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Expanding the scope of application of user innovation theory—A case study of the civil-military integration project in China

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ABSTRACT

The focus of scholars studying user innovation has been restricted to the interaction between companies and individual users, and how companies can unilaterally exploit values from the value chain between companies and users. We argue that the value chain between the user and manufacturer should be a bilateral value chain in which both the user and manufacturer can conduct their own innovations and provide greater value to the whole value chain. In this paper, using examples from China's civil-military integration project, we took a step forward to apply the user innovation theory in the explanation of inter-sector technological value transfer. The main theoretical contribution of this paper is the expansion of the scope of application of the user innovation theory to inter-sector level research. Studying cases from China's civil-military integration project, we found that the concepts of user and innovator become blurred when we study the phenomenon across time. When we go beyond individual user and manufacturer and shift the focus of our discussion to the level of inter-sector technological value transfer, we will find that it is possible for organizational agents at large to be both users and innovators of technology.

1. Introduction

In his seminal work on user innovation, Von Hippel (1976) argued that industrial products that were commercially successful were usually products that manufacturers have produced in response to their perceptions of user needs but not technological advancements. Thus, manufacturers must find the means to accurately capture the needs of users to achieve commercial success. Toward this end, instead of merely focusing on the roles played by manufacturers and suppliers in the cycle of product innovation, Von Hippel (1976) called for more scholarly emphasis to be given to the role of users in the cycle and their capability to innovate.

Von Hippel (1988) argued that the entity that best understands the needs of users will invariably be users themselves. To better meet their own specific needs, users can create their own products or making changes to existing products (Chen & Chen, 2007; Von Hippel, 1976). That is, users can engage in user innovation when their needs cannot be fulfilled by

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products available in the open market. Thus, other than manufacturers and suppliers, Von Hippel (1988) proposed that users are also an important source for innovation. In contrast to the traditional perspective on innovation in which users are merely passive consumers of innovations made by such industrial agents as manufacturers and suppliers, the users have the capacity to become active innovators under the perspective of user innovation.

Over the years, the focus of scholars studying user innovation has been restricted to the interaction between companies and individual users, and how companies can unilaterally exploit values from the value chain between companies and users (Baldwin & Von Hippel, 2011). By value, we refer to the utility that an agent can derive from the consumption of a product or the use of a technology (Blanchard, 2009; Yan, 2001). For example, how the effective identification of lead users can become a source of competitive advantage for companies in the telecommunication market (Chen, Tong, & Xu, 2003); how companies can effectively locate innovative users and exploit user innovation (Baldwin & Von Hippel, 2011; Franke, Von Hippel, & Schreier, 2006); and how companies can effectively motivate and collect innovations from users to become the inputs for their own manufacturer innovation processes (Jing, 2014).

Essentially, what scholars studying user innovation had done over the years was find the effective means for companies to push the duty to innovate to the users and how they can effectively exploit the benefit of user innovation for their own commercial success. We argue that such a perspective on user innovation has deviated from the theory's initial focus on how users can create products that have greater value with their own innovation. In addition, it has also unnecessarily limited the scope of application of user innovation theory to the unilateral transfer of values from the user to the manufacturer.

We argue that research on user innovation theory should not only be restricted to the study of how companies can exploit the innovation of users for their own commercial success. We argue that the value chain between the user and manufacturer should be a bilateral value chain in which both the user and manufacturer can conduct their own innovation and provide greater values to the value chain as a whole. Toward this end, we will use the case of the civil-military integration project of China's central government to illustrate the possibility of a bilateral value chain in which both the manufacturer and user can become the “user” and “innovator” of a product.

The civil-military integration project was initiated by the central government of China in the late 1970s to optimize the resource allocation structure of the country's civil sector and military sector (Lu, 2007; Shu, Xie, & Wang, 2010). The project's aims are to bridge the independent economic systems of the two sectors, promote inter-sector mutual transfer of technology, and develop technology that can be used by agents from both sectors (Huang, Tan, & Huang, 2016).

Since its initiation, the civil-military integration project has been progressing very slowly due to such obstacles as the main stakeholders' lack of motivation to actively participate (Huang, Ng, Tan, & Huang, 2016). We chose the case of civil-military integration as the focal topic of this paper's discussion because observations of the recent interactions between the two sectors indicate that certain technologies that were transferred from agents of the military sector to agents of the civil sector in the past were improved by the latter with their own user innovations, and these improved technologies were then transferred by agents of the civil sector to agents of the military sector (Jiang & Li, 2007). As will be discussed, we argue that in the case of the civil-military integration project, the role played by agents from the military sector was analogous to the manufacturer of technology, and the role played by agents from the civil sector was analogous to the user of technology. Thus, when agents of the civil sector improved the technology that they received from agents of the military sector, it was analogous to the case of user innovation. Given this, we chose the case of China's civil-military integration project for this paper's discussion because it is an excellent exemplar of the arguments that we brought forward in this paper.

Aims of research

In this paper, we aimed to contribute to the literature in two ways. First, we argue that the cause for scholars to oversee the bilateral value chain between the user and manufacturer is because they have tended to focus on the interactions between agents at the individual-corporate level. As will be discussed, if we go beyond the individual-corporate level and examine the interactions between users and manufacturers at the inter-sector level, it is possible for the boundary between manufacturer and user to blur, and both parties can be the “user” who consumes a product or the “innovator” who creates or make changes to the product. To the best of our knowledge, this paper represents one of the few pioneering articles that argued for the existence of a bilateral value chain between the user and manufacturer of a product, and this paper is one of the first few articles that applied the user innovation theory to explain macro-level inter-sector phenomenon.

Second, there is a lack of literature that studies the technological value chain between the civil sector and military sector. The literature available in the open press is usually focused on the short-term value exchanges between agents from the military sector and civil sector. For example, Lewis-Fleming and Knapp (2009) discussed their experiences in the medical conference that civilian doctors conducted with military doctors. Schulman et al. (2010) studied the effects of the training courses that civilian doctors conducted for frontline military doctors. Felton (2015) discussed the role that the United States Air Force could play in humanitarian operations.

However, as will be discussed, in the context of China, since the initiation of the civil-military integration project, the civil sector and military sector in China have been engaging in technological value transfer. Such long-term interaction between agents from the civil sector and military sector has yet to receive enough attention in the mainstream literature. We aim to fill this gap in the research.

Third, in the history of many countries, technological values are usually transferred unilaterally from the military sector to the civil sector (Li, 2010). For example, mobile phones and commercial aircrafts were created by the civil sector based on the