



Bandwagon and leapfrog effects in Internet implementation



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ABSTRACT

This paper underscores the critical relationship between innovation adoption and innovation implementation, particularly how two contrasting effects—bandwagon and leapfrog—relate to organizational Internet diffusion. Bandwagon effects, adopting a technology due to fad and fashion, accelerate adoption but often lead to ineffective technology implementation. Leapfrog effects, however, attenuate adoption and often lead to effective technology use relative to early adopters. Drawing on and combining related Malaysian hospitality studies, this paper illustrates these two effects and extends the literature by showing that early, and late, adoption can relate positively to successful Internet implementation. In addition, the findings complement and question literature suggesting that business websites evolve through predictable linear patterns, and that adopter categories differ in innovation implementation styles.

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1. Introduction

Network values in Metcalfe's Law, cost and space reductions with Moore's Law, converging technological devices and social media are fuelling explosive communication growth and change (Anderson and Wolff, 2010; Hanson and Kalyanam, 2007). Scholars have investigated how businesses use emerging communication technologies, such as the organizational diffusion of websites, for decades. Importantly, diffusion research distinguishes between adopting an innovation, and implementing that innovation. Despite the importance of organizations actually using a technology, adoption research is mature relative to implementation research (Fichman, 2004; Jeyaraj et al., 2006).

Early or widespread adoption of an innovation may not correlate with successful implementation. Whereas the adoption of a website seems a one-off decision, website implementation never stops. Business websites typically evolve from simple brochures to sites with transactions and personalization (Teo and Pian, 2004). Four proposed website stages in 2007 were static publishing, dynamic selection, e-commerce and personalized information (Hanson and

Kalyanam, 2007). However, two contrasting effects—bandwagon and leapfrog—alter these logical and phased models.

Adoption driven by fad and fashion rather than logic, a bandwagon effect, often attenuates technology use (McBride, 1997). Businesses that follow this adoption approach do not use the technology or use it ineffectively, such as when hotels offer poor responses to customer email queries (Gherissi-Labben et al., 2003; Murphy et al., 2007a,b). In contrast to bandwagon effects, leapfrog effects associate with late adopters who surpass early adopters in organizational technology use (Davison et al., 2000). Rapid generational technology change, such as the explosion of social media, can lead to leapfrog effects (Kauffman and Techatassanasoontorn, 2009; Stremersch et al., 2010). Seemingly laggard hotels, for example, could skip having a website and launch their digital marketing efforts with a strong Facebook presence (Anderson and Wolff, 2010).

Insights into bandwagon and leapfrog effects should help critique and understand technology adoption, technology implementation and the pro-innovation bias in diffusion research (Jeyaraj et al., 2006; Rogers, 2003). Both effects illustrate the importance of considering implementation prior to the adoption decision. In addition to scant mention of bandwagon and leapfrog effects (Ismail et al., 2012), many website studies have two limitations.

Firstly the study populations tend to ignore businesses yet to adopt websites; the population is right-censored. Similar to non-respondents in survey research, omitting businesses yet to adopt websites gives an incomplete view of diffusion. A leading US hotel

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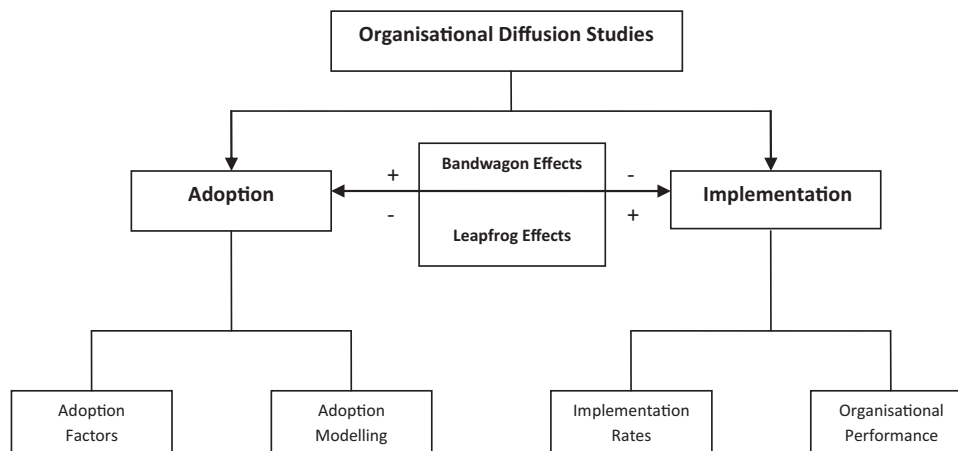


Fig. 1. Organizational innovation diffusion studies.

technology study, for example, probably investigated a subset of hotels, those early to adopt (Siguaw et al., 2000). A hotel study last century (Murphy et al., 1996) may include just two of Rogers' (2003) five adopter categories, innovators and early adopters, and omit later adopter categories.

This right censoring often leads to a second limitation of many website studies, poor estimates of total market size and adopter categories. Rogers (2003) models adoption as a normal distribution across five categories: *innovators*, the first 2.5% to adopt an innovation; *early adopters*, the next 13%; *early majority*, the next 34%; *late majority*, the next 34% and *laggards* are the last 16% to adopt. Although adopter categories differ in characteristics and innovation use, there is little justification that Rogers' category sizes fit all products (Mahajan et al., 1990a,b). Certain products, for example, have abnormal adopter category distributions (Peterson, 1973).

One solution to relying on statistical estimates, the coupled Bass Rogers model (hereafter the BR model) relies on actual data to calculate the proportion of adopter categories, the size of adopter categories and total market adoption. The BR model fits abnormal adopter category distributions and acknowledges the presence of late adopters yet to become part of the market, or right censoring of the data (Peres et al., 2010; Scaglione et al., 2009; Stremersch et al., 2010). This study draws on the BR results of website adoption in Malaysia's hospitality industry (Hashim et al., 2012) and configuration theory (Miller, 1996) to illustrate bandwagon and leapfrog effects.

How an innovation, such as a technology or strategy, relates to organizational performance depends upon how organizations configure that innovation (Meyer et al., 1993; Miller, 1996). What website features Malaysian hotels have, i.e., how the hotels configure their websites, suggests website performance. Comparing website adopter categories with these website configurations should therefore help illustrate bandwagon effects and leapfrog effects in technology implementation. Considering bandwagon and leapfrog effects helps businesses make reasoned technology adoption decisions and subsequently implement that technology successfully. This paper also answers calls for innovation research in tourism (Hjalager, 2010), particularly in developing countries such as Malaysia (Hashim et al., 2010).

The paper opens with a review of organizational diffusion of innovations, which provides a foundation for bandwagon and leapfrog effects. The subsequent methodology combines four related Malaysian hospitality studies of Bass Rogers adoption modeling, website content analysis, mystery email shopping and cluster analysis of website features. The cluster analysis yields four distinct configurations of website features that when compared with the

Bass Rogers' adopter categories illustrate how leapfrog and bandwagon effects relate to website adoption and performance. The paper closes with implications, limitations and future research.

2. Literature review

2.1. Organizational diffusion

At the turn of the 20th century, French sociologist Gabriel de Tarde discussed society's acceptance and rejection of innovations (Kinnunan, 1996). Diffusion research continued during the 1940s and 50s as studies in anthropology, education, public health and medical sociology, marketing, management, communication and sociology (Rogers, 2003). Everett M. Rogers' 1962 book *Diffusion of Innovations*, the most cited work in innovation research (Jeyaraj et al., 2006), notes innovation diffusion at the individual and organizational level. Organizational diffusion, the focus of this study, examines characteristics related to the adoption and subsequent implementation of innovations as shown in Fig. 1.

2.2. Adoption studies

Organizational adoption studies, far more popular than implementation studies, tend to focus on modeling adoption and factors related to adoption (Fichman, 2004). A meta-analysis of diffusion of innovation (DOI) studies identified three common factors—organizational, innovation and environmental—in business innovation adoption (Jeyaraj et al., 2006). Thanks in part to half a century of research, adoption factor studies are reaching maturity and conclude that individuals and organizations with "greater innovation-related needs and abilities, or the Right Stuff, are more likely to adopt an innovation than those with less needs and abilities (Fichman, 2004, p. 315)".

Adoption modeling studies examine adoption rates and adopter categories (Bass, 1969; Mahajan et al., 1990a,b). A study of American Online users, for example, found that innovators preferred content-based information while laggards preferred interpersonal information (Stafford, 2003). Those early to adopt sought content; those late to adopt sought people.

At the organizational level, the website configuration of medium-large US and Singapore firms differed significantly in terms of features between early and late adopters (Teo and Pian, 2004). The late adopter websites offered basic company and product information, feedback forms, email and simple search. In addition to these basic offerings, early adopter websites included business integration and transformation features such as

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