

Design Leadership: A Conceptual Framework of Leadership, Design and Team Performance

Nuttawuth Muenjohn¹⁺, Prem Chhetri¹, Lynnel Hoare¹, Sharif As-Saber¹, and Yusuke Suzumura²

¹Centre for Sustainable Organisations and Work, RMIT University, Australia

²Hosei University, Japan, Jun Ishikawa, Rikkyo University, Japan

Abstract. Success in today's markets and those of the future depends heavily upon leadership through the use of design (Gloppen, 2009). It is believed that business leaders are required to understand how to effectively use design to create their company's competitive advantages. In this regard, design leadership, a new concept of leadership, would assist firms to obtain full return on investment in their design. The key purpose of this paper is to introduce a conceptual framework that represents the relationship between design leadership and design process that in turn affect team performance and satisfaction. The conceptual framework would assist researchers in advancing the understanding of design leadership and its influence on R&D team performance.

Keyword: Leadership, Design process, Team performance, Research and Development.

1. Introduction

In business, innovative design can build long-term competitive sustainability that leads to superior performance of organisations. As a result, public and private firms have invested enormously in design and innovation through their research and development (R&D) activities. At the global level, the world's R&D expenditures have been growing rapidly from an estimated \$525 billion in 1996 to approximately \$1.1 trillion in 2007, according to UNESCO (2009). For example, Japan and Australia are reported as among the highest ranked countries in terms of increase in R&D expenditure over the last ten years. While Japan is ranked the 4th highest on R&D expenditure in the world, Australia's expenditure on R&D has increased from 1.51% of GDP in 2000 to 2.06% in 2006 (OECD, 2010). At the business level, increasing competition in the global market is forcing businesses to become more competitive by being different and unique in their strategic markets. To be different and unique, many companies choose to focus on improving the design of their products through R&D activities. Numerous researchers have emphasised that innovative design can assist corporations in creating product differentiation, developing competitive advantage and reinforcing excellent performance that can be sustainable into the future (Turner 2006). Companies, such as Apple, Lego and Toyota, have heavily invested in 'designing and innovating the difference' (Design Management Institute; 2006) which has resulted in them becoming world-class companies and prominent players in their industry sectors through the integration of technological advancements based on R&D processes.

To date, there is still no empirical attempt that has been made to propose an accepted measure for design leadership let alone to assess the impact of design leadership on the product design process. Design leadership is important since it is one of the most significant means of generating new ideas, making tangible market expectations met through research and rehearsals of user experiences, contributing added value and differentiating in a cost effective way (Topalian 2002). Based on initial idea of what constitute design leadership by Turner & Topalian, (2002), this study intends to propose a conceptual relationship between design leadership and design process that in turn affect R&D team performance and satisfaction. A conceptual framework and propositions will later be developed based on the proposed relationship. The conceptual framework will not only contribute to the body of knowledge in the field of leadership and design but will also advance our understanding of the concept of design leadership and its influence on the design process.

⁺ Corresponding author. Tel.: + 61399255109
E-mail address: nuttawuth.muenjohn@rmit.edu.au.

2. Literature Review

2.1. Design Leadership: A New Force of Leadership

Design leadership can be defined simply as the ‘...means both to design and to lead - to lead design and to lead business by design’ (Design Management Institute, 2006, p.2) and is also described as a form of leadership that creates and sustains innovative design solutions (Turner & Topalian, 2002). These authors also argued that the qualities of design leadership are displayed through design leaders’ core responsibilities such as envisioning the future, manifesting strategic intent, directing design investment and creating and nurturing an environment of innovation. A number of academics and business practitioners believe that leadership makes an important contribution to the process of design and innovation and as a result creates a company’s sustainable competitive advantage (Design Management Institute, 2006). The first element of design leadership is the ability of the leader to envision the future. She further suggests that design leaders set the vision for how design could be used within an organization, selling the vision to, and obtaining buy-in from, key stakeholders and decision makers.

The second element refers to manifesting strategic intent. Topalian (2002) proposes that for firms to consistently obtain high quality of effective design in their products, services and operations, they need to instill a concern and pride for design standards in the hearts and minds of employees at all levels. The third is directing design funding. Based on six different case studies, Moultrie (2009) concludes that it is important to capture the funding of the design. However, this is not an easy task since design can take in many forms and it is an integrated approach (Topalian, 2002). The final element is creating and nurturing an environment of innovation. Hult et al. (2004) suggest that key element to the success of industrial firms is innovativeness. Firms need to cultivate the innovation environment because without innovation, they have to rely upon consecutive ways of doing business, consecutive products/services and traditional distributions channel (Lee, Lee & Pennings 2001).

2.2. Process of Design

The design process is one of the major tasks for any firm who is involved in design activities, whether it is a new product design and development or process design and development. By combining these two design activities, organisation shapes the scope of the transformation process by determining the types of inputs required and outputs generated. In this stage, there is integration of multiple groups or stakeholders, both internally with other functions and externally with stakeholders, customers and suppliers (Sroufe et al. 2000). Rungtusanatham & Forza (2005) also agree that product design or manufacturing process design need to be coordinated, rather than being treated as independent sets of decisions and activities occurring sequentially in time.

There are several stages that involved in the design process. According to Khandani (2005), design process begins with defining the problem, gathering pertinent information, generating multiple solutions, analyzing and selecting a solution and testing and implementing a solution. Meyer (1993) suggests that new product development should consists of seven linked stages which include advance research, product concept, product specification, product development, pilot product, production and reincarnation or disposal. Based from these suggestions, there are three major stages of design process that will be introduced in this study that will include idea generation, design development and design evaluation. Based on the different stages that occur during the design phase, it shows that there are different sets of activities and different constituents that were involved throughout the design process. A leader that can integrate all of these activities and monitor the coordination of work at different stages can help to ensure the effectiveness of the design process. For example, Formoso et al. (1998) suggest that the performance of the design process in the building industry has a major influence on the success of the following processes in construction projects and also the quality of the final design. As pointed out by Ferguson (1986) that poor design process was the main cause for defects in building and production stage.

2.3. Team Performance: R&D Environment

To be involved in R&D, firms need to have an effective R&D teams. Therefore, an understanding of how teams perform successfully is important (Huang, Chin & Jiang 2008). Team performance can be

referred to as the extent to which a group achieves or exceeds its standard of performance, group outcomes, organisational commitment and satisfaction of team members (Jones & Harrison 1996). Team performance has been suggested as a multidimensional and should be operationalized relative to the activities of the team (Goodman, Ravlin & Schminke, 1987). Henderson (1998) on the other hand evaluates the performance of the design teams as the normal engineering measures of efficiency, effectiveness and timeliness.

In their study of 44 R&D teams, Kratzer, Leenders & Engelen (2006) found that creative team performance is affected by the proximity of team members, the communication modes chosen and the manner in which the team is organized. Changes in the business environment have had a significant effect on the way in which R&D is carried out. The knowledge needed for the development for most new products has become increasingly concentrated and particular. Therefore, R&D projects need in-depth mastery of specialized knowledge and skills. The results revealed that the more variable R&D teams are in the manner in which they employ these three variables, the better their creative team performance.

3. Conceptual Framework

3.1. Leadership, Design and Team performance

Design is a dynamic process that is never finished and is always updated with new innovative ideas in order to meet customers' needs and requirements (Krishnapillai & Zeid, 2006). It is a form of strategic resource that is important to wealth creation because it has a critical influence on the initial conception and delivery of products and services that meet customer expectations and aspirations (Topalian 2002). From the very beginning of this process - idea development - leadership could play a facilitative role in the generation of innovative solutions to meet customers' preferences. However, based on existing evidence, little is known about the impact of leadership on the product design process, or how the quality of leadership might play a role in creating business competitive advantages through the design process.

Figure 1 represents a conceptual relationship between Design leadership, Design process and Team performance. The explanation of the existing relationships is also given below.

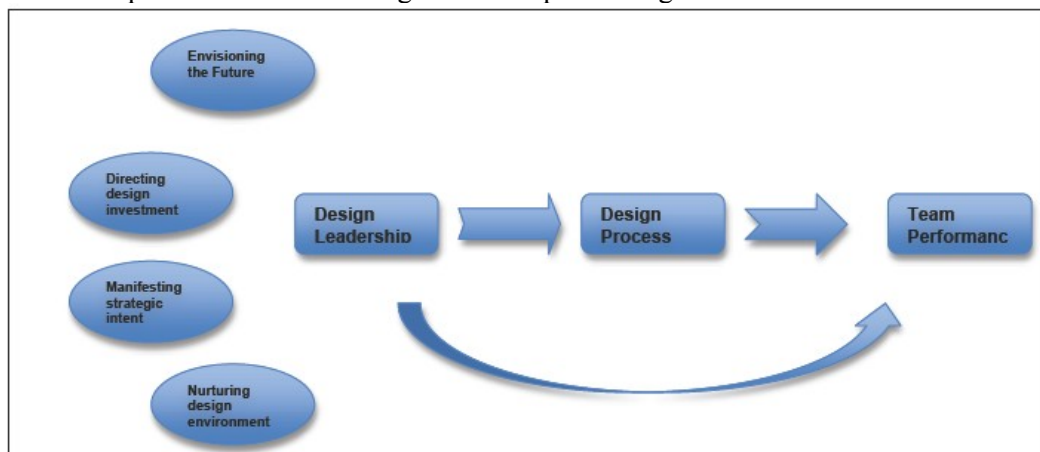


Fig. 1: Conceptual Framework

By merging the leadership process and design process, organisations are capable to produce something that is useful and desirable. This could be in the form of a breakthrough technology, a valuable service or a fresh solution to an existing problem (Horth & Buchner 2009). Bucolo, Wringley & Matthews (2012) suggest that in dealing with the design framework, design leader should play more than just a leadership role. Existing literature has indicated that leadership has been one of the most important factors that influences team performance (i.e. Carson, Tesluk & Marrone, 2007). In particular within the R&D environment, leadership can play a significant role in team development and performance (see Cox, Pearce & Perry, 2003). Most studies investigating leadership in R&D teams have focused on the individual team leaders and their influence on team performance (i.e. Kozlowski and Bell 2003). However, these studies viewed leadership as a one-way process where only a team leader has the power to influence team members. Based on interviews conducted with 71 members of new product development team in 18 diverse technology-based companies,

Barczak & Wilemon (2001) found that one of the factors that emerged to contribute to better team performance is effective leadership. Leaders must be able to manage their teams that include the ability to take actions and motivate, coordinate and facilitate team members. They also need to have the skill to manage the process of designing and developing the product itself. It is crucial for them to set schedules, define roles and responsibilities, organize and manage meetings, establish financial requirements and review the performance.

3.2. Propositions

Based on the foregoing literature review and results from previous research on the variables discussed above, this paper proposes the following propositions:

Proposition 1: Design leadership has a significant effect on design process.

Proposition 2: Design leadership has a positive relationship with team performance.

Proposition 3: Design process is associated with team performance within the R&D environment.

Proposition 4: Design process mediates the relationship between Design leadership and Team performance.

4. Conclusion

It is expected that the framework and conceptual relationships proposed in the current paper will assist researchers in advancing their understanding of design leadership and its impact on design process and R&D team performance. The propositions were developed in accordance with previous and current research still waiting to be tested and confirmed. Furthermore, researchers, who are interested in this area, would want to find out an answer to key research questions: what role does design leadership play in the process of design and how does this occur? And is there a relationship between design leadership and R&D team performance? If so, what is the nature of the relationship?

5. Acknowledgements

This paper is one of the outcomes of '2012 RMIT Business Special Research Grant Scheme in Business and Design'. It is supported by the College of Business, School of Management and Centre for Sustainable Organisations and Work, RMIT University, Australia.

6. References

- [1] Bucolo, S, Wringley, C & Matthews, J 2012, 'Gaps in organizational leadership: Linking strategic and operational activities through design-led propositions', *Design Management Journal*, vol. 7, no. 1, pp. 18-28.
- [2] Carson, J. B., P. E. Tesluk and J. A. Marrone. (2007) 'Shared Leadership in Teams: An Investigation of Antecedent Conditions and Performance', *Academy of Management Journal*, 50(5), 1217-1234.
- [3] Cox, J. F., C. L. Pearce and M. L. Perry. (2003). 'Toward a Model of Shared Leadership and Distributed Influence in the Innovation Process: How Shared Leadership Can Enhance New Product Development, Team Dynamics and Effectiveness'. in C. L. Pearce and J. A. Conger (eds.), *Shared Leadership: Reframing the Hows and Whys of Leadership*. Thousand Oaks, CA: Sage, pp. 48-76.
- [4] Design Management Institute (2006) The 10th European International Design Management Conference, 29–31 March, 2006, Amsterdam, The Netherlands Ferguson, I. (1989). *Buildability in Practice*. London, Mitchell.
- [5] Formoso, CT, Tzotzopoulos, P, Jobim, MSS & Liedtke R, 1998, Developing a Protocol For Managing the Design Process in the Building Industry, Proceedings IGLC 1998, Guarujá, Brazil.
- [6] Gloppen, J 2009, ' Perspectives on design leadership and design thinking and how they relate to European services industries', *The Design Management Institute*, vol.4, no. 1, pp. 33-47
- [7] Goodman, PS, Ravlin, EC & Schminke, M, 1987, 'Understanding Groups in Organizations', *Tepper School of Business*. Paper 1034. Available at <http://repository.cmu.edu/tepper/1034>
- [8] Henderson, JC, 1988, Involvement as a Predictor of Performance in US Planning and Design, Working Paper, No 175, Center for Information Systems Research, MIT, MA

- [9] Horth, D & Buchner, D 2009, “innovation leadership: How to use innovation to lead effectively, work collaboratively and drive results’, Center for Creative Leadership & Continuumm, pp. 1-22.
- [10] Huang, CC, Chin, H & Jiang, PC 2008, ‘Knowledge Sharing and Performance in Technology R&D Teams: A Mediated Effect of Knowledge Integration. Proceedings of the 2008 IEEE ICMIT.
- [11] Hult, GTM, Ketchen, DJ & Slater SF, 2004, ‘Information processing, knowledge development, and strategic supply chain performance’, *Academy of Management Journal*, vol. 47, no. 2, pp. 241–253.
- [12] Jones, MC & Harrison, AW 1996, ‘IS project team performance: An empirical assessment’, *Information & Management*, vol. 31, pp. 57-65.
- [13] Khandani S, 2005, Engineering Design Process, Education Transfer Plan, IISME/Selectron/2005
- [14] Kozlowski, S. W. J. and B. S. Bell. (2003). 'Work Groups and Teams in Organizations'. in W. C. Borman and D. R. Ilgen (eds.), *Comprehensive Handbook of Psychology: Industrial and Organizational Psychology* (Vol. 12). New York: Wiley, pp. 333-375.
- [15] Kratzer, J, Leenders, RTAJ, Van Engelen, JML, 2006, ‘Managing creative team performance in virtual environments: An empirical study in 44 R&D teams, *Technovation*, vol. 26, pp. 42-49.
- [16] Krishnapillai, R. and Zeid, A (2006) Mapping Product Design Specification for Mass Customization, *Journal of Intelligent Manufacturing*, 17(1), pp. 29-43
- [17] Lee, C, Lee, K & Pennings, JM 2001, 'Internal capabilities, external networks, and performance: a study on technology-based ventures', *Strategic Management Journal*, vol. 22, no. 6-7, pp. 615-640.
- [18] Meyer, C. (1993), *Fast Cycle Time: How to Align Purpose, Strategy, and Structure for Speed*, The Free Press, New York, NY.
- [19] Moultrie, J 2009, design funding in firms: A conceptual model of the role of design in industry’, *Design management Journal*, vol, 4, no. 1, pp. 62-82.
- [20] Organisation for Economic Co-operation and Development-OECD (2010) Factbook 2010: Economic, Environmental and Social Statistics - ISBN 92-64-08356-1 - © OECD 2010: Science and technology - Research and Development - Expenditure on R&D
- [21] Rungtusanatham, M & Forza, C, 2005, ‘Coordinating product design, process design, and supply chain design decisions. Part A: Topic motivation, performance implications, and article review process’, *Journal of Operations Management*, vol. 23, pp. 257-265.
- [22] Sroufe, R, Curkovic, S Montabon, F & Melnyk SA, 2000, ‘The new product design process and design for environment: “Crossing the chasm”’, *International Journal of Operations & Production Management*, vol. 20, no. 2, pp. 267-291.
- [23] Topalian, A 2002, Promoting design leadership through skills development programs’, *Design Management Journal*, vol. 13, no.3, pp. 10- 18.
- [24] Turner, R. (2006) Design Leadership: A Commercial Imperative, The 10th European International Design Management Conference, Amsterdam, The Netherlands
- [25] Turner, R., Topalian, A. (2002) Core responsibilities of design leaders in commercially demanding environments, 2002, Inaugural presentation at the Design Leadership Forum
- [26] United Nations Educational, Scientific, and Cultural Organization-UNESCO Institute for Statistics (2009), http://stats.uis.unesco.org/unesco/tableviewer/document.aspx?ReportId=143&1F_Language=eng (viewed Dec 2011).