

Developing a Relationship Matrix for Organizational Learning and Innovativeness: With A Case Study in a Manufacturing Company

Arash Shahin (Corresponding author)

Department of Management, University of Isfahan

1.242 Saeb Avenue, 81848-13713, Isfahan, Iran

Tel: 98-311-793-2040 E-mail: arashshahin@hotmail.com

Zahra Zeinali

Department of Management, University of Isfahan

18 Syrous Alley, Kashani St., 81838-67731, Isfahan

Tel: 98-311-2361397 E-mail: zeinali_z87@yahoo.com

Abstract

The propose of this paper is to develop a conceptual matrix for the relationship between organizational learning (OL) and innovativeness. A new matrix has been developed to denote the relationship between OL and innovativeness dimensions. A questionnaire has been designed and filled by managers/experts of Ghetehkaran manufacturing company, as a supplier of automobile parts in Iran by which, the importance values of innovativeness dimensions are determined. Results imply that "up to date skill and knowledge" has the most effect on innovativeness. Up to date skills lead to adaptation of products to customer needs and employees have contribution in competition through production of competitive products and services. Up to date skills and knowledge of employees change the entire organization. Also, "Creativity and initiatives" has been addressed as the next important factor affecting innovativeness.

Keywords: Relationship, Matrix, Innovation, Innovativeness, Organizational learning

1. Introduction

Innovation is identified as the main driver for companies to prosper, grow and sustain high profitability (Elmquist et al., 2009). Innovation is the application of ideas, concepts and designs to create wealth and refers to new subjects and ideas. It is "the act of introducing something new". In relation to organizational management, innovation is the process of being creative and implementing new methods to organize or run a company and to create improved results (Ehigie and McAndrew, 2005).

Organizational learning (OL) is an increasingly important area of research that examines how organizations learn and thus increase their competitive advantage, innovativeness, and effectiveness. OL requires tools facilitating knowledge acquisition, information distribution, interpretation and organization (Abel, 2008) and is defined as developing and applying new knowledge that has the potential to change employees' behavior, which in turn will strengthen the organization to achieve improved results, adaptability to change, grow through innovation and create result-oriented employees (Aydin and Ceylan, 2009). According to Sunassee and Haumant (2004), OL deals with way in which individuals in an organization learn, from the approaches that they take, to address a task-related challenge and to increase their understanding of how they should learn (Abel, 2008). An organization learns when its employees are continuously creating, organizing, storing, retrieving, interpreting and applying information. This information becomes knowledge (and hopefully wisdom) about improving the working environment, improving performance, improving business processes, and achieving long-range goals that will make the organization successful. It is clear that when one considers learning and innovativeness in organizations, the working environment is a highly important influencing factor in terms of facilitator or inhibitor of learning and creative behavior on the job (Van der Sluis, 2004).

Innovativeness is implicitly associated with change and as such has always been a challenge for management. Therefore, innovation requires a commitment to continuous learning. Innovativeness is increasingly one of the

key drivers of the long-term success of a firm in today's competitive markets and its reason is that companies are innovative, are able to respond to environmental challenges faster and better than non-innovative companies (Jimenez et al., 2008).

Although most of the available investigations have emphasized on innovation, only a few address the relationship between learning and innovativeness and studies the influence of learning on innovation. It is important to note that while many studies have reported aspects of organizational learning as antecedents of innovativeness, they do not provide enough empirical evidence to the relationship between learning and innovativeness. Thus, the aim of this article is highlighting the impact of organizational learning on different types of innovativeness. For this purpose in the following, innovativeness and its dimensions are demonstrated. Then, OL and its dimensions are addressed. Subsequently, the relationship between OL and innovativeness is discussed and respectively, a conceptual model is proposed. In order to examine the proposed methodology, a case study is also conducted in a manufacturing company and its results are discussed and final conclusions are made.

2. Innovation

Innovation is different from invention and means doing something new, or introducing a product that reduces the market for an existing product (Hyland and Beckett, 2005). Innovating activity is a multi-disciplinary process that requires the involvement of all individual functions in order to deliver products and services to completely satisfy the end customer. Innovation is also considered as those activities which organizations can deliberately control and influence the direction of, plus those which are highly desired and to which organizations can only react on a discontinuous basis. The process of innovating is dynamic and has to be able to cope with organizational changes which could either be evolutionary or revolutionary (Zairi, 1995). If organizations can manage the changes to become innovative, then they will have an environment that fosters innovation (Orange et al., 2007). Innovation is manifested in various types, such as product innovation (a new or significantly enhanced good or service), process innovation (a new or significantly enhanced production process, distribution method or support activity), market innovation, administrative innovation (Zaltman et al., 1984; Utterback, 1994; Cooper, 1998) and also organizational innovation and behavior innovation. Product innovation consists of successful exploitation of new ideas (Alegre et al., 2006). Product innovation deals with the choice of new products and their development (Johne, 1996). Process innovation deals with the number of changes in the processes and pioneer disposition to introduce new process and quick response to the introduction of competitors' new processes (Jimenez et al., 2008). It occurs when a given amount of output (goods, services) can be produced with less input and technological innovation is a part of process innovation (Figure 1). Process innovation is about improving internal capabilities (Johne, 1996). Organizational innovation includes new forms of management like total quality management and administrative innovation, which are parts of organizational innovation. Strategic Innovation is the creation of growth strategies, new product categories, services or business models that change the game and generate significant new value for customers and the corporation. Process innovation, product innovation and strategic innovation form organizational innovation. As it is illustrated in Figure 1, the four types of innovation are interconnected. Administrative innovation is novelty of the management systems (Jimenez et al., 2008). Behavior innovation can be presented at different levels as individuals, teams and management. The behavioral dimension should reflect the "sustained behavioral change" of the organization towards innovations, i.e. behavioral commitment (Avlonitis et al., 1994). Individual innovation can be considered as "a normally distributed underlying personality construct, which may be interpreted as a willingness to change" (Hurt et al., 1977). Team innovation is the team's adaptability to change (Lovelace et al., 2001). It is not simply a sum of innovative individuals, but a synergy based on the group dynamics. Managerial innovation demonstrates management's willingness to change, and commitment to encourage new ways of doing things, as well as the willingness to foster new ideas (Rainey, 1999). Behavioral innovation demonstrated through individuals, teams and management enables the formation of an innovative culture, the overall internal receptivity to new ideas and innovation. Behavioral innovation is a fundamental factor that underlines innovative outcomes. Innovative culture serves as a catalyst of innovations, while its lack acts as blocker of innovations (Wang and Ahmed, 2004).

2.1 Dimensions of innovativeness

Innovativeness dimensions cover several aspects of innovation and affect organizational performance. One of the dimensions is 'innovating leadership', which is a very satisfactory dimension and shows a strong commitment to innovation (Humphreys et al., 2005). It provides strategic advantage since innovation has become a key element in strategic planning at the organization with greater emphasis placed on new technology, products and processes. The development of the process of innovation is viewed as a means of enhancing strategic advantage

through a strong external focus, effective team working and visioning (McAdam and McClelland, 2002). Literature review shows that prudent radicalism results in a good balance in the management decision-making process. The ability to identify the need and direction for change, coupled with an open-minded approach to adopting new ideas and effective change management are realized as important results. Strong commitment to team working is also another important factor in innovativeness. In order to take benefit from the full competencies portfolio, innovation must travel through the whole organization, affecting every discipline, process and level and an organization should have the ability to identify and provide the necessary competencies needed to develop innovation capabilities. These include financial resources, time, facilities, technology skills, energy and support, consistent with a broad approach to innovation development (Tidd et al., 2001). Capable implementation, the effective use of innovation initiatives and project management are key components of this element. For selective empowerment, the company should use job appraisals, information bulletins and informal discussions to communicate and involve employees within the innovation process. High enrolment, commitment to the company, valued contributions and an absence of a blame culture are addressed in the literature as the main characteristics needed to achieve high enrolment in the process of innovation. Considering the time and resources the company should invest in training and development, continuous learning is viewed as another important dimension. It is important to note that “continuous learning” may require enabling learning, competency development, training in team-working and problem-solving, knowledge management, exploratory dialogue and experimental initiatives. The perception among employees that they are given the resources and recognition of their efforts are encouraged, reflecting the organization’s efforts at involving all employees in innovation implementation. High performing is another dimension, which denotes the commitment and effort of the company in new product and process development. If a company invests heavily in new products and processes, new factory and equipment and improved process technology, then this investment demonstrates its commitment to overcoming transitional problems in innovation implementation. The management team should invest considerable time and searching for new and novel approaches to work and management thinking. This includes benchmarking and developing the organization-university partnerships. Sound decision making is a dimension that reflects the consistency and quality of the management decision-making process in the company and investment in management information systems and use of innovation measures as key elements, indicating the time and effort the management team has invested in such a system. According to Humphreys et al. (2005), sustained senior management commitment facilitates the process of innovation implementation. The above introduced dimensions are illustrated in Figure 2. Andrews and Smith (1996) consider appropriateness as the extent to which a new product is viewed as useful or beneficial to some consumers, as an important feature of product innovativeness. From the customers’ perspective, characteristics such as innovation attributes, adoption risks, and levels of change in established behavioral patterns are regarded as forms of product newness. From the firm’s perspective, environmental familiarity and project-firm fit, and technological and marketing aspects are viewed as dimensions of product innovativeness. Thus, product innovativeness can be regarded as a salient dimension. Market innovativeness is highly connected to product innovativeness, and often studied as product-market innovativeness (Miller, 1995). At a broader level, market innovativeness refers to innovation related to market research, advertising and promotion, as well as identification of new market opportunities and entry into new markets (Ali et al., 1995). For measuring organizational innovativeness, the above aspects are inter-linked and together depict an organization’s overall innovativeness (Wang and Ahmed, 2004). 29 items on these aspects are addressed in Appendix 1.

3. Organizational learning (OL)

Organizational Learning (OL) refers to the process of developing new knowledge and insights derived from the common experiences of people within the organization and has the potential to influence behaviors and improve a firm’s capabilities. This process includes the acquisition of information and existing knowledge from both the internal and external environment of the organization, its distribution within the company, its interpretation and storing for future use in organizational memory (Jimenez et al., 2008). Many authors state individual learning as the foundation to organizational learning. Group or team levels creates the next level of organizational learning (Hoang et al., 2006). Unless teams can learn, the organization cannot learn. In the next level, it is the organization as an entity that could learn. Huber (1991) describes the OL process, which includes: knowledge acquisition, information distribution, information interpretation, and memorizing. Slater and Narver (1995) argued three stage process of OL as information acquisition, information dissemination, and shared interpretation. Gomez et al. (2005) proposed five factors as managerial commitment, systems perspectives, openness and experimentation, knowledge transfer and integration as the basic elements needed for an organization to learn.

3.1 Dimensions of OL

According to Zdzunczyk and Blenkinsopp (2007), the key dimensions which influence organizational learning include 40 items, ten items per dimension, with equal weights assumed for each dimension. The four dimensions are classified into strategy, structure, support mechanisms, and behavior. Strategic orientation defines the context for organizational learning and sets the direction for the search of new knowledge and opportunities. A strategy that is supportive of learning will be market and customer oriented and places an emphasis on quality and service rather than efficiency and productivity. In this way, organizational members are motivated to seek information from the outside (from customers, suppliers and competitors) to inform their innovativeness, and will be encouraged to experiment and take risks. A flat, decentralized, flexible structure is generally considered to support creative action and innovativeness. A flat structure facilitates decision making both by granting more autonomy to all members of the organization and by making access to superior and easier job rotation schemes, while networking opportunities are conducive to knowledge sharing and integration. This covers all support mechanisms a company can utilize to operate in a well-coordinated, effective way. It includes procedures and policies, technology, training schemes and other resources. Employee evaluation procedures based on appreciation for creativity, initiative and innovation coupled with intrinsic rewards such as increased autonomy or opportunities for personal growth are powerful instruments in the promotion of a learning culture. A culture supporting higher-level learning would be rooted in the values of creativity, innovation, expertise, self-development, knowledge sharing, mutual trust and appreciation of diversity.

Dobni (2008) also addressed several dimensions of OL including:

1. Involvement of everyone in organization in learning (training).
2. Relation of training to supporting strategic initiatives as opposed to being general in nature.
3. Direction of training towards helping deliver customer value.
4. An expectation to develop new skills, capabilities and knowledge that is directed toward supporting innovation in the organization.
5. Knowing training/learning required to engage in supporting innovation.
6. Encouraging continued organizational learning and time/opportunity to improve skills and capabilities.
7. Mentorship and post-training support.
8. Act of the management team as coaches and facilitators in support of training.
9. Possessing of appropriate leadership qualities to support innovation by managers.
10. Empowerment of people to apply what they learn.

Continuing the discussion, Appendix 2 presents 40 dimensions of OL. However, in this paper, 32 dimensions of OL are considered for investigation of their impact on innovativeness. The dimensions are selected from the above addressed literature.

4. OL and innovation

Innovation involves the transformation and exploitation of existing knowledge. It requires employees to share information and knowledge. As Nonaka (1994) suggests, innovation occurs when employees share their knowledge within the organization and when this shared knowledge generates new and common insights, in a process of divergence and convergence and new key capabilities enhance innovation in the firm. In conclusion, organizational learning results in development, acquisition, transformation and exploitation of new knowledge, which in turn foster organizational innovation (Jimenez et al., 2008). It is clear that firms need continuous learning for innovation. Regarding the characteristics of a working area that stimulates learning of employees and enforces the innovativeness of the organization, several parameters can be taken into account. The climate for learning and innovation of the department, business unit or organization are important (Van der Sluis, 2004) as well as several factors of organizational learning influencing the organization's ability to stimulate innovation (Martins and Terblanche, 2003). More specifically, in the working environment, managerial support for learning and innovation is also potentially influential (Williams, 2001).

5. New methodology

As addressed and emphasized earlier, OL seems as an effective factor for continuous improvement and innovation. However, in order to present a matrix of the relationship between OL and innovativeness, the reviewed literature is considered and respectively, 32 and 49 items are selected as OL dimensions and dimensions of innovativeness. In fact, the 40 dimensions of OL presented in Appendix 2 are reduced by the

authors to 32 dimensions, since some of the items were found similar and therefore their combinations seem reasonable. On the other hand, the 49 dimensions of innovativeness included in the questionnaire (Appendix 3) are developed based on a mix of the dimensions addressed in Appendix 1 and the literature review. House of Quality (HoQ) is used to develop the proposed matrix in which, the relationship between each OL dimension and innovativeness dimension is determined (Figure 3). As it is highlighted, the importance ratings of innovativeness dimensions which must be gathered by questionnaire is considered in the matrix, which is then multiplied by the values of the interrelationship matrix of HoQ and finally, the sum of the multiplied values are calculated, which in turn helps to highlight the priorities of OL dimensions. It is important to note that each dimension of innovativeness is a subdivision of a major category. Figure 4 addresses the relationship between each of the subdivided innovativeness dimensions and their major category. The relationships are addressed based on the reviewed literature. It is understood from Figure 4 that categorizing each of the dimensions under a specific major category is difficult, since each of the dimensions are not related to one major category. Nevertheless, such categorization is useful in providing affinity and tree diagrams prior to designing house of quality as addressed on the left side of Figure 3.

The proposed matrix highlights what kind of OL dimension has the most influence on innovativeness. The matrix provides a great advantage to managers to transfer their learning and knowledge to innovative organization. As it was mentioned, the results of the proposed matrix, which are derived from the matrix, determine priorities of the OL dimensions. The influence of each of the OL dimensions on each of the innovativeness dimensions (i.e. the interrelationship matrix) is illustrated by a three-point scale (3 as low by a single blank circle, 5 as medium by a double blank circle, 9 as high by a filled black circle) which are denoted in Figure 5 by specific symbols. Also, a five point Likert scale is used in the questionnaire for gathering data on the importance of each of the innovativeness dimensions (as it is illustrated in Appendix 3).

6. Case study

The Ghetehkaran manufacturing company is selected as the case study. This company is located in one of the industrial towns of the province of Isfahan and is one of the major suppliers of automobile parts in Iran. In a survey, 47 people (7 managers and 40 experts) of the company are asked to fill the questionnaire of innovativeness dimensions for the purpose of gathering the importance ratings of each of the dimensions. A sample of the questionnaire is presented in Appendix 3.

The reliability of the gathered data is computed using the Cronbakh's alpha coefficient as 0.81, which seems satisfactory.

As it is addressed in Figure 5, almost all the importance ratings have a value greater than the median (i.e. 3) outlining the fact that the managers and experts of the company feel that all the innovativeness dimensions are important.

According to the results, "Up to date skills and knowledge" and "Select new employee" are highlighted as the first and the last priorities of OL dimensions with a sum value of 475 and 20, respectively.

7. Discussion

Considering the literature review, it is argued that the relationships between learning, quality and innovation have been widely studied, while the relationship between OL and innovation has not been addressed adequately.

With regard to the results of the case study, it was first expected that continuous learning should have the most influence on creating innovation in organization, but the study in the manufacturing company reveals no evidence on this expectation and this dimension is targeted as the last priority. As it is illustrated, each dimension of OL could affect a number of innovativeness dimensions. The survey results imply that "up to date skill and knowledge" (with sum of 475) strongly affects innovativeness and has the first priority. "Up to date skill and knowledge" also has influence on employees' skills, market competition, innovation demanded, linkage of key employees to external environment of organization and customers, generating innovative employees, development of products and changing existing products/services in organization. "Up to date machinery" influences on production methods, various ways of doing job and high performance; and finally investing in improving processes, equipments, products and technology leads to innovativeness.

Considering the results, the second and the third priorities of OL are "initiatives and creativity" and "development of new products/services", respectively. These two dimensions have the most effect on management style, staff, quality, innovation demanded, development of new products as compared to competitors, advertising and promotion of new products differently, new solutions for organizational problems and variety of the methods of doing work and the existing system of the organization, productivity, market

competition, products/services technology and changing production methods. Regarding the innovation types, each of the innovation dimensions leads to a type of innovation (Figure 4). As addressed, among the innovation types, strategic innovation contributes to the most of the innovativeness dimensions and behavior innovation is the next important item. Therefore, it seems that these two types of innovation are the major means towards spreading innovativeness throughout the organization.

Development of innovation and innovativeness should be addressed in an organization's strategy. Developing new products and services to solve customer's problems affects existing systems of organizations and these systems will change according to the development of new products/services that increase firm's performance. Development of products/services in turn requires experts and motivated people involved in innovation and leads to behavior innovation. Developing of new products/services increase organization's productivity and productivity leads to strategic innovation. It also leads to find relevant market for business and can enhance behaviours against competitors and consequently leads to behavior innovation and market innovation. Product/service development requires necessary competencies and this is a movement towards strategic innovation. If new products/services are better than competitors in market, product innovation is supported in the organization. Also, fast growth of products/services in market creates market innovation. Organizations try to provide variety in their outputs and increase innovation in all levels. Developing of new products and services provides strategic advantage to firms, which in turn means strategic innovation. Adequacy of advertising and promotion of the new products/services leads to process innovation and if product is delivered first to market, it leads to product innovation. Also, development of new products/services needs technology, which in turn leads to process innovation. However, all the above improvements will lead to market innovation. It is important to note that equipment development and improvement of process technology increase innovation and eliminate problems of innovation implementation and this is another means for strategic innovation.

Analysis of gaps leads to exploitation of suitable market for products, which implies behavior innovation. Gaps analysis increases market awareness and helps in recognizing suitable markets for new products, which is compatible with market innovation. Analyzing gaps highlights how to develop new products for first to market (product innovation), and how to affect advertising and promotion of new products if it is different from existing products. Analysis of gaps in the market leads to recognition of relevant markets for products and facilitates fast growth. Marketing plans of product must attract all customers, which imply market innovation.

Understanding strategic goals by employees helps managers to orchestrate leadership style and strategies, which consolidates strategic innovation. By understanding strategic firm's goals, quality of products improves and product innovation is reinforced and new products are developed in markets. Also, understanding strategic goals leads to effective use of innovation capabilities and plan for innovation. This in turn supports strategic innovation.

Consistency of personal goals with organizational goals is an important means for change of leadership style to friendship style in firms, which influences shared values and supports strategic innovation. Such consistency also improves products' quality because employees are motivated and they are initiatives in products improvement and development of new products and methods, which consolidates product innovation. In addition, if employees' goals are consistent with organizational goals, firms become more effective and strategic innovation is reinforced.

Understanding organizational goals by the staff from all levels of the firm affects strategy, management style, shared values, systems, staff, skills and quality of deliverable products to customers; hence, strategic, behavior and product innovation are stimulated. If the organizational goal is to improve products, which are consistent with customers' needs, staff in all levels must endeavor to achieve such important goal.

Flat organizational structure enhances leadership style. Decision making patterns must fit to organizational structure and leadership so as to further strategic innovation. Decision-making process must be formal and standard. Decision-making process must be accomplished by considering various conditions and employees partnership. Key employees' linkages with external environment for receiving different information and right decisions assist in decision-making process. In fact, this is a strategic advantage for organization. Decision making requires an information system, effort of management team, which are effective reasons for quality and innovation. Decision making process distinguishes management styles. For example, if the manager encourages employees' partnership of all levels in decisions, his/her management style will be participative and the firm is expected to succeed. Various decision making patterns influence process of innovation, which in turn intensifies strategic innovation. Flexible work (e.g. job rotation, flexible hours,...) increases employees' skills and productivity, which foment behavior and strategic innovation, respectively. Also it is possible to perform jobs in

different ways, which provides growth opportunities to employees and vindicates strategic innovation.

Formal job description for all employees aids selection and allocation of capable employees and this enhances job planning and actuates behavior innovation. Decision making in lower levels by employees propagates strategic innovation. Functional teams affect organizational structure and decision making patterns. Teams seek relevant markets for business; they search for special customers and relevant markets and make decisions that lead to organizational success, which underpin strategic innovation. Variety in skills, expertise and personalities require functional specialism and capable staff. This confirms the necessity of change in organization towards competition in market, which supports market innovation. This variety meets customers' expectations and enforces the firm to produce and deliver their needs faster.

Employees with variety skills and knowledge can better communicate with external environment including other companies and customers to solve their problems. Such employees play an important role in development of products compared to competitors and accelerate innovation for firm. It is important to note that change and development in products require technology improvement and change in processes and equipments, which assist in providing effective solutions and ideas for problem solving and manifest strategic innovation.

Employee motivation systems such as rewards increase their commitment to organization and this reinforces behavior innovation. The outcome of motivation could be easier implementation of innovation in organization, which intensifies strategic innovation. Fault free and efficient work environment are important capitals for firms. Fault free work reduces costs and increases product quality. Generation of new ideas moves management toward innovation and encourages the organization to spend more energy to achieve it. New ideas provide strategic advantages through development of new technology, processes and products. Managers can make good decisions by adopting new ideas and changing their management methods, which furthers strategic innovation. Innovation demanded, improvement in organization and replacing relevant staff, new job approaches, benchmarking, senior management commitment to innovation, development of new products, differences between new and old products and necessary technology, change in production methods, development of new management approaches, new solution for problems of firm as well as for workplace, altogether influence new ideas into organization. Doing of all the mentioned evolutions requires investment in necessary fields. Access of employees to necessary information increases their awareness and perceptions from the existing systems of the firm and helps them to control the systems with more confidence. Empowered and competent staffs utilize such information and their access to information improves decision making in developing new products as well as in planning marketing programs.

Selecting new employees similar to the existing staff (in case of characteristics and expertise) leads to promotion and development of organization. Dealing with implementation of several projects requires adoption of high risk. Risk adoption itself intensifies competition in the market among competitors, while it provides growth opportunities to employees and managers. Well trained and experienced employees are important components in organizational efficiency. In training, necessary competencies should be determined. If trained skills could be continuously reviewed, its outcome would be continuous learning, which propagates strategic innovation. The result of skill training is innovative employees. Employee training is helpful in solving operational problems. High performance is another consequence of such training. It is important to add that effective training is a strategic advantage for organization and leads to continuous improvement in business processes. Creativity and initiatives together with management methods affect strategy type, management style and job approaches.

Creativity leads to quality improvement of products/services and meeting customers' expectations. Advertising new products and changing existing products influence creativity and initiatives of employees and management. Managers with creativity can adopt new approaches and suggest new ways for doing job. Improvement of entire organization (production methods, business processes, etc.) can guarantee organization's success. Correction of mistakes results in productivity increase and cost reduction and influences change in products and production methods. Employees and managers can mutually learn from each other; this leads to change of strategy and style of management as well as to increase of organizational productivity. Staffs with mutual learning can learn from each other and respond to innovation demand of customers. It is important to have solutions in mind which will be used for doing job and solving problems through partnership with employees, managers and learning at all organizational levels. Continuous learning is a result of effective training and affects organizational improvement or change in existing products. Also, continuous improvement in business processes, changes the ways of doing job and use of new ideas. Staffs should update their skills and knowledge so that new skills replace old skills, which conform more to customers' needs. Thus, firm responds faster to innovation demand of customers. Through up to date skills and knowledge, employees can communicate to external environment. Innovative employees are worth capital in organization. Development of new products, changing existing products and

performing job in different ways require new skills and knowledge. On the other hand, solving conflicts in workplace affects organization's costs. Conflicts arise from differences in staff perspectives relative to their job and methods of doing job. To solve this problem, listening to their ideas is very beneficial. Suggesting new ways of doing job affects quality, competition, innovation demanded, selection of capable employees for solutions implementation, new and variety of products development, process technology, advertising products and solving problems. Such great impact in turn motivates managers to adopt new ideas and solutions. If workplace is highly competitive, it will also affect strategy and management style of the organization.

Innovative workplace leads to search for relevant market of products, develops employees' awareness and facilitates benchmarking with competitors by the use of technology. Continuous improvement of business and adoption of innovation ideas are effective components for success in such environment.

8. Conclusions

In this paper, a new matrix was developed to address the relationship between OL and innovativeness dimensions. A questionnaire was designed and filled by managers/experts of Gheteckaran manufacturing company, as a supplier of automobile parts in Iran by which, the importance values of innovativeness dimensions were determined. The findings imply that not all OL dimensions equally enhance the firm's innovativeness. Only three dimensions, i.e. up to date skill and knowledge, creativity and initiatives and development of new products had a positive and strong relationship with innovation out of which, "up to date skill and knowledge" had the most effect on innovativeness and "Creativity and initiatives" was addressed as the next important factor affecting innovativeness. Major limitations included small sample size in the case study and the practical results, which were limited to the case study and might not be extended to other organizations. However, the findings have important implications for managers in industrial companies who aim to improving their company's business performance through product, service or process innovation with application of OL in organization.

For future research it is suggested to assess the impact of OL on innovativeness in other manufacturing companies and even in service firms. In future studies, selecting different organizations and comparing their results with the results of this research will provide a good basis for further discussion.

References

- Abel, A.H. (2008). Competencies management and learning organizational memory. *Journal of Knowledge Management*, 12(6), 15-30.
- Alegre, J., Lapiedra, R., & Chiva, R. (2006). A measurement scale for product innovation performance. *European Journal of Innovation Management*, 9(4), 333-346.
- Ali, A., Krapfel, R. Jr & Labahn, D. (1995). Product innovativeness and entry strategy: impact on cycle time and break-even time. *Journal of Product Innovation Management*, 12(1), 54-70.
- Andrews, J., & Smith, D.C. (1996). In search of marketing imagination: factors affecting the creativity of marketing programs for mature products. *Journal of Marketing Research*, 33(May), 17-37.
- Avermaete, T., Viaene, J., Morgam, E.J., & Crawford, N. (2003). Determinants of innovation in small food firms. *European Journal of Innovation Management*, 6(1), 8-17.
- Avlonitis, G.J., Kouremenos, A., & Tzokas, N. (1994). Assessing the innovativeness of organizations and its antecedents: project innovation. *European Journal of Marketing*, 28(11), 5-28.
- Aydin, B., & Ceylan, A. (2009). Feature article does organizational learning capacity impact on organizational effectiveness? Research analysis of the metal industry. *Development & Learning in Organizations*, 23(3), 21-23.
- Cooper, J.R. (1998). A multidimensional approach to the adoption of innovation. *Management Science*, 36(8), 493-502.
- Dobni, C.B. (2008). Measuring innovation culture in organizations: the development of a generalized innovation culture construct using exploratory factor analysis. *European Journal of Innovation Management*, 11(4), 539-559.
- Ehigie, B.O. & McAndrew, E.B. (2005). Innovation, diffusion and adoption of total quality management (TQM). *Management Decision*, 43(6), 925-940.
- Elmqvist, M., Fredberg, T., & Ollila, S. (2009). Exploring the field of open innovation. *European Journal of Innovation Management*, 12(3), 326-345.
- Gomez, P.J., Lorente, J.C., & Cabrera, R.V. (2005). Organizational learning capability: a proposal of

measurement. *Journal of Business Research*, 56(8), 715-725.

Hoang, D.T., Igel, B., & Laosirihongthong, T. (2006). The impact of total quality management on innovation - findings from a developing country. *International Journal of Quality & Reliability Management*, 23(9), 1092-1117.

Huber, G.P. (1991). Organizational Learning: the contributing Process and the Literature. *Organizational Science*, 2(2), 88-115.

Humphreys, P., McAdam, P., & Leckey, J. (2005). Longitudinal evaluation of innovation implementation in SMEs. *European Journal of Innovation Management*, 8(3), 283-304.

Hurt, H.T., Joseph, K., & Cook, C.D. (1977). Scales for the measurement of innovativeness. *Human Communication Research*, 4(1), 58-65.

Hyland, P., & Beckett, R. (2005). Engendering an innovative culture and maintaining operational balance. *Journal of Small Business & Enterprise Development*, 12(3), 336-352.

Jimenez, D.J., Valle, R.S., & Hernandez-Espallardo, M. (2008). Fostering innovation: the role of market orientation and organizational learning. *European Journal of Innovation Management*, 11(3), 389-412.

Johne, F.A. (1996). Avoiding product development failure is not enough. *European Management Journal*, 14(2), 176-180.

Lovelace, K., Shapiro, D.L., & Weingart, L.R. (2001). Maximizing cross-functional new product teams' innovativeness and constraint adherence: a conflict communications perspective. *Academy of Management Journal*, 44(4), 779-793.

Martins, E.C., & Terblanche, F. (2003). Building organizational culture that stimulates creativity and innovation. *European Journal of Innovation Management*, 6(1), 64-74.

McAdom, R., & McClelland, J. (2002). Individual and team-based idea generation within innovation management: organizational and research agendas. *European Journal of Innovation Management*, 5(2), 86-97.

Miller, W.C. (1995). Is innovation built into your improvement processes?. *Journal of Quality & Participation*, 18(1), 46-48.

Nonaka, I. (1994). Dynamic theory of organizational knowledge creation. *Organization Science*, 5(1), 14-37.

Orange, G., Elliman, T., Kor, A.L., & Tassabehji, R. (2007). Local government and social or innovation value, *Transforming Government: People, Process & Policy*, 1(3), 242-254.

Rainey, H.G. (1999). Using comparison of public and private organizations to assess innovative attitudes among members of organizations. *Public Productivity & Management Review*, 23(2), 49-130.

Slater, S.F., & Narver, J.C. (1995). Market Orientation and the Learning Organization. *Journal of Marketing*, 59(3), 63-74.

Sunassee, N., & Haumant, V. (2004). Organizational learning versus the learning organization. *Proceedings of the South African Institute of Computer Scientists Information Technologists*, SACSIT, 264-268.

Tidd, J., Bessant, J., & Pavitt, K. (2001). *Managing innovation: integrating technological Market and Organizational Change*. Bognor Regis: Wiley.

Utterback, J.M. (1994). *Mastering the Dynamics of Innovation*. Boston: Harvard Business School Press.

Van der Sluis, E.C. (2004). Designing the workplace for learning and innovation. *Development & Learning in Organizations: An International Journal*, 18(5), 10-13.

Wang, C.L., & Ahmed, P.K. (2004). The development and validation of the Organizational innovativeness construct using confirmatory factor analysis. *European Journal of Innovation Management*, 7(4), 303-313.

Williams, S. (2001). Increasing employees' creativity by training their managers. *Industrial & Commercial Training*, 33(2), 63-68.

Zairi, M. (1995). Benchmarking innovation for best practice. *World Class Design to Manufacture*, 2(3), 33-40.

Zaltman, G., Duncan, R., & Holbek, J. (1984). *Innovations and Organizations*. New York: John Wiley & Sons.

Zdunczyk, K., & Blenkinsopp, J. (2007). Do organizational factors support creativity and innovation in Polish firms?. *European Journal of Innovation Management*, 10(1), 25-40.

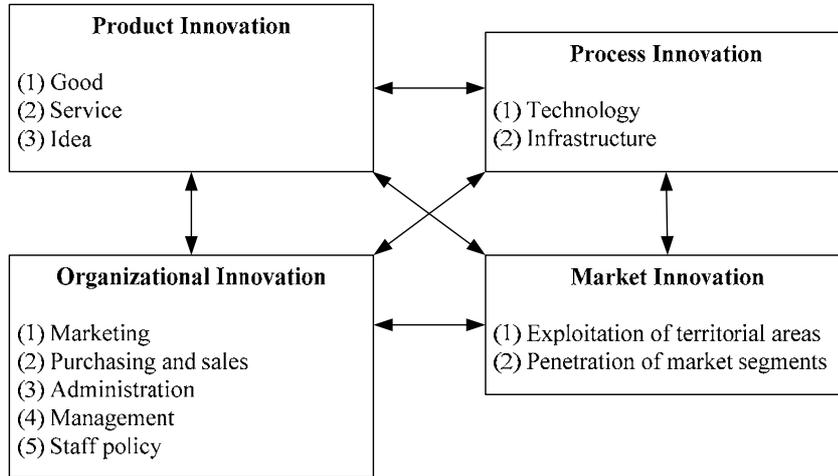


Figure 1. Domains of innovation (Avermaete et al., 2003)

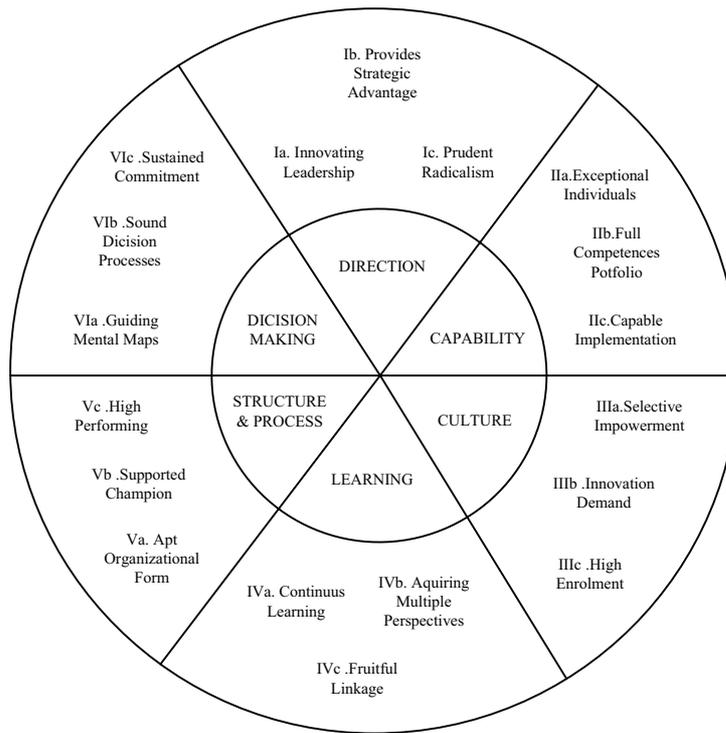


Figure 2. Dimensions of innovativeness (Humphreys et al., 2005)

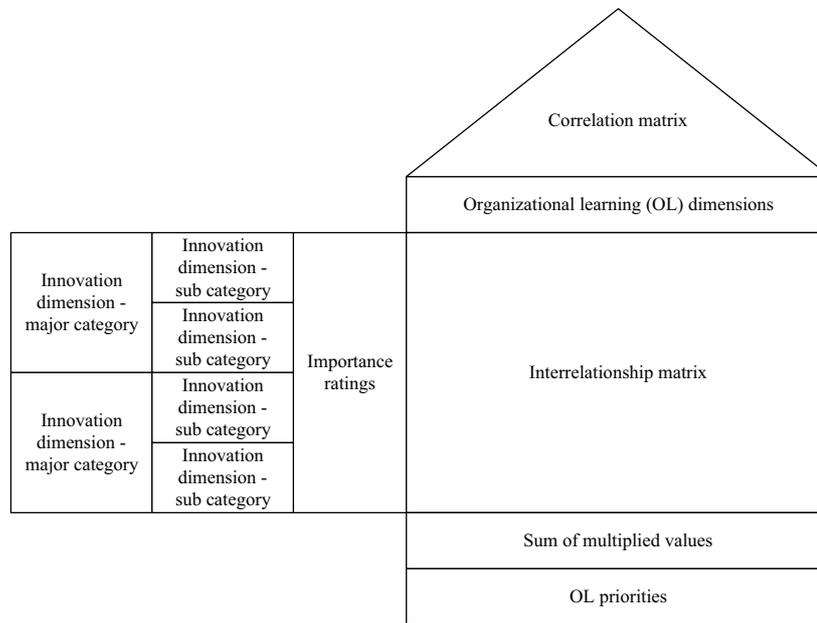


Figure 3. The proposed matrix based on HoQ

Innovativeness dimensions \ Types of innovation	Behaviour innovation	Product innovation	Process innovation	Market innovation	Strategic innovation
Strategy					✓
Style					✓
Shared values					✓
Structure					✓
System					✓
Staff	✓				
Skill	✓				
Cost		✓			
Quality		✓			
Productivity					✓
Relevance	✓				
Market awareness				✓	
Competition				✓	
Discipline					✓
Innovation leadership					✓
Providing strategic advantage					✓
Prudent radicalism					✓
Exceptional individuals	✓				
Full competencies portfolio	✓				
Capable implementation					✓
Selective empowerment	✓				
Innovation demanded		✓			
High enrolment	✓				
Continuous learning					✓
Acquiring multiple perspective					✓
Fruitful linkages					✓
Apt organizational form					✓
Supported champions					✓
Guiding mental maps	✓				
Sound decision processes					✓
Sustained commitment	✓				
Development of new products		✓			
Change in existing products		✓			
Difference between new and old products/services			✓		
New products/services against competitors				✓	
Faster growth of new products/services in market				✓	
Product marketing plan in the market				✓	
Advertisement and promotion of new products				✓	
Use of technology for new products/services				✓	
Up to date main machinery			✓		
Constant improvement in business process			✓		
Change the production methods			✓		
Development of new management approach	✓				
Try new ways of doing things	✓				
Adoption of innovative ideas by managers					✓
Explore growth opportunities					✓
Seek novel solutions and new ideas to problems					✓
Doing jobs in different ways	✓				
High performing					✓

Figure 4. A conceptual model of the relationship between innovation dimensions and types of innovation

Appendix 1. Dimensions of organizational innovativeness (Wang and Ahmed, 2004)

No.	Key variables
1	In new product and service introductions, our company is often first-to-market
2	Our new products and services are often perceived as very novel by customers
3	Our recent new products and services are only minor changes from our previous products and services
4	New products and services in our company often take us up against new competitors
5	In comparison with our competitors, our company has introduced more innovative products and services during the past five years
6	In comparison with our competitors, our company is faster in bringing new products or services into the market
7	In comparison with our competitors, our company has a lower success rate in new products and services launch
8	In comparison with our competitors, our products' most recent marketing program is revolutionary in the market
9	Our company's most recent new product introduction required a new form of advertising and promotion, different from that used for our existing products
10	In new product and service introductions, our company is often at the cutting edge of technology
11	The technology of our main machinery in use is very up-to-date
12	Our future investments in new machinery and equipment are significant compared with our annual turnover
13	In comparison with our competitors, we are late in adoption of technological innovations
14	Our firm's R&D or product development resources are not adequate to handle the development need of new products and services
15	The nature of the manufacturing process in our company is new compared with that of our main competitors
16	We are constantly improving our business processes
17	Our company changes production methods at a great speed in comparison with our competitors
18	Our future investments in new methods of production are significant compared with our annual turnover
19	During the past five years, our company has developed many new management approaches
20	We get a lot of support from managers if we want to try new ways of doing things
21	Management is very cautious in adopting innovative ideas
22	Key executives of the firm are willing to take risks to seize and explore "chancy" growth opportunities
23	Management actively responds to the adoption of "new ways of doing things" by main competitors
24	Senior executives constantly seek unusual, novel solutions to problems via the use of "idea men"
25	In our company, we tolerate individuals who do things in a different way
26	We are willing to try new ways of doing things and seek unusual, novel solutions
27	We encourage people to think and behave in original and novel ways
28	When we see new ways of doing things, we are last at adopting them
29	When we cannot solve a problem using conventional methods, we improvise on new methods

Appendix 2. Dimensions of OL (Zdunczyk and Blenkinsopp, 2007)

1. All employees have a thorough understanding of the company's mission and vision.
2. The vision and mission are focused on the future.
3. The vision and mission are strongly market oriented.
4. Developing new products and services to solve customers' problems is a strategic priority.
5. The gap between where we are and where we want to be is regularly analyzed and discussed.
6. Top management does not prescribe the details of how strategic goals are to be realized.
7. Personal goals of the employees are consistent with organizational goals.
8. Quality is the main emphasis reflected in the organizational goals.
9. Organizational goals are strongly oriented towards effectiveness.
10. There is a strong sense of purposefulness of the goals at all levels of the organization.
11. The organizational structure is flat.
12. The organization is composed of highly specialized functional departments.
13. Decision making processes are formalized and standardized.
14. Flexible work arrangements (e.g. job rotation, flexible hours, job sharing) are possible.
15. All the employees have formal job descriptions which they are expected to adhere to strictly.
16. Employees have autonomy in organizing their work and determining their own procedures.
17. Decisions are taken at the lowest possible level.
18. A lot of importance is attached to the development and support of team-work.
19. Cross-functional teams are a common mode of work.
20. Work-teams are diversified in terms of members' expertise, skills and personalities.
21. Intrinsic rewards (e.g. increased autonomy, improved opportunities for personal growth) are a significant part of the motivation system.
22. Employees are rewarded for fault-free, efficient work.
23. Experimenting and generating ideas is appreciated.
24. Everyone has access to all the information they need.
25. New employees are selected for similarity of background and personality to the existing staff.
26. It is difficult to obtain resources for projects that involve above-average risk.
27. The training provided is focused on functional expertise rather than on social skills.
28. Employees have an influence on how much and what sort of training they receive.
29. Promotions are awarded in recognition of exceptional creativity, initiative and innovation.
30. If I want to devote special attention to a project of interest to me I have to do so in my own time.
31. Mistakes are ignored or covered up.
32. In case of failure there is an investigation to find out who is to blame.
33. All ideas are given a fair consideration.
34. Personnel are encouraged to talk and learn from one another.
35. Everyone is motivated to keep their knowledge and skills up to date.
36. Individuals are allowed to take risks as long as they do not harm the organization.
37. Conflicts are resolved through constructive discussion.
38. We try to challenge the way things have always been done and look for a better way.
39. One is not supposed to contradict one's superiors.
40. The working environment is highly competitive.

Appendix 3. Survey questionnaire

In this questionnaire, we would like to determine the importance of dimensions of innovativeness in organization. For this purpose, you are kindly asked to answer to the questions.

Thank you for corporation.

Demographic characteristics

Job title:

Years of experience since employment: Bellow 10years 10–20 years 20–30 years

Education: B.S M.S PhD

Gender: Female Male

Age: 20–30 years 30–40 years More than 40 years

	Questions	Very low	Low	Moderate	High	Very high
1	Effect of organizational strategy on innovation					
2	Effect of organizational style on innovation					
3	Effect of consist of employees goals to organizational goals on innovation					
4	Effect of organizational structure on innovation					
5	Effect of existing systems in organization (coordination and control approach) on innovation					
6	Effect of staff on innovation					
7	Effect of existing skills in organization on innovation					
8	Effect of cost reduction on innovation					
9	Effect of goals/services quality (continuous improvement of products) on innovation					
10	Effect of productivity on innovation					
11	Effect of relevant market for business on innovation					
12	Effect of market awareness (market gaps) on innovation					
13	Effect of market competition on innovation					
14	Effect of planning and discipline in work on innovation					
15	Effect of innovation leadership (strong commitment to innovation) on innovation					
16	Effect of strategic advantage (through team working and focus on external customer) on innovation					
17	Effect of management decision-making process to adopting new ideas and change management on innovation					
18	Effect of recruitment young individuals for training on innovation					
19	Effect of necessary competencies in organization on innovation					
20	Effect of improvement project (initiatives) on innovation					
21	Effect of selecting powerful and ready employees on innovation					
22	Effect of innovation demanded (innovation-related needs) on innovation					
23	Effect of high commitment and making value by employees on innovation					
24	Effect of continuous learning on innovation					
25	Effect of close contact to customer and acquiring multiple perspectives on innovation					
26	Effect of linking key employees to external environment in organization on innovation					
27	Effect of organizational improvement methods on innovation					

Questions		Very low	Low	Moderate	High	Very high
28	Effect of organizational efforts for developing innovate employees on innovation					
29	Effect of new approach for management and doing work (benchmarking) on innovation					
30	Effect of quality of decision-making process on innovation					
31	Effect of sustained senior management commitment (for developing innovation) on innovation					
32	Effect of new products development (first-to-market) on innovation					
33	Effect of change in existing products on innovation					
34	Effect of difference between new and old products/services on innovation					
35	Effect of new products/services as compared with competitors on innovation					
36	Effect of faster growth of new products/services in the market on innovation					
37	Effect of product marketing plan on innovation					
38	Effect of advertising and promotion of new products on innovation					
39	Effect of the use of technology for producing new products/services on innovation					
40	Effect of up to date machines on innovation					
41	Effect of constant improvement in business processes on innovation					
42	Effect of changing production methods on innovation					
43	Effect of the development of new management approaches on innovation					
44	Effect of trying new ways of doing things on innovation					
45	Effect of adopting innovative ideas by management on innovation					
46	Effect of exploring growth opportunities on innovation					
47	Effect of novel solutions and new ideas for organizational problems on innovation					
48	Effect of doing works in various ways on innovation					
49	Effect of investing in developing new products, processes and equipments and improving process technology on innovation					