



Perceived Usefulness and Perceived Ease of Use of New Technologies Described by Chinese Textile and Apparel Firm Owners and Managers

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Technological advancement has fundamentally changed the nature of the textile and apparel (T&A) industry during the past three major industrial revolution eras. Industry experts warn us the new industrial revolution is coming, which is called, Industry 4.0 (Lasi & Kemper, 2014). Industry 4.0 heavily relies on cyber-physical systems, Internet of Things, and cloud computing, and is expected to lead to the digitization, informatization, and intellectualization of all industrial activities, including textiles and apparel (Wang & Ha-Brookshire, 2018). However, the much of current T&A industry is still concentrating on mechanical mass production and intensive labor. This indicates that the T&A industry might be late to accept new technologies, making it, perhaps, slow to respond to the potential Industry 4.0. In this light, researchers argue that further research is necessary to assess T&A firms' technology acceptance behavior.

Technology Acceptance Model (TAM) (Davis, 1989) is one of the most well researched models to explain users' technology acceptance behavior. It shows that perceived usefulness (PU) and perceived ease of use (PEOU) are two fundamental determinants of users' technology acceptance: PU refers to the subjective prospect that specific technology will increase the user's job performance when accepted, and PEOU refers to the extent to which the user considers that making use of specific technology would be effortless and hassle free. Although TAM is a useful framework, it has been mostly applied to and tested in end-user consumer settings, rather than organizations' or firms' environments (Davis, 1989). In fact, to our knowledge, there are no reliable or valid scales to measure PU and PEOU at the firm level, making it difficult to assess what determines T&A firms' acceptance of new technologies.

Given the lack of previous studies in measuring firms' technology acceptance behavior, an exploratory qualitative research method, specifically semi-structured in-depth interviews, was employed (Creswell & Clark, 2010). The Chinese T&A industry was explored in this study, not only because that China has the largest trade volume of T&A products in the world, but also it has a huge number of firms that need critical technology upgrades (Zhang, et al., 2016). After approval of Institutional Review Board, a total of 13 firm owners/senior managers from 13 different Chinese T&A firms, covering various firm sizes, ownership types, supply chain functions and products, were interviewed in 2017. Theme saturation occurred by the 10th interview. All the interviews were conducted via online video conferences, lasting from 30 to 60 minutes respectively. Interview questions included "If you think new technology is 'useful' to your firm, what do you mean by that?" and "If you think new technology is 'easy to use' in your firm, what do you mean by that?" to uncover in-depth meaning of PU and PEOU from the participants' point of view. Interviews were transcribed and translated from Chinese to English. The researchers reviewed the data together to reach the 100% consensus of theme interpretation.

Overall, two major themes of PU were emerged. The first theme of PU of new technology was cost saving, which was associated with reduction in (a) resource use (e.g., “it can reduce the amount of workforce”); (b) work time (e.g., “it can shorten working time”); and (c) human mistakes (e.g., “it can reduce working mistakes”). Second, performance enhance was emerged as another key salient component of the new technology’s PU, including increase in (a) financial performance (e.g., “it can gain more profit”); (b) market performance (e.g., “it can enlarge business size”); and (c) internal firm performance (e.g., “it can increase productivity”).

Three themes were generated as key salient components of new technology’s PEOU. First, little or no resource requirement for (a) skills or training (e.g., “employee can use it without training, or with very little training”); (b) human resources (e.g., “no need to hire new employee to use it”); (c) infrastructure (e.g., “it fits with existing infrastructure”); and (d) financial resources (e.g., “it fits with firm’s financial capacity”) was evident. Second, a theme of smooth adaption emerged described by (a) high adaptability (e.g., “employees can be master and adapt to it quickly”) and (b) high compatibility (e.g., “it is compatible to the current technology in a firm”). Third, easy usability surfaced as the third theme, including (a) easy manageability (e.g., “it must be easy to get the technology to do its work”); (b) intuitive interactive interface (e.g., “interactive interface must be clear and understandable”); (c) excellent after-sales service (e.g., “technology provider must give adequate customer service”); and (d) easy maintainability (e.g., “it must be easy to maintain normal working”).

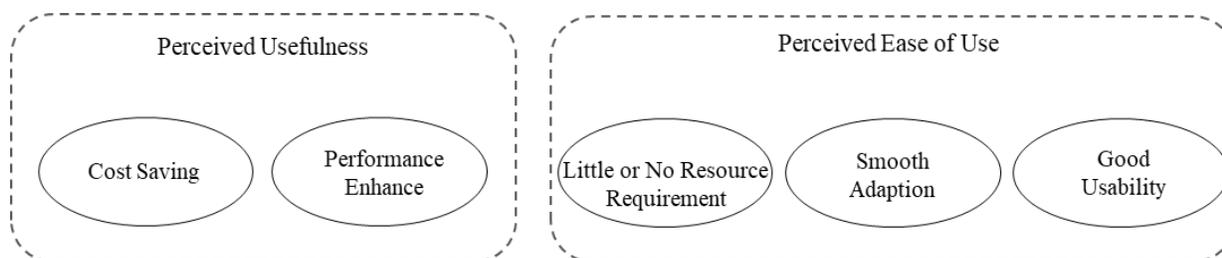


Figure 1. Themes Emerged from the Study Data

The study results show unique salient components of the concepts of PU and PEOU. These are different from Davis’s (1989) PU and PEOU scales developed for consumers’ technology acceptance. For example, key themes of PU discovered in this study were related to firm performance, rather than consumers’ operating performance in original TAM. The themes of PEOU in this study emphasized effortlessness of technology usage with easy interactions between firm’s resources, employee skills, and technology infrastructure, whereas Davis’ TAM did consumers’ physical and mental effortlessness. The study findings highlight the need for new ways to measure PU and PEOU that could successfully assess T&A firms’ determinants of new technology acceptance, which will further develop appropriate TAM at the firm level. Future empirical research is recommended to test and verify the salient components of PU and PEOU.

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