

CLUSTER CONCEPT IN ENHANCING THE MARKETING CAPABILITY OF SMALL BUSINESS IN BANGLADESH: THE CASE OF LIGHT ENGINEERING SUB-SECTOR

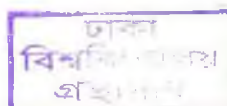


GOLAM MOHAMMAD FORKAN

A Thesis Paper Submitted to the University of Dhaka,
Bangladesh for the Degree of Master of Philosophy

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**UNDER THE SUPERVISION OF
PROFESSOR DR. SYED FERHAT ANWAR
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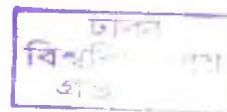
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DECLARATION

I hereby declare that the thesis entitled **“Cluster Concept in Enhancing the Marketing Capability of Small Business in Bangladesh: The Case of Light Engineering Sub-Sector”** submitted to the University of Dhaka, Bangladesh for the degree of Master of Philosophy is based on my research work carried out under the supervision of Dr. Syed Ferhat Anwar, Professor, Institute of Business Administration, University of Dhaka. The material embodied in this thesis is original and has not been submitted in part or in full for any other degree, diploma, or title recognition of any university.


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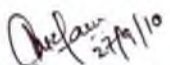


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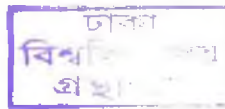
CERTIFICATE

This is to certify that the thesis entitled “**Cluster Concept in Enhancing the Marketing Capability of Small Business in Bangladesh: The Case of Light Engineering Sub-Sector**” is hereby submitted by Mr Golam Mohammad Forkan, Assistant Professor, Faculty of Business Administration, Eastern University, Dhaka in partial fulfillment for the requirements of the degree of Master of Philosophy. It is also certified that the research work embodied in this thesis is original and carried out by him under my supervision. No part of the work has been submitted for any other degree.

He is permitted to submit the thesis.


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Needless to mention, all errors and mistakes made in this report will be of my sole responsibility.

Golam Mohammad Forkan

Dated: 27 September 2010

DEDICATED TO MY PARENTS

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EXECUTIVE SUMMARY

Small and Medium Enterprises (SMEs) in Bangladesh has been one of the major forces fuelling the sound growth of Bangladesh economy. Within the SMEs, the Light Engineering sub-sector has carved out an important space that provide vital support to both manufacturing and cottage industries of Bangladesh. The broad spectrum of light engineering firms serves two broad functions. On the one hand there are firms that manufacture machinery and parts and on the other hand there are firms that offer repair services.

Though the Light Engineering industry occupies an important space within the Bangladeshi industrial domain, very few attempts of scholarly work to understand and improve the capabilities of this sub-sector has been undertaken in the past. As a result the sector still suffers from some rudimentary problems that has been plaguing it for years. Most of these problems can be grouped into two fronts: technological deficiencies and marketing inefficiencies. The technological deficiencies are outside the purview of this research, while the marketing challenges are at the center of the research.

The objective of this research is to identify the scope of enhancing the marketing capability of **light engineering sub-sector** in Bangladesh through the cluster concept. To understand the objective properly, explanation of two key constructs is warranted.

First, marketing capability refers to how well an organization is able to identify needs and requirements of its target market and provide quality products and services considering financial and environmental costs. In other words, marketing capability is the ability of an organization of buying valuable relationships with customers, capturing sustainable revenue streams and attaining brand loyalty.

Second, Cluster is geographical co-location of similar companies within an industry and interconnected companies. If individual small firms are weak and vulnerable, networking give them strengths and networks can be increased through cluster concept (Hatch, 2001). Clusters arise because they increase the productivity with which companies can compete. A cluster develops when a pocket of innovative knowledge-based firms act as a magnet, attracting other firms to invest and locate in the same area. Simply put, clusters are accumulation of firms in a geographic area and network is linkage of the firms (same as well as associated). Thus a symbiotic relationship strengthens both.

In light of this stated objective the central hypothesis of the research is, *Cluster creation of small businesses under Light Engineering Industry (LEI) will result in marketing efficiency.* The methodology of the research was designed in line with the hypothesis of the research. As per the methodology, the first stage of this research comprised of an exploratory research component. This component helped acquire critical insights into the industry dynamics and problems facing the industry. The exploratory research included survey of experts, focus groups and pilot survey.

The second stage of this research was a conclusive research, where the insights gained from exploratory research were verified. Target population of this research were all the small businesses under machinery and spare parts related sub-sector of light engineering industry, Bangladesh. Sampling frame was different groups under machinery and spare parts related sub-sector considering type of activities like manufacturing, manufacturing and repairing, repairing, and trading. Sampling technique was quota sampling under non-probability sampling. Sample size was 60 representing all the groups. The study was done based on primary as well as secondary data. Finally, different statistical tools under SPSS software, i.e., cross tabulation, descriptive statistics, ANOVA test, Chronbach's alpha, and factor analysis were used to analyze data.

After the exploratory study the subsector was grouped into four types of firms considering types of activity. First, most of the companies under machinery and spare parts related sub-sector of light engineering industry are involved in manufacturing and repairing complete machinery and spare parts and marketing activities are broadly found within this group. Second is repairing businesses but marketing activities are not broadly found within this group. Third representing group is light metal products and hardware manufacturing businesses that engage in marketing activities. Last representing group is trading (reselling) businesses and marketing activities are minimul within this group.

Most of these companies' asset value is below Tk. 3,75,0000 with number of employees below 7. These are some of the symptoms of lack of financial capability, insufficient manpower, indiscipline, improper planning, lack of financial management skills, marketing

etc. The research tried to identify whether the cluster concept can directly or indirectly solve some of these problems.

The statistical analysis of the research was performed based on seven (7) specific hypotheses. Cronbach's Alpha was used for the measurement of internal consistency of answers of the respondents. The results showed high internal consistency. Alpha value considering all the items was .725 and alpha values of each individual dimension ranged between .660 to .821, which are in the acceptable range. According to Nunnally (1967) the minimally acceptable reliability for preliminary research should be in the range of .50 to .60. 67 questions were developed for 7 hypotheses and ultimate goal of these hypotheses was to support the main construct of this research.

Descriptive statistics found that the respondents agree or strongly agree with the hypothesis (Cluster creation of small businesses under light engineering industry will result in marketing efficiency) of the research. In the cluster, the success of one company attracts another, and this eventually builds a critical mass of skilled people, expertise, capital and entrepreneurial drive.

Data of this research were collected mainly from different groups of machinery and spare parts related businesses considering types of activity. But at the time of ANOVA test groups were considered from different point of views, i.e., assets value, number of employees and types of activity. When groups are considered from assets value and employee point of view there is no significant differences between answers of the respondents. But when groups are

considered from type of activity point of view significant differences are found between answers of the respondents because of variation of degree of involvement in marketing activities and nature of activities of these groups.

After testing all the hypotheses, it was found that all seven hypotheses support the broad hypothesis, i.e., cluster creation of small businesses under light engineering industry of Bangladesh will enhance marketing capability. After factor analysis it was found that 33 items directly had load on the main construct or hypothesis and other items are also somehow related with the construct.

So, small businesses under light engineering industry should go ahead through their association to establish cluster concept so that marketing capability can be increased and aforementioned problems can be solved to face domestic and international challenges. Related organizations and government should play all supportive roles, i.e., providing land, monetary benefits, quality testing support, business friendly environment etc. to materialize the dream.

CLUSTER CONCEPT IN ENHANCING THE MARKETING CAPABILITY OF SMALL BUSINESS IN BANGLADESH: THE CASE OF LIGHT ENGINEERING SUB-SECTOR

CHAPTER-1

INTRODUCTION

1. 1 BACKGROUND OF THE STUDY

1. 1. 1 Brief Overview of SMEs of Bangladesh

In Bangladesh, most of the industries are primarily comprised of Small and Medium Enterprises (SMEs). This sector has been contributing heavily in Bangladesh economy since its inception. In the manufacturing sector “Small Industry” means an industry in which the value/replacement cost of durable resources other than land and factory buildings is under 15 million taka and “Medium Industry” means where value/replacement cost is between 15 million to 100 million taka. In the non-manufacturing sector “Small Industry” means an industry in which fewer than 25 worker work (unlike family members in a cottage industry) and “Medium Industry” means where 25 to 100 worker work (Industrial Policy, 2005).

Small businesses are based on limited capital, but they are subject to bigger risks. So conducting small business needs experience, discipline, proper planning, manpower, financial management skill, marketing etc (ASA, 2000). Bangladesh has many small businesses like farming, carpentry, livestock, handicrafts and grocery shops. The total numbers of small businesses in Bangladesh are 68,960 units, which is 87.9% of total number of units (including small, medium and large). Out of these 68,960 units of small businesses 29,900 units are in urban areas, and 29,000 units are in rural areas and 12,57,200 people are

directly involved with the small enterprises of Bangladesh, which is creating 35.9% of total employment (BBS Census of Enterprises, 2001/2003). SMEs can acquire learning at local and international levels through co-operative inter-firm arrangements, where co-operation may be defined as reciprocal involvement between firms vertically linked in design and production of determinate goods allowing access to the knowledge in possession of firms' downstream (Golden and Dollinger, 1993). Since the research explores ideas relevant to the marketing domain of SME's, a closer look at marketing is warranted.

1. 1. 2 Marketing Process

Marketing is the process of identifying the needs and requirements of consumers and developing appropriate products, services, prices, distribution channels and communications to satisfy those requirements (Hutt and Speh, 1985). Marketing capabilities are defined as the integrative processes designed to apply the collective knowledge, skills, and resources of the firm to the market-related needs of the business, enabling the business to add value to its goods and services and meet competitive demands (Day, 1994; Tuominen et al., 1997). Since marketing processes are often firm specific (Day, 1994), unique marketing capabilities will develop as individuals combine their particular knowledge and skills with the resources available to them (Tuominen et al., 1997). Competing firms focusing on similar market needs may be expected to evolve similar, but not identical marketing capabilities. When these value adding capabilities cannot easily be imitated by competitors, when one capability cannot be easily substituted for another capability, and when these capabilities cannot be easily transferred between competitors, then the capability forms the basis for

sustainable competitive advantage (Grant, 1991, 1996; Moller and Anttila, 1987; Tuominen et al., 1997). So, when marketing capabilities are enhanced is called efficient marketing.

Effective marketing means delivering the goods and services that consumers want and need. It means getting products to them at the right time, in the right place, and at a price they are willing to pay. It means keeping consumers satisfied after the sale, and bringing them back to purchase again when they are ready. That's not an easy job – especially if it is thought about the variety of goods and services a highly developed economy can produce and the many kinds of goods and services consumers want. Production is a very important economic activity. Although production is a necessary economic activity, some people overrate its importance in relation to marketing. Their attitude is reflected in the old saying: “make a better mousetrap and the world will beat a path to your door.” In modern economies, the grass grows high on the path to the better mousetrap factory – if the new mousetrap is not properly marketed. The point is that production and marketing are both important parts of a total business system aimed at providing customers with need-satisfying goods and services. Together, production and marketing supply five kinds of economic utility – form, task, time, and possession utility – that are needed to provide consumer satisfaction (Perreault and McCarthy, 2002).

Effective marketing is more difficult because producers and consumers are often separated in several ways. Exchange between producer and consumer is hampered by spatial separation, separation in time, separation of information and values, and separation of ownership. “Discrepancies of quantity” and “discrepancies of assortment” further

complicate exchange between producers and consumers. That is, each producer specializes in producing and selling large amounts of a narrow assortment of goods and services, but each consumer wants only small quantities of a wide assortment goods and services. The purpose of a macro-marketing system is to overcome these separations and discrepancies. The “universal functions of marketing” help do this. The universal functions of marketing are: buying, selling, transportation, storing, standardization and grading, financing, risk taking, and market information. The **buying function** means looking for and evaluating goods and services. The **selling function** involves promoting the products. It includes the use of personal selling, advertising, and other direct and mass-selling methods. This is the most visible function of marketing. The **transportation function** means the movement of goods from one place to another. The **storing function** involves holding goods until customers need them. **Standardization and grading** involve sorting products according to size and quality. This makes buying and selling easier because it reduces the need for inspection and sampling. **Financing** provides the necessary cash and credit to produce, transport, store, promote, sell, and buy products. **Risk taking** involves bearing the uncertainties that are part of the marketing process. The **marketing information function** involves the collection, analysis, and distribution of all the information needed to plan, carry out, and control marketing activities, whether in the firm’s own neighborhood or in a market overseas (Perreault and McCarthy, 2002).

1. 1. 3 Cluster Concept

Now that an in-depth analysis of the marketing ideas relevant to the research has been presented, the a more detailed analysis of the Cluster Concept is required since the research

focuses on the use of this concept in developing marketing competencies of SMEs. Clusters are geographic concentrations of interconnected companies, specialized suppliers, service providers, and associated institutions in a particular field that are present in a nation or region. Clusters arise because they increase the productivity with which companies can compete (Porter, 2001).

Clusters are accumulation of firms in a geographic area and all of the aforementioned functions of marketing are directly or indirectly enhanced by geographical concentration of firms. Co-located firms reduce hassles of customers to look for and evaluate goods and services as they get huge offerings at a small geographic area. Operation from same geographic area helps in promoting products and services by sharing or joint activities. By collective and sharing initiative small businesses can enjoy transportation, storing, and standardization & grading facilities more smoothly than individual operation. Joint operation of small businesses can also reduce cost of different marketing activities. Co-location of forward linkage organizations can share uncertainties of sale, damage, stole and outdate more effectively by enhancing integration. Co-location and joint operation also help in collecting, analyzing, and distributing of the information needed to plan, carry out, and control marketing activities. This means an inter-firm network is created that facilitates all the firms present in the network.

Although it is not easy to define inter-firm networks, it can be seen as a group of firms using combined resources to co-operate on joint projects (Akoorie 1998, Ceglie et al., 1999). In business, networks take different forms and serve different objectives. Some examples

include structured and formal networks, which even have their own legal personality. Other networks are informal; this is the case where groups of firms exchange ideas or develops broad forms of cooperation. Some of the firms aim at the general sharing of information, and others deal with more specific objectives such as joint ventures. Furthermore, it has been suggested that the entrepreneurs who choose to develop and maintain ties with other entrepreneurs are likely to outperform those who do not (OECD 2000). Developed countries have different large-scale industries. Yet they give due importance on small-scale enterprises also. In developed countries where small-scale entrepreneurs are subjected to a great deal of “education” concerning the value of business services and generally have money to spend. BDS (Business Development services) provision continues to require public subsidies and supply does not appear to create adequate demand. The European Commission spends a great deal every year to keep its small business information center and technology transfer programs going. In the United States, the nationwide system of Manufacturing Extension Partnership center provides a cautionary tale. Japan has reached such development stage through small-scale enterprises (Hatch, 2001).

Most of the people of the world live in third world countries. Their main problems are poverty and unemployment. Poverty alleviation, employment growth and private sector development are at the top of the development agenda along with an emphasis on micro and small enterprises (MSEs). Poverty alleviation requires private sector development which requires MSE development. Again, MSE development entails business development services that require the development of BDS (Business Development Services) markets. The aim of the governments should be to create “an environment conducive of MSE

development.” Such environments provide “relevant, differentiated services” that are critical to MSE success. Entrepreneurs are dynamic in their business deeds. Training facilities both for entrepreneurs and workers have been established. So, there is an extensive opportunity of investment in SMEs sector. With this background, Bangladesh needs Capital, Technology and Human Resources Development (HRD) for a rapid capacity building and industrialization. Therefore, FDI is welcomed for these factors. In light of this discussion, Light Engineering Industry too, as a sub-sector under SME, also needs attention (Hatch, 2001).

According to Hatch (2001), there are several reasons for re-examining traditional service delivery model:

- Individual service delivery system is expensive and makes inefficient use of scarce factors, including consulting capabilities and MSE (micro and small enterprises) investments. It is also unwise.
- BDS (business development services) providers with an eye only on their immediate clients’ interests often encourage firms to take the low road to competitiveness-competition based on price alone. In this process labor is de-skilled, wages are squeezed, and jobs are eliminated. Although the individual bottom line is improved, the overall economy suffers.
- In reality, firms – small and large – compete by cooperating in groups. These groups are more and less conscious and vary in complexity, from local chains of value added to the supply systems of auto makers and the global alliances in the electronics industry. Only if small companies position themselves in the right networks or

systems of firms they can leverage their own capabilities with those of others to achieve the levels of productivity, flexibility, and innovation in the market demand.

1. 1. 4 Light Engineering Sector in Bangladesh

Light engineering industry in Bangladesh has grown with informal cottage status over the years. This labor-intensive operation produces a diverse range of items having an annual valuation of about US\$ 120 million. These items include import-substitute machinery spares, plant machineries, small tools, toys, consumer items, paper products and bicycle for the domestic & international markets (http://www.boi.gov.bd/sector_brief.php). Light industries in Bangladesh produce a multitude of labor intensive goods including toys, consumer items, small tools and paper products for the domestic market. Export oriented production in light industries has gained momentum in the past few years (http://www.bizbangladesh.com/potential_sectors_investment.php). Light Engineering Industry is a diverse group with a number of distinctive sectors including low-tech items like castings, forgings and fasteners, to the highly sophisticated microprocessors based processed control equipment and diagnostic medical instruments. The LES supply chain comprises firms engaged in metal sourcing, metal preparation, metal cutting, forming & finishing, parts manufacturing, assembly & production of finished goods for a large variety of industrial and household applications (Survey, 2007-08).

According to the survey conducted by Bangladesh Engineering Industry Owners' Association (BEIOA) carried out during June 2007 to February 2008, Light Engineering (machinery & spare parts) Products are as follows:

1. Agricultural Machinery & Spares
2. Motor launch & Marine Transport Spares
3. Textile Machinery & Spares
4. Jute Machinery & Spares
5. Tea plant Machinery & Spares
6. Construction Machinery & Spares
7. Bread, Biscuit and Food Processing Machinery & Spares
8. Metal Furniture
9. Paper and Pulp Machinery & Spares
10. Mold & Dies
11. Components & Spares of Gas Transmission & Distribution
12. Printing & Packaging Machinery & Spares
13. Poultry Machinery & Spares
14. Kitchenware & Bathroom Fittings
15. Metal Product & Hardware
16. LP Gas Cylinder & Fire Extinguisher
17. Pharmaceutical Machinery & Spares

Some key features of the light engineering sub-sector of Bangladesh (Survey 2007-08):

- Around 40,000 Light Engineering Industries are operating all over the country and are engaged in production and manufacturing of highly value added engineering goods and services with the value of annual turn over more than TK. 5000 crore. In recognizing this fact, the government has declared this sector as a thrust sector in its Industry Policy –2005;
- In the Export Policy-2007, the sector has been attached as one of the Highest Priority Sector and 10% cash incentive is granted for the export of light engineering products;
- Around 6 lack people are directly involved with the light engineering sector;
- The Ministry of Commerce has established Light Engineering Product Business Promotion Council and SME Foundation has attached the industry as Booster Sector;

The Small and Medium Enterprises in Bangladesh contributed up to 25% of national gross domestic product in 2006, about 40% of gross manufacturing output, 80% of industrial jobs, and around 25% of the total labor force of the country. According to rough estimations, light engineering sector of Bangladesh created about 6,00,000 direct employment and at the same time around 20,00,000 indirect job opportunities in different supportive industries. The light engineering sector is largely comprised of SMEs. This sector occupies a unique position in the economy of Bangladesh. It acts as feeder to key national industries and plays a vital role in the socio-economic development of the country. These enterprises make significant contribution towards technological and economic development and employment generation. The product line of the light engineering sector is large and diverse. Machinery and spare parts produced by the entrepreneurs of the sector are supplied to various mills and factories

such as jute, cotton, sugar, paper, textile, garments, fertilizer, tea plantation and processing industries, ferry, railways, power plants, construction sector, transport, pharmaceuticals, etc. Day to day technological progress, adaptation of innovative concept and technical expertise are the continuous process of activities in upholding a firm pledge to reach a sustainable position to meet the challenge in the world market and the environment of globalization. It has been upholding its role in developing and maintaining mechanized agriculture, maintaining continuity of vehicular transports and production of capital machinery and equipment of various descriptions for industrial and engineering sector (<http://www.beioa.net/> 2008).

Speakers at a seminar underscored the need for introducing new banking products and a revised banking policy for the country's light engineering sector's access to finance. They also said regular training programmes for the workers and introducing a specialised bank for the sector would help tap its potentials. Bangladesh Engineering Industry Owners Association (BEIOA) and Business Promotion Council (BPC) in collaboration with IFC-South Asia Enterprise Development Facility (SEDF) organised the programme. "We need a push for the sector and it will attain a better geometric progression and play a role in poverty alleviation," it was observed. The light engineering sector earned US\$ 12.51 million (1.251 crore) in 2002-03, \$ 41.47 million in 2003-04, \$ 85.20 million in 2004-05, and \$ 111.20 million in the 2005-06 fiscal. It earned \$ 173.47 million over the first nine months of 2006-2007 (FE Report, 2007).

1. 1. 5 Clusters in Light Engineering Sector of Bangladesh

Cluster is related to sub-sectors. Enterprises of light engineering sub-sector are found mainly geographic cluster wise in different areas of Bangladesh. Very few are surviving individually also. Bangladesh is a least developed country. The numbers of large-scale enterprises are very few here, because of high entry barrier. But some clusters of small businesses are found here. These are garment, leather goods, metalworking, plastic products and electrical appliance clusters (Geographic) in greater Dhaka and the metalworking and agricultural processing clusters (Geographic) around Bogra. But these clusters will not improve without any service. Business Development Services (BDS) and network strategies are necessary for these cluster's development. BDS include training, consultancy and advisory services, marketing assistance, information, technology development transfer and business linkage promotion. These BDS can be provided by the private sector. On the other hand different enterprises of a cluster can help each other. As a result marketing capabilities and other capabilities will increase (Hatch, 2001). This study tries to understand the impact of these geographic cluster operations of small businesses on marketing as well as possibility of enhancing marketing capability through materializing cluster concept. Intention is not to accumulate firms in a single geographic area.

By cluster operation organizations can enjoy some common benefits like increasing trust, increasing knowledge about norms of the society, increasing social network, increasing knowledge of work through word of mouth, increasing knowledge of work through electronic media, increasing internal specialization, generating management economies, managing fund, managing business development services, managing bureaucratic snafu,

managing government for taking necessary steps, removing gap between corporate world and academic education, managing job related training for employees, giving idea about contemporary technology, giving ideas about business ethics, managing special fund for employees, minimizing losses for political problems, minimize losses for electricity problems, develop own infrastructure, taking corrective action before facing the problem, finding out weak points of own organization, arranging different cultural programs, and managing business friendly environment (From discussion with the officials of Bangladesh Engineering Industry Owners' Association).

Cluster operation of organizations also helps in marketing activities like getting supply of raw materials smoothly, getting raw material according to requirement, collaborating with distributors, collaborating with retailer, knowing about competitors' products, knowing about strengths and weaknesses of competitors' products, differentiating products, modifying products regularly, sharing cost of marketing research, setting appropriate price, increasing bargaining power, ignoring dominance of customer on price, setting value based price, sharing material at the time of need, sharing final product at the time of need, sharing machinery use at time of need, sharing after sales services, transferring customers to another organization at the time of overfull demand, transferring customers to another suitable organization, delivering products timely, attracting many supplier to take position in the cluster, attracting many distributor to take position in the cluster, increasing customer value, reducing intermediary dominance on distribution channel, reconfiguring value delivery network at any time, establishing 'one stop shop', setting marketing communication strategies jointly, creating form primary market, setting own advertising strategy, setting

own personal selling strategy, setting own sales promotion strategy, setting own public relation strategy, setting own integrated marketing communication strategy, creating brand primary market, adopting the marketing strategies taken by leading organizations, sharing purchasing cost, sharing distribution cost, getting standardization related suggestions, getting grading related suggestions, getting product design related suggestions, getting help for developing new products according to the choice of the customer, and managing different quality testing institutions for getting quality testing related services (From discussion with the officials of Bangladesh Engineering Industry Owners' Association).

1. 2 PROBLEM STATEMENT

The gaps (gaps between the requirements for establishing cluster concept effectively and the present scenario of light engineering industry of Bangladesh for capitalizing opportunities going to be flourished worldwide) in the literature offer many opportunities for research in this specific area (light engineering sub-sector) and especially in the relationship of cluster, marketing externalities and collaborative networks. However, before further empirical research is conducted we need to clearly understand where we are now, with the current body of knowledge, so we will recognize where we need to go. These ideas construct the main purpose of this research, which is to build a deeper understanding and relationship of the issues related to inter-firm co-operation, marketing externalities in regional clusters and collaborative networks in marketing, as important social elements that firms need to take into account in an every day more and more competitive environment.

In the literature review there seems to be an agreement and consensus that clusters provide general benefits to firms, especially in the value chain inputs as well as in the general aspects of the production process (Olsen, 2002; Hanes, 2002; MacKinnon et al., 2002; Parr et al., 2002; Marshall, 1919; Weber, 1929; Krugman, 1991; Malmberg et al., 1996; Staber, 1997; Storper and Salais, 1997; Baptista, 1998; Porter, 1998; Asheim and Cooke, 1999; Schmitz, 1999). However, as Brown and Bell (2001, p 11) state, “limited research exists to indicate the degree of impact that clustering has on marketing activities in a domestic and international context”. Furthermore, research on strategic behaviour of firms has been mainly concentrated on large-scale firms. However, knowledge base about strategies and marketing strategy of small firms is quite limited (Olson and Bokor 1995; Lee et al. 1999; Forsman 2003).

Bangladesh does not have a glorious history of industrialization or entrepreneurship. It experienced looting of its resources and once its nature of economy has been changed. In 1757, at first, it was looted by the East India Company. In 1971, again, Bangladesh had been looted by West Pakistanis. In 1972, Bangladesh economy was wrongly diverted to nationalization in the light at socialistic economy. By these sorts of draining out of resources and wrong path driving of policies, ‘industrialization baby’ of Bangladesh is still in the womb of mother. It has prospects and at the same time it has chance to fall in bad position. Bangladesh is not that much old; only 39 years of age which could be considered as infant in the context of a nation. So, dreaming for most advantageous industrialized country is far away (Karim, 2005).

Due to lack of engineering knowledge, the existing firms of Bangladesh do not venture into making new products although this mostly involves carbon copy duplication. The rate of establishment of new firms is not also very significant. It appears that the light engineering industry has reached a point where further development and growth of this sector largely depend on the qualitative improvement of products through the inputs of modern technological know-how. Most of the light engineering firms either do not have the capability or are reluctant to invest in R & D activities because of the lack of adequate capital. From the information obtained from different sources, it appears that the light engineering sector needs extensive support in:

- Identification of materials of foreign made goods and selection of proper substitute materials if original materials are not available in the country;
- Selection of appropriate manufacturing processes and proper equipment and machinery;
- Designing and manufacturing/procuring appropriate dies as required in some other manufacturing operations;
- Testing of properties of the manufactured products to conform to the desired quality level;
- Estimation of production cost;
- Facilitation of high-end manufacturing operations e.g. CNC machining, surface finishing, etc. including heat treatment (<http://www.iutoic-dhaka.edu/roadmap/4.%20Helping%20and%20Advising%20SME%20Sectors%20for%20Employment%20Generation.pdf>).

The Light Engineering Industry of Bangladesh involves four types of businesses (sub-sectors), i.e., machinery and spare parts related businesses, electrical and electronic goods related businesses, plastic goods related businesses and accessory goods related businesses. Machinery and spare parts related sub-sector is mainly involves four types of activities: Manufacturing, repairing & marketing complete machinery and spare parts, manufacturing light metal products and hardware, repairing old machines and parts, and trading engineering machine parts, metal parts & hardware (From discussion with the officials of Bangladesh Engineering Industry Owners' Association). This study considered all types of small enterprises under machinery and spare parts related sub-sector for data collection and analysis.

Light engineering industries are/have been set up principally on private initiative with little assistance from the government because of low investment requirement. Some of the worth mentioning characteristics of the light engineering firms are:

- Ownership: Usually 1 – 3 persons for small firms; medium sized firms are usually a limited company.
- Percentage of small firms: more than 90%.
- No. of workers: For small firms less than 10 and for medium sized firms less than 100.
- Percentage of skilled workers: For small firms about 50%, for medium sized firms less than 50%.
- Education level of skilled workers: Usually school dropouts with a certain percentage receiving vocational training in different trades.

- Supervisors/managers with formal engineering education: Medium sized firms usually employ some graduate/ diploma engineers, but most of the small firms cannot afford to employ engineers.
- Product variety: Small firms are typically engaged in making variety of products on job order basis and medium sized firms usually specialize on a few products produced in batches.
- Engineering knowledge and skill: Since most of the firms produce same type of products repeatedly, they gain considerable experience and skill in making those products, but in the wake of globalization and trade liberalization, they encounter stiff challenges from foreign made goods in terms of cost and quality. Many of the light engineering firms, particularly small ones, do not have their own facility for testing raw material properties and finished goods' quality. They rather rely on experience (<http://www.iutoic-dhaka.edu/roadmap/4.%20Helping%20and%20Advising%20SME%20Sectors%20for%20Employment%20Generation.pdf>).

The ultimate goal of any type of business is to maximize profit. For profit maximization it needs to increase sale. For increasing sale strong marketing strategy is a must. In different countries of the world marketing capabilities of these small businesses were increased through cluster concept and ultimately above described problems were largely solved. When same types of businesses are operated from a same geographic area keeping some linkage is called a business cluster (geographic) and/or same types of businesses operated unitedly staying different places with a technology component is called a business cluster (production). This research has taken an initiative to address some of the problems of light

engineering small businesses as well as other small businesses of Bangladesh using the cluster concept. It is said, if marketing problem of an organization is solved, other problems are mostly solved. So, the topic of this research is stated as “**Cluster Concept in Enhancing the Marketing Capability of Small Business in Bangladesh: The Case of Light Engineering Sub-Sector**”

1. 3 OBJECTIVES OF THE STUDY

Objective is a virtue that guides report writing (Malhotra, 2006). Broad and specific objectives of this study are as follows:

1. 3. 1 Broad Objective

The broad objective of this research is to identify the scope of enhancing the marketing capability of **light engineering sub-sector** in Bangladesh through cluster concept.

1. 3. 2 Specific Objectives

The specific objectives of this research are as follows:

- a) To find out the result of **collaboration** of small businesses under Light Engineering Industry with immediate stakeholders (suppliers, employees, distributors, retailers).
- b) To find out the result (s) of **information sharing** of small businesses under LEI.

- c) To find out the result (s) of **geographical concentration** of small businesses under LEI.
- d) To find out the result (s) of **inter-firm network** of small businesses under LEI.
- e) To find out the result (s) of **sharing knowledge** within employees of small businesses under LEI.
- f) To find out the result (s) of **mutual learning through observation** of small businesses under LEI.
- g) To find out the result (s) of **collective initiative** of small businesses under LEI.

1. 4 HYPOTHESES

A hypothesis is what is yet to be tested. Hypothesis of objectives of this study are as follows:

1. 4. 1 Hypothesis for Broad Objective

Cluster creation of small businesses under Light Engineering Industry (LEI) will result in marketing efficiency.

1. 4. 2 Hypotheses for Specific Objectives

- a) Collaboration with immediate stakeholders (suppliers, employees, distributors, retailers) of small businesses under LEI will result in right product mix.
- b) Sharing information of small businesses under LEI will result in right price
- c) Geographical concentration of small businesses under LEI will result in right value delivery network
- d) Inter-firm network of small businesses under LEI will result in integrated marketing communication
- e) Sharing knowledge within employees of small businesses under LEI will result in efficiency enhancement of employees
- f) Mutual learning through observation of small businesses under LEI will result in greater productivity
- g) Collective initiative of small businesses under LEI (Light Engineering Industry) will result in maximizing benefit of organizations

1.5 JUSTIFICATION OF THE RESEARCH

Light engineering is an important sub-sector of the manufacturing sector. It provides critical support to industrial, agricultural and other sectors of the economy by manufacturing a wide range of spare parts, casting, molds and dies, oil and gas pipeline fittings, light machinery, etc and by providing repair services. With regard to the spare parts, the light engineering industry is known to manufacture spare parts for cement factories, paper mills, jute mills, textile mills, sugar mills, food processing industries, plastic industries, printing industry, fertilizer factories, railway, shipping, marine transport, automobiles, construction related machinery, and pharmaceutical industry, just to name a few. Undoubtedly, light engineering industry supports the very basic requirements of industrialization and plays a key role in keeping other industries running (<http://www.iutoic-dhaka.edu/roadmap/4.%20Helping%20and%20Advising%20SME%20Sectors%20for%20Employment%20Generation.pdf>).

Light Engineering Sector in Bangladesh is one of the sub-sectors of SMEs. This sector occupies a unique position in the economy of Bangladesh. It prudently acts as feeder of support industries to all other industries and plays a vital role in the socio-economic development of the country. These industries have potentials to make significant contribution towards technological and economic development along with wide opportunities for employment generation. These small & medium scale industries have made substantial contribution to Gross Domestic Product (GDP) during the last few decades and created appreciable employment opportunities. The product lines of this sector (LES) are quite large and diversified. Day to day technological progress, adaptation of innovative

concept & technical expertise are the continuous process of activities in upholding a firm pledge to reach a sustainable position to meet the challenge in the world market and the environment of globalization. It has been upholding its role in developing & maintaining mechanized agriculture, maintaining continuity of vehicular transports and production of capital machinery and equipment of various descriptions for industrial and engineering sector (Survey, 2007-08).

The Least Developed Countries (LDCs) in the east have started refocusing their attention on SMEs to enhance their role in bringing about structural changes in their economies. For Bangladesh SMEs have assumed special significance for poverty reduction programs and potential contribution to the overall industrial and economic growth. As a least development country for economic development we will have to depend on above discussed small-scale business clusters and these are very prospective. Of these small-scale clusters light engineering is one of the thrusts in the export sectors and the government is providing 15 percent cash incentive for exporting different products under this category. Light engineering is a very potential sector but entrepreneurs in this sector are facing serious problems (Star Business Report, 2002). **It is said that, if individual small firms are weak and vulnerable, networks give them strengths.** In general terms, networks have three important business functions: they reconfigure enterprise value chain, they increase internal specialization, and they generate management economies (Hatch, 2001). And networks between the competitors, interconnected organizations and associated institutions can be increased through cluster concept.

If we want to capitalize the high prospect of the sector (light engineering) we will have to eliminate the problems. For this reason this type of research is must and I firmly believe that this research will enlighten the prospect of this sector. Because light engineering industry is mainly small business industry and most of the firms under this sector suffer from weak and vulnerable problem. So, applying **cluster concept** on this sector we may get some advantages, i.e., reconfiguring enterprise value chain, increasing internal specialization, and generating management economies, which will enhance marketing capability and ultimately problems of the sector will be solved.

1. 6 SCOPE AND LIMITATIONS

1. 6. 1 Scope

The Light Engineering Industry of Bangladesh involves four types of businesses, i.e., machinery and spare parts related businesses, electrical and electronic goods related businesses, plastic goods related businesses, and accessory goods related businesses. The research was done only on machinery and spare parts related businesses. The sector (machinery and spare parts) mainly involves four kinds of works: Manufacturing and repairing complete machinery and spare parts, manufacturing light metal products and hardware, repairing old machines and parts, and trading engineering machine parts, metal parts and hardware. Research covered all these four areas from Dholaikhal, Mohammadpur, Mirpur, Gendaria, Demra, Dhanmondi, Taherbagh Lane, Tipu Sultan Road (Dhaka), and Bogra clusters.

1. 6. 2 Limitations

Nothing in this world happens smoothly. This research had some limitations also.

- a) **Unwilling to provide data:** Some respondents were not willing to provide data, because they were afraid of harassments of different government bodies. They have also feeling of deprivation. Different government and non government bodies gave assurance of different services but did not give. But at last they were managed to provide data whey they could understand that the study is only for academic purpose.
- b) **Lack of education:** Most of the respondents were less educated. So, it was needed to make the questionnaire understand to the respondents. The question of **lack of education** is important in terms of the fact that the entrepreneurs do not have a clear understanding of the terms but are clear in terms of the concept and benefit of the concept. Qualitative findings indicate that they do understanding the importance of clustering which is obvious from the fact that they exist in clusters. Some of the respondents could answer the questionnaire by reading first time. Other could also answer after helping them little bit to understand because they have huge practical knowledge.
- c) **Shortage of secondary data:** Very few previous works were done exactly on this field. So, there was scarcity of secondary data.
- d) **Shortage of contemporary data:** Very few secondary data were found are not up-to-date.

- e) **Lack of accurate data:** Willingly or unwillingly few respondents gave inaccurate data (from my realization), but not significant.
- f) **All clusters were not considered:** Only important geographic clusters were considered for collecting primary data as this study is based on non-probability sampling.
- g) **Use of quota sampling technique:** As quota sampling technique under non-probability sampling was used, all the respondents had not equal probability to be drawn.

CHAPTER-2

METHODOLOGY

Methodology of any research means how that research is conducted and findings are presented. This research also followed some steps from idea generation to report presentation. The methodology of this research is as follows:

2. 1 RESEARCH DESIGN

Research design is a framework or blueprint for conducting the marketing research project. It specifies the details of the procedures necessary for obtaining the information needed to structure and/or solve marketing research problems. Research design may be broadly classified as exploratory and conclusive. The research conducted on light engineering industry was based on such a research design. The first stage of this research was exploratory research. The primary objective of exploratory research is to have insights into, and an understanding of, the problem confronting the research. The methods of exploratory research were survey of experts, focus groups interviews, and pilot survey. To conduct the pilot survey a questionnaire was developed in keeping with the view of the objective of the research. For pilot survey the questionnaire was less structured with more open ended questions. After the exploratory research population and sampling frame were defined more clearly, and questionnaire was made more structured (used Likert scale) with very few open ended questions. Then the questionnaire was translated into Bangla language to make comfortable for some respondents (as some respondents were very weak in English but clear in terms of the concept and benefit of the concept). Then again the questionnaire was pre-tested to minimize sampling and non-sampling errors like wrong sample selection, non-

response error, inability to answer, unwillingness to answer, and questioning error as much as possible. The second stage of this research was conclusive research; the insights gained from exploratory research were verified to assist the decision maker in determining, evaluating, and selecting the best course of action to take for light engineering industry.

2. 2 POPULATION

The target population is the collection of elements or objects that possess the information sought by the researcher and about which inferences are to be made (Malhotra, 2006). The Light Engineering Industry of Bangladesh involves four types of businesses (sub-sectors), i.e., machinery and spare parts related businesses, electrical and electronic goods related businesses, plastic goods related businesses, and accessory goods related businesses. In this research population were all the small businesses under machinery and spare parts related sub-sector (involved in manufacturing, manufacturing and repairing, repairing, and trading), Bangladesh.

2. 3 SAMPLING FRAME

Sampling frame is a representation of the elements of the target population. It consists of a list or set of directions for identifying the target population (Malhotra, 2006). Sampling frame of this research was different groups under machinery and spare parts related sub-sector of Bangladesh considering type of activities like manufacturing and repairing complete machinery and spare parts, manufacturing light metal products and hardware, repairing old machines and parts, and trading engineering machine parts, metal parts and hardware. Samples were drawn from different geographic clusters in keeping with the view of grouping of enterprises.

2. 4 SAMPLING TECHNIQUE

The sampling technique of this study was **quota sampling** under non-probability sampling, as data were collected targeting to measure internal validity from the standpoint of theory application. Here, at first four quotas were developed for total population of the sector (machinery and spare parts related light engineering enterprises) depending on type of activity, i.e., manufacturing & repairing complete machinery and spare parts, manufacturing light metal products & hardware, repairing old machines and parts, and trading engineering machine parts, metal parts & hardware. Then sample elements were selected based on convenience and judgment from different clusters of light engineering small businesses.

2. 5 SAMPLE SIZE

Clusters are geographic concentrations of interconnected companies, specialized suppliers, service providers, and associated institutions in a particular field that are present in a nation or region. In Bangladesh mainly four types (depending on activity) of small business are found in different clusters under machinery & spare parts related sector. The types are manufacturing and repairing complete machinery and spare parts, manufacturing light metal products and hardware, repairing old machines and parts, and trading engineering machine parts, metal parts and hardware. Sample size of this research was 60 representing from all these groups considering the objective of the research and importance of the groups. Majority number of the organizations under this sector (machinery & spare parts) representing from ‘manufacturing and repairing complete machinery and spare parts’ group and marketing activities (supply part and distribution part) are also broadly found in this group. So, more than 50% (33) samples were taken from this group. Second representing group is repairing businesses but marketing activities are not broadly (supply part and

distribution part are insignificant) found and only 10 samples were taken from here. Third representing group is manufacturing light metal products and hardware businesses. Small numbers of businesses are found under this group but forward linkage and backward linkage marketing activities are available and 10 samples were also taken from here. Last representing group is trading (reselling) businesses. Small numbers of businesses are also found under this group as well as marketing activities are narrowly found here and lowest number (7) of samples was considered.

Sampling of this study was non-probabilistic and results are valid for sample only, not for universe. Non-probability sampling relies on the personal judgment of the researcher rather than chance to select sample elements. The researcher can arbitrarily or consciously decide what elements to include in the sample. Non-probability samples may yield good estimates of the population characteristics. However, they do not allow for objective evaluation of the precision of the sample results. Because there is no way of determining the probability of selecting any particular element for inclusion in the sample, the estimates obtained are not statistically projectable to the population (Malhotra, 2006). So the sample size 60 was considered for some reasons like budget available for the study and nature of sample units & time required to collect data from every unit.

2. 6 DATA COLLECTION METHODS

The study was done based on primary as well as secondary data.

2. 6. 1 Primary Data

The primary data were collected through questionnaire (keeping open ended and close ended options), personal interview, word of mouth, discussion with employees of different small

businesses and officials of the association, and observation. A 5-point Likert scale questionnaire was used to measure marketing capability of geographic accumulation of small firms under light engineering industry, where one (1) represented strongly disagree and five (5) represented strongly agree. Then the questionnaire was translated into Bangla language to make the respondents more comfortable. Bangla questionnaire is a translation to link with the report which is in English language. So, there was no difference between two versions of the questionnaire and the quality of answers was also same. Under observation method structured non-disguised, structured disguised, non-structured non-disguised and non-structured disguised procedures were followed by the researcher to collect data.

2. 6. 2 Secondary Data

The secondary data were collected through brochures, prospectus and papers published by association of the sub-sector, annual report of the association, relevant journals and dailies, periodicals, related research works and books, and websites.

2. 7 DATA ANALYSIS

Data were analyzed by using SPSS Software, and under SPSS software following tools were used:

- Cross tabulation
- Descriptive statistics
- ANOVA test
- Chronbach's alpha for measuring reliability or internal consistency
- Factor analysis

CHAPTER-3

LITERATURE REVIEW

Many economic geographers, economists and now-a-days more international business and public policy scholars have seen agglomeration economic theories as a starting point for academic research in the issues of inter-firm co-operation in clusters. However, these issues are far from recent. During the last century, Marshall (1923) and Weber (1929) combined, for the first time, the geographical location of industries with the concept of *marketing factors*, including the *social elements of proximity, cooperation, co-partnership and joint-marketing activities*. This represents an important contribution to the marketing and economic theories of their period. Furthermore, Marshall (1923) influenced some of the ideas about marketing in industrial clusters introducing the concepts of mutual ‘discovery’ as a key advantage of co-location. That is, co-location lessens the search of cost of buyers, and this is an important influence on the contemporary retail location theory.

Although some authors (Sunley 1992; Courlet and Soulage 1995), argued that Alfred Marshall’s contributions present some gaps and ambiguities in his concepts, many contemporary economic geographers and international business scholars still take Marshall’s work as the basis for the explanations of agglomeration economies, industrial districts and then, inter-firm co-operation in specific regions. At the same time, these concepts have been used extensively in the academic literature with the most diverse industries, evolutions, levels of development and in a range of different countries. For instance, there are well-known cases regarding industrial district such as in Germany (Baden-Württemberg) and

“Third Italy” in Northern Italy, where there are existing districts established (Martin and Sunley, 2002).

When one tries to establish how clusters are defined and understood, the literature provides numerous definitions of clusters. Cluster, the result of improvements in the business environment, "is a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities" As the sum of its parts is of greater value than each individual company or institution, clusters create synergy (Porter, 1998). Clusters, by definition include not only business entities such as companies, but also universities, trade associations, financial institutions, vocational training providers, economic development agencies, and any other entity that can be considered “important to competition” (Porter, 1998). The development and upgrading of clusters is an important agenda for governments, companies, and other institutions. Cluster development initiatives are an important new direction in economic policy, building on earlier efforts in macroeconomic stabilization, privatization, market opening, and reducing the costs of doing business (Porter, 2001). Clustering is a term that economists have borrowed from science to describe the growth of a significant concentration of innovative companies around a nucleus of R&D facilities, such as those provided by the universities or leading-edge government laboratories (Choudhary, 2003).

The idea of business clusters is used more and more in public policy as businesses and governments are noticing their advantages. That the basic elements of a cluster consist of: geography, the role of government, entrepreneurship, SME's, trust, cooperation and

networking. All are necessary for a cluster to succeed. Frisillo (2007) documented the origin of the cluster by attending several meetings and a trade show. Interviews were conducted with the leaders who were involved in the cluster, which included government, educational and business officials. Most of the above elements were present in the Albany area to develop a cluster, and therefore the cluster could be possible (Frisillo, 2007). With over five hundred cluster-based economic development initiatives worldwide (Solvell et al, 2003) there is, not surprisingly, a wide array of organizational and morphological forms that clusters take on. Indeed, every cluster-based economic development initiative should be unique and should be designed to reflect the cultural, political, and economic context of the geographic region within which it functions (Diez, 2001; Porter 1998). It is extremely difficult to create successful clusters from scratch and building upon the existing industrial strengths of a geographic region is the foundation of most successful cluster initiatives (Castells and Hall, 1994; Schmidt and Nadvi, 1999; Hospers and Beugelsdijk, 2002).

The concept of clustering is familiar for economists and policy-makers. Clusters are widely regarded as sources of regional competitiveness. However, although the concept of clustering is widely used, there is no clear consensus of what actually constitutes a cluster. Van and De (2001) developed a dynamic cluster concept. This cluster concept places one particular value chain as central. First, on the basis of the literature numbers of characteristics are described for identifying a cluster. Second, a stylized cluster cycle developed with states of development, expansion, maturity and transition. The development of a cluster in some states stems from external contingent events as well as the internal dynamic of clusters. This dynamic cluster concept can be used to formulate policy

alternatives for the different cluster states. The dynamic cluster concept is used to analyze the shipbuilding industry. This cluster went through the states of development and expansion and now shows signs of maturation. The cluster is described and possible policies to support it are suggested (Van and De, 2001).

Marketing deals with identifying and meeting human and social needs. One of the shortest definitions of marketing is “meeting needs profitably”. According to American Marketing Association “Marketing is an organizational function and a set of processes for creating, communicating, and delivering value to customers and for managing customer relationships in ways that benefit the organization and its stake holders” (Kotler and Keller, 2005). Marketing is the anticipation, management, and satisfaction of demand through the exchange process (Evans and Berman, 1994). To understand marketing capabilities, it is necessary to understand the foundation upon which capabilities are built. Marketing capabilities are developed when the firm’s marketing employees repeatedly apply their knowledge and skills (an intangible resource) to solve the firm’s marketing problems. Often, in the course of solving these marketing problems, intangible resources are combined with tangible resources (assets). Marketing capabilities are not resources in and of themselves, but are the integrative processes by which resources are applied to add value to the resource inputs (Day, 1994; Grant, 1991, 1996). From these repeated efforts, complex patterns of coordination between people, and between people and other resources occur (Grant, 1991, 1996). These coordinated patterns of behavior are often quite consistent, yet they remain dynamic and change as the firm’s needs change (Grant, 1991). One of the hallmarks of capabilities development is learning through repetition (Grant, 1991; Prahalad and Hamel,

1990; Sinkula, 1994; Tuominen et al., 1997). By bringing people and resources together in repeated efforts, firms develop the processes upon which capabilities are based. Furthermore, as people repeatedly apply their knowledge and skills to marketing problems, a deeper marketing knowledge base develops. When employees throughout the organization apply this deeper knowledge to solving marketing problems, the firm's marketing capabilities are enhanced (Slater and Narver, 1995; Tuominen et al., 1997). Finally, when value-adding, functional-level capabilities are integrated across functional lines and are deployed across multiple product-markets to deliver competitive advantage, then a core capability has developed (Grant, 1996).

Vorhies et al. (1999) investigated six marketing areas for evidence of capabilities in their study. The first area is market research and is defined as the set of processes needed to discover information about customer needs and broad market information, and design marketing programs to meet these needs and market conditions (Moller and Anttila, 1987). The second area is concerned with pricing and is defined as the processes needed to competitively price the firm's products and monitor prices in the market. The third area is product development. For a firm to have a capability in product development it is important to design products in response to customer needs, meet internal company goals and hurdles, and outperform competition in this key area (Moller and Anttila, 1987). The fourth capability relevant to marketing is the management of the firm's channels of distribution. To have a capability in channel management, relationships with distributors must be formed and effectively managed. To do this it is important to work closely with channel members, build effective relationships with channel members, and to bring efficiencies to the channel.

Promotion is another important capability for many firms. Promotion for this study was defined as advertising, sales promotions, and personal selling activities the firm uses to communicate with the market and sell the product. The last area in which firms would be expected to have marketing capabilities is in the marketing management area. Marketing management capabilities are focused on customer acquisition management, the management of marketing programs, and the ability to coordinate action among the diverse elements in the firm needed to implement a marketing program (Moller and Anttila, 1987). It is important to note that the conceptualization of each of the six marketing capabilities taps an importance dimension and an effectiveness dimension since a capability that is not important cannot serve as a basis for competitive advantage and a capability (by definition) must be performed effectively (Day, 1994). It is also important to note that each marketing capability area is conceptualized as existing relative to competitors (Grant, 1991).

Establishment of clusters and role of Information and Communication Technology is a new paradigm in the economic growth in globally traded industries. The general departure from the industrial economy to the knowledge economy has made ITC a mandatory requirement for sustainable innovation and flexibility in adaptation of new ideas and approaches in fast paced businesses and ITC has become a key driver of growth. Addressing the opportunities in an unplanned linear fashion in routine does not yield most optimal returns. However, addressing the opportunities in an opportunistic way is a key and ITC provides that capability to the firms. Formal and informal flows of knowledge, interdisciplinary and cross-fertilization of ideas, and opportunities for team entrepreneurial development certainly adds synergetic impact which very conveniently can be achieved with the help of ITC. ITC can

only make a difference in association with all other players, actors and ingredients, catalysts that play their part with their core competencies for overall national or regional economic development system. The core competencies in the different segments of the nations may be different (Choudhary, 2003).

Currently, the Thai government has implemented cluster development strategies to improve the national economic performance and technological capabilities. The strategic management of the reorganization of industrial clusters undertaken at the National Science and Technology Development Agency (NSTDA), a major research organization in Thailand, is based on the concept of the National System of Innovation (NSI). NSTDA has focused on this cluster-based economic development model to position Thailand to meet the challenges in the environment of knowledge-based economy. The aim of the cluster-based strategy is to focus on specific internal capabilities in order to improve technological competitiveness and research capabilities to meet the needs of the country. The Operating Model of NSTDA is proposed as a manifestation for industrial development and effective research management to support Thailand's national innovation system. Policy implications and supportive initiatives at NSTDA are expected to be useful for similar research organizations in other developing countries to better exploit the industrial cluster concept to develop technological innovations and enhance performance in the NSI (Wonglimpiyarat, 2006).

The analysis of the available definitions of technology clusters indicates that Porter's definition provides a reasonable foundation to analyze the clusters and development thought while the other definitions are based on the need of the researcher and are generally skewed

to serve the purpose of the researcher and or analyst. There are many definitions which describe and analyze the industrial and economic clusters in isolation and not as system which has related entities as integrated part of the development system. Another important observation about other definitions is that the concepts of geographical concentration and synergy is not discretely present in the definitions but in the subsequent discussions. This led us to coin a definition of cluster general enough but sufficient to be used in any type of technology clusters that aspires to achieve the economic growth and general societal development. Thus our definition of technology cluster is that it is the concentration of businesses, academic institutions, research and development agencies, philanthropic organizations and regional/ local government organizations including financial institutions active in some particular geographical area or is clustered around some development theme for individual and collective benefits to be drawn through synergetic impacts. Research Triangles, Technology Parks, Industrial Parks, Technology Corridor, Industrial Estates, Incubation Schemes are common examples of clustering approach. This definition of Technology Cluster offers a very significant potential for local and regional economic development initiatives in Balochistan. The Fruit & Vegetable Processing Clusters, Marble and Mineral Development Cluster, Aquaculture Cluster, Livestock and Dairy Development Cluster are few examples (Choudhary, 2003).

In recent years a large number of communities around the world have adopted cluster-based economic development as a strategy to propel their economies to new levels of economic competitiveness (Lundquist and Power, 2002; SANDAG, 2001). Despite concerns, in some quarters, over the ability of a cluster-based development strategy to deliver its promised

economic benefits (Martin and Sunley, 2003) the greenhouse nursery industry in northwest Ohio, USA has adopted this particular approach to retain its competitive edge in an increasingly competitive industry. Like many northwest Ohio industries, the greenhouse nursery industry is facing increasing international competition. In particular, competition from southern Ontario is threatening the future viability of many northwest Ohio greenhouse nursery operations. The northwest Ohio greenhouse cluster is in its formative stages of development. The cluster is being supported by university researchers who function as the Cluster Strategy Team (CST) (Reid and Carroll, 2009).

It is very common in the west that the universities and research institutes act like nucleolus and have become central hubs for dynamic technology clusters in diverse areas of science and engineering. Communities such as silicon valley, Boston, Maryland technology corridor, Montreal, Ottawa and Saskatoon have seen the tremendous growth that can occur when industry leaders and researchers come together to identify needs and develop solutions that touch the lives of people in their sphere of influence. With stakeholder involvement in strategic planning, this local touch can quickly transform a small community into a dynamic network with global reach. As a result of the efforts of stakeholders and catalyzation of the governments, a large number of the technology clusters have emerged in almost all parts of the world: in USA & Canada, Central & South America, Middle East, Europe, China and Asia during the last decade. The survey of the cluster development after the advent of the Internet has accelerated manifold. In soft sciences and research clusters are active beyond national boundaries (Choudhary, 2003).

Porter (1998) states that paradoxically today's competitive advantages of the global economy lies increasingly on local things, such as knowledge, relationships, and motivations that distant rivals cannot match. These factors determine the concept of clusters, which are defined as "critical masses in one place – of unusual competitive success in particular fields" (Porter 1998, p.78). Arguably, the cluster theory is positively correlated with the present trend towards globalization, because it affects not only the competitiveness of specific regions and countries, but also it has an effect across national borders, changing the nature of the value chain activities. This means that an increasingly globalised economic system does not necessarily indicate an increasing number of people engaged in international activities. Thus, as Felsenstein and Taylor (2001) states, much of the economic growth is found at local and regional levels in the diffusion of geographic clusters.

The cluster group performs manufacturing tasks as collaborative engineering in the design phase. They share the process of designing information of product using CAD/CAPP/CAE and PDM. ERP (Enterprise Resource Planning) system management is implemented to manage the cluster company group with the same platform which would be established inside companies. Instead of working separately, those companies would share facilities to produce standard parts. Consequently, the lead time and cost of production are reduced; the quality standard is more consistent. Each company's ERP is linked to SCM in order to control the delivery of components to assembly parts of final production stage of the selected company which is considered the most capable and appropriate. The transportation cost is optimized at this stage. The productivity of equipment efficiency is increased clearly in this model (Mitsuishi et. al., 2008).

Different examples of clusters development around the world provide “evidence that even as competition and economic activity is globalised, the competitive advantage can be localised” (Enright, 1999, p. 35). Simultaneously, during the last few years, various studies in dissimilar industries (Porter, 1998; Enright, 1999; Peters and Hood, 2000; Romano et al, 2001; Felsenstein and Taylor, 2001; Rosenberg, 2002) have concluded that the geographical implication of clusters has an effect on the development of local wealth, not only attracting foreign investors, but also generating global networking and helping in the export and internationalisation process of companies as part of ‘regional clusters’. On the other hand, Morgan and Hant (1994) have suggested that in order to be an effective competitor in the global economy requires more cooperation or networking between firms, which will lead to establish or maintain a marketing competitive advantage. Thus, this argument can be seen as a strategic issue for small and medium sized enterprises (SME’s), especially those located in open and small economies, which must seek out different alternatives of differentiation, obtaining in the end a marketing competitive advantage (Brown and Bell, 2001). Eleven apparel manufacturers formed CD-Line to exploit their contemporary capabilities in the production of suits, shirts, accessories, and knitwear. The manufactures successfully market an integrated line of what they call “image clothing” (uniforms) to large European companies. Seven companies engaged in shipbuilding, marine fittings, fishing equipment, and electronic navigation systems networked with a bank and private research center to develop a state-of -the-art trawler for the international market (Hatch, 2001). In a project with agricultural equipment companies in northern Argentina, networks were organized to develop farm implements for the difficult soil conditions found in the nearby Brazilian province of Mato Grosso. The joint market research and engineering design exercises led to

the realization that the small firms were too highly integrated vertically and almost no production process reached minimum efficient scale. This soon led to greater manufacturing specialization, increased subcontracting, competitive prices, and solid export sales.

The case of the “third Italy” is well known, and it has been studied extensively, for the large concentration of specialized small firms well networked and successfully active on the world markets. At the same time, these SMEs shared social, economical and historical traditions within their local communities (Brusco, 1986; Pyke, 1990). On the other hand, the case of Germany and its Baden-Württemberg region is well known for the engineering, machine tool building and the inter-firm co-operation in the automotive sector (Boekholt and Thuriaux, 1999). One of Pakistan's rare examples of consistent export success has been the Sialkot stainless steel surgical instrument cluster. This cluster, consisting mainly of small and medium enterprises (SMEs), has as its main markets the United States and Western Europe. In recent years, access to these markets has become contingent on meeting international quality assurance standards. The hypothesis explored is that meeting such standards requires greater local cooperation, both among producers as well as between producers and their suppliers and subcontractors. The study draws on quantitative and qualitative data to examine how inter-firm ties, both vertical and horizontal, have changed. The evidence suggests that joint action has increased, but that there remain significant areas of collective failure. Thus, the quality assurance pressures mark a possible turning point for the cluster, raising questions as to whether local sources of competitiveness, captured in the collective efficiency concept, can continue to provide the basis for export success. It also leads directly to an evaluation of the cluster's growth trajectory (Nadvi, 1999).

An assessment is made of the effects of strategic alliances, among other factors, on the performance of community-based food processing enterprises in the northern province of Thailand. Using survey data, researchers estimate a stochastic frontier production function and examine a number of factors affecting technical inefficiency of housewives groups focusing on the nature of strategic alliances. Results show that vertical strategic alliances in marketing at the regional and provincial levels provide a means for housewives groups to increase productivity by attaining higher levels of technical efficiency through membership (Nonthakot et. al., 2008).

Although marketing is a key factor for small firms' survival, they face certain problems as restricted customer base, limited marketing expertise and lack of funding among others (Stokes, 2000). Small firms networks in industrial districts have been well documented specially in the northern Italy (Pyke, 1992; Pyke and Sengerber, 1992), focused on the understanding of how collaborative arrangements can enhance competitiveness in SMEs. The development of a strong small firm sector has become an increasingly important priority of industrial policy because of its importance in the employment generation. According to Guo (1999), the research on small firms' growth has been concentrated in three primary areas: (1) external environment issues, such as product and market structure; (2) internal structural dynamics of the firm, for instance the firm's management structure, control and reporting situation; and (3) characteristics of the owner/ manager. At the same time, the emergence of new types of industrial organization, especially those related to stimulate more inter-firm cooperation, offers new elements for research as well as for public policies that can support the SMEs development plans.

The previous examples of industrial districts demonstrate that by locating small and medium enterprises (SMEs) together, the firms could establish networks, thereby overcoming the resource constraints they would otherwise face. As Pietrobelli (1998) described, this is a new pattern of development different from which was pursued by large firms as well as by many isolated SMEs, constrained by their small sizes. This development will benefit the small firms with more flexible and specialized production rather than large firms, while the cooperation between these firms raises the efficiency of production. It will also allow better information flows and linkages between companies, as well as leading to an increased aptitude of innovation.

OECD report (2000) has made some differences between softer and harder networks. According to this, *softer networks* generally encompass a larger number of firms rather than harder networks, with membership subscription open to all those that meet the minimum requirements. Soft networks come to an agreement with research bodies, education and training institutions as well as public authorities. By contrast, *harder networks* are commercially inclined, involving a limited number of preselected firms that are sometimes formally and tightly linked through a joint venture or strategic alliances. Thus, networks facilitate accelerated *learning process* (Grabher, 1993; Staber, 2001; Evangelista et al., 2002; Furman et al., 2002; Acs and Vaga, 2002). Furthermore the peer-based learning, which networking makes available, becomes the means of choice of learning for many small firms. For innovation, often the entrepreneurs need to reconfigure their relationships with suppliers, which again networking does facilitate (Acs and Vaga, 2002).

Clearly, the recent progress of information technology, telecommunications, and transportation has caused markets to expand globally and this offers opportunities as well as new challenges to all business concerns. Globalization, therefore, has made imperative for SMEs to pursue technological improvements and information networking by establishing new forms of partnerships and strategic alliances among themselves and with large enterprises. Also, according to Nadvi (1995) networking SMEs is crucial; especially in weak economic regions as it enables SMEs to make informed business decisions on how to fully exploit their innovativeness and creative potential.

According to Bianchi and Giordani (1993), Garofoli (1991), the linkages between companies in industrial districts foster incremental rather than drastic innovations. Thus, this may be attributed to the fact that industrial districts are composed of small companies which do not have research and development (R&D) capacities, compared to other bigger companies that come from the same industry. Furthermore, as Asheim (1996) states, in today's increasingly globalised world, incremental innovation and higher productivity might not be enough to ensure long term competitiveness, and today this should be based on combining knowledge from many different sources (Guinet, 1999). Although trust and linkages between firms are crucial in helping the diffusion of knowledge, having companies from the same industry in one place is not likely to be enough. Thus, this is one of the key differences between the industrial district's theory and the cluster approach, since the latter addresses the important strategic factors which promote innovation and trust, turning a cluster into the material basis of an innovation based economy (Asheim, 1996).

Hatch (2001) reported in his study that in India though there are large-scale enterprises, in many villages and cities, low barrier to entry have attracted large number of small-scale enterprises into nearly identical businesses. The availability of micro finance programs contributes to the trend. In Dakshinpuri, a resettlement colony on the distant edge of Delhi, 54 women-owned micro-enterprises compete for orders for Salwar suits (a woman's garment) from the several hundred neighborhood households. Their fabrics came from the same market stalls. The design of the clothes they make is fixed by tradition. West in the Aligarh, a cluster of several thousand micro enterprises has supplied India with locks for generations. These little firms make their own tooling and use hand-operated machines to manufacture the intricate brass parts from which a vast variety of padlocks, bicycle locks, and mortise locks are made. Although these firms have links to large customers and national markets, they are not much better off than the apparel marketers in the Delhi slums. In Aligarh, unequal bargaining power enables trades and wholesalers to make tiny supplies bid against one another, facing price concessions and keeping downward pressure on wages. To make marketers worse, Taiwanese firms have now entered the Indian market. With modern lock designs and automated production techniques, they undersell and outsell Aligarh. The tiny firms there, like those in Dakshinpuri, are unable to respond to their competitive challenges.

From the above discussion it is found that India's small business markets are being captured by Taiwanese due to weak marketing policy & strategy. It seems reasonably clear that traditional BDS (Business Development Services) will not be effective in situations like these. Even if firms could see the usefulness of BDS, they can afford little of them. These

firms do not need services to help them do what they now do better; they need to do different things, quite differently. The fundamental need of the firms in Dakshinpuri and Aligarh are product differentiation to improve margins, greater productivity to increase revenues, and internal specialization to make productivity growth possible (Hatch, 2001). BDS alone cannot produce these changes. The familiar limitations of small firm size, shallow management depth, lack of research and development capacity, inability to master alternative markets, and restricted access to capital- are handicaps too great for individual tiny enterprises to overcome. Only by networking their skills and equipment can they confront their problems.

The Least Developed Countries (LDCs) in the east have started refocusing their attention on SMEs to enhance their role in bringing about structural changes in their economies. For Bangladesh, SMEs have assumed special significance for poverty reduction programmes and potential contribution to the overall industrial and economic growth (*Mintoo, 2006*). In Bangladesh very few small firms use feedback mechanism to collect the customers' reaction. About 50% of these firms do not consider that customer opinion would help improve the product quality. Less than 40% of our industrial units feel to improve the quality, while more than 60% are satisfied with the current product quality. More than 75% of the units do not adopt any standard procedure for measuring quality, rather based on physical appearance as observed by bare eye is followed. The rest claimed that they use some sort of measuring instruments. Only 40% of the units using some measuring instruments have claimed that they set some target for quality. But the standard they set as targets mainly of their own, not from standard organization. Only a small faction adapt BSTI standard (Haque et. al., 1998).

Haque et. al. (1998) reported in their study that, about 78% of the small and cottage industries do not have any employee training scheme/ program. The rest are very poorly equipped with any kind of such scheme. 90% of the enterprises (small and cottage) do not use any kind of SPC (statistical process control) tools for process and production control, the rest have limited practice. The essential element of proper documentation procedure for maintaining and upgrading the quality level of the products is almost absent. More than 95% do not maintain records related to quality, while the rest maintain very loosely. Other problems of the enterprises are as follows:

- Poor communications between the various levels of management
- Poor quality of materials from vendors
- Company practices inconsistent with quality goals
- Poor performers
- Arbitrary standards of quality maintained
- Lack of measures for quality
- Fear about excessive costs with quality improvement
- Inefficient use of facilities
- Lack of awareness about quality at management

After the signing of the WTO agreement, government of Bangladesh is now going through the rules and regulation of WTO. Already our economy is affected by open market. All types of foreign goods (products of small and cottage industries or large industries) are now in the domestic market. Domestic products are in tremendous state of competition in respect of price, quality, and durability. Up-to-date data regarding investment, employment,

marketing profit and loss etc. in the SCI (small and cottage industry) sector is not readily available (Mohiuddin and Haque, 1996).

Bangladesh's light engineering sector has flourished from almost nothing to a multi-crore taka business now since the country's independence in 1971, with the sector's development coming about mainly at an informal cottage status. The sector makes products ranging from automated teller machine (ATM) frames to pharmaceutical packaging machines, from machinery for garment sector to rice mills, from automobile spare parts to power looms, and from ammunition boxes for Bangladesh Army to machinery for paint industry. It also produces machinery for making ballpoint pens, furniture, bakery equipments, flourmills, CD and DVD covers, plastic baskets and carriers, and many more. The sector mainly involves three kinds of works: making complete machinery, producing spare parts and repairing old machines. It also does the maintenance works of different machinery. The sector was dominated by the non-Bengale before 1971, and later local people replaced them by purchasing their year-old businesses. The sector came to the fore after 1971, with many entrepreneurs who earlier worked as mainly mechanic and helper taking interest in establishing their own businesses. In 1984 the government recognised the sector bringing it under industries ministry. Finally the government in its latest industrial policy in 2005 put more focus on light engineering sector. Currently, there are around 40,000 small-scale light engineering enterprises across the country with six lakh people directly involved, as per Board of Investment statistics. Now the sector manufactures around 10,000 types of items worth \$120 million a year for the local industries. The annual turnover of the sector accounts for Tk 20,000 crore per year. Most of the light machinery used for tea plantation and processing are made locally. In Dhaka, the sector has mainly developed in some specific

areas including Dholaikhal, Tipu Sultan Road, Demra, Lalbagh, Mohammadpur and Shialbarri in Mirpur. The sector exports such products as bicycle, iron chain, dry cell battery, generator, instant power supply (IPS) device, copper wire, telephone set, fishing reel, garments cutting table, light garment machinery, electric fan, and GI pipe. According to Export Promotion Bureau (EPB) data, the country's light engineering sector posted an export earning of Tk 1,507 crore in 2007-08 fiscal year. Bicycle, generally an import item, is also made locally, and in FY2007-08 an amount of Tk 450 crore was earned by exporting bicycle. Junayed Engineering, a local UPS device maker at Shialbarri in Mirpur, exported 10 UPS units to Assam in April, and is preparing to export 30 pieces to Nepal by the year-end. Junayed Ahmed, owner of the company, started making UPS devices three years ago. Industry experts say the light engineering sector will flourish further if necessary infrastructure and adequate finance can be assured (<http://www.zimbio.com/Bangladesh/articles/303/Light+engineering+comes+fore>).

Bogra is a **machinery and spare parts related** (under light engineering industry) geographic business cluster. Bogra is the heart of the country's foundry industry. More than 70 per cent of the foundry industries of the country are situated at Bogra. Foundry industry of Bogra supplies around 80 per cent agricultural equipment of the country especially centrifugal pump which is used in irrigation. Almost all kinds of spare parts of power tillers and agricultural machinery are manufactured by these factories. Tubewell, lathe machine, saw mill, flower mill, slip and brake drum of motor vehicle, machinery of textile mills and jute mills, grinding machine and parts of ships are also made by this industry (FE Report, 2007). According to Bangladesh Agricultural Machinery Merchants Association sources, a few small manufacturing industries that spearheaded the manufacture of agricultural

machinery in northern districts and especially in Bogra in the 1970s are now meeting 95 per cent of local demand. These manufacturers are meeting the spares of the imported machines from China, Japan and South Korea. In fact some of the locally-manufactured products such as spare parts and farm equipments are cheaper and quality-wise better than the imported ones.

For example a cylinder that previously cost Tk 1000 to import is now being sold at Tk 250 in Bogra, sources said. Farm machineries such as tubewells, cylinders, and pistons that are manufactured in Bogra are now smuggled out to India. Bangladesh could earn foreign currency worth over Tk 50 crore every year if the government could provide assistance for exporting the agricultural machinery to India legally (Holiday Desk, 2007).

Bangladesh Standard Testing Institute (BSTI) authority in Dhaka does not have any testing equipment at their disposal for testing light engineering products, such as agricultural equipment. However, no government initiative has so far been taken to improve the quality of production of such equipment. To improve the quality of agricultural equipment, heat treatment plants and technical assistance along with other government support like financial assistance are needed. According to a research report on light engineering in Bogra, prepared by Rural Development Academy (RDA) at Bogra, at least 30 foundry units are grappling with problems like high prices of hard coke and pig iron. About 42 agroindustrial equipment workshops and 78 industries have sprung up in the district town. A research paper on Bogra based agroindustrial equipment industries and marketing, which was prepared by journalists, identified as many as 13 problems in the sector, which include lack

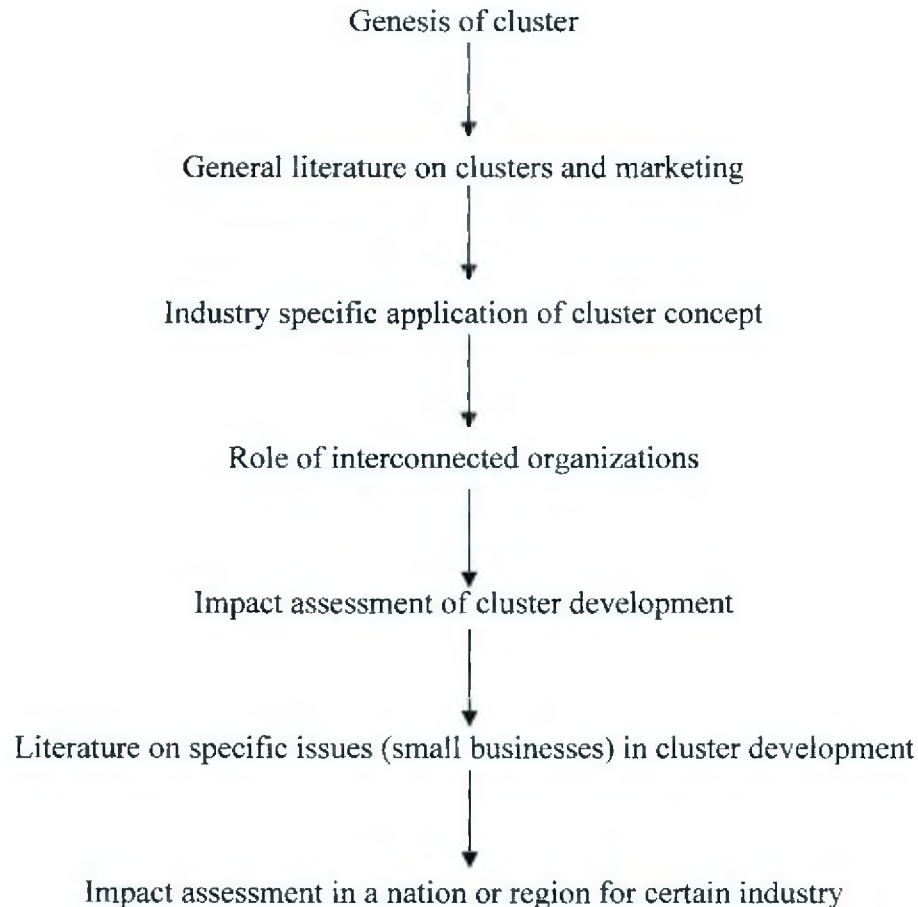
of working capital and high prices of raw materials. Engineering industry has developed in Bogra totally from private initiative. They have invested from self finance. In this industry amount of loan providing and government cooperation is very low. Proper training facilities for personnel are not available. There is also shortage of quality machineries to produce these equipments. For mismanagement some enterprises are running in loss (Roundtable discussion, 2008).

SUMMARY OF THE LITERATURE REVIEW:

Considerable amount of general literature is available on clusters and economic development and spread on issues from one extreme to another. However, literature on specific issues in cluster development and impact assessment is rather limited. Exact chronology is difficult to ascertain since earlier researches were done in isolations. Anyway, literature review **started** with the discussion of **genesis of cluster** concept. Marshall (1923) and Weber (1929) combined, for the first time, the geographical location of industries with the concept of *marketing factors*, including the *social elements of proximity, cooperation, co-partnership and joint-marketing activities*. Although some authors (Sunley, 1992; Courlet and Soulage, 1995), argued that Alfred Marshall's contributions present some gaps and ambiguities in his concepts, many contemporary economic geographers and international business scholars still take Marshall's work as the basis for the explanations of agglomeration economies, industrial districts and then, inter-firm co-operation in specific regions. Complete **definitions of cluster concept** were analyzed at **second stage** sourced from literatures, i.e., cluster, the result of improvements in the business environment, "is a geographically proximate group of interconnected companies and associated institutions in a

particular field, linked by commonalities and complementarities" (Porter, 1998). **Scope** of application of cluster concept is also found from literature and was put at **third stage**. Clusters, by definition include not only business entities such as companies, but also universities, trade associations, financial institutions, vocational training providers, economic development agencies, and any other entity that can be considered "important to competition" (Porter, 1998). Research Triangles, Technology Parks, Industrial Parks, Technology Corridor, Industrial Estates, Incubation Schemes are common examples of clustering approach. This definition of Technology Cluster offers a very significant potential for local and regional economic development initiatives in Balochistan. The Fruit and Vegetable Processing Clusters, Marble and Mineral Development Cluster, Aquaculture Cluster, Livestock and Dairy Development Cluster are few examples (Choudhary, 2003). **Role of interconnected organizations** of cluster was talked about at **fourth stage**, i.e., communities such as Silicon valley, Boston, Maryland technology corridor, Montreal, Ottawa and Saskatoon have seen the tremendous growth that can occur when industry leaders and researchers come together to identify needs and develop solutions that touch the lives of people in their sphere of influence. **Impacts of cluster concept** were placed at **fifth stage**, i.e., Felsenstein and Taylor (2001) states, much of the economic growth is found at local and regional levels in the diffusion of geographic clusters. The cluster group performs manufacturing tasks as collaborative engineering in the design phase. They share the process of designing information of product using CAD/CAPP/CAE and PDM. ERP (Enterprise Resource Planning) system management is implemented to manage the cluster company group with the same platform which would be established inside companies. Instead of

working separately, those companies would share facilities to produce standard parts. Consequently, the lead time and cost of production are reduced; the quality standard is more



Structural diagram of discussion of literature

consistent (Mitsuishi et. al., 2008). Some literatures on **cluster concept related to small businesses** were reviewed at **sixth stage**. Through these literatures, authors explain that how cluster concept can help small businesses to earn competitive advantages in this era of globalization, i.e., one of Pakistan's rare examples of consistent export success has been the

Sialkot stainless steel surgical instrument cluster. This cluster, consisting mainly of small and medium enterprises (SMEs), has as its main markets the United States and Western Europe. In recent years, access to these markets has become contingent on meeting international quality assurance standards (Nadvi, 1999). The case of the “third Italy” is well known, and it has been studied extensively, for the large concentration of specialised small firms well networked and successfully active on the world markets. At the same time, these SMEs shared social, economical and historical traditions within their local communities (Brusco, 1986; Pyke, 1990). **At the last stage** literatures related to **objective of this research** were discussed, i.e., literatures related to scope of enhancing marketing capability of light engineering small businesses of Bangladesh through cluster concept. In Bangladesh numbers of large-scale enterprises are very few, because of high entry barrier. But some clusters of small businesses are found here. These are garment, leather goods, metalworking, plastic products and electrical appliance clusters (Geographic) in greater Dhaka and the metalworking and agricultural processing clusters (Geographic) around Bogra (Hatch, 2001). Impacts of these geographic clusters on marketing capability were assessed.

CHAPTER-4

RESULTS AND DISCUSSIONS

In today's global economy, which has integrated the production and management process, clusters can be seen as a competitive tool of networking, which facilitates the development not only of local economic strategies, but also the capacity to achieve competitiveness in global markets. How can firms achieve this? Firms have a role in upgrading their cluster such as a shared understanding of the cluster's competitiveness, wide involvement of all participants and a bias towards action. The factors mentioned are important preconditions for a cluster's success. The cluster concept is based on several constructs of which some of the most important will be discussed here based on collected data and their analysis. For this research question paper was prepared and data were collected considering "how cluster concept can enhance marketing capability". The results of the research and analysis are discussed below:

4.1 GENERAL INFORMATION

The main objective of this research was to find out how cluster concept enhances marketing capability of light engineering small businesses and marketing capability is the ability of identifying and meeting human and social needs appropriately. The research started with the collection of general information on the way of collection of information for specific objectives as well as main objective. Light Engineering Sector in Bangladesh is one of the sub-sectors of SMEs. Bangladesh's light engineering sector has flourished from almost nothing to a multi-crore taka business now since the country's independence in 1971 (<http://www.zimbio.com/Bangladesh/articles/303/Light+engineering+comes+fore>). General

information is presented here using different statistical tools. In order to describe situations, draw conclusions, or make inferences about events, researcher organized the data in some meaningful way and at this stage it has been the most convenient method of organizing data, i.e., frequency distribution. Scenario of general information is being presented here using frequency distribution tables as well as discussed how these are linked with cluster formation.

4. 1. 1 Business type

Population of this research can be divided into four groups considering type of activity, i.e., manufacturing and repairing complete machinery and spare parts, manufacturing light metal products and hardware, repairing old machines and parts, and trading engineering machine parts, metal parts and hardware. Following table (Table 01) shows the activity wise distribution of the small businesses (samples). Highest numbers (33) of organizations are

Table 01: Number of Companies Considering Type of Activity

Type of Business	Frequency	Percent	Valid Percent	Cumulative Percent
Manufacturing	10	16.7	16.7	16.7
Repairing	10	16.7	16.7	33.3
Trading	7	11.7	11.7	45.0
Manufacturing & repairing	33	55.0	55.0	100.0
Total	60	100.0	100.0	

involved in manufacturing & repairing, ten (10) in repairing, ten (10) in manufacturing and rest of the organizations are involved in trading. These companies' activities are related with various types of products (appendix-3.2, page-161). Above described types of light engineering small businesses are found in the same geographic clusters in different areas of Bangladesh. Geographic cluster wise survival of different types of small businesses started

for having some synergic benefits. Trading organizations are forward linkage of manufacturing organizations and they are sharing the risk of selling of the manufactured products. On the other hand manufacturing organizations are working as backward linkage of trading organizations and supplying products for those organizations. Manufacturing organizations sometimes take repairing services from repairing organizations as well as when ultimate customers come to take repairing services also buy some products from manufacturing organizations. When consumers come to purchase final products from manufacturing organizations, can also come to know the offers provided by repairing organizations.

4. 1. 2 Assets Value

Information was also collected from assets value (cost of durable resources other than land and factory buildings) point of view. Assets value has impact on diversified decision making and thinking of the organizations of light engineering. This sector has been contributing well in Bangladesh economy. Following table (Table 02) shows the scenario of cost of durable

Table 02: Number of Companies Considering Assets Value

Assets value	Frequency	Percent	Valid Percent	Cumulative Percent
Below tk 3750000	18	30.0	30.0	30.0
Tk 3750000 to tk 7499999	16	26.7	26.7	56.7
tk 7500000 to tk 11249999	12	20.0	20.0	76.7
tk 11250000 to tk 14999999	14	23.3	23.3	100.0
Total	60	100.0	100.0	

resources other than land and factory buildings of selected companies. Highest number (30%) of companies' assets value is below tk. 3750000 and 56.7% companies' assets value is below tk. 7500000. Companies' (60) average assets value is 64,45,313 (median value). So, above information say that, most of the companies' assets values are limited which is the

signal of greater risk. If individual small firms are weak and vulnerable, networking give them strengths and networks can be increased through cluster concept (Hatch, 2001). So, surviving in the same geographic area organizations can increase their network. Cluster based organizations are already enjoying this advantage and scattered organizations can also enjoy this advantage coming under a cluster.

4. 1. 3 Number of Employees

Light engineering industry in Bangladesh has grown with informal cottage status over the years. This labor-intensive operation produces a diverse range of items having an annual valuation of about US\$ 120 million (http://www.boi.gov.bd/sector_brief.php). Following is the scenario (Table 03) of number of employees of organizations (machinery and spare parts related small businesses) from where data were collected. Highest numbers of organizations (24 out of 60) are with “Below 7” employees, that means most of the organizations are very

Table 03: Number of Companies Considering Number of Employees

Group	Frequency	Percent	Valid Percent	Cumulative Percent
Below 7	24	40.0	40.0	40.0
7 to 12	11	18.3	18.3	58.3
13 to 18	15	25.0	25.0	83.3
19 to 24	10	16.7	16.7	100.0
Total	60	100.0	100.0	

small (cottage type). Small organizations always suffer from different problems, i.e., lack of experience, indiscipline, improper planning, insufficient manpower, lack of financial management skill, inefficient marketing etc. and individually cannot solve these problems. As light engineering industry in Bangladesh has grown with informal cottage status, most of the employees are from same family and they learn through experience. But academic

knowledge is also badly needed for smooth operation of any organization. If these organizations go for collective movement can solve some of their employee related problems, and some organizations are already doing this one by joint training, knowledge sharing, joint funding etc.

4. 2 RELATIONSHIP BETWEEN MAIN VARIABLES OF LIGHT ENGINEERING ENTERPRISES

At this stage researcher tries to find out relationship between different main drivers of light engineering small organizations and cross tabulation is a way to find out that relationship. Cross-tabulation is statistical technique that describes two or more variables simultaneously and results in values that reflect the joint distribution of two or more variables that have limited number of categories or distinct values. From another point of view, cross tabulation is the merging of the frequency distribution of two or more variables in a single table. It helps us to understand how one variable such as brand loyalty relates to another variable such as sex (Malhotra, 2006). In this research at the time of collecting of data different general dimensions of the organizations, i.e., type of activities, assets value, numbers of employees were considered. Following are the joint distributions of these focusing dimensions of the organizations using cross-tabulation.

4. 2. 1 Assets value and Type of Activities

Different companies' assets value and type of activities are different. Following table (Table 04) shows joint distribution of different levels of assets value and types of activities of different business, which means how levels of assets value relate to types of activities. Table also shows that, out of 33 (55%) manufacturing and repairing companies 18 (30%) are in the

Table 04: Cross-Tabulation of Assets Value and Type of Activities

Assets Value	Type of Activities				Total
	Manufacturing	Repairing	Trading	Manufacturing and Repairing	
Below tk 3750000	6 (10%)	6 (10%)	3 (5%)	3 (5%)	18 (30%)
tk 3750000 to tk 7499999	0 (0%)	0 (0%)	4 (6.67%)	12 (20%)	16 (26.67%)
tk 7500000 to tk 11249999	1 (1.67%)	2 (3.33%)	0 (0%)	9 (15%)	12 (20%)
tk 11250000 to tk 14999999	3 (5%)	2 (3.33%)	0 (0%)	9 (15%)	14 (23.33%)
Total	10 (16.67%)	10 (16.67%)	7 (11.67%)	33 (55%)	60 (100%)

upper half, that means these type of companies require more assets value but highest numbers of manufacturing and repairing companies (20%) are with low assets value (between tk. 3750000 to 7499999). So, the study found that highest number of manufacturing and repairing companies suffer from poor assets value. And Out of 27 (45%) manufacturing, repairing and trading companies 19 (31.67%) are in the lower half, that means these type of companies require less assets value, yet some companies are suffering from poor assets value. As individually most of the firms are weak (assets value point of view), collective operation may make them strong.

4. 2. 2 Number of Employees and Type of Activities

Following table (Table 05) shows joint distribution of the number of employees and type of activities, that means how employee numbers relate to types of activities. The highest numbers of companies (12) are manufacturing and repairing companies operated by 13 to 18 employees. Most of the organizations (58.33%) are operated by only 12 or below 12 and most of them are labor type employees. So, from number of employee point of view it is also found that organizations are small in size. If this small number and inefficient

Table 05: Cross-Tabulation of Number of Employees and Type of Activities

Employee	Types of Activities				Total
	Manufacturing	Repairing	Trading	Manufacturing and Repairing	
Below 7	4	6	6	8	24
7 to 12	2	0	1	8	11
13 to 18	2	1	0	12	15
19 to 24	2	3	0	5	10
Total	10	10	7	33	60

employees can be trained, the organizations can be made competitive for this globalization era. And small size (from number of employee point of view) organizations cannot do that one individually. Cluster concept can help to solve some these problems.

4. 2. 3 Assets Value and Number of Employees

By the following table (Table 06) the study tries to show the condition of sample organizations by joint distribution of number of employees and levels of assets value. Table shows that, highest numbers of organizations (15, 25%) are operated by lowest number of employees (below 7) with lowest amount of assets value (below tk 3750000). So, from assets value and number of employee point of view organizations are small and weak. These

Table 06: Cross-Tabulation of Assets Value and Number of Employees

Assets value	Number of Employees				Total
	Below 7	7 to 12	13 to 18	19 to 24	
Below tk 3750000	15	2	0	1	18
Tk 3750000 to tk 7499999	8	5	3	0	16
tk 7500000 to tk 11249999	0	3	8	1	12
tk 11250000 to tk 14999999	1	1	4	8	14
Total	24	11	15	10	60

small and weak organizations can make them strong through establishing cluster concept as individually they cannot solve these problems.

4. 3 ANALYSIS OF FINDINGS REGARDING OBJECTIVES AND HYPOTHESES

Objective is a virtue that guides report writing. Researchers can become so fascinated with their project that they overlook their scientific role (Malhotra, 2006) and objective of the research helps them not doing such type of mistake. A hypothesis is an unproven statement or proposition about a factor or phenomenon that of interest of the researcher. It may, for example, be a tentative statement about relationships between two or more variables as stipulated by the theoretical framework or the analytical model. Often, a hypothesis is a possible answer to the research question (Malhotra, 2006). This research was done mainly based on seven specific objectives and hypotheses were developed for these objectives, i.e., (i) Collaboration with immediate stakeholders (suppliers, employees, distributors, retailers) of small businesses under LEI will result in right product mix, (ii) Sharing information of small businesses under LEI will result in right price, (iii) Geographical concentration of small businesses under LEI will result in right value delivery network, (iv) Inter-firm network of small businesses under LEI will result in integrated marketing communication, (v) Sharing knowledge within employees of small businesses under LEI will result in efficiency enhancement of employees, (vi) Mutual learning through observation of small businesses under LEI will result in greater productivity, and (vii) Collective initiative of small businesses under LEI (Light Engineering Industry) will result in maximizing benefit of organizations. To test the hypotheses different questions were developed and asked to the respondents. After collecting the data specific hypothesis wise scenario of light engineering industry is presented here through descriptive statistics.

4. 3. 1 Collaboration with Immediate Stakeholders Results in Right Product Mix

First hypothesis of this study was collaboration with immediate stakeholders (suppliers, employees, distributors, retailers) results in right product mix. Historically, distribution channels have been loose collections of independent companies, each showing little concern for overall channel performance. The conventional distribution channels have lacked strong leadership and have been troubled by damaging conflict and poor performance. The conventional distribution channel consists of one or more independent producers, wholesalers, and retailers. Each is a separate business seeking to maximize its own profit, even at the expense of profits for the system as a whole. No channel member has much control over the other members, and no formal means exist for assigning roles and resolving the channel conflict (Kotler and Armstrong, 1997). Collaboration with channel member type stakeholders can reduce the above problem of conventional distribution channel. To find out the result of collaboration with immediate stakeholders on product mix of organizations (small businesses under Light Engineering Industry), eleven (11) questions related to collaboration with stakeholders like suppliers, employees, distributors, and retailers (q6 to q16, appendix-1, page-142) were developed and asked to the respondents.

Following table (Table 07) shows the average results of answers of those eleven questions. Average mean, median and mode (central tendency) of answer of the questions are 4, 3.91 and 3.91, that means respondents agree with the hypothesis (as in the likert scale used for this research, 1=Strongly disagree 2=Disagree 3=Uncertain 4=Agree 5=Strongly agree) or the hypothesis is null, i.e., proper collaboration with immediate stakeholders (suppliers, employees, distributors, retailers) will result in right product mix and collaborative

Table 07: Summary Statistics of Collaboration with Immediate Stakeholders

Dimension	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
Mean	4.30	4.27	4.17	3.63	3.88	4.28	4.32	4.32	3.93	4.12	2.87
Median	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.00
Mode	4	4	4	4	4	4	4	4	4	4	3
Std. Deviation	.646	.710	.827	1.262	.846	.739	.748	.725	1.087	.904	1.255
Variance	.417	.504	.684	1.592	.715	.545	.559	.525	1.182	.817	1.575
Range	3	3	3	4	4	4	4	4	4	4	4
Minimum	2	2	2	1	1	1	1	1	1	1	1
Maximum	5	5	5	5	5	5	5	5	5	5	5

environment can be developed by creating cluster. Here variation between mean, median and mode is not significant, that means consistency lies between results of different parameters of measuring central tendency and answers of the respondents also consistent. Standard deviations and variances are not significant, which is also meaning of consistency of answers. Range is 3 to 4, highest answer is 5 and lowest answer is 1 that means, most of the options of the scale were answered by the respondents which are also symptom of reliability of the treatment (questionnaire). For this hypothesis question wise frequency distribution table (appendix-4.1, page-162) shows results of answers of respondents at different level of likert scale. From there we also find that most of the respondents agree or strongly agree with the hypothesis.

There are time, place and possession gaps that separate producers' products from those who would use them. Sometimes producers say that, to have shelf space of intermediaries is harder than selling the products. Shelf space is so scarce these days that manufacturers often have to offer price-offs, allowances, or free goods to retailers and wholesalers to get on the shelf and, once there, to stay on it (Kotler and Armstrong, 1997). Even when marketing and production combine to provide form or task utility, consumers won't be satisfied until time, place, and possession utility are also provided. Time utility means having the product

available when the customer wants it. Place utility means having the product available where the customer wants it. And possession utility means obtaining a good or service and having the right to use or consume it (Perreault and McCarthy, 2002). Without collaboration with stakeholders any organization cannot run smoothly. Collaboration can be increased by different ways and geographical accumulation is one of those. When same types and related organizations of light engineering will be co-located, marketers will be able to ensure right products to customers at the right time, in the right place, and at a price they're willing to pay more easily. This geographical concentration can increase marketing efficiency by increasing customer value through reducing time cost, energy cost and psychic cost. Smooth supply of raw materials is the precondition of uninterrupted production and distribution. Co-location of backward linkage organizations can ensure smooth supply of raw materials. To know about competitor is badly needed to set correct strategy. Sometimes it is not possible to know about competitors directly. This problem can be solved in some extent by collaborating with stake holders of light engineering small businesses (like wholesaler, retailer, distributor and employee), as competitor firms co-operate with same stakeholders (more or less). Sometimes producers are very far from ultimate customers. Intermediaries directly meet with forward linkage customers & sometimes employees also, and they know the need, want and reaction of customers directly. So, collaboration with these parties helps a lot in right product mix.

4. 3. 2 Sharing Information between Competitor Firms Results in Right Price

Second hypothesis of this study was Sharing information between competitor firms result in right price. Price is one of the four major variables a marketing manager controls. Price-

level decisions are especially important because they affect both the number of sales a firm makes and how much money it earns. From a customer's perspective, price is what must be given up to get the benefits offered by the rest of a firm's marketing mix, so it plays a direct role in shaping customer value (Perreault and McCarthy, 2002). For any strategy setting information is must and isolated operation of an organization can create lack of information. For lack of information an organization can set under price or over price and both are harmful. Co-located organizations can share information by hearing (directly or indirectly) or observing and reduce risk of incorrect price setting. To find out the result of sharing information on price setting of rival organizations (small businesses under Light Engineering Industry), four (4) questions related to sharing information with competitors (q17 to q20, appendix-1, page-143) were developed and asked.

Following table (Table 08) shows the average results of survey of those four questions. Average mean, median and mode (central tendency) of answer of the questions are 3.74, 4 and 4, that means respondents agree with the hypothesis (as in the likert scale used for this research, 1=Strongly disagree 2=Disagree 3=Uncertain 4=Agree 5=Strongly agree) or hypothesis is null, i.e., through sharing information competitor and interconnected firms can set right price and co-located survival can be more helpful for information sharing. Here variation between mean, median and mode is not significant, that means consistency lies between results of different parameters of measuring central tendency and answers of the respondents also consistent. Standard deviations and variances are not significant, what is also the meaning of consistency of answers. Range is 4, highest answer is 5 and lowest answer is 1 that means, most of the options of the scale were answered by the respondents,

Table 08: Summary Statistics of Sharing Information between Competitor Firms

Dimension	Q17	Q18	q19	Q20
Mean	3.72	3.78	3.67	3.78
Median	4.00	4.00	4.00	4.00
Mode	4	4	4	4
Std. Deviation	.993	.885	.837	.922
Variance	.986	.783	.701	.851
Range	4	4	4	4
Minimum	1	1	1	1
Maximum	5	5	5	5

which is a symptom of reliability of the treatment (questionnaire). For this hypothesis question wise frequency distribution tables (appendix-4.2, page-164) show results of answers of respondents at different level of likert scale. From there we also find that most of the respondents agreed with the hypothesis.

The price the company charges will be somewhere between one that is too low to produce a profit and one that is too high to produce any demand. Product costs set a floor to the price; consumer perceptions of the product's value set the ceiling. The company must consider competitors' prices and other external and internal factors to find the best price between two extremes (Kotler and Armstrong, 1997). Cluster operation of light engineering small businesses helps in reducing cost by sharing information of purchasing cost, sharing information of distribution cost, and sharing information of business development services (BDS) between competitor firms and related organizations because they are linked by commonalities and complementarities. Customers' perception can be also understood by gathering adequate information and co-located enterprises can share information through word of mouth and observation more easily than scattered enterprises. Organizations which are isolated from other competitor organizations or are not well informed about competitors organizations may think that they have set the right price, but may not be the appropriate one

as they are in the dark. On the other hand, surviving from same geographic area may help to know the variables to be considered to set right price. Knowledge makes people powerful, and having correct information by sharing with competitors small businesses can strongly bargain with suppliers and customers.

4. 3. 3 Geographical Concentration Results in Right Value Delivery Network

Third hypothesis of this study was geographical concentration results in right value delivery network. A value network is a system of partnerships and alliances that a firm creates to source, augment, and deliver its offerings. A value network includes a firm's suppliers and its suppliers' suppliers, and its immediate customers and their end customers (Kotler and Keller, 2005). To find out the result of geographical concentration on value delivery network of organizations (same types of small businesses under Light Engineering Industry), thirteen (13) questions related to co-location with suppliers and customers were developed and asked (q21 to q33, appendix-1, page-143).

Following table (Table 09) shows the average results of survey of those thirteen questions. Average mean, median and mode (Central tendency) of answer of the questions are 3.97, 4.23 and 4.31, that means respondents agree with the hypothesis (as in the likert scale used for this research, 1=Strongly disagree 2=Disagree 3=Uncertain 4=Agree 5=Strongly agree) or the hypothesis is null, i.e., by co-locating same types of and interconnected organizations will be able to create right value delivery network and co-location idea is found in cluster concept. Here variation between median and mode is not significant, that means consistency lies between results of different parameters of measuring central tendency and answers of

Table 09: Summary Statistics of Geographical Concentration of Light Engineering Organizations

	Q21	Q22	Q23	q24	Q25	Q26	q27	Q28	q29	q30	q31	Q32	Q33
Mean	4	3.63	4.40	4.08	4.32	4.58	3.9	3.85	3.27	4.08	3.7	4.02	3.82
Median	5	4.00	5.00	4.00	5.00	5.00	4	4.00	3.00	4.00	4.0	4.00	4.00
Mode	5	4	5	5	5	5	4	4	3	4	4	4	4
Std. Deviation	1.4	1.3	1.01	1.09	.911	.743	1.1	.954	.918	.889	1.066	.911	1.00
Variance	1.9	1.6	1.02	1.19	.830	.552	1.1	.909	.843	.790	1.2	.830	1.00
Range	4	4	4	4	4	4	4	4	4	4	4	4	4
Minimum	1	1	1	1	1	1	1	1	1	1	1	1	1
Maximum	5	5	5	5	5	5	5	5	5	5	5	5	5

the respondents also consistent. Standard deviations and variances are not significant, which is also meaning of consistency of answers. Range is 4, highest answer is 5 and lowest answer is 1 that means, most of the options of the scale were answered by the respondents which is symptom of reliability of the treatment (questionnaire). For this hypothesis question wise frequency distribution table (appendix-4.3, page-165) shows results of answers of respondents at different level of likert scale. From there we also find that most of the respondents **agreed or strongly agree** with the hypothesis.

Distribution channel (value delivery network) is a set of interdependent organizations involved in the process of making a product or service available for use or consumption by the consumer or business user. Historically, distribution channel have been loose collections of independent companies, each showing little concern for overall channel performance. These **conventional distribution channels** have lacked strong leadership and have been troubled by damaging conflict and poor performance. One of the biggest recent channel developments has been the **vertical marketing systems** that have emerged to challenge conventional marketing channels. A **vertical marketing system (VMS)** consists of producers, wholesalers, and retailers acting as a unified system. One channel member owns

the others, has contracts with them, or wields so much power that they all operate. Vertical marketing can be three types, i.e., corporate VMS, contractual VMS, and administered VMS. In a corporate VMS, coordination and conflict management are attained through common ownership at different levels of the channel. In a contractual VMS, they are attained through contractual agreements among channel members. In an administered VMS, leadership is assumed by one or a few dominant channel members (Kotler and Armstrong, 1997).

So, right value delivery network can be set by developing relation between channel members (from supplier to consumer) through reducing conflict and increasing coordination. Out of different ways of developing relation, one way is operating from same geographic area. When forward linkage and backward linkage organizations of light engineering are in the same cluster, gaps of these channel members can be removed by common ownership, or by contractual ownerships, or by one or a few dominant channel members. If same types of organizations operate from same geographic area, they can share material, final products, machinery use, and after sales services to satisfy customers timely or to provide more customer value. When organizations are in a same geographic area, customers can be sent to organizations with idle production capacity at the time of overfull demand and productivity of both sides can be increased. By mistake, sometime customers go to wrong organizations, can be sent to right organization if they are closely available and correct value delivery network can be developed. Where there is customer, there is seller or where there is seller, there is customer. When some same types of organizations will be operated from same geographic area, some backward linkage and forward linkage organizations will be also there, and will help to form right value delivery network. If organizations survive in a cluster

will be able to face intermediary dominance by increasing their strength as well as by disintermediation. Geographically concentrated vertically integrated organizations can reconfigure value delivery network at any time, as they can understand the environment easily. Co-located same types of organizations can establish 'one stop shop' easily.

4. 3. 4 Inter-firm Network Results in Integrated Marketing Communication

Maskell et al. (1998), explain that the creation of informal networks go through several phases, from relations between two individuals to entire networks, where their transfer knowledge among them. Furthermore, these relationships are done both vertically and horizontally, where common understanding and trust are the common features (Maskell, 2001). Integrated marketing communication is a concept of marketing communications planning that recognizes the added value of a comprehensive plan. Such a plan evaluates the strategic roles of a variety of communications disciplines – for example, general advertising, direct response, sales promotion and public relation – and combines these disciplines to provide clarity, consistency, and maximum impact through the seamless integration of messages. Marketing communication mix consists of six major modes of communication, i.e., advertising, sales promotion, events and experiences, public relations and publicity, direct marketing and personal selling (Kotler and Keller, 2005). Enterprises under light engineering industry do not take marketing communication activities so seriously. They mainly use advertising, personal selling, sales promotion and public relation. Fourth hypothesis of this study was inter-firm network results in integrated marketing communication. To find out the result of inter-firm network on integrated marketing communication of organizations (same types of small businesses under Light Engineering

Industry), eight (8) questions related to joint marketing communication, form primary market, advertising, personal selling, sales promotion, public relation, integrated marketing communication, and brand primary market (q34 to q41, appendix-1, page-144) were developed and asked.

Following table (Table 10) shows the average results of survey of those eight questions. Average mean, median and mode (Central tendency) of answer of the questions are 3.77, 4 and 4, that means respondents agree with the hypothesis (as in the likert scale used for this research, 1=Strongly disagree 2=Disagree 3=Uncertain 4=Agree 5=Strongly agree) or the hypothesis is null, i.e., inter-firm network of small businesses will results in integrated marketing communication and by creating cluster inter-firm network can be increased. Here

Table 10: Summary Statistics of Inter-Firm Network of Light Engineering Enterprises

	Q34	Q35	q36	Q37	Q38	q39	Q40	Q41
Mean	3.30	3.60	4.07	3.72	4.15	3.92	3.68	3.72
Median	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Mode	4	4	4	4	4	4	4	4
Std. Deviation	1.139	.995	.578	.904	.755	.907	.725	.825
Variance	1.298	.990	.334	.817	.570	.823	.525	.681
Range	4	4	3	4	4	4	4	4
Minimum	1	1	2	1	1	1	1	1
Maximum	5	5	5	5	5	5	5	5

variation between mean, median and mode is not significant, that means consistency lies between results of different parameters of measuring central tendency and answers of the respondents also consistent. Standard deviations and variances are not significant, which is also meaning of consistency of answers. Range is 3 to 4, highest answer is 5 and lowest answer is 1 that means, most of the options of the scale were answered by the respondent which is symptom of reliability of the treatment (questionnaire). For this hypothesis

question wise frequency distribution table (appendix-4.4, page-168) shows results of answers of respondents at different level of likert scale. From there we also find that most of the respondents agreed or strongly agree with the hypothesis.

When light engineering small businesses are in the same geographic area and under same management, can take initiatives of marketing communication strategy jointly, because individually small businesses are weak and they individually cannot go for any major promotional activity through mass media. For these major promotional activities through mass media their joint demand as well as individual demand will increase. Surviving from same geographic area small enterprises can learn (through observation and word of mouth) to set advertising strategy, personal selling strategy, sales promotion strategy, public relation strategy, and integrated marketing communication strategy individually through inter-firm network. Sometimes small businesses are benefited by the promotional activity of medium or big sizes organization, if they are in the same geographic area. Because when customers come to buy products or services being attracted by the promotional activities of medium or large sizes organizations, also buy some products from small sizes organization because of quality and exceptionality.

4. 3. 5 Sharing Knowledge within Employees Results in Efficiency Enhancement of Employees

Economic value is created through what Schmitz and Nadvi (1999) call *collective efficiency*. Collective efficiency is the competitive advantage that can be attained through the combination of external economies of scale and joint action. While external economies of scale are *passive* (and often fall into the producer's lap) joint action is *active* and can only be

derived through conscious collaboration (Schmitz and Nadvi, 1999). Collective efficiency is powerful and is the essence and lifeblood of successful cluster-based economic development initiatives (Reid and Carroll, 2009). When same types of organizations operate from same geographic area, employees of those organizations formally or informally share knowledge. Fifth hypothesis of this study was sharing knowledge within employees result in efficiency enhancement of employees. To find out the result of sharing knowledge within employees on degree of efficiency enhancement of organizations (same types of small businesses under Light Engineering Industry), seven (7) questions related to trust, norms of the society, social network, efficiency enhancement through electronic media, efficiency enhancement through word of mouth, internal specialization, and management economies (q42 to q48, appendix-1, page-144) were developed and asked.

Following table (Table 11) shows the average results of survey of those seven questions. Average mean, median and mode (Central tendency) of answer of the questions are 4.31, 4.57 and 4.57, that means respondents agree or strongly agree with the hypothesis (as in the likert scale used for this research, 1=Strongly disagree 2=Disagree 3=Uncertain 4=Agree 5=Strongly agree) or the hypothesis is null, i.e., sharing knowledge within employees of same types and interconnected organizations will increase collective efficiency and cluster

Table 11: Summary Statistics of Sharing Knowledge of Employees of Small Organizations

Dimensions	q42	Q43	Q44	q45	q46	q47	Q48
Mean	4.62	4.57	4.52	4.62	4.18	3.77	3.88
Median	5.00	5.00	5.00	5.00	4.00	4.00	4.00
Mode	5	5	5	5	4	4	4
Std. Deviation	.585	.563	.567	.555	.624	.745	.715
Variance	.342	.318	.322	.308	.390	.555	.512
Range	2	2	2	2	2	3	4
Minimum	3	3	3	3	3	2	1
Maximum	5	5	5	5	5	5	5

based business operation is very much supportive for sharing knowledge. Here variation between mean, median and mode is not significant, that means consistency lies between answers of the respondents. Standard deviations and variances are less, which is also meaning of consistency of answers. Range is 2 to 4, highest answer is 5 and lowest answer is 1 that means, most of the options of the scale were answered by the respondent which is symptom of reliability of the treatment (questionnaire). For this hypothesis question wise frequency distribution table (appendix-4.5, page-169) shows results of answers of respondents at different level of likert scale. From there we also find that most of the respondents **agreed or strongly agreed** with the hypothesis.

Service type activities of any organization and factory mainly create two types of utilities, i.e., form and task. Together, production and marketing supply five kinds of economic utility – form, task, time, and possession utility – that are needed to provide consumer satisfaction (Perreault and McCarthy, 2002). Question may arise how many utilities are created by marketing or marketing creates form and task utilities or not. Form utility is provided when someone produces something tangible – for instance, a bicycle. Task utility is provided when someone performs a task for someone else – for instance, when a bank handles financial transactions (Perreault and McCarthy, 2002). Form utility is created by production department and task utility is created by different business activities (mainly by services marketing organizations). Whatever is produced by these two areas is produced by the direction of marketing department. Because, at first marketing department identifies needs and requirement of customers and directs the production department to produce that type of products (may be tangible or intangible). Different departments of an organization are

interconnected, any single department cannot be operated smoothly without help of other departments and ultimate goal of all the departments is to increase sale and make profit. So, by sharing knowledge within employees of light engineering small businesses if efficiency is enhanced, all the departments will be benefited and as a vital department of any organization marketing capability will be also enhanced. It may be noticed that, in small size organizations mainly production and marketing activities are broadly found. If same types and interconnected organizations do business from same geographic area and under same management, employees get opportunity to share knowledge which is not possible in case of scattered organizations. Sharing knowledge light engineering employees can be benefited by different ways, i.e., increases trust on each other, increases social network, knowing about norms of the society, increases internal specialization, generating management economies, and ultimately enhancing efficiency.

4. 3. 6 Mutual Learning through Observation Results in Greater Productivity

Successful clusters promote collective learning that tends to be bottom-up and interactive in nature (Landabaso, 1995). Participation in a cluster enables firms to operate more productively. It does so because cluster participants have better access to resources such as information, ideas, technology, suppliers, and markets than they would have if they were operating in isolation (Reid and Carroll, 2009). Sixth hypothesis of this study was mutual learning through observation results in greater productivity. To find out the result of mutual learning on degree of productivity of organizations (same types of small businesses under Light Engineering Industry), four (4) questions related to development own infrastructure,

weak points of own organization, adopt the marketing strategies of leading organizations, and reactive action (q49 to q52, appendix-1, page-145) were developed and asked.

Following table (Table 12) shows the average results of survey of those four questions. Average mean, median and mode (Central tendency) of answer of the questions are 4.34, 4.25 and 4.25, that means respondents agree or strongly agree with the hypothesis (as in the likert scale used for this research, 1=Strongly disagree 2=Disagree 3=Uncertain 4=Agree 5=Strongly agree) or the hypothesis is null, i.e., by learning from each other through observation it is possible to increase total productivity and leaning through observation is only possible if businesses are operated from quickly reachable and seeable geographic area. Here variation between mean, median and mode is not significant, that means consistency lies between answers of the respondents. Standard deviations and variances are less, which is also meaning of consistency of answers. Range is 2 to 4, highest answer is 5 and lowest answer is 1 that means, most of the options of the scale were answered by the respondent,

Table 12: Summary Statistics of Mutual Learning through Observation

Dimensions	q49	Q50	q51	Q52
Mean	4.28	4.68	4.08	4.32
Median	4.00	5.00	4.00	4.00
Mode	4	5	4	4
Std. Deviation	.783	.504	.696	.624
Variance	.613	.254	.484	.390
Range	4	2	3	2
Minimum	1	3	2	3
Maximum	5	5	5	5

which is symptom reliability of the treatment (questionnaire). For this hypothesis question wise frequency distribution table (appendix-4.6, page-171) shows results of answers of respondents at different level of likert scale. From there we also find that most of the respondents **agreed or strongly agreed** with the hypothesis.

In modern economies, the grass grows high on the path to the better mousetrap factory – if the new mousetrap is not properly marketed (Perreault and McCarthy, 2002). Production of any organization is mainly related with production department, i.e., factory but productivity is related with overall performance of any organization. So, employee efficiency and quality products are not the only prerequisite of greater productivity. For greater productivity some other factors need to consider also like infrastructure of the organization, finding out limitations comparing with competitors, learning from superior, and taking proactive action. Cluster operation of light engineering small businesses can help a lot to enhance the above factors. When organizations are in the same geographic area, one can see the infrastructure of others easily learn the strategies of infrastructure development. On the other hand, as clustered organizations are linked by common management can take any major initiative jointly. Organizations being isolated can think them strong enough, but when they are closer can understand about their strength or limitations. Sometimes superior organizations don't mind if inferior organizations follow them. Geographic concentration gives the better opportunity to follow superior. Organizations can solve problems before facing by following experienced companies or taking help from them, if they are in the same cluster. If total productivity of any organization is increased, productivity of marketing is also increased as marketing activities are part of total business activities.

4. 3. 7 Collective Initiative Results in Maximizing Benefit of Organizations

Clustering is really a process whereby competitor firms work together to solve problems and address challenges that, due to the lack of resources, they are unable to address and solve as individual business entities (Reid and Carroll, 2009). Seventh hypothesis of this study was

collective initiative results in maximizing benefit of organizations. To find out the result of collective initiative on degree of benefit of organizations (same types of small businesses under Light Engineering Industry), twenty (20) questions related to purchasing cost, distribution cost, fund for the industry, business development services, bureaucratic snafu, managing government for taking necessary steps, gap between corporate world and academic education, training for employees, contemporary technology, business ethics, special fund for employees, political problems, electricity problems, cultural programs, standardization related suggestions, grading related suggestions, design related suggestions, development of new products, quality testing related services, and business friendly environment (q53 to q72, appendix-1, page-145) were developed and asked.

Following tables (Table 13, part 1&2) shows the average results of survey of those twenty questions. Average mean, median and mode (Central tendency) of answer of the questions are 4.27, 4.33 and 4.4, that means respondents agree or strongly agree with the hypothesis (as in the likert scale used for this research, 1=Strongly disagree 2=Disagree 3=Uncertain 4=Agree 5=Strongly agree) or the hypothesis is null, i.e., through collective initiative organizations will have maximum benefit and co-location ensures better collective initiative. Here variation between mean, median and mode is not significant, that means consistency

Table 13 (part-1): Summary Statistics of Collective Initiative of Organizations

Dimensions	Q53	Q54	q55	q56	Q57	q58	Q59	Q60	q61	q62
Mean	3.93	3.48	4.08	4.25	4.15	4.63	3.87	4.50	4.52	4.23
Median	4.00	4.00	4.00	4.00	4.00	5.00	4.00	5.00	5.00	4.50
Mode	4	4	4	4	4	5	4	5	5	5
Std. Deviation	1.056	.983	.996	.876	.880	.637	.947	.725	.624	1.064
Variance	1.114	.966	.993	.767	.774	.406	.897	.525	.390	1.131
Range	4	4	4	4	4	3	4	3	2	4
Minimum	1	1	1	1	1	2	1	2	3	1
Maximum	5	5	5	5	5	5	5	5	5	5

Table 13 (part-2): Summary Statistics of Collective Initiative of Organizations

Dimensions	Q63	Q64	Q65	Q66	q67	q68	Q69	q70	Q71	Q72
Mean	4.43	3.52	4.33	4.53	4.40	4.32	4.37	4.47	4.48	4.85
Median	4.50	4.00	4.00	5.00	4.00	4.00	4.00	4.00	4.50	5.00
Mode	5	3	5	5	4	4	4	4	5	5
Std. Deviation	.621	1.157	.816	.650	.643	.567	.581	.536	.537	.481
Variance	.385	1.339	.667	.423	.414	.322	.338	.287	.288	.231
Range	2	4	4	3	3	2	2	2	2	3
Minimum	3	1	1	2	2	3	3	3	3	2
Maximum	5	5	5	5	5	5	5	5	5	5

lies between answers of the respondents. Standard deviations and variances are not significant, which is also meaning of consistency of answers. Range is 2 to 4, highest answer is 5 and lowest answer is 1 that means, most of the options of the scale were answered by the respondent which is symptom of reliability of the treatment (questionnaire). For this hypothesis question wise frequency distribution table (appendix-4.7, page-172) shows results of answers of respondents at different level of likert scale. From there we also find that most of the respondents **agreed or strongly agree** with the hypothesis.

If individual small firms are weak and vulnerable, networking give them strengths and networks can be increased through cluster concept (Hatch, 2001). Joint bargaining with associated organizations always brings more benefit than individual bargaining and cluster operation gives more opportunity of joint bargaining. For joint bargaining teamwork is badly needed and co-located operation of small businesses gives more opportunity for that one. There are some issues which cannot be solved individually (some are especially for small businesses), collective initiative is the only way of solution and collective initiative is one of the important characteristics of cluster concept. Cost efficiency can be earned for purchasing and distribution through joint purchase and distribution more effectively when organizations are in the same geographic area. There are some other activities of marketing, cannot be

performed efficiently by small businesses individually like new product development, standardization, grading, product designing, and quality testing because of nature of business. Light engineering small businesses can manage these services from different associated organizations jointly by least cost. There are some common activities badly needed to perform efficiently for the overall performance of the light engineering small businesses like managing fund, managing business development services, managing bureaucratic snafu, managing government for taking necessary steps, removing gap between corporate world and academic education, managing job related training for employees, having idea about contemporary technology, giving ideas to employees about business ethics, managing special fund for employees, minimizing losses for political problems, minimizing losses for electricity problems, arranging different cultural programs, and managing business friendly environment. Some of these activities rarely can be performed by light engineering small businesses individually. But most of the activities are impossible to perform for individual small businesses. According to the entrepreneurs of this industry, joint operation can help a lot solve these problems and ultimately individual organizations will be benefited. If marketing problems can be solved, marketing capability will be enhanced automatically. On the other hand, if common problems of the organizations can be solved, marketing will be also benefited as a vital part of any organization.

4. 4 ANALYSIS OF VARIANCE (ANOVA) AND F TEST

Analysis of variance is used for examining the differences in the mean values of the dependent variable associated with the effect of the controlled independent variables, after taking into account the influence of the uncontrolled independent variables. Essentially, analysis of variance is used as a test of means for two or more populations. The null hypothesis, typically, is that all means are equal (Malhotra, 2006) and the alternative hypothesis is that at least one mean will be different. When an F test is used to test a hypothesis concerning the means of three or more populations, the technique is called analysis of variance. If there is no difference in the means, the between-group variance estimate will be approximately equal to 1. However when the means differ significantly, the between-group variance will be much larger than the within-group variance; the test value will be significantly greater than 1; and the null hypothesis will be rejected (Bluman, 19998). ANOVA was used to understand degree of similarity and dissimilarity of perception toward ‘cluster concept to enhance marketing capability of small businesses’ of different groups (considered from assets value, number of employees and types of activity point of view).

4. 4. 1 Analysis of Variance (ANOVA) and F Test of Groups Considering Assets Value

For this research considering assets value (cost of durable resources other than land and factory buildings) total small business enterprises were divided into four groups, i.e., below tk.750000, tk.750000 to tk.7499999, tk.7500000 to tk.11249999, and tk.12500000 to tk.14999999. ANOVA was used to understand the perception of different groups which are called test units (as test units’ assets values vary significantly) toward treatment (questionnaire) for 67 questions. After analysis (using SPSS) based on collected data study

found **F value** (which is called calculated value, appendix-5.1, page-176) for every individual question (q6 to q72, appendix-1, page-142). At 5% significance level critical value of this test is 2.76 (d.f.N.=3, d.f.D.=56). After comparing critical value and calculated values the result shows that hypotheses of most of the questions are null (except five questions) as critical value is less than calculated values, that means perception of the groups more or less same, i.e., cluster creation of small businesses Light Engineering Industry will enhance marketing capability. Only for five questions (q21, q56, q60, q61, and q70) mean value between the groups vary significantly (at least one mean is different from others), that means hypotheses for these questions are alternative.

Statement of the question no.21 was “co-location of many light engineering small firms will make possible to share material at the time of need”. For this question dissimilar answers were found from the respondents. Groups with lower assets value (lower end groups) agreed more with the statement, as they have shortage of capital sometimes need to take material from neighbor organizations. Groups with higher assets value (higher end groups) agreed less with the statement, as they have more capital very few times they take material from neighbor organizations. Statements of the question no.56, 60, 61 and 70 are collective initiative will make possible to manage business development services, collective initiative will make possible to manage job related training for employees, collective initiative will make possible to give idea about contemporary technology, and collective initiative will make possible to manage cooperation of different organizations to develop new products according to the choice of the customer. Some members of groups with lower assets value (lower end groups) disagreed with the statements, as they have doubt about upper end

groups. For collective initiative they (all small businesses) need an association and those members of lower end groups think by forming this association upper end group will be more benefited. Upper end groups agreed more with the statement, but they think lower end groups are very much own benefit oriented, they do not think about the industry and their thinking is back dated. So, they have some differences because of lack of trust. Moreover, as formal cluster is yet to establish, organizations do not realize the benefit of cooperation.

4. 4. 2 Analysis of Variance and F Test of Groups considering Number of Employees

For this study considering number of employee total small business enterprises were divided into four groups, i.e., Below 7, 7 to 12, 13 to 18, and 19 to 24. ANOVA was used to understand the perception of different groups which are called test units (as test units' numbers of employee vary significantly) toward treatment (questionnaire) for 67 questions. After analysis (using SPSS) based on collected data study found **F value** (which is called calculated value, appendix-5.2, page-181) for every individual question (q6 to q72, appendix-1, page-142). At 5% significance level critical value of this test is 2.76 (d.f.N.=3, d.f.D.=56). After comparing critical value and calculated values the result shows that hypotheses of most of the questions are null (except four questions) as critical value is less than calculated values, that means perception of the groups more or less same, i.e., cluster creation of small businesses Light Engineering Industry will enhance marketing capability. Only for four questions (q6, q28, q61, and q65) mean values between the groups vary significantly (at least one mean is different from others), that means hypotheses for these questions are alternative.

Statements of the question no.6 and 28 are through collaboration with suppliers it will be possible to get smooth supply of raw materials and co-location of many light engineering small firms will make possible to attract many supplier to take position in the cluster. Very few members of these groups were so illiterate and isolated that they could not realize the benefit of the cluster concept properly, though researcher tried his level best to make them understand the matter. Subject matter of the question no.61 and 65 are collective initiative will make possible to give idea about contemporary technology and collective initiative will make possible to minimize losses for electricity problems. Some lower assets value members (under lower end groups) disagreed with the statements, as they have doubt about upper end groups. They think that, by collective initiative only upper end group members become gainer. Association leaders take membership fee from them but do not provide adequate help at the time of need. Upper end groups agreed more with the statement, but they think lower end groups are very much own benefit oriented, they do not think about the industry and their thinking is back dated. So, they have some differences because of lack of trust.

4. 4. 3 Analysis of Variance and F Test of Groups Considering Type of Activity

For this study considering type of activity total small business enterprises were divided into four groups, i.e., manufacturing and repairing, repairing, manufacturing, and trading. ANOVA was used to understand the perception of different groups which are called test units (as test units' types of activity vary significantly) toward treatment (questionnaire) for 67 questions. After analysis (using SPSS) based on collected data study found **F value** (which is called calculated value, appendix-5.3, page-186) for every individual question (q6

to q72, appendix-1, page-142). At 5% significance level critical value of this test is 2.76 (d.f.N.=3, d.f.D.=56). After comparing critical value and calculated values the result shows that hypotheses of more than two third questions (47 out of 67) are null as critical value is less than calculated values, that means perception of the most of the group members is similar, i.e., cluster creation of small businesses under Light Engineering Industry will enhance marketing capability. Hypotheses of about one third questions (20 out of 67, i.e., q9, q10, q11, q14, q15, q19, q21, q23, q25, q26, q27, q28, q33, q38, q47, q48, q51, q52, q61 and q63) are alternative as critical value is more than calculated values, that means, for these every individual question at least one mean is different from other groups' mean.

Statements of question no. q9, q10, q11, q14, q15, q19, q21, q23, q25, q26, q27, q28, q33, q38, q47, q48, q51, q52, q61 and q63 are through collaboration with distributor it will be possible to identify needs of customers, through collaboration with retailer it will be possible to identify needs of customers, through collaboration with intermediaries (distributor and retailer) it will be possible to know about competitors' products, through collaboration with intermediaries (distributor and retailer) it will be possible to differentiate products, through collaboration with intermediaries (distributor and retailer) it will be possible to modify products regularly, well informed (sharing information) small businesses under LEI will be able to ignore dominance of customer on pricing, co-location of many light engineering small firms will make possible to share material at the time of need, co-location of many light engineering small firms will make possible to share machinery use at time of need, co-location of many light engineering small firms will make possible to transfer customers to another organization at the time of overfull demand, co-location of many light engineering

small firms will make possible to transfer customers to another suitable organization, co-location of many light engineering small firms will make possible to deliver products timely (by reducing production related problems), co-location of many light engineering small firms will make possible to attract many supplier to take position in the cluster, co-location of many light engineering small firms will make possible to establish 'one stop shop', inter-firm network of small businesses will make possible to set own sales promotion strategy, sharing knowledge within employees of small businesses will make possible to increase internal specialization, sharing knowledge within employees of small businesses will make possible to generate management economies, Mutual learning of light engineering small businesses through observation will make possible to adopt the marketing strategies taken by leading organizations, mutual learning through observation will make possible to take corrective action before facing the problem, collective initiative will make possible to give idea about contemporary technology, and collective initiative will make possible to manage special fund for employees.

Here it is found that, variation of perception between the groups is significant and more than previous two grouping (depending on type of activity and assets value). This research is mainly based on manufacturing and repairing companies because marketing activities are broadly found in this group. But other three types of enterprises, i.e., manufacturing, repairing, and trading were also considered for this study to know the overall perception of this sub-sector toward cluster concept. Manufacturing and repairing companies are with big size, more employee, more efficient employee, more practice of modern marketing and management than other three groups and this group is linked with more stakeholders. Members of this group are strongly in favor of cluster concept, because needs of these types

of enterprises are related with the benefits of the cluster concept. Manufacturing companies are also in favor of cluster concept, because members of this group think cluster concept will help them to reduce production cost as well as to increase total productivity but their understanding about cluster concept is not so good. Other two groups' business nature is less similar with the characteristics of cluster concept, that is why some members of those two groups disagreed little bit with the concept and alternative hypotheses were found for twenty (20) questions. But overall scenario of this study is in favor of cluster concept.

4. 5 MEASUREMENT OF INTERNAL CONSISTENCY

Internal consistency reliability is used to assess the reliability of a summated scale where several items are summated to form a total score (Malhotra, 2006). Conceptually, reliability is defined as the degree to which measures are free from error and therefore yield consistent results (Peter, 1979). In this study seven dimensions or constructs were considered. Under each dimension number of items or variables was also considered. The consistency measurement started with the analysis of Cronbach Coefficient Alpha. The Cronbach's α (alpha) or coefficient alpha, is the average of all possible split-half coefficients resulting from different ways of splitting the scale items (Malhotra, 2006). It has an important use as a measure of the reliability of a psychometric instrument. It was first named as alpha by Cronbach (1951). Alpha value considering all the items and alpha values of each dimension were assessed. Resulting value of total item coefficient alpha was .725 and alpha values of each individual dimension ranged between .660 to .821. Individual item value suggested that deletion of one item with low item-to-total correlation would improve the alpha values. Hence, four items (variables), item 16 (q16), 31 (q31), 32 (q32) & 33 (q33) showing low

Table 14: Consistency Test Results of Cluster Concept

Sl No.	Dimensions	Number of Items	Alpha Values
1.	Collaboration with stakeholders	10	.742
2.	Sharing information	4	.710
3.	Geographical concentration	10	.782
4.	Inter-firm network	8	.660
5.	Sharing knowledge among employees	7	.774
6.	Mutual learning by observation	4	.711
7.	Collective initiative	20	.821

item-to-total correlations were deleted (Appendix-6.1 and 6.3, pages-192 and 195). Coefficient alpha was again assessed for the remaining 63 items (variables) and alpha value of all the items increased to .743 (Table-14). This coefficient alpha or Cronbach's α varies from 0 to 1, and a value of 0.6 or less generally indicates unsatisfactory internal consistency reliability (Malhotra, 2006). The minimally acceptable reliability for preliminary research should be in the range of .50 to .60 (Nunnally, 1967). Thus, the high alpha values indicated good internal consistency among items (variables) within each dimensions or hypothesis (Cronbach, 1951). Therefore, the 63 items were considered for further testing.

4. 6 MEASUREMENT OF THE FACETS

Factor analysis is a general name denoting a class of procedures primarily used for data reduction and summarization. In marketing research, there may be a large number of variables, most of which are correlated and which must be reduced to a manageable level. Relationships among sets of many interrelated variables are examined and represented in

terms of a few underlying factors (Malhotra, 2006). Factor analysis was performed for all the hypotheses.

4. 6. 1 Collaboration with Immediate Stakeholders (suppliers, employees, distributors, and retailers) of Small Business under LEI will Result in Right Product Mix (hypothesis1)

Under this hypothesis one item (q16, i.e., collaboration with immediate stakeholders will make possible to share cost of marketing research) was deleted at the time of analysis of Cronbach Coefficient Alpha for showing low item-to-total correlation. Then factor analysis was performed on rest of the ten items (from q6 to q15, page-142), i.e., collaboration with suppliers for smooth supply of raw materials, collaboration with suppliers for getting raw material according to requirement, collaboration with employees for identification of need of customers, collaboration with distributor for identification of need of customers, collaboration with retailer for identification of need of customers, collaboration with intermediaries to know about competitors' products, collaboration with intermediaries to know about strength of competitors' products, collaboration with intermediaries to know about weaknesses of competitors' products, collaboration with intermediaries will make possible to differentiate products, and collaboration with intermediaries will make possible to modify products regularly to see whether the construct measured was empirically associated with measures of other conceptually related variables.

Conducting a factor analysis on a single summated scale will show whether all items within the summated scale load on the same construct, or whether the summated scale actually measures more than one construct. It is specified both the number of dimensions in the construct and the specific items or scales which are hypothesized to load on those

dimensions a priori. Principal component analysis using a varimax rotation technique generated 4 (four) factors but failed to produce a clear factor pattern (Appendix-7.1, pp. 202).

Table 15: Principal Component Analysis Results for the Final Four (04) **Right Product Mix** Measurement Items

Item	Factor 1	Factor 2	Factor 3	Factor 4
11. Know about competitors' products	.819	-.320	-.069	-.072
12. Strengths of competitors' products	.827	-.463	-.132	-.090
13. Weaknesses of competitors' products	.854	-.429	-.112	-.099
14. Product differentiation	.333	.671	-.515	-.076

The principal component factor analysis results show that all the 4 items loaded on 4 factors

Item 6, 7, 8, 9, 10, and 15, i.e., collaboration with suppliers for smooth supply of raw materials, collaboration with suppliers for getting raw material according to requirement, collaboration with employees for identification of need of customers, collaboration with distributor for identification of need of customers, collaboration with retailer for identification of need of customers, and collaboration with intermediaries will make possible to modify products regularly had the problem of high loading on more than one dimension. Thus, factor analysis was performed with item 6, 7, 8, 9, 10, and 15 dropped and principal component analysis using a varimax generated four distinctive dimensions with clear factor patterns (Appendix-7.1, page-204). Items from the same dimension loaded high on one factor and low on all the others (Table 15).

4. 6. 2 Sharing Information of Small Businesses will Result in Right Price (hypothesis-2)

Under this hypothesis no item was deleted at the time of analysis of Cronbach Coefficient Alpha for showing high item-to-total correlation ($\alpha=.710$). So factor analysis was performed

on all of the four items (from q17 to q20, page-143), i.e., sharing information within light engineering firms will make possible to set appropriate price, sharing information within light engineering firms will make possible to increase bargaining power, sharing information within light engineering firms will make possible to ignore dominance of customer on pricing, and sharing information within light engineering firms will make possible to set value based price to see whether the construct measured was empirically associated with measures of other conceptually related variables. Conducting a factor analysis on a single

Table 16: Principal Component Analysis Results for the Final Three (03) **Right Price Mix** Measurement Items

Item	Factor 1	Factor 2
17. Information sharing & right price setting	.702	-.612
18. Information sharing & more bargaining power	.833	-.347
20. Information sharing & value based pricing	.722	.459

The principal component factor analysis results show that all the 3 items loaded on 2 factors

summated scale will show whether all items within the summated scale load on the same construct, or whether the summated scale actually measures more than one construct. It is specified both the number of dimensions in the construct and the specific items or scales which are hypothesized to load on those dimensions a priori. Principal component analysis using a varimax rotation technique generated 2 (two) factors but failed to produce a clear factor pattern (Appendix-7.2, page-204). Item 19 (q19, i.e., sharing information within light engineering firms will make possible to ignore dominance of customer on pricing) had the problem of high loading on more than one dimension. Thus, factor analysis was performed with item 19 dropped and principal component analysis using a varimax generated two

distinctive dimensions with clear factor patterns (Appendix-7.2, page-204). Items from the same dimension loaded high on one factor and low on all the others (Table 16).

4. 6. 3 Geographical Concentration will Result in Right Value Delivery Network

(hypothesis-3)

Under this hypothesis three items (q31, q32, and q33), i.e., co-location will make possible to reduce intermediary dominance, co-location will make possible to reconfigure value delivery network, and co-location will make possible to establish 'one stop shop' were deleted at the time of analysis of Cronbach Coefficient Alpha for showing low item-to-total correlation. Then factor analysis was performed on rest of the ten items (q21, q22, q23, q24, q25, q26, q27 q28, q29, and q30, page-143), i.e., co-location will make possible to share material, co-location will make possible to share final product, co-location will make possible to share machinery use, co-location will make possible to share after sales services, co-location will make possible to transfer customers to another organization, co-location will make possible to transfer customers to suitable organization, co-location will make possible to deliver products timely, co-location will make possible to attract many supplier, co-location will make possible to attract many distributor, and co-location will make possible to increase customer value to see whether the construct measured was empirically associated with measures of other conceptually related variables (Appendix-7.3, page-205).

Conducting a factor analysis on a single summated scale will show whether all items within the summated scale load on the same construct, or whether the summated scale actually measures more than one construct. It is specified both the number of dimensions in the

Table 17: Principal Component Analysis Results for the Final Six (06) **Right Value Delivery Network** Measurement Items

Item	Factor 1	Factor 2	Factor 3
21. Co-location and material sharing	.675	-.007	-.183
23. Co-location and machinery sharing	.814	-.009	-.168
24. Co-location and after sales services	.798	.115	-.305
25. Co-location and customer transfer to another org.	.759	-.062	-.225
26. Co-location and customer transfer to suitable org.	.761	-.263	-.158
27. Co-location and timely product deliver	.758	-.239	.390

The principal component factor analysis results show that all the 6 items loaded on 3 factors

construct and the specific items or scales which are hypothesized to load on those dimensions a priori. Principal component analysis using a varimax rotation technique generated 3 (three) factors but failed to produce a clear factor pattern. Item 22, 28, 29 and 30, i.e., co-location will make possible to share final product, co-location will make possible to attract many supplier, co-location will make possible to attract many distributor, and co-location will make possible to increase customer value had the problem of high loading on more than one dimension. Thus, factor analysis was performed with item 22, 28, 29 and 30 dropped and principal component analysis using a varimax generated three distinctive dimensions with clear factor patterns (Appendix-7.3, page-206). Items from the same dimension loaded high on one factor and low on all the others (Table 17).

4. 6. 4 Inter-firm Network of Small Businesses under LEI will Result in Integrated

Marketing Communication (hypothesis-4)

Under this hypothesis no item was deleted at the time of analysis of Cronbach Coefficient Alpha for showing high item-to-total correlation ($\alpha=.660$). So factor analysis was performed

on all of the eight items (from q34 to q41, page-144), i.e., inter-firm network will make possible to set marketing communication strategies jointly, inter-firm network will make possible to create form primary market, inter-firm network will make possible to set own advertising strategy, inter-firm network will make possible to set own personal selling strategy, inter-firm network will make possible to set own sales promotion strategy, inter-firm network will make possible to set own public relation strategy, inter-firm network will make possible to set own integrated marketing communication strategy, and inter-firm network will make possible to create brand primary market to see whether the construct measured was empirically associated with measures of other conceptually related variables.

Conducting a factor analysis on a single summated scale will show whether all items within the summated scale load on the same construct, or whether the summated scale actually measures more than one construct. It is specified both the number of dimensions in the construct and the specific items or scales which are hypothesized to load on those dimensions a priori. Principal component analysis using a varimax rotation technique generated 3 (three) factors but failed to produce a clear factor pattern (Appendix-7.4, page-

Table 18: Principal Component Analysis Results for the Final Four (04) **Integrated Marketing Communication** Measurement Items

Item	Factor 1	Factor 2	Factor 3
38. Inter-firm network and sales promotion str.	.680	-.354	-.360
39. Inter-firm network and public relation str.	.814	-.073	.182
40. Inter-firm network and IMC strategy	.607	-.318	.432
41. Inter-firm network and brand primary market	.381	-.648	.307

The principal component factor analysis results show that all the 4 items loaded on 3 factors

206). Item 34, 35, 36 and 37, i.e., inter-firm network will make possible to set marketing communication strategies jointly, inter-firm network will make possible to create form primary market, inter-firm network will make possible to set own advertising strategy, and inter-firm network will make possible to set own personal selling strategy had the problem of high loading on more than one dimension. Thus, factor analysis was performed with item 34, 35, 36 and 37 dropped and principal component analysis using a varimax generated three distinctive dimensions with clear factor patterns (Appendix-7.4, page-207). Items from the same dimension loaded high on one factor and low on all the others (Table 18).

4. 6. 5 Sharing Knowledge within Employees of Small Businesses under LEI will Result in Efficiency Enhancement of Employees (hypothesis-5)

Under this hypothesis no item was deleted at the time of analysis of Cronbach Coefficient Alpha for showing high item-to-total correlation ($\alpha=.774$). So factor analysis was performed on all of the seven items (from q42 to q48, page-144), i.e., sharing knowledge within employees will make possible to increase trust on each other, sharing knowledge within employees will make possible to know about norms of the society, sharing knowledge within employees will make possible to increase social network, sharing knowledge through word of mouth within employees will make possible to enhance efficiency, sharing knowledge through electronic media within employees will make possible to enhance efficiency, sharing knowledge within employees will make possible to increase internal specialization, and sharing knowledge within employees will make possible to generate management economies to see whether the construct measured was empirically associated with measures of other conceptually related variables.

Table 19: Principal Component Analysis Results for the Final Five (05) **Efficiency Enhancement of Employees** Measurement Items

Item	Factor 1	Factor 2
42. Sharing knowledge & increasing trust	.833	-.094
43. Sharing knowledge & know about norms	.835	-.212
44. Sharing knowledge & increasing social network	.783	-.251
45. Sharing knowledge by word of mouth & efficiency	.682	-.344
46. Sharing knowledge by electronic media & efficiency	.507	.007

The principal component factor analysis results show that all the 5 items loaded on 2 factors

Conducting a factor analysis on a single summated scale will show whether all items within the summated scale load on the same construct, or whether the summated scale actually measures more than one construct. It is specified both the number of dimensions in the construct and the specific items or scales which are hypothesized to load on those dimensions a priori. Principal component analysis using a varimax rotation technique generated 2 (two) factors but failed to produce a clear factor pattern (Appendix-7.5, page-208). Items 47 and 48, i.e., sharing knowledge within employees will make possible to increase internal specialization, and sharing knowledge within employees will make possible to generate management economies had the problem of high loading on more than one dimension. Thus, factor analysis was performed with item 47 and 48 dropped and principal component analysis using a varimax generated two distinctive dimensions with clear factor patterns (Appendix-7.5, page-208). Items from the same dimension loaded high on one factor and low on all the others (Table 19).

4. 6. 6 Mutual Learning through Observation of Small Businesses under LEI will

Result in Greater Productivity (hypothesis-6)

Under this hypothesis no item was deleted at the time of analysis of Cronbach Coefficient Alpha for showing high item-to-total correlation ($\alpha=.711$). So factor analysis was performed on all of the four items (from q49 to q52, page-145), i.e., mutual learning will make possible to develop own infrastructure, mutual learning will make possible to find out weak points of own organization, mutual learning will make possible to adopt the marketing strategies taken by leading organizations, and mutual learning will make possible to take corrective action before facing the problem to see whether the construct measured was empirically associated with measures of other conceptually related variables.

Table 20: Principal Component Analysis Results for the Final Four (4) **Greater Productivity** Measurement Items

Item	Factor 1
49. Mutual learning & developing own infrastructure	.730
50. Mutual learning & weak points of own organization	.644
51. Mutual learning & follow leading organizations	.787
52. Mutual learning & proactive strategy	.773

The principal component factor analysis results show that all the 4 items loaded on single factor

Conducting a factor analysis on a single summated scale will show whether all items within the summated scale load on the same construct, or whether the summated scale actually measures more than one construct. It is specified both the number of dimensions in the construct and the specific items or scales which are hypothesized to load on those dimensions a priori. Principal component analysis using a varimax rotation technique

generated one factor and produced a clear factor pattern (Appendix-7.6, page-209). Items from the same dimension loaded on one factor (Table 20).

4. 6. 7 Collective Initiative of Small Businesses under Light Engineering Industry will

Result in Maximizing Benefit of Organizations (hypothesis-7)

Under this hypothesis no item was deleted at the time of analysis of Cronbach Coefficient Alpha for showing high item-to-total correlation ($\alpha=.821$). So factor analysis was performed on all of the twenty items (from q53 to q72, page-145), i.e., joint purchase of materials will make possible to share purchasing cost, joint distribution of final products will make possible to share distribution cost, collective initiative will make possible to manage fund, collective initiative will make possible to manage business development services, collective initiative will make possible to manage bureaucratic snafu, collective initiative will make possible to manage government for taking necessary steps, collective initiative will make possible to remove gap between corporate world and academic education, collective initiative will make possible to manage job related training for employees, collective initiative will make possible to give idea about contemporary technology, collective initiative will make possible to give ideas to employees about business ethics, collective initiative will make possible to manage special fund for employees, collective initiative will make possible to minimize losses for political problems, collective initiative will make possible to minimize losses for electricity problems, collective initiative will make possible to arrange different cultural programs, collective initiative will make possible to manage institutions for getting standardization related suggestions, collective initiative will make possible to manage institutions for getting grading related suggestions, collective initiative

will make possible to manage institutions for getting product design related suggestions, collective initiative will make possible to manage cooperation of different organizations to develop new products according to the choice of the customer, collective initiative will make possible to manage different quality testing institutions for getting quality testing related services, and collective initiative will make possible to manage business friendly environment to see whether the construct measured was empirically associated with measures of other conceptually related variables.

Conducting a factor analysis on a single summated scale will show whether all items within the summated scale load on the same construct, or whether the summated scale actually measures more than one construct. It is specified both the number of dimensions in the construct and the specific items or scales which are hypothesized to load on those dimensions a priori. Principal component analysis using a varimax rotation technique generated 7 factors but failed to produce a clear factor pattern (Appendix-7.7, page-209). Item 53, 54, 55, 57, 58, 59, 61, 62, 63, 64, 65, 66 and 72, i.e., joint purchase of materials will

Table 21: Principal Component Analysis Results for the Final Seven (07) **Maximizing Benefit of Organizations** Measurement Items

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
56. BDS	.602	-.079	.040	.457	-.323	.394	.032
60. Training	.723	-.197	.144	.047	-.169	-.444	.032
67. Standardization	.651	-.182	-.087	.090	.295	-.082	.105
68. Grading	.718	.054	-.138	-.229	.236	-.031	-.321
69. Product design	.741	.060	-.095	-.054	.158	.044	-.455
70. New product	.554	-.470	.096	.071	.276	.223	-.295
71. Quality testing	.639	-.234	-.201	.003	.256	.083	.033

The principal component factor analysis results show that all the 7 items loaded on 7 factors

make possible to share purchasing cost, joint distribution of final products will make possible to share distribution cost, collective initiative will make possible to manage fund, joint purchase of materials will make possible to share purchasing cost, joint distribution of final products will make possible to share distribution cost, collective initiative will make possible to manage fund, collective initiative will make possible to give idea about contemporary technology, collective initiative will make possible to give ideas to employees about business ethics, collective initiative will make possible to manage special fund for employees, collective initiative will make possible to minimize losses for political problems, collective initiative will make possible to minimize losses for electricity problems, collective initiative will make possible to arrange different cultural programs, and collective initiative will make possible to manage business friendly environment had the problem of high loading on more than one dimension. Thus, factor analysis was performed with item 53, 54, 55, 57, 58, 59, 61, 62, 63, 64, 65, 66 and 72 dropped and principal component analysis using a varimax generated seven distinctive dimensions with clear factor patterns (Appendix-7.7, page-215). Items from the same dimension loaded high on one factor and low on all the others (Table 21).

CHAPTER-5

MAJOR FINDINGS

Outcomes of this research (**Cluster concept** to enhance marketing capability of small businesses under light engineering industry in Bangladesh) were discussed in the previous chapters descriptively as well as using different statistical tools. Summary of these results are further elaborated below.

5. 1 GENERAL INFORMATION

This research is based on the data of machinery and spare parts related small business under light engineering industry, Bangladesh. The research was started with the collection of general information on the way of collection of information for specific objectives as well as main objective to understand the functionality of the clusters related to machinery and spare parts. These are as follows:

- The Light Engineering Industry of Bangladesh consists of four types of businesses (sub-sectors), i.e., machinery and spare parts related businesses, electrical and electronic goods related businesses, plastic goods related businesses and accessory goods related businesses.
- Many geographic clusters, i.e., Dholaikhal, Mohammadpur, Mirpur, Gendaria, Demra, Dhanmondi, Taherbagh Lane, Tipu Sultan Road (Dhaka), Bogra etc. of machinery and spare parts related small business under light engineering industry are available in Bangladesh .

- Depending on functionality small businesses under these clusters are four types, i.e., Manufacturing, repairing and marketing complete machinery and spare parts, manufacturing light metal products and hardware, repairing old machines and parts, and trading engineering machine parts, metal parts and hardware.
- Majority of the organizations under this sub-sector (machinery and spare parts) representing ‘manufacturing and repairing complete machinery and spare parts’ group (33 out of 60, 55%) and marketing activities (supply and distribution parts) are also broadly found in this group.
- Second representing group is ‘repairing businesses’ but marketing activities are not broadly (supply part and distribution part are insignificant) found.
- Third representing group is ‘light metal products and hardware manufacturing businesses’. Small numbers of businesses are found under this group but forward linkage and backward linkage marketing activities are available
- Fourth representing group is trading (reselling) businesses. Small numbers of businesses are also found under this group as well as marketing activities are narrowly found here.
- Highest number (30% of samples) of companies’ assets value is below tk. 3750000 and 56.7% companies’ assets value is below tk. 7500000. Companies’ (60) average assets value is 64,45,313 (median value), which are the symptoms of financial weaknesses.
- Most of the companies’ (24 out of 60, 40%) number of employee is below 7, which is the symptom of small in size.
- Most of the organizations are surviving in congested residential areas.

- Associated government institutions do not have required modern equipments.
- Sufficient numbers of interconnected organizations and associated institutions are not available.
- Some geographic clusters are available but cluster concept yet to establish.

5. 2 RELATIONSHIP BETWEEN MAIN DIMENSIONS OF LIGHT ENGINEERING ENTERPRISES

To understand the functionality of anything, at first need to know the fundamentals of that one and their relation. Following are the findings of joint distributions of different focusing elements of the light engineering small businesses (machinery and spare parts) of Bangladesh by using cross-tabulation:

- Normally for manufacturing businesses big amount of assets value is needed, but this study found that, highest numbers (individual group wise) of manufacturing and repairing companies (12 out of 60, 20%) are with low assets value (between Tk. 3750000 to 7499999). The study also found that, 18 (out of total 60) manufacturing and repairing organizations (30%) are in the upper half of the assets value, are in better position.
- Out of 27 (45% of 60) manufacturing, repairing and trading companies 19 (31.67% of 60) are in the lower half, that means these type of companies require less assets value, yet some companies are suffering from poor assets value.
- 35 organizations of 60 (58.33%) are operated by only 12 or below 12 employees and most of them are labor type employee. So, from number of employee point of view

organizations are small in size and employees of these organizations are not with higher academic background.

- The study found that, highest numbers of organizations (15, 25% of 60) are operated by lowest number of employee group (below 7) with lowest amount of assets value (below tk 3750000). So, from assets value and number of employee point of view organizations are small and weak.

5.3 ANALYSIS OF VARIANCE OF MEAN VALUES OF DIFFERENT GROUPS

Analysis of variance is used for examining the differences in the mean values of the dependent variable associated with the effect of the controlled independent variables, after taking into account the influence of the uncontrolled independent variables. In this study groups were considered mainly from three different perspectives, i.e., assets value, number of employee, and type of activity. The findings of this analysis are as follows:

5.3.1 Analysis of Variance (ANOVA) and F Test of Groups Considering Assets Value

For this research considering assets value total small business enterprises were divided into four groups, i.e., below tk.750000, tk.750000 to tk.7499999, tk.7500000 to tk.11249999, and tk.12500000 to tk.14999999. ANOVA was used to understand the perception of different assets value groups toward 67 questions and study found **F value** for every individual question. After comparing critical values and calculated values the results show that hypotheses of most of the questions are null (except five questions) as critical values are less than calculated values, that means perception of the groups more or less same, i.e., cluster creation of small businesses under Light Engineering Industry will enhance marketing

capability. Only for five questions (q21, q56, q60, q61, and q70) mean value between the groups vary significantly (at least one mean is different from others), that means hypotheses of these questions are alternative. Statements of the question no. 21, 56, 60, 61 and 70 are co-location of many light engineering small firms will make possible to share material at the time of need, collective initiative will make possible to manage business development services, collective initiative will make possible to manage job related training for employees, collective initiative will make possible to give idea about contemporary technology, and collective initiative will make possible to manage cooperation of different organizations to develop new products according to the choice of the customer. So, it can be said that there is no significant difference (s) of perception between groups.

5. 3. 2 Analysis of Variance and F Test of Groups considering Number of Employees

For this study considering number of employee total small business enterprises were divided into four groups, i.e., Below 7, 7 to 12, 13 to 18, and 19 to 24. ANOVA was used to understand the perception of different employee groups toward 67 questions and study found **F value** for every individual question. After comparing critical values and calculated values the results show that hypotheses of most of the questions are null (except four questions) as critical values are less than calculated values, that means perception of the groups more or less same, i.e., cluster creation of small businesses under Light Engineering Industry will enhance marketing capability. Only for four questions (q6, q28, q61, and q65) mean values between the groups vary significantly (at least one mean is different from others), that means hypotheses of these questions are alternative. Statements of the question no. q6, q28, q61, and q65 are through collaboration with suppliers it will be possible to get

smooth supply of raw materials, co-location of many light engineering small firms will make possible to attract many supplier to take position in the cluster, collective initiative will make possible to give idea about contemporary technology, and collective initiative will make possible to minimize losses for electricity problems. So, it can be said that there is no significant difference (s) between groups.

5. 3. 3 Analysis of Variance and F Test of Groups Considering Type of Activity

For this study considering types of activity total small business enterprises were divided into four groups, i.e., manufacturing, repairing, trading, and manufacturing & repairing. ANOVA was used to understand the perception of different functionality groups toward 67 questions and found **F value** for every individual question. After comparing critical values and calculated values the results show that hypotheses of more than two third questions (47 out of 67) are null as critical values are less than calculated values, that means perception of the most of the group members is similar, i.e., cluster creation of small businesses under Light Engineering Industry will enhance marketing capability. Hypotheses of about one third questions (20 out of 67, i.e., q9, q10, q11, q14, q15, q19, q21, q23, q25, q26, q27, q28, q33, q38, q47, q48, q51, q52, q61 and q63) are alternative as critical values are more than calculated values, that means, for these every individual question at least one mean is different from other groups' mean. Statements of question no. q9, q10, q11, q14, q15, q19, q21, q23, q25, q26, q27, q28, q33, q38, q47, q48, q51, q52, q61 and q63 are through collaboration with distributor it will be possible to identify needs of customers, through collaboration with retailer it will be possible to identify needs of customers, through collaboration with intermediaries (distributor & retailer) it will be possible to know about competitors' products, through collaboration with intermediaries (distributor & retailer) it

will be possible to differentiate products, through collaboration with intermediaries (distributor and retailer) it will be possible to modify products regularly, well informed (sharing information) small businesses under LEI will be able to ignore dominance of customer on pricing, co-location of many light engineering small firms will make possible to share material at the time of need, co-location of many light engineering small firms will make possible to share machinery use at time of need, co-location of many light engineering small firms will make possible to transfer customers to another organization at the time of overfull demand, co-location of many light engineering small firms will make possible to transfer customers to another suitable organization, co-location of many light engineering small firms will make possible to deliver products timely (by reducing production related problems), co-location of many light engineering small firms will make possible to attract many supplier to take position in the cluster, co-location of many light engineering small firms will make possible to establish 'one stop shop', inter-firm network of small businesses will make possible to set own sales promotion strategy, sharing knowledge within employees of small businesses will make possible to increase internal specialization, sharing knowledge within employees of small businesses will make possible to generate management economies, Mutual learning of light engineering small businesses through observation will make possible to adopt the marketing strategies taken by leading organizations, mutual learning through observation will make possible to take corrective action before facing the problem, collective initiative will make possible to give idea about contemporary technology, and collective initiative will make possible to manage special fund for employees. So, it can be said that there is significant difference (s) of perception between groups.

5. 4 HYPOTHESES TESTING, VERIFICATION AND FACTOR ANALYSIS

This research is mainly based on seven (7) hypotheses. These hypotheses were tested by using summary statistics. Hypothesis wise answers of the respondents were verified by using Cronbach's α (alpha) or coefficient alpha. Then factor analysis was performed on items under each hypothesis to reduce correlated variables to a manageable level.

5. 4. 1 Collaboration with Immediate Stakeholders (suppliers, employees, distributors, retailers) of Small Businesses under LEI will Result in Right Product Mix.

This one is the first hypothesis of this study. At first this hypothesis was tested, then answers of the questions were verified and then factor analysis was performed.

5. 4. 1. 1 Results of test of hypothesis through summary statistics

From summary statistics it is found that, average mean, median and mode (central tendency) of answers of the questions of this hypothesis are 4, 3.91 and 3.91, that means respondents agree with the hypothesis (as in the likert scale used for this research, 1=Strongly disagree 2=Disagree 3=Uncertain 4=Agree 5=Strongly agree) or the hypothesis is null, i.e., proper collaboration with immediate stakeholders (suppliers, employees, distributors, and retailers) will result in right product mix and collaborative environment can be developed by creating cluster. Smooth supply of raw materials is the precondition of uninterrupted production and distribution. Co-location of backward linkage organizations can ensure smooth supply of raw materials. To know about competitor is badly needed to set correct strategy. Sometimes it is not possible to know about competitors directly. This problem can be solved in some extent by collaborating with stake holders of light engineering small businesses (like wholesaler, retailer, distributor and employee), as competitor firms take co-operation from

same stakeholders (more or less). Sometimes producers are very far from ultimate customers. Intermediaries and employees directly meet with customers and they can know the need, want and reaction of customers directly. So, collaboration with these parties helps a lot in right product mix.

5. 4. 1. 2 Verification of internal consistency of answers through Cronbach's Alpha

Internal consistency reliability is used to assess the reliability of a summated scale where several items are summated to form a total score (Malhotra, 2006). Under this hypothesis eleven (11) items or variables were considered and consistency measurement started with the analysis of Cronbach Coefficient Alpha. Alpha value considering all the items of this hypothesis was .679, which is acceptable as it is said that, a value of 0.6 or less generally indicates unsatisfactory internal consistency reliability (Malhotra, 2006). The minimally acceptable reliability for preliminary research should be in the range of .50 to .60 (Nunnally, 1967). But one item (q16) showing low item-to-total correlation (-.035) was deleted and alpha value increased to .742, which is symptom of more internal consistency.

5. 4. 1. 3 Measurement of the facets

For this hypothesis factor analysis was performed on 10 items (one item was deleted at the time of Cronbach's alpha analysis) to see whether the construct (collaboration with immediate stakeholders of small businesses under LEI will result in right product mix) measured was empirically associated with measures of other conceptually related variables. Principal component analysis using a varimax rotation technique generated 4 (four) factors but failed to produce a clear factor pattern. Thus, factor analysis was performed with problematic six items (problem of high loading on more than one dimension) dropped. So, other four items from the same dimension, i.e., collaboration with intermediaries will make

possible to know about competitors' products, collaboration with intermediaries will make possible to know about strength of competitors' products, collaboration with intermediaries will make possible to know about weaknesses of competitors' products, and collaboration with intermediaries will make possible to differentiate products loaded high on one factor and low on all the others.

5. 4. 2 Sharing Information of Small Businesses under LEI will Result in Right Price

This one is the second hypothesis of this study. At first this hypothesis was tested, then answers of the questions were verified and then factor analysis was performed.

5. 4. 2. 1 Results of test of hypothesis through summary statistics

From summary statistics it is found that, average mean, median and mode (central tendency) of answer of the questions are 3.74, 4 and 4, that means respondents agree with the hypothesis (as in the likert scale 4=Agree 5=Strongly agree) or hypothesis is null, i.e., for sharing information between competitor firms can set right price and co-located survival can be more helpful for information sharing. Cluster operation of light engineering small businesses helps in reducing cost by sharing information of purchasing cost, sharing information of distribution cost, and sharing information of business development services (BDS) between competitor firms and related organizations. Customers' perception can be also understood by gathering adequate information and co-located enterprises can share information through word of mouth and observation more easily than scattered enterprises. Organizations which are isolated from other competitor organizations or are not well informed about competitor organizations may think that they have set the right price, but may not be the appropriate one as they are in the dark.

5. 4. 2. 2 Verification of internal consistency of answers through Cronbach's Alpha

Under this hypothesis four (04) items or variables were considered and alpha value considering all the items of this hypothesis was .710, which is acceptable (as a value of 0.6 or less generally indicates unsatisfactory internal consistency reliability or minimally acceptable reliability for preliminary research should be in the range of .50 to .60). And no item was deleted as all the items showed high item-to-total correlations.

5. 4. 2. 3 Measurement of the facets

For this hypothesis factor analysis was performed on 04 items (no item was deleted at the time of Cronbach's alpha analysis) to see whether the construct (sharing information of small businesses under LEI will result in right price) measured was empirically associated with measures of other conceptually related variables. Principal component analysis using a varimax rotation technique generated 2 (two) factors but failed to produce a clear factor pattern. Thus, factor analysis was performed with problematic item (problem of high loading on more than one dimension) dropped. So, other three (3) items from the same dimension, i.e., sharing information within light engineering firms will make possible to set appropriate price, sharing information within light engineering firms will make possible to increase bargaining power, and sharing information within light engineering firms will make possible to set value based price loaded high on one factor and low on all the others.

5. 4. 3 Geographical Concentration of Small Businesses under LEI will Result in Right Value Delivery Network

This one is the third hypothesis of this study. At first this hypothesis was tested, then answers of the questions were verified and then factor analysis was performed.

5. 4. 3. 1 Results of test of hypothesis through summary statistics

From summary statistics it is found that, Average mean, median and mode (Central tendency) of answer of the questions are 3.97, 4.23 and 4.31, that means respondents agree with the hypothesis (as in the likert scale 4=Agree 5=Strongly agree) or the hypothesis is null, i.e., by co-locating same types of organizations will be able to create right value delivery network and co-location idea found in cluster concept. Right value delivery network can be set by developing relation between channel members (from supplier to consumer) through reducing conflict and increasing coordination. Out of different ways of developing relation, one way is operating from same geographic area. When forward linkage and backward linkage organizations of light engineering are in the same cluster, gaps of these channel members can be removed by common ownership, or by contractual ownerships, or by one or a few dominant channel members.

5. 4. 3. 2 Verification of internal consistency of answers through Cronbach's Alpha

Under this hypothesis thirteen (13) items or variables were considered and alpha value considering all the items of this hypothesis was .718, which is acceptable (as a value of 0.6 or less generally indicates unsatisfactory internal consistency reliability or minimally acceptable reliability for preliminary research should be in the range of .50 to .60). But three items (q31, q32, q33) showing low item-to-total correlations (.100, .121, .004) were deleted and alpha value increased to .782, which is symptom of more internal consistency.

5. 4. 3. 3 Measurement of the facets

For this hypothesis factor analysis was performed on 10 items (three items were deleted at the time of Cronbach's alpha analysis) to see whether the construct (Geographical concentration of small businesses under LEI will result in right value delivery network)

measured was empirically associated with measures of other conceptually related variables. Principal component analysis using a varimax rotation technique generated 3 (three) factors but failed to produce a clear factor pattern. Thus, factor analysis was performed with problematic four items (problem of high loading on more than one dimension) dropped. So, other six (6) items from the same dimension, i.e., co-location will make possible to share material, co-location will make possible to share machinery use, co-location will make possible to share after sales services, co-location will make possible to transfer customers to another organization at the time of overfull demand, co-location will make possible to transfer customers to suitable organization, and co-location will make possible to deliver products timely loaded high on one factor and low on all the others.

5. 4. 4 Inter-firm Network of Small Businesses under LEI will Result in Integrated Marketing Communication

This one is the fourth hypothesis of this study. At first this hypothesis was tested, then answers of the questions were verified and then factor analysis was performed.

5. 4. 4. 1 Results of test of hypothesis through summary statistics

From summary statistics it is found that, average mean, median and mode (Central tendency) of answer of the questions are 3.77, 4 and 4, that means respondents agree with the hypothesis (as in the likert scale 4=Agree 5=Strongly agree) or the hypothesis is null, i.e., inter-firm network of small businesses will results in integrated marketing communication and by creating cluster inter-firm network can be increased. When light engineering small businesses are in the same geographic area, can take initiatives of marketing communication strategy jointly, because individually small businesses are weak and they individually cannot

go for any major promotional activity through mass media. For these major promotional activities through mass media their joint demand as well as individual demand will increase. Surviving from same geographic area small enterprises can learn (by observation and word of mouth) to set advertising strategy, personal selling strategy, sales promotion strategy, public relation strategy, and integrated marketing communication strategy individually through inter-firm network.

5. 4. 4. 2 Verification of internal consistency of answers through Cronbach's Alpha

Under this hypothesis eight (08) items or variables were considered and alpha value considering all the items of this hypothesis was .660, which is acceptable (as a value of 0.6 or less generally indicates unsatisfactory internal consistency reliability or minimally acceptable reliability for preliminary research should be in the range of .50 to .60). And no item was deleted as all the items showed high item-to-total correlations.

5. 4. 4. 3 Measurement of the facets

For this hypothesis factor analysis was performed on 08 items (no item was deleted at the time of Cronbach's alpha analysis) to see whether the construct (Inter-firm network of small businesses under LEI will result in integrated marketing communication) measured was empirically associated with measures of other conceptually related variables. Principal component analysis using a varimax rotation technique generated 3 (three) factors but failed to produce a clear factor pattern. Thus, factor analysis was performed with problematic four (4) items (problem of high loading on more than one dimension) dropped. So, other four (4) items from the same dimension, i.e., inter-firm network will make possible to set own sales promotion strategy, inter-firm network will make possible to set own public relation strategy, inter-firm network will make possible to set own integrated marketing communication

strategy, and inter-firm network will make possible to create brand primary market loaded high on one factor and low on all the others.

5. 4. 5 Sharing Knowledge within Employees of Small Businesses under LEI will Result in Efficiency Enhancement of Employees

This one is the fifth hypothesis of this study. At first this hypothesis was tested, then answers of the questions were verified and then factor analysis was performed.

5. 4. 5. 1 Results of test of hypothesis through summary statistics

From summary statistics it is found that, average mean, median and mode (Central tendency) of answer of the questions are 4.31, 4.57 and 4.57, that means respondents agree or strongly agree with the hypothesis (as in the likert scale 4=Agree 5=Strongly agree) or the hypothesis is null, i.e., by sharing knowledge within employees of same types of organizations will increase collective efficiency and cluster based business operation is very much supportive for sharing knowledge. By sharing knowledge within employees of light engineering small businesses if efficiency is enhanced, all the departments will be benefited and as a vital department of any organization marketing capability will be also enhanced. It may be noticed that, in small size organizations mainly production and marketing activities are broadly found. If same types of organizations do business from same geographic area, employees get opportunity to share knowledge which is not possible in case of scattered organizations. Sharing knowledge light engineering employees can be benefited by different ways, i.e., increases trust on each other, increases social network, knowing about norms of the society, increases internal specialization, generating management economies, and ultimately enhancing efficiency.

5. 4. 5. 2 Verification of internal consistency of answers through Cronbach's Alpha

Under this hypothesis seven (07) items or variables were considered and alpha value considering all the items of this hypothesis was .774, which is acceptable (as a value of 0.6 or less generally indicates unsatisfactory internal consistency reliability or minimally acceptable reliability for preliminary research should be in the range of .50 to .60). And no item was deleted as all the items showed high item-to-total correlations.

5. 4. 5. 3 Measurement of the facets

For this hypothesis factor analysis was performed on 07 items (no item was deleted at the time of Cronbach's alpha analysis) to see whether the construct (Sharing knowledge within employees of small businesses under LEI will result in efficiency enhancement of employees) measured was empirically associated with measures of other conceptually related variables. Principal component analysis using a varimax rotation technique generated 2 (two) factors but failed to produce a clear factor pattern. Thus, factor analysis was performed with problematic two (2) items (problem of high loading on more than one dimension) dropped. So, other five (5) items from the same dimension, i.e., sharing knowledge within employees will make possible to increase trust on each other, sharing knowledge within employees will make possible to know about norms of the society, sharing knowledge within employees will make possible to increase social network, sharing knowledge through word of mouth within employees will make possible to enhance efficiency, and sharing knowledge through electronic media within employees will make possible to enhance efficiency loaded high on one factor and low on all the others.

5. 4. 6 Mutual Learning through Observation of Small Businesses under LEI will

Result in Greater Productivity

This one is the sixth hypothesis of this study. At first this hypothesis was tested, then answers of the questions were verified and then factor analysis was performed.

5. 4. 6. 1 Results of test of hypothesis through summary statistics

From summary statistics it is found that, average mean, median and mode (Central tendency) of answer of the questions are 4.34, 4.25 and 4.25, that means respondents agree or strongly agree with the hypothesis (as in the likert scale 4=Agree 5=Strongly agree) or the hypothesis is null, i.e., by learning from each other through observation it is possible to increase total productivity and leaning through observation is only possible if businesses are operated from same reachable and seeable geographic area. Employee efficiency and quality products are not the only prerequisite of greater productivity. For greater productivity some other factors need to consider also like infrastructure of the organization, finding out limitations comparing with competitors, learning from superior, and taking proactive action. Cluster operation of light engineering small businesses can help a lot to enhance the above factors.

5. 4. 6. 2 Verification of internal consistency of answers through Cronbach's Alpha

Under this hypothesis four (04) items or variables were considered and alpha value considering all the items of this hypothesis was .711, which is acceptable (as a value of 0.6 or less generally indicates unsatisfactory internal consistency reliability or minimally acceptable reliability for preliminary research should be in the range of .50 to .60). And no item was deleted as all the items showed high item-to-total correlations.

5. 4. 6. 3 Measurement of the facets

For this hypothesis factor analysis was performed on 4 (four) items (no item was deleted at the time of Cronbach's alpha analysis) to see whether the construct (Mutual learning through observation of small businesses under LEI will result in greater productivity) measured was empirically associated with measures of other conceptually related variables. Principal

component analysis using a varimax rotation technique generated 1 (one) factor and produced a clear factor pattern. So, four (4) items from the same dimension, i.e., mutual learning will make possible to develop own infrastructure, mutual learning will make possible to find out weak points of own organization, mutual learning will make possible to adopt the marketing strategies taken by leading organizations, and mutual learning will make possible to take corrective action before facing the problem loaded on one factor.

5. 4. 7 Collective Initiative of Small Businesses under LEI will Result in Maximizing Benefit of Organizations

This one is the seventh hypothesis of this study. At first this hypothesis was tested, then answers of the questions were verified and then factor analysis was performed.

5. 4. 7. 1 Results of test of hypothesis through summary statistics

From summary statistics it is found that, Average mean, median and mode (Central tendency) of answer of the questions are 4.27, 4.33 and 4.4, that means respondents agree or strongly agree with the hypothesis (as in the likert scale 4=Agree 5=Strongly agree) or the hypothesis is null, i.e., by collective initiative organizations will have maximum benefit and co-location ensures better collective initiative. Joint bargaining with associated organizations always brings more benefit than individual bargaining and cluster operation gives more opportunity of joint bargaining. For joint bargaining teamwork is badly needed and co-located operation of small businesses gives more opportunity for that one. There are some issues which cannot be solved individually (some are especially for small businesses), collective initiative is the only way of solution and collective initiative is one of the important characteristics of cluster concept.

5. 4. 7. 2 Verification of internal consistency of answers through Cronbach's Alpha

Under this hypothesis twenty (20) items or variables were considered and alpha value considering all the items of this hypothesis was .821, which is acceptable (as a value of 0.6 or less generally indicates unsatisfactory internal consistency reliability or minimally acceptable reliability for preliminary research should be in the range of .50 to .60). And no item was deleted as all the items showed high item-to-total correlations.

5. 4. 7. 3 Measurement of the facets

For this hypothesis factor analysis was performed on 20 items (no item was deleted at the time of Cronbach's alpha analysis) to see whether the construct (Collective initiative of small businesses under LEI will result in maximizing benefit of organizations) measured was empirically associated with measures of other conceptually related variables. Principal component analysis using a varimax rotation technique generated 7 (seven) factors but failed to produce a clear factor pattern. Thus, factor analysis was performed with problematic thirteen (13) items (problem of high loading on more than one dimension) dropped. So, other seven (7) items from the same dimension, i.e., collective initiative will make possible to manage business development services, collective initiative will make possible to manage job related training for employees, collective initiative will make possible to manage institutions for getting standardization related suggestions, collective initiative will make possible to manage institutions for getting grading related suggestions, collective initiative will make possible to manage institutions for getting product design related suggestions, collective initiative will make possible to manage cooperation of different organizations to develop new products according to the choice of the customer, and

collective initiative will make possible to manage different quality testing institutions for getting quality testing related services loaded high on one factor and low on all the others.

5. 5 Significant Findings

Analysis and discussion of findings of this study is mainly based on summary statistics, Cronbach's alpha, ANOVA and F test, and factor analysis. Extracts of the findings are as follows:

- Average value of mean, median, and mode (central tendency) of total items of seven hypotheses is 4.15 and average values of each individual hypothesis ranged between 3.91 to 4.48 (where 5=strongly agree and 4=agree), that means, respondents agree with the broad hypothesis as well as specific hypotheses.
- After analysis of ANOVA and F test it is found that, variation of perception of different groups under light engineering industry toward cluster concept is not significant.
- After analysis of Cronbach's alpha resulting value of total item coefficient alpha is .725 and alpha values of each individual dimension ranged between .660 to .821, which is the symptom of high internal consistency.
- After factor analysis it is found that, out of 67 items 33 are from same dimension, which load high on one factor and low on all the others. Other 34 items are not from same dimension and have the problem of high loading on more than one dimension.

So, ultimate findings of this study say that there is huge scope of enhancing marketing capability of small businesses under Light Engineering Industry (LEI) through cluster creation.

CHAPTER-6

CONCLUSION AND RECOMMENDATIONS

Engineering industry is integrated with various core sectors for its demand. The products under the engineering industry are largely used as input to the capital goods industry. Hence the demand of this sector is a derived demand of the capital goods industry. The demand is derived primarily from capacity creations in sectors like infrastructure and general manufacturing including process industries. Due to the need for compliance of environmental restrictions, higher labor cost and transformation of conventional economy to knowledge intensive economy, developed countries have started to procure engineering goods from less developing countries. At the same time, developed countries have relocated their supply chain components in low-cost countries with state of art technology.

Light Engineering Sector in Bangladesh is one of the sub-sectors of SMEs. This sector occupies a unique position in the economy of Bangladesh. It prudently acts as feeder of support industries to all other industries and plays a vital role in the socio-economic development of the country. These industries have potentials to make significant contribution towards technological and economic development along with wide opportunities for employment generation. These small & medium scale industries have made substantial contribution to Gross Domestic Product (GDP) during the last few decades and created appreciable employment opportunities. The product lines of this sector (LES) are quite large and diversified. Machinery and spare parts produced by the entrepreneurs of the sector are supplied to various mills and factories such as jute, cotton, sugar, paper, textile,

garments, fertilizer, tea plantation & processing industries, ferry, railways, power plants, construction sector, transport, pharmaceuticals, etc. Day to day technological progress, adaptation of innovative concept and technical expertise are the continuous process of activities in upholding a firm pledge to reach a sustainable position to meet the challenge in the world market and the environment of globalization. Light engineering industry has been upholding its role in developing and maintaining mechanized agriculture, maintaining continuity of vehicular transports and production of capital machinery and equipment of various descriptions for industrial and engineering sector.

The light engineering sector of Bangladesh is passing through a transition phase due to some domestic problems like political problem, electricity problem, lack of government patronization etc. and international problems like globalization, competitiveness and challenges. There are some countries of the world, especially China and Taiwan, who can sell products at a very low price, which is not only threat for developing and underdeveloped countries but also for developed countries; undoubtedly, Bangladesh is no exception. Finishing of light engineering products of China, Taiwan is good and price is also low but durability is not good. Finishing of our products is not so good and price is also high (compared to China) but durability is very high. We have some very efficient and cheap human resources in this field also. Macro environment is uncontrollable and we have no alternative to adjust with it. To adjust with the changing environment industry needs to follow strategic marketing progress. Most of the firms in light engineering sector of Bangladesh are either micro or small or medium. It also needs to integrate with the global

industry and trends for betterment. The sector has a great potentiality to attract FDI in the form of joint venture with leading Asian countries.

Research was done to find a way to solve some of the above problems. Cluster-based economic development is premised on the idea that a geographic region, and the businesses that it contains, can compete more effectively when everyone in the region works together to the common benefit of all the stakeholders. A cluster is much more than just a geographic concentration of interrelated firms. Clustering is really a process whereby competitor firms work together to solve problems and address challenges that, due to the lack of resources, they are unable to address and solve as individual business entities. There are some geographic clusters under light engineering industry of Bangladesh. Organizations of these clusters are already enjoying some mutual benefits and it was attempted in this research to find out the possibility of enhancing marketing capability through establishing cluster concept. Respondents agreed or strongly agreed with the hypotheses of this research, i.e., cluster creation of small businesses under Light Engineering Industry (LEI) will result in marketing efficiency. The success of one company attracts another, and another-eventually building a critical mass of skilled people, expertise, capital and entrepreneurial drive. Such an environment helps create local jobs and fuels economic growth in a region. Present era is called the era of globalization, which not only creates threats, but opportunities also. In order to capitalize on opportunities and to face the threats cluster concept can help a lot. Fuelled by innovation, the cluster can become a hotbed of investment and technology transfer.

Social capital plays a critical role in the development of a successful organization or industry. Social capital is some features of organizations, such as trust, norms, and networks,

which can improve the efficiency by facilitating coordinated actions. Research results say that, some same type of enterprises under same industry or some interconnected companies under different industry operating from same geographic area can increase social capital. Firms gain strength when supported by strong research institutions, a concentration of capital and business expertise as well as an appropriate environment in which innovation can flourish. So, small businesses under light engineering industry should go ahead through their association to establish cluster concept so that marketing capability can be increased. Related organizations and government should play a supportive role to materialize the dream.

Today's potential entrepreneurs are highly educated and have good exposure to the world, and they can certainly perform better than earlier generation entrepreneurs. But they cannot solve problems that are not in their domain or are beyond their capacity. The tasks of funding R&D, generating social overhead capital, setting up viable institutions for upgrading education and skills of workers and managers, improving power and gas supply and making the transport and communication sectors better remain the responsibility of the government. Without reducing the cost of doing business by making the public services work more effectively, combating corruption and reducing harassment from the usual extortionists within the government and outside, maintaining a peaceful law and order situation and the like will all require concerted efforts to resolve. With globalization at the door, all energies have to be concentrated on developing and supporting micro, small and medium enterprises by removing all constraints.

Main objective of this research was to find out the scope of enhancing the marketing capability of **light engineering sub-sector** in Bangladesh through cluster concept, not for any specific public or private organization. The study found that if cluster concept for light engineering small businesses can be established, marketing capability will enhance significantly. But this enhancement is not possible by one or two or few organizations. Already some geographic business clusters are available in different places of Bangladesh. Cluster concept can be established by providing business development services (BDS) like training, consultancy and advisory services, marketing assistance, information, technology development transfer, business linkage promotion etc. Only collective effort of interconnected companies (like supplier, producer, distributor etc) and associated institutions (like different government bodies, financial institutions, quality testing institutions etc) can materialize this long-felt well-timed theory. So, specific recommendations of this study are for all of these interconnected companies and associated institutions:

1. Government should provide some helps which are not possible in case of individual and commercial organizations like infrastructural development (providing land, expansion of gas line, power generation etc.) for cluster development, taking friendly policies for the technological development of the sector, different legal assistances by passing favorable laws etc.
2. For establishing cluster vertically and horizontally integrated organizations need to survive in the same geographic area. But in case of Bangladesh some of these interconnected organizations are from overseas countries. Some local entrepreneurs are capable and want to invest in such type of organizations but because of some

- visible and invisible barriers like red tape barrier, system barrier, bribe, more time consumption, extortion etc., cannot materialize their plan. Government should be more flexibility (from monetary or non-monetary entry barrier point of view) and caring to local entrepreneurs for establishing such type of companies (not harmful for the society), so that cluster concept can be established.
3. If we analyze the environment of the industry it is found that huge opportunities to be flourished because of globalization and high production cost in the developed countries. But overall strength of the industry is not capable to capitalize all the opportunities. Most of the firms of this industry are small size, some are medium and very few are large. So there is a gap between opportunity and capability. By establishing cluster concept interconnected and associated organizations can get synergy benefit and capitalize the opportunities. Establishing cluster is not an easy job for small size light engineering organizations. For this cluster development business development services (BDS) like training, consultancy and advisory services, marketing assistance, information, technology development transfer and business linkage promotion are badly needed. At the time of this era of privatization government does not provide all of these services. Small businesses needs to take these BDS from private sector but sufficient number of organizations for providing these services is not presently available in Bangladesh. So, government will have to take initiative for establishing and monitoring such type of organizations.
 4. Bangladesh Standard Testing Institute (BSTI) authority in Dhaka does not have any testing equipment at their disposal for testing light engineering products, such as agricultural equipment. However, no government imitative has so far been taken to

- improve the quality of production of such equipment (Roundtable discussion, 2008). To improve the quality of agricultural equipments as well as light engineering products, heat treatment plants and technical assistance government should provide required supports to the concerned bodies.
5. Government should provide a budgetary allocation for the cluster wise development of light engineering industry considering driver of the economy.
 6. A research paper on Bogra based agroindustrial equipment industries and marketing, which was prepared by journalists, identified some problems in the sector. Out of these problems most important is high price of raw materials like base metals, hard cokes and pig irons (Roundtable discussion, 2008). So, government should supply raw materials at a reasonable price or take steps for reducing price of raw materials as much as possible.
 7. Low quality but nice looking and low priced China products are almost freely entering in the local market. Being attracted by nice finishing and lower price people are buying these products but later they are being looser. We have no way to escape from entering these overseas products in this globalization era but government can impose more terms and conditions on importing China products. On the other hand government should influence people to use indigenous light engineering products.
 8. At the time of data collection study found that light engineering organizations cannot use their optimum production capacity because of interrupted electricity supply. So, government should try to supply uninterrupted electricity as early as possible so that organizations can increase their production as well as productivity.

9. Until it is not possible to provide uninterrupted electricity supply, government should subsidize diesel to run generators in the industrial units.
10. Government should reduce the value added tax (VAT) as it is demand of most of the entrepreneurs of this sector.
11. Financial limitation is a major problem of light engineering small businesses. So, Bangladesh Bank should suggest and create pressure on commercial banks to provide loan to these organizations at flexible terms & conditions and lower interest rate.
12. Without getting reasonable salary some skilled employees are going to abroad and it is creating a problem for producing quality products & establishing cluster concept. So, labor ministry of Bangladesh and Bangladesh Engineering Industry Owners' Association (BEIOA) should jointly create pressure on organizations under this sector to follow labor law and pay reasonable salary.
13. Government and Bangladesh Engineering Industry Owners' Association (BEIOA) should follow the experiences of successful countries where cluster concept is established in some sectors like third Italy, Germany and its Baden-Württemberg region, Pakistan's Sialkot stainless steel surgical instrument cluster etc.
14. Bangladesh Engineering Industry Owners' Association (BEIOA) should manage to provide business development services (BDS) like training, consultancy and advisory services, marketing assistance, information, technology development transfer, business linkage promotion etc. to the members (group wise) taking from commercial service providers to face the threat of foreign products and cope up with

globalization. At the same time association should influence different enterprises of every cluster to help each other.

15. Bangladesh Engineering Industry Owners' Association (BEIOA) should take steps to remove gap between light engineering organizations and educational institutions, so that educated people can forward to participate or help in establishing clusters of these sector.

16. Political stability is badly needed for the success of any type of economic formula. Light engineering entrepreneurs also demand stable political situation. Stable political situation cannot imagine without collaborative effort of government and opposition political parties. So, government should try to create stable political environment in the country by showing willingness and convincing opposition parties.

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APPENDICES

APPENDIX-1

CLUSTER CONCEPT IN ENHANCING THE MARKETING CAPABILITY OF SMALL BUSINESS IN BANGLADESH: THE CASE OF LIGHT ENGINEERING SUB-SECTOR

QUESTIONNAIRE for Small businesses under Light Engineering Sub-sector

Section A: General Information

1. Company name _____
Telephone# _____
2. Main products _____
3. Assets value (cost of durable resources other than land and factory buildings)
A. Below 3750000 B. 3750000 to 7499999 C. 7500000 to 11249999 D. 12500000 to 14999999
4. Number of employees
A. Below 7 B. 7 to 12 C. 13 to 18 D. 19 to 24
5. Type of activity A. Manufacturing B. Repairing
C. Trading D. Manufacturing & Repairing

Section B: Probability of increasing marketing capability through cluster concept

In Bangladesh, private sector virtually means Small and Medium Enterprises (SMEs). Light Engineering Sector in Bangladesh is one of the sub-sectors of SMEs. This sector occupies a unique position in the economy of Bangladesh. But the sector is suffering from different problems. Clusters are geographic concentrations of interconnected companies, specialized suppliers, service providers, and associated institutions in a particular field that are present in a nation or region. Depending on information of a pilot survey it is assumed that, isolated operation of SMEs creates different marketing problems. It is also said that, problems of SMEs can be removed through cluster operation some extent and can be increased marketing capability. Please indicate (✓) the intensity of prospect to remove marketing problems through cluster concept, faced by your organization for following factors to operate individually:

Scale: 1=Strongly disagree 2=Disagree 3=Uncertain 4=Agree 5=Strongly agree

Sl#	Factors	Scale				
6	Through collaboration with suppliers it will be possible to get smooth supply of raw materials	1	2	3	4	5
7	Through collaboration with suppliers it will be possible to get raw material according to requirement	1	2	3	4	5

8	Through collaboration with employees it will be possible to identify needs of customers	1	2	3	4	5
9	Through collaboration with distributor it will be possible to identify needs of customers	1	2	3	4	5
10	Through collaboration with retailer it will be possible to identify needs of customers	1	2	3	4	5
11	Through collaboration with intermediaries (Distributor & retailer) it will be possible to know about competitors' products	1	2	3	4	5
12	Through collaboration with intermediaries (Distributor & retailer) it will be possible to know about strengths of competitors' products	1	2	3	4	5
13	Through collaboration with intermediaries (Distributor & retailer) it will be possible to know about weaknesses of competitors' products	1	2	3	4	5
14	Through collaboration with intermediaries (Distributor & retailer) it will be possible to differentiate products	1	2	3	4	5
15	Through collaboration with intermediaries (Distributor & retailer) it will be possible to modify products regularly	1	2	3	4	5
16	Through collaboration with immediate stakeholders (suppliers, employees, distributors, retailers) it will be possible to share cost of marketing research	1	2	3	4	5
17	Sharing information within competitor firms under light engineering industry will make possible to set appropriate price	1	2	3	4	5
18	Sharing information within light engineering firms will increase bargaining power	1	2	3	4	5
19	Well informed (sharing information) small businesses under LEI will be able to ignore dominance of customer on pricing	1	2	3	4	5
20	Sharing information small business entrepreneurs will be able to set value based price	1	2	3	4	5
21	Co-location of many light engineering small firms will make possible to share material at the time of need	1	2	3	4	5
22	Co-location of many light engineering small firms will make possible to share final product at the time of need	1	2	3	4	5
23	Co-location of many light engineering small firms will make possible to share machinery use at time of need	1	2	3	4	5
24	Co-location of many light engineering small firms will make possible to share providing after sales services to customers	1	2	3	4	5
25	Co-location of many light engineering small firms will make possible to transfer customers to another organization at the time of overfull demand	1	2	3	4	5
26	Co-location of many light engineering small firms will make possible to transfer customers to another suitable organization	1	2	3	4	5
27	Co-location of many light engineering small firms will make possible to deliver products timely (by reducing production related problems)	1	2	3	4	5

28	Co-location of many light engineering small firms will make possible to attract many supplier to take position in the cluster	1	2	3	4	5
29	Co-location of many light engineering small firms will make possible to attract many distributor to take position in the cluster	1	2	3	4	5
30	Co-location of many suppliers and buyers will make possible to increase customer value (by reducing money cost, time cost, energy cost and psychic cost)	1	2	3	4	5
31	Co-location of seller and buyers will make possible to reduce intermediary dominance on distribution channel	1	2	3	4	5
32	Co-location of supplier, producer and distributor will make possible to reconfigure value delivery network at any time	1	2	3	4	5
33	Co-location of many light engineering small firms will make possible to establish 'one stop shop'	1	2	3	4	5
34	Inter-firm network of small businesses under LEI will make possible to set marketing communication strategies jointly	1	2	3	4	5
35	Inter-firm network of small businesses under LEI will make possible to create form primary market	1	2	3	4	5
36	Inter-firm network of light engineering small businesses will make possible to set own advertising strategy	1	2	3	4	5
37	Inter-firm network of light engineering small businesses will make possible to set own personal selling strategy	1	2	3	4	5
38	Inter-firm network of small businesses will make possible to set own sales promotion strategy	1	2	3	4	5
39	Inter-firm network of light engineering small businesses will make possible to set own public relation strategy	1	2	3	4	5
40	Inter-firm network of small businesses will make possible to set own integrated marketing communication strategy	1	2	3	4	5
41	Inter-firm network of light engineering small businesses will make possible to create brand primary market	1	2	3	4	5
42	Sharing knowledge within employees of small businesses under LEI will make possible to increase trust on each other	1	2	3	4	5
43	Sharing knowledge within employees of light engineering small businesses will make possible to know about norms of the society	1	2	3	4	5
44	Sharing knowledge within employees of light engineering small businesses will make possible to increase social network	1	2	3	4	5
45	Sharing knowledge of work through word of mouth within employees of small businesses will make possible to enhance efficiency	1	2	3	4	5
46	Sharing knowledge of work through electronic media within employees of small businesses will make possible to enhance efficiency	1	2	3	4	5
47	Sharing knowledge within employees of small businesses will make possible to increase internal specialization	1	2	3	4	5
48	Sharing knowledge within employees of small businesses will make possible to generate management economies	1	2	3	4	5

49	Mutual learning of light engineering small businesses through observation will make possible to develop own infrastructure	1	2	3	4	5
50	Mutual learning of light engineering small businesses through observation will make possible to find out weak points of own organization	1	2	3	4	5
51	Mutual learning of light engineering small businesses through observation will make possible to adopt the marketing strategies taken by leading organizations	1	2	3	4	5
52	Mutual learning through observation will make possible to take corrective action before facing the problem	1	2	3	4	5
53	Through joint purchase of materials by light engineering small businesses will make possible to share purchasing cost	1	2	3	4	5
54	Joint distribution of final products by light engineering small businesses will make possible to share distribution cost	1	2	3	4	5
55	Collective initiative by light engineering small businesses will make possible to manage fund	1	2	3	4	5
56	Collective initiative will make possible to manage business development services	1	2	3	4	5
57	Collective initiative will make possible to manage bureaucratic snafu	1	2	3	4	5
58	Collective initiative will make possible to manage government for taking necessary steps	1	2	3	4	5
59	Collective initiative will make possible to remove gap between corporate world and academic education	1	2	3	4	5
60	Collective initiative will make possible to manage job related training for employees	1	2	3	4	5
61	Collective initiative will make possible to give idea about contemporary technology	1	2	3	4	5
62	Collective initiative will make possible to give ideas to employees about business ethics	1	2	3	4	5
63	Collective initiative will make possible to manage special fund for employees	1	2	3	4	5
64	Collective initiative will make possible to minimize losses for political problems	1	2	3	4	5
65	Collective initiative will make possible to minimize losses for electricity problems	1	2	3	4	5
66	Collective initiative will make possible to arrange different cultural programs	1	2	3	4	5
67	Collective initiative will make possible to manage institutions for getting standardization related suggestions	1	2	3	4	5
68	Collective initiative will make possible to manage institutions for getting grading related suggestions	1	2	3	4	5
69	Collective initiative will make possible to manage institutions for getting product design related suggestions	1	2	3	4	5

70	Collective initiative will make possible to manage cooperation of different organizations to develop new products according to the choice of the customer	1	2	3	4	5
71	Collective initiative will make possible to manage different quality testing institutions for getting quality testing related services	1	2	3	4	5
72	Collective initiative will make possible to manage business friendly environment	1	2	3	4	5

73. Give some suggestions for the betterment of the industry

THANK YOU VARY MUCH FOR YOUR KIND COOPERATION

Appendix-2

Translation of Questionnaire in Bangla

বাংলাদেশের ক্ষুদ্র ব্যবসায়ের বাজারজাতকরণ দক্ষতা বৃদ্ধিতে গুচ্ছ মতবাদ (Cluster Concept): হালকা ইঞ্জিনিয়ারিং সাব-সেক্টরের (উপ-খাত) উপর একটি সমীক্ষা

হালকা ইঞ্জিনিয়ারিং সাব-সেক্টরের (উপ-খাত) অধীনস্থ ক্ষুদ্র ব্যবসায়ের উপর
প্রশ্নমালা

ক-বিভাগ : সাধারণ তথ্য

১. প্রতিষ্ঠানের নাম _____

টেলিফোন # _____

২. প্রধান পণ্যসমূহ _____

৩. সম্পদের মূল্য (জমি ও কারখানা ভবন বাদে টেকসই সম্পদ)

ক. ৩৭৫০০০০ এর কম খ. ৩৭৫০০০০ হতে ৭৪৯৯৯৯৯ গ. ৭৫০০০০০ হতে ১১২৪৯৯৯৯ ঘ. ১২৫০০০০০ হতে ১৪৯৯৯৯৯৯

৪. কর্মীদের সংখ্যা

ক. ৭ এর কম খ. ৭ হতে ১২ গ. ১৩ হতে ১৮ ঘ. ১৯ হতে ২৪

৫. কাজের ধরণ

ক. উৎপাদন (Manufacturing)

খ. মেরামত করণ (Repairing)

গ. ক্রয়-বিক্রয় (Trading)

ঘ. উৎপাদন এবং মেরামত করণ

খ-বিভাগ : গুচ্ছ মতবাদের মাধ্যমে সমস্যা সমাধানের সম্ভাবনা (বাজারজাতকরণ দক্ষতা বৃদ্ধির সম্ভাবনা)

বাংলাদেশের বেসরকারী খাত বলতে মূলত ক্ষুদ্র ও মাঝারী আকারের প্রতিষ্ঠানকে বুঝায়। বাংলাদেশের হালকা ইঞ্জিনিয়ারিং খাত ক্ষুদ্র ও মাঝারি প্রতিষ্ঠানের একটি উপ-খাত। এই খাত (হালকা ইঞ্জিনিয়ারিং) দেশের অর্থনীতিতে একটি গুরুত্বপূর্ণ স্থান দখল করে আছে। গুচ্ছ মতবাদ (Cluster concept) হলো একটি নির্দিষ্ট খাতের কতগুলো সমজাতীয় প্রতিষ্ঠানের ভৌগলিকভাবে সহাবস্থান করণ। অন্যভাবে বলা যায়, গুচ্ছ মতবাদ হলো পারস্পরিক সংযুক্ত প্রতিষ্ঠান, বিশেষায়িত সরবরাহকারী, সেবা প্রদানকারী এবং সহযোগী প্রতিষ্ঠান সমূহের কোন একটি দেশে বা অঞ্চলে ভৌগলিকভাবে সহাবস্থান করণ। একটি পরীক্ষামূলক সমীক্ষায় দেখা যায় ক্ষুদ্র ও মাঝারি আকারের প্রতিষ্ঠান সমূহের বিচ্ছিন্ন কার্যপরিচালনা বাজারজাতকরণ সংক্রান্ত নানারকম সমস্যা সৃষ্টি করে। এই সমীক্ষা থেকে এও ধারণা করা হয় যে, ক্ষুদ্র ও মাঝারি আকারের এই প্রতিষ্ঠান সমূহের সমস্যা গুচ্ছ কার্যপরিচালনার মাধ্যমে দূর করা সম্ভব। ক্ষুদ্র ও মাঝারি আকারের এই প্রতিষ্ঠান সমূহের সমস্যা সংক্রান্ত নিম্নোক্ত বিবৃতি গুলোর ক্ষেত্রে আপনার মতামত (✓) দিন।

পরিমাপক: ১= কোনভাবেই একমত নই ২= একমত নই ৩= অনিশ্চিত ৪= একমত ৫= পুরোপুরি একমত

ক্রঃ #	বিবৃতি সমূহ	পরিমাপক				
৬	সরবরাহকারী প্রতিষ্ঠানের সহিত সহযোগীতার সম্পর্ক স্থাপনের মাধ্যমে মালের বাঁধামুক্ত সরবরাহ পাওয়া যাবে	১	২	৩	৪	৫
৭	সরবরাহকারী প্রতিষ্ঠানের সহিত সহযোগীতার সম্পর্ক স্থাপনের মাধ্যমে পছন্দ অনুযায়ী মালের সরবরাহ পাওয়া যাবে	১	২	৩	৪	৫

৮	কর্মীদের সহিত সহযোগীতার সম্পর্ক স্থাপনের মাধ্যমে ক্রেতাদের প্রয়োজন সম্পর্কে জানা যাবে	১	২	৩	৪	৫
৯	পরিবেশকদের সহিত সহযোগীতার সম্পর্ক স্থাপনের মাধ্যমে ক্রেতাদের প্রয়োজন সম্পর্কে জানা যাবে	১	২	৩	৪	৫
১০	খুচরাকারবারীদের সহিত সহযোগীতার সম্পর্ক স্থাপনের মাধ্যমে ক্রেতাদের প্রয়োজন সম্পর্কে জানা যাবে	১	২	৩	৪	৫
১১	মধ্যস্থকারবারীদের (পরিবেশক এবং খুচরাকারবারী) সহিত সহযোগীতার সম্পর্ক স্থাপনের মাধ্যমে প্রতিযোগীদের পণ্য সম্পর্কে জানা যাবে	১	২	৩	৪	৫
১২	মধ্যস্থকারবারীদের (পরিবেশক এবং খুচরাকারবারী) সহিত সহযোগীতার সম্পর্ক স্থাপনের মাধ্যমে প্রতিযোগীদের পণ্যের শক্তিমত্তা সম্পর্কে জানা যাবে	১	২	৩	৪	৫
১৩	মধ্যস্থকারবারীদের (পরিবেশক এবং খুচরাকারবারী) সহিত সহযোগীতার সম্পর্ক স্থাপনের মাধ্যমে প্রতিযোগীদের পণ্যের দুর্বলতা সম্পর্কে জানা যাবে	১	২	৩	৪	৫
১৪	মধ্যস্থকারবারীদের (পরিবেশক এবং খুচরাকারবারী) সহিত সহযোগীতার সম্পর্ক স্থাপনের মাধ্যমে পণ্যের বৈচিত্র্যময়তা আনয়ন সম্ভব হবে	১	২	৩	৪	৫
১৫	মধ্যস্থকারবারীদের (পরিবেশক এবং খুচরাকারবারী) সহিত সহযোগীতার সম্পর্ক স্থাপনের মাধ্যমে প্রতিনিয়ত পণ্যের উৎকর্ষ সাধন সম্ভব হবে	১	২	৩	৪	৫
১৬	নিকটবর্তী স্টেকহোল্ডারদের (কর্মী, সরবরাহকারী, বন্টনকারী, খুচরাকারবারী) সহিত সহযোগীতার সম্পর্ক স্থাপনের মাধ্যমে বাজারজাতকরণ গবেষণা খরচ ভাগাভাগি করণ সম্ভব হবে	১	২	৩	৪	৫
১৭	হালকা ইঞ্জিনিয়ারিং খাত এর অধীনস্থ একই জাতীয় প্রতিযোগী প্রতিষ্ঠান সমূহের মধ্যে তথ্য জানাজানির মাধ্যমে সঠিক মূল্য নির্ধারণ সম্ভব হবে	১	২	৩	৪	৫
১৮	একই জাতীয় প্রতিযোগী প্রতিষ্ঠান (হালকা ইঞ্জিনিয়ারিং) সমূহের মধ্যে তথ্য জানাজানির মাধ্যমে দরকষাকষির ক্ষমতা বৃদ্ধি পাবে	১	২	৩	৪	৫
১৯	একই জাতীয় প্রতিযোগী প্রতিষ্ঠান (হালকা ইঞ্জিনিয়ারিং) সমূহের মধ্যে তথ্য জানাজানির মাধ্যমে মূল্য নির্ধারণের ক্ষেত্রে ক্রেতাদের কর্তৃত্ব কমানো সম্ভব হবে	১	২	৩	৪	৫
২০	একই জাতীয় প্রতিযোগী প্রতিষ্ঠান (হালকা ইঞ্জিনিয়ারিং) সমূহের মধ্যে তথ্য জানাজানির মাধ্যমে পণ্যের প্রতি ক্রেতাদের আগ্রহ বুঝে মূল্য নির্ধারণ সম্ভব হবে	১	২	৩	৪	৫
২১	হালকা ইঞ্জিনিয়ারিং খাত এর অধীনস্থ অনেকগুলি ক্ষুদ্র প্রতিষ্ঠানের ভৌগলিকভাবে সহাবস্থান করণের মাধ্যমে প্রয়োজনের সময় মালের (material) আদান প্রদান করণ সম্ভব হবে	১	২	৩	৪	৫
২২	অনেকগুলি হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র প্রতিষ্ঠানের ভৌগলিকভাবে সহাবস্থান করণের মাধ্যমে প্রয়োজনের সময় পণ্যের (final product) আদান প্রদান করণ সম্ভব হবে	১	২	৩	৪	৫
২৩	অনেকগুলি হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র প্রতিষ্ঠানের ভৌগলিকভাবে সহাবস্থান করণের মাধ্যমে প্রয়োজনের সময় যন্ত্রপাতির ব্যবহারের বিনিময় সম্ভব হবে	১	২	৩	৪	৫
২৪	অনেকগুলি হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র প্রতিষ্ঠানের ভৌগলিকভাবে সহাবস্থানের মাধ্যমে প্রয়োজনের সময় ভোক্তাসেবা বিনিময় সম্ভব হবে	১	২	৩	৪	৫
২৫	অনেকগুলি হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র প্রতিষ্ঠানের ভৌগলিকভাবে সহাবস্থানের মাধ্যমে ব্যস্ততার সময় অন্য প্রতিষ্ঠানের নিকট কাজের হস্তান্তর সম্ভব হবে	১	২	৩	৪	৫
২৬	অনেকগুলি হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র প্রতিষ্ঠানের ভৌগলিকভাবে সহাবস্থানের মাধ্যমে উপযুক্ত প্রতিষ্ঠানের নিকট কাজের হস্তান্তর সম্ভব হবে	১	২	৩	৪	৫

২৭	অনেকগুলি হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র প্রতিষ্ঠানের ভৌগলিকভাবে সহাবস্থানের ফলে সঠিক সময়ে পণ্যের সরবরাহ (উৎপাদন সংক্রান্ত বাঁধা কমানোর মাধ্যমে) প্রদান করা সম্ভব হবে	১	২	৩	৪	৫
২৮	অনেকগুলি হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র প্রতিষ্ঠানের ভৌগলিকভাবে সহাবস্থান করণের মাধ্যমে সরবরাহকারীদেরও উক্ত স্থানে অবস্থান গ্রহণে উদ্বুদ্ধকরণ (motivate) সম্ভব হবে	১	২	৩	৪	৫
২৯	অনেকগুলি হালকা ইঞ্জিনিয়ারিং প্রতিষ্ঠানের ভৌগলিকভাবে সহাবস্থান করণের মাধ্যমে পরিবেশকদেরও উক্ত স্থানে অবস্থান গ্রহণে উদ্বুদ্ধকরণ (motivate) সম্ভব হবে	১	২	৩	৪	৫
৩০	অনেক সরবরাহকারী এবং উৎপাদনকারী প্রতিষ্ঠানের ভৌগলিকভাবে সহাবস্থানের মাধ্যমে ক্রেতা ভ্যালু (customer value) বৃদ্ধিকরণ সম্ভব হবে	১	২	৩	৪	৫
৩১	ক্রেতা এবং বিক্রেতার ভৌগলিকভাবে সহাবস্থানের মাধ্যমে বন্টন প্রণালীর উপর মধ্যস্থ কারবারীদের কর্তৃত্ব কমানো সম্ভব হবে	১	২	৩	৪	৫
৩২	সরবরাহকারী, উৎপাদক এবং পরিবেশকদের সহাবস্থানের মাধ্যমে বন্টন প্রণালীকে যে কোন সময় যুগোপযোগী করে সাজানো সম্ভব হবে	১	২	৩	৪	৫
৩৩	অনেকগুলি হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র প্রতিষ্ঠানের ভৌগলিকভাবে সহাবস্থান করণের মাধ্যমে “ওয়ান স্টপ শপ (One Stop Shop)” স্থাপন সম্ভব হবে	১	২	৩	৪	৫
৩৪	আন্ত-প্রাতিষ্ঠানিক যোগাযোগের মাধ্যমে হালকা ইঞ্জিনিয়ারিং খাত এর অধীনস্থ ক্ষুদ্র প্রতিষ্ঠানগুলোর পক্ষে যৌথভাবে বাজারজাতকরণ যোগাযোগ কৌশল গ্রহণ সম্ভব হবে	১	২	৩	৪	৫
৩৫	আন্ত-প্রাতিষ্ঠানিক যোগাযোগের মাধ্যমে হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র প্রতিষ্ঠানগুলোর পক্ষে শিল্পের শৈশবকালীন সময়ে বাজার উন্নয়ন সম্ভব হবে	১	২	৩	৪	৫
৩৬	আন্ত-প্রাতিষ্ঠানিক যোগাযোগের মাধ্যমে হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র প্রতিষ্ঠানগুলোর পক্ষে নিজস্ব বিজ্ঞাপন (Advertising) কৌশল নির্ধারণ করা সম্ভব হবে	১	২	৩	৪	৫
৩৭	আন্ত-প্রাতিষ্ঠানিক যোগাযোগের মাধ্যমে হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র ব্যবসা প্রতিষ্ঠানগুলোর পক্ষে নিজস্ব বিক্রয় প্রসার (Sales promotion) কৌশল নির্ধারণ করা সম্ভব হবে	১	২	৩	৪	৫
৩৮	আন্ত-প্রাতিষ্ঠানিক যোগাযোগের মাধ্যমে হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র ব্যবসা প্রতিষ্ঠানগুলোর পক্ষে নিজস্ব ব্যক্তিক বিক্রয় (Personal selling) কৌশল নির্ধারণ করা সম্ভব হবে	১	২	৩	৪	৫
৩৯	আন্ত-প্রাতিষ্ঠানিক যোগাযোগের মাধ্যমে হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র ব্যবসা প্রতিষ্ঠানগুলোর পক্ষে নিজস্ব জনসংযোগ (Public relation) কৌশল নির্ধারণ করা সম্ভব হবে	১	২	৩	৪	৫
৪০	আন্ত-প্রাতিষ্ঠানিক যোগাযোগের মাধ্যমে হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র ব্যবসা প্রতিষ্ঠানগুলোর পক্ষে নিজস্ব সমন্বিত বাজারজাতকরণ যোগাযোগ (Integrated marketing communication) কৌশল নির্ধারণ করা সম্ভব হবে	১	২	৩	৪	৫
৪১	আন্ত-প্রাতিষ্ঠানিক যোগাযোগের মাধ্যমে হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র প্রতিষ্ঠানগুলোর পক্ষে প্রতিযোগিতামূলক শিল্পের ক্ষেত্রেও এককভাবে বাজার উন্নয়ন সম্ভব হবে	১	২	৩	৪	৫
৪২	হালকা ইঞ্জিনিয়ারিং খাত এর অধীনস্থ ক্ষুদ্র ব্যবসা প্রতিষ্ঠানগুলোর কর্মীগণ নিজেদেরও মধ্যে জ্ঞান বিনিময়ের মাধ্যমে পারস্পরিক বিশ্বাস বৃদ্ধি করতে পারবে	১	২	৩	৪	৫

৪৩	হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র ব্যবসা প্রতিষ্ঠানগুলোর কর্মীগণ নিজেদের মধ্যে জ্ঞান বিনিময়ের মাধ্যমে সমাজের প্রথা/নিয়ম সম্পর্কে অবগত হতে পারবে	১	২	৩	৪	৫
৪৪	হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র ব্যবসা প্রতিষ্ঠানগুলোর কর্মীগণ নিজেদের মধ্যে জ্ঞান বিনিময়ের মাধ্যমে সামাজিক যোগাযোগ বৃদ্ধি করতে পারবে	১	২	৩	৪	৫
৪৫	হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র ব্যবসা প্রতিষ্ঠানগুলোর কর্মীগণ নিজেদের মধ্যে কথাবার্তার মাধ্যমে কাজ সংক্রান্ত জ্ঞান বিনিময়ের ফলে দক্ষতা বৃদ্ধিকরন সম্ভব হবে	১	২	৩	৪	৫
৪৬	হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র ব্যবসা প্রতিষ্ঠানগুলোর কর্মীগণ নিজেদের মধ্যে ইলেকট্রনিক মিডিয়ার মাধ্যমে কাজ সংক্রান্ত জ্ঞান বিনিময়ের ফলে দক্ষতা বৃদ্ধিকরন সম্ভব হবে	১	২	৩	৪	৫
৪৭	হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র প্রতিষ্ঠানগুলোর কর্মীগণ নিজেদের মধ্যে জ্ঞান বিনিময়ের মাধ্যমে অভ্যন্তরীণ বিশেষায়ন (Internal specialization) বৃদ্ধিকরন সম্ভব হবে	১	২	৩	৪	৫
৪৮	হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র প্রতিষ্ঠানগুলোর কর্মীগণ নিজেদের মধ্যে জ্ঞান বিনিময়ের ফলে ব্যবস্থাপনাকীর্ষ মিতব্যয়িতা বৃদ্ধিকরন সম্ভব হবে	১	২	৩	৪	৫
৪৯	পর্যবেক্ষন করে পারস্পরিক জ্ঞান অর্জনের মাধ্যমে হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র ব্যবসা প্রতিষ্ঠানগুলোর পক্ষে নিজস্ব অবকাঠামোগত উন্নয়ন সম্ভব হবে	১	২	৩	৪	৫
৫০	পর্যবেক্ষন করে পারস্পরিক জ্ঞান অর্জনের মাধ্যমে হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র ব্যবসা প্রতিষ্ঠানগুলো নিজেদের দুর্বলতা সম্পর্কে জানতে পারবে	১	২	৩	৪	৫
৫১	পর্যবেক্ষন করে পারস্পরিক জ্ঞান অর্জনের মাধ্যমে ক্ষুদ্র ব্যবসা প্রতিষ্ঠানগুলো (LEI) নেতৃত্বদানকারী প্রতিষ্ঠানগুলোর বাজারজাতকরণ কৌশলের সাথে তাল মিলাতে পারবে	১	২	৩	৪	৫
৫২	পর্যবেক্ষন করে পারস্পরিক জ্ঞান অর্জনের মাধ্যমে হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র ব্যবসা প্রতিষ্ঠানগুলো বিপদের সম্মুখীন হওয়ার পূর্বেই সংশোধনক্ষম পদক্ষেপ নিতে পারবে	১	২	৩	৪	৫
৫৩	যৌথভাবে মাল ক্রয়ের মাধ্যমে হালকা ইঞ্জিনিয়ারিং খাত এর অধীনস্থ ক্ষুদ্র প্রতিষ্ঠানগুলোর পক্ষে ক্রয় খরচ ভাগাভাগি করন সম্ভব হবে	১	২	৩	৪	৫
৫৪	যৌথভাবে পণ্যের (final product) বন্টনের মাধ্যমে হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র প্রতিষ্ঠানগুলোর পক্ষে বন্টন খরচ ভাগাভাগি করন সম্ভব হবে	১	২	৩	৪	৫
৫৫	যৌথ উদ্যোগের মাধ্যমে হালকা ইঞ্জিনিয়ারিং ক্ষুদ্র ব্যবসা প্রতিষ্ঠানগুলোর পক্ষে অর্থসংস্থান করা সম্ভব হবে	১	২	৩	৪	৫
৫৬	যৌথ উদ্যোগের মাধ্যমে ব্যবসায় উন্নয়ন সেবা সমূহের ব্যবস্থা করা সম্ভব হবে	১	২	৩	৪	৫
৫৭	যৌথ উদ্যোগের মাধ্যমে আমলাতান্ত্রিক জটিলতা সংক্রান্ত সমস্যার সমাধান সম্ভব হবে	১	২	৩	৪	৫
৫৮	যৌথ উদ্যোগের মাধ্যমে সরকারকে যথাযথ পদক্ষেপ নিতে রাজি করানো যাবে	১	২	৩	৪	৫
৫৯	যৌথ উদ্যোগের মাধ্যমে কর্পোরেট জগৎ (বাস্তব জগৎ) ও প্রাতিষ্ঠানিক শিক্ষার মধ্যেও দূরত্ব দূর করা সম্ভব হবে	১	২	৩	৪	৫
৬০	যৌথ উদ্যোগের মাধ্যমে কর্মীদের কাজ সম্পর্কিত প্রশিক্ষনের আয়োজন করা সম্ভব হবে	১	২	৩	৪	৫
৬১	যৌথ উদ্যোগের মাধ্যমে কর্মীদের যুগোপযোগী প্রযুক্তি সম্পর্কে ধারণা দেওয়া সম্ভব হবে	১	২	৩	৪	৫
৬২	যৌথ উদ্যোগের মাধ্যমে কর্মীদের ব্যবসায় নৈতিকতা সম্পর্কে ধারণা দেওয়া সম্ভব হবে	১	২	৩	৪	৫
৬৩	যৌথ উদ্যোগের মাধ্যমে কর্মীদের জন্য বিশেষ তহবিলের ব্যবস্থা করা সম্ভব হবে	১	২	৩	৪	৫

৬৪	যৌথ উদ্যোগের মাধ্যমে রাজনৈতিক কারণে সৃষ্ট ক্ষতি ন্যূনতম পর্যায়ে রাখা সম্ভব হবে	১	২	৩	৪	৫
৬৫	যৌথ উদ্যোগের মাধ্যমে বৈদ্যুতিক কারণে সৃষ্ট ক্ষতি ন্যূনতম পর্যায়ে রাখা সম্ভব হবে	১	২	৩	৪	৫
৬৬	যৌথ উদ্যোগের মাধ্যমে বিভিন্নরকম সাংস্কৃতিক অনুষ্ঠানের আয়োজন করা সম্ভব হবে	১	২	৩	৪	৫
৬৭	যৌথ উদ্যোগের মাধ্যমে আদর্শমান সংক্রান্ত পরামর্শের ব্যবস্থা করা সম্ভব হবে	১	২	৩	৪	৫
৬৮	যৌথ উদ্যোগের মাধ্যমে গ্রেডিং (পর্যায়িতকরণ) সংক্রান্ত পরামর্শ পাওয়া সম্ভব হবে	১	২	৩	৪	৫
৬৯	যৌথ উদ্যোগের মাধ্যমে পণ্যের যতার্থ নকশাকরন সংক্রান্ত সেবা পাওয়া সম্ভব হবে	১	২	৩	৪	৫
৭০	যৌথ উদ্যোগের মাধ্যমে পণ্য উৎপাদন সংক্রান্ত পরামর্শের ব্যবস্থা করা সম্ভব হবে	১	২	৩	৪	৫
৭১	যৌথ উদ্যোগের মাধ্যমে পণ্যের মান পরীক্ষাকরণ সংক্রান্ত সেবার ব্যবস্থা করা সম্ভব হবে	১	২	৩	৪	৫
৭২	যৌথ উদ্যোগের মাধ্যমে ব্যবসা বান্ধব পরিবেশের ব্যবস্থা করা সম্ভব হবে	১	২	৩	৪	৫

৭৩. এই শিল্পের সুন্দর ভবিষ্যতের জন্য কিছু পরামর্শ দিনঃ

আপনার সদয় সহযোগিতার জন্য ধন্যবাদ

Appendix-3

Profile of the respondents

3. 1 Addresses, educational qualifications, and experiences of the respondents of the firms (sample units) from where data were collected

Manufacturing and Repairing

Respondent 01

Mr Abdur Razzaque, Proprietor-Sunrise Engineering (Producer and repairing services provider of all kinds of plastic injection mold), 31, Nandalal Datta Lane, Laxmibazar, Dhaka-1100, President of Bangladesh Engineering Industry Owner Association, Mr Razzaque is an MA and has more than twenty (20) years of experience in this field, He is known about the concept of clustering theoretically as well as from experience, He is capable to answer in English and Bangla.

Respondent 02

Mr Md. Ali Akbar, Proprietor-Akbar Engineering Works (Manufacturer and repairing services provider of all kinds of spare parts), 7, Taherbag, Dhaka, Secretary of Bangladesh Engineering Industry Owner Association, Mr Akbar is an MA and has more than fifteen (15) years of experience in this field, He is known about the concept of clustering theoretically as well as from experience, He is capable to answer in English and Bangla.

Respondent 03

Mr. Md. Abu Hossain Khokon, , Proprietor-New Rupali Engineering (Manufacturer and repairing services provider of all kinds of spare parts), 14, 14/1 Tipu sultan Road, Dhaka-1100, Ex-Secretary of Bangladesh Engineering Industry Owner Association, Mr Khokon is an MA and has more than fifteen (15) years of experience in this field, He is known about the concept of clustering theoretically as well as from experience, He is capable to answer in English and Bangla.

Respondent 04

Mr. Md. Bachhu Mia, Managing Director-Dider Engineering (Pvt.) Ltd. (Manufacturer of all kinds of spare parts and repairing services provider), 74, H.K. Das Road, Dhaka-1100, Member of Bangladesh engineering Industry Owner Association, Mr Bachu is a BA and has more than fifteen (15) years experience in this field, He is known about the concept of clustering theoretically as well as from experience, He is capable to answer in English and Bangla.

Respondent 05

Mr Md. Abdul Hakim Miah, Proprietor- H. T. Engineering Works (Manufacturer and repairing services provider of machinery parts of paper mill, textile mill, sugar mill), 1/1, Taherbag lane, Dhaka, member of Bangladesh Engineering Industry Owner Association, Mr Akbar is a BA and has more than fifteen (15) years of experience in this field, He is known about the concept of clustering theoretically as well as from experience, He is capable to answer in English and Bangla.

Respondent 06

Mr Abul Hossain Khan, Proprietor-Abul Gas Kit & Engineering works (Manufacturer and repairing services provider of all kinds of spare parts of automobile and agriculture), 74/1, Lalmohon Saha Street, Dholaikhal, Dhaka, He is a BA and has more than fifteen (15) years experience in this field, He is known about the concept of clustering theoretically as well as from experience, He is capable to answer in English and Bangla.

Respondent 07

Mr. Mohammad Ali, Managing Director- Shakiba Engineering Works (Manufacturer and repairing services provider of body of ATM machine), 68, H.K. Das Road, Dhaka-1100, Member of Bangladesh engineering Industry Owner Association, Mr Ali is an MA and has more than ten (10) years experience in this field, He is known about the concept of clustering theoretically as well as from experience, He is capable to answer in English and Bangla.

Respondent 08

Mr Md Anwar, Proprietor-Anwar Engineering works (Manufacturer and repairing services provider of different spare parts of textile mills & sugar mills), Tipu sultan Road, Dhaka-1100, Educational qualification- BA and has around ten (10) years experience in this field, He is known about the concept of clustering from experience and capable to answer in English and Bangla.

Respondent 09

Mr Abul Hassan, Proprietor- Nipun Engineering (Manufacturer and repairing services provider of different spare parts), 29/1, Goalghat Lane, Dhaka, Ex-President of Bangladesh Engineering Industry Owner Association, Mr Hassan is an MA and has more than twenty (20) years of experience in this field, He is known about the concept of clustering theoretically as well as from experience, He is capable to answer in English and Bangla.

Respondent 10

Mr Md. Nazrul Islam, Proprietor- Northern Engineering Works (Manufacturer and repairing services provider of gear, pinion, pulley), 5/A, Tipu Sultan Road, Dhaka -1100, Member of Bangladesh engineering Industry Owner Association, Mr Nazrul is a BA and has more than fifteen (15) years of experience in this field, He is known about the concept of clustering theoretically as well as from experience, He is capable to answer in English and Bangla.

Respondent 11

Mr Md Solaman Zohur, Proprietor- Solaman Engineering works (Manufacturer and repairing services provider of different agricultural machinery), 7/3, Taherbag Lane, Dhaka -1100, Educational qualification- SSC and has around twelve (12) years experience in this field. He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 12

Mr Sumon Rahman, Employee- Khirul Engineering works (Manufacturer and repairing services provider of spare parts), Tipu sultan Road, Dhaka-1100, Educational qualification- below SSC and has around ten (10) years experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 13

Mr Md. Delwar Hossain Dilu, Proprietor-Harun Engineering Works (Manufacturer and repairing services provider of spare parts), 13, Tipu sultan Road, Dhaka-1100, Educational qualification- HSC and has around sixteen (16) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 14

Mr Md. Faruk Ahmed, Proprietor- Faruk Ahmed Engineering Works (Manufacturer and repairing services provider of all kinds of spare parts of textile machine and garments machine), 12, Taherbag , Dhaka, Educational qualification- below SSC and has around sixteen (16) years of experience in this field and, He is known about the concept of clustering from experience, He is capable to answer Bangla.

Respondent 15

Mr Bashir Ahmed, Proprietor-Model Steel & Engineering Works (Manufacturer and repairing services provider of different textile and agricultural machinery), 2, Narinda Road, Dhaka, Member of Bangladesh engineering Industry Owner Association, Mr Bashir is a BA and has more than fifteen (15) years of experience in this field, He is known about the concept of clustering theoretically as well as from experience, He is capable to answer in English and Bangla.

Respondent 16

Mr. Md. Anwar Hossain, Proprietor- Jewel Engineering Works (Manufacturer and repairing services provider of spare parts of textile mills), 15/8-9, Tipu Sultan Road, Dhaka-1100, Educational qualification- HSC and has more than twelve (12) years experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 17

Mr. Md. Abdus Sattar, Proprietor-Sattar Engineering works (Manufacturer and repairing services provider of spare parts of textile mills), Tipu sultan Road, Dhaka-1100, Educational qualification- HSC and has more than ten (10) years experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 18

Mr. Md. Ibrahim Kholil Gong, Proprietor- Fatema Engineering works (Manufacturer and repairing services provider of Pharmaceutical blister packaging machine), 58, Dr Radasham Saha Street, North Maisunndi, Dhaka -1100, Educational qualification- HSC and has more than twenty (20) years of experience in this field, He is known about the concept of clustering theoretically as well from experience and capable to answer in Bangla.

Respondent 19

Mr. Md. Shiful Islam, Proprietor- Progoti Engineering works (Manufacturer and repairing services provider of Knife bulb, Glue pump roller, Silinder, Knife), 23, Tipu Sultan Road, Dhaka -1100, Educational qualification- HSC and has more than ten (10) years of experience in this field, He is known about the concept of clustering theoretically as well from experience and capable to answer in Bangla.

Respondent 20

Mr Md Shamsul Haque, Proprietor-Shams Engineering (Manufacturer and repairing services provider of grill gate and door), Section-1, Bloc-H, Road-1, Plot-15, Kolwalapara, Mirpur, Dhaka-1210, Educational qualification- HSC and has more than ten (10) years of experience in this field, He is known about the concept of clustering theoretically as well from experience and capable to answer in Bangla.

Respondent 21

Mr Abdul Majid Rana, Managing Director-Star Engineering Works (Manufacturer and repairing services provider of spare parts of textile machinery), 18/3, Modonlal Lane, Nababpur, Dhaka, Educational qualification- BA and has around twenty (20) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 22

Mr Md Abul Kalam, Manager-Janani Engineering works (Manufacturer and repairing services provider of different machine and washing hydro machine), Tipu sultan Road, Dhaka-1100, Educational qualification- HSC and has around ten (10) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 23

Mr. Md. Alauddin, Proprietor - Azad Spring & Co. (Manufacturer and repairing services provider of spare parts of different types of machine), 15, Taherbagh lane, Dhaka-1100, Educational qualification- BA and has around fifteen (15) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 24

Mr. S.M. Muniruzzaman Khokon, Proprietor - Bipa Engineering Works (Manufacturer and repairing services provider of different spare parts), 16/1, Tipu Sultan Road, Dhaka-1100, Educational qualification- HSC and has around fifteen (15) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 25

Mr. Md. Abdu Awal Miah, Proprietor – Gausia Engineering Works (Manufacturer and repairing services provider of different spare parts), 20, Tipu Sultan Road, Dhaka -1100, Educational qualification- HSC and has around fifteen (15) years of experience in this field, He is known about the concept of clustering theoretically as well as from experience and capable to answer in Bangla.

Respondent 26

Mr Md Rubel Rahman, Proprietor- Rubel Engineering Works (Manufacturer and repairing services provider of all kinds of spare parts), 15/19, Tipu sultan Road, Dhaka-1100, Educational qualification-below SSC and has more than ten (10) years experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 27

Mr Sazzad Jaman, Proprietor-Maxim Engineering Works (Manufacturer and repairing services provider of different machinery parts), 41/1, Tipu sultan Road, Dhaka-1100, Member of Bangladesh engineering Industry Owner Association, Educational qualification-HSC and has more than fifteen (15) years of experience in this field, He is known about the concept of clustering theoretically as well as from experience and capable to answer in English and Bangla.

Respondent 28

Mr Zillur Rahman, Proprietor-Sumon Engineering works (Manufacturer and repairing services provider of spare parts of textile machine and water pump), Railway market, Satmatha, Bogra, Educational qualification- SSC and has around fifteen (15) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 29

Mr Siddique Nurul Alam, Proprietor-Sharan Engineering works (Manufacturer and repairing services provider of different agricultural machinery), Railway market, Satmatha, Bogra, Educational qualification- HSC and has around fifteen (15) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 30

Mr Abdul Khaleque, Proprietor-Khaleque Engineering works (Manufacturer and repairing services provider of different types of spare parts), Railway market, Satmatha, Bogra, Educational qualification- HSC and has around eighteen (18) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 31

Mr Babul Mia, Proprietor-Babul Engineering works (Manufacturer of parts of different agricultural machinery), Railway market, Satmatha, Bogra, Educational qualification- SSC and has around twelve (12) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 32

Mr Abdus Sobhan, Proprietor-Mukti Engineering works (Manufacturer of spare parts of water pump), Railway market, Satmatha, Bogra, Educational qualification- Below SSC and has around fifteen (15) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 33

Mr Iqbalur Rahim, Executive- Haque metal works (Manufacturer of agricultural machinery), Gohile Road, Bogra, Educational qualification- Student of polytechnic institute, Bogra and has around eight (08) years of experience in this field, He is known about the concept of clustering theoretically (little bit) as well as from experience and capable to answer in Bangla.

Repairing

Respondent 34

Mr Abdul Aziz, Proprietor- Macca Engineering Works (Repairing services provider of different machineries), 5, Tipu Sultan Road, Dhaka -1100, Educational qualification- HSC and has around twelve (12) years experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 35

Mr Md. Javed Ahmed, Proprietor- **Swiss Engineering Works** (Repairing services provider of machine and automobile), 34, Tipu Sultan Road, Dhaka -1100, Member of Bangladesh engineering Industry Owner Association, Educational qualification- BA and has around twenty (20) years of experience in this field, He is known about the concept of clustering theoretically as well as from experience and capable to answer in Bangla and English.

Respondent 36

Mr Md. Salahuddin, Proprietor-Binimoy Engineering Works (Repairing services provider of different machineries and spare parts), 27/2, Tipu Sultan Road, Dhaka -1100, Member of Bangladesh engineering Industry Owner Association, Educational qualification- HSC and has around fifteen (12) years of experience in this field, He is known about the concept of clustering theoretically (little bit) as well from experience and capable to answer in Bangla.

Respondent 37

Mr Md. Khalid Hasan, Manager-General Engineering Works (Repairing services provider of different machineries and spare parts), Tipu Sultan Road, Dhaka -1100, Educational qualification- SSC and has around ten (10) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 38

Mr Md. Rafiul Hasan, Proprietor-Rafi Engineering Works (Repairing services provider of different textile and agricultural machineries), Goalghat Lane, Dhaka, Educational qualification- HSC and has around fifteen (15) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 39

Mr Abdur Rahim, Proprietor- Sewly Engineering Works (Repairing services provider of different spare parts), Mohammadpur, Dhaka, Educational qualification- SSC and has around fifteen (15) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 40

Mr Md. Munna, Proprietor-Munna Engineering Works (Repairing services provider of different generator and pilling machines), Goalghat Lane, Dhaka, Educational qualification- SSC and has around eighteen (18) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 41

Mr Ahmed, Proprietor-Ahmed Engineering Works (Repairing services provider of different water pump and agricultural machineries), Tipu Sultan Road, Dhaka, Educational qualification - HSC and has around fifteen (15) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 42

Mr. Iqbal, Proprietor- Akota Repairing House (Repairing services provider of commotator), South Moisundy, Dholaikhal, Dhaka, Educational qualification- below SSC and has more than fifteen (15) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 43

Mr Rezaul Karim, Proprietor- Rezaul Gas Welding (Repairing services provider of different textile machineries), Railway market, Satmatha, Bogra, Educational qualification- SSC and has around twelve (12) years experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Manufacturing

Respondent 44

Mr Bashar, Proprietor- Bashar Engineering works (Manufacturer of tubewell, water pump, and agricultural equipments), BRTC market, Satmatha, Bogra, Educational qualification- MA and has around fifteen (15) years experience in this field, He is known about the concept of clustering theoretically as well as from experience and capable to answer in English and Bangla.

Respondent 45

Mr Md Kamal Mia, Proprietor – M/S Kamal Machine Tools (Manufacturer of different agricultural machinery), Silimpur, Bogra, Educational qualification- BA and has around twenty (20) years experience in this field, He is known about the concept of clustering theoretically as well as from experience and capable to answer in Bangla.

Respondent 46

Mr Abdul Karim, Manager – Azad Pump (Manufacturer of water pump), Gohile Road, Bogra, Educational qualification- BA and has around eight (08) years experience in this field, He is known about the concept of clustering theoretically (little bit) as well as from experience and capable to answer in Bangla.

Respondent 47

Mr. Jani, Proprietor- Jani Enterprise (Manufacturer of hardware materials), South Moisundy, Dholaikhal, Dhaka, Educational qualification- below SSC and has more than twenty (20) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 48

Mr. Sultan, Proprietor- Sultan Metal (Manufacturer of light metal products), South Moisundy, Dholaikhal, Dhaka, Educational qualification- below SSC and has more than fifteen (15) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 49

Mr. Nasir Uddin, Proprietor- Nasir Engineering Works (Manufacturer of light agricultural & hardware products), South Moisundy, Dholaikhal, Dhaka, Educational qualification- below SSC and has more than seventeen (17) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 50

Mr. Md Mujibor, Proprietor- Mujibor Engineering Works (Manufacturer of light metal products), South Moisundy, Dholaikhal, Dhaka, Educational qualification- SSC and has more than fifteen (15) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 51

Mr. Md Manirul Islam, Proprietor- Mujibor Engineering Works (Manufacturer of spare parts of agricultural machinery), South Moisundy, Dholaikhal, Dhaka, Educational qualification- below SSC and has more than fifteen (15) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 52

Mr. Md Humayan Kabir, Proprietor- Humayan Engineering Works (Manufacturer of light metal products), South Moisundy, Dholaikhal, Dhaka, Educational qualification- SSC and has more than twelve (12) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 53

Mr. Md Rafsan, Proprietor- Rafsan Engineering Works (Manufacturer of chain and metal products), South Moisundy, Dholaikhal, Dhaka, Educational qualification- HSC and has more than twenty (20) years of experience in this field, He is known about the concept of clustering theoretically as well as from experience and capable to answer in Bangla.

Trading

Respondent 54

Mr. Md Rajib Ullah, Proprietor- New Light House (Buyer and seller of light engineering products like nichurome, carbon, pet/pye/tefton, concimmell wire, heat proof wire etc.), Nawabpur Road, Dhaka, Educational qualification- MA and has more than ten (10) years of experience in this field, He is known about the concept of clustering theoretically as well as from experience and capable to answer in English and Bangla.

Respondent 55

Mr. Md Anwar Hossain, Proprietor- Anwar Traders (Buyer and seller of screw), Nawabpur Road, Dhaka, Educational qualification- SSC and has more than fifteen (15) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 56

Mr. Rafiqul Islam, Proprietor- Rafique Traders (Buyer and seller of light engineering products and hardware materials), Nawabpur Road, Dhaka, Educational qualification- below SSC and has more than fifteen (15) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 57

Mr. Md Alam, Proprietor- Alam Traders (Buyer and seller of light engineering products and hardware materials), Nawabpur Road, Dhaka, Educational qualification- HSC and has more than fifteen (15) years of experience in this field, He is known about the concept of clustering theoretically as well as from experience and capable to answer in Bangla.

Respondent 58

Mr. Md Sumon, Proprietor- Sumon Traders (Buyer and seller of light engineering products and hardware materials), Nawabpur Road, Dhaka, Educational qualification- below SSC and has more than ten (10) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 59

Mr. Abdul Alim, Proprietor- ABC Traders (Buyer and seller of light engineering products and hardware materials), English Road, Dhaka, Educational qualification- below SSC and has more than fifteen (15) years of experience in this field, He is known about the concept of clustering from experience and capable to answer in Bangla.

Respondent 60

Mr. Md Saiham, Proprietor- Saiham Traders (Buyer and seller of light engineering products and hardware materials), English Road, Dhaka, Educational qualification- HSC and has more than fifteen (15) years of experience in this field, He is known about the concept of clustering theoretically as well as from experience and capable to answer in Bangla.

3. 2 Scenario of product type of firms (samples) from where data were collected

Frequency table of product type

Type of product	Frequency	Percent	Valid Percent	Cumulative Percent
Body of ATM machine	1	1.7	1.7	1.7
Agricultural machine spare parts	1	1.7	1.7	3.3
Agricultural & industrial spare parts	1	1.7	1.7	5.0
Agricultural machinery	4	6.7	6.7	11.7
Agricultural machinery parts	5	8.3	8.3	20.0
Agricultural machinery spare parts	1	1.7	1.7	21.7
All types of spare parts	6	10.0	10.0	31.7
Any types of spare parts	1	1.7	1.7	33.3
Commutator	1	1.7	1.7	35.0
Different light eng products	7	11.7	11.7	46.7
Different machinery parts	1	1.7	1.7	48.3
Different parts of machine	1	1.7	1.7	50.0
Different types of machine	1	1.7	1.7	51.7
Different types of spare parts	1	1.7	1.7	53.3
Door, grill gate	1	1.7	1.7	55.0
Gear, pinion, puli	1	1.7	1.7	56.7
Hardware material	1	1.7	1.7	58.3
Nut, chain	1	1.7	1.7	60.0
Parts of paper, textile & sugar mills	1	1.7	1.7	61.7
Pharmaceutical packaging machine	1	1.7	1.7	63.3
Plastic injection mold	1	1.7	1.7	65.0
Repairing	8	13.3	13.3	78.3
Spare of textile & sugar mills	1	1.7	1.7	80.0
Spare of textile & water pump	1	1.7	1.7	81.7
Spare of water pump & textile	1	1.7	1.7	83.3
Spare parts	2	3.3	3.3	86.7
Spare parts of auto & agri	1	1.7	1.7	88.3
Spare parts of water pump	1	1.7	1.7	90.0
Textile & agricultural machinery parts	1	1.7	1.7	91.7
Textile machinery parts	1	1.7	1.7	93.3
Textile spare parts	2	3.3	3.3	96.7
Tube-well, pump, agricultural machinery	1	1.7	1.7	98.3
Water pump	1	1.7	1.7	100.0
Total	60	100.0	100.0	

Appendix-4

Frequency table of questions asked for different hypotheses

4.1 Collaboration with Immediate Stakeholders Results in Right Product mix (hypothesis – 1)

Collaboration with immediate stakeholders results in smooth material supply (q6)

Scale	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	1	1.7	1.7	1.7
Uncertain	3	5.0	5.0	6.7
Agree	33	55.0	55.0	61.7
Strongly Agree	23	38.3	38.3	100.0
Total	60	100.0	100.0	

Collaboration with immediate stakeholders results in required material supply (q7)

Scale	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	1	1.7	1.7	1.7
Uncertain	6	10.0	10.0	11.7
Agree	29	48.3	48.3	60.0
Strongly Agree	24	40.0	40.0	100.0
Total	60	100.0	100.0	

Collaboration with employees results in need identification of customer (q8)

Scale	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	3	5.0	5.0	5.0
Uncertain	7	11.7	11.7	16.7
Agree	27	45.0	45.0	61.7
Strongly Agree	23	38.3	38.3	100.0
Total	60	100.0	100.0	

Collaboration with distributor results in need identification of customer (q9)

Scale	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	5	8.3	8.3	8.3
Disagree	7	11.7	11.7	20.0
Uncertain	11	18.3	18.3	38.3
Agree	19	31.7	31.7	70.0
Strongly Agree	18	30.0	30.0	100.0
Total	60	100.0	100.0	

Collaboration with distributor results in need identification of customer (q10)

Scale	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	1	1.7	1.7	1.7
Disagree	1	1.7	1.7	3.3
Uncertain	16	26.7	26.7	30.0
Agree	28	46.7	46.7	76.7
Strongly Agree	14	23.3	23.3	100.0
Total	60	100.0	100.0	

Collaboration with intermediaries results in know about competitors' products (q11)

Scale	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	1	1.7	1.7	1.7
Uncertain	4	6.7	6.7	8.3
Agree	31	51.7	51.7	60.0
Strongly Agree	24	40.0	40.0	100.0
Total	60	100.0	100.0	

Collaboration with intermediaries to know competitors' product strengths (q12)

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	1	1.7	1.7	1.7
Uncertain	4	6.7	6.7	8.3
Agree	29	48.3	48.3	56.7
Strongly Agree	26	43.3	43.3	100.0
Total	60	100.0	100.0	

Collaboration with intermediaries to know competitors' product weaknesses (q13)

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	1	1.7	1.7	1.7
Uncertain	3	5.0	5.0	6.7
Agree	31	51.7	51.7	58.3
Strongly Agree	25	41.7	41.7	100.0
Total	60	100.0	100.0	

Collaboration with intermediaries to diversify products (q14)

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	3	5.0	5.0	5.0
Disagree	4	6.7	6.7	11.7
Uncertain	7	11.7	11.7	23.3
Agree	26	43.3	43.3	66.7
Strongly Agree	20	33.3	33.3	100.0
Total	60	100.0	100.0	

Collaboration with intermediaries to improve products (q15)

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	2	3.3	3.3	3.3
Disagree	1	1.7	1.7	5.0
Uncertain	6	10.0	10.0	15.0
Agree	30	50.0	50.0	65.0
Strongly Agree	21	35.0	35.0	100.0
Total	60	100.0	100.0	

Collaboration with immediate stakeholders to share marketing research cost (q16)

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	11	18.3	18.3	18.3
Disagree	12	20.0	20.0	38.3
Uncertain	17	28.3	28.3	66.7
Agree	14	23.3	23.3	90.0
Strongly Agree	6	10.0	10.0	100.0
Total	60	100.0	100.0	

4. 2 Sharing Information of Small Businesses under LEI will Result in Right Price

Sharing information for appropriate price setting (q17)

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	2	3.3	3.3	3.3
Disagree	6	10.0	10.0	13.3
Uncertain	10	16.7	16.7	30.0
Agree	31	51.7	51.7	81.7
Strongly Agree	11	18.3	18.3	100.0
Total	60	100.0	100.0	

Sharing information within light engineering firms will increase bargaining power - q18

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	2	3.3	3.3	3.3
Disagree	2	3.3	3.3	6.7
Uncertain	13	21.7	21.7	28.3
Agree	33	55.0	55.0	83.3
Strongly Agree	10	16.7	16.7	100.0
Total	60	100.0	100.0	

Sharing information it will be possible to ignore dominance of customer on pricing-q19

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	1	1.7	1.7	1.7
Disagree	4	6.7	6.7	8.3
Uncertain	16	26.7	26.7	35.0
Agree	32	53.3	53.3	88.3
Strongly Agree	7	11.7	11.7	100.0
Total	60	100.0	100.0	

Sharing information small business entrepreneurs will be able to set value based price q20

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	3	5.0	5.0	5.0
Disagree	2	3.3	3.3	8.3
Uncertain	9	15.0	15.0	23.3
Agree	37	61.7	61.7	85.0
Strongly Agree	9	15.0	15.0	100.0
Total	60	100.0	100.0	

4.3 Geographical concentration results in right value delivery network

Co-location of many light engineering small firms will make possible to share material at the time of need -q21

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	7	11.7	11.7	11.7
Disagree	5	8.3	8.3	20.0
Uncertain	1	1.7	1.7	21.7
Agree	14	23.3	23.3	45.0
Strongly Agree	33	55.0	55.0	100.0
Total	60	100.0	100.0	

Co-location of many light engineering small firms will make possible to share final product at the time of need: q22

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	7	11.7	11.7	11.7
Disagree	3	5.0	5.0	16.7
Uncertain	11	18.3	18.3	35.0
Agree	23	38.3	38.3	73.3
Strongly Agree	16	26.7	26.7	100.0
Total	60	100.0	100.0	

Co-location of many light engineering small firms will make possible to share machinery use at time of need: q23

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	2	3.3	3.3	3.3
Disagree	3	5.0	5.0	8.3
Uncertain	2	3.3	3.3	11.7
Agree	15	25.0	25.0	36.7
Strongly Agree	38	63.3	63.3	100.0
Total	60	100.0	100.0	

Co-location of many light engineering small firms will make possible to share providing after sales services to customers: q24

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	3	5.0	5.0	5.0
Disagree	3	5.0	5.0	10.0
Uncertain	6	10.0	10.0	20.0
Agree	22	36.7	36.7	56.7
Strongly Agree	26	43.3	43.3	100.0
Total	60	100.0	100.0	

Co-location of many light engineering small firms will make possible to transfer customers to another organization at the time of overfull demand: q25

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	1	1.7	1.7	1.7
Disagree	2	3.3	3.3	5.0
Uncertain	6	10.0	10.0	15.0
Agree	19	31.7	31.7	46.7
Strongly Agree	32	53.3	53.3	100.0
Total	60	100.0	100.0	

Co-location of many light engineering small firms will make possible to transfer customers to another suitable organization: q26

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	1	1.7	1.7	1.7
Uncertain	3	5.0	5.0	6.7
Agree	15	25.0	25.0	31.7
Strongly Agree	41	68.3	68.3	100.0
Total	60	100.0	100.0	

Co-location of many light engineering small firms will make possible to deliver products timely (by reducing production related problems): q27

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	5	8.3	8.3	8.3
Uncertain	5	8.3	8.3	16.7
Agree	34	56.7	56.7	73.3
Strongly Agree	16	26.7	26.7	100.0
Total	60	100.0	100.0	

Co-location of many light engineering small firms will make possible to attract many supplier to take position in the cluster: q28

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	3	5.0	5.0	5.0
Disagree	1	1.7	1.7	6.7
Uncertain	11	18.3	18.3	25.0
Agree	32	53.3	53.3	78.3
Strongly Agree	13	21.7	21.7	100.0
Total	60	100.0	100.0	

Co-location of many light engineering small firms will make possible to attract many distributor to take position in the cluster: q29

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	3	5.0	5.0	5.0
Disagree	5	8.3	8.3	13.3
Uncertain	30	50.0	50.0	63.3
Agree	17	28.3	28.3	91.7
Strongly Agree	5	8.3	8.3	100.0
Total	60	100.0	100.0	

Co-location of many suppliers and buyers will make possible to increase customer value (by reducing money cost, time cost, energy cost and psychic cost): q30

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	2	3.3	3.3	3.3
Disagree	2	3.3	3.3	6.7
Uncertain	3	5.0	5.0	11.7
Agree	35	58.3	58.3	70.0
Strongly Agree	18	30.0	30.0	100.0
Total	60	100.0	100.0	

Co-location of seller and buyers will make possible to reduce intermediary dominance on distribution channel : q31

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	4	6.7	6.7	6.7
Disagree	4	6.7	6.7	13.3
Uncertain	10	16.7	16.7	30.0
Agree	31	51.7	51.7	81.7
Strongly Agree	11	18.3	18.3	100.0
Total	60	100.0	100.0	

Co-location of supplier, producer and distributor will make possible to reconfigure value delivery network at any time: q32

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	1	1.7	1.7	1.7
Disagree	3	5.0	5.0	6.7
Uncertain	9	15.0	15.0	21.7
Agree	28	46.7	46.7	68.3
Strongly Agree	19	31.7	31.7	100.0
Total	60	100.0	100.0	

Co-location of many light engineering small firms will make possible to establish 'one stop shop': q33

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	3	5.0	5.0	5.0
Disagree	1	1.7	1.7	6.7
Uncertain	15	25.0	25.0	31.7
Agree	26	43.3	43.3	75.0
Strongly Agree	15	25.0	25.0	100.0
Total	60	100.0	100.0	

4.4 Inter-firm Network Results in Integrated Marketing Communication

Inter-firm network of small businesses under LEI will make possible to set marketing communication strategies jointly: q34

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	8	13.3	13.3	13.3
Disagree	4	6.7	6.7	20.0
Uncertain	14	23.3	23.3	43.3
Agree	30	50.0	50.0	93.3
Strongly Agree	4	6.7	6.7	100.0
Total	60	100.0	100.0	

Inter-firm network of small businesses under LEI will make possible to create form primary market: q35

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	3	5.0	5.0	5.0
Disagree	4	6.7	6.7	11.7
Uncertain	16	26.7	26.7	38.3
Agree	28	46.7	46.7	85.0
Strongly Agree	9	15.0	15.0	100.0
Total	60	100.0	100.0	

Inter-firm network of light engineering small businesses will make possible to set own advertising strategy : q36

	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	1	1.7	1.7	1.7
Uncertain	5	8.3	8.3	10.0
Agree	43	71.7	71.7	81.7
Strongly Agree	11	18.3	18.3	100.0
Total	60	100.0	100.0	

Inter-firm network of light engineering small businesses will make possible to set own personal selling strategy: q37

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	3	5.0	5.0	5.0
Disagree	2	3.3	3.3	8.3
Uncertain	11	18.3	18.3	26.7
Agree	37	61.7	61.7	88.3
Strongly Agree	7	11.7	11.7	100.0
Total	60	100.0	100.0	

Inter-firm network of small businesses will make possible to set own sales promotion strategy: q38

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	1	1.7	1.7	1.7
Uncertain	7	11.7	11.7	13.3
Agree	33	55.0	55.0	68.3
Strongly Agree	19	31.7	31.7	100.0
Total	60	100.0	100.0	

Inter-firm network of light engineering small businesses will make possible to set own public relation strategy: q39

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	3	5.0	5.0	5.0
Uncertain	9	15.0	15.0	20.0
Agree	35	58.3	58.3	78.3
Strongly Agree	13	21.7	21.7	100.0
Total	60	100.0	100.0	

Inter-firm network of small businesses will make possible to set own integrated marketing communication strategy: q40

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	1	1.7	1.7	1.7
Disagree	3	5.0	5.0	6.7
Uncertain	13	21.7	21.7	28.3
Agree	40	66.7	66.7	95.0
Strongly Agree	3	5.0	5.0	100.0
Total	60	100.0	100.0	

Inter-firm network of light engineering small businesses will make possible to create brand primary market: q41

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	1	1.7	1.7	1.7
Disagree	1	1.7	1.7	3.3
Uncertain		36.7	36.7	40.0
Agree	26	43.3	43.3	83.3
Strongly Agree	10	16.7	16.7	100.0
Total	60	100.0	100.0	

4. 5 Sharing knowledge of employees results in efficiency enhancement of employees

Sharing knowledge within employees of small businesses under LEI will make possible to increase trust on each other: q42

	Frequency	Percent	Valid Percent	Cumulative Percent
Uncertain	3	5.0	5.0	5.0
Agree	17	28.3	28.3	33.3
Strongly Agree	40	66.7	66.7	100.0
Total	60	100.0	100.0	

Sharing knowledge within employees of light engineering small businesses will make possible to know about norms of the society: q43

	Frequency	Percent	Valid Percent	Cumulative Percent
Uncertain	2	3.3	3.3	3.3
Agree	22	36.7	36.7	40.0
Strongly Agree	36	60.0	60.0	100.0
Total	60	100.0	100.0	

Sharing knowledge within employees of light engineering small businesses will make possible to increase social network: q44

	Frequency	Percent	Valid Percent	Cumulative Percent
Uncertain	2	3.3	3.3	3.3
Agree	25	41.7	41.7	45.0
Strongly Agree	33	55.0	55.0	100.0
Total	60	100.0	100.0	

Sharing knowledge of work through word of mouth within employees of small businesses will make possible to enhance efficiency: q45

	Frequency	Percent	Valid Percent	Cumulative Percent
Uncertain	2	3.3	3.3	3.3
Agree	19	31.7	31.7	35.0
Strongly Agree	39	65.0	65.0	100.0
Total	60	100.0	100.0	

Sharing knowledge of work through electronic media within employees of small businesses will make possible to enhance efficiency : q46

	Frequency	Percent	Valid Percent	Cumulative Percent
Uncertain	7	11.7	11.7	11.7
Agree	35	58.3	58.3	70.0
Strongly Agree	18	30.0	30.0	100.0
Total	60	100.0	100.0	

Sharing knowledge within employees of small businesses will make possible to increase internal specialization: q47

	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	1	1.7	1.7	1.7
Uncertain	22	36.7	36.7	38.3
Agree	27	45.0	45.0	83.3
Strongly Agree	10	16.7	16.7	100.0
Total	60	100.0	100.0	

Sharing knowledge within employees of small businesses will make possible to generate management economies: q48

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	1	1.7	1.7	1.7
Uncertain	13	21.7	21.7	23.3
Agree	37	61.7	61.7	85.0
Strongly Agree	9	15.0	15.0	100.0
Total	60	100.0	100.0	

4. 6 Mutual Learning through Observation Results in Greater Productivity

Mutual learning of light engineering small businesses through observation will make possible to develop own infrastructure : q49

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	1	1.7	1.7	1.7
Uncertain	6	10.0	10.0	11.7
Agree	27	45.0	45.0	56.7
Strongly Agree	26	43.3	43.3	100.0
Total	60	100.0	100.0	

Mutual learning of light engineering small businesses through observation will make possible to find out weak points of own organization: q50

	Frequency	Percent	Valid Percent	Cumulative Percent
Uncertain	1	1.7	1.7	1.7
Agree	17	28.3	28.3	30.0
Strongly Agree	42	70.0	70.0	100.0
Total	60	100.0	100.0	

Mutual learning of light engineering small businesses through observation will make possible to adopt the marketing strategies taken by leading organizations: q51

	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	1	1.7	1.7	1.7
Uncertain	9	15.0	15.0	16.7
Agree	34	56.7	56.7	73.3
Strongly Agree	16	26.7	26.7	100.0
Total	60	100.0	100.0	

Mutual learning through observation will make possible to take corrective action before facing the problem: q52

	Frequency	Percent	Valid Percent	Cumulative Percent
Uncertain	5	8.3	8.3	8.3
Agree	31	51.7	51.7	60.0
Strongly Agree	24	40.0	40.0	100.0
Total	60	100.0	100.0	

4. 7 Collective Initiative will Results in Maximizing Benefit of Organizations

Through joint purchase of materials by light engineering small businesses will make possible to share purchasing cost: q53

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	4	6.7	6.7	6.7
Disagree	1	1.7	1.7	8.3
Uncertain	8	13.3	13.3	21.7
Agree	29	48.3	48.3	70.0
Strongly Agree	18	30.0	30.0	100.0
Total	60	100.0	100.0	

Joint distribution of final products by light engineering small businesses will make possible to share distribution cost: q54

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	3	5.0	5.0	5.0
Disagree	4	6.7	6.7	11.7
Uncertain	22	36.7	36.7	48.3
Agree	23	38.3	38.3	86.7
Strongly Agree	8	13.3	13.3	100.0
Total	60	100.0	100.0	

Collective initiative by light engineering small businesses will make possible to manage fund : q55

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	2	3.3	3.3	3.3
Disagree	3	5.0	5.0	8.3
Uncertain	6	10.0	10.0	18.3
Agree	26	43.3	43.3	61.7
Strongly Agree	23	38.3	38.3	100.0
Total	60	100.0	100.0	

Collective initiative will make possible to manage business development services: q56

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	1	1.7	1.7	1.7
Disagree	3	5.0	5.0	6.7
Uncertain	2	3.3	3.3	10.0
Agree	28	46.7	46.7	56.7
Strongly Agree	26	43.3	43.3	100.0
Total	60	100.0	100.0	

Collective initiative will make possible to manage bureaucratic snafu: q57

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	1	1.7	1.7	1.7
Disagree	2	3.3	3.3	5.0
Uncertain	7	11.7	11.7	16.7
Agree	27	45.0	45.0	61.7
Strongly Agree	23	38.3	38.3	100.0
Total	60	100.0	100.0	

Collective initiative will make possible to manage government for taking necessary steps: q58

	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	1	1.7	1.7	1.7
Uncertain	2	3.3	3.3	5.0
Agree	15	25.0	25.0	30.0
Strongly Agree	42	70.0	70.0	100.0
Total	60	100.0	100.0	

Collective initiative will make possible to remove gap between corporate world and academic education: q59

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	1	1.7	1.7	1.7
Disagree	3	5.0	5.0	6.7
Uncertain	16	26.7	26.7	33.3
Agree	23	38.3	38.3	71.7
Strongly Agree	17	28.3	28.3	100.0
Total	60	100.0	100.0	

Collective initiative will make possible to manage job related training for employees: q60

	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	1	1.7	1.7	1.7
Uncertain	5	8.3	8.3	10.0
Agree	17	28.3	28.3	38.3
Strongly Agree	37	61.7	61.7	100.0
Total	60	100.0	100.0	

Collective initiative will make possible to give idea about contemporary technology: q61

	Frequency	Percent	Valid Percent	Cumulative Percent
Uncertain	4	6.7	6.7	6.7
Agree	21	35.0	35.0	41.7
Strongly Agree	35	58.3	58.3	100.0
Total	60	100.0	100.0	

Collective initiative will make possible to give ideas to employees about business ethics:q62

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	4	6.7	6.7	6.7
Uncertain	4	6.7	6.7	13.3
Agree	22	36.7	36.7	50.0
Strongly Agree	30	50.0	50.0	100.0
Total	60	100.0	100.0	

Collective initiative will make possible to manage special fund for employees: q63

	Frequency	Percent	Valid Percent	Cumulative Percent
Uncertain	4	6.7	6.7	6.7
Agree	26	43.3	43.3	50.0
Strongly Agree	30	50.0	50.0	100.0
Total	60	100.0	100.0	

Collective initiative will make possible to minimize losses for political problems: q64

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	4	6.7	6.7	6.7
Disagree	6	10.0	10.0	16.7
Uncertain	19	31.7	31.7	48.3
Agree	17	28.3	28.3	76.7
Strongly Agree	14	23.3	23.3	100.0
Total	60	100.0	100.0	

Collective initiative will make possible to minimize losses for electricity problems: q65

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	1	1.7	1.7	1.7
Disagree	1	1.7	1.7	3.3
Uncertain	4	6.7	6.7	10.0
Agree	25	41.7	41.7	51.7
Strongly Agree	29	48.3	48.3	100.0
Total	60	100.0	100.0	

Collective initiative will make possible to arrange different cultural programs: q66

	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	1	1.7	1.7	1.7
Uncertain	2	3.3	3.3	5.0
Agree	21	35.0	35.0	40.0
Strongly Agree	36	60.0	60.0	100.0
Total	60	100.0	100.0	

Collective initiative will make possible to manage institutions for getting standardization related suggestions : q67

	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	1	1.7	1.7	1.7
Uncertain	2	3.3	3.3	5.0
Agree	29	48.3	48.3	53.3
Strongly Agree	28	46.7	46.7	100.0
Total	60	100.0	100.0	

Collective initiative will make possible to manage institutions for getting grading related suggestions: q68

	Frequency	Percent	Valid Percent	Cumulative Percent
Uncertain	3	5.0	5.0	5.0
Agree	35	58.3	58.3	63.3
Strongly Agree	22	36.7	36.7	100.0
Total	60	100.0	100.0	

Collective initiative will make possible to manage institutions for getting product design related suggestions : q69

	Frequency	Percent	Valid Percent	Cumulative Percent
Uncertain	3	5.0	5.0	5.0
Agree	32	53.3	53.3	58.3
Strongly Agree	25	41.7	41.7	100.0
Total	60	100.0	100.0	

Collective initiative will make possible to manage cooperation of different organizations to develop new products according to the choice of the customer: q70

	Frequency	Percent	Valid Percent	Cumulative Percent
Uncertain	1	1.7	1.7	1.7
Agree	30	50.0	50.0	51.7
Strongly Agree	29	48.3	48.3	100.0
Total	60	100.0	100.0	

Collective initiative will make possible to manage different quality testing institutions for getting quality testing related services: q71

	Frequency	Percent	Valid Percent	Cumulative Percent
Uncertain	1	1.7	1.7	1.7
Agree	29	48.3	48.3	50.0
Strongly Agree	30	50.0	50.0	100.0
Total	60	100.0	100.0	

Collective initiative will make possible to manage business friendly environment: q72

	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	1	1.7	1.7	1.7
Agree	6	10.0	10.0	11.7
Strongly Agree	53	88.3	88.3	100.0
Total	60	100.0	100.0	

Appendix – 5 (ANOVA test)

5.1 ANOVA test between groups considering assets value (question-3) and all the questions related to cluster concept(Q6 to Q72)

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Q6	Between Groups	2.310	3	.770	1.935	.134
	Within Groups	22.290	56	.398		
	Total	24.600	59			
Q7	Between Groups	1.682	3	.561	1.119	.349
	Within Groups	28.052	56	.501		
	Total	29.733	59			
Q8	Between Groups	1.904	3	.635	.925	.435
	Within Groups	38.430	56	.686		
	Total	40.333	59			
Q9	Between Groups	5.882	3	1.961	1.247	.301
	Within Groups	88.052	56	1.572		
	Total	93.933	59			
Q10	Between Groups	.406	3	.135	.181	.909
	Within Groups	41.778	56	.746		
	Total	42.183	59			
Q11	Between Groups	.298	3	.099	.175	.913
	Within Groups	31.885	56	.569		
	Total	32.183	59			
Q12	Between Groups	.637	3	.212	.368	.777
	Within Groups	32.346	56	.578		
	Total	32.983	59			
Q13	Between Groups	1.339	3	.446	.843	.476
	Within Groups	29.644	56	.529		
	Total	30.983	59			
Q14	Between Groups	1.470	3	.490	.402	.752
	Within Groups	68.263	56	1.219		
	Total	69.733	59			
Q15	Between Groups	1.775	3	.592	.714	.548
	Within Groups	46.409	56	.829		
	Total	48.183	59			
Q16	Between Groups	10.298	3	3.433	2.326	.084
	Within Groups	82.635	56	1.476		
	Total	92.933	59			
Q17	Between Groups	4.611	3	1.537	1.607	.198
	Within Groups	53.572	56	.957		
	Total	58.183	59			
Q18	Between Groups	1.539	3	.513	.644	.590
	Within Groups	44.644	56	.797		
	Total	46.183	59			

		Sum of Squares	df	Mean Square	F	Sig.
Q19	Between Groups	1.060	3	.353	.491	.690
	Within Groups	40.274	56	.719		
	Total	41.333	59			
Q20	Between Groups	5.194	3	1.731	2.155	.104
	Within Groups	44.989	56	.803		
	Total	50.183	59			
Q21	Between Groups	15.182	3	5.061	2.784	.049
	Within Groups	101.802	56	1.818		
	Total	116.983	59			
Q22	Between Groups	3.587	3	1.196	.741	.532
	Within Groups	90.346	56	1.613		
	Total	93.933	59			
Q23	Between Groups	3.348	3	1.116	1.096	.359
	Within Groups	57.052	56	1.019		
	Total	60.400	59			
Q24	Between Groups	6.710	3	2.237	1.961	.130
	Within Groups	63.873	56	1.141		
	Total	70.583	59			
Q25	Between Groups	1.744	3	.581	.689	.562
	Within Groups	47.239	56	.844		
	Total	48.983	59			
Q26	Between Groups	3.761	3	1.254	2.436	.074
	Within Groups	28.822	56	.515		
	Total	32.583	59			
Q27	Between Groups	5.348	3	1.783	1.653	.187
	Within Groups	60.385	56	1.078		
	Total	65.733	59			
Q28	Between Groups	5.527	3	1.842	2.144	.105
	Within Groups	48.123	56	.859		
	Total	53.650	59			
Q29	Between Groups	1.089	3	.363	.418	.741
	Within Groups	48.644	56	.869		
	Total	49.733	59			
Q30	Between Groups	2.115	3	.705	.888	.453
	Within Groups	44.468	56	.794		
	Total	46.583	59			
Q31	Between Groups	2.339	3	.780	.676	.571
	Within Groups	64.644	56	1.154		
	Total	66.983	59			
Q32	Between Groups	.772	3	.257	.299	.826
	Within Groups	48.211	56	.861		
	Total	48.983	59			

		Sum of Squares	df	Mean Square	F	Sig.
Q33	Between Groups	.277	3	.092	.088	.966
	Within Groups	58.706	56	1.048		
	Total	58.983	59			
Q34	Between Groups	1.389	3	.463	.345	.793
	Within Groups	75.211	56	1.343		
	Total	76.600	59			
Q35	Between Groups	5.456	3	1.819	1.923	.136
	Within Groups	52.944	56	.945		
	Total	58.400	59			
Q36	Between Groups	.408	3	.136	.394	.758
	Within Groups	19.325	56	.345		
	Total	19.733	59			
Q37	Between Groups	2.160	3	.720	.876	.459
	Within Groups	46.024	56	.822		
	Total	48.183	59			
Q38	Between Groups	2.554	3	.851	1.533	.216
	Within Groups	31.096	56	.555		
	Total	33.650	59			
Q39	Between Groups	.810	3	.270	.316	.814
	Within Groups	47.774	56	.853		
	Total	48.583	59			
Q40	Between Groups	.554	3	.185	.340	.797
	Within Groups	30.430	56	.543		
	Total	30.983	59			
Q41	Between Groups	.865	3	.288	.411	.746
	Within Groups	39.318	56	.702		
	Total	40.183	59			
Q42	Between Groups	.977	3	.326	.950	.423
	Within Groups	19.206	56	.343		
	Total	20.183	59			
Q43	Between Groups	.451	3	.150	.460	.711
	Within Groups	18.283	56	.326		
	Total	18.733	59			
Q44	Between Groups	.194	3	.065	.192	.901
	Within Groups	18.790	56	.336		
	Total	18.983	59			
Q45	Between Groups	.278	3	.093	.289	.833
	Within Groups	17.906	56	.320		
	Total	18.183	59			
Q46	Between Groups	.908	3	.303	.768	.517
	Within Groups	22.075	56	.394		
	Total	22.983	59			
Q47	Between Groups	.777	3	.259	.454	.716
	Within Groups	31.956	56	.571		
	Total	32.733	59			

		Sum of Squares	df	Mean Square	F	Sig.
Q48	Between Groups	3.489	3	1.163	2.440	.074
	Within Groups	26.694	56	.477		
	Total	30.183	59			
Q49	Between Groups	.191	3	.064	.099	.960
	Within Groups	35.992	56	.643		
	Total	36.183	59			
Q50	Between Groups	.451	3	.150	.579	.631
	Within Groups	14.533	56	.260		
	Total	14.983	59			
Q51	Between Groups	.551	3	.184	.367	.777
	Within Groups	28.033	56	.501		
	Total	28.583	59			
Q52	Between Groups	2.158	3	.719	1.934	.135
	Within Groups	20.825	56	.372		
	Total	22.983	59			
Q53	Between Groups	1.867	3	.622	.546	.653
	Within Groups	63.866	56	1.140		
	Total	65.733	59			
Q54	Between Groups	.201	3	.067	.066	.978
	Within Groups	56.783	56	1.014		
	Total	56.983	59			
Q55	Between Groups	2.044	3	.681	.675	.571
	Within Groups	56.540	56	1.010		
	Total	58.583	59			
Q56	Between Groups	7.460	3	2.487	3.685	.017
	Within Groups	37.790	56	.675		
	Total	45.250	59			
Q57	Between Groups	2.686	3	.895	1.167	.331
	Within Groups	42.964	56	.767		
	Total	45.650	59			
Q58	Between Groups	1.587	3	.529	1.326	.275
	Within Groups	22.346	56	.399		
	Total	23.933	59			
Q59	Between Groups	6.052	3	2.017	2.410	.077
	Within Groups	46.881	56	.837		
	Total	52.933	59			
Q60	Between Groups	7.011	3	2.337	5.455	.002
	Within Groups	23.989	56	.428		
	Total	31.000	59			
Q61	Between Groups	7.451	3	2.484	8.954	.000
	Within Groups	15.533	56	.277		
	Total	22.983	59			
Q62	Between Groups	3.554	3	1.185	1.050	.378
	Within Groups	63.180	56	1.128		
	Total	66.733	59			

		Sum of Squares	df	Mean Square	F	Sig.
Q63	Between Groups	1.415	3	.472	1.239	.304
	Within Groups	21.318	56	.381		
	Total	22.733	59			
Q64	Between Groups	.860	3	.287	.206	.892
	Within Groups	78.123	56	1.395		
	Total	78.983	59			
Q65	Between Groups	1.238	3	.413	.607	.613
	Within Groups	38.095	56	.680		
	Total	39.333	59			
Q66	Between Groups	.968	3	.323	.754	.525
	Within Groups	23.965	56	.428		
	Total	24.933	59			
Q67	Between Groups	1.789	3	.596	1.477	.231
	Within Groups	22.611	56	.404		
	Total	24.400	59			
Q68	Between Groups	.825	3	.275	.848	.474
	Within Groups	18.159	56	.324		
	Total	18.983	59			
Q69	Between Groups	1.901	3	.634	1.967	.129
	Within Groups	18.033	56	.322		
	Total	19.933	59			
Q70	Between Groups	3.028	3	1.009	4.064	.011
	Within Groups	13.906	56	.248		
	Total	16.933	59			
Q71	Between Groups	2.078	3	.693	2.602	.061
	Within Groups	14.906	56	.266		
	Total	16.983	59			
Q72	Between Groups	.158	3	.053	.219	.883
	Within Groups	13.492	56	.241		
	Total	13.650	59			

5.2. ANOVA test between groups considering number of employee (question-4) and all the questions related to cluster concept(Q6 to Q72)

ANOVA						
		Sum of Squares	Df	Mean Square	F	Sig.
Q6	Between Groups	6.452	3	2.151	6.636	.001
	Within Groups	18.148	56	.324		
	Total	24.600	59			
Q7	Between Groups	3.573	3	1.191	2.549	.065
	Within Groups	26.161	56	.467		
	Total	29.733	59			
Q8	Between Groups	1.433	3	.478	.687	.564
	Within Groups	38.901	56	.695		
	Total	40.333	59			
Q9	Between Groups	9.555	3	3.185	2.114	.109
	Within Groups	84.379	56	1.507		
	Total	93.933	59			
Q10	Between Groups	1.041	3	.347	.472	.703
	Within Groups	41.142	56	.735		
	Total	42.183	59			
Q11	Between Groups	.480	3	.160	.282	.838
	Within Groups	31.704	56	.566		
	Total	32.183	59			
Q12	Between Groups	.798	3	.266	.463	.709
	Within Groups	32.186	56	.575		
	Total	32.983	59			
Q13	Between Groups	1.298	3	.433	.816	.490
	Within Groups	29.686	56	.530		
	Total	30.983	59			
Q14	Between Groups	.942	3	.314	.256	.857
	Within Groups	68.792	56	1.228		
	Total	69.733	59			
Q15	Between Groups	2.025	3	.675	.819	.489
	Within Groups	46.158	56	.824		
	Total	48.183	59			
Q16	Between Groups	2.858	3	.953	.592	.623
	Within Groups	90.076	56	1.608		
	Total	92.933	59			
Q17	Between Groups	4.998	3	1.666	1.754	.166
	Within Groups	53.186	56	.950		
	Total	58.183	59			
Q18	Between Groups	.202	3	.067	.082	.970
	Within Groups	45.982	56	.821		
	Total	46.183	59			
Q19	Between Groups	.085	3	.028	.038	.990
	Within Groups	41.248	56	.737		
	Total	41.333	59			

		Sum of Squares	Df	Mean Square	F	Sig.
Q20	Between Groups	2.983	3	.994	1.180	.326
	Within Groups	47.201	56	.843		
	Total	50.183	59			
Q21	Between Groups	6.555	3	2.185	1.108	.354
	Within Groups	110.428	56	1.972		
	Total	116.983	59			
Q22	Between Groups	3.458	3	1.153	.713	.548
	Within Groups	90.476	56	1.616		
	Total	93.933	59			
Q23	Between Groups	2.239	3	.746	.719	.545
	Within Groups	58.161	56	1.039		
	Total	60.400	59			
Q24	Between Groups	.658	3	.219	.176	.912
	Within Groups	69.925	56	1.249		
	Total	70.583	59			
Q25	Between Groups	2.113	3	.704	.841	.477
	Within Groups	46.870	56	.837		
	Total	48.983	59			
Q26	Between Groups	1.664	3	.555	1.005	.398
	Within Groups	30.919	56	.552		
	Total	32.583	59			
Q27	Between Groups	3.866	3	1.289	1.166	.331
	Within Groups	61.867	56	1.105		
	Total	65.733	59			
Q28	Between Groups	7.313	3	2.438	2.946	.041
	Within Groups	46.337	56	.827		
	Total	53.650	59			
Q29	Between Groups	2.305	3	.768	.907	.443
	Within Groups	47.428	56	.847		
	Total	49.733	59			
Q30	Between Groups	2.871	3	.957	1.226	.309
	Within Groups	43.712	56	.781		
	Total	46.583	59			
Q31	Between Groups	7.792	3	2.597	2.457	.072
	Within Groups	59.192	56	1.057		
	Total	66.983	59			
Q32	Between Groups	.941	3	.314	.366	.778
	Within Groups	48.042	56	.858		
	Total	48.983	59			
Q33	Between Groups	1.514	3	.505	.492	.690
	Within Groups	57.470	56	1.026		
	Total	58.983	59			
Q34	Between Groups	1.599	3	.533	.398	.755
	Within Groups	75.001	56	1.339		
	Total	76.600	59			

		Sum of Squares	Df	Mean Square	F	Sig.
Q35	Between Groups	.206	3	.069	.066	.978
	Within Groups	58.194	56	1.039		
	Total	58.400	59			
Q36	Between Groups	.358	3	.119	.344	.793
	Within Groups	19.376	56	.346		
	Total	19.733	59			
Q37	Between Groups	.480	3	.160	.188	.904
	Within Groups	47.704	56	.852		
	Total	48.183	59			
Q38	Between Groups	.908	3	.303	.517	.672
	Within Groups	32.742	56	.585		
	Total	33.650	59			
Q39	Between Groups	.592	3	.197	.230	.875
	Within Groups	47.992	56	.857		
	Total	48.583	59			
Q40	Between Groups	1.014	3	.338	.631	.598
	Within Groups	29.970	56	.535		
	Total	30.983	59			
Q41	Between Groups	.389	3	.130	.182	.908
	Within Groups	39.795	56	.711		
	Total	40.183	59			
Q42	Between Groups	.098	3	.033	.091	.965
	Within Groups	20.086	56	.359		
	Total	20.183	59			
Q43	Between Groups	.439	3	.146	.448	.719
	Within Groups	18.294	56	.327		
	Total	18.733	59			
Q44	Between Groups	.564	3	.188	.572	.636
	Within Groups	18.419	56	.329		
	Total	18.983	59			
Q45	Between Groups	.631	3	.210	.671	.573
	Within Groups	17.552	56	.313		
	Total	18.183	59			
Q46	Between Groups	1.610	3	.537	1.406	.251
	Within Groups	21.373	56	.382		
	Total	22.983	59			
Q47	Between Groups	.685	3	.228	.399	.754
	Within Groups	32.048	56	.572		
	Total	32.733	59			
Q48	Between Groups	1.017	3	.339	.651	.586
	Within Groups	29.167	56	.521		
	Total	30.183	59			
Q49	Between Groups	.823	3	.274	.434	.729
	Within Groups	35.361	56	.631		
	Total	36.183	59			

		Sum of Squares	Df	Mean Square	F	Sig.
Q50	Between Groups	1.525	3	.508	2.115	.109
	Within Groups	13.458	56	.240		
	Total	14.983	59			
Q51	Between Groups	1.343	3	.448	.920	.437
	Within Groups	27.240	56	.486		
	Total	28.583	59			
Q52	Between Groups	.680	3	.227	.569	.638
	Within Groups	22.304	56	.398		
	Total	22.983	59			
Q53	Between Groups	1.072	3	.357	.309	.818
	Within Groups	64.661	56	1.155		
	Total	65.733	59			
Q54	Between Groups	1.198	3	.399	.401	.753
	Within Groups	55.786	56	.996		
	Total	56.983	59			
Q55	Between Groups	3.746	3	1.249	1.275	.292
	Within Groups	54.837	56	.979		
	Total	58.583	59			
Q56	Between Groups	2.874	3	.958	1.266	.295
	Within Groups	42.376	56	.757		
	Total	45.250	59			
Q57	Between Groups	3.464	3	1.155	1.533	.216
	Within Groups	42.186	56	.753		
	Total	45.650	59			
Q58	Between Groups	1.914	3	.638	1.623	.194
	Within Groups	22.019	56	.393		
	Total	23.933	59			
Q59	Between Groups	4.505	3	1.502	1.737	.170
	Within Groups	48.428	56	.865		
	Total	52.933	59			
Q60	Between Groups	1.406	3	.469	.887	.454
	Within Groups	29.594	56	.528		
	Total	31.000	59			
Q61	Between Groups	2.968	3	.989	2.768	.050
	Within Groups	20.015	56	.357		
	Total	22.983	59			
Q62	Between Groups	.260	3	.087	.073	.974
	Within Groups	66.473	56	1.187		
	Total	66.733	59			
Q63	Between Groups	1.260	3	.420	1.095	.359
	Within Groups	21.473	56	.383		
	Total	22.733	59			
Q64	Between Groups	2.508	3	.836	.612	.610
	Within Groups	76.476	56	1.366		
	Total	78.983	59			

		Sum of Squares	Df	Mean Square	F	Sig.
Q65	Between Groups	6.327	3	2.109	3.578	.019
	Within Groups	33.007	56	.589		
	Total	39.333	59			
Q66	Between Groups	1.027	3	.342	.802	.498
	Within Groups	23.907	56	.427		
	Total	24.933	59			
Q67	Between Groups	.285	3	.095	.220	.882
	Within Groups	24.115	56	.431		
	Total	24.400	59			
Q68	Between Groups	.389	3	.130	.391	.760
	Within Groups	18.594	56	.332		
	Total	18.983	59			
Q69	Between Groups	.248	3	.083	.235	.872
	Within Groups	19.686	56	.352		
	Total	19.933	59			
Q70	Between Groups	1.330	3	.443	1.591	.202
	Within Groups	15.604	56	.279		
	Total	16.933	59			
Q71	Between Groups	.598	3	.199	.681	.567
	Within Groups	16.386	56	.293		
	Total	16.983	59			
Q72	Between Groups	.149	3	.050	.206	.892
	Within Groups	13.501	56	.241		
	Total	13.650	59			

5.3. ANOVA test between groups considering type of activity (question-5) and all the questions related to cluster concept(Q6 to Q72)

ANOVA

		Sum of Squares	Df	Mean Square	F	Sig.
Q6	Between Groups	2.010	3	.670	1.660	.186
	Within Groups	22.590	56	.403		
	Total	24.600	59			
Q7	Between Groups	.543	3	.181	.347	.791
	Within Groups	29.190	56	.521		
	Total	29.733	59			
Q8	Between Groups	3.435	3	1.145	1.738	.170
	Within Groups	36.898	56	.659		
	Total	40.333	59			
Q9	Between Groups	15.677	3	5.226	3.740	.016
	Within Groups	78.256	56	1.397		
	Total	93.933	59			
Q10	Between Groups	6.911	3	2.304	3.657	.018
	Within Groups	35.272	56	.630		
	Total	42.183	59			
Q11	Between Groups	4.224	3	1.408	2.820	.047
	Within Groups	27.960	56	.499		
	Total	32.183	59			
Q12	Between Groups	1.799	3	.600	1.077	.366
	Within Groups	31.184	56	.557		
	Total	32.983	59			
Q13	Between Groups	2.324	3	.775	1.513	.221
	Within Groups	28.660	56	.512		
	Total	30.983	59			
Q14	Between Groups	9.249	3	3.083	2.854	.045
	Within Groups	60.484	56	1.080		
	Total	69.733	59			
Q15	Between Groups	12.790	3	4.263	6.745	.001
	Within Groups	35.394	56	.632		
	Total	48.183	59			
Q16	Between Groups	8.596	3	2.865	1.903	.140
	Within Groups	84.338	56	1.506		
	Total	92.933	59			
Q17	Between Groups	2.921	3	.974	.987	.406
	Within Groups	55.262	56	.987		
	Total	58.183	59			
Q18	Between Groups	3.808	3	1.269	1.678	.182
	Within Groups	42.375	56	.757		
	Total	46.183	59			
Q19	Between Groups	6.643	3	2.214	3.574	.019
	Within Groups	34.690	56	.619		
	Total	41.333	59			

		Sum of Squares	df	Mean Square	F	Sig.
Q20	Between Groups	3.517	3	1.172	1.407	.250
	Within Groups	46.666	56	.833		
	Total	50.183	59			
Q21	Between Groups	44.512	3	14.837	11.465	.000
	Within Groups	72.471	56	1.294		
	Total	116.983	59			
Q22	Between Groups	4.126	3	1.375	.858	.469
	Within Groups	89.807	56	1.604		
	Total	93.933	59			
Q23	Between Groups	27.943	3	9.314	16.071	.000
	Within Groups	32.457	56	.580		
	Total	60.400	59			
Q24	Between Groups	8.999	3	3.000	2.728	.053
	Within Groups	61.584	56	1.100		
	Total	70.583	59			
Q25	Between Groups	8.494	3	2.831	3.916	.013
	Within Groups	40.489	56	.723		
	Total	48.983	59			
Q26	Between Groups	8.336	3	2.779	6.417	.001
	Within Groups	24.248	56	.433		
	Total	32.583	59			
Q27	Between Groups	39.044	3	13.015	27.308	.000
	Within Groups	26.689	56	.477		
	Total	65.733	59			
Q28	Between Groups	11.552	3	3.851	5.122	.003
	Within Groups	42.098	56	.752		
	Total	53.650	59			
Q29	Between Groups	2.364	3	.788	.931	.432
	Within Groups	47.370	56	.846		
	Total	49.733	59			
Q30	Between Groups	1.642	3	.547	.682	.567
	Within Groups	44.942	56	.803		
	Total	46.583	59			
Q31	Between Groups	2.293	3	.764	.662	.579
	Within Groups	64.690	56	1.155		
	Total	66.983	59			
Q32	Between Groups	1.469	3	.490	.577	.632
	Within Groups	47.514	56	.848		
	Total	48.983	59			
Q33	Between Groups	11.190	3	3.730	4.370	.008
	Within Groups	47.794	56	.853		
	Total	58.983	59			
Q34	Between Groups	3.555	3	1.185	.908	.443
	Within Groups	73.045	56	1.304		
	Total	76.600	59			

		Sum of Squares	df	Mean Square	F	Sig.
Q35	Between Groups	4.093	3	1.364	1.407	.250
	Within Groups	54.307	56	.970		
	Total	58.400	59			
Q36	Between Groups	1.235	3	.412	1.246	.302
	Within Groups	18.498	56	.330		
	Total	19.733	59			
Q37	Between Groups	.666	3	.222	.261	.853
	Within Groups	47.518	56	.849		
	Total	48.183	59			
Q38	Between Groups	5.312	3	1.771	3.499	.021
	Within Groups	28.338	56	.506		
	Total	33.650	59			
Q39	Between Groups	3.685	3	1.228	1.532	.216
	Within Groups	44.898	56	.802		
	Total	48.583	59			
Q40	Between Groups	.636	3	.212	.391	.760
	Within Groups	30.348	56	.542		
	Total	30.983	59			
Q41	Between Groups	2.527	3	.842	1.252	.300
	Within Groups	37.657	56	.672		
	Total	40.183	59			
Q42	Between Groups	1.118	3	.373	1.095	.359
	Within Groups	19.065	56	.340		
	Total	20.183	59			
Q43	Between Groups	.826	3	.275	.861	.467
	Within Groups	17.907	56	.320		
	Total	18.733	59			
Q44	Between Groups	1.344	3	.448	1.423	.246
	Within Groups	17.639	56	.315		
	Total	18.983	59			
Q45	Between Groups	1.185	3	.395	1.301	.283
	Within Groups	16.998	56	.304		
	Total	18.183	59			
Q46	Between Groups	.423	3	.141	.350	.789
	Within Groups	22.561	56	.403		
	Total	22.983	59			
Q47	Between Groups	6.018	3	2.006	4.205	.009
	Within Groups	26.715	56	.477		
	Total	32.733	59			
Q48	Between Groups	4.708	3	1.569	3.450	.022
	Within Groups	25.475	56	.455		
	Total	30.183	59			
Q49	Between Groups	3.794	3	1.265	2.187	.100
	Within Groups	32.389	56	.578		
	Total	36.183	59			

		Sum of Squares	df	Mean Square	F	Sig.
Q50	Between Groups	1.294	3	.431	1.765	.164
	Within Groups	13.689	56	.244		
	Total	14.983	59			
Q51	Between Groups	5.640	3	1.880	4.588	.006
	Within Groups	22.944	56	.410		
	Total	28.583	59			
Q52	Between Groups	4.021	3	1.340	3.959	.012
	Within Groups	18.962	56	.339		
	Total	22.983	59			
Q53	Between Groups	5.240	3	1.747	1.617	.196
	Within Groups	60.493	56	1.080		
	Total	65.733	59			
Q54	Between Groups	1.166	3	.389	.390	.761
	Within Groups	55.818	56	.997		
	Total	56.983	59			
Q55	Between Groups	2.499	3	.833	.832	.482
	Within Groups	56.084	56	1.002		
	Total	58.583	59			
Q56	Between Groups	3.766	3	1.255	1.695	.179
	Within Groups	41.484	56	.741		
	Total	45.250	59			
Q57	Between Groups	2.121	3	.707	.910	.442
	Within Groups	43.529	56	.777		
	Total	45.650	59			
Q58	Between Groups	1.626	3	.542	1.361	.264
	Within Groups	22.307	56	.398		
	Total	23.933	59			
Q59	Between Groups	3.743	3	1.248	1.420	.246
	Within Groups	49.190	56	.878		
	Total	52.933	59			
Q60	Between Groups	2.935	3	.978	1.952	.132
	Within Groups	28.065	56	.501		
	Total	31.000	59			
Q61	Between Groups	3.836	3	1.279	3.739	.016
	Within Groups	19.148	56	.342		
	Total	22.983	59			
Q62	Between Groups	6.410	3	2.137	1.984	.127
	Within Groups	60.323	56	1.077		
	Total	66.733	59			
Q63	Between Groups	3.074	3	1.025	2.918	.042
	Within Groups	19.660	56	.351		
	Total	22.733	59			
Q64	Between Groups	1.208	3	.403	.290	.832
	Within Groups	77.775	56	1.389		
	Total	78.983	59			

		Sum of Squares	df	Mean Square	F	Sig.
Q65	Between Groups	1.744	3	.581	.866	.464
	Within Groups	37.589	56	.671		
	Total	39.333	59			
Q66	Between Groups	2.140	3	.713	1.753	.167
	Within Groups	22.793	56	.407		
	Total	24.933	59			
Q67	Between Groups	1.102	3	.367	.883	.456
	Within Groups	23.298	56	.416		
	Total	24.400	59			
Q68	Between Groups	1.266	3	.422	1.333	.273
	Within Groups	17.718	56	.316		
	Total	18.983	59			
Q69	Between Groups	1.700	3	.567	1.740	.169
	Within Groups	18.233	56	.326		
	Total	19.933	59			
Q70	Between Groups	.362	3	.121	.408	.748
	Within Groups	16.571	56	.296		
	Total	16.933	59			
Q71	Between Groups	.412	3	.137	.464	.708
	Within Groups	16.571	56	.296		
	Total	16.983	59			
Q72	Between Groups	.821	3	.274	1.194	.320
	Within Groups	12.829	56	.229		
	Total	13.650	59			

Appendix – 6 (Chronbach's alpha reliability test)

6.1. For hypothesis-1 (Collaboration with immediate stakeholders, i.e., suppliers, employees, distributors, and retailers of small businesses under LEI will result in right product mix.)

Reliability Statistics

Cronbach's Alpha	N of Items
.679	11

Item Statistics

	Mean	Std. Deviation	N
Q6	4.30	.646	60
Q7	4.27	.710	60
Q8	4.17	.827	60
Q9	3.63	1.262	60
Q10	3.88	.846	60
Q11	4.28	.739	60
Q12	4.32	.748	60
Q13	4.32	.725	60
Q14	3.93	1.087	60
Q15	4.12	.904	60
Q16	2.87	1.255	60

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q6	39.78	21.562	.310	.663
Q7	39.82	21.576	.267	.668
Q8	39.92	21.671	.193	.679
Q9	40.45	18.997	.296	.671
Q10	40.20	18.671	.610	.611
Q11	39.80	19.586	.567	.625
Q12	39.77	19.945	.500	.634
Q13	39.77	19.741	.555	.628
Q14	40.15	19.418	.338	.657
Q15	39.97	19.829	.397	.646
Q16	41.22	22.681	-.035	.742

Intraclass Correlation Coefficient

	Intra class Correlation(a)	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.162(b)	.098	.252	3.119	59.0	590	.000
Average Measures	.679(c)	.544	.788	3.119	59.0	590	.000

Two-way mixed effects model where people effects are random and measures effects are fixed.

a Type C intra class correlation coefficients using a consistency definition-the between-measure variance is excluded from the denominator variance.

b The estimator is the same, whether the interaction effect is present or not.

c This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.

After deletion of question number 16**Reliability Statistics**

Cronbach's Alpha	N of Items
.742	10

Item Statistics

	Mean	Std. Deviation	N
Q6	4.30	.646	60
Q7	4.27	.710	60
Q8	4.17	.827	60
Q9	3.63	1.262	60
Q10	3.88	.846	60
Q11	4.28	.739	60
Q12	4.32	.748	60
Q13	4.32	.725	60
Q14	3.93	1.087	60
Q15	4.12	.904	60

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q6	36.92	20.620	.280	.736
Q7	36.95	20.319	.290	.735
Q8	37.05	20.353	.220	.746
Q9	37.58	16.823	.412	.727
Q10	37.33	17.514	.629	.687
Q11	36.93	18.673	.542	.704
Q12	36.90	18.905	.495	.710
Q13	36.90	18.769	.539	.705
Q14	37.28	18.105	.367	.730
Q15	37.10	18.905	.377	.725

Intraclass Correlation Coefficient

	Intraclass Correlation(a)	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.223(b)	.147	.327	3.872	59.0	531	.000
Average Measures	.742(c)	.632	.829	3.872	59.0	531	.000

Two-way mixed effects model where people effects are random and measures effects are fixed.

a Type C intraclass correlation coefficients using a consistency definition-the between-measure variance is excluded from the denominator variance.

b The estimator is the same, whether the interaction effect is present or not.

c This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.

6.2. For hypothesis-2 (Sharing information of small businesses under LEI will result in right price)

Reliability Statistics

Cronbach's Alpha	N of Items
.710	4

Item Statistics

	Mean	Std. Deviation	N
Q17	3.72	.993	60
Q18	3.78	.885	60
Q19	3.67	.837	60
Q20	3.78	.922	60

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
q17	11.23	4.284	.445	.683
q18	11.17	4.040	.640	.558
q19	11.28	4.817	.431	.684
q20	11.17	4.379	.485	.654

Intraclass Correlation Coefficient

	Intraclass Correlation(a)	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	Df1	df2	Sig
Single Measures	.379(b)	.247	.522	3.446	59.0	177	.000
Average Measures	.710(c)	.568	.813	3.446	59.0	177	.000

Two-way mixed effects model where people effects are random and measures effects are fixed.

- a Type C intraclass correlation coefficients using a consistency definition-the between-measure variance is excluded from the denominator variance.
- b The estimator is the same, whether the interaction effect is present or not.
- c This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.

6.3. For hypothesis-3 (Geographical concentration of small businesses under LEI will result in right value delivery network)

Reliability Statistics

Cronbach's Alpha	N of Items
.718	13

Item Statistics

	Mean	Std. Deviation	N
Q21	4.02	1.408	60
Q22	3.63	1.262	60
Q23	4.40	1.012	60
Q24	4.08	1.094	60
Q25	4.32	.911	60
Q26	4.58	.743	60
Q27	3.93	1.056	60
Q28	3.85	.954	60
Q29	3.27	.918	60
Q30	4.08	.889	60
Q31	3.68	1.066	60
Q32	4.02	.911	60
Q33	3.82	1.000	60

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q21	47.67	31.785	.447	.685
Q22	48.05	36.319	.194	.724
Q23	47.28	32.986	.590	.668
Q24	47.60	32.075	.613	.662
Q25	47.37	34.643	.503	.683
Q26	47.10	36.261	.453	.692
Q27	47.75	34.191	.450	.686
Q28	47.83	36.209	.326	.703
Q29	48.42	35.603	.403	.694
Q30	47.60	36.346	.348	.700
Q31	48.00	38.407	.100	.731
Q32	47.67	38.667	.121	.725
Q33	47.87	39.812	.004	.740

Intraclass Correlation Coefficient

	Intraclass Correlation(a)	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.163(b)	.103	.250	3.540	59.0	708	.000
Average Measures	.718(c)	.600	.812	3.540	59.0	708	.000

Two-way mixed effects model where people effects are random and measures effects are fixed.

a Type C intraclass correlation coefficients using a consistency definition-the between-measure variance is excluded from the denominator variance.

b The estimator is the same, whether the interaction effect is present or not.

c This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.

After deletion of question number 31, 32 & 33**Reliability Statistics**

Cronbach's Alpha	N of Items
.782	10

Item Statistics

	Mean	Std. Deviation	N
Q21	4.02	1.408	60
Q22	3.63	1.262	60
Q23	4.40	1.012	60
Q24	4.08	1.094	60
Q25	4.32	.911	60
Q26	4.58	.743	60
Q27	3.93	1.056	60
Q28	3.85	.954	60
Q29	3.27	.918	60
Q30	4.08	.889	60

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q21	36.15	26.943	.526	.755
Q22	36.53	33.202	.125	.812
Q23	35.77	28.216	.686	.734
Q24	36.08	27.569	.683	.732
Q25	35.85	29.960	.584	.749
Q26	35.58	31.535	.543	.758
Q27	36.23	28.928	.579	.747
Q28	36.32	31.610	.382	.772
Q29	36.90	32.397	.323	.778
Q30	36.08	33.400	.236	.787

Intraclass Correlation Coefficient

	Intraclass Correlation(a)	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.264(b)	.182	.373	4.595	59.0	531	.000
Average Measures	.782(c)	.690	.856	4.595	59.0	531	.000

Two-way mixed effects model where people effects are random and measures effects are fixed.

a Type C intraclass correlation coefficients using a consistency definition-the between-measure variance is excluded from the denominator variance.

b The estimator is the same, whether the interaction effect is present or not.

c This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.

6.4. For hypothesis-4 (Inter-firm network of small businesses under LEI will result in integrated marketing communication)

Reliability Statistics

Cronbach's Alpha	N of Items
.660	8

Item Statistics

	Mean	Std. Deviation	N
Q34	3.30	1.139	60
Q35	3.60	.995	60
Q36	4.07	.578	60
Q37	3.72	.904	60
Q38	4.15	.755	60
Q39	3.92	.907	60
Q40	3.68	.725	60
Q41	3.72	.825	60

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q34	26.85	10.130	.396	.621
Q35	26.55	11.336	.294	.647
Q36	26.08	12.925	.250	.652
Q37	26.43	11.572	.311	.640
Q38	26.00	11.356	.466	.605
Q39	26.23	9.911	.624	.553
Q40	26.47	11.880	.379	.625
Q41	26.43	12.724	.152	.675

Intraclass Correlation Coefficient

	Intraclass Correlation(a)	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.195(b)	.116	.302	2.943	59.0	413	.000
Average Measures	.660(c)	.513	.776	2.943	59.0	413	.000

Two-way mixed effects model where people effects are random and measures effects are fixed.

a Type C intraclass correlation coefficients using a consistency definition-the between-measure variance is excluded from the denominator variance.

b The estimator is the same, whether the interaction effect is present or not.

c This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.

6.5. For hypothesis-5 (Sharing knowledge within employees of small businesses under LEI will result in efficiency enhancement of employees)

Reliability Statistics

Cronbach's Alpha	N of Items
.774	7

Item Statistics

	Mean	Std. Deviation	N
Q42	4.62	.585	60
Q43	4.57	.563	60
Q44	4.52	.567	60
Q45	4.62	.555	60
Q46	4.18	.624	60
Q47	3.77	.745	60
Q48	3.88	.715	60

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q42	25.53	5.948	.657	.715
Q43	25.58	6.078	.636	.721
Q44	25.63	6.168	.594	.728
Q45	25.53	6.490	.483	.749
Q46	25.97	6.575	.375	.770
Q47	26.38	5.834	.493	.749
Q48	26.27	6.470	.325	.786

Intraclass Correlation Coefficient

	Intraclass Correlation(a)	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.329(b)	.229	.451	4.431	59.0	354	.000
Average Measures	.774(c)	.675	.852	4.431	59.0	354	.000

Two-way mixed effects model where people effects are random and measures effects are fixed.

- a Type C intraclass correlation coefficients using a consistency definition-the between-measure variance is excluded from the denominator variance.
- b The estimator is the same, whether the interaction effect is present or not.
- c This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.

6.6. For hypothesis-6 (Mutual learning through observation of small businesses under LEI will result in greater productivity)

Reliability Statistics

Cronbach's Alpha	N of Items
.711	4

Item Statistics

	Mean	Std. Deviation	N
Q49	4.28	.783	60
Q50	4.68	.504	60
Q51	4.08	.696	60
Q52	4.32	.624	60

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q49	13.08	2.010	.497	.658
Q50	12.68	2.762	.425	.692
Q51	13.28	2.105	.564	.604
Q52	13.05	2.319	.536	.626

Intraclass Correlation Coefficient

	Intraclass Correlation(a)	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.380(b)	.248	.522	3.454	59.0	177	.000
Average Measures	.711(c)	.569	.814	3.454	59.0	177	.000

Two-way mixed effects model where people effects are random and measures effects are fixed.

a Type C intraclass correlation coefficients using a consistency definition-the between-measure variance is excluded from the denominator variance.

b The estimator is the same, whether the interaction effect is present or not.

c This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.

6.7. For hypothesis-7 (Collective initiative of small businesses under Light Engineering Industry will result in maximizing benefit of organizations)

Reliability Statistics

Cronbach's Alpha	N of Items
.821	20

Item Statistics

	Mean	Std. Deviation	N
Q53	3.93	1.056	60
Q54	3.48	.983	60
Q55	4.08	.996	60
Q56	4.25	.876	60
Q57	4.15	.880	60
Q58	4.63	.637	60
Q59	3.87	.947	60
Q60	4.50	.725	60
Q61	4.52	.624	60
Q62	4.23	1.064	60
Q63	4.43	.621	60
Q64	3.52	1.157	60
Q65	4.33	.816	60
Q66	4.53	.650	60
Q67	4.40	.643	60
Q68	4.32	.567	60
Q69	4.37	.581	60
Q70	4.47	.536	60
Q71	4.48	.537	60
Q72	4.85	.481	60

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q53	81.42	53.874	.168	.829
Q54	81.87	52.490	.290	.820
Q55	81.27	51.724	.340	.818
Q56	81.10	50.295	.525	.806
Q57	81.20	52.197	.363	.815
Q58	80.72	54.986	.232	.820
Q59	81.48	51.135	.410	.813
Q60	80.85	50.909	.595	.804
Q61	80.83	52.955	.467	.811
Q62	81.12	49.291	.480	.809
Q63	80.92	52.756	.493	.810
Q64	81.83	50.582	.344	.819
Q65	81.02	53.847	.256	.821
Q66	80.82	52.051	.545	.807
Q67	80.95	52.455	.507	.809
Q68	81.03	52.541	.575	.808
Q69	80.98	52.084	.616	.806
Q70	80.88	54.139	.401	.814
Q71	80.87	53.575	.474	.812
Q72	80.50	55.339	.282	.819

Intraclass Correlation Coefficient

	Intraclass Correlation(a)	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.187(b)	.130	.270	5.596	59.0	1121	.000
Average Measures	.821(c)	.749	.881	5.596	59.0	1121	.000

Two-way mixed effects model where people effects are random and measures effects are fixed.

- a Type C intraclass correlation coefficients using a consistency definition-the between-measure variance is excluded from the denominator variance.
- b The estimator is the same, whether the interaction effect is present or not.
- c This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.

Appendix – 7 (Factor Analysis)

7.1. For hypothesis-1 (Collaboration with immediate stakeholders, i.e., suppliers, employees, distributors, and retailers of small businesses under LEI will result in right product mix.)

Component Matrix (a)

	Component			
	1	2	3	4
Q6	.359	.286	.618	-.255
Q7	.268	.561	.473	-.220
Q8	.282	.225	.047	.886
Q9	.481	.400	.199	-.036
Q10	.757	.105	.270	.277
Q11	.819	-.320	-.069	-.072
Q12	.827	-.463	-.132	-.090
Q13	.854	-.429	-.112	-.099
Q14	.333	.671	-.515	-.076
Q15	.363	.547	-.633	-.135

Extraction Method: Principal Component Analysis.

a 4 components extracted.

Component Matrix (b)

	Component		
	1	2	3
Q6	.318	.051	.618
Q8	.274	.249	.377
Q9	.452	.333	.372
Q10	.747	.066	.445
Q11	.838	-.243	-.155
Q12	.856	-.354	-.269
Q13	.879	-.337	-.256
Q14	.308	.820	-.248
Q15	.352	.753	-.392

Extraction Method: Principal Component Analysis.

a 3 components extracted.

Component Matrix (c)

	Component		
	1	2	3
Q6	.298	.000	.624
Q8	.265	.258	.574
Q10	.718	.043	.477
Q11	.857	-.173	-.144
Q12	.892	-.260	-.250
Q13	.911	-.244	-.239
Q14	.273	.871	-.108
Q15	.324	.820	-.271

Extraction Method: Principal Component Analysis.

a 3 components extracted.

Component Matrix (d)

	Component		
	1	2	3
Q6	.299	-.010	.887
Q10	.696	.000	.417
Q11	.866	-.138	-.119
Q12	.906	-.213	-.233
Q13	.925	-.198	-.220
Q14	.256	.888	.013
Q15	.316	.859	-.131

Extraction Method: Principal Component Analysis.

a 3 components extracted.

Component Matrix (e)

	Component	
	1	2
Q6	.222	-.010
Q11	.881	-.138
Q12	.937	-.213
Q13	.949	-.198
Q14	.256	.888
Q15	.331	.859

Extraction Method: Principal Component Analysis.

a 2 components extracted.

Component Matrix (f)

	Component	
	1	2
Q6	.228	.651
Q11	.891	-.026
Q12	.959	-.120
Q13	.967	-.117
Q14	.133	.767

Extraction Method: Principal Component Analysis.
a 2 components extracted.

Component Matrix (g)

	Component
	1
Q11	.890
Q12	.964
Q13	.973
Q14	.126

Extraction Method: Principal Component Analysis.
a 1 components extracted.

7.2. For hypothesis-2 (Sharing information of small businesses under LEI will result in right price)

Component Matrix (a)

	Component	
	1	2
Q17	.702	-.612
Q18	.833	-.347
Q19	.672	.577
Q20	.722	.459

Extraction Method: Principal Component Analysis.
a 2 components extracted.

Component Matrix (b)

	Component
	1
Q17	.833
Q18	.887
Q20	.622

Extraction Method: Principal Component Analysis.
a 1 components extracted.

7.3. For hypothesis-3 (Geographical concentration of small businesses under LEI will result in right value delivery network)

Component Matrix (a)

	Component		
	1	2	3
Q21	.675	-.007	-.183
Q22	.089	.719	-.122
Q23	.814	-.009	-.168
Q24	.798	.115	-.305
Q25	.759	-.062	-.225
Q26	.761	-.263	-.158
Q27	.758	-.239	.390
Q28	.526	-.108	.679
Q29	.316	.583	.558
Q30	.198	.795	-.118

Extraction Method: Principal Component Analysis.
a 3 components extracted.

Component Matrix (b)

	Component	
	1	2
Q21	.699	.050
Q22	.079	.774
Q23	.839	.014
Q24	.821	.202
Q25	.779	-.001
Q26	.782	-.246
Q27	.713	-.313
Q30	.179	.799

Extraction Method: Principal Component Analysis.
a 2 components extracted.

Component Matrix (c)

	Component	
	1	2
Q21	.698	.020
Q23	.839	.039
Q24	.818	.235
Q25	.779	.039
Q26	.786	-.192
Q27	.716	-.387
Q30	.169	.939

Extraction Method: Principal Component Analysis.
a 2 components extracted.

Component Matrix (d)

	Component
	1
Q21	.698
Q23	.837
Q24	.810
Q25	.777
Q26	.794
Q27	.728

Extraction Method: Principal Component Analysis.

a 1 components extracted.

7.4. For hypothesis-4 (Inter-firm network of small businesses under LEI will result in integrated marketing communication)

Component Matrix (a)

	Component		
	1	2	3
Q34	.541	.564	-.123
Q35	.406	.706	.353
Q36	.380	.404	.084
Q37	.526	-.011	-.745
Q38	.680	-.354	-.360
Q39	.814	-.073	.182
Q40	.607	-.318	.432
Q41	.381	-.648	.307

Extraction Method: Principal Component Analysis.

a 3 components extracted.

Component Matrix (b)

	Component	
	1	2
q34	.430	.568
q36	.305	.387
q37	.557	.467
q38	.747	-.028
q39	.811	-.027
q40	.638	-.396
q41	.465	-.705

Extraction Method: Principal Component Analysis.

a 2 components extracted.

Component Matrix (c)

	Component	
	1	2
q34	.421	.644
q37	.549	.550
q38	.755	.044
q39	.798	-.036
q40	.658	-.373
q41	.503	-.661

Extraction Method: Principal Component Analysis.
a 2 components extracted.

Component Matrix (d)

	Component	
	1	2
q34	.350	.850
q38	.704	-.032
q39	.811	.190
q40	.742	-.084
q41	.599	-.612

Extraction Method: Principal Component Analysis.
a 2 components extracted.

Component Matrix (e)

	Component
	1
q38	.699
q39	.783
q40	.756
q41	.668

Extraction Method: Principal Component Analysis.
a 1 components extracted.

7.5. For hypothesis-5 (Sharing knowledge within employees of small businesses under LEI will result in efficiency enhancement of employees)

Component Matrix (a)

	Component	
	1	2
Q42	.833	-.094
Q43	.835	-.212
Q44	.783	-.251
Q45	.682	-.344
Q46	.507	.007
Q47	.557	.659
Q48	.390	.811

Extraction Method: Principal Component Analysis.
a 2 components extracted.

Component Matrix (b)

	Component	
	1	2
Q42	.848	.211
Q43	.871	.130
Q44	.807	-.166
Q45	.712	-.388
Q46	.497	-.251
Q48	.285	.853

Extraction Method: Principal Component Analysis.
a 2 components extracted.

Component Matrix (c)

	Component
	1
Q42	.840
Q43	.870
Q44	.816
Q45	.731
Q46	.496

Extraction Method: Principal Component Analysis.
a 1 components extracted.

7.6. For hypothesis-6 (Mutual learning through observation of small businesses under LEI will result in greater productivity)

Component Matrix (a)

	Component
	1
Q49	.730
Q50	.644
Q51	.787
Q52	.773

Extraction Method: Principal Component Analysis.

a 1 components extracted.

7.7. For hypothesis-7 (Collective initiative of small businesses under Light Engineering Industry will result in maximizing benefit of organizations)

Component Matrix (a)

	Component						
	1	2	3	4	5	6	7
Q53	.076	.541	.537	.194	.481	-.071	.099
Q54	.221	.401	.640	.199	.211	-.145	.059
Q55	.356	.424	-.045	.528	-.214	.411	-.113
Q56	.602	-.079	.040	.457	-.323	.394	.032
q57	.365	.505	-.003	.039	-.274	-.066	-.110
q58	.302	.452	-.581	.015	-.133	-.060	.060
q59	.506	-.138	.245	.307	-.162	-.353	-.142
q60	.723	-.197	.144	.047	-.169	-.444	.032
q61	.599	-.343	.288	-.147	-.422	-.239	.160
q62	.590	-.110	.294	-.457	-.189	.281	-.077
q63	.567	.248	-.016	-.453	-.021	.047	.258
q64	.317	.317	.437	-.417	-.097	.324	.215
q65	.389	-.341	-.167	.122	.266	.236	.578
q66	.660	.143	-.307	.248	.014	-.202	.356
q67	.651	-.182	-.087	.090	.295	-.082	.105
q68	.718	.054	-.138	-.229	.236	-.031	-.321
q69	.741	.060	-.095	-.054	.158	.044	-.455
q70	.554	-.470	.096	.071	.276	.223	-.295
q71	.639	-.234	-.201	.003	.256	.083	.033
q72	.341	.504	-.436	-.260	.087	-.138	-.037

Extraction Method: Principal Component Analysis.

a 7 components extracted.

Component Matrix (b)

	Component					
	1	2	3	4	5	6
q54	.210	.034	.519	.326	-.075	-.058
q55	.353	.396	.027	.628	.390	-.024
q56	.603	-.081	-.050	.529	.323	.154
q57	.362	.461	.238	.182	-.104	-.057
q58	.303	.678	-.259	-.017	-.097	.087
q59	.505	-.241	.065	.354	-.354	-.163
q60	.724	-.232	.064	.087	-.468	-.004
q61	.603	-.395	.287	.011	-.333	.208
q62	.591	-.191	.440	-.288	.241	.017
q63	.566	.250	.249	-.377	.011	.261
q64	.312	.106	.648	-.199	.279	.270
q65	.391	-.256	-.410	-.085	.207	.549
q66	.660	.251	-.306	.151	-.233	.304
q67	.651	-.148	-.269	-.067	-.038	.029
q68	.719	.119	-.037	-.276	.052	-.364
q69	.741	.095	-.057	-.091	.123	-.462
q70	.556	-.479	-.193	-.054	.298	-.299
q71	.642	-.131	-.320	-.156	.121	-.002
q72	.340	.651	-.096	-.297	-.119	-.069

Extraction Method: Principal Component Analysis.

a 6 components extracted.

Component Matrix (c)

	Component				
	1	2	3	4	5
Q54	.196	-.039	.511	.291	-.061
Q56	.576	-.205	-.066	.226	.178
Q57	.347	.437	.239	.335	-.059
Q58	.287	.688	-.251	.159	.082
Q59	.509	-.263	.056	.507	-.182
Q60	.734	-.200	.062	.322	-.034
Q61	.618	-.359	.285	.160	.185
Q62	.602	-.134	.445	-.365	.030
Q63	.569	.323	.261	-.282	.258
Q64	.312	.131	.653	-.248	.287
Q65	.401	-.224	-.411	-.180	.561
Q66	.650	.245	-.306	.291	.290
Q67	.661	-.103	-.267	-.011	.027
Q68	.722	.179	-.028	-.244	-.362
Q69	.738	.118	-.054	-.130	-.454
Q70	.566	-.463	-.197	-.271	-.280
Q71	.649	-.086	-.317	-.213	.004
Q72	.332	.711	-.081	-.093	-.078

Extraction Method: Principal Component Analysis.

a 5 components extracted.

Component Matrix (d)

	Component				
	1	2	3	4	5
Q54	.191	-.147	.481	.411	-.109
Q56	.577	-.206	-.143	.148	.191
Q58	.265	.705	-.128	.177	.078
Q59	.509	-.302	-.056	.459	-.201
Q60	.736	-.212	.001	.346	-.065
Q61	.626	-.393	.213	.220	.159
Q62	.603	-.188	.451	-.345	.054
Q63	.563	.318	.391	-.122	.240
Q64	.300	.002	.684	-.198	.308
Q65	.416	-.100	-.414	-.218	.584
Q66	.646	.311	-.253	.354	.257
Q67	.664	-.039	-.284	-.077	.044
Q68	.724	.234	.065	-.198	-.362
Q69	.733	.145	-.011	-.154	-.443
Q70	.580	-.391	-.268	-.397	-.239
Q71	.666	.050	-.258	-.166	-.001
Q72	.317	.742	.104	.034	-.101

Extraction Method: Principal Component Analysis.

a 5 components extracted.

Component Matrix (e)

	Component				
	1	2	3	4	5
Q54	.181	-.139	.485	.302	-.396
Q56	.562	-.197	-.149	.223	.117
Q58	.277	.726	-.092	.109	.103
Q60	.717	-.197	-.001	.284	-.334
Q61	.611	-.406	.197	.322	-.090
Q62	.619	-.275	.425	-.207	.182
Q63	.588	.249	.391	.065	.200
Q64	.302	-.045	.678	-.042	.494
Q65	.426	-.139	-.433	.197	.559
Q66	.652	.318	-.237	.465	-.062
Q67	.666	-.062	-.293	.006	.003
Q68	.733	.198	.067	-.367	-.195
Q69	.735	.126	-.009	-.394	-.244
Q70	.575	-.427	-.297	-.420	-.012
Q71	.672	.021	-.265	-.108	.052
Q72	.339	.730	.135	-.078	-.036

Extraction Method: Principal Component Analysis.

a 5 components extracted.

Component Matrix (f)

	Component			
	1	2	3	4
Q54	.198	-.195	.435	.356
Q56	.553	-.182	-.164	.209
Q58	.278	.734	.005	.079
Q60	.721	-.208	-.083	.364
Q61	.612	-.429	.137	.338
Q62	.632	-.326	.361	-.247
Q63	.598	.207	.429	.001
Q64	.307	-.105	.752	-.193
Q66	.644	.339	-.193	.478
Q67	.655	-.035	-.314	.022
Q68	.749	.173	-.011	-.307
Q69	.753	.105	-.117	-.313
Q70	.556	-.397	-.360	-.396
Q71	.660	.045	-.271	-.105
Q72	.351	.709	.196	-.083

Extraction Method: Principal Component Analysis.
a 4 components extracted.

Component Matrix (g)

	Component			
	1	2	3	4
Q56	.553	-.199	-.153	.229
Q58	.284	.727	-.065	.075
Q60	.716	-.207	-.116	.338
Q61	.608	-.416	.174	.435
Q62	.630	-.305	.471	-.107
Q63	.597	.239	.442	.119
Q64	.297	-.033	.789	-.061
Q66	.645	.325	-.284	.443
Q67	.660	-.074	-.291	-.005
Q68	.750	.165	.000	-.356
Q69	.755	.087	-.100	-.378
Q70	.559	-.443	-.261	-.445
Q71	.665	.010	-.246	-.130
Q72	.354	.723	.131	-.097

Extraction Method: Principal Component Analysis.
a 4 components extracted.

Component Matrix (h)

	Component		
	1	2	3
Q56	.544	-.245	-.117
Q58	.329	.693	-.171
Q60	.671	-.167	-.145
Q62	.605	-.274	.539
Q63	.593	.298	.393
Q64	.287	.051	.811
Q66	.657	.288	-.362
Q67	.678	-.200	-.225
Q68	.777	.058	.052
Q69	.773	-.022	-.042
Q70	.551	-.565	-.119
Q71	.675	-.088	-.206
Q72	.396	.708	.034

Extraction Method: Principal Component Analysis.

a 3 components extracted.

Component Matrix (i)

	Component		
	1	2	3
Q56	.534	-.273	-.085
Q58	.366	.628	-.358
Q60	.663	-.206	-.106
Q63	.578	.364	.397
Q64	.230	.236	.810
Q66	.702	.170	-.340
Q67	.688	-.271	-.067
Q68	.780	.041	.176
Q69	.779	-.058	.090
Q70	.535	-.594	.096
Q71	.683	-.151	-.135
Q72	.421	.688	-.120

Extraction Method: Principal Component Analysis.

a 3 components extracted.

Component Matrix (j)

	Component		
	1	2	3
Q56	.554	-.226	-.178
Q58	.357	.727	-.135
Q60	.679	-.152	-.137
Q64	.182	.107	.774
Q66	.691	.231	-.427
Q67	.710	-.216	-.124
Q68	.768	.058	.285
Q69	.788	-.007	.253
Q70	.574	-.551	.165
Q71	.690	-.099	-.115
Q72	.392	.738	.124

Extraction Method: Principal Component Analysis.
a 3 components extracted.

Component Matrix (k)

	Component		
	1	2	3
Q56	.577	-.006	-.087
Q58	.305	.777	.059
Q60	.688	-.057	-.134
Q64	.175	.046	.910
Q66	.679	.471	-.248
Q67	.735	.000	-.060
Q68	.756	-.025	.251
Q69	.781	-.098	.178
Q70	.609	-.615	-.051
Q71	.693	-.075	-.173

Extraction Method: Principal Component Analysis.
a 3 components extracted.

Component Matrix (l)

	Component	
	1	2
Q56	.562	-.078
Q58	.257	.755
Q60	.678	-.120
Q64	.199	.514
Q67	.717	-.040
Q68	.779	.200
Q69	.799	.100
Q70	.676	-.457
Q71	.696	-.099

Extraction Method: Principal Component Analysis.
a 2 components extracted.

Component Matrix (m)

	Component	
	1	2
Q56	.561	-.111
Q58	.255	.908
Q60	.681	-.094
Q67	.718	-.035
Q68	.775	.181
Q69	.797	.101
Q70	.683	-.443
Q71	.702	.003

Extraction Method: Principal Component Analysis.
a 2 components extracted.

Component Matrix (n)

	Component
	1
Q56	.562
Q60	.684
Q67	.721
Q68	.769
Q69	.792
Q70	.703
Q71	.700

Extraction Method: Principal Component Analysis.
a 1 components extracted.

THE END