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ROLE OF KNOWLEDGE MANAGER IN KNOWLEDGE-PRODUCT DEVELOPMENT

EVIDENCE FROM INDIAN AUTOMOTIVE INDUSTRY

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ORGANIZATIONS that do not operate upon knowledge unmistakably do partial optimal utilisation of resources. Knowledge, infact, has become the synonym for intellectual efforts of the members of the organization to develop products, provide customer satisfaction and sustaining existence through knowledge-managed growth levels. Capable new technologies have overtaken the conventional business practices driven by innovations that are too rapid. It is evident that interpreting right knowledge more effectively and exploiting it for long term gains is the latest quest of competitive managers. This views a strategic approach towards managing knowledge within the organization, in such a way that every unit of knowledge produced should do a value addition, i.e. yield a competitive edge in totality. Value Chain (Porter, 1980) holds true in this context, that the business should develop practices to do value addition at various stages from procurement to operations, to output generated to what has been marketed and finally, the service part, through 'support activities'. Integration of value at these stages infact generates a more functional product but point of consideration here is the recognition of such a derived 'Value'. What rather should be the source of such 'Value'? Stating otherwise, it is the recognition of 'Innovation' as a value addition to respective businesses.

Such an innovation is the outcome of team-work mentored by a 'Mediator' (Dervisoglu and Berber, 2001). This mediator is believed to act as the generator and disseminator of the knowledge. However, the label 'mediator' would confine the scope of such a person, delivering utility to create exchanges at the two ends. Instead, this mediator should rather be characterised as 'Knowledge Manager' for his diverse roles. This knowledge manager, infact, is the key in value generation. He manages people individually, and in alliance, creates channel, and makes implicit look explicit for obtaining information and sharing, and use. He sees to it that everyone contributes reasonably to the knowledge creation process with their domain expertise. But, in all, it is clear that knowledge is ubiquitously a source of competitiveness, which is very much derived through 'innovation'.

Keywords: Knowledge Management System, Product Development, Core Competence, Knowledge Products, Knowledge Manager.

Introduction

The source of knowledge is *'information'*, which assumes a strategic significance in business, providing it a sense of direction in the dynamic environment. Such information is derived from *'data'*. When information is practiced it becomes a learning which establishes a kind of *'knowledge'* and then, *'benchmarked'*. This basic structure encompassing learned practices gave birth to the concept of '*knowledge management*'. Posed with challenges of productivity and technological know-how, the organisations are focusing on speedy deliveries for first market penetration advantage, possible by

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reducing time-gaps in product development cycle. These organisations are deliberately pursuing this course of obtaining products (and services) at faster rate for delivering the same at the directed set of audiences before the market or product saturates or enhances further to the next level. Of Course, the organisations this way would expect to establish firm foothold in the market as an early entrant, emerging as market leader, while imitators later follow. The initial operations provide a scope for more profitable stage, if the product hits. Also, the thought of concern here is '*smart customer*', who has developed new tastes and ways of seeking satisfaction with new concepts and technologies in practice almost everyday. This customer has adopted new learning curves. They demand sophisticated goods, involve themselves in active learning about the goods they use, and look for handiness in use or control. This marks the concept of managing knowledge and sustaining development to create and re-create products for the new age.

A well leveraged knowledge in action conveys competitiveness. But the key issue is – *who will leverage such required knowledge into actions*. This paper seeks to establish the role of knowledge leveler in *'Knowledge Product Development'* which has become a competency tool of the present times. The knowledge, as identified, is disseminated and controlled by a function head or project manager, within the organization that can, be referred to as 'Knowledge Manager'. The paper critically examines the process of knowledge integration in product development as based on his capabilities and firm's strategic vision and, thereafter seeks to establish an identity for this 'exchange facilitator' as the diversity in his roles increases. However, it is acknowledged that the competition would be sustained by those who actively create such knowledge, integrate information flow within organizations, develop ways to disseminate it, build right and flexible practices, and benchmark such knowledge created, if it is productive. The knowledge network thus, is source of creation of new concepts for developing products.

Literature Review

According to Davenport and Prusak (1998), *knowledge* is a fluid mix of framed experience, values, contextual information, expert insight and grounded intuition that provides an environment and framework for evaluating and incorporating new experiences and information.

The concept *knowledge management* prescribes tools that enable businesses to be managed proactively. According to Nonaka and Takeuchi, (1995) continuous knowledge creation leads to rapid innovations, this in turn leads to competitive advantage. Knowledge management has a wider applicability in *new product development*.

New Product Development is a problem-solving activity (Iansiti, 1995; McDonough and Barczak, 1992; Verganti 1997; Thomke and Fujimoto, 2000). Hi Tech products and Hi Touch environment (Bukowitz and Williams, 1999) makes this process more complex (Nightingale, 2000). The key to new product development success demands identification and solving of problems to very early phases of the product development process (Thomke and Fujimoto, 2000).

Kotler (1997) defines new product development, as a modification in an existing product or all together a new product that is offered to the customer to enhance satisfaction derived from its use. The major thrust is on Innovation. Here, we call them Knowledge Products.

As Nonaka and Takeuchi (1995) defines, 'knowledge-based product' is the most general term that describes various products and services whose primary input is human creativity. They include ideas, information, news, databases, technologies, and other products and services, which are created, collected, processed and enhanced by human knowledge. The major thrust of knowledge-focused strategies is that of innovation, the creation of new knowledge and turning ideas into valuable products and services (Zack, 1999).

In a global economy, "Knowledge may be your company's greatest competitive advantage." (Davenport and Prusak, 1998).

One important point of consideration as quoted by Bukowitz and Williams (1999) is the task of managing both tacit and explicit knowledge, turning it into technology based or people based knowledge and making it readily available to the different parts of the organization. This adores a new view of product development process.

Inventive thinking, turning tacit into explicit knowledge, creating a high touch and high tech environment and thus deploying a balanced and correct stock of knowledge assets (Bukowitz and Williams, 1999) is the start of product development. But, what is strategically important here is the person, who shall be managing the right knowledge and disseminate it for common sharing to the various parts of the organization for knowledge product development.

The main factor is the coordination of these vital elements in the knowledge creating process. This co-ordination is the prime task of this '*mediator*' who provides the development team with the vital resources and necessary direction. (Dervisoglu and Berber, 2001). This 'mediator' could better be labeled as *'knowledge manager'*.

Concept of Knowledge Product

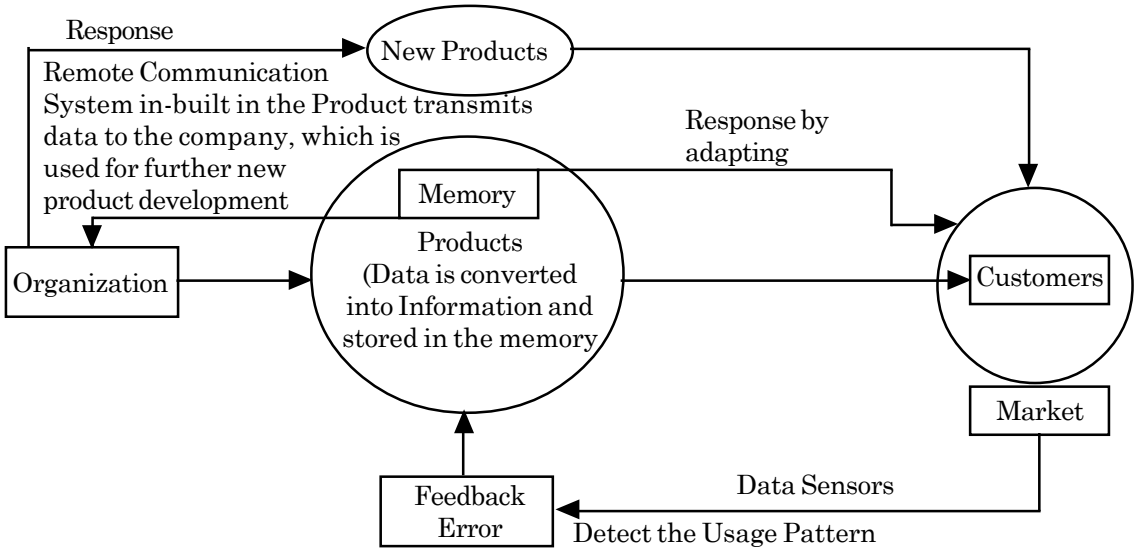
It is not enough to know – *what to produce*? A firm must also know – *How to create a product that speaks out about the firm's continuous struggle to deliver best to its customers and consumers*?

In the present times, Knowledge products have become essential ingredient for competitive advantage as it marks a product differentiation between the products of the firms in the same industry.

Imagine a pack of 'peas' (with inbuilt chip) which doesn't require to be set on a temperature level in a microwave. The inbuilt chip communicates with sensor of the microwave, which automatically, rings as soon as the peas are ready for consumption. Here both microwave and 'chip inbuilt packet of peas' are knowledge products. This eventually produces a '*smart customer*', who is more techno savvy and subsequently goes about reducing times on consumption patterns and other usages.

Knowledge-based Product Model

'A knowledge-based product is anything that satisfies dynamic/arising needs and wants of the customers. It possesses embedded knowledge and it embodies learning.' *Knowledge Based Product is techno-savvy or technology oriented product using sensor and chip technology (Knowledge Based Products, 2005)*.

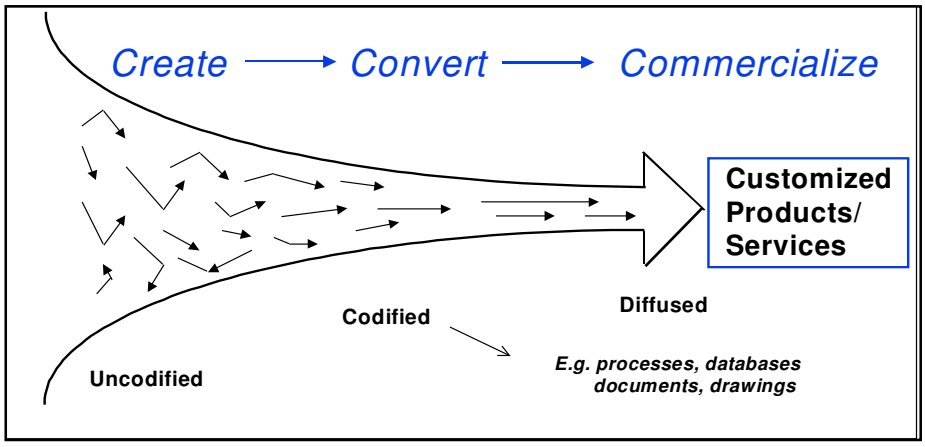


These products learn with their usage and try to adapt to the user's style of using the product. They impart knowledge to user also. The knowledge products are different from the conventional products as the former holds some sort of database in the form of a chip within the product which senses the digital code.

For example, *television with smart eyes* that automatically adjusts the brightness, contrast and colour depending upon lighting condition. *battery level*, which indicates the usage level. *Brake suspensions to thermostats*, in automobiles, which automatically, sense the heated engine and switches off the ignition. A major example could also be the automated driven cars.

Characteristics of Knowledge Product

1. *Companies get smarter* with development of knowledge products, which involves highly technical soundness.
2. Consumers enhance their *learning with the usage* of such products.
3. They relatively have *short PLCs*; hence frequent upgradations are obvious.
4. *Such products adjust to changing circumstances* like, a thermostat, which automatically cuts – off the supply after reaching at a particular temperature.



Source: David Skyrme "The Codification of Knowledge into products and Services"

According to Skyrme (1999), knowledge is packaged and commercialized in many ways, involving some form of codification from tacit knowledge to knowledge in more explicit forms, such as, documents databases and computer software. Uncodified knowledge is a set of ideas, which is gradually shaped through dialogue and expression into something more tangible, such as a process description or a product design that finally emerges as products for sale. This is generally referred to as a practice of converting tacit knowledge into explicit (Nonaka and Takeuchi, 1995). *This marks the packing of knowledge for developing more sophisticated goods.*

Mediator Vs. Knowledge Manager

The mediator as defined by Dervisoglu and Berber (2001) reflects the qualities and characteristics of the 'Managers' who bears the managerial capabilities and yet not conferred with the status of '*Manager*'. According to the *Deputy Minister Human Resources Management Advisory Committee (DMHRMAC 2005), Canada, "a manager is an employee who forms part of a management team and is accountable for exercising delegated authority over human and financial resources to accomplish the objectives of the organization…"*

Clearly, a manager leads a team of members by exercising control, delegates them responsibilities and a level of power control and is accountable for individual's or team's actions and results. Going by this definition would mean that both – manager and mediator - are same. Hence, it is worth to identify them as interchangeably. However, Dervisoglu and Berber (2001), differentiates between the duo - *"The mediator is not exactly a manager…"*

In common parlance a manager is one who manages a given task with a firm's given resources under a given environment or with respect to some timeframe. A mediator actually does the same; he manages the knowledge flow by creating user specific knowledge by sharing tacit knowledge (Nonaka and Takeuchi, 1995) converting tacit knowledge to explicit (Bukowitz and Williams, 1999), establishing the knowledge and finally diffusion of new knowledge (Wikstrom and Norman, 1994). But, roles of a manager are more diversified and his actions already cover the functions of those of a mediator, and hence, he is above to the mediator as he facilitates not just the right knowledge, but also, a control system to keep process under check.

Hence, this *mediator* should strategically be referred to as '*knowledge manager*' of the '*knowledge economy*' who directs the flow of knowledge within a firm say, for product development process. This is because, mediator is only an exchanger i.e. one who facilitates information, but the knowledge manager is the one who actually manages it through directing knowledge at right people, with a right method and with an acumen to lead to new technological directions for devising methods of control. The Knowledge Manager as the role enlarges, not only integrate processes from different streams but also establish practices. And of course, is above the scope of what a mediator do. Hence, *a manager could be a 'mediator' but a mediator is not essentially a 'manager'.*

Further, it has been said (Dervisoglu and Berger, 2001) that mediator leads a '*zero-hierarchy team*'. That means none of the authority flows downwards in the stream but actually vertically. But this can not also be true. The fact is the manager leads a team of people who are down - in - line to him so that he could delegate tasks to particular team members working on a problem-solving activity on new product development (Thomke and Fujimoto, 2000). A team without a hierarchy level can not be led.

According to Skyrme (1999) an organization has members and structures that adapt to changing circumstances. Usually, it is a hierarchy of levels within the function and departments. A manager leads such a department or function. Hence, the existence of hierarchy becomes important here. Similarly, a mediator recognises the functions of a manager by managing team with people from different profile and background which demand problem solving through co-operation and co-existence. In fact innovation by very its own nature is dependent on mutual understanding between the team members.

This *sense of belongingness* is incorporated by the *knowledge manager*. And that's too only when he has the authority to direct the people. By being just one team member with no higher authority a mediator or manager can't lead a team. Team leading by very its own nature requires leader's decisive significance in formulating new values. (Schultz, 1995)

The organization's proactive stance towards participation in product development, and risk-taking, will have an impact on product acceptability and market shares. A resemblance between corporate vision, culture and structure is imperative which, if missing can result in undefined responsibility-authority relationships, incompatible organizational system and inappropriate goal setting offsetting future prospects, across the organization. To reiterate, it is important to ensure a match between the culture and the structure for an 'environment system'. Hence, it is clear that a *mediator is always above the members of the team down-in-the line*.

Methodology

Research Objective

To analyse and develop a contemporary illustration of knowledge manager's role in knowledge product development, with special reference to OEMs in Indian Automotive Industry, and particularly, SMEs manufacturing spare parts and end-components. The research approach is *inductive* in nature. The inductive approach can be described as research approach involving the development of a theory as a result of the observation of the practical data (Saunders et al, 2003). Out of the 32 SMEs interviewed personally, 28 responded with detailed and required information for this study.

Rationale of Industry Selection

India's initiative in economic liberalization and globalization is quite apparent in the automobile sector. Automotive industry contributes nearly 5% to the GDP. Reforms and the foray of international firms have intensified competition and the tremendous inflows of automobiles have turned the *seller's market into buyer's market* in the Indian automotive sector. The production is estimated to be 6,155,688 in figures and *16 per cent* growth in 2004-05 as based on the previous year's growth of 15.1 per cent. This concludes that the diversity is high and penetration is fast, and hence, innovations are rapid and significant with the ongoing trend.

Data Collection

The data for conducting the research questions was gathered by means of personal interviewing, also, wherever, required research has been conducted by telephonic interview and through electronic mails either for follow up or to fill missing information gaps. Secondary data, was, obtained from *report on Automobile Industry, (2005) on Indiainfoline.com* and, *Society of Indian Automobile Manufacturers,* (2005) and the respective official websites of the firms. Also, the journals, research articles, white papers, books and websites for gathering information on Knowledge Management and *Knowledge Product Development* were observed.

Selection Criteria

The industry selection was based according to the product-market conditions in automobile industry. The criterion for selection of small-medium enterprises (SMEs), for the purpose of research, was taken on the basis of '*net profitability*' as evident from their respective '*turnover*' for the previous year. And hence, these organisations were selected for the study.

Findings

In *Figure 1*, while numerics 1, 2….6 are the steps for the process of knowledge management (*Basic Knowledge Management System*) in the knowledge product development, the alphabets A,B,C and D represents the tasks of knowledge manager (*like assessing technical capability of team and the organisation*) for the purpose of study.

Knowledge Management improves performance as it affects '*what is done*', '*how it is done*', *and* '*how well it is done*'. In other words, Knowledge Management is recognized as a potent tool for improving the performance of business processes. And, the knowledge manager performs invariably stringent and distinct roles depending upon the complexity of innovation and the level of depth required.

Figure 2 represents a three-component model, where the alphabets; *A, B, C….F* represents the roles of the knowledge manager, the numerics; 1, 2, 3….5 illustrates the process of new knowledge product development and finally, the numbers; *i, ii, iii …..x* denotes the basic knowledge management structure for *New Product Development*. The prescribed model integrates '*Basic Knowledge Management System*',

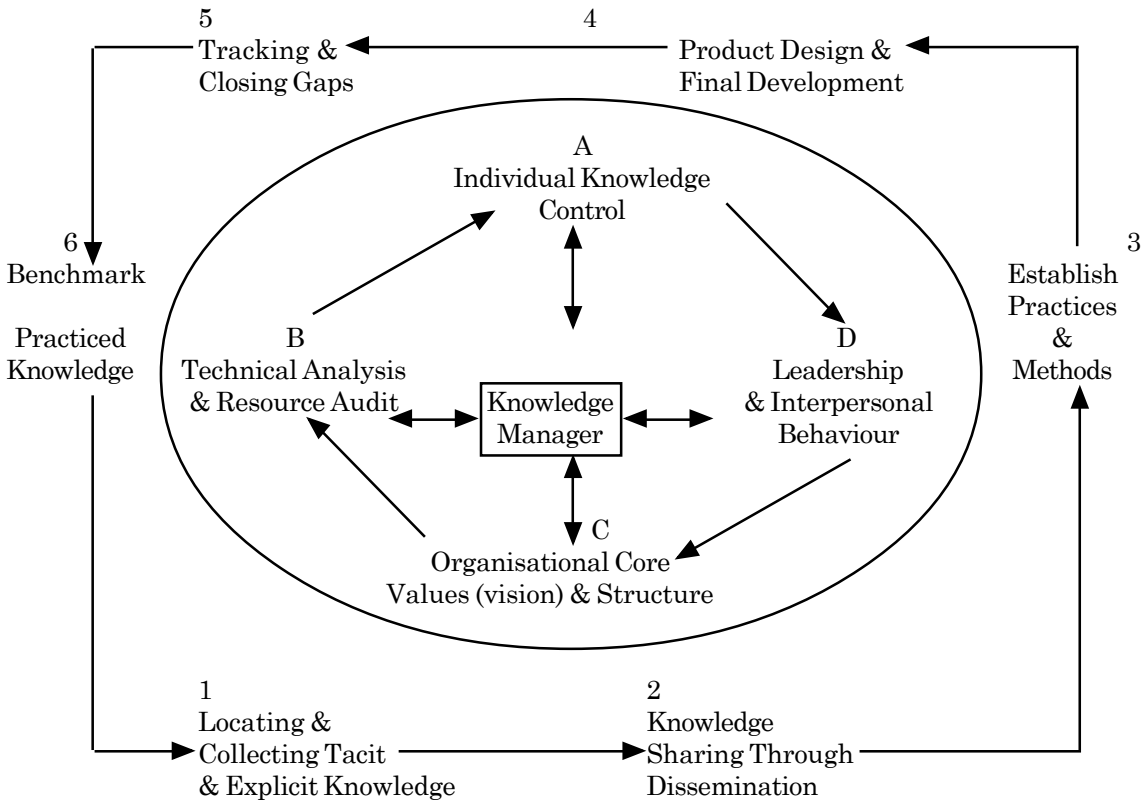


Fig. 1. Illustration for representation of Basic Roles of Knowledge Managers in Product Development

'*Roles of Knowledge Manager*' and '*Product Development Process*' for the understanding of functions performed by the knowledge managers within the *Indian automotive industry*, particularly SMEs manufacturing end components (*brakes and suspension, automotive lights and leaf springs*) and spares (*coils, thermostats*) with special reference to product development.

This model representation is based on the variables that has been rated by the *IT Officer / Product Manager / Executive(s)* of selected SMEs, at middle management level, and are mainly responsible for managing and controlling IT and/ or Product based operations, within their respective organisations. All these organisations studied are into automobile spare parts manufacturing in Delhi and National Capital Region (NCR). This has allowed us to be informed on important considerations and the weightage or preference the persons contacted gave variables mentioned in model, as crucial for strategic product development.

The '*customer needs*' (both explicit and latent), which provides input for identifying the scope for new product development due to any one of the cause - either product saturation or recession in the market, or sometimes both, is the focal point to start *new product development* (NPD). The explicit customer participation throws light on '*points of dissatisfaction*' and further, on the area of improvements for the products. However, the firms, also on their own are engaged in several practices of producing '*state of the art*' products out of their '*innovative box*'. This process of '*creativity and innovation*', on which the firms spend huge resources, is also the major impetus for growth in the market place, and attempts increased industry competitiveness. The factor - creativity and innovation - becomes the strategic advantage for firms by providing them with '*first mover advantage*' in the given market.

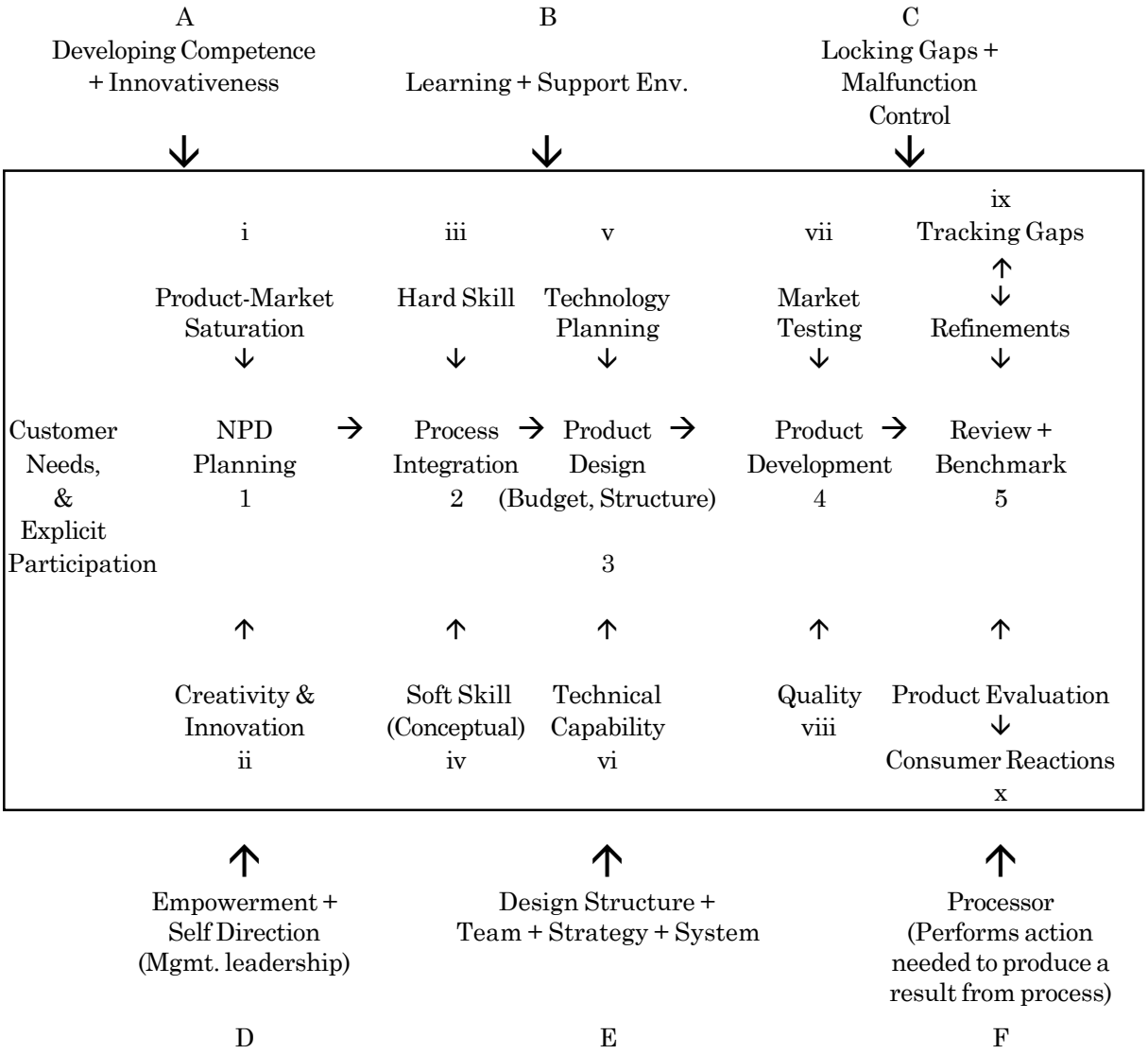


Fig. 2: The 3-component representation for Knowledge Manager Roles, Knowledge Management, and Product Development Process in Indian Automotive SMEs

After, the views have been recorded from the participants – both – customers and R&D centre, the process of '*new product development*' starts officially. The weightage given to the both the aspects vary invariably from firm to firm with high or low degree of importance, depending *upon need, time and strategic requirements*. However, no organization can develop products without getting into the customer's shoes, especially, for identifying the latent needs of target customers. This marks the process of product development and a knowledge management system network for finding appropriate source to value addition, which can be incorporated as required; in a sense to enhance overall product utility.

Here, '*developing competency*' (both individual and team competencies) is the key to '*innovativeness*' or what has been called previously as '*value addition*'. This knowledge manager takes care of, by making, '*implicit look explicit*'. In fact, the role of knowledge manager is critical in provoking associates, to act in accordance with the streaming requirements arising from time to time in the product development process.

On the other hand, delegating responsibility-authority relations and providing directions to development phases, coherently, is a prime task for knowledge manager to lead groups. Self motivated and self driven managers have the capability to lead timely, keeping the strategic vision of the firm at top. Without this, no manager can lead teams or control functions.

Once the process of development starts, the next in line is integrating the process, which could be done by assigning hard skill jobs (physical labour based like installations and commissioning) and soft skills (purely conceptual in nature like designing and crafting strategy or operation), but only after having evaluated *what functions are most crucial to product development and who is requiring what to carry out what part of operation.*

To integrate the *knowledge management* process for product development, the knowledge manager strives to create *congenial and learning environment* as a support system. This support system is a back-up for augmenting the team work, so if, at any stage some support with respect to a problem or need arises; the knowledge manager keeps previously arranged provisions to offset trouble. This support system leverages much needed 'environment' required for smooth transactions of work among the teams, within the teams and within the organization.

The product design is the next function of the '*product development process*' like formulating structural (viz. functional unit structure and team structure) and budgetary equations (investment decisions). Here, identifying the right technology for right designs and choosing out the best technical capabilities available and possibly, what could be managed with the available resources, is the criteria for an effective product planning and design. The blueprint provides a direction to chalk out further course of action. If approved, the product is ready to penetrate the markets faster. '*technical capability*' requires a firm to audit its resources for – *what is available and matching the gaps between availability and non-availability (of resources)*? It is more of a resource planning for finding out – *Are we capable enough to undertake such an activity / function or should be devise some other route to product development*?

The knowledge manager, in order to provide a base, to the blueprint formation for product design and to final development at some later time, invent suitable system by outlining the team structure and strategies (and very often, policies) for action. The structural system can further be divided into '*functional*' and '*behavioural*' based skill-set to design the product. Functional structure tells knowledge manager about which activity is being done by whom, individually or collectively, with what level of diligence and when is expected to be finished at a certain but tentative time period. While the behavioural structure guides the behaviours of the individuals (*say, emotional standability, work pressure handling and working with large teams and learning curves*). The knowledge manager tends to balance both the strategic factors for augmenting the development process further.

The process is broken down into parts and on completion is accumulated to form one entire process. (*A function can have any number of processes depending upon the nature of product innovation*) The knowledge manager contributes to the effective product designs after matching the technology planning with the technical capability of the firm.

Market testing is yet another important aspect of the product development process which bears upon the final placement of the product. An early distant warning or an idea, about product failure would help in integrating the system as per to the requirements and shall also act as a '*feedback*' source for the firm for necessary adjustments and malfunction controls. The task of knowledge manager is to lock the gaps formed with respect to the '*technicality*' and '*time*' expected for the completion of the function or the process, as compared with the real time taken for the same process to execute. A delay in product time management could cause variations in terms of revenue for the firm and obsoletion of the technology

on which already a large amount of resources has been allocated, and hence, losing out on market shares and tremendous stock overflows. The knowledge manager makes things happen on time ensuring right quality levels (*viz. ISOs and, six sigma belts, TQM*). He embarks the improvements to be made in the process and the product for quality, checks system for further refinements in both the product as well as in the process.

The final stage is characterized by the product-under-process (inbound logistics) to product-in-market (outbound), (Porter, 1980) and after, all the necessary feedback has gathered in market testing with reference to the product malfunctions or severe defects. Besides this, knowledge manager keeps the team engaged in identifying flaws in the product overtime and if any is found, the correction mechanism is undertaken. After the entire product refinements are done and product with acceptable quality is approved, the product evaluation is done timely, as based on the consumer reactions. For this task, the knowledge manager assumes strategic significance; he acts as a '*processor*' who performs action needed to produce a result from process.

The results based on two fold process, one, '*consumer reactions*' and the other is, '*internal identification of flaws*' in the process or updation of product features for enhanced utility in some future time. This marks the benchmarking of practices for final production and as a result, the uninterrupted production mechanism and speedy deliveries in the market place.

The overall process of product development in automobile industry represents a benchmarked system from idea percolating (*competency development*) to devising a *knowledge based network to support the ideas and encourage further innovativeness* for regular NPD.

As said earlier, one of the strategic functions of knowledge management is to infuse '*innovation*' among processes of product development. As it stands for competitive advantage (Porter, 1980) but not solely a tool for deriving an edge in present day business system over competitors or for running businesses. It is highly an intellectual activity and the crux of the matter is that, inventing '*things*' require efforts and initiatives to be channelised in a proper direction to sail oneself to success. This study does not reveal much on the characteristics of innovation and its importance, and neither it's the purpose of this paper, rather, it is confined to the roles of knowledge manager in a structured knowledge management system, as established for SMEs in automobile component manufacturing.

The 'knowledge manager' as researched herein, generates and integrates knowledge in such a way that it creates a competitive advantage for a firm, which reaps up quick benefits and sometimes long term benefits, depending upon the complexity of innovation, out of their ability to innovate.

Conclusion

The knowledge manager of Indian automotive industry, is no doubt, is the major source of innovation in the process of knowledge product development, whose task is to match the internal capabilities with those of strategic resources available to the firm, and most prominently, managing the available intellectual human capital in a way that every individual contributes skillfully to manage high-growth levels. This knowledge manager is above to a mediator; he forms, leads and controls groups; holds good working technical understanding; he is motivated internally with matured behaviour, contributes to knowledge processing and sharing in departments; works in team hierarchy (rather than a zero-hierarchy team) and exercise control to enhance productivity and required quality, by formulating and establishing best practices within the firm, and further, he creates a pro-active stance for the firm in the given industry.

Below is the representation which is not a benchmark to distinguish between a Manager and Knowledge Manager. Also, it does not intend to highlight difference between the two but to give a simple view for clarity in understanding of roles of Knowledge Manager in general.

Manager	**Knowledge Manager**
What is available?	*What is to be made available, strategically?*
What is value?	*Where is the value?*
How can I use it?	*How should I use it / how it could be used?*
Want results	*Produce results*
Produces a product	*A knowledge product rather*
Follow basic consumption practice	*Learned Disposition and benchmarks theory*
Wait for product- market saturation	*Regular NPD*
Undertakes Competitive analysis	*Do Competitive Intelligence*

As based on the interaction with the executives in various automobile SMEs, and information retrieved on characteristics of Knowledge Manager.

References

Centre For Monitoring Indian Economy, Data, 2003-04, CMIE, Mumbai.

Davenport, Thomas, H. and Laurece Prusak (1998), "*Working Knowledge: How Organization Manage What They Know*", *Harvard Business School Press,* Boston, p.5.

Dervisoglu, Gokce and Aykut, Berber (2001), "Knowledge Flow during the Product Development Process and Role of the Mediator: A Model Presentation".

DMHRC (2005), Definition of a Manager by DMHRMAC, Canada as available at http://www.hrma-agrh.gc.ca/leadership/mp-ps/documents/final_report/revised_definition_e.asp.

Iansiti, Marco (1995), "Technology Integration: Managing Technological Evolution in a Complex Environment", Research Policy, Vol. 24, pp.521-542.

Kotler, Philip (1997), "*Marketing Management – Analysis, Planning, Implementation and Control*", 9th Edition, Prentice-Hall Publication, pp.309-311.

Knowledge Based Products (2005) as available on http://www.smartecon.com/products/sample/ie039.html.

McDonough, Edward III and Barczak, Gloria (1992), "The Effects of Cognitive Problem-Solving Orientation and Technological Familiarity on Faster New Product Development", *Journal of Product Innovation Management*, Vol. 9, pp.44-52.

Nightingale, Paul (2000), "The Product-Process-Organisation Relationship in Complex Development Projects", Research Policy, Vol. 29, pp.913-930.

Nonaka, Ikujiro and Takeuchi, Hirotaka (1995), "*The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation*", Oxford University Press, New York.

Porter, Michael E. (1980), "Competitive Strategy - Techniques for Analyzing Industries and Competitors", First Free Press, 2004, pp.49-59.

Report on Automobile Industry (2005) as available on http://www.indiainfoline.com

Saunders, Mark NK, Lewis, Philip and Thornhill, Adrian (2003), "Research Methods for Business Students", Third Edition, Pearson Education Limited.

Schultz, Majken (1995), "On Studying Organizational Cultures", de Gruyter, Berlin - New York.

SIAM (2005), Sectoral Report, Society of Indian Automobile Manufacturers, www.indiainfoline.com

Skyrme, David (1999), "Knowledge Commerce: Succeeding in a Global Knowledge Marketplace", Knowledge Economy Conference Beijing, 1-3 Nov.

Society of Indian Automobile Manufacturers (2005) http://www.siamindia.com/

Thomke, Stefan and Takahiro Fujimoto (2000), "The Effect of 'Front-Loading' Problem-Solving on Product Development

Performance", *Journal of Product Innovation Management*, Vol. 17, pp.128-142.

Verganti, Roberto (1997), "Leveraging on Systemic Learning to Manage the Early Phases of Product Innovation Projects", R&D Management, Vol. 27, No. 4, pp.377-392.

Wikstrom, S., and Norman, R., (1994), "Knowledge and Value: A New Perspective on Corporate Transformation", Routledge Press, London.

Bukowitz, Wendi R. and Williams, Ruth L. (1999), "The Knowledge Management Field Book", Pearson Education Limited, London, p.2.

Zack, H. Micheal (1999) "Developing a Knowledge Strategy", *California Management Review*, Vol. 41, No. 3, Spring, pp.125-145.