CHAPTER 2
REVIEW OF LITERATURE

2.1 INTRODUCTION

The most important initial phase of any research work is conducting of a review of past studies conducted on the subject. This phase consist of reviewing important points related to the information available about the subject which is under study so that all academic and research studies related to the subject is placed on record and a gap for conduct of the proposed research can be explored.

An exhaustive literature review shall enable the researchers to identify the research problem, formulate effective hypotheses, identify necessary constructs to be included for the study, formulation of appropriate research instrument, anticipation of complexities that may crop up while conducting the proposed research and utilization of prior experiences of researchers to effectively overcome shortcomings which may be encountered while conducting research.

2.2 RESEARCH AREA

The entire research consists of four main constructs. These are Advanced Manufacturing Technology (AMT), Competitive Priority (CP), Business Environment Characteristics (BEC) and Business Performance (BP). Past studies related to these four constructs have been searched for in different research database like Emerald, Science direct, Springer Links, EBSCO host research database, etc. Brief descriptions about literature available in these four areas have been discussed in the forthcoming paragraphs.

2.2.1 Business Environment Characteristics (BEC)

Business environment of manufacturing enterprisess consist of vitality, intricacy, assortment and largesse (Ward et al., 1995; Mintzberg, 1979; Harris, 2004; Dess and Beard, 1984). The aforesaid issues are most important aspects of business environment with regard to strategic decision-making (Lawless and Finch, 1989). Vitality (dynamism) is the speed at which change occurs in the environment in which firms operate due to technological advancements, competition and change in customer needs and wants. Intricacy (complexity) refers to the acquaintance to be possessed by the firms about their products and customers. Assortment (Diversity) is the nature of homogeneity or heterogeneity of the environment in which the business firms are supposed to operate.
Largesse (munificence) refers to the threats and opportunities provided to the business firms by the environment in which they operate. Impact of business environment on business performance has been extensively studied in the past by eminent researchers such as (Van Dierdonck and Miller, 1980; Skinner, 1969; Hofer, 1975).

Judge and Douglas (1998) has found out that enterprises which are able to effectively manage their external and internal environment through efficient strategies can alone manage to achieve good financial and non-financial performance.

Krajewski and Ritzman (1996) included conditions of economy, scientific advancements, political environment, resource availability, supplier and buyer strengths and weaknesses and social dimensions into the environmental concerning issues.

Heizer and Render (1993) has stated that environment shall consist of fiscal and monetary conditions, artistic (cultural), scientific (technological), personalized and political conditions.

Badri et al. (2000) has increased the scope of environment to engulf six issues which are beyond the control of the business administration atleast in the short-run. These issues are dynamism, political considerations, cost associated, availability of labour, Government laws and regulations and Competitive hostility in the business environment.

Dornier et al. (1998) found out that government rules and policies significantly influence the operational efficiency of business enterprises. They are of the opinion that the global environment is often troublesome due to ever-changing political circumstances.

Taylor and Gutfeld (1992) express the necessity of enterprises to adjust their operations to accommodate to the changing governmental regulations caused due to change in governments.

The importance of business strategies to enhance the competitive spirit and business performance of business firms have been a point of extensive and serious discussion (Lankoski, 2000; Porter and van der Linde, 1995; Bragdon and Merlin, 1972; Palmer et al. 1995).
2.2.2 Advanced Manufacturing Technology (AMT)

AMT perpetually helps to improve the performance of manufacturing industries and it helps the enterprises to formulate the manufacturing strategy and gain competitive advantage, improve productivity, reduce operation time, and increase the flexibility and customers satisfaction (Boody and Buchanan, 1986).

AMT always have a good relationship among the manufacturing performance (Harisson & Samson, 1997). When studying best practices about technology, they found that technological strength was directly related to the competitive drivers of average change-over process, finished product defect rate, new product introduction lead time, on-time delivery, productivity and increased customer morale. Lower cost, material cost, labor cost, and overhead cost can be managed by the firms when they utilize rationally, the most appropriate and apt technology. It can be concluded that technological strength was found to be generally a significant factor in explaining performance in manufacturing companies. The benefits of AMT are classified into two types of tangible and intangible benefits.

Salaheldin Ismail Salaheldin (2007) studied AMT adaptation in the 61 Egyptian industrial sectors. Using ANOVA, the authors found out that adaptation of AMT immensely led to the enterprises gaining competitive advantage, excellence improvement and enhancement of flexibility. The study also revealed that AMT adaptation exerts significant impact on type of product, firm size, organizational structure and principal ownership of the enterprise.

Wiarda (1987) categorized AMT into two groups of Hardware technologies and software technologies. Stations consist of automated identification station; automated material handling devices; numerical control machine tools; robots; computerized numerical control machine tools; programmable production controllers; computer aided design workstations; automated inspection stations; shop-floor control systems. Software technology (otherwise known as integrative and managerial systems), consist of computer aided manufacturing, computer-aided engineering, production planning/inventory management software, statistical process control, computer aided process planning; group technology, local area networks and engineering data management. His study revealed
that SDS and IMS technologies were absolutely vital components of AMT implementation endeavours of manufacturing enterprises.

George W. Mechling et al. (1995) elaborated the influence of AMT on the global competitiveness of manufacturing enterprises. They exclusively talk about the reasons why small firms adopt AMT. They have also explored the AMT adoption pattern among the exporting and non-exporting small concerns in the US by administering a mailed questionnaire to 108 small manufacturing firms in the State of Virginia. Employing the statistical tools of MANOVA and multiple regression models, the authors found out that firms adopting AMT are highly successful in competing in the global market. They found that these firms are dynamic in nature and are quick and flexible and fulfill the needs of their customers without any grievance. They also found out that firms adopting AMT were able to engage in more exports than the firms which have not implemented AMT. The authors concluded that AMT had a positive and significant impact on export potentials of firms.

Abdul Ghani and Jayabalan (2000) conducted a study in India about AMT and how it improves the efficiency of performance of manufacturing undertakings in India. They explored the related issues that help to improve the productivity of manufacturing industries. They considered some of the important factors which influence the AMT implementation such as organizational structure, employees psychology and environment. They found that the performance of AMT implementation depends on the positive feature of organizational structure, employees’ psychology and environment.

Dangayach and Deshmukh (2005) made an attempt to analyse the pattern of AMT implementation among Indian SMEs, and tried to analyse the investment pattern in AMT among the Indian firms. They found out that Indian enterprises are attaching maximum concern to quality and minimum concern to flexibility. Their study also revealed that the Indian SMEs attach least importance to the AMT Post-implementation evaluation and “Requirement Analysis”. They also established that Indian firms prefer to invest in Indirect and Administrative AMT, while they least invest in Direct AMT, which actually offers greater degree of flexibility to the operations of the manufacturing concerns. They also established the impact of technology and Competitive priorities on the performance efficiency of enterprises.
Laosirihongthong and Dangayach. G. S (2005) empirically investigated about manufacturing strategies, improvement activities and order winning criteria of automotive manufacturing companies in India and Thailand. With the help of questionnaires they collected 68 and 54 data from automotive manufacturing companies in India and Thailand respectively. The authors used the statistical tools of Mean and Standard Deviation to unearth the important competitive priority among the firms of the two countries and the nature of improvement activities and order-winning activities prevailing among the firms in the two countries. Indian automotive manufacturing companies assigned product durability the topmost importance among the competitive priority and ranked quality as the most important domain in Competitive Priority. However, the Thai companies assigned dependable delivery as the topmost important item and delivery as the most important domain in competitive priority. Indian firms consider Total Quality Management as the most important improvement activity and Robotic as the least important activity. However, the Thai companies considered Just-in-time as the most important improvement activity and Business Process Re-engineering as the least important activity. Indian enterprises accord maximum Importance to product durability and time as far as their order-winning activities are concerned.

2.2.3 Competitive Priorities (CP)

Deming (1982, 1986), Motwani, et al. (1994) and Hendricks and Singhal (1997, 2001) found that quality is an important factor that has a positive impact on the performance of the manufacturing industries. It helps to improve the level of performance in the organization.

Xiande Zhao et al. (2002) studied the strengths and opportunities available with Chinese enterprises in the light of the highly competitive environment posed by the WTO. The study has revealed that Chinese firms should concentrate on excellence improvement, controlling cost, promptness of delivery, rapid introduction of innovative products, serving customers and skill to innovate to be successful. Based on their study on 130 enterprises, the authors conclude that the skill to innovate, flexibility, post-sales services and quality will be the most important CP factors which the Chinese firms must focus for the forthcoming five years. Though the Chinese firms have got tremendous strength in these areas, they lack behind others in the capacity to be innovative.
Ravi Kathuria et al. (2010) undertook a study to explore the CP of Indian manufacturing enterprises. The authors collected data about the enterprises studied from Senior Executives and manufacturing managers about the CP policies followed by their enterprise with the view to explore the level of identity of opinion among them about the CP issues. They collected data from 156 respondents in respect of 78 enterprises. They employed the paired samples t-tests and multivariate analysis and found out that both cadres of the managerial staff had identical opinion in placing high emphasis to quality followed by delivery. Not much emphasis was placed on product variety and dynamism to bring innovative changes in the product mix, as far as CP strategy crafting is concerned.

Sherwat E. Ibrahim (2010) conducted a study on the IT sector to explore the operational strategies that could be followed to boost the turnover of the companies. Using Correlation and Logistic Regression, the authors explored the relationship between past turnover accomplished and operational strategies forming part of the CP of the enterprise. The study revealed that quality was the most important factor influencing the turnover of the enterprise, while customer-centric approach giving due importance to servicing them as the most indispensable aspects for boosting turnover.

Tawfik Mady (2008) conducted a study on Kuwaiti manufacturing enterprises to explore their important CP policies. The study also endeavoured to assess the effect of plant size and industry type on CP. They conducted this study on 62 Kuwaiti enterprises belonging to refractors and food processing industries. The author applied the Mann-Whitney test, Kruska-Wallis test and Goodman and Kruskal’s g coefficients. The study revealed that plant size exerted significant impact on the CP practices of enterprises. Small and medium enterprises placed utmost importance to the delivery aspect, while the larger enterprises placed paramount importance to flexibility. The two industries surveyed placed paramount importance to delivery and quality aspects of CP, while they attach least priority to innovativeness and flexibility aspects.

Nagabhushana and Janat Shah (1999) conducted a study on Indian manufacturing enterprises to get an imminent into their production priorities and implementation plans. The study reveal that Indian firms attach paramount importance to cost, followed by quality and delivery and they attach the least importance to flexibility. However, the
enterprises are endeavouring to accomplish these objectives without making additional investments and major change in the pattern of operation.

Kathuria et al. (1999) in their research, studied whether there was any difference of opinion among the general managers and manufacturing managers about competitive priority in a same firm. To collect the data authors used two set of questionnaires to each firms, one questionnaire for general managers and another for the manufacturing managers. 158 firms from different manufacturing industries agreed to participate. 98 completed questionnaires were received from the US manufacturing firms. The authors used the five domains of Cost, Quality-of-Conformance, Quality-of-Design, Flexibility and Delivery to measure the competitive priority of these enterprises using the statistical tools of mean and factor analysis. Results of the survey revealed that there is a significant difference in view among the general managers and the manufacturing managers regarding the competitive priority. The study revealed that the General Managers give importance to external factors such as consumer demand and competitive challenges while trying to take decision. However, the manufacturing managers give more importance to internal factors such as cost control and manufacturing flexibilities while trying to take decisions.

Lucia Avella (1999) studied the manufacturing strategies of manufacturing enterprises in Spain and compared it with USA and Europe manufacturing industries. The author collected data from 114 Spanish manufacturing units with the help of questionnaire in the year 1995. Each questionnaire contained 175 items, which was organized into 3 sections namely company profile, competitive strategy and manufacturing strengths, objectives & policies. Authors found that the Spanish manufacturing units concentrated more on on-time deliveries. Whereas, the American and European manufacturing industries gave more importance to high quality and low cost.

Kenneth K. Boyer (2000) examined the measures used in operational management. Specifically they studied the measures used in operational strategies and AMT. The author explained the importance of these two measures to Operational management. The author has discussed the possibility of modifying such measures and have recommended various measures for making suitable modifications in the process.
They have made a methodological analysis of the strengths and weaknesses of these two measures and also propagated suitable suggestions to improve them in the future.

Rouhollah Mojtahedzadeh and Veeri Chettiar Arumugam (2011) found customer focus is an essential aspect in the organization’s success. The aim of customer focus is to satisfy the customer’s needs and demand and provide the required things.

Kenneth K. Boyer and Marianne W. Lewis (2002) investigated the competitive priorities on manufacturing industries and examined whether there is any difference of opinion among the managers and operators. For that they used questionnaires which contain sixteen Competitive priority questions in the form of four domains namely Cost, Flexibility, Quality and Delivery. Finally they collected 110 data from manufacturing industries through managers and operators. The result explains managers and operators give importance to quality followed by delivery and ratings of both managers and operators are similar for cost, but operators gives more emphasis on flexibility. It shows even though managers may start a strategy initially but the operators only take an operation decisions continuously at all levels of the manufacturing units’ production. In addition it is proved that managers and operators have difference of opinion on competitive priority strategies.

Dangayach and Deshmukh (2003) examined the various manufacturing strategies in four industrial sectors namely electronics, automobile, machinery and process industry in India. Various domains such as competitive priorities, activities of improvement and order winners were considered in that study. The author’s main objective was to find out the important strategic issues and assess the competitive priority of an organization sector wise among the Indian manufacturing companies. For that they collected date from Indian manufacturing companies by using questionnaires all over India. Finally, they obtain 100 filled questioners from the respondent. Authors applied mean and standard deviation to find the result. The results show that in India all the four manufacturing sectors give first priority to quality. They also found in India, automobile manufacturers are highly interested in new innovation, faster new product development and continuous improvement which is a positive sign for the automobile industries in India for its future growth.
Haeri (2005) found that customers suggestion and feedback helps the manufacturing units to be successful in the business. He suggested that those who have a strong relationship with the customers only have the higher level of success and it helps them to take a decision at the right time.

Kongkiti Phusavat and Rapee Kanchana (2008) conducted a study among the manufacturing and service providing industries in Thailand about the present and future competitive priority position and they compared the difference between those two sectors. With the help of survey method they collected data from 40 manufacturing industries and 35 service providing industries. Questionnaires are used to obtain the information from the respondent, each instrument contain 31 variables grouped into 6 domains namely quality, cost, customer-focus, delivery/provision, flexibility and know-how. They found delivery/service provisions are the number one competitive domains for both the manufacturing and service-providing industries. They also found in future quality plays a first and most important role in Thailand manufacturing and service industries.

LI Ping et al. (2008) conducted a study among the Chinese manufacturing industries about the cumulative relationship of manufacturing strategies. To find out the competitive priority of Chinese manufacturing undertakings, the authors used five domains namely quality, cost, delivery, flexibility and innovation. To obtain the data for the period of 1997, 2001 and 2005 authors used International Manufacturing Strategy Survey (IMSS) data base. They used factor analysis, correlation and multiple regression analysis to find out the result. The results reveal that there is slight difference between global enterprise and Chinese manufacturing enterprises about manufacturing strategies. It was also found that the Chinese manufacturing enterprises enjoy an advantage in quality, flexibility and innovation over the global enterprises.

2.2.4 Business Performance (BP)

Performance measurement helps the manufacturing industries to evaluate the trend in success and failure of the organization (Phusavat et al. 2009).

Past studies have concentrated on assessing the performance of undertakings through various profitability ratios such as, return on sales (ROS), operation income to sales (OI/S), operating income to asset (OI/A), return on assets (ROA) etc. (Wade &
Hulland, 2004; Bharadwaj, 2000; Santhanam & Hartono, 2003). Some researchers have included perceived performance method to assess the performance of firms. In this method, data can be obtained from the Chief Executives, Managing Directors, General Managers and Senior Level Managers of the manufacturing firms by asking them to rate the performance of their respective firms over a given period of time by making an intra-firm or inter-firm comparisons (Ebben et al. 2005; Cragg, 2006; Kathuria, 2000; Chen et al. 2000).

Ketokivi and Schroeder (2004) conducted an analytical study about the effectiveness of the perceived performance and financial performance of manufacturing firms and compared the two different methods in his research. The author found that perceived performance measurement was a better representative of the financial figures. The authors concluded that perceived performance measurement system is the best method to measure the firms’ performance as it helps to avoid single respondent bias at time of measuring the firms performance.

Mark Pagell and Daniel R. Krause (2004) has expressed a very interesting observation that enterprises may not react to turbulent environment with enhanced flexibility, which shall enhance their BP.

2.2.5 BEC and CP

BEC significantly influences manufacturing strategies and firm development. Improbability and turmoil are the features associated with business environment and enterprises have to formulate strategies to cope up to these conditions. Not much studies have been conducted to explore the effect of BEC on CP (Badri M.A. et al. 2000 and Swamidass PM, 1987). Available literatures reveal that CP of manufacturing enterprises have significant relationship with BEC. BEC significantly influences CP strategies of any undertaking (Burns and Stalker, 1961; Hambrick, 1983).

Kwasi Amoako-Gyampah, (2003) examined the effect exerted by business environmental domains such as labor availability, business costs, competitive hostility, and environmental dynamism on manufacturing strategies domain consisting of flexibility, low cost, quality and delivery dependability. The author explored the influence exerted by the features of firm size and degree of foreign ownership on manufacturing enterprises of Ghana by conducting a survey on 58 manufacturing
enterprises spread over nine industries. The author used the statistical tool of Regression Analysis to explore the relationship between business environment domains and manufacturing strategies. Results revealed that there is a significant relationship between business environmental variable and each manufacturing strategy component.

Ting Chi et al. (2009) conducted a study on 202 US enterprises in the textile industry and analysed the relationship among BEC, CP, SCS and BP of these enterprises. They used the four factors of Diversity, Complexity, Hostility and Dynamism to measure the BEC, while they used the four factors of low cost, quality, delivery and flexibility to assess the CP of the enterprises. They used the five important financial variables of market share, sales growth, profit margin, return on asset and return on investment to measure the BP, while they used ten variables to predict the supply chain structures. The authors segregated the enterprises into two groups of “High Performing Group” and “Low Performing Group” and applying SEM, they found out that high performing enterprises had significant relationship with these domains while the low performing enterprises did not have any such relationship.

Macarena et al. (2005) conducted a study on 20 Spanish enterprises in the aeronautical sector to analyse whether size of the firms exerted any impact on their CP, AMT and PMS (Performance Management System). They measured the CP domain using the four factors of cost, quality, delivery and flexibility, while they used the factors of Design AMT, Manufacturing AMT and Planning AMT to measure the AMT. They further used 20 other variables to measure the BP of the enterprises. Applying the t-test and correlation analyses, they found that size of the firm exerts a significant impact on PMS, AMT and BP of the enterprises.

Ward et al. (1995) studied the relationship between environmental factors and operational strategies formulated by Singapore manufacturing industries. The authors used the variables of competitive hostility, business cost, labor availability, environment and dynamism under environmental factors and Flexibility, low cost, quality and dependability under competitive priorities and used Profit after Tax to analyse the performance of the enterprises. The study revealed that environmental concerns had a significant bearing on the crafting of operational strategy and those undertakings which are able to craft different operational strategies to cater to different environmental
situations will be able to perform well. The study also revealed that the close relationship between environment and operational strategy formulation facilitated enhanced performance of enterprises.

Based on the above literature, the researcher has developed a tentative model to display the link among BEC and CP. This tentative model shall be tested in the proposed study. Based on this model, the researcher has formulated Hypothesis 5 which states that “There is no significant relationship between BEC and CP”.

**MODEL- 1**


Competitive Priorities-CP, Quality-Q, Cost-C, Delivery-D, Flexibility-F, Customer focus-CF, Know how-KH.

### 2.2.6 BEC and AMT

Louis Raymond (2005) endeavoured to study the linkage of environmental uncertainties and AMT. Towards this endeavour, the authors surveyed 118 manufacturing enterprises in the Province of Quebec, Canada. The study has found that enhanced environmental uncertainties doesn’t result in enhanced incorporation of AMT by small and medium sized undertakings.

Oleh and Lena Ellitan (2007) investigated the dynamic relationship between munificence environment and hard & soft technology available with Indonesian manufacturing enterprises. The study shows that environmental munificence support the
use of technology in the production function. It shows that the impact of technology on manufacturing performance is always positive in high munificence environment. On the other hand, their study does not find the moderating impact of soft technology on performance. Furthermore, the study only considered environmental munificence as moderator, and has not considered other environment perspectives such as dynamism, hostility and complexity that may moderate the technology-performance relationship. The authors have suggested that consideration of these environmental perspectives will open up a new avenue for technology environmental variable performance relationship.

Based on the above literature, the researcher has developed a tentative model to display the link among BEC and AMT. This tentative model shall be tested in the proposed study. Based on this model, the researcher has formulated Hypothesis 6 which states that “There is no significant relationship between BEC and AMT”.

**MODEL- 2**

2.2.7 BEC and BP

Alvarez Gil et al. (2001) found out that there was a slight linkage between BEC and BP of manufacturing undertakings. The authors have concluded that environment exerts positive impact on financial performance of firms in the short run. Some studies have confirmed the existence of positive relationship between BEC and BP (Klassen, 1996 and Judge, 1998) few other studies have reported a negative relationship between these two issues (Worrell, 1995, Cordeiro, 1997).

Some authors have labeled the environmental factors which have a serious effect on BP of enterprises as environmental Dynamism (Hoque, 2004; Amoako-Gyampah, 2003; Ward and Duray, 2000; Ketokivi and Schroeder, 2004b).

Some authors such as Hayes RH et al. (1984) and Skinner W. (1969) have talked about the link among manufacturing strategies and BP. However, available literature reveal conflicting results regarding the link among BEC and financial performance of enterprises. Positive link has been established among the pecuniary performance and BEC strategies of undertakings (Russo, 1997; Judge, 1998; Klassen, 1996), while some other studies have yielded a conflicting result of establishing a negative link among the two issues (Cordeiro, 1997; Worrell, 1995).

Masood A. Badri et al. (2000) included two additional variables of Government Legislations and Policies and Political environment to make up the domains constituting the BEC of manufacturing enterprises. Path Analysis has been employed by these authors to analyse the effect of environmental situations on selecting operational strategies and the BP of the enterprise. Results revealed that the UAE manufacturing enterprises felt the serious impact of environment concerns on their operational strategies. The study unearthed that triumphant enterprises were dynamic to adopt varied strategies to cope up with changing environmental situations. The authors also concluded that link among BEC and CP of manufacturing enterprises led to an enhancement in their performance level.

Based on the above literature, the researcher has developed a tentative model to display the link among BEC and BP. This tentative model shall be tested in the proposed study. Based on this model, the researcher has formulated Hypothesis 7 which states that “There is no significant relationship between BEC and BP”.

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2.2.8 AMT and BP

Boyer et al. (1996) conducted an investigation into the pattern of investment of enterprises and their performance level. They found that there is no difference in performance of the enterprises with varied pattern of investment. It is worthy to note that this result is consistent with the findings of other studies indicating the absence of a direct impact of AMT on performance of enterprises (Swamidass and Kotha, 1998).

Macarena et al. (2003) investigated the dynamic relationship between a plant’s pattern of investments in AMT and its performance. The findings show that the differences between groups are not significant in either of the two aspects used to measure performance; however, they are closer to being significant in the case of growth than in profitability.

Parthasarthy and Sethi (1992) argued that a plant’s operations strategy should complement AMT’s strengths of greater processing precision, adaptability, and speed. In support, they found that strategies based on quality and flexibility is positively related to plant performance, while cost strategies impede performance.

According to Lei et al. (1996) enterprises implementing AMT, placing due emphasis on quality, flexibility, delivery and costs have a higher probability of succeeding in their business endeavours by achieving high level of performance.
Kenneth K. Boyer et al. (1997) studied the various implementation and investment level of AMT, manufacturing infrastructural investment and how it improves the performance level of manufacturing industries in US. To find out the implementation and investment level of AMT, the authors considered 20 different types of tools like CAD, CAM, and Robotics. To calculate the manufacturing infrastructural investment domain they used variables such as worker empowerment, quality leadership and soft integration. To measure the performance level they used three domains of profit, growth and flexibility. Authors collected data through questionnaires from 202 US manufacturing industries and analysed the data using the statistical tools of correlation and regression analyses. They found that investment in manufacturing infrastructure has a positive relationship with business performance. They also found out that those manufacturing enterprises investing on AMT and improving manufacturing infrastructure were able to accomplish an improvement in their performance.

Marianne W. Lewis and Kenneth K. Boyer (2002) talks about the opportunities and challenges offered by AMT implementation for enterprises. The authors endeavored to study the effect of operational strategies, organization culture and execution measures affect BP. They have found that successful enterprises implement strategies emphasizing quality, delivery and suppleness over cost. Such enterprises are dynamic and flexible to cope up with changing environmental situations through training, pilot projects and long-term AMT objectives.

Macarena et al. (2005) has made an attempt to measure the performance of 20 enterprises of the Spanish aeronautical sector using three domains of Performance measurement systems (PMS), CP and AMT. the four factors of cost, delivery, quality and flexibility were used by the authors to measure the CP of the firms, while they used the three factors of Design AMT, Manufacturing AMT and Planning AMT to measure the AMT. Furthermore, they used 20 variables to measure the BP of the enterprises, and by applying t-test and correlation they found out that size of the manufacturing enterprises exerted a significant impact on the AMT investment, CP and PMS.

Swamidass and Kotha, (1998) found that the use of AMT does not have any direct impact on a company’s performance.
Honggeng Zhou et al. (2009) in their research work investigated about the investment on AMT and investment on manufacturing infrastructure and BP of manufacturing industries in Singapore and Sweden. The economic, cultural and geographical differences and varied business environment prevalent in these two countries motivated the authors to select these two countries. Data were collected by administering survey instrument to 323 manufacturing enterprises in Sweden and 128 Singapore enterprises. Employing the statistical tools of Chi-square analysis, Hierarchical regression and Correlations, the authors found that investments in AMT and manufacture set-up had a significant impact on investment in AMT and on profitability of the enterprises in Sweden and not in Singapore.

Based on the above literature, the researcher has developed a tentative model to display the link among AMT and BP. This tentative model shall be tested in the proposed study. Based on this model, the researcher has formulated Hypothesis 8 which states that “There is no significant relationship between AMT and BP”.

MODEL- 4

Note: Advanced Manufacturing Technology –AMT, Implementation-I, Direct –D and Indirect –Business Performance-BP.

2.2.9 CP and BP

Dangayach and Deshmukh (2001) endeavored to discover the essential manufacturing strategy issues of automobile industries and evaluate the competitive strength of Indian automobile industries. They conducted their study using survey instrument in the year of 2001 on 18 auto component manufacturers in India. The authors used cluster analyses and segregated the entire respondent enterprises into four strategic groups of reactive enterprise, neutral enterprise, active enterprise and proactive enterprises. The reactive enterprises are attaching most priority to low cost and they
follow traditional opportunistic approach. The neutral enterprises consider quality as their dominant competitive priority and they invest moderately in TQM. The active enterprises consider dependable delivery, product reliability and durability as their important main competitive priorities while low cost is their least priority. Furthermore, they invest more in improvement activities such as CAD, CNC, etc. The last groups of proactive enterprises attach much importance to quality, product reliability and product performance and they highly stress on innovation and flexibility. This study has yielded an overall result that Indian automobile enterprises attach maximum importance to quality followed by delivery, while they accord least importance to cost element.

Lynn Ling X. Li (2000) has empirically tested the relationship between business environment, manufacturing capability and firm performance in Chinese manufacturing industries. With the help of questionnaires they collected data from 72 manufacturing firms covering three important topics of business environment consisting of two domains of Dynamism and Government regulations, manufacturing capability covering four domains of Flexibility, Cost, Delivery and Quality, and firm business performance containing four variables of Market Share, Sales Revenue, Profit After Tax and Return on Investment (ROI). Applying path analyses, the authors found that Business Environment, Manufacturing capability and firm business performance have significant relationship between all the domains. The study also revealed that successful Chinese firms are dynamic to adopt different competitive priorities to suit different environmental situations.

Lindman et al. (2001) used Low cost, flexibility, quality, and dependability as variables to measure the competitive priorities and business performance of enterprises. Their study revealed that manufacturing priorities positively influence manufacturing performance.

Rusjan (2006) used Low cost, flexibility, delivery, quality and innovation to measure competitive priorities and Return-on-assets (ROA) as variable to measure performance. The author found that competitive priorities lead to higher ROA.

Kwasi Amoako-Gyampah and Moses Acquaah (2008) examined the relationship between manufacturing strategy, competitive strategy and firm performance. They considered cost leadership and differentiation domains to measure competitive strategy,
and used the four domains of cost, delivery, flexibility and quality to measure manufacturing strategy. Based on the data collected from 180 manufacturing units in Ghana, and analyzing the data using Path Analysis, the study revealed that competitive strategy possess a direct link with manufacturing strategy and quality has direct link with performance of firms.

Ely lauremo Paiva and Iuri Gavronski (2009) studied the relationship between cross-functional integration, competitive priorities and business performance based on data collected from 99 manufacturing industries in Brazil by administering questionnaires. Applying CFA and SEM, the authors found that cross-functional integration and competitive priorities positively influence the business performance of manufacturing enterprises in Brazil.

Yinan Qi et al. (2009) endeavoured to study the link among manufacturing and financial performance of 2976 manufacturing enterprises in chain. Using SEM, the author found that manufacturing performance exerted a significant impact on financial performance. Furthermore, the study revealed that quality and flexibility exert significant impact on financial performance while delivery exerted nil effect.

Anthony Inman (2011) studied whether application of lean practices such as just in time, total quality management and agile manufacturing leads to a reduction in labor cost, material cost, storage cost, wastages during production process and improvement in the productivity and quality of the product. Using CFA and SEM models on the data collected from 96 manufacturing enterprises, the author found out that just in time purchase and just in time production strategies improves the suppleness of manufacturing enterprises. This enhances the operational, financial and marketing efficiency of the enterprises.

Based on the above literature, the researcher has developed a tentative model to display the link among CP and BP. This tentative model shall be tested in the proposed study. Based on this model, the researcher has formulated Hypothesis 9 which states that “There is no significant relationship between CP and BP”.

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2.3 CONCLUSION

A thorough review of available literature suggests that researchers have extensively discussed about various issues related to BEC, CP, AMT and BP of manufacturing concerns. However, most of these studies have been conducted in western countries while a very few studies have been conducted in Asian and under-developed countries. Furthermore, none of the studies pertain to the manufacturing concerns located in Union Territory of Puducherry.

Almost all the authors have studied the BEC construct including the four variables of business cost, labour availability, competitive hostility and dynamism, and very few authors have included Government legislations and policies and political environment under the preview of their study. Hence, the researcher felt it apt to conduct a comprehensive study including all the six constructs related to BEC.

With regard to AMT, many authors have focused their study on factors such as hard and soft technologies. Hence, the researcher felt it apt to conduct a comprehensive study including Direct AMT, Indirect AMT and Implementation AMT under AMT construct.

Regarding the CP construct, many authors have included factors such as quality, delivery, cost and flexibility while a few of them have used the factors of Customer focus-CP, Quality-Q, Cost-C, Delivery-D, Flexibility-F, Customer focus-CF, Know how-KH, Business Performance-BP.
and Know-how. Hence, the researcher has included all these six factors under the construct of CP to make the study more comprehensive.

Regarding BP aspect of assessing performance of manufacturing undertakings, many authors have focused on variables of market share, profit margin and return on investment, while some have used sales growth and return on assets for their study. The researcher felt that a comprehensive study can be done by including all the aforesaid five factors relating to BP.

Hence, the researcher is proposing to undertake a study which is wide in scope, incorporating aspects which have not been included in a single study. Most importantly, the researcher has identified a research gap of absence of studies relating to the assessment of efficiency of manufacturing enterprises in Union Territory of Puducherry and is proposing to fill this particular gap.