Chapter 7

Knowledge Sharing and Creation in Virtual Teams: An Integrated Framework Based on Distributed Cognition Theory and Transactive Memory Systems

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ABSTRACT

For a more integrative view on social, technical, and individual aspects of knowledge sharing and generation in virtual environments, the current contribution suggests a socio-technical framework based on distributed cognition theory and transactive memory systems. In combination, these well-established social theories provide theoretical foundations for describing and understanding how groups of individuals organize shared activities and interact with technology to store, retrieve, and use individual knowledge for common problem solving and innovation.

INTRODUCTION

The fourth industrial revolution goes hand in hand with massive changes in traditional industries, markets and work places. New forms of technologies and artificial intelligence as well as the omnipresent networking of everything with everything (Richert et al., 2016) lead to the emergence of new forms of work and working environments. As a result, collaboration and networking in virtual environments with teams distributed across company and national borders becomes more and

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more common. In the future, companies will rely more heavily on virtual teams and networks in order to meet changing customer expectations and needs and to successful navigate in digital environments.

Furthermore, in the context of “Post-Industrialisation” (Drucker, 1993), the primary resource of organisations is moving away from classical tangible production factors towards intangible intellectual assets and digital productivity. The competitiveness of organisations increasingly depends on their ability to manage and harness large amounts of digital information and knowledge for creating innovation and solving complex problems (e.g. McAfee et al., 2012). Additionally, because of digitalisation and automation companies have to come up with more knowledge-intensive work and services, in order to adapt to changing customer needs (Hossain and Lassen, 2017). Against this background, successful knowledge creation and transfer in virtual contexts are crucial for gaining and sustaining competitive advantage in the fourth industrial revolution and are an important field of future research.

At the same time, progressive development of novel technologies promises new possibilities and tools to support critical knowledge processes in virtual collaboration (Schwab, 2017). For example, developments in artificial intelligence, virtual simulation- and virtual collaboration tools, opens up new ways and tools for representing, networking and transferring knowledge among distributed individuals. However, despite emergent technological opportunities, knowledge sharing and knowledge creation in virtual collaboration environments comes with special challenges. Physical distance of team members, cultural diversities and dependence on information technologies complicate knowledge processes (Aritz, Walker & Cardon, 2018; Fiol & O’Conner, 2005; Klitmøller & Lauring 2013). As previous research shows, virtual teams find it harder to overcome social distance between team members and to uncover the team’s existing knowledge. As a result, exchange and generation of new knowledge in virtual environments may be more prone to errors and takes more time (e.g. Hayward, 2002; Kauppila, Rajala & Jyrämä, 2011). Virtual teams are thus in a field of tension between growing needs and technological opportunities for virtual knowledge integration on the one side and social challenges of managing knowledge processes over physical, social and cultural distances on the other side. In order to reach effective knowledge processes in virtual teams, both sides, technology and social processes, need to be considered and managed simultaneously.

Although some studies on knowledge processes in virtual teams exists, the field of research is very heterogeneous and lacks of a common and integrative basis (see Fang et al. 2014). Current studies and contributions originate from various domains, especially team performance management, human-computer interaction, knowledge management, organizational learning and innovation management. Most of these contributions considering a one-sided perspective on knowledge processes
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