

Chapter 37

Technology Innovation Adoption Theories

Omar Ali

University of Southern Queensland, Australia

Jeffrey Soar

University of Southern Queensland, Australia

ABSTRACT

Increasing the adoption of Information Technology (IT) is one potential means for strengthening national economies through enhancing productivity; there is a need for theoretical models to assist the development of national strategies to achieve this end. Theories for adoption models at the entity and the firm level used in Information Systems (IS) literature are discussed in this chapter. A detailed study of the major theories was undertaken along with reviews that compare more than one theory. Independent and dependent variables and the empirical literature are considered in this analysis.

INTRODUCTION

Innovation is a significant business challenge (Hamel 2002), it is seen as increasingly essential for growth and viability (Tidd 2001) yet is a challenge for companies to know what is necessary for successful innovation (Christensen 2003).

An innovation adoption is 'the generation, development, and adaptation of novel ideas on the part of the firm' (Damanpour 1991; Higgins 1995), either as an anticipatory act to control the environment, or as a response to the environment. It can completely change the nature of an organization (Damanpour 1996) and from an IS perspective can involve new practice or operational idea (Annukka 2008; Lind & Zmud 1991). IT can affect firm productivity (Caldeira & Ward 2003; Oliveira & Martins 2011) and new technologies are developing constantly (Wang et al. 2011; Shiels, 2003; Alam & Noor, 2009).

This chapter explores theories of industrial innovation and the diffusion of innovation literature:

- **Theories of Industrial Innovation:** This includes innovations, fresh thoughts and artefacts, plans, behaviour, or impacts of artefacts that are fresh for the industry or the public (Abernathy & Clark 1985; Christensen 1992a, 1992b).
- **The Diffusion of Innovation Literature:** This area of research is focused on applied diffusion of innovation theory (Rogers 1990) including the reasons and progressions that can reveal the results of adoption (Fichman 1992; Lyytinen & Damsgaard 2001; Prescott & Conger 1995).

Categorization of the point of innovation can be done into two classes. Firstly, service alterations in the method of manufacturing and distributing products while secondly as new things (products and services) themselves (Johne 1999). Systematization, dealings, administration technique and business models can be types of innovation (Slappendel 1996; Paap & Katz 2004). These different types of innovation relate primarily to process innovation. Innovation can be distinguished by aggregation level. Innovation can take place at many different levels such as an individual level (improvement), at functional level (process improvement or adaptation), at company level as an entire value chain (product and service innovation, new business models), and at industry level (technology breakthroughs) as systems of innovation (Edquist 1997).

The adoption and implementation of new innovations is explored in the study of the diffusion of innovations (Rogers 2003) which draws on sociology and psychology (AlQaisi 2009). Challenges are associated with the implementation of new technologies as reflected in IT/IS innovation adoption studies (Jeyaraj et al. 2006; Korpelainen 2011).

Innovation adoption can be studied from both the individual and firm levels (Slappendel 1996); the concept of innovation first started to appear in the 1950's (Zaltman et al. 1973) and was accelerated by new communication technologies in the 1980s (Van De Ven & Rogers 1988).

Fifty types of adoption of IT innovations theories were identified by Williams et al. (2009). These included Technology Acceptance Model (TAM) which is the best-known theory and the Diffusion of Innovation (DOI) theory. The next most popular theory was the Theory of Planned Behaviour (TPB) and this was followed by the Theory of Reasoned Action (TRA).

This chapter explores disruptive innovation and its barriers, the significant theoretical models at the individual and the firm level in IT/IS literature, and the empirical studies used in predicting and understanding the adoption of technology innovations.

DISRUPTIVE INNOVATION

Innovation is a key to competitive advantage, it can increase uncertainty and create market pressures (Lettice & Thomond 2002). The more radical the innovation, the more difficult it is to estimate its market acceptance and potential (Lettice & Thomond 2002). The increasing complexity and market dynamics create a knowledge gap between theory and practice. Many companies are not organized to give new ideas a chance, to recognise trend breaking points in the market, to adapt quickly to changing market circumstances, or to cause market changes in the first place (Markides 1999). A chain of preceding technological innovation studies served as foundations for disruptive innovation which was developed by Christensen (1997, 2006); Christensen and Bower (1996); Christensen and Raynor (2003).

38 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:
www.igi-global.com/chapter/technology-innovation-adoption-theories/196707

Related Content

Ambient Learning Conceptual Framework for Bridging Digital Divide in Higher Education

Simon Nyaga Mwendia, Peter Waiganjo Wagacha and Robert Oboko (2016). *Human-Computer Interaction: Concepts, Methodologies, Tools, and Applications* (pp. 417-446).

www.irma-international.org/chapter/ambient-learning-conceptual-framework-for-bridging-digital-divide-in-higher-education/139047

Promoting Human-Computer Interaction and Usability Guidelines and Principles through Reflective Journal Assessment

Tomayess Issa and Pedro Isaias (2016). *Human-Computer Interaction: Concepts, Methodologies, Tools, and Applications* (pp. 1551-1570).

www.irma-international.org/chapter/promoting-human-computer-interaction-and-usability-guidelines-and-principles-through-reflective-journal-assessment/139106

Moving Object Detection and Tracking Based on the Contour Extraction and Centroid Representation

Naveenkumar M, Sriharsha K. V. and Vadivel A (2019). *Advanced Methodologies and Technologies in Artificial Intelligence, Computer Simulation, and Human-Computer Interaction* (pp. 147-157).

www.irma-international.org/chapter/moving-object-detection-and-tracking-based-on-the-contour-extraction-and-centroid-representation/213124

What-If Analysis on the Evaluation of User Interface Usability

Saulo Silva, Mariana Carvalho and Orlando Belo (2020). *Interactivity and the Future of the Human-Computer Interface* (pp. 50-71).

www.irma-international.org/chapter/what-if-analysis-on-the-evaluation-of-user-interface-usability/250745

A Conceptual Framework of RFID Adoption in Retail Using TOE Framework

Mithu Bhattacharya and Samuel Fosso Wamba (2018). *Technology Adoption and Social Issues: Concepts, Methodologies, Tools, and Applications* (pp. 69-102).

www.irma-international.org/chapter/a-conceptual-framework-of-rfid-adoption-in-retail-using-toe-framework/196673