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DEVELOPMENT OF A MODEL FOR FOSTERING INNOVATION CULTURE IN SMALL SCALE AUTOPARTS MANUFACTURING INDUSTRY OF PUNJAB.

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ABSTRACT

This paper presents an approach designed to be used to develop a model for fostering innovation culture in small scale autoparts industry of Punjab. The approach entails conducting the study in a phased manner. Five phases of the study include; defining innovation culture; evaluation of innovation culture in small scale auto parts manufacturing industry of Punjab; assessing the role and contribution of various agencies like R&D organizations, government organizations etc; bench marking with the best in class in India and in other countries and evolution of a model by synthesizing the findings of the earlier four phases and by incorporating expert opinion. The tools and techniques to be employed for evolving the model include questionnaire survey, statistical analysis, SAP, LAP analysis, benchmarking and qualitative modeling using FST and AHP for incorporation of expert opinion.

Keywords: Innovation, Creativity, Organization Culture, Organization Structure, National Innovation System.

Innovation has been the major strategic tool used by global organizations for dominating the markets. Innovation as a process, which was earlier visible only in the big organizations serving high end markets, has now become a basic necessity in every organization and in all parts of their value chain. In the 21st century, it's the very nature of innovation that has changed; it's happening faster, it's more open and collaborative, and outdated concepts around tightly controlled intellectual property are giving way to a more enlightened emphasis on sharing intellectual capital. In a number of countries, today innovation has become one of the key factors propelling economic growth and enhancing social benefits. Innovation needs to be built into the culture of an organization to enable it gain sustainability by involving and inspiring every process associated with the organization.

Globalization has made it necessary to project innovative capabilities of nations, regions, industries and firms. Innovation has become a major tool in the race to create jobs and increase

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incomes. Innovation should not be accidental. Many companies do it by accident; that is why, they hope some one will come up with an idea for a product or service and then it would capitalize on it. At a time when companies need to generate more ideas than ever before and turn these into viable products and services before competition can catch up, the accidental approach is no longer enough. Business needs a sustainable, repeatable approach to creativity and innovation. For an innovation to be successful, we need to have a system of idea generation, evaluation system to choose better, incubation of innovative idea through interactions and discussion and finally developing prototype of product to have feedback.

The Indian industry over the past 40 years has built a vast range of capabilities but still it is felt that the technology, needs to be updated or to be replaced with a new one for satisfying the present day needs of the competitive world. Liberalization policy of the government and other steps to attract the multinationals also stress on the need to acquire the state-of-the art technologies.

Manufacturing sector in India has been looking up in the past three years and its growth rate has jumped from 8.7% to 11.3%. The Manufacturing sector is backed up by a strong ancillary SSI units which is quite large in number and is widely spread in the shape of clusters across the country. In India the small scale industry assumes special significance because of its higher employment potential. India is also fast emerging as a global outsourcing hub in the automotive manufacturing sector. In order to increase and sustain a reasonable market share in the world and to progress further; manufacturing sector will be required to gear-up for enhancing their competitiveness. The manufacturing competitiveness can only come through a consistent and systematic technological development environment of the country. A sound technological development system definitely requires effective innovation system in place at the national level. The manufacturing sector requires to shift its strategy from 'Labour Arbitrage' to 'Innovation' to sustain its competitiveness in the global market. For making successful innovation process to happen; the country requires to adopt a systematic approach to have an effective system of innovation at the national level. The approach used should be flexible and should take into account the prevailing factors and forces in a region. In this paper the usefulness of an approach based on Flexible Systems Methodology is highlighted.

The three basic components that define the dynamic interplay of reality in Flexible systems Management paradigm are situation, actor and process. They interact flexibly on multiple planes in the ambiguous reality and ultimately melt together into one at the enlightened stage. The boundaries between the basic three components are fuzzy. The actor forms a part of the situation as well as the process. Thus, it is difficult to say where situation is ending and where process is beginning. The three are parts of an inseparable whole. The philosophy of integration of quantitative and qualitative tools is emerging very rapidly to cater to the diverse requirements of the decision making and managerial process. Deriving inspirations from the development of the system methodology in terms of scheme as of system techniques and the wide applicability of integrated systems in computer based management; the philosophy of integration techniques is generalized over the whole spectrum of system techniques. It is presented in the form of an evolving methodology, which can take care of the varied requirements of problem situations in a flexible manner. Flexible system methodology bridges the gap between hard system based techniques and soft system based techniques.

Punjab is a State located in northern part of the country and is popularly known as Manchester of India due to the presence of very dynamic and vibrant small scale industrial sector. The auto parts manufacturing is one of the major small scale industry of Punjab. There are about 880 units in Ludhiana, 450 units in Jalandhar and 170 units in Phagwara districts of

Development of a Model for Fostering Innovation Culture in Small Scale Autoparts Manufacturing Industry of Punjab.

the Punjab State, which are directly / indirectly engaged in the manufacturing of auto parts. Ludhiana district in the State of Punjab is one of the important auto parts cluster identified by the Govt. of India. With this background a research work is being taken up and will involve five phases: defining innovation culture, evaluation of innovation culture, assessing the role and contribution of various agencies, benchmarking and evolving a model for fostering innovation culture. These phases are briefly explained below.

Defining Innovation Culture

Innovation is about an organized search for changes and monitoring resources for innovative opportunity both within and outside the enterprise. The ultimate objective of innovation is not to establish technological superiority but to maximize the returns on constrained resources by improving products and processes and creating a market for it. Innovation is the key to any organization's sustainability in this competitive business environment, where continuous metamorphosis of strategies, designs, products and deliveries are essential. Innovation or innovative thinking is probably the most influential factor that helps in ensuring the organization's future.

The process of Innovation has been around us for a long time. In fact it's a part of the evolution process itself. In some ways, at the dawn of the human civilization the ability to create and control fire was a massive innovation, which transformed human beings to social creatures. This probably happened, as most innovations do, because one individual chooses to look at a problem differently than everyone else.

Innovation is fundamentally a learning process. Such learning, by "doing", by "using", by observing from, and sharing with others, depends upon the accumulation and development of relevant knowledge of a very wide variety. According to Porter (1998), clusters are geographic concentrations of interconnected companies or institutions in a particular field. Industrial clusters or districts existing within the region could provide important inputs as sources of innovative ideas as well as of technical information and skilled manpower. Linkages or networks with elements of such clusters could eventually prove crucial in the success of innovations.

The relationship between innovation and the evolution of industries is at the core of the work of Schumpeter (1939) and is one of the major Schumpeterian legacies. It is a central theme in the Schumpeterian approach to economic dynamics, as well in evolutionary and neoclassical theories. For him, innovation was very closely linked to the emergence, growth and decline of industries. Standard economic analysts claim that demand provides incentives to innovation during industry evolution. The size, growth, structure and composition of demand, differentiation and market segmentation affect innovation in various ways in different stages of the evolution of an industry.

Organization culture appears to have an influence on the degree to which creativity and innovation are stimulated in an organization. There are three known characteristics, which support creativity and innovation within firms. Creativity in an organization comes from creative behavior, which is a composite of individual characteristics, internal characteristics and external characteristics.

Under the individual characteristics, the following five elements have been identified:

- i. Risk taking (Fadzean, 1998)
- ii. Effective leadership (Cook, 1998), (Ahmed, 1998)
- iii. Motivation to the staff (Barron et. al., 1991)

- iv. Time for innovation (Anderson et al., 1992), (Ambile 1998)
- v. Processing of ideas (Ambile et. al., 1996).

Under internal characteristics, the following 11 elements have been identified:

- i. Supportive structure (Brand, 1998)
- ii. Project resources (Ambile et. al., 1996)
- iii. Selection process (Fadzean, 1998)
- iv. Reward strategy (Martin et. al., 2003), (K. Ahmed, 1998)
- v. Employee empowerment (Martin et. al., 2003)
- vi. Well defined goals (Martin et. al., 2003), (Ahmed, 1998)
- vii. Workplace design and tolerance for mistakes (Anderson et.al., 1992), (Ahmed, 1998).
- viii. Training programs (Fadzean, 1998)
- ix. Communication (Martin et. al., 2003)
- x. Team building (Taylor, 1995)
- xi. Problem solving approaches (Martins, 1996), (Taylor, 1995)

Similarly under the external characteristics, the following four elements have been identified:

- i. The government policy and regulatory mechanism.
- ii. R&D and support institutional frame work.
- iii. Skill up-gradation training and educational infrastructure.
- iv. National innovation system.

A detailed review of literature shall be carried out and after learning from literature some of the identified elements of innovation culture can be categorized under individual, internal and external characteristics. Under the category of individual characteristics we have the element such as leadership, risk taking, time for innovation, generation of ideas and motivation. The internal characteristic category includes the elements such as Organization Structure, Resources, Objectives, Goals, Quality of work place, Work Culture, Reward Policy, Recruitment and Promotion Policies, Motivation Schemes. HRD initiative, Communication, Team work, Problem solving, Overlooking mistakes. Similarly, the external factors have elements as Industrial Policy, R&D Institutions, Incentives for R&D, Awards for innovation, Skill up-gradation training, Entrepreneur Development Programmes

Evaluation of Innovation Culture

Indian Innovation System can be viewed as a system that is presently going through an evolution phase. Indian innovation system is continuously adapting itself to the newer ways of conducting R&D and funding the same. It is keen to adopt select features of innovation systems in other countries to improve its effectiveness. NGOs in tandem with government are turning enthusiastic to trigger an innovation movement in the country covering more sectors and all segments of industrial sectors such as large, medium, small and tiny units so as to enhance the share of innovative products in country's production and exports and thereby help the country to attain a competitive world ranking. India has a huge pool of educated and skilled young manpower which is quite adequate for becoming a technology enabled country. Earlier a sectoral system of innovation and production has been successfully tried in the country which was adopted by

Development of a Model for Fostering Innovation Culture in Small Scale Autoparts Manufacturing Industry of Punjab.

CSIR (Council for Scientific and Industrial Research), ISRO (Indian Space and Research Organization) and CSIO (Central Scientific Instruments Organization) in the area of Scientific Instruments. The government of India has taken an initiative to promote innovation by following a cluster development approach for enhancing productivity, competitiveness as well as capacity building of the small scale industry.

There are certain dedicated institutes for technology development in SSI's. Institute for Auto parts Technology, (IAPT) Ludhiana, (UNIDO Project) is one of the major industry service institute in the state of Punjab for technology development in the area of auto parts manufacturing. Organizations like Small Industries Service Institutes (SISI, Ludhiana), State Directorate of Industries (SDI's), District Industries Centers (DIC's) and other center and state level agencies can play an active role in technology development in SSI's; as individual industries can't spend much on R&D. A vibrant cluster development programme in the automotive sector can cater to common technological / engineering problems and also for applied R&D work required to accelerate innovation process in the sector.

This phase involves the preparation and pre-testing of the questionnaire. In this questionnaire various key elements of the innovation culture would be taken up in the form of questions with multiple choices. In addition to above, qualitative information will be also be sought in the form of suggestions. Questionnaire will be framed on the basis of the elements of innovation culture indicated above in the Phase I of the study.

Survey will be conducted through mail and personal visits. Considering the importance and complex nature of the subject of innovation, it will not be solely left to the respondent to fill up the questionnaire rather more emphasis would be given on personal visits for collection of the data. Suitable statistical tools shall be used to evaluate the collected data for its evaluation.

Assessing the Role and Contribution of Various Agencies

The role of different institutions, some of them national, other sectoral, has been recognized as relevant. The major point here is that innovative activities in industries are shaped by institutions, which include standards, regulations, norms, routines, common habits, established practices, rules, and so on (Edquist, 1997). There is now enormous evidence on the contributions of universities, public research organizations, the military, other public actors and financial organizations (such as venture capital) in the generation and diffusion of technological advance in industries. Their roles, however, have been shown to be quite different in different industries (Levin et al. 1987; Cohen et al. 2002). In a study, Kharbanda (2001), has shown, through a few case studies that how enterprises in India are gearing up to face the challenges of globalization and increased international competition, by facilitating innovations in small-and medium scale enterprises through linkages with R & D institutions.

A complete analysis of the on going programmes for promotion of innovation shall be taken up. The status of national innovation system of the country shall be studied. The role of various NGOs such as CII, SIDBI and UNIDO working in the automotive sector in Punjab shall be studied. Similarly, the contribution and the role of various industrial service institutes and the R&D institutions working in the automotive sector shall also be examined in depth. By using the SAP-LAP techniques, the learning from the experience of above mentioned agencies and groups shall be compiled to comprehend the elements of innovation culture under the category of external characteristics.

Bench Marking

Under this Phase an in depth study of a few successful enterprises working in the autoparts

manufacturing sector in the country is proposed to be taken up for the purpose of benchmarking. Here, the bench marks shall be taken on the lines of the identified elements of innovation culture under the categories of individual, internal and external characteristics. Similarly, detailed study of national innovation systems of various developed and leading developing countries shall also be taken up for the purpose of its comparison with the national innovation system of the country.

Evolving a Model for Fostering Innovation Culture

A model shall be evolved by synthesizing the findings of all the above mentioned four phases of the study and by incorporating expert opinion. The tools and techniques to be implied for evolving the model shall include statistical analysis of the questionnaire survey, SAP, LAP analysis, benchmarking and qualitative modeling using FST and AHP for incorporation of expert opinion.

Conclusions

Due to globalization and liberalization of economy and the consequent unprecedented level of competition, the old practice of depending on borrowed technology or technology acquisition is not expected to make Indian industry competitive. Technology development seems to be the only option available. Technology development, however, is an expensive proposition which can become viable only through innovations at grass root level, consortiums and by redefining the roles of various agencies set up for help to industry. The approach presented in this paper uses Flexible Systems Methodology which endeavors to evolve a process for problem solving in a flexible manner taking into account the factors and forces prevalent in the environmental boundaries. It is expected that the detailed research work carried out using the above approach will help evolve effective strategy for development of innovation culture in industry

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Development of a Model for Fostering Innovation Culture in Small Scale Autoparts Manufacturing Industry of Punjab.

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