https://doi.org/10.1504/ijeim.2005.006335>
- Basco, R., & Calabrò, A. (2016). Open innovation search strategies in family and non-family SMEs: Evidence from a natural resource-based cluster in Chile. *Academia Revista Latinoamericana de Administracion*. <https://doi.org/10.1108/ARLA-07-2015-0188>
- Bass, H. H., & Ernst-Siebert, R. (2007). SME in Germany's maritime industry: Innovation, internationalisation and employment. *International Journal of Globalisation and Small Business*. <https://doi.org/10.1504/ijgsb.2007.014185>
- Bauer, F., Coenen, L., Hansen, T., McCormick, K., & Palgan, Y. V. (2017). Technological innovation systems for biorefineries: a review of the literature. In *Biofuels, Bioproducts and Biorefining*. <https://doi.org/10.1002/bbb.1767>
- Baycan-Levent, T., & Nijkamp, P. (2010). Migrant entrepreneurship in a diverse europe: In search of sustainable development. In *The Sustainability of Cultural Diversity: Nations, Cities and Organizations*. <https://doi.org/10.4337/9780857937186.00028>
- Beharry, A. K., & Pun, K. F. (2011). Managing innovation practices of SMEs in the Caribbean: An exploratory study. *Proceedings of the 1st International Technology Management Conference, ITMC 2011*. <https://doi.org/10.1109/ITMC.2011.5995961>
- Bell, J., & Loane, S. (2010). "New-wave" global firms: Web 2.0 and SME internationalisation. *Journal of Marketing Management*. <https://doi.org/10.1080/02672571003594648>
- Belton, P. (2017). Competitive Strategy: Techniques for Analyzing Industries and Competitors. In *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. <https://doi.org/10.4324/9781912281060>

- Berger-Douce, S. (2011). Le développement durable, un levier d'innovation pour les PME? *Revue Francaise de Gestion*. <https://doi.org/10.3166/RFG.215.147-166>
- Bharati, P., & Chaudhury, A. (2012). Technology assimilation across the value chain: An empirical study of small and medium-sized enterprises. *Information Resources Management Journal*. <https://doi.org/10.4018/irmj.2012010103>
- Bianchi, M., Campodall'Orto, S., Frattini, F., & Vercesi, P. (2010). Enabling open innovation in small- and medium-sized enterprises: How to find alternative applications for your technologies. *R and D Management*. <https://doi.org/10.1111/j.1467-9310.2010.00613.x>
- Bjerregaard, T. (2009). Universities-industry collaboration strategies: A micro-level perspective. *European Journal of Innovation Management*. <https://doi.org/10.1108/14601060910953951>
- Blatz, F., Bulander, R., & Dietel, M. (2018a). Maturity Model of Digitization for SMEs. Maturity model to measure the status of digitization in SMEs. *2018 IEEE International Conference on Engineering, Technology and Innovation, ICE/ITMC 2018 - Proceedings*. <https://doi.org/10.1109/ICE.2018.8436251>
- Blatz, F., Bulander, R., & Dietel, M. (2018b). Maturity Model of Digitization for SMEs. *2018 IEEE International Conference on Engineering, Technology and Innovation, ICE/ITMC 2018 - Proceedings*. <https://doi.org/10.1109/ICE.2018.8436251>
- Bley, K., Leyh, C., & Schäffer, T. (2016). Digitization of German enterprises in the production sector - Do they know how "digitized" they are? *AMCIS 2016: Surfing the IT Innovation Wave - 22nd Americas Conference on Information Systems*.
- Blinn, N., Gehrke, N., Peris, M., Nüttgens, M., & Wolf, T. (2010). From conventional SME networks to CoINs - Requirements centered transition model and case study. *2010 1st International Workshop on the Web and Requirements Engineering, WeRE 2010*. <https://doi.org/10.1109/WERE.2010.5623998>
- Bobowski, S., Gola, J., & Szydło, W. (2018). *Access to Public Procurement Contracts in EU: Perspective of SMEs*. [https://doi.org/10.1007/978-3-319-67916-7\\_6](https://doi.org/10.1007/978-3-319-67916-7_6)
- Boekhoudt, P., & Van Der Stappen, P. (2004). The ASpect project case: A model for SME adoption of ICT innovation. *ACM International Conference Proceeding Series*. <https://doi.org/10.1145/1052220.1052246>
- Bogers, M., Chesbrough, H., & Moedas, C. (2018). Open innovation: Research, practices, and policies. *California Management Review*. <https://doi.org/10.1177/0008125617745086>
- Bogers, & West, J. (2014). Innovation creation and commercialization beyond the firm: A multi-level framework. *DRUID Society Conference 2014*.
- Boldrini, J. C., Schieb-Bienfait, N., & Chéné, E. (2011). Improving SMEs' guidance within public innovation supports. *European Planning Studies*. <https://doi.org/10.1080/09654313.2011.561036>
- Bos-brouwers, H. E. J. (2009). Corporate sustainability and innovation in SMEs: Evidence of themes and activities in practice - Bos-Brouwers - 2009 - Business Strategy and the Environment - Wiley Online Library. *Business Strategy and the Environment*.
- Bouwman, H., Molina-Castillo, F. J., & de Reuver, M. (2016). Business model innovation in European SMEs: Some preliminary findings. *29th Bled EConference: Digital Economy, BLED 2016*.
- Brem, A., Nylund, P. A., & Hitchen, E. L. (2017). Open innovation and intellectual property rights: How do SMEs benefit from patents, industrial designs, trademarks and copyrights? *Management Decision*. <https://doi.org/10.1108/MD-04-2016-0223>
- Brink, T. (2014). The impact on growth of outside-in and inside-out innovation in SME network contexts. In *International Journal of Innovation Management*. <https://doi.org/10.1142/S1363919614500236>

- Brocke, J. vom, & Mendling, J. (2018). Business Process Management Cases - Digital Innovation and Business Transformation in Practice. In *Management for Professionals*.
- Brunswick, S., & Kianto, A. (2006). The networked SME – Investigating the Interplay of Openness , Performance and Innovation Management Practices Aino Kianto. *Management*.
- Cai, H., Zhang, K., Zhou, M. J., Gong, W., Cai, J. J., & Mao, X. S. (2009). An end-to-end methodology and toolkit for fine granularity SaaS-ization. *CLOUD 2009 - 2009 IEEE International Conference on Cloud Computing*.  
<https://doi.org/10.1109/CLOUD.2009.63>
- Černá, M. (2014). Aspects of information management in context with is selection by SME. *Procedia Engineering*. <https://doi.org/10.1016/j.proeng.2014.03.050>
- Chesbrough, H. (2003). The logic of open innovation: Managing intellectual property. In *California Management Review*. <https://doi.org/10.2307/41166175>
- Chesbrough, H. (2004). Managing open innovation. *Research Technology Management*.  
<https://doi.org/10.1080/08956308.2004.11671604>
- Chesbrough, H. (2006a). Open Innovation: a New Paradigm for Understanding Industrial Innovation. In *Open Innovation: Researching a New Paradigm*.
- Chesbrough, H. (2006b). Open Innovation and Open Business Models : A new approach to industrial innovation. *Globalization and Open Innovation*.
- Chesbrough, H. (2011a). Bringing open innovation to services. *MIT Sloan Management Review*.
- Chesbrough, H. (2011b). Open Services Innovation: Rethinking Your Business to Grow and Compete in a New Era. *Presentation*. <https://doi.org/10.1017/CBO9781107415324.004>
- Chesbrough, H. (2012a). Open innovation: Where we've been and where we're going. In *Research Technology Management*. <https://doi.org/10.5437/08956308X5504085>
- Chesbrough, H. (2012b). Open innovation: Where we've been and where we're going. In *Research Technology Management* (Vol. 55, Issue 4, pp. 20–27).  
<https://doi.org/10.5437/08956308X5504085>
- Chesbrough, H. (2017). The future of open innovation. In *Research Technology Management*. <https://doi.org/10.1080/08956308.2017.1255054>
- Chesbrough, H., Birkinshaw, J., & Teubal, M. (2006). Introduction to the research policy 20th anniversary special issue of the publication of “Profiting from Innovation” by David J. Teece. In *Research Policy*. <https://doi.org/10.1016/j.respol.2006.09.001>
- Chesbrough, H., & Bogers, M. (2014a). Explicating Open Innovation: Clarifying an Emerging Paradigm for Understanding Innovation Keywords. *New Frontiers in Open Innovation*. <https://doi.org/10.1093/acprof>
- Chesbrough, H., & Bogers, M. (2014b). Explicating Open Innovation. In *New Frontiers in Open Innovation*. <https://doi.org/10.1093/acprof:oso/9780199682461.003.0001>
- Chesbrough, H., & Brunswick, S. (2014). A fad or a phenomenon? The adoption of open innovation practices in large firms. In *Research Technology Management*.  
<https://doi.org/10.5437/08956308X5702196>
- Chesbrough, H., & Crowther, A. K. (2006a). Beyond high tech: Early adopters of open innovation in other industries. *R and D Management*. <https://doi.org/10.1111/j.1467-9310.2006.00428.x>
- Chesbrough, H., & Crowther, A. K. (2006b). Beyond high tech: early adopters of open innovation in other industries - Chesbrough - 2006 - R&D Management - Wiley Online Library. *R&D Management*.
- Chesbrough, H., & Euchner, J. (2011). The evolution of open innovation: An interview with henry chesbrough. In *Research Technology Management*.  
<https://doi.org/10.5437/08956308X5405003>

- Chesbrough, H., Lettl, C., & Ritter, T. (2018). Value Creation and Value Capture in Open Innovation. *Journal of Product Innovation Management*. <https://doi.org/10.1111/jpim.12471>
- Chesbrough, H., & Schwartz, K. (2007). Innovating business models with co-development partnerships. *Research Technology Management*. <https://doi.org/10.1080/08956308.2007.11657419>
- Chesbrough, H W. (2003). The new imperative for creating and profiting from technology. In *Harvard Business Publishing*. <https://doi.org/10.1111/j.1467-8691.2008.00502.x>
- Chesbrough, Henry W. (2003). The era of open innovation. *MIT Sloan Management Review*.
- Chesbrough, Henry W. (2007). Why companies should have open business models. In *MIT Sloan Management Review*.
- Chesbrough, Henry W., & Garman, A. R. (2012). How open innovation can help you cope in lean times. *IEEE Engineering Management Review*. <https://doi.org/10.1109/EMR.2012.6291580>
- Chesbrough, Henry W. (2006). Open Business Models: How to Thrive in the New Innovation Landscape (Hardcover). In *Harvard Business School Press Books*.
- Chung, Y. R. K., & Tibben, W. (2006). Understanding the adoption of clusters by SMEs using innovation theory. *ICMIT 2006 Proceedings - 2006 IEEE International Conference on Management of Innovation and Technology*. <https://doi.org/10.1109/ICMIT.2006.262190>
- Clifton, N., Keast, R., Pickernell, D., & Senior, M. (2010). Network structure, knowledge governance, and firm performance: Evidence from innovation networks and SMEs in the UK. *Growth and Change*. <https://doi.org/10.1111/j.1468-2257.2010.00529.x>
- Colomb, V., Martel, M., Bockel, L., Martin, S., Chotte, J. L., & Bernoux, M. (2014). Promoting GHG mitigation policies for agriculture and forestry: A case study in Guadeloupe, French West Indies. *Land Use Policy*. <https://doi.org/10.1016/j.landusepol.2014.03.004>
- Conole, G. (2014). A new classification schema for MOOCs. *The International Journal for Innovation and Quality in Learning*. <https://doi.org/10.1007/s13312-014-0371-6>
- Cuerva, M. C., Triguero-Cano, Á., & Córcoles, D. (2014). Drivers of green and non-green innovation: Empirical evidence in Low-Tech SMEs. *Journal of Cleaner Production*. <https://doi.org/10.1016/j.jclepro.2013.10.049>
- Cunha, A., Mendonca, J. P., Catarino, M., Costa, H., & Nogueira, R. (2018). Sustainable Manufacturing: The impact of Collaboration on SMEs. *9th International Conference on Intelligent Systems 2018: Theory, Research and Innovation in Applications, IS 2018 - Proceedings*. <https://doi.org/10.1109/IS.2018.8710505>
- D, R., & T, R. (2010). Open innovation in SMEs: from closed boundaries to networked paradigm Issues in Informing Science & Information Technology. *Journal of African Business*.
- Dahlander, L., & Gann, D. M. (2010). How open is innovation? *Research Policy*. <https://doi.org/10.1016/j.respol.2010.01.013>
- Dai, W., & Uden, L. (2008). Empowering SME users through technology innovation: A services computing approach. *Journal of Information and Knowledge Management*. <https://doi.org/10.1142/S0219649208002159>
- Darus, N. M., Yunus, A. R., & Rahman, N. W. (2017). Factors enhancing the performance of SMEs' services sectors: A conceptual framework. *International Journal of ADVANCED AND APPLIED SCIENCES*. <https://doi.org/10.21833/ijaas.2017.03.025>
- De Lille, C., & Buur, J. (2010). Participatory innovation in SMEs. *ACM International Conference Proceeding Series*. <https://doi.org/10.1145/1900441.1900506>
- de Reuver, M., Athanasopoulou, A., Haaker, T., Roelfsema, M., Riedl, A., & Breitfuss, G.

- (2016). Designing an ICT tooling platform to support SME business model innovation: Results of a first design cycle. *29th Bled EConference: Digital Economy, BLED 2016*.
- Deck, M. J. (2008). Open Business Models: How to Thrive in the New Innovation Landscape by Henry Chesbrough. *Journal of Product Innovation Management*. [https://doi.org/10.1111/j.1540-5885.2008.00309\\_1.x](https://doi.org/10.1111/j.1540-5885.2008.00309_1.x)
- Deegan, G., Fernando, A. T. J., & Ratsch, G. (2015). Local government interventions for facilitating SME IT innovation. *Pacific Asia Conference on Information Systems, PACIS 2015 - Proceedings*.
- Dhaoui, I. (2015). The role of Islamic Microfinance in Poverty Alleviation: Lessons from Bangladesh Experience. *Humanomics*. <https://doi.org/10.1108/17538391111144515>
- Dick, J., & Payne, D. (2005). Regional sectoral support: A review of the construction industry, smes and regional innovation strategies across Europe. *International Journal of Strategic Property Management*. <https://doi.org/10.1080/1648715X.2005.9637527>
- Digital capabilities for SMEs' innovation in collaborative networks: A literature review. (2015). *20th Symposium of the Association Information and Management 2015, AIM 2015*.
- Dini, P., Lombardo, G., Mansell, R., Razavi, A. R., Moschoyiannis, S., Krause, P., Nicolai, A., & León, L. R. (2008). Beyond interoperability to digital ecosystems: regional innovation and socio-economic development led by SMEs. *International Journal of Technological Learning, Innovation and Development*. <https://doi.org/10.1504/IJTLID.2008.019981>
- Doh, S., & Kim, B. (2014). Government support for SME innovations in the regional industries: The case of government financial support program in South Korea. *Research Policy*. <https://doi.org/10.1016/j.respol.2014.05.001>
- Du, J., Wu, D., Lu, J., & Yu, H. (2013). Knowledge networks and technological capabilities of SMEs: The role of technology strategies and its implications for knowledge service intermediaries. *Asian Journal of Technology Innovation*. <https://doi.org/10.1080/19761597.2013.819248>
- Ebersberger, B., & Herstad, S. J. (2013). The relationship between international innovation collaboration, intramural R&D and SMEs' innovation performance: A quantile regression approach. *Applied Economics Letters*. <https://doi.org/10.1080/13504851.2012.724158>
- Edwards, Tim. (2007). A critical account of knowledge management: agentic orientation and SME innovation. *International Journal of Entrepreneurial Behaviour & Research*. <https://doi.org/10.1108/13552550710736910>
- Edwards, Thomas V. (2017). SME Innovation: A case study. *2017 International Annual Conference of the American Society for Engineering Management, ASEM 2017*.
- Egorov, I. Y., & Voytovich, A. (2001). SME AND INNOVATION ACTIVITIES IN UKRAINE. *Enterprise in Transition: International Conference Proceedings: 2001*.
- Enjolras, M., Camargo, M., & Schmitt, C. (2016). SMEs' innovation and export capabilities: Toward a common conceptual framework. *IAMOT 2016 - 25th International Association for Management of Technology Conference, Proceedings: Technology - Future Thinking*.
- Enkel, E., & Gassmann, O. (2010). Creative imitation: Exploring the case of cross-industry innovation. *R and D Management*. <https://doi.org/10.1111/j.1467-9310.2010.00591.x>
- Enkel, E., Gassmann, O., & Chesbrough, H. (2009a). Open R&D and open innovation: Exploring the phenomenon. In *R and D Management*. <https://doi.org/10.1111/j.1467-9310.2009.00570.x>
- Enkel, E., Gassmann, O., & Chesbrough, H. (2009b). Open R&D and open innovation exploring the phenomenon - 2009 - Enkel, Gassmann, Chesbrough.pdf. *R&D*

- Management*, 39(4), 311–316. <http://dx.doi.org/10.1111/j.1467-9310.2009.00570.x>
- Eppinger, E., & Vladova, G. (2013). Intellectual property management practices at small and medium-sized enterprises. *International Journal of Technology Management*. <https://doi.org/10.1504/IJTM.2013.050244>
- Ericson, Å., Lugnet, J., Wenngren, J., & Kaartinen, H. (2018). Online innovation supports. *2018 2nd International Symposium on Small-Scale Intelligent Manufacturing Systems, SIMS 2018*. <https://doi.org/10.1109/SIMS.2018.8355300>
- European Commission. Science and Society. (2008). A more research-intensive and integrated European Research Area: science, technology and competitiveness key figures report 2008/2009. In *European Commission*.
- Fakieh, B., Blount, Y., & Busch, P. (2016). SMEs and cloud computing: The benefits to the national economy and global competitiveness. *Proceedings of the 13th European, Mediterranean and Middle Eastern Conference on Information Systems, EMCIS 2016*.
- Federici, T. (2009). Factors influencing ERP outcomes in SMEs: A post-introduction assessment. *Journal of Enterprise Information Management*. <https://doi.org/10.1108/17410390910922840>
- Fernandez-Ribas, A. (2009). Global patent strategies of SMEs in nanotechnology. *Atlanta Conference on Science and Innovation Policy Atlanta Conference on Science and Innovation Policy 2009*.
- Ferneley, E., & Bell, F. (2006). Using bricolage to integrate business and information technology innovation in SMEs. *Technovation*. <https://doi.org/10.1016/j.technovation.2005.03.005>
- Foreman-Peck, J., Makepeace, G., & Morgan, B. (2006). Growth and profitability of small and medium-sized enterprises: Some Welsh evidence. *Regional Studies*. <https://doi.org/10.1080/00343400600725160>
- Franquesa, J., & Brandyberry, A. (2009). Organizational slack and information technology innovation adoption in SMEs. *International Journal of E-Business Research*. <https://doi.org/10.4018/jebr.2009010102>
- Galeano, C. P., & Gaviria, P. A. (2016). Open innovation models, a literature review with a focus on SMEs | Modelos de Innovación Abierta, Una revisión Bibliográfica con enfoque a las PYME. *Iberian Conference on Information Systems and Technologies, CISTI*. <https://doi.org/10.1109/CISTI.2016.7521534>
- Gallo, C., & Möhring, J. (2002). Innovation and clusters. *Proceedings of the East-West Cluster Conference OECD LEED*.
- Gallouj, F., & Savona, M. (2009). Innovation in services: A review of the debate and a research agenda. *Journal of Evolutionary Economics*. <https://doi.org/10.1007/s00191-008-0126-4>
- Gao, X. (2011). Research about product innovation of SME based on market orientation. *2011 International Conference on Management Science and Industrial Engineering, MSIE 2011*. <https://doi.org/10.1109/MSIE.2011.5707649>
- Gardet, E., & Fraiha, S. (2012). Coordination Modes Established by the Hub Firm of an Innovation Network: The Case of an SME Bearer. *Journal of Small Business Management*. <https://doi.org/10.1111/j.1540-627X.2012.00351.x>
- Gardet, E., & Mothe, C. (2010). Le rôle des ressources dans la dépendance du pivot au sein de réseaux d'innovation. *Revue Française de Gestion*. <https://doi.org/10.3166/rfg.204.171-186>
- Garrido, C. (2016). The Latin American and Caribbean higher education institutions, and the international entrepreneurship training. New opportunities with institutional networking and Open Education approach. *Proceedings of 2015 International Conference on Interactive Collaborative and Blended Learning, ICBL 2015*.

- <https://doi.org/10.1109/ICBL.2015.7387640>
- Gassmann, O., Enkel, E., & Chesbrough, H. (2010). The Future of Open Innovation. *R&D Management*. <https://doi.org/http://dx.doi.org/10.1080/08956308.2017.1373048>
- Gassmann, O., Enkel, E., & Chesbrough, H. (2010). The future of open innovation. In *R and D Management*. <https://doi.org/10.1111/j.1467-9310.2010.00605.x>
- Gassmann, O., Kausch, C., & Enkel, E. (2010). Negative side effects of customer integration. *International Journal of Technology Management*. <https://doi.org/10.1504/IJTM.2010.031917>
- Gassmann, O., Zeschky, M., Wolff, T., & Stahl, M. (2010). Crossing the industry-line: Breakthrough innovation through cross-industry alliances with “Non-Suppliers.” *Long Range Planning*. <https://doi.org/10.1016/j.lrp.2010.06.003>
- Gausdal, A. H., & Nilsen, E. R. (2011). Orchestrating Innovative SME Networks. The Case of “HealthInnovation.” *Journal of the Knowledge Economy*. <https://doi.org/10.1007/s13132-011-0070-7>
- Gebhardt, C., & Pohlmann, M. C. (2013). Managing the organisation 2.0: Entrepreneurial spirit and general management competences as early indicators for cluster success and sustainable regional development: Findings from the German Entrepreneurial Regions Programme. *Journal of High Technology Management Research*. <https://doi.org/10.1016/j.hitech.2013.09.007>
- Giesecke, R., Surakka, T., & Hakonen, M. (2016). Conceptualising Mobility as a Service. *2016 11th International Conference on Ecological Vehicles and Renewable Energies, EVER 2016*. <https://doi.org/10.1109/EVER.2016.7476443>
- Gordon, I., Hamilton, E., & Jack, S. (2012). A study of a university-led entrepreneurship education programme for small business owner/managers. *Entrepreneurship and Regional Development*. <https://doi.org/10.1080/08985626.2011.566377>
- GPFI. (2015). New Trends in Agricultural Finance. In *Global Partnership for Financial Inclusion*.
- Graversen, E. K., Schmidt, E. K., & Langberg, K. (2005). Dynamic research environments: A development model. *International Journal of Human Resource Management*. <https://doi.org/10.1080/09585190500220754>
- Gray, C., & Allan, J. (2002). Role of management education in developing capacity for innovation in small firms. *International Journal of Entrepreneurship and Innovation Management*. <https://doi.org/10.1504/ijeim.2002.000491>
- Grundström, C., Öberg, C., & öhrwall Rönnbäck, A. (2012). Family-owned manufacturing SMEs and innovativeness: A comparison between within-family successions and external takeovers. *Journal of Family Business Strategy*. <https://doi.org/10.1016/j.jfbs.2012.07.001>
- Guillaume, Y. R. F., Dawson, J. F., Priola, V., Sacramento, C. A., Woods, S. A., Higson, H. E., Budhwar, P. S., & West, M. A. (2014). Managing diversity in organizations: An integrative model and agenda for future research. *European Journal of Work and Organizational Psychology*. <https://doi.org/10.1080/1359432X.2013.805485>
- Guston, D. H., & Sarewitz, D. (2002). Real-time technology assessment. *Technology in Society*. [https://doi.org/10.1016/S0160-791X\(01\)00047-1](https://doi.org/10.1016/S0160-791X(01)00047-1)
- Hafkesbrink, J., & Schroll, M. (2011). Innovation 3.0: embedding into community knowledge - collaborative organizational learning beyond open innovation. *Journal of Innovation Economics*. <https://doi.org/10.3917/jie.007.0055>
- Halilem, N., Bertrand, C., Cloutier, J. S., Landry, R., & Amara, N. (2012). The knowledge value chain as an SME innovation policy instrument framework: An analytical exploration of SMEs public innovation support in OEcD countries. *International*

- Journal of Technology Management*. <https://doi.org/10.1504/IJTM.2012.046617>
- Hamid, N. A., & Tasmin, R. (2013). The Relationship of Business Innovation Capabilities and Technology Innovation Capabilities on SME Organization Performance: A Conceptual Framework. *Proceedings The 2nd International Conference On Global Optimization and Its Applications 2013 (ICoGOIA2013)*.
- Hanelt, A., Hildebrandt, B., & Polier, J. (2015). Uncovering the role of is in business model innovation - A taxonomy-driven approach to structure the field. *23rd European Conference on Information Systems, ECIS 2015*.
- Hanif, A., & Manarvi, I. A. (2009). Performance based segmentation of small and medium enterprises: A datamining approach. *2009 International Conference on Computers and Industrial Engineering, CIE 2009*. <https://doi.org/10.1109/iccie.2009.5223690>
- Harms, R., Reschke, C. H., Kraus, S., & Fink, M. (2010). Antecedents of innovation and growth: Analysing the impact of entrepreneurial orientation and goal-oriented management. *International Journal of Technology Management*. <https://doi.org/10.1504/IJTM.2010.035859>
- Haron, H., Md Sabri, S., & Zolkarnain, Z. N. (2013). A situational analysis of Strategic Information System Planning in the context of a Malaysian SME. *International Conference on Research and Innovation in Information Systems, ICRIIS*. <https://doi.org/10.1109/ICRIIS.2013.6716766>
- Harvie, C. (2015). SMEs, trade and development in South-east Asia. *University of Wollongong Faculty of Business - Papers*.
- Hashim, H. (Dato). (2015). Sme Development Framework : the Malaysian Case. *Cairo AMC-CBE-WBG SME Conference*.
- Heikkilä, J., & Heikkilä, M. (2017). Innovation in micro, small and medium sized enterprises: New product development, business model innovation and effectuation. *30th Bled EConference: Digital Transformation - From Connecting Things to Transforming Our Lives, BLED 2017*. <https://doi.org/10.18690/978-961-286-043-1.15>
- Heikkilä, M., & Bouwman, H. (2018). Business Model Innovation in European SMEs - Descriptive analysis of quantitative survey and case survey data. *31st Bled EConference: Digital Transformation: Meeting the Challenges, BLED 2018*. <https://doi.org/10.18690/978-961-286-170-4.38>
- Heikkilä, M., Bouwman, H., Heikkilä, J., Haaker, T., Nicolas, C. L., & Riedl, A. (2016). Business model innovation paths and tools. *29th Bled EConference: Digital Economy, BLED 2016*.
- Heimann, R. B., & Lehmann, H. D. (2015). Future Developments and Outlook. In *Bioceramic Coatings for Medical Implants*. <https://doi.org/10.1002/9783527682294.ch8>
- Helfat, C. E. (2011). Open Innovation: The New Imperative for Creating and Profiting from Technology. *Academy of Management Perspectives*. <https://doi.org/10.5465/amp.2006.20591014>
- Hjalager, A. M. (2005). Innovation in tourism from a welfare state perspective. *Scandinavian Journal of Hospitality and Tourism*. <https://doi.org/10.1080/15022250510014282>
- Hocová, P., Cunha, J. F. E., & Staníček, Z. (2009). Design and management of an innovative software enterprise: A case study of a spin-off from university. *PICMET: Portland International Center for Management of Engineering and Technology, Proceedings*. <https://doi.org/10.1109/PICMET.2009.5261802>
- Hodges, D. H., & Patil, M. (2000). Multi flexible body analysis for application to wind turbine control design. *2000 ASME Wind Energy Symposium*. <https://doi.org/10.2514/6.2000-30>
- Hollon, S. D., Muñoz, R. F., Barlow, D. H., Beardslee, W. R., Bell, C. C., Bernal, G., Clarke, G. N., Franciosi, L. P., Kazdin, A. E., Kohn, L., Linehan, M. M., Markowitz, J. C.,



- Miklowitz, D. J., Persons, J. B., Niederehe, G., & Sommers, D. (2002). Psychosocial intervention development for the prevention and treatment of depression: Promoting innovation and increasing access. In *Biological Psychiatry*. [https://doi.org/10.1016/S0006-3223\(02\)01384-7](https://doi.org/10.1016/S0006-3223(02)01384-7)
- Hongsaprabhas, T., Parisot, X., & Heo, D. (2018). Food Manufacturer Innovation Logics and Practices Flexibility: A Thai SME Case Study. *PROCEEDINGS OF THE 6TH INTERNATIONAL CONFERENCE ON MANAGEMENT, LEADERSHIP AND GOVERNANCE (ICMLG 2018)*.
- Huang, Y., & Li, J. C. (2009). A fuzzy-AHP based innovation ability evaluation system for small and medium-sized enterprise clusters. *2009 International Conference on Information Management, Innovation Management and Industrial Engineering, ICIII 2009*. <https://doi.org/10.1109/ICIII.2009.74>
- Huggins, R., & Johnston, A. (2009). Knowledge networks in an uncompetitive region: SME innovation and growth. *Growth and Change*. <https://doi.org/10.1111/j.1468-2257.2009.00474.x>
- HUGHES, A. (2008). Entrepreneurship and Innovation Policy: Retrospect and Prospect. *Political Quarterly*. <https://doi.org/10.1111/j.1467-923x.2008.02041.x>
- Humphrey, J., & Schmitz, H. (2008). Inter-firm relationships in global value chains: trends in chain governance and their policy implications. *International Journal of Technological Learning, Innovation and Development*. <https://doi.org/10.1504/IJTLID.2008.019974>
- Hunter, L., & Lean, J. (2014). Investigating the role of entrepreneurial leadership and social capital in SME competitiveness in the food and drink industry. *International Journal of Entrepreneurship and Innovation*. <https://doi.org/10.5367/ije.2014.0153>
- Institute, J. S. B. R. (2009). White Paper on Small and Medium Enterprises in Japan. *Small and Medium Enterprise Agency Ministry of Economy, Trade and Industry*.
- Islam, M. A., Tedford, J. D., & Haemmerle, E. (2006). Strategic risk management approach for small and medium-sized manufacturing enterprises SMEs - A theoretical framework. *ICMIT 2006 Proceedings - 2006 IEEE International Conference on Management of Innovation and Technology*. <https://doi.org/10.1109/ICMIT.2006.262309>
- Ismail, H. P. M., & Alina, S. (2010). Level of supply chain collaboration of Malaysian SME manufacturers. *5th IEEE International Conference on Management of Innovation and Technology, ICMIT2010*. <https://doi.org/10.1109/ICMIT.2010.5492883>
- Jean, R. J. B., Kim, D., & Sinkovics, R. R. (2012). Drivers and Performance Outcomes of Supplier Innovation Generation in Customer-Supplier Relationships: The Role of Power-Dependence. *Decision Sciences*. <https://doi.org/10.1111/j.1540-5915.2012.00380.x>
- Jiménez, J. (2008). Open innovation in mobile and convergent communications. *IFIP International Federation for Information Processing*. [https://doi.org/10.1007/978-0-387-87503-3\\_31](https://doi.org/10.1007/978-0-387-87503-3_31)
- Justen, C. R., De Almeida, M. F. L., & Souza, R. C. (2016). Innovation and quality infrastructure in the Brazilian electricity sector. *IAMOT 2016 - 25th International Association for Management of Technology Conference, Proceedings: Technology - Future Thinking*.
- Jutla, D., & Weatherbee, T. (2003). Supporting CLEAR: A strategy for small and medium size enterprise adoption of e-business practices in Atlantic Canada. *IFIP Advances in Information and Communication Technology*. [https://doi.org/10.1007/978-0-387-35692-1\\_10](https://doi.org/10.1007/978-0-387-35692-1_10)
- Kaivanto, K., & Stoneman, P. (2007). Public provision of sales contingent claims backed finance to SMEs: A policy alternative. *Research Policy*. <https://doi.org/10.1016/j.respol.2007.01.001>

- Kang, J., Gwon, S. hoon, Kim, S., & Cho, K. (2013). Determinants of successful technology commercialization: Implication for Korean Government-sponsored SMEs. *Asian Journal of Technology Innovation*. <https://doi.org/10.1080/19761597.2013.810947>
- Kaur, J., & Mustafa, N. (2013). Examining the effects of knowledge, attitude and behaviour on information security awareness: A case on SME. *International Conference on Research and Innovation in Information Systems, ICRIIS*. <https://doi.org/10.1109/ICRIIS.2013.6716723>
- Keoplang, P., Rungkasiri, T., Sophatsathit, P., & Nilsook, P. (2011). Convergence of mobile learning technology and knowledge management system innovation for SME clustering. *Proceedings of the International Conference on E-Learning, ICEL*.
- Kim and Mauborgne. (2015). What Colour is your Ocean. *CENTRAL EUROPEAN BUSINESS REVIEW*.
- Kim, D. Y., Kumar, V., & Kumar, U. (2012). Relationship between quality management practices and innovation. *Journal of Operations Management*. <https://doi.org/10.1016/j.jom.2012.02.003>
- Kim, J. H., & Bae, Z.-T. (2008). Successful Collaborative New Product Development in Vertical and Horizontal Partnerships. *International Conference on Management of Technology 2008*.
- Kim, J., & Wilemon, D. (2002). Strategic issues in managing innovation's fuzzy front-end. *European Journal of Innovation Management*. <https://doi.org/10.1108/14601060210415153>
- Kim, W. C., & Mauborgne, R. (2005). Value innovation: A leap into the blue ocean. In *Journal of Business Strategy*. <https://doi.org/10.1108/02756660510608521>
- Klonowski, D. (2012). Innovation propensity of the SME sector in emerging markets: Evidence from Poland. *Post-Communist Economies*. <https://doi.org/10.1080/14631377.2012.647633>
- Kogabayev, T., & Maziliauskas, A. (2017). The definition and classification of innovation. *HOLISTICA – Journal of Business and Public Administration*. <https://doi.org/10.1515/hjbpa-2017-0005>
- Konsti-Laakso, S., Pihkala, T., & Kraus, S. (2012). Facilitating SME innovation capability through business networking. *Creativity and Innovation Management*. <https://doi.org/10.1111/j.1467-8691.2011.00623.x>
- Kosała, M. (2015). Innovation processes as a stimulant of internationalisation process of firms. In *Entrepreneurial Business and Economics Review*. <https://doi.org/10.15678/EBER.2015.030206>
- Kotturu, C. M. V. V., & Mahanty, B. (2017). Determinants of SME integration into global value chains. *Journal of Advances in Management Research*. <https://doi.org/10.1108/jamr-02-2017-0013>
- Krabye, A., Matthews, J., Wrigley, C., & Bucolo, S. (2014). From production to purpose- Using design led innovation to build strategic potential in a family-owned SME. *2013 IEEE-Tsinghua International Design Management Symposium: Design-Driven Business Innovation, TIDMS 2013 - Proceedings*. <https://doi.org/10.1109/TIDMS.2013.6981213>
- Krause, W., Schutte, C., & Du Preez, N. (2012). Open innovation in south african small and medium-sized enterprises. *Proceedings of International Conference on Computers and Industrial Engineering, CIE*.
- Krause, Willie, & Schutte, C. (2015). A framework towards an open innovation approach for SMES. *IAMOT 2015 - 24th International Association for Management of Technology Conference: Technology, Innovation and Management for Sustainable Growth, Proceedings*.
- KRSTEVSKI, D., & MANCHESKI, G. (2016). (2016). SMEs OPEN INNOVATION

MANAGEMENT: STRATEGY MAP FOR INNOVATION DRIVEN COMPANY.  
*SMEs OPEN INNOVATION MANAGEMENT: STRATEGY MAP FOR INNOVATION DRIVEN COMPANY.*

- Kühne, B., Lefebvre, V., & Gellynck, X. (2013). Knowledge exchange in innovation networks: How networks support open innovation in food SMEs. *Proceedings of the International European Forum on System Dynamics and Innovation in Food Networks.*
- Kuivalainen, O., Sundqvist, S., Saarenketo, S., McNaughton, R. B., D'Angelo, A., Buck, T., Majocchi, A., & Zucchella, A. (2013). Geographical pathways for SME internationalization: Insights from an Italian sample. *International Marketing Review.* <https://doi.org/10.1108/02651331311314538>
- Kurniawati, A., Samadhi, T. M. A. A., & Wiratmadja, I. I. (2016). Indicators of knowledge management cycle in Indonesian small and Medium Enterprises. *2016 IEEE International Conference on Management of Innovation and Technology, ICMIT 2016.* <https://doi.org/10.1109/ICMIT.2016.7605033>
- Lambert, S., & Abdul-Nour, G. (2007). Value stream mapping of SME with growth potential. *37th International Conference on Computers and Industrial Engineering 2007.*
- Lee, S. M., Kim, S. T., & Choi, D. (2012). Green supply chain management and organizational performance. *Industrial Management & Data Systems.* <https://doi.org/10.1108/02635571211264609>
- Lei, W., Xing, W., & Xiaoyan, W. (2008). A study on the enhancement of competitiveness of small and medium enterprises through the integration of marketing capability with technological innovation. *Proceedings - 2008 International Seminar on Future Information Technology and Management Engineering, FITME 2008.* <https://doi.org/10.1109/FITME.2008.33>
- Li, J., Merenda, M., & Venkatachalam, A. R. (2010). Business process digitalization and new product development: An empirical study of small and medium-sized manufacturers. In *Global Perspectives on Small and Medium Enterprises and Strategic Information Systems: International Approaches.* <https://doi.org/10.4018/978-1-61520-627-8.ch014>
- Li, Z., & Li, H. L. (2013). On the effects of the entrepreneurship to SME' innovation. *Research Journal of Applied Sciences, Engineering and Technology.* <https://doi.org/10.19026/rjaset.5.4279>
- Lindeke, R. R., Wyrick, D. A., & Chen, H. (2009). Creating change and driving innovation in highly automated and lean organizations: The Temporal Think Tank™ (T3™). *Robotics and Computer-Integrated Manufacturing.* <https://doi.org/10.1016/j.rcim.2009.04.007>
- Lindgren, P. (2012). Business Model Innovation Leadership: How Do SME's Strategically Lead Business Model Innovation? *International Journal of Business and Management.* <https://doi.org/10.5539/ijbm.v7n14p53>
- Lisanti, Y., & Luhukay, D. (2014). The design of knowledge management system model for SME (UKM). *Journal of Theoretical and Applied Information Technology.*
- Löfgren, A. (2014). International network management for the purpose of host market expansion: The mediating effect of co-innovation in the networks of SMEs. *Journal of International Entrepreneurship.* <https://doi.org/10.1007/s10843-014-0129-1>
- Ma, L., & Lee, C. S. (2019). Understanding the Barriers to the Use of MOOCs in a Developing Country: An Innovation Resistance Perspective. *Journal of Educational Computing Research.* <https://doi.org/10.1177/0735633118757732>
- Macpherson, A., Jones, O., & Zhang, M. (2005). Virtual reality and innovation networks: Opportunity exploitation in dynamic SMEs. *International Journal of Technology Management.* <https://doi.org/10.1504/IJTM.2005.006345>
- Madrid-Guijarro, A., García-Pérez-de-Lema, D., & Van Auken, H. (2016). Financing constraints and SME innovation during economic crises. *Academia Revista*

- Latinoamericana de Administración*. <https://doi.org/10.1108/arla-04-2015-0067>
- Mahmod, R., Rosnan, H., & Hazman-Fitri, M. H. (2013). Knowledge management and innovation readiness among SMEs in. *BEIAC 2013 - 2013 IEEE Business Engineering and Industrial Applications Colloquium*. <https://doi.org/10.1109/BEIAC.2013.6560221>
- Malawige, I. R., & Nanayakkara, L. D. J. F. (2014). SME EIS adoption: Towards development of EIS for SMEs in Sri Lanka. *2014 14th International Conference on Advances in ICT for Emerging Regions, ICTer 2014 - Conference Proceedings*. <https://doi.org/10.1109/ICTER.2014.7083897>
- Małecka, J. (2018). Knowledge management in SMEs: In search of a paradigm. *Proceedings of the European Conference on Knowledge Management, ECKM*.
- Malik, K., & Wei, J. (2011). How external partnering enhances innovation: Evidence from Chinese technology-based SMEs. *Technology Analysis and Strategic Management*. <https://doi.org/10.1080/09537325.2011.558398>
- Manhart, M., Thalmann, S., & Maier, R. (2015). The ends of knowledge sharing in networks: Using information technology to start knowledge protection. *23rd European Conference on Information Systems, ECIS 2015*.
- Manimala, M. J. (2008). Entrepreneurship education in India: An assessment of SME training needs against current practices. *International Journal of Entrepreneurship and Innovation Management*. <https://doi.org/10.1504/IJEIM.2008.023831>
- Marcati, A., Guido, G., & Peluso, A. M. (2008). The role of SME entrepreneurs' innovativeness and personality in the adoption of innovations. *Research Policy*. <https://doi.org/10.1016/j.respol.2008.06.004>
- Marín-Idárraga, D. A., & Cuartas, J. C. (2016). Organizational structure and innovation: analysis from the strategic co-alignment. *Academia Revista Latinoamericana de Administración*. <https://doi.org/10.1108/arla-11-2015-0303>
- Marolt, M., Lenart, G., Borštnar, M. K., Vidmar, D., & Pucihar, A. (2018). SMEs perspective on business model innovation. *31st Bled EConference: Digital Transformation: Meeting the Challenges, BLED 2018*. <https://doi.org/10.18690/978-961-286-170-4.40>
- Marzi, G., Dabić, M., Daim, T., & Garces, E. (2017). Product and process innovation in manufacturing firms: a 30-year bibliometric analysis. *Scientometrics*. <https://doi.org/10.1007/s11192-017-2500-1>
- Masocha, R., & Dzomonda, O. (2016). The Mediating Role of Effective Working Capital Management on the Growth Prospects of Small and Medium Enterprises in Polokwane Municipality. *SAAPAM Limpopo Chapter 5th Annual Conference Proceedings 2016*.
- Matheis, H., Tilebein, M., Hirsch, M., & Lau, A. (2014). Managing diversity of collaborative innovation projects. *2014 International Conference on Engineering, Technology and Innovation: Engineering Responsible Innovation in Products and Services, ICE 2014*. <https://doi.org/10.1109/ICE.2014.6871587>
- Maurer, F., & Fritzsche, A. (2018). Boosting innovation for the development of smart-service factories of the future: The cases of the federal state of Vorarlberg and its neighbouring regions. *31st Bled EConference: Digital Transformation: Meeting the Challenges, BLED 2018*. <https://doi.org/10.18690/978-961-286-170-4.24>
- Mazzarol, T., & Reboud, S. (2005). Customers as predictors of rent returns to innovation in small firms: an exploratory study. *International Journal of Entrepreneurship and Innovation Management*. <https://doi.org/10.1504/ijeim.2005.007001>
- Mbuyisa, B., & Leonard, A. (2015). ICT adoption in SMES for the alleviation of poverty. *IAMOT 2015 - 24th International Association for Management of Technology Conference: Technology, Innovation and Management for Sustainable Growth, Proceedings*.
- Mcadam, R. (2002). Large Scale Innovation Reengineering Methodology in SMEs:

- Positivistic and Phenomenological Approaches. *International Small Business Journal*.  
<https://doi.org/10.1177/0266242602201004>
- McCole, P., & Ramsey, E. (2005). A Profile of Adopters and Non-adopters of eCommerce in SME Professional Service Firms. *Australasian Marketing Journal*.  
[https://doi.org/10.1016/S1441-3582\(05\)70066-5](https://doi.org/10.1016/S1441-3582(05)70066-5)
- Meuleman, M., & De Maeseneire, W. (2012). Do R&D subsidies affect SMEs' access to external financing? *Research Policy*. <https://doi.org/10.1016/j.respol.2012.01.001>
- Meyer, K., & Thieme, M. (2010). Activating the innovation potential of SME: The bottom-up approach. *INFORMATIK 2010 - Business Process and Service Science, Proceedings of ISSS and BPSC*.
- Moch, R., Merkel, A., Günther, L., & Müller, E. (2011). The dimension of innovation in SME networks - A case study on Cloud Computing and Web 2.0 technologies in a textile manufacturing network. *International Journal of Innovation and Sustainable Development*. <https://doi.org/10.1504/IJISD.2011.043067>
- Mokwena, S., & Hlebela, C. (2018). Factors Affecting the Adoption of Software as a Service in South African Small Medium Enterprises. *2018 Open Innovations Conference, OI 2018*. <https://doi.org/10.1109/OI.2018.8535714>
- Monge-González, R., Rodríguez-Alvarez, J. A., & Leiva, J. C. (2016). An impact evaluation of a fund to finance innovation in SMEs. *Academia Revista Latinoamericana de Administración*. <https://doi.org/10.1108/arla-02-2015-0041>
- Mouritsen, J., Bukh, P. N., & Bang, H. K. (2005). Understanding intellectual capital in an innovative medium-sized firm: The case of maxon telecom. In *Australian Accounting Review*. <https://doi.org/10.1111/j.1835-2561.2005.tb00290.x>
- Muhammad, M. Z., Junoh, A. S., Abdullah, A. R., Redzuan, R. H., & Muhamad, S. F. (2013). The concept of business ethics in Islamic perspective: An introductory study of Small and Medium Enterprises (SMEs). *Entrepreneurship Vision 2020: Innovation, Development Sustainability, and Economic Growth - Proceedings of the 20th International Business Information Management Association Conference, IBIMA 2013*.
- Mulani, J., Shijie, Z., Guotai, C., & Katakdhond, S. (2017). Issues and Challenges to Small and Medium Enterprises in India. *PROCEEDINGS OF THE 9TH (2017) INTERNATIONAL CONFERENCE ON FINANCIAL RISK AND CORPORATE FINANCE MANAGEMENT*.
- Mun, C., Kim, Y., Yoo, D., Yoon, S., Hyun, H., Raghavan, N., & Park, H. (2019). Discovering business diversification opportunities using patent information and open innovation cases. *Technological Forecasting and Social Change*.  
<https://doi.org/10.1016/j.techfore.2018.11.006>
- Nagi, K. (2008). Use of moodle reports for knowledge management, planning and eTraining in SMEs. *Proceedings of the 4th IEEE International Conference on Management of Innovation and Technology, ICMIT*. <https://doi.org/10.1109/ICMIT.2008.4654494>
- Narayanasamy, K., & Velmurugan, M. S. (2009). ICT adoption and development by the SME sector in Malaysia. *Creating Global Economies through Innovation and Knowledge Management Theory and Practice - Proceedings of the 12th International Business Information Management Association Conference, IBIMA 2009*.
- Ndou, V., & Passiante, G. (2005). Value Creation in Tourism Network Systems. In *Information and Communication Technologies in Tourism 2005*.  
[https://doi.org/10.1007/3-211-27283-6\\_40](https://doi.org/10.1007/3-211-27283-6_40)
- Nerone, M. A., Canciglieri, O., & Liao, Y. (2014). Classification of the open innovation practices: The creativity level. *Advances in Transdisciplinary Engineering*.  
<https://doi.org/10.3233/978-1-61499-440-4-871>
- Newell, S., Bresnen, M., Edelman, L., Scarbrough, H., & Swan, J. (2006). Sharing

- knowledge across projects: Limits to ICT-led project review practices. *Management Learning*. <https://doi.org/10.1177/1350507606063441>
- Ng, H. S., & Kee, D. M. H. (2012). The Issues and Development of Critical Success Factors for the SME Success in a Developing Country. *International Business Management*. <https://doi.org/10.3923/ibm.2012.680.691>
- Ngah, R., & Ibrahim, A. R. (2008). Tacit knowledge sharing and organizational performance: Malaysian SMEs perspective. *Kmice 2008 - Knowledge Management International Conference, 2008 - Transferring, Managing and Maintaining Knowledge for Nation Capacity Development*.
- Ngah, Rohana, & Ibrahim, A. R. (2007). The relationship of Intellectual Capital , Knowledge Sharing Process and Innovation on Malaysia SMEs ' Performance. In *eprints.um.edu.my*.
- Nielsen, K. R., Reisch, L. A., & Thøgersen, J. (2016). Sustainable user innovation from a policy perspective: a systematic literature review. In *Journal of Cleaner Production*. <https://doi.org/10.1016/j.jclepro.2016.05.092>
- North, D., & Smallbone, D. (2000). The innovativeness and growth of rural SMEs during the 1990s. *Regional Studies*. <https://doi.org/10.1080/00343400050006069>
- Nyuur, R. B., Brecic, R., & Debrah, Y. A. (2018). SME international innovation and strategic adaptiveness. *International Marketing Review*. <https://doi.org/10.1108/imr-11-2015-0239>
- OECD. (2014). SME Policy Index: The Mediterranean Middle East and North Africa 2014. In *SME Policy Index: The Mediterranean Middle East and North Africa 2014*. <https://doi.org/10.1787/9789264218413-en>
- OECD. (2018). SME and Entrepreneurship Policy in Indonesia 2018. In *OECD Studies on SMEs and Entrepreneurship*, OECD Publishing, Paris. <https://doi.org/10.1787/9789264306264-en>
- Oliveira, A. C. De, & Kaminski, P. C. (2012). A reference model to determine the degree of maturity in the product development process of industrial SMEs. *Technovation*. <https://doi.org/10.1016/j.technovation.2012.08.001>
- Oliveira, F., Ramos, I., & Santos, L. (2010). Definition of a crowdsourcing innovation service for the European SMEs. *Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*. [https://doi.org/10.1007/978-3-642-16985-4\\_37](https://doi.org/10.1007/978-3-642-16985-4_37)
- Otejere, A. J., Joe, A. E., & Okorhi, O. J. (2015). Assessment of innovation-activities of smes in Niger-Delta Nigeria. *IAMOT 2015 - 24th International Association for Management of Technology Conference: Technology, Innovation and Management for Sustainable Growth, Proceedings*.
- Paio, A., Eloy, S., Rato, V. M., Resende, R., & de Oliveira, M. J. (2012). Prototyping Vitruvius, New Challenges: Digital Education, Research and Practice. *Nexus Network Journal*. <https://doi.org/10.1007/s00004-012-0124-6>
- Paiola, M. (2018). KIBS, pilot-customers and lead-users in the digital transformation of manufacturing firms. *Proceedings of the European Conference on Knowledge Management, ECKM*.
- Parida, V., Westerberg, M., & Ylinenpaa, H. (2009). How do small firms use ICT for business purposes? A study of Swedish technology-based firms. *International Journal of Electronic Business*. <https://doi.org/10.1504/ijeb.2009.032039>
- Parrilli, M. D., Aranguren, M. J., & Larrea, M. (2010). The role of interactive learning to close the “innovation gap” in SME-based local economies: A furniture cluster in the basque country and its key policy implications. *European Planning Studies*. <https://doi.org/10.1080/09654310903497660>

- Parrilli, Mario Davide. (2004). A stage and eclectic approach to industrial district development: Two policy keys for “survival” clusters in developing countries. *European Planning Studies*. <https://doi.org/10.1080/0965431042000289241>
- Partanen, J., Möller, K., Westerlund, M., Rajala, R., & Rajala, A. (2008). Social capital in the growth of science-and-technology-based SMEs. *Industrial Marketing Management*. <https://doi.org/10.1016/j.indmarman.2007.09.012>
- Pedersen, K., & Saglie, J. (2005). New technology in ageing parties Internet use in Danish and Norwegian parties. *Party Politics*. <https://doi.org/10.1177/1354068805051782>
- Pénin, J., Hussler, C., & Burger-Helmchen, T. (2011). New shapes and new stakes: a portrait of open innovation as a promising phenomenon. *Journal of Innovation Economics*. <https://doi.org/10.3917/jie.007.0011>
- Pett, T. L., & Wolff, J. A. (2009). SME opportunity for growth or profit: What is the role of product and process improvement? *International Journal of Entrepreneurial Venturing*. <https://doi.org/10.1504/IJEV.2009.023817>
- Pett, T. L., & Wolff, J. A. (2011). Examining SME performance: The role of innovation, R&D and internationalisation. *International Journal of Entrepreneurial Venturing*. <https://doi.org/10.1504/IJEV.2011.041277>
- Pietrobelli, C., & Rabellotti, R. (2007). Business Development Service centres in Italy: Close to firms, far from innovation. *World Review of Science, Technology and Sustainable Development*. <https://doi.org/10.1504/WRSTSD.2007.012659>
- PLM for the SME: Technology no longer just for the big boys. (2004). *Strategic Direction*. <https://doi.org/10.1108/02580540410567274>
- Porath, A., Rahman, H., & Ramos, I. (2015). Collaborative research (CR): To reduce transaction cost in open innovation. In *Economics: Concepts, Methodologies, Tools, and Applications*. <https://doi.org/10.4018/978-1-4666-8468-3.ch015>
- Porter, M. E. (1997). Competitive strategy. In *Measuring Business Excellence*. <https://doi.org/10.1108/eb025476>
- Porumb, E. M., & Analoui, F. (2008). How to use KM effectively in a European context: the case of BCT in Romania. *International Journal of Business Information Systems*. <https://doi.org/10.1504/IJBIS.2008.018993>
- Potinecke, T., Rogowski, T., Boucher, X., Dolgui, A., Agoti, S., Stylios, C., Groumpos, P. P., Heavey, C., Liston, P., Byrne, P., Salvador, S., & Salvador, M. (2009). A view of SME clusters and networks in Europe. In *A Road Map to the Development of European SME Networks: Towards Collaborative Innovation*. <https://doi.org/10.1007/978-1-84800-342-2-2>
- Prasanth, S. (2005). Management of technology in an SME: A case study of Hind High Vacuum Co. Pvt. Ltd. *International Journal of Technology Management*. <https://doi.org/10.1504/IJTM.2005.006819>
- Procopie, R., Bumbac, R., Giușcă, S., & Vasilcovschi, A. (2015). The game of innovation. Is gamification a new trendsetter? *Amfiteatru Economic*.
- Pucihar, A., Lenart, G., Marolt, M., Borštnar, M. K., & Maletič, D. (2016). Role of ICT in business model innovation in SMEs - Case of Slovenia. *IDIMT 2016 - Information Technology, Society and Economy Strategic Cross-Influences - 24th Interdisciplinary Information Management Talks*.
- Pullen, A., de Weerd-Nederhof, P. C., Groen, A. J., & Fisscher, O. A. M. (2012). SME Network Characteristics vs. Product Innovativeness: How to Achieve High Innovation Performance. *Creativity and Innovation Management*. <https://doi.org/10.1111/j.1467-8691.2012.00638.x>
- Pullen, A., De Weerd-Nederhof, P., Groen, A., Song, M., & Fisscher, O. (2009). Successful patterns of internal SME characteristics leading to high overall innovation performance.

*Creativity and Innovation Management*. <https://doi.org/10.1111/j.1467-8691.2009.00530.x>

- Qian, Q., & Chen, Y. (2011). Sme, Technological innovation and regional environment: The case of guangdong, china. *Procedia Earth and Planetary Science*. <https://doi.org/10.1016/j.proeps.2011.09.051>
- Quintane, E., Casselman, R. M., Reiche, B. S., & Nylund, P. A. (2011). Innovation as a knowledge-based outcome. In *Journal of Knowledge Management*. <https://doi.org/10.1108/13673271111179299>
- Rabelo, R. J. (2008). Advanced collaborative business ICT infrastructures. In *Methods and Tools for Collaborative Networked Organizations*. [https://doi.org/10.1007/978-0-387-79424-2\\_14](https://doi.org/10.1007/978-0-387-79424-2_14)
- Račić, D., Aralica, Z., & Redžepagić, D. (2008). Export strategies as a factor of SME growth in Croatia. *International Journal of Entrepreneurship and Innovation Management*. <https://doi.org/10.1504/IJEIM.2008.019531>
- Radas, S., & Bozic, L. (2012). Overcoming Failure: Abandonments and Delays of Innovation Projects in SMEs. *Industry and Innovation*. <https://doi.org/10.1080/13662716.2012.739769>
- Radziwon, A., Bogers, M., & Bilberg, A. (2014). Managing Open Innovation Across SMEs: The Case of a Regional Ecosystem. *Academy of Management Proceedings*. <https://doi.org/10.5465/ambpp.2014.11740abstract>
- Rahim, R. A., Mahmood, N. H. N., & Masrom, M. (2016). The role of knowledge management in facilitating innovation for sustainable SMEs performance. *Proceedings of the 2015 International Conference on Technology, Informatics, Management, Engineering and Environment, TIME-E 2015*. <https://doi.org/10.1109/TIME-E.2015.7389749>
- Rahman, H., & Ramos, I. (2010). Open Innovation in SMEs: From Closed Boundaries to Networked Paradigm. *Issues in Informing Science and Information Technology*. <https://doi.org/10.28945/1221>
- Rahman, H., & Ramos, I. (2011a). A research model for open innovation: Synthesizing opportunities and challenges surrounding SMEs. In *SMEs and Open Innovation: Global Cases and Initiatives*. <https://doi.org/10.4018/978-1-61350-519-9.ch005>
- Rahman, H., & Ramos, I. (2011b). Is Open innovation imperative to small and medium enterprises?: A comparative study. *17th Americas Conference on Information Systems 2011, AMCIS 2011*.
- Rahman, H., & Ramos, I. (2011c). SMEs and open innovation: Global cases and initiatives. In *SMEs and Open Innovation: Global Cases and Initiatives*. <https://doi.org/10.4018/978-1-61350-519-9>
- Rahman, H., & Ramos, I. (2012). Open Innovation in Entrepreneurships: Agents of Transformation towards the Knowledge-Based Economy. *Proceedings of the 2012 InSITE Conference*. <https://doi.org/10.28945/1666>
- Rahman, H., & Ramos, I. (2013a). A research model for open innovation: Synthesizing opportunities and challenges surrounding SMEs. In *Small and Medium Enterprises: Concepts, Methodologies, Tools, and Applications*. <https://doi.org/10.4018/978-1-4666-3886-0.ch014>
- Rahman, H., & Ramos, I. (2013b). Challenges in Adopting Open Innovation Strategies in SMEs: An Exploratory Study in Portugal. *Issues in Informing Science and Information Technology*. <https://doi.org/10.28945/1820>
- Rahman, H., & Ramos, I. (2013c). Open innovation strategies in SMEs: Development of a business model. In *Small and Medium Enterprises: Concepts, Methodologies, Tools, and Applications*. <https://doi.org/10.4018/978-1-4666-3886-0.ch015>



- Rahman, H., & Ramos, I. (2013d). Research and practices on open innovation: Perspectives on SMEs. In *Small and Medium Enterprises: Concepts, Methodologies, Tools, and Applications*. <https://doi.org/10.4018/978-1-4666-3886-0.ch010>
- Rahman, H., & Ramos, I. (2013e). Trends of open innovation in developing nations: Contexts of SMEs. In *Small and Medium Enterprises: Concepts, Methodologies, Tools, and Applications*. <https://doi.org/10.4018/978-1-4666-3886-0.ch091>
- Rahman, H., & Ramos, I. (2014). *Open Innovation in SMEs: Prospects and Challenges*. [https://doi.org/10.1007/978-3-642-38244-4\\_16](https://doi.org/10.1007/978-3-642-38244-4_16)
- Rahman, N. A., Yaacob, Z., Rafisah, & Radzi, M. (2015). Adoption of Motivation theory in SME Leadership : A Malaysian study. *The 7th Indonesia International Conference on Innovation, Entrepreneurship, and Small Business (IICIES 2015)*.
- Ramadani, V., Gërguri, S., Rexhepi, G., & Abdulj, S. (2013). Innovation and economic development: The case of FYR of Macedonia. *Journal of Balkan and Near Eastern Studies*. <https://doi.org/10.1080/19448953.2013.789326>
- Raposo, M. L., Ferreira, J. J. M., & Fernandes, C. I. (2014). Local and cross-border SME cooperation: Effects on innovation and performance. *Revista Europea de Dirección y Economía de La Empresa*. <https://doi.org/10.1016/j.redee.2014.08.001>
- Raymond, L., & Bergeron, F. (2008). Enabling the business strategy of SMEs through e-business capabilities: A strategic alignment perspective. *Industrial Management & Data Systems*. <https://doi.org/10.1108/02635570810876723>
- Rees, M., & Edwards, R. (2010). Innovation roles in SME internationalization. *2010 International Conference on Management Science and Engineering, ICMSE 2010*. <https://doi.org/10.1109/ICMSE.2010.5719972>
- Rezgui, Y., & Miles, J. (2009). Transforming SME strategies via innovative transient knowledge-based alliances in the Construction Sector. *IEEE International Conference on Industrial Informatics (INDIN)*. <https://doi.org/10.1109/INDIN.2009.5195915>
- Rezgui, Y., & Miles, J. (2010). Exploring the potential of SME alliances in the construction sector. *Journal of Construction Engineering and Management*. [https://doi.org/10.1061/\(ASCE\)CO.1943-7862.0000150](https://doi.org/10.1061/(ASCE)CO.1943-7862.0000150)
- Rezk, M. R. A., Ibrahim, H. H., Radwan, A., Sakr, M. M., Tvaronavičienė, M., & Piccinetti, L. (2016). Innovation magnitude of manufacturing industry in Egypt with particular focus on SMEs. *Entrepreneurship and Sustainability Issues*. [https://doi.org/10.9770/jesi.2016.3.4\(1\)](https://doi.org/10.9770/jesi.2016.3.4(1))
- Rodríguez-Ferradas, M. I., & Alfaro-Tanco, J. A. (2016). Open innovation in automotive SMEs suppliers: An opportunity for new product development. *Universia Business Review*. <https://doi.org/10.3232/UBR.2016.V13.N2.05>
- Romani Chocce, G. (2003). Necessary conditions for venture capital development in Latin America: the Chilean case. *International Journal of Entrepreneurship and Innovation Management*. <https://doi.org/10.1504/ijeim.2003.002225>
- Romero-Martínez, A. M., Ortiz-de-Urbina-Criado, M., & Soriano, D. R. (2010). Evaluating European Union support for innovation in Spanish small and medium enterprises. *Service Industries Journal*. <https://doi.org/10.1080/02642060802253868>
- Romero, I. (2011). Analysing the composition of the SME sector in high- and low-income regions: Some research hypotheses. *Entrepreneurship and Regional Development*. <https://doi.org/10.1080/08985626.2010.491872>
- Rothwell, R., & Dodgson, M. (1991). External linkages and innovation in small and medium- sized enterprises. *R&D Management*. <https://doi.org/10.1111/j.1467-9310.1991.tb00742.x>
- Ruivo, P., Oliveira, T., Johansson, B., & Neto, M. (2013). Differential effects on ERP post-adoption stages across Scandinavian and Iberian SMEs. *Journal of Global Information*

- Management*. <https://doi.org/10.4018/jgim.2013070101>
- Rujirawanich, P., Addison, R., & Smallman, C. (2011). The effects of cultural factors on innovation in a Thai SME. *Management Research Review*. <https://doi.org/10.1108/01409171111186397>
- Rutherforda, T., & Holmesb, J. (2008). Engineering networks: University-industry networks in Southern Ontario automotive industry clusters. *Cambridge Journal of Regions, Economy and Society*. <https://doi.org/10.1093/cjres/rsn001>
- Saeidi, S. P., Saeidi, P., Othman, M. S. H., & Saeidi, S. P. (2018). The moderating role of environmental management accounting between environmental innovation and firm financial performance. *International Journal of Business Performance Management*. <https://doi.org/10.1504/ijbpm.2018.10011849>
- Salojärvi, S. (2004). The role and nature of knowledge management in Finnish SMEs. *International Journal of Learning and Intellectual Capital*. <https://doi.org/10.1504/IJLIC.2004.005707>
- Salvador, E., Montagna, F., & Marcolin, F. (2013). Clustering recent trends in the open innovation literature for SME strategy improvements. *International Journal of Technology, Policy and Management*. <https://doi.org/10.1504/IJTPM.2013.056788>
- Sandmeier, P., Morrison, P. D., & Gassmann, O. (2010). Integrating customers in product innovation: Lessons from industrial development contractors and in-house contractors in rapidly changing customer markets. *Creativity and Innovation Management*. <https://doi.org/10.1111/j.1467-8691.2010.00555.x>
- Saqib, M., Udin, Z. M., & Zarine, R. (2018). Exploring the technology orientation influence on the innovativeness-performance relationship of manufacturing SMEs. *International Journal of Innovation and Learning*. <https://doi.org/10.1504/ijil.2018.10015245>
- Sari, Y. M., Purwandari, B., Satria, R., Wirani, Y., Solichah, I., & Nastiti, T. I. (2018). Factors Influencing Users Acceptance of Online Consultation Feature on the SOBAT-UKM Portal. *2018 International Conference on Information Technology Systems and Innovation, ICITSI 2018 - Proceedings*. <https://doi.org/10.1109/ICITSI.2018.8696047>
- Schaarschmidt, M., Von Kortzfleisch, H., Valcárcel, S., & Lindermann, N. (2011). Web 2.0 enabled employee collaboration in diverse SME networks: A CEOs perspective. *19th European Conference on Information Systems, ECIS 2011*.
- Schultheiss, F. (2018). The Agile Innovation Framework: A Next Generation Innovation (Process) Model. *Fincalabs*. <https://doi.org/10.1109/PICMET.2008.4599663>
- Schuurman, D., De Marez, L., & Ballon, P. (2015). Exploring the Impact of Methodological Set-up on Innovation Contribution in Living Labs. *XXVI ISPIM Conference: Shaping the Frontiers of Innovation Management*.
- Schwab, S., Koch, J., Flachskampf, P., & Isenhardt, I. (2011). Strategic implementation of Open Innovation methods in small and medium-sized enterprises. *2011 17th International Conference on Concurrent Enterprising, ICE 2011 - Conference Proceedings*. [https://doi.org/10.1007/978-3-642-33389-7\\_12](https://doi.org/10.1007/978-3-642-33389-7_12)
- Şengün, A. E., & Önder, Ç. (2011). The Conditional Impact of Competence Trust on Inter-Firm Learning in a Collectivist SME Context. *Industry and Innovation*. <https://doi.org/10.1080/13662716.2011.621746>
- Seow, C., & Jiying, L. (2006). Innovation in maintenance strategy through six sigma: Insights of a Malaysian SME. *ICMIT 2006 Proceedings - 2006 IEEE International Conference on Management of Innovation and Technology*. <https://doi.org/10.1109/ICMIT.2006.262329>
- Serrasqueiro, Z., Nunes, P. M., & Leitão, J. (2011). Sources of finance for R&D investment: Empirical evidence from Portuguese SMEs using dynamic estimators. *Innovation: Management, Policy and Practice*. <https://doi.org/10.5172/impp.2011.13.2.187>

- Sezer, E., Romero, D., Guedea, F., MacChi, M., & Emmanouilidis, C. (2018). An Industry 4.0-Enabled Low Cost Predictive Maintenance Approach for SMEs. *2018 IEEE International Conference on Engineering, Technology and Innovation, ICE/ITMC 2018 - Proceedings*. <https://doi.org/10.1109/ICE.2018.8436307>
- Shah, S., & Mattiuzza, S. (2018). Adoption of Additive Manufacturing Approaches: The Case of Manufacturing SMEs. *2018 IEEE International Conference on Engineering, Technology and Innovation, ICE/ITMC 2018 - Proceedings*. <https://doi.org/10.1109/ICE.2018.8436257>
- Sheen, D. P., & Yang, Y. (2018). Assessment of Readiness for Smart Manufacturing and Innovation in Korea. *2018 IEEE Technology and Engineering Management Conference, TEMSCON 2018*. <https://doi.org/10.1109/TEMSCON.2018.8488424>
- Singh, S. K., Gupta, S., Busso, D., & Kamboj, S. (2019). Top management knowledge value, knowledge sharing practices, open innovation and organizational performance. *Journal of Business Research*. <https://doi.org/10.1016/j.jbusres.2019.04.040>
- Siyanbola, W. O., Olamide, O. O., & Isola, O. O. (2011). Assessing technological innovation in SME footwear clusters in Nigeria. *PICMET: Portland International Center for Management of Engineering and Technology, Proceedings*.
- Skuras, D., Tseggenidi, K., & Tsekouras, K. (2008). Product innovation and the decision to invest in fixed capital assets: Evidence from an SME survey in six European Union member states. *Research Policy*. <https://doi.org/10.1016/j.respol.2008.08.013>
- SME Corporation Malaysia. (2016). SME Developments and Outlook. *SME Annual Report 2016/2017*.
- Smes, M., & Idt, A. N. (2013). Journal of ICT, 12, 2013, pp: 103 – 119. *Journal of ICT*,.
- Sok, P., O’Cass, A., & Sok, K. M. (2013). Achieving superior SME performance: Overarching role of marketing, innovation, and learning capabilities. *Australasian Marketing Journal*. <https://doi.org/10.1016/j.ausmj.2013.04.001>
- Sparling, L., Toleman, M., & Cater-Steel, A. (2007). SME Adoption of e-commerce in the Central Okanagan region of Canada. *ACIS 2007 Proceedings - 18th Australasian Conference on Information Systems*.
- Spiegel, M., & Marxt, C. (2012). Innovation behavior of technology-based SME. *2012 Proceedings of Portland International Center for Management of Engineering and Technology: Technology Management for Emerging Technologies, PICMET’12*.
- Spithoven, A. (2013). Open innovation practices and innovative performances: An international comparative perspective. *International Journal of Technology Management*. <https://doi.org/10.1504/IJTM.2013.053037>
- Struik, P. C., Klerkx, L., van Huis, A., & Röling, N. G. (2014). Institutional change towards sustainable agriculture in West Africa. *International Journal of Agricultural Sustainability*. <https://doi.org/10.1080/14735903.2014.909641>
- Suh, Y., & Kim, M. S. (2012). Effects of SME collaboration on R&D in the service sector in open innovation. *Innovation: Management, Policy and Practice*. <https://doi.org/10.5172/impp.2012.14.3.349>
- Sulastri, R. E., & Dilastri, N. (2015). Peran Pemerintah Dan Akademisi Dalam Memajukan Industri Kreatif Kasus Pada UKM Kerajinan Sulaman Di Kota Pariaman. *Seminar Nasional Ekonomi Manajemen Dan Akuntansi (SNEMA) Fakultas Ekonomi Universitas Negeri Padang*.
- Sun, X., & Wang, Q. (2011). Open innovation in small and medium enterprise under the view of knowledge management. *2011 2nd International Conference on Artificial Intelligence, Management Science and Electronic Commerce, AIMSEC 2011 - Proceedings*. <https://doi.org/10.1109/AIMSEC.2011.6010655>
- Tai, Y. L., & Watada, J. (2010). Creating SMEs’ innovation capabilities through formation of

- collaborative innovation network in Taiwan. *2010 World Automation Congress, WAC 2010*.
- Tebaldi, L., Bigliardi, B., & Bottani, E. (2018). Sustainable supply chain and innovation: A review of the recent literature. In *Sustainability (Switzerland)*. <https://doi.org/10.3390/su10113946>
- Teirlinck, P., & Spithoven, A. (2013). Research collaboration and R&D outsourcing: Different R&D personnel requirements in SMEs. *Technovation*. <https://doi.org/10.1016/j.technovation.2012.11.005>
- Teirlinck, P., & Spithoven, A. (2019). The R&D knowledge base in city-agglomerations and knowledge searching in product innovative SMEs. *Entrepreneurship and Regional Development*. <https://doi.org/10.1080/08985626.2018.1545053>
- Tekic, A., & Willoughby, K. W. (2020). Configuring intellectual property management strategies in co-creation: a contextual perspective. *Innovation: Organization and Management*. <https://doi.org/10.1080/14479338.2019.1585189>
- Tektas, A., Gunay, E. N. O., Karatas, A., & Kuyucu, A. D. H. (2011). SME innovation ecosystem in Turkey. *Creating Global Competitive Economies: A 360-Degree Approach - Proceedings of the 17th International Business Information Management Association Conference, IBIMA 2011*.
- Thieme, M., & Meyer, K. (2011). Innovation through collaboration: A case-study based strategy to connect research institutions and enterprises. *Proceedings - 2011 Annual SRII Global Conference, SRII 2011*. <https://doi.org/10.1109/SRII.2011.68>
- Thomas, B., Packham, G., Miller, C., & Brooksbank, D. (2004). The use of Web sites for SME innovation and technology support services in Wales. *Journal of Small Business and Enterprise Development*. <https://doi.org/10.1108/14626000410551654>
- Thomson, J., & Dekkers, R. (2008). A Systematic Approach to Managing Open Innovation Systems with Embedded Technology Valorisation. *International Conference on Management of Technology 2008*.
- Thorgren, S., Wincent, J., & Örtqvist, D. (2009). Designing interorganizational networks for innovation: An empirical examination of network configuration, formation and governance. *Journal of Engineering and Technology Management - JET-M*. <https://doi.org/10.1016/j.jengtecman.2009.06.006>
- Tomlinson, P. R. (2011). Strong ties, Substantive Embeddedness and Innovation: Exploring Differences in the Innovative Performance of Small and Medium-sized Firms in UK Manufacturing. *Knowledge and Process Management*. <https://doi.org/10.1002/kpm.376>
- Tovstiga, G., & Birchall, D. W. (2008). Henley SME innovation study 2007. *PICMET: Portland International Center for Management of Engineering and Technology, Proceedings*. <https://doi.org/10.1109/PICMET.2008.4599657>
- Trott, P., & Hartmann, D. (2009). Why “open innovation” is old wine in new bottles. *International Journal of Innovation Management*. <https://doi.org/10.1142/S1363919609002509>
- Tsou, H. T., & Chen, J. S. (2012). The influence of interfirm codevelopment competency on e-service innovation. *Information and Management*. <https://doi.org/10.1016/j.im.2012.04.001>
- Turner, R., Ledwith, A., & Kelly, J. (2010). Project management in small to medium-sized enterprises: Matching processes to the nature of the firm. *International Journal of Project Management*. <https://doi.org/10.1016/j.ijproman.2010.06.005>
- Uden, L., & Naaranoja, M. (2009). Service innovation by SME. *International Journal of Web Engineering and Technology*. <https://doi.org/10.1504/IJWET.2009.031010>
- van de Vrande, V., de Jong, J. P. J., Vanhaverbeke, W., & de Rochemont, M. (2009). Open innovation in SMEs: Trends, motives and management challenges. *Technovation*.

- <https://doi.org/10.1016/j.technovation.2008.10.001>
- Van De Vrande, V., Vanhaverbeke, W., & Gassmann, O. (2010). Broadening the scope of open innovation: Past research, current state and future directions. *International Journal of Technology Management*. <https://doi.org/10.1504/IJTM.2010.035974>
- Van Echtelt, F. E. A., Wynstra, F., Van Weele, A. J., & Duysters, G. (2008). Managing supplier involvement in new product development: A multiple-case study. *Journal of Product Innovation Management*. <https://doi.org/10.1111/j.1540-5885.2008.00293.x>
- Vanhaverbeke, W., & Chesbrough, H. (2014). A Classification of Open Innovation and Open Business Models. In *New Frontiers in Open Innovation*. <https://doi.org/10.1093/acprof:oso/9780199682461.003.0003>
- Vatamanescu, E. M., Pinzaru, F., Andrei, A. G., & Zbucea, A. (2016). Investigating SMEs sustainability with partial least squares structural equation modelling. *Transformations in Business and Economics*.
- Vega, A., Chiasson, M., & Brown, D. (2008). Extending the research agenda on diffusion: The case of public program interventions for the adoption of e-business systems in SMEs. *Journal of Information Technology*. <https://doi.org/10.1057/palgrave.jit.2000135>
- Villa, A., & Antonelli, D. (2009). A road map to the development of European SME networks: Towards collaborative innovation. In *A Road Map to the Development of European SME Networks: Towards Collaborative Innovation*. <https://doi.org/10.1007/978-1-84800-342-2>
- Villa, A., & Bruno, G. (2013). Promoting SME cooperative aggregations: Main criteria and contractual models. *International Journal of Production Research*. <https://doi.org/10.1080/00207543.2013.831503>
- Virtanen, M. (2001). Entrepreneurship and venture capital market in Finland. *International Journal of Entrepreneurship and Innovation Management*. <https://doi.org/10.1504/IJEIM.2001.000453>
- Vladova, G., & Mueller, E. (2010). A process-oriented tool development in the open innovation paradigm. *16th Americas Conference on Information Systems 2010, AMCIS 2010*.
- Volchek, D., Jantunen, A., & Saarenketo, S. (2013). The institutional environment for international entrepreneurship in Russia: Reflections on growth decisions and performance in SMEs. *Journal of International Entrepreneurship*. <https://doi.org/10.1007/s10843-013-0115-z>
- von Ahsen, A., & Heesen, M. (2009). Innovation portfolio management: A framework for SMEs in the automotive industry. *International Journal of Technology Intelligence and Planning*. <https://doi.org/10.1504/IJTIP.2009.024175>
- Wait, A. L., Seidel, R. H. A., & Seidel, M. (2008). A new approach to innovation management in SMEs. *2008 IEEE International Conference on Industrial Engineering and Engineering Management, IEEM 2008*. <https://doi.org/10.1109/IEEM.2008.4737832>
- Wang, S., Hong, Y., Archer, N., & Wang, Y. (2011). Modeling the success of small and medium sized online vendors in business to business electronic marketplaces in china: A motivation - Capability framework. *Journal of Global Information Management*. <https://doi.org/10.4018/jgim.2011100103>
- Weitzel, U., & McCarthy, K. J. (2011). Theory and evidence on mergers and acquisitions by small and medium enterprises. *International Journal of Entrepreneurship and Innovation Management*. <https://doi.org/10.1504/IJEIM.2011.041734>
- West, J., & Bogers, M. (2017). Open innovation: current status and research opportunities. *Innovation: Management, Policy and Practice*. <https://doi.org/10.1080/14479338.2016.1258995>

- West, J., Salter, A., Vanhaverbeke, W., & Chesbrough, H. (2014). Open innovation: The next decade. In *Research Policy*. <https://doi.org/10.1016/j.respol.2014.03.001>
- West, J., Vanhaverbeke, W., & Chesbrough, H. (2006). Open Innovation: A Research Agenda. In *Open Innovation: Researching a New Paradigm*.
- Wood, P. (2005). A service-informed approach to regional innovation - Or adaptation? *Service Industries Journal*. <https://doi.org/10.1080/02642060500092063>
- Wu, G. C. (2017). Effects of Socially Responsible Supplier Development and Sustainability-Oriented Innovation on Sustainable Development: Empirical Evidence from SMEs. *Corporate Social Responsibility and Environmental Management*. <https://doi.org/10.1002/csr.1435>
- Xerri, M. J., & Brunetto, Y. (2011). The impact of the perceived usefulness of workplace social networks upon the innovative behaviour of sme employees: A social capital perspective. In *International Journal of Innovation Management*. <https://doi.org/10.1142/S1363919611003350>
- Xu, Q., Chen, J., Chen, L., Jin, L., & Lou, D. (2008). Total innovation management competence and innovation performance in SMEs-An empirical study based on SME survey in Zhejiang Province. *2008 IEEE International Conference on Industrial Engineering and Engineering Management, IEEM 2008*. <https://doi.org/10.1109/IEEM.2008.4738010>
- Yahya, A. Z., Othman, M. S., Othman, A. S., Rahman, I. A., & Moen, J. A. (2011). Process innovation : A study of Malaysian small medium enterprises (SMEs). *World Journal of Management*.
- Yang, C. (2007). Risk management of small and medium enterprise cooperative innovation based on network environment. *2007 International Conference on Wireless Communications, Networking and Mobile Computing, WiCOM 2007*. <https://doi.org/10.1109/WICOM.2007.1121>
- Yeh-Yun Lin, C., & Yi-Ching Chen, M. (2007). Does innovation lead to performance? An empirical study of SMEs in Taiwan. *Management Research News*. <https://doi.org/10.1108/01409170710722955>
- Yew, M. H., & Goh, J. C. L. (2015). An SME's adoption of a cloud based integrated management system (IMS) when certifying against management system standards (MSS). *ACIS 2015 Proceedings - 26th Australasian Conference on Information Systems*.
- Yokakul, N., & Zawdie, G. (2009). The role of triple helix for promoting social capital, industrial technology and innovation in the SME sector in Thailand. *Science, Technology and Society*. <https://doi.org/10.1177/097172180801400104>
- Yosoenarto, R. P. N., Handayani, P. W., & Pinem, A. A. (2018). Readiness framework of Enterprise Resource Planning (ERP) implementation at Small and Medium Company (SME). *Proceedings of the 11th IADIS International Conference Information Systems 2018, IS 2018*.
- Yu, J., & Ni, J. (2013). Development strategies for SME E-commerce based on cloud computing. *Proceedings - 2013 7th International Conference on Internet Computing for Engineering and Science, ICICSE 2013*. <https://doi.org/10.1109/ICICSE.2013.9>
- Yun, J. H. J., Jung, W. Y., & Yang, J. H. (2015). Knowledge strategy and business model conditions for sustainable growth of SMEs. *Journal of Science and Technology Policy Management*. <https://doi.org/10.1108/JSTPM-01-2015-0002>
- Zagade, S., & Panda, A. C. (2018). "Effect of service innovation on performance of select small and medium (SME) hotels in Pune." *ACADEMICIA: An International Multidisciplinary Research Journal*. <https://doi.org/10.5958/2249-7137.2018.00043.5>
- Zakaria, N. (2016). *The Innovation-Performance Linkage: Empirical Evidence of Malaysian Manufacturing SMEs*. <https://doi.org/10.15405/epsbs.2016.08.59>

- Zhang, Y., Yang, F., & Zhao, R. (2018). Does the Sharing Economy Benefits the Relationship between External Network Utilization and Innovation Performance? *TEMS-ISIE 2018 - 1st Annual International Symposium on Innovation and Entrepreneurship of the IEEE Technology and Engineering Management Society*. <https://doi.org/10.1109/TEMS-ISIE.2018.8478524>
- Zheng, G., Lu, J., Yu, X. Z., Li, W. F., & Ding, X. (2010). Total innovation management paradigm for SMEs - An empirical study based on SME survey. *International Journal of Learning and Intellectual Capital*. <https://doi.org/10.1504/IJLIC.2010.034364>
- Zieba, M., & Schivinski, B. (2015). Knowledge management driven leadership, culture and innovation success – an integrative model. *IFKAD 2015 - International Forum on Knowledge Asset Dynamics*.
- Zucchella, A., & Siano, A. (2014a). Internationalization and innovation as resources for SME growth in foreign markets: A focus on textile and clothing firms in the campania region. *International Studies of Management and Organization*. <https://doi.org/10.2753/IMO0020-8825440102>
- Zucchella, A., & Siano, A. (2014b). Internationalization and Innovation as Resources for SME Growth in Foreign Markets. *International Studies of Management & Organization*. <https://doi.org/10.2753/imo0020-8825440102>

## **Web sites Address**

1. Economy Underperforms for Some Shortcomings  
**<https://thefinancialexpress.com.bd/economy/bangladesh/economy-underperforms-for-some-shortcomings-1510640008>**
2. The Daily Star, June 27,2018). <https://www.thedailystar.net/opinion/perspective/the-real-scenario-internet-access-1611499>
3. .SMEs Policies 2019,  
**[http://bscic.portal.gov.bd/sites/default/files/files/bscic.portal.gov.bd/page/7a956433\\_c02\\_483d\\_9c17\\_db194d9f4a23/2020-01-01-19-01-8029ba8887b407ce0836783a9424a605.pdf](http://bscic.portal.gov.bd/sites/default/files/files/bscic.portal.gov.bd/page/7a956433_c02_483d_9c17_db194d9f4a23/2020-01-01-19-01-8029ba8887b407ce0836783a9424a605.pdf)**
- 4.The Global Startup Ecosystem Report 2019<https://startupgenome.com/reports/gser2019>
- 5.Beaureau of Labour [https://www.bls.gov/bdm/us\\_age\\_naics\\_00\\_table7.txt](https://www.bls.gov/bdm/us_age_naics_00_table7.txt)
- 6.The Future Direction of SMEs in Bangladesh , The Planning Division, The Government of RepublicBangladesh[https://plandiv.portal.gov.bd/sites/default/files/files/plandiv.portal.gov.bd/notices/afbf34\\_be4c\\_417d\\_b36c\\_ecf8db4614fc/ToR%20final%20SME.pdf](https://plandiv.portal.gov.bd/sites/default/files/files/plandiv.portal.gov.bd/notices/afbf34_be4c_417d_b36c_ecf8db4614fc/ToR%20final%20SME.pdf)
- 7.SMEs in Promoting Sustainable Growth(the Financial Express, December,2019)  
<https://thefinancialexpress.com.bd/views/smes-in-promoting-sustainable-growth-1576305701>

**8.**Productivity and Performance Evaluation of SME Sector in Bangladesh: Evidence from the Historical Data(2015), Journal of Islamic Finance and Business Research Vol. 3. No. 1. March2015Issue.[https://www.researchgate.net/profile/Md\\_Qamruzzaman3/publication/289368085\\_Productivity\\_and\\_Performance\\_Evaluation\\_of\\_SME\\_Sector\\_in\\_Bangladesh\\_Evidence\\_from\\_the\\_Historical\\_Data/links/568bd23008ae129fb5cb874d.pdf](https://www.researchgate.net/profile/Md_Qamruzzaman3/publication/289368085_Productivity_and_Performance_Evaluation_of_SME_Sector_in_Bangladesh_Evidence_from_the_Historical_Data/links/568bd23008ae129fb5cb874d.pdf)

**9.**Business, Entrepreneurship and Innovation Toward Poverty Reduction Entrepreneurship & Regional Development An International Journal ISSN: 0898-5626 (Print) 1464-5114 (Online) Journal homepage: <https://www.tandfonline.com/loi/tepn20>

**10.** Bangladesh Bank 2012, *Small and Medium Enterprise (SME) Credit Policies & Programmes* [online]. Dhaka: Bnagladesh Bank. Available at: <https://www.bb.org.bd/sme/smepolicye.pdf> (Accessed: 20 September, 2019).

**11.** Kotelnikov, V. (2007). *Small and Medium Enterprises and ICT*, United Nations Development programme – Asia-Pacific Development Information Programme (UNDP-APDIP) and Asian and Pacific Training Centre for Information and Communication Technology for Development (APCICT) – 2007, ISBN: 978-974-8283-93-7.



## APPENDIX-A

### RESULTS OF MEASUREMENT MODEL AND REGRESSION MODEL

#### Model Summary (1<sup>st</sup> Hypothesis):

A1

##### KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.706
Bartlett's Test of Sphericity      Approx. Chi-Square	66.099
Df	6
Sig.	.000

A2

##### Anti-image Matrices

		Expansion Strategy (Blue Ocean )	Cost Leadership Strategy	Focus Strategy	Competitive Strategy
Anti-image Covariance	Expansion Strategy (Blue Ocean )	.883	.050	-.136	-.112
	Cost Leadership Strategy	.050	.723	-.143	-.213
	Focus Strategy	-.136	-.143	.609	-.254
	Competitive Strategy	-.112	-.213	-.254	.575
Anti-image Correlation	Expansion Strategy (Blue Ocean )	.756 <sup>a</sup>	.062	-.185	-.157
	Cost Leadership Strategy	.062	.736 <sup>a</sup>	-.216	-.330
	Focus Strategy	-.185	-.216	.702 <sup>a</sup>	-.429
	Competitive Strategy	-.157	-.330	-.429	.677 <sup>a</sup>

a. Measures of Sampling Adequacy(MSA)

A3

##### Communalities

	Initial	Extraction
Expansion Strategy (Blue Ocean )	1.000	.255
Cost Leadership Strategy	1.000	.516
Focus Strategy	1.000	.680
Competitive Strategy	1.000	.712

Extraction Method: Principal Component Analysis.

A4

##### Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.163	54.065	54.065	2.163	54.065	54.065
2	.893	22.318	76.384			
3	.535	13.384	89.767			
4	.409	10.233	100.000			

Extraction Method: Principal Component Analysis.

#### A5 Component Matrix<sup>a</sup>

	Component
	1
Expansion Strategy (Blue Ocean )	.505
Cost Leadership Strategy	.718
Focus Strategy	.825
Competitive Strategy	.844

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

#### A6 Case Processing Summary

		N	%
Cases	Valid	80	100.0
	Excluded <sup>a</sup>	0	.0
	Total	80	100.0

a. Listwise deletion based on all variables in the procedure.

#### A7 Reliability Statistics

Cronbach's Alpha	N of Items
.737	3

#### A8 Descriptive Statistics

	Mean	Std. Deviation	N
Open Innovation	4.6261	.29014	80
Cost Leadership Strategy	4.58	.497	80
Focus Strategy	4.6075	.35499	80
Competitive Strategy	4.6125	.40546	80

**A9 Variables Entered/Removed<sup>b</sup>**

Model	Variables Entered	Variables Removed	Method
1	Competitive Strategy, Cost Leadership Strategy, Focus Strategy		Enter

- a. All requested variables entered.
- b. Dependent Variable: Open Innovation

**A10 Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.863 <sup>a</sup>	.745	.735	.14945

- a. Predictors: (Constant), Competitive Strategy, Cost Leadership Strategy, Focus Strategy

**A11 ANOVA<sup>b</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.953	3	1.651	73.910	.000 <sup>a</sup>
	Residual	1.698	76	.022		
	Total	6.650	79			

- a. Predictors: (Constant), Competitive Strategy, Cost Leadership Strategy, Focus Strategy
- b. Dependent Variable: Open Innovation

**A12 Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.221	.237		5.160	.000
	Cost Leadership Strategy	.217	.040	.372	5.475	.000
	Focus Strategy	.272	.060	.333	4.561	.000
	Competitive Strategy	.251	.054	.351	4.651	.000

- a. Dependent Variable: Open Innovation

## Model Summary (2<sup>nd</sup> Hypothesis):

### A13 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.761
Bartlett's Test of Sphericity	Approx. Chi-Square	60.668
	df	6
	Sig.	.000

### A14 Anti-image Matrices

		Target Product	Strength of R&D	Domestic Market	International Market
Anti-image Covariance	Target Product	.760	-.172	-.090	-.167
	Strength of R&D	-.172	.685	-.184	-.177
	Domestic Market	-.090	-.184	.739	-.176
	International Market	-.167	-.177	-.176	.695
Anti-image Correlation	Target Product	.781 <sup>a</sup>	-.238	-.119	-.230
	Strength of R&D	-.238	.747 <sup>a</sup>	-.258	-.256
	Domestic Market	-.119	-.258	.770 <sup>a</sup>	-.245
	International Market	-.230	-.256	-.245	.753 <sup>a</sup>

a. Measures of Sampling Adequacy(MSA)

### A15 Communalities

	Initial	Extraction
Target Product	1.000	.504
Strength of R&D	1.000	.602
Domestic Market	1.000	.529
International Market	1.000	.591

Extraction Method: Principal Component Analysis.

### A16 Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.226	55.659	55.659	2.226	55.659	55.659
2	.671	16.772	72.431			
3	.558	13.944	86.375			
4	.545	13.625	100.000			

Extraction Method: Principal Component Analysis.

**A17 Component Matrix<sup>a</sup>**

	Component
	1
Target Product	.710
Strength of R&D	.776
Domestic Market	.727
International Market	.769

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

**A18 Case Processing Summary**

		N	%
Cases	Valid	80	100.0
	Excluded <sup>a</sup>	0	.0
	Total	80	100.0

a. Listwise deletion based on all variables in the procedure.

**A19 Reliability Statistics**

Cronbach's Alpha	N of Items
.733	4

**A20 Descriptive Statistics**

	Mean	Std. Deviation	N
Open Innovation	4.6261	.29014	80
Target Product	4.60	.493	80
Strength of R&D	4.72	.449	80
Domestic Market	4.69	.466	80
International Market	4.59	.495	80

**A21 Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.883 <sup>a</sup>	.780	.769	.13958

**A21 Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.883 <sup>a</sup>	.780	.769	.13958

a. Predictors: (Constant), International Market, Target Product, Domestic Market, Strength of R&D

**A22 ANOVA<sup>b</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.189	4	1.297	66.589	.000 <sup>a</sup>
	Residual	1.461	75	.019		
	Total	6.650	79			

a. Predictors: (Constant), International Market, Target Product, Domestic Market, Strength of R&D

b. Dependent Variable: Open Innovation

**A23 Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.291	.208		6.216	.000
	Target Product	.162	.037	.275	4.429	.000
	Strength of R&D	.182	.042	.282	4.318	.000
	Domestic Market	.159	.039	.256	4.067	.000
	International Market	.214	.038	.366	5.629	.000

a. Dependent Variable: Open Innovation

**Model Summary (3<sup>rd</sup> Hypothesis):**

**A24 KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.727
Bartlett's Test of Sphericity	Approx. Chi-Square	105.342
	Df	21
	Sig.	.000

**A25 Communalities**

	Initial	Extraction
Networking for Intelligence and Consulting	1.000	.590
Licensing	1.000	.517
Collaboration with others	1.000	.501
Outsourcing	1.000	.505
Financing	1.000	.522
Market Discovery/Planning	1.000	.540
Product Development	1.000	.677

Extraction Method: Principal Component Analysis.

**A26 Total Variance Explained**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.722	38.890	38.890	2.722	38.890	38.890	1.952	27.886	27.886
2	1.129	16.134	55.024	1.129	16.134	55.024	1.900	27.138	55.024
3	.880	12.569	67.593						
4	.750	10.717	78.310						
5	.642	9.168	87.479						
6	.464	6.626	94.104						
7	.413	5.896	100.000						

Extraction Method: Principal Component Analysis.

**A27 Component Matrix<sup>a</sup>**

	Component	
	1	2
Networking for Intelligence and Consulting	.598	.482
Licensing	.565	-.444
Collaboration with others	.612	.355
Outsourcing	.711	.014
Financing	.654	-.306
Market Discovery/Planning	.566	.469
Product Development	.645	-.510

Extraction Method: Principal Component Analysis.

**A27 Component Matrix<sup>a</sup>**

	Component	
	1	2
Networking for Intelligence and Consulting	.598	.482
Licensing	.565	-.444
Collaboration with others	.612	.355
Outsourcing	.711	.014
Financing	.654	-.306
Market Discovery/Planning	.566	.469
Product Development	.645	-.510

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

**A28 Case Processing Summary**

		N	%
Cases	Valid	80	100.0
	Excluded <sup>a</sup>	0	.0
	Total	80	100.0

a. Listwise deletion based on all variables in the procedure.

**A29 Reliability Statistics**

Cronbach's Alpha	N of Items
.736	7

**A30 Descriptive Statistics**

	Mean	Std. Deviation	N
Open Innovation	4.6261	.29014	80
Networking for Intelligence and Consulting	4.55	.525	80
Licensing	4.45	.525	80
Collaboration with others	4.66	.502	80
Outsourcing	4.64	.509	80
Financing	4.60	.518	80
Market Discovery/Planning	4.54	.526	80
Product Development	4.56	.548	80



**A31 Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.514 <sup>a</sup>	.264	.193	.26066

a. Predictors: (Constant), Product Development, Market Discovery/Planning, Collaboration with others, Licensing, Networking for Intelligence and Consulting, Financing, Outsourcing

**A32 ANOVA<sup>b</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.758	7	.251	3.697	.002 <sup>a</sup>
	Residual	4.892	72	.068		
	Total	6.650	79			

a. Predictors: (Constant), Product Development, Market Discovery/Planning, Collaboration with others, Licensing, Networking for Intelligence and Consulting, Financing, Outsourcing

b. Dependent Variable: Open Innovation

**A33 Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.210	.416		7.719	.000
	Networking for Intelligence and Consulting	-.003	.065	-.005	-.041	.968
	Licensing	-.027	.063	-.049	-.430	.669
	Collaboration with others	.028	.069	.049	.410	.683
	Outsourcing	.157	.072	.276	2.197	.031
	Financing	-.109	.068	-.195	-1.600	.114
	Market Discovery/Planning	.125	.063	.227	1.978	.052
	Product Development	.136	.067	.257	2.037	.045

a. Dependent Variable: Open Innovation

## APPENDIX-B



### COVER LETTER TO RESPONDENTS PARTICIPATING IN SURVEY

Dear Survey Participant,

I am a Ph.D. student, Department of Marketing, University of Dhaka. For my Ph.D. thesis I am doing research on the topic of *Management Strategies and Challenges for Adopting Open Innovation in SME Business in Bangladesh*. I would very much appreciate the opportunity to talk with you about your knowledge & experience. This research is part of my academic studies. Your answer is of great value to the proposed research. The information provided by you will be confidential and your cooperation will be highly appreciated. Please fill it out and return to the researcher.

Thank you very much in advance.

Sincerely yours,

Researcher:Most. TahuraPervin,

Enc: Questionnaire

## APPENDIX-B

### Questionnaire for Entrepreneur of SMEs

---

First, I would like to ask some general questions. Please, write you answer.

Name of the respondent:

.....

Designation of the respondent:

.....

Management Level:

- a) Junior Level      b) Middle Level      c) Senior Level

Mobile number:

.....

### Part-A

#### Personal Characteristics of owner/entrepreneur

i. Name of the organization:

.....

ii. Gender of the ownership

A. Male

B. Female

iii. Age of the owner

A    Up to 30      C    41 to 50

B    31 t0 40      D    Above 50

iv. Level of education

A Up to SSC      C Up to Graduation      E Other  
(Hons./Degree)

B Up to HSC      D Masters

v. Types of ownership

A Sole Proprietorship      D Government  
B Partnership              E Co-operative  
C Company                  F Other

vi. Type of Business

A Manufacturing                                      E Pharmaceutical & Chemical  
B Services    F Textile  
C Software Development                              G Leather & Leather goods  
D Knowledge Intensive Services (Education,      H Other  
Health care, Consultancy)

## Part-B

### Organization's Characteristics

1. Year of establishment of the Organization: .....

2. Age of organization

- a) Less than five years                      b) Between 5-15 years  
c) Between 15-30 years                      d) More than 30 years

3. Location of organization

d) Dhaka	e) Gazipur	f) Narshingdi
----------	------------	---------------

4. The number of employees in the organization

- a) 16-30 persons employed    b) 31-50 persons employed    c) 51-120 person employed,
- d) 121-300 persons employed. e) 300+ persons employed

6 How is organization formed?

- a) Start up                      b) Purchased                      c) Inherited
- d) Joint Venture                e) Partnership                    f) Other

7 Where do you want to see your organization in next five years?

- a)Expansion    b)Shut down    c)Extension of territory    d) Others (please specify)

8 Whether you want to keep remain existing ownership structure or want to change of ownership in next five years?

a. Yes	b. No
--------	-------

9 If you want to change then which type of ownership do you want?

- a)Sole proprietorship    b)Partnership    c)Joint venture    d) Frenching    e) Licensing
- f) Do not want change in ownership    g) Others (please specify)

10 Total assets of your organization was during the period of establishment

- a) 2-10 lack taka    b) 10-25 lack taka    c) 25-50 lack taka    d) others (please specify)

11 Total assets of your organization is at present

- a) 2-10 lack taka    b) 10-25 lack taka    c) 25-50 lack taka    d) others (please specify)

12 The sources of fund of the organization

a. Own	b. Loan	c. Other
--------	---------	----------

13 Please indicate your organization’s main economic activity:---

- a) Products    b)Services    c) Production    d)Distribution    e) Others (please specify)

14 The company’s revenue (Lack taka)

- a) 2-10 lack taka    b) 10-25 lack taka    c) 25-50 lack taka    d) Others (please specify)--

15 Please can you tell the rate of industry average rate of return of your sector-?

- a) Between 1% -5%    b) Between 6%- 10%    c) Between 11%-15%    d) Between 16%-20%
- e)No    f) Others (please specify)---

16 The percentages of investment on new products –

- a) Between 1% -5%    b) Between 6%- 10%    c) Between 11%-15%    d) Between 16%-20%
- e)No    f) No new or improved products    f) Others (please specify)---

17 The percentages of income spend on innovation activities—

- a) 0-2%    b) 3%-5%    c) 6%-8%    d) 9%-11%    e)12%-14%    f) Above 15%

18. The firm’s characteristics to adopt open innovation in SMEs in Bangladesh

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Target Product					
R&D					
Domestic Market					
International Market					
Competitive Strategy					

Part-C

Basic Ideas for Open Innovation

1. What do you mean by innovation?

.....  
 ....

2. Do you have any idea about open innovation

.....  
 ....

3. Provide your comment/agreement regarding the meaning of innovation

	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
Think a totally new design					
Create new design					
Get new idea in discussion with suppliers/ customers/distributors					
The implementation of new or significantly improved product/process					
The implementation of new marketing					

method or a new organizational method in business practices					
The implementation of new external relation					
Others					

4. Provide your comment/agreement regarding the meaning of open innovation

	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
Collecting new developmental ideas					
To have a better understanding of customer needs & expectations					
Access to new technologies or technical knowledge used in the firm					
Improving the efficiency of the organization					
Removal of complex investment risk					
Strengthen relationships with suppliers/customers/distributors					
Recovery of intellectual property & patents.					
Acquiring new sources of knowledge & technology from external partners to incorporate those developed internally.					
Sharing internal technology & knowledge to others.					
Combining internal and external knowledge & technology to make a new path of development					
Others					

5. Do you need to Adopt Technology in your organization—

a) Yes    b) No

6. You want to adopt technology in your organization either  
 a) Automated                  b) Skilled human                  c) Both                  d) Other (please specify)
7. In your organization where the innovation is needed you think  
 a) Market discovery & planning                  b) Development & test                  c) Production  
 d) Sales, distribution, marketing & services                  f) Other (please specify)
8. Measurement /Arrangement for adopting technology  
 a) At least any project remains within five years  
 b) Collaboration planning with other parties  
 c) Hiring specialized people  
 d) Changing organizational structure  
 e) Other
9. Strategies for adopting innovation in the organization—  
 a) Competitive strategy    b) Growth strategy    c) Cost leadership strategy  
 d) Acquisition strategy    e) Other (please specify)

10. Internal capabilities of the organization for adopting innovation

	Yes	No	No comment
Owner/Management attitude			
Employee attitude			
Capabilities			
Support of the organizational structure			
Sufficient budget			
Existing corporate culture & idea sharing within organization			
Long term investment			
Whether project control and ownership remains			
Whether any scope remains for development of the sector			



Employees and managers at all levels and division have a common understanding of the organizational vision			
The organization has a wide range of training and development process that include career path planning for all the employees			
Management in our organization considers that employee learning is an investment and not as an expense			
Employees and managers at all levels and division have al common understanding of the organization vision			
Our organization manages its own intellectual assets like special techniques, patents, copyrights, licenses.			

#### 11. External capabilities of the organization for adopting innovation

	Yes	No	No comment
Whether the product/service is customized			
Market worthiness			
Hiring /sharing with other parties both internally & externally			
Whether there is legal & financial support of govt.			
Joint purchasing of technology from other country			
Whether there is proper selection & encouraging of partnership			
To have a corporate culture that promotes idea-sharing with others			
Existence of systematic and organized approach for acceptance of external ideas			

#### 12. The degree of competition

- a) High      b) Low      c) Medium      d) Other (please specify)

### Part-D

#### Management of R&D Innovation Activities

##### 1. Do you have any R & D activities/department/team

- a) Yes      b) No

2. Number of staff engaged in R & D activities—
  - a) 0-5
  - b) 6-10
  - c) 11-15
  - d) 16-20
  - e) 21-25
  - f) Above 25
  
3. Expenditure on R&D activities of last five years
  - a) Yes
  - b) No
  
4. Success rate of R&D activities of the organization
  - a) 0-10%
  - b) 10%-20%
  - c) 20%-30%
  - d) 30%-40%
  - e) 40%-50%
  - f) 50%-60%
  - f) Above 60%
  - g) Other (please specify)
  
5. During last 5 years how many innovative projects have you conducted—
  - a) Zero
  - b) 2 to 5
  - c) More than 5
  - d) Other (please specify)
  
6. How many projects have been successful or rewarded--
  - a) Zero
  - b) 2 to 5
  - c) more than 5
  - d) Other (please specify)
  
7. Whether any collaboration with outsiders
  - a) Networking for intelligence & consulting
  - b) Licensing
  - c) Outsourcing
  - d) Collaborative R&D
  - d) Other (Venturing etc please specify)
  
8. Which types of innovation partners do you like
  - a) Clients and customers
  - b) Suppliers
  - c) Competitors
  - d) Government-funded research centers
  - e) Universities
  - f) IT support business & business services
  - g) Affiliates
  - h) Other (please specify)
  
9. Do you have any joint project?
  - a) Joint venture
  - b) Sale of ideas
  - c) Licensing
  - d) joint R&D
  - e) Supply of technical services
  - f) Personnel exchange
  - g) Spin-offs
  - h) Other
  
10. The project level characteristics for adopting open innovation in SMEs in Bangladesh

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
--	-------------------	----------	---------	-------	----------------

Networking for intelligence and consulting					
Licensing					
Outsourcing					
Collaborative R&D					
Product Development					
Market Discovery/Planning					
Seles/Distribution/Marketing/Services					

**PART-E**

**GENERAL QUESTIONS**

Strategies Factors for starting Open Innovation

1. Can you please tell, what is the motivation for starting open innovation project for you?

.....

....

i The motivating factors and strategies for adopting open innovation in SMEs in Bangladesh

(Please indicate your degree of agreement the following strategies factors)

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Technology					
Competition					
Cost leadership					
Market leadership					
Entry into international market					
Product/service development					
Networking					
Government incentive planning					
To have a better understanding of					

customer needs & expectations					
Access to new technologies or technical knowledge used in the firm					
Strengthen relationships with suppliers					

### The Benefit for Adopting Open Innovation

2. Which types of advantages do you expect from Adopting OI?

.....

....

i The benefits to adopt open innovation in SMEs in Bangladesh

**Please rank (give numbers) the following benefits of adopting open innovation**

SN	Benefits	Rank
01	Reduce time & cost	
02	Competitive advantages	
03	Specialized product/services	
04	Adoption of technology	
05	Networking/collaboration with similar or same firms/competitors	
06	Improvement of industry standard	
07	Synergy created by combining knowledge among participating firms.	
08	Introduce new or significantly improved products or services or process of producing our products or services	
09	Opening up of new markets	
10	Increase quality of products/services	
11	Attracting skilled workers	
12	Bring expertise into R&D team or organization	
13	External paths to market	
14	Increase capability	
15	Meet current & future market requirements	

## Challenges for Adopting Open Innovation

3. What are the major challenges for the organization to adopt open innovation?

.....

.....

i The challenges for adopting open innovation in SMEs in Bangladesh

**Please rank (give numbers) the following challenges of adopting open innovation**

SN	Challenges	Rank
01	Lack of expertise to handle/manage the innovation—In/Out	
02	Difficult in transferring knowledge from organization to organization	
03	Difficult in collaborative partners	
04	Requirement in large amount of investment	
05	Lengthy process	
06	Legal difficulties	
07	Time consuming	
08	Higher unsuccessful project rate	
09	Lack of market demand (Low purchasing power of customer)	
10	Problems with infrastructure (e.g., electricity, gas, communication, etc)	
11	Lack of customers' responsiveness	
12	Hard to find partners	
13	Government regulations	
14	High cost of open innovation	
15	Too expensive manpower	