Technology Use in the Virtual R&D Teams

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Abstract: Problem statement: Although, literature proves the importance of the technology role in the effectiveness of virtual Research and Development (R&D) teams for new product development. However, the factors that make technology construct in a virtual R&D team are still ambiguous. The manager of virtual R&D teams for new product development does not know which type of technology should be used. Approach: To address the gap and answer the question, the study presents a set of factors that make a technology construct. The proposed construct modified by finding of the field survey (N = 240). We empirically examine the relationship between construct and its factors by employing the Structural Equation Modeling (SEM). A measurement model built base on the 19 preliminary factors that extracted from literature review. The result shows 10 factors out of 19 factors maintaining to make technology construct. Results: These 10 technology factors can be grouped into two constructs namely Web based communication and Web base data sharing. The findings can help new product development managers of enterprises to concentrate in the main factors for leading an effective virtual R&D team. In addition, it provides a guideline for software developers as well. Conclusion: The second and third generation technologies are now more suitable for developing new products through virtual R&D teams.

Key words: Collaboration teams, questionnaires, performance, cross-functional teams, product development, structural equation modeling, measurement model, literature review

INTRODUCTION

Virtual teams are defined as “small temporary groups of geographically, organizationally and/or time dispersed knowledge workers who coordinate their work, mainly with electronic information and communication technologies to carry out one or more organization tasks” (Ebrahim et al., 2009b). Virtual R&D team is a form of a virtual team, which includes the features of virtual teams and concentrates on R&D activities (Ebrahim et al., 2011). The members of a virtual R&D team use different degrees of communication technology to complete the research without space, time and organizational boundaries (Nader et al., 2010a, Husain and Yang, 2009). “We are becoming more virtual all the time!” is heard in many global corporations today (Chudoba et al., 2005). On the other hand, New Product Development (NPD) is widely recognized as a key to corporate prosperity (Lam et al., 2007). The specialized skills and talents needed for developing new products often remain locally in pockets of excellence around the company or even around the world. Therefore, enterprises have no choice but to disperse their new product units to access such dispersed knowledge and skills (Kraemer et al., 2005). As a result, enterprises are finding that internal development of all technology needed for new products and processes are difficult or impossible. They must increasingly be able to receive technology from external sources (Snoek and Tatikonda, 2004). Virtualization in NPD has recently started to make serious headway due to developments in technology-virtuality in NPD which is now technologically possible (Leenders et al., 2003). As product development becomes the more complex, supply chain, also have to collaborate more closely than in the past. These kinds of collaborations almost always involve individuals from different locations, so virtual team working supported by Information Technology (IT), offers notable potential benefits (Anderson et al., 2007). Although the use of the internet in NPD has received notable attention in the literature, little is written about collaborative tool and effective virtual teams for NPD (Ebrahim et al., 2009a). In addition, literature shows the