CHAPTER-2
LITERATURE REVIEW

Manufacturing Competency is a situation for improved competitiveness. More experienced and trained individuals will perform than lesser ones. Also, learning increases reliability and produces fewer surprises (Levinthal and March, 1993). Competencies are broadly classified as organisational level and employee level (Cardy and Selvarajan, 2006). Competence is a quality of both people and organisations (Nicolin, 1983). Technological competencies are multi-field, highly stable and differentiated (Patel and Pavitt, 1997). The manufacturing function is a formidable weapon for organisations for achieving competitive superiority (Dangayach and Deshmukh, 2000).

The constituents of competencies, that is, technological, marketing and integrative competencies, influence company performance (Wang et al., 2004). Manufacturing competencies has an important role in company’s Strategic Success in order to enable companies improved its competitiveness of manufacturing companies (Nguyen, 2008). Competitive strategy affects quality and firm performance (Amoako-Gyampah and Acquaah, 2008).

Quality and business excellence awards are driving forces in improving the competency of Indian firms in the global market (Dutta, 2007). Small and Medium Enterprises are considered to be an engine for economic growth all over the world. (Singh et al., 2008)
2.1 COMPETENCY

Hollenbeck et al., (2006) argued regarding assumptions for competency models and counters with an investigation of the benefits of leadership competency models for organisations and individuals. Competency model is a more comprehensive model of effectiveness.

In today’s competitive world, it is hard for firms to retain sources to respond to new services and new product offerings, such as reducing development time even if, there is rise in development cost. As competition intensifies, it is important that firms reinforce and protect their sources of competitive advantage and try to compensate for organisational weaknesses (Tyler, 2001).

2.1.1 COMPETENCY DEVELOPMENT

Drejer (2001) formulated a framework for competency development in accordance with management in firms. The model was followed by some considerations about practicing competency development in management. Understanding of model as a stable entity and using it as basis for dynamic development are the areas to focus on.

In present times, companies are facing rapid evolution in integrating new technologies, competitive environment, respect for new environmental and safety regulations, etc. Companies must produce distinctive competencies so as to maintain competitive advantage (Belkadi et al., 2007). Technology acquisition and integration must be strengthened so as to improve the capability of suppliers in order to receive integrated electronic and mechanical components (Reed and Walsh, 2000).
To be more competitive, organisations need to develop competencies in a strategic way and thus, develop a strategic architecture for the same. For competence development, a framework, along with competence model, has been presented to form and improve strategies (Gilgeous and Parveen, 2001). Traditional ways tend to take a lot of time and are expensive. Competency development in sustainable global manufacturing creates experience by showing how specific competencies are identified and how a scenario has been developed (Taisch, 2013).

Competencies, in a weak manner, capture and portray different emotions and social interactions in everyday job life. Competency frameworks have innovative insight to alternative dimensions to improve firm’s performance (Stokes and Oiry, 2012).

In contemporary environments, organisations measure their performance against a set of predefined performance measures. These measures are governed by the ability of the organisation for maintaining necessary sets of ‘competencies’ that assist in the successful execution of its projects. Competencies being multidimensional and subjective in nature are a lot difficult to be defined and measured. A new modeling approach considering prioritized fuzzy aggregation, factor analysis, and fuzzy neural networks has been applied for identifying the relationship between project competencies and project key performance indicators. The diverse project competencies are analysed using factor analysis. A standardized framework and methodology for evaluating the impact of project competencies on project key performance indicators has been established (Omar and Fayek, 2016).
2.1.2 COMPETENCY MANAGEMENT

Competency management concerns with the competency distribution and development. The architecture of the design activities aims to assist competency management through the qualitative feature of the work (Belkedi et al., 2006). For improving business performance, reliable and valid techniques are developed for measuring and managing competency. Apart from development, advancement of these measurement techniques for an end user computing capability is the need of the hour (Yoon, 2007). Knowledge, the major aspect of manpower and assets, is even contained in simplest tool. In market, price is governed highly by quality than by supply and demand. Production factors and industrial processes are combined to minimize the end product cost and thus, managing competency and improving firm’s performance (Nicolin, 1983).

Competency management, combined with strategic management, represents and evaluates core competencies in relation to the processes and products. Competency management along with the ‘value creating network concept’ and the diffusion of matrix-based tools helps in managing the interdependencies between the project domains: organisation, process and product. Competency management experts have underlined the responsibility of design organisations for developing of products in order to satisfy customer requirements (Bonjour et al., 2010).

During the past years, important changes have happened in the automotive industry. With competency management, a new framework has been developed for analysing the decision of the automakers, whether to develop a new component in-house or
outsourced it. Competency management led to pass the decision about supplier product to independent, then complementary, of the assembler product (Veloso and Fixson, 2001).

Hong and Stahle (2005) identified various key concepts on competency and competency management. Competency management has led to an integrated and systemic view where managing system towards a self-generative and self-renewable organisation is a big challenge.

Competency management and development regarded as vital tools to improve competitiveness of organisations. Competency management helps to identify opportunities and expand organisations in global market (Lee, 2006). Indian organisations follow various philosophies like 5S, TPM, TQM, etc., however they have not been able to make any substantial improvement in this regard. Competency management and development contributes to a larger extent for the successful implementation of these philosophies. TQM index, Competency index, and 5 ‘S’ index have been analysed before and after competency-based training in organisations. Manufacturing industry can improve its competitiveness by focusing on competency management and competency-based training along with training on these philosophies (Khanna and Gupta, 2014). HRD interventions have an impact on building of employee competencies, thus improving organizational effectiveness. The HRD interventions undertaken in this study are training, performance management and career management. A model has been developed by combining various factors.
The validity of the model is tested by applying structural equation modeling (SEM) approach (Potnuru and Sahoo, 2016).

2.1.3 CORE COMPETENCY

Prahlad and Hamel (1990) described core competencies as collective learning in a firm, especially the integration of multiple streams of technologies and coordinate diverse production skills. ‘In the short run, an organisation’s competitiveness derives from the price or performance attributes of products whereas in long run, it derives from the ability to develop, more quickly and at a lower cost than competitors’. Prahlad and Hamel (1994), described ‘competitor differentiation, extendibility and customer value’ as conditions for core competency.

With core competency, an organisation should be able to provide benefit to customers as well as expand into new markets. Also, competitors should find it hard to replicate. Core competency thinking promotes approach to mobilize and focus on an organisation’s resources. Technology executives and R and D should describe the core competencies of their companies as core competency thinking enables competitive advantage without disruption to business activities (Gallon et al., 1999).

Core competency has a dynamic role in improving the potential of project teams. Core competency improves strategies: by balancing itself with the external environment and activities; by reducing path-dependency influences and carefully arranging resources, by guidance rather than control. (Ljungquist, 2007 and Ljungquist, 2013)
Core competencies affect entrepreneurial performance and business success. Core competencies develop strategies in relation to firm’s performance (Mitchelmore and Rowley, 2009). Core competencies enable firms to develop different perspectives in accordance with company values and strategies (Nyhan 1998). Core competencies have an important role in Indian organisations in different conditions. SMEs should be as proactive in making changes such as development of competencies, awareness about market changes, upgrading of technology and human resources (Singh et al., 2008).

Core competencies should enhance strategic thinking in order to achieve its goal. Without the core competencies, well-stated and well-conceptualized strategies cannot be successfully realized and implemented. Core competencies are important for organisations in achieving competitive advantage (Cardy and Selvarajan, 2006). Core competencies are linked to business profitability as these are cross-culturally valid. Core competency models should focus on selection, feedback, training, and performance management (Ryan et al., 2012).

Core competency model focuses on competency scoring, competency identification and aligning competency with strategic functions to survive in the competition. Organisations will manage their employee competencies to ensure competitive advantage and better performance (Sengupta et al., 2013). Core competencies help individuals to be able to perform on different positions throughout the organisation. Various competency models are used to identify and expand the global competitiveness of organisations (Singh et al., 2013).
2.1.4 RESOURCE BASED PERSPECTIVE

Resource based perspective is the competitive advantage that is derived from the valuable, sustainable, rare resources and capabilities for a firm. (Barney et al., 2001) Resource-based perspective uncovers long-term effects of outsourcing. It focuses on organisational resources, for integrating the dispersed knowledge required in developing complex products (Becker and Zirpoli, 2003).

By resource-based analysis, it is argued regarding cooperative competencies that whether they are socially complex and ambiguous or not as they result from historical conditions. Cooperative competencies are competencies relevant to knowledge transfer, communication, information processing, inter- and intra-unit coordination, negotiation and the ability to develop trusting relationships. They can complement technological competencies in dynamic and uncertain industries. Therefore, they can provide organisations with competitive advantage, which cannot be easily competed and imitated with (Tyler, 2001).

Cooperative competency and process-oriented view facilitates the effects of transfer mechanisms, including adaptation and replication of knowledge transfer performance. Cooperative competencies relate to transfer mechanisms in partnering firms, thus knowledge transfer performance improves. A conceptual model shows interrelationships between cooperative competency, knowledge transfer performance and transfer mechanisms (Chen et al., 2014). Main focus of companies should be on innovations according to market need as due to competition, they can be exposed to a tough challenge (Herna´ndez-Espallardo and Delgado-Ballester, 2009).
Resource based view, including core competencies, assist organisations in strategic management. Core competencies and the strategies are based on the ideas that are rare and intangible. There is lack of understanding regarding core competencies and their potential value for the company (Bhamra et al., 2010). Higher priority in manufacturing companies is given to delivery, cost and whereas flexibility is given lower priority. For accomplishing these objectives, resource based view emphasis on shop-floor activities and favors adopting options like periodic reviews, worker training etc. Firms are reluctant in adopting approaches which require either major organisational restructuring or substantial investments (Shah et al., 1999).

Individual competencies, composed within self-managed teams, translate into more effectiveness for Multi-Team Systems (MTS). A wide range of self-management competencies by team members combine to influence productivity of a team network (Millikin et al., 2010). Integration of marketing, R and D, and engineering functions along with strategic thinking and new product development time is vital for developing competitive advantage. Agility of organisations is a prerequisite for export involvement (Lim et al., 2006). Resource based view combines with manufacturing excellence to demonstrate best industrial practices and thus achieving competitive advantage. Frameworks have been developed for the assessment and implementation of manufacturing excellence (Sharma et al., 2008).

2.1.5 ECONOMIC EFFECTS

The economic, social and environmental pressures contribute towards the phases of automotive life cycle in global industry (Orsato, 2009). Managing decentralized and
dispersed knowledge network is the key challenge confronting Multi-National Enterprises (MNEs) today. The design of architectures and economics in MNEs for harnessing individual creativity is a critical component of competitive advantage (Mudambi and Swift, 2010). A competency typology is a methodology for identifying competencies to aid the transition to competency based logic from task based for human resource management. Integrating and implementing economics and the competency framework offers guidelines for competitive advantage and managerial insights (Soderquist et al., 2009).

Remanufacturing is a process in which used products are restored to useful form. Reverse logistics is a systematic process for planning, controlling and implementing distribution and manufacturing activities, such as the in-process inventory, packaging of finished goods and backward flow of raw materials to a point of proper disposal or recovery. Remanufacturing and reverse logistics affect company’s economic and strategic decision making (Subramoniam et al., 2009). Competency framework provides the organisation with better information regarding selection decisions and understanding of managerial success. Performance ratings, rather than competencies, are influenced by manager’s ability to understand the business (Sutton and Watson, 2013).

Due to globalization, competitive pressures and strategic responses of organisations have intensified. Financial performances and marketing outcomes are also varied by sectors. The economic realignment focuses on the internal competitive developments,
strategic response to these developments, and the financial and marketing outcomes (Akhter, 2013).

2.1.6 TECHNOLOGICAL COMPETENCY

Technology competencies interact with competitive environment to affect firm innovation and competitiveness. Moreover, different types of technological competencies are required during different types of competitive environment for enhancing firm’s innovativeness (Huang, 2011). A technological competency is described as the ability to use technology effectively, through extensive learning and experimentation, development and employment in production. Technological competencies have emerged strongly during the twentieth century in their corresponding fields (Fai and Tunzelmann, 2001).

Geels, (2001) described technological competencies as long term and major technical changes in the way satisfying customers’ needs. Technological insights have 3 levels viz., socio technical landscape, socio technical regime and technological deliberation.

Technological competency and R and D focus on the creation of competencies and new knowledge and the benefits that firms can reap from collaboration. For acquisition of competencies, a perfect balance between the firm’s technological development and the collaboration’s strategic orientation is required (Mothe and Bertrand, 2000). Information Technology Competency (ITC) plays a critical role in learning various competencies. In fact, learning competencies mediate the relation
between ITC and Commercial Success of Innovation (CSI) as CSI is directly related to competencies (Fernández-Mesa et al., 2014).

The technological competencies are to some extent multi-field rather they become more with time and competencies beyond their product range. These competencies are highly differentiated and stable, with both the direction of localised search and technology profile strongly influenced by organisations' principal products (Patel and Pavit, 1997). Technological competencies have the ability to improve products, and thus customer base, as they create and use technologies effectively. Competency development plays an important role in enhancing the industrial competitiveness (Singh et al., 2014). Risk, status, uncertainty, observability, disruptiveness, pervasiveness and centrality are technical characteristics that influence the learning modes selected by an organisation. Technological competencies have an impact on organisation performance and they possess all the prerequisite competencies required for a given technology-product-market paradigm as the organisation enters or remains over time in market. Consequently, high tech entrepreneurial firms must learn, acquire and develop competencies in response to the changing requirements of industry products (Linton and Walsh, 2013).

2.1.7 COMPETITION

Success and survival in today’s tough environment depends on competitiveness. Competitiveness is achieved through integration of efforts between various functions of organisations and use of Advanced Manufacturing Technologies (AMT). AMT has a vital role in flexibility and quality improvements in manufacturing organisations.
Technology is also a competitive weapon as new products and processes with complexity and higher accuracy are introduced and changes in customer needs and expectations. AMT helps manufacturers in enhancing financial and quality performances and thus, improving competitiveness (Dangayach et al., 2006).

Survival in today’s highly fragmented market requires firms’ to focus on factors such as adherence to standards, quality, rapid response and innovation as the basis for competitive advantage. In order to meet these demands, firms are deploying innovations including reconfiguration of their internal organisation, advanced equipment and their external relationships (Barnes et al., 2001). Competencies in innovations is the need of the hour for organisations, and most importantly, balancing the existing competencies to survive in competitive world. Organisations need to master the competencies in innovation so as to exploit the various phases of an innovation process (Janssen et al., 2014).

The manufacturing industry plays a key role in a country’s economy. Also, it adds high value to exports and generates jobs and contributes to political and social stability to achieve higher profits. Functional competencies are important to an organisation’s performance as they help the companies in improving their competitiveness (Nguyen, 2008).

The strategic Automobile Shredder Residue (ASR) recycling model helps vehicle recyclers in improving their economy as there will be a decrease in disposed ASR quantity with an increase in recycling (Simic and Dimitrijevic, 2013). Due to factors,
such as increases in oil prices, advances in technology and government regulation of emissions, the automobile market has entered into a period of uncertainty. The existing manufacturing industries try to develop and patent Alternative Fuel Vehicle (AFV) technologies (Wee et al., 2012).

2.2 STRATEGY

Strategy means deliberately selecting different sets of activities for creating a unique mix of value (Porter, 1996). Corporate strategy provides an overall plan for the firm since the production of goods is separate, from the purchase and consumption of these goods (Jones and Parker, 2004). Major emphasis in various models, theoretical concepts and frameworks has been given to Manufacturing Strategy (MS). There seems to be a relation between production competency and business competitiveness thus leading to improved strategies (Schroeder et al., 1986).

2.2.1 STRATEGY AGILITY

Strategy agility and learning has three dimensions: process adaptation and experimentation, collaborative technology sourcing and proactive technology posture. These aspects help organisations in gaining competitive advantage (Ahmad and Schroeder, 2010). To be more competitive, organisations need to operate in a strategy driven way and develop a strategic architecture to enable them for developing necessary core competencies (Gilgeous and Parveen, 2001). MS contributes to company level competitiveness. Intuitively, it seems obvious that a smoothly running manufacturing system will have significant influence on firm performance (Demeter, 2003).
(Alsudiri et al., 2013) descried the factors for strategy agility, project management and the business strategy. A framework provides a relation between business strategy and project management. This helped the companies in implementing business strategies by embedding their projects in the overall strategy.

Strategy agility and development is considered as an engine for the economic growth and improving competitiveness of SMEs in the global market (Singh and Garg, 2008). Strategic agility gives a new dimension to thinking about strategic entry barriers whereby competitor’s decisions are altered by government rules. Companies attack competitors by modeling government rules so as to create a misalignment of competitor’s transactions and governance structures. A firm’s governance structure will be established by the guidance from the attributes of the transaction (Averyt and Ramagopal, 1999).

Regional strategies are alternative, potentially superior solutions for globally integrated and locally responsive approaches. Companies follow a diverse path for regionalization and globalization. Such an approach involves a cluster of nations that reveal similar market conditions and homogenized regional consumer needs, while minimizing adaptation costs. Regional strategies are associated in evolving a firm’s global strategy (Schlie, 2000).

Financial performance is often used to measure firm performance. There is need for an integrated framework to assess manufacturing flexibility and firm performance.
Moreover, strategic agility and thinking is reckoned to be an integral parameter towards manufacturing flexibility and competitiveness (Mishra et al., 2014).

Corporate Social Responsibility (CSR) is more important to managers, still CSR is considered as an informal structure of corporations. According to economic conditions, corporate social responsibility has an impact on corporate reputation and customer satisfaction in the automotive industry. Although, there does not exist a correlation between corporate reputation, economic responsibility and customer satisfaction. Thus, to increase efficiency in production, the industries need to be strategically agile, so that managers are open to new perspective with most basic and important responsibilities (Hanzaee and Sadeghian, 2014).

A CSR competency framework supply CSR skills and competencies for managers and practitioners. Large companies use these attributes with regard to attitudes, knowledge, and practical skills. Organisational competency framework of strategy for integrating CSR and its associated skills into mainstream business has been provided (Shinnaranantana, 2013).

2.2.2 STRATEGY AND BUSINESS PERFORMANCE

Strategic thinking has a significant impact on strategy formulation and strategic actions thus affecting business performance. Strategic thinking model consists of conceptual ability, visionary thinking, analytical ability, synthesizing ability, objectivity, creativity, and learning ability. This set of abilities and skills are termed ‘strategic thinking competency’. The ‘strategic thinking competency’ model offers a
framework for developing strategic thinking which contributes to better strategy and better business performance. This model is applied for designing training programs to develop better strategic thinkers (Nuntamanop et al., 2013).

The major challenges of upgrading technology, reducing costs and building product quality are common to SMEs globally. Although Indian SMEs lack capacity in product design and development capabilities but government policies have a prominent impact on development of strategy for competitive nature of SMEs globally (Singh et al., 2010). A framework shows the relationship between the process of manufacturing and the strategic thinking. Various forms of manufacturing strategy process and their impact on business performance have been provided (Swamidass, 2001). Strategy thinking competencies facilitate process innovation, as organisations can enhance their performance by their innovative efforts for developing and strengthening relevant strategies (Tarafdar and Gordon, 2009).

Panda, (2010) gave the brief overview of the Indian small car industry. The mid-segment cars their concept, evolution, physical aspects and contribution to the growing need of the segment has been highlighted.

Outsourcing along with strategic thinking influences sustainable growth in the organisations. At technological level, machining and composite technologies; at product group level, structural parts and brake system parts are core competence logistics for an organisation. Various criteria, such as operation effectiveness, safety, technological feature, cost effectiveness, usage quantity, procuring sufficiency and
work force, are effected by core competencies, thus core competencies in an organisation effects strategic outsourcing (Demirtas, 2013).

2.2.3 MANAGEMENT

Management coordinates the efforts of people to accomplish various objectives by utilizing available resources effectively and efficiently. Competitive advantage is a management concept that describes attributes which allow an organisation to outperform its competitors. Basically, it means being self-evident. There may be different competitive advantages including customer support, distribution network, company’s product offerings and cost structure. For competitive advantage, customers should be able to distinguish differences between one company’s products and services and their competitors. This difference exists because of a capability gap between a company and its competitors. Competitive advantage leads to technological innovation and thus, leading to better strategy formulation and management (Coyne, 1986).

Technological innovation at products or processes level affects environmental and economic condition of the automobile industry. For achieving sustainability, change in processes must be undertaken at the system and functional level. A product service system (PSS), system of products and services, is designed for competitiveness with lower environmental impact and satisfying customer demands. PSS involves developing, maintaining, obtaining and improving products and services in response to market opportunities. PSS is assessed against expanded set of key evaluative criteria: changes in institutional and infrastructural practices, changes in vehicle
ownership structure, evidence of ‘higher-order’ learning amongst stakeholders, changes in vehicle design, manufacture and end-of-life management and changes in modes of producer user interactions. Information and Communication Technologies (ICTs) is used by most organisations to offer more sophisticated innovation options (Williams, 2006).

Firm competencies, such as, New Product Development (NPD), marketing management and business network has an effect on strategic management of an organisation. Business network is a kind of competency that covers inter-organisational network, government relationship and R and D partnership. NPD consists of product process innovation and R and D capability, while marketing management includes branding, information management, promotion and distribution channel (Wang and Lestari, 2013). Loan amounts play an important role on the forecasting of automobile sales. There exists a relation between automobile production and automobile loan amounts as automobile production through sales varies according to different loan conditions and amounts. Thus, loan amounts from banks have an impact on strategic management of an organisation (Yildirim et al., 2012).

Preventive maintenance is carried out on equipment to avoid its breakdown or malfunction. It is a routine and regular action taken on equipment. Preventive maintenance can be extended effectively only if maintenance engineering instruments are adopted to assure that preventive maintenance programs harmonize well with production schedules and with the actual state of manufacturing equipment.
Maintenance performance of an organisation leads to growth in firm’s performance. Thus it can be said that preventive management affects organisation’s competencies and strategies in present tough environment (Chinese and Ghirardo, 2010).

2.2.3.1 Strategy Management

Strategic management is the formulation and implementation of the initiatives and major goals taken by company's top management based on consideration of resources and environments in which the organisation competes. In today’s world, the main feature of economy has changed from an individual’s effort to team work. In inter organisational network, competencies are built by each firm and are influenced by strategy formulation (Fleury and Fleury, 2003). Intense competitiveness and rapid developments in manufacturing technology and information technology has led to turbulent and uncertain marketplaces throughout the world. Advances in biological and physical sciences and shortening of product life cycles to some extent lead to uncertainty. There has been rapid transition in production systems to new organisational forms due to radical changes in technologies, competition and marketplaces. The manufacturing function and strategic management is a formidable weapon to achieve competitive superiority. A model links the action plan of firms and the manufacturing competitive priorities (Dangayach and Deshmukh, 2000).

A company’s internal and external variables are linked regarding strategic management which leads to an improved marketing performance. Strategic management includes human resource management, marketing strategy and strategic thinking. Marketing competency substitute strategic management but formalized
organisational structure hampers it. Along with this, the attitude of organisations' management towards risk taking and emphasis of CEO's on strategic thinking also get slow down due formal structure of organisation. Strategic thinking is positively related to centralization in the organisational structure. Market performance improves with enhancements strategic management and technological turbulence (Moon, 2013).

Strategic management elements in the operations unit and business strategies are correlated. A model has been presented that associates organisations performance with the challenges in the strategic management field (Shavarini et al., 2013). Managerial cognition along with corporate and individual values have an impact on strategic management. Strategic management and competencies are important to a firm’s performance. Along with management, psychological elements provide an understanding of the strategic thinking and decision making process (Steptoe-Warren et al., 2011). Strategic management along with Quality management affects the quality as a source of consistent competitive advantage. Quality competency plays an important role in sustaining advantage in today’s highly competitive world (Yu et al., 2006).

2.2.4 KNOWLEDGE TRANSFER MANAGEMENT

Knowledge, technological skills and capability constitute a major part of firm’s competitiveness. For creation of knowledge that will be transformed into new products and services firms have started to form knowledge-based strategic alliances, thus a new form of competition has been created. Nevertheless, this creation and transfer of knowledge through inter firm cooperation has proven to be quite difficult.
The issue of knowledge transfer management is more important for firms lacking in technological capabilities. Strategic variables related to knowledge and flexibility effect an organisation’s performance. A framework has been presented for capturing knowledge and information from external sources and the process that organisations use to assimilate transform and use this knowledge (Ferna´ndez-Pe´rez et al., 2012).

Knowledge management helps in dealing with the complexities of social behavior in organisations. Knowledge plays an important role in firm’s performance as strategic actions are planned according to knowledge and knowledge management involves both workers as well as managers (Moore, 2011). Along with knowledge management, habitual expressions also form a part in production process. Individuals use various habitual expressions for conveying their desires for product forms. Even oral styling procedure is described to a designer, who progressively sketches the product as it is described (Chang et al., 2005). Multi-team systems are greatly affected by individual capabilities in self-managed teams. Self- management competencies influence the productivity of a team network. Multi team systems comprise of teams which widely practice self-management and knowledge management strategies to attain higher productivity. Multi-team systems having consistent self-managers are the most productive ones (Millikin et al., 2010).

Knowledge transfer and management has led industries switch to re-insourcing. Besides outsourcing, re-insourcing helps organisations in decision-making in manufacturing strategy and in achieving various underlying motives. Re-insourcing implementation gained momentum especially, during situations of financial crisis.
In modular assembly, automobile manufacturers can either outsource the units for assembling or assemble them internally. Module assembly units’ performance is affected by ownership and location. Even the internal and customer side conditions of different organisations greatly affect module assembly units’ performances (Fredriksson, 2004).

A Fit Manufacturing Framework helps manufacturing companies to operate effectively and become economically sustainable in global competitive market. A Fit manufacturing paradigm, through effective marketing and product innovation strategies, integrates the manufacturing efficiencies, agility and new markets, to achieve long term economic sustainability (Pham and Thomas, 2012).

2.2.5 STRATEGY MANAGEMENT AND TECHNOLOGY

There is a strong linkage between technology strategy and business management but organisations can have different approach for technology acquisition and development. Strategic management and technology is practiced in various organisations in the auto component industries. Effective strategic management and technology or strategy technology management contributes to faster technology absorption and improved firm performance (Sahoo et al., 2011).

Certain business adaptations are required while entering a new market to have an improved strategic technology and management. MATCH is a new conceptual framework that assesses the strategic management and potential value creation in relation to the business model (Sleuwaegen, 2013). Strategy management and
technology is affected by the techniques for organisational learning process. Cognitive maps of Indian automobile industry are used for understanding organisational learning process. A simulation experiment, in the light of organisational learning, was performed on uncertainty based cognitive map for generating future scenarios (Srinivas and Shekhar, 2000).

Maintenance Quality Function Deployment (MQFD) is a feasible model for nourishing the synergic benefits of TPM and Quality Function Deployment (QFD). Successful implementation of MQFD leads to an enhanced firm performance as by this model strategic thinking, which involves strategic management and technology, gets improved (Pramod et al., 2006). TPM implementation leads to the enhancement of employee competency. It also shows how competency has been improving by implementing TPM. The study uses Analytical Heirarchical Process (AHP) for analysis. This study integrates TPM implementation with employee training, empowerment, teamwork, compensation and management leadership in a theoretical model for studying employee competency within the framework of Management system (Maran et. al, 2016).

Strategic technology management involves concurrent engineering and lean manufacturing towards new product development. Moreover, high degree of similarities exists between concurrent engineering and lean manufacturing. With lean manufacturing, organisations are able to develop new products faster and better with less cost than conventional companies. The benefits of lean manufacturing principles go much beyond frequent deliveries and inventory reduction (Meybodi, 2013).
Entrepreneur training and education ensures the improvement in the performance of micro firms. An investment in entrepreneur training and education is especially relevant to firms which are highly competitive. This implication leads to improved competencies and strategic management. A positive association between business training program and company performance exists based on four performance variables: organisational improvements, better job satisfaction within a company, increased exports and increased number of employees (Yazdanfar et al., 2014).

Performance Management and Measurement (PMM) techniques and tools, in recent years, have gained interest as by implementation of PMM yields many advantages. There are number of benefits experienced by organisations, in practice, after introducing PMM. It leads to better strategic formation as with PMM, even strategic technology and management improves, thus, improving the competencies. Management should make PMM advantages explicit before starting its implementation and stress these advantages during and after implementation. With this, the commitment of organisational members’ will boost up for PMM and its successful use (Waal and Kourtit, 2013).

Firms with strategy technology management use open innovation practices and core competencies whereas firms with strategy of diversification use managerial practices. The framework gives useful indications about dependency of firm performance on competitive strategy and open innovation. Firms, with an innovative strategy, invest more on technical skills and core competencies. The integrated model developed,
links open innovation, innovation performance and company’s strategy in SMEs (Crema et al., 2014).

2.3 MANUFACTURING COMPETENCY AND STRATEGIC SUCCESS

The literature highlights that the organisations offering flexible production routines, exhibiting product innovations and timely responsiveness have reaped tremendous business success through effective coordination and redeployment of internal and external competences (Teece et al., 1997). The organisation’s short term competitiveness can be realized through strategic success attributes of different products, while the long term competitiveness can be attained through the competency of an organisation to deliver cost effective innovative products with high degree of flexibility (Prahalad and Hamel, 1990).

Manufacturing strategy is influenced by competitive strategy and both affect firm performance in manufacturing industry. There exists a significant relationship between manufacturing and competitive strategies of quality, flexibility, cost and delivery. Firm performance, to a great extent, is affected by quality. An emphasis on quality provides a means by which organisations can mitigate the effects of competitive manufacturing environment (Amoako-Gyampah et al., 2008).

2.3.1 MANUFACTURING COMPETENCY

Manufacturing competency along with competence management comprises of management, leveraging, building and deployment of operational competencies and
strategies. The causal relationships between them and the way competencies are embedded in individual and organisational resources. Competence management and agile management are to some extent inter dependent (Assen, 2000). Manufacturing competencies in the form of global and strategic play an important role in organisations’ performance and technology development. Manufacturing competencies support strategies to enhance the competitiveness of an organisation in global market (Chaiprasit and Swierczek, 2011).

Three concepts of manufacturing competency, that is, organisational capability, administrative heritage and core competency are inter related with economic condition and strategy formulation. Resource-based view complements economic analysis and both are vital for complete understanding of global strategy (Collis, 2009). Manufacturing competencies framework consists of competencies such as, research and development, production, information system, human resources and marketing competencies. This model also assesses the level of impact that functional competencies have on organisation performance. Also, marketing competencies, research and development competencies and production competencies are key determinants of customer satisfaction and efficiency (Masoud, 2013).

Manufacturing competency and Competence-based management has led to major changes in the field of strategic management. As there is an interlinking between design management field and value creating network so changes in one leads to change in other. Therefore, design managers need to use these fields together in order to improve company’s competitiveness. Design organisations contribute strongly to
the organisation’s core competence (Banjour and Micaelli, 2010). In-house development and external acquisition, along with organisations’ strategic orientations are interrelated. Low and high performing firms differ regarding their strategies and methods for competency development and acquisition. ‘The difference’, is related to the combination of various integrated and discrete factors (Millikan, 2009).

Technology adoption affects the operational competitiveness in international manufacturing organisations. The mechanism developed provides a deep understanding of trust building for improving operational competitiveness. The managers should focus on their actions, which in turn will help to improve their firm’s competitiveness (Kristianto et al., 2011).

Knowledge and manufacturing competency variables affect international performance. Small firms’ expand into international market by examining the effects of absorptive capacity on the relationship between organisations’ networks and knowledge competencies. Drivers of knowledge competency help in performance and early expansion of the firm in global market (Park and Rhee, 2012). Drastic changes in customer expectations, technology and competition have created an uncertain environment. In order to control this situation, manufacturers are seeking to enhance competencies especially, manufacturing competency and flexibility across the value chain. Manufacturing flexibility is the ability of an organisation to produce a variety of products according to customer demand and expectation while maintaining high performance. Moreover, it is a critical dimension of value chain flexibility. It is strategically important for enhancing competitiveness and winning customer trust.
The existing literature describes a framework for exploring the relationship among flexible capability, flexible competencies and customer satisfaction (Zhang et al., 2003).

2.3.1.1 Competency based Business Performance

Technical activities are vital factors in the globalisation of multinational firms. The intangible nature of technological assets suggests that R, D and E activities should be managed strategically, sometimes favoring centralization and at times, decentralization. Strategic management of R, D and E activities leads to improved competencies and hence enhanced business performance (Miller, 1992).

Companies should maintain a higher degree of rationality among order-winning criteria, competitive priorities and improvement activities due to the customer pressures and competitive market. The competitive priorities of Indian companies are improving process and product quality as well as on-time delivery. Companies try to enhance competitive priorities by implementing manufacturing strategies from, TQM, Material Requirements Planning (MRP), Just-In-Time (JIT) and Statistical Process Control (SPC). Manufacturing efficiency and quality are significant criteria in today’s industry towards competency and business performance (Laosirihongthong and Dangayach, 2005). These challenges provide the basis for new and advanced manufacturing strategy which aims to create economically sustainable manufacturing organisations. Along with these challenges and their corresponding technologies, strategies and competencies are improved, thus achieving better firm performance (Thomas et al., 2012).
Competencies influence the performance of different types of services of industries. Services have often been classified as predictability of supply and demand, maintenance level, degree of labor intensity, method of delivery and level of customization and. These dimensions propose different types of services as service factories, service stores, service shops, service complexes. Along with competencies, services often improve by having proper strategic management thus, leading to improved competitiveness and firm performance (Davis, 1999).

Cloud manufacturing is a manufacturing model which is service oriented, customer centric and demand driven. It presents a strategic vision for the field which is influenced by competencies. Key commercial implementations are critical to enablement of cloud manufacturing, including industrial control systems, automation, service composition, flexibility, business models and architectures. Further improvements in business performance can be made by having higher competition and improvements in the areas of industrial control systems, business models, flexibility enablement and cloud computing applications in manufacturing (Wu et al., 2014).

There is a relation between export performance, competencies and manufacturing strategy of manufacturing SMEs. By adopting the manufacturing strategy, SMEs would gain competitive advantage over their rivals and reap higher exports. They could also seek out opportunities and anticipate future threats for further expansions in the global markets (Singh and Mahmood, 2014).
2.3.2 STRATEGIC SUCCESS

Strategy is the direction of the organisation. It ideally synchronizes with its resources and changing competencies (Johnson and Scholes, 1993). It signifies deliberately evolving distinct initiatives to accrue a unique mix of value (Porter, 1996). Strategic success embodies formulation and execution of key organisational objectives, taking into account available resources and by making holistic consideration of internal and external organisational competitive environments (Nag et al., 2007).

Strategic planning must yield the necessary data and facilitate the organisation to execute management efficiently to realize the business potential. Strategic planning assists executives to take key business decisions in light of consistent presumptions and a clearer perspective. Strategic thinking involves effective creation and execution of distinct business understanding and opportunities aimed at realizing sustainable competitive advantage. Strategic planning initiatives can be carried out by individual alone or cooperatively for providing favorable organisational benefits. Strategic thinking calls for acquiring and evolving strategic innovative ability, by examining available organisational resources, and confronting contemporary intuition to foster decision making today. Recent strategic thought focuses perpetually obviously towards the conclusion that the critical strategic question is not the conventional ‘What?’, but ‘Why?’ or ‘How?’

Interdependencies between process, organisation and product have been managed by using the diffusion of matrix-based tools. Design management along with strategic management represents and evaluates design core competencies in relation to the
organisational, product and process architectures. Small business owners should understand strategies required for growth as they may lead to unintended consequences, like the demise of their firms. Strategic formulation that enables larger organisations to survive and grow, do not necessarily have the same effects for smaller ones. Certain boundary conditions exist for the effectiveness of strategies on firm performance in terms of size (Armstrong, 2013).

2.3.2.1 Competitiveness

Competitiveness is the ability and performance of a firm. Competitiveness may be short-term and long-term. The short-term are the ones that last through a business cycle whereas long-term advantages are those that last over more than one business cycle. The ‘unthreatened competitive advantage’ is the noticeable advantage which had the potential of lasting over the entire length of the predictable future (Flint, 2000). Manufacturing capabilities affect the competencies and strategy formulation and thus competitiveness. The concept of absorptive capacity has been provided that will be applied to clear the view that the manufacturing capabilities are associated with operational performance, and for firms whose main competitive priority is operational performance, the association is the strongest. Manufacturing capabilities have a significant impact on integration of the customers. Manufacturing capabilities have direct contribution to firm performance (Haartman, 2012).

Maintenance is becoming more challenging in the present dynamic business environment as it leads to competitiveness in market. Maintenance management system focuses on improving productivity, equipment effectiveness, environmental
issues and workplace safety. Maintenance practices in manufacturing companies have good prospects as all practices are at high level and affect business performance to a larger extent (Lazim and Ramayah, 2010).

Functional strategies of manufacturing, market orientation and human resource management have impact on competitive strategy. They, even, affect performance as it differs among family and non-family firms. There exist significant relationships between the functional strategies and competitive strategy. An HR participation strategy, flexibility and a delivery strategy has a significant impact on profitability for family firms but not for non-family firms; but Cost manufacturing strategy and market orientation is related to cost leadership strategy for both family and non-family firms (Amoako-Gyampah et al., 2007).

Performance measurement systems has an impact on business performance thus competitiveness. It includes the use of integrated measures related to the perspectives of the balanced scorecard and the stage of development. With performance measurement systems, the organisational performance was higher than that of their competitors. Flexible integrated performance measurement system for greater administrative intensity and higher level of formalizations, leads to an increase the organisational efficiency (Lee and Yang, 2008). Certain quality management practices have a significant effect on customer satisfaction and productivity improvement. Hence, these practices increase competition in the market and lead to an improved firm performance (Terziovski, 2006).
Almost all countries try to bridge the gap in competitiveness between their and global firms. The fundamental characteristic of product development strategy is based on variety and it leads to introduction of the new perspective of product platforms. Furthermore, relating to suppliers, the black box method has improved. Two approaches possible towards product line management are: static and dynamic. The isomorphism between design and production activities enables the lean production system analysis to be applied to design. The evolution of the product development model adopted by organisations has relation with the strategy of product variety. The strategy and organisation at the multi project is considered the most promising (Muffatto, 1998).

Industrial competitiveness is vital for nations having export-oriented industrialisation policies. Competitiveness of an industry, being a complex process, can be analysed from various perspectives. The aggregate performance of many organisations can reflect their competitiveness. Based on theories from operations and strategic management, AHP-based model has been presented to explore the varying degrees of significance of the drivers and indicators of industrial competitiveness. The model identifies the degree of importance of organisational performance indicators when assessing industrial competitiveness. Further, it helps to evaluate the factors that are important for companies to perform better (Sirikrai and Tang, 2006).

2.3.2.2 Company Enactment

The automotive sector is flexible in strategies development. These strategies, related to competency development, investment, quality and cost are significantly correlated
with competitiveness. Growth-supportive environment, shortage of technical manpower and raising funds from the market are major constraining factors whereas delivery time, quality and cost are the main pressures on the automotive sector. Strategies along with the different dimensions of competitiveness have a relationship with these major factors. Organisations should make investments for developing new competencies and address quality improvement and cost reduction (Singh et al., 2007).

Corporate Financial Performance (CFP) is effected by Corporate Social Performance (CSP). By increasing productivity and lowering costs, CFP might also be affected by the impact of perceived CSP on customer satisfaction. CSP in terms of environmental performance, labor practices and community development contributes to consumer satisfaction. However, determinants outside the empire of CSP, such as product quality, perceived service and understanding with the brand, were much important for customers. The overall importance of CSP for customer satisfaction suggests that in the automobile industry, CSP may contribute indirectly by increasing consumer satisfaction as well as to better financial performance directly by increasing productivity and reducing costs (Reijnders et al., 2012).

According to Kassahun and Molla (2013), the Business Process Reengineering Complementary Competences (BPRCC) is composed of the Business Process Reengineering Complementary Transformational Competences (BPRCTC) and Business Process Reengineering Managerial Competences (BPRCMC). The BPRCC has an impact on company performance as it leads to improved strategies, thus,
improved business competencies. The BPRCC with measurement instrument for
government sector of a developing economy has been modeled.

The impact of an advanced, even authoritative structure on an organisation's execution and development encourages the accomplishment of higher worth included and in addition has an immediate effect of administrative abilities on an organisation's execution (Verle et al., 2014).

Agile manufacturing, a manufacturing paradigm, is the winning strategy to be adopted by manufacturers for drastic performance improvements to become leaders in highly competitive market and changing customer needs. Agility, basically, refers to the efficiency with which an organisation accommodates changes in product and process. The drivers of agility and competitive advantages have emerged because of changing manufacturing requirements. The need for achieving competitive advantages of manufacturing and without trade-offs is essential for agile paradigm (Yusuf et al., 1999).

With an increase in turbulent and dynamic nature of competitiveness, there is a tendency to understand organisations in terms of the effective and efficient use of capabilities that creates consistent industrial performance. The main concern of contemporary strategic management is the development of more effective methods for management of knowledge and intangible resources. The relative influences of three constituents of core competencies, that is, technological, marketing and integrative competencies have an impact on strategic competency. Market turbulence and
technological turbulence are moderately significant but amongst all the relationships between major constituents of organisation performance and core competencies, market turbulence regulates the relationship between integrative competencies and organisation performance (Wang et al., 2004).

2.4 CONCLUDING REMARKS

Organisational learning capability has an impact on product innovation performance of SMEs and this relationship is facilitated by design management capability. Interplay between product innovation, design management capability and organisational learning can be very useful in better understanding for improving innovation performance. Design management, being dynamic in nature, emerges from learning and allows the company to adapt to environmental changes. The industry-based efficiency evaluation provides management with information about the relatively best practice and locates the relatively inefficient sectors by comparing them. Based on the literature, more perspectives such as service activities and financial power contribute to the four main competitive priorities of quality, flexibility, cost and delivery.