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Dynamic isomorphism: IT adaptation of the bandwagon followers

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Abstract

Firms often mindlessly adopt IT due to institutional pressure, which often leads to hastened and irrational decisions. Institutional pressure is therefore often considered as a negative effect on IT adoption. That is because little literature investigates into the adaptation effect after IT adoption due to institutional pressure. We advocate that institutional pressure indeed has a catalyzing effect on IT adoption in general, but firms can still mindfully correct the hastened decisions into a competitive advantage over time. We call this phenomenon dynamic isomorphism, which describes the IT adaptation process after institutional pressure. We propose to investigate in dynamic isomorphism by the use of a cross-case analysis, as it can provide an in-depth explanation of the proposed phenomenon.

Introduction

Information technology is often used in firms to enhance performance and to gain competitive advantages. The technology itself cannot help to gain competitive advantages, but the way of utilizing IT can develop capabilities that are unique to a firm and hence these capabilities can lead to a competitive advantage. The resource based view is a theory which discusses that capabilities make firms unique and can develop sustained competitive advantages [1]. This theory is especially applicable in the IS context, as IT on itself is easy to replicate by competitors, but the innovative usage of IT can lead to sustained competitive advantages [2].

Obviously, rational firms will always utilize IT in such a way that it is economic beneficial to the firm. However, often institutional pressure can drive

firms to make irrational decisions [3], e.g. firms need to stay abreast and develop a web presence or adopt RFID because of a mandate proposed by a customer. These sporadic decisions can lead to disappointing firm performance [4]. Institutional pressure is therefore often seen as a phenomenon that has a negative impact on firms.

The mindfulness theory proposes that often companies make mindless decisions under institutional pressure [5]. Mindless decisions are described as decisions that do not take the firm's facts and specifics into account, whilst mindful decisions do take the firm's facts and specifics into account. These mindless decisions can lead to a stagnation of IT adoption and less than expected benefits [4]. However, mindless firms can mindfully review the IT adoption and adjust it according to their firm's facts and specifics [5]. After all, the firms get to better know the technology and have more cases to reference to.

We propose that institutional pressure can lead to mindless decision making, which can lead to isomorphism. However, firms with isomorphic behavior can gradually over time mindfully evaluate the mindless decision and develop capabilities that are beneficial to the firms. For now we call this phenomenon 'dynamic isomorphism'. Thus dynamic isomorphism describes how the firm adapts to a new technology, which is adopted due to institutional pressure. In that sense, dynamic isomorphism does not necessarily lead to a negative consequence, as it ushers firms to adopt and test a technology. The benefits remain elusive at the beginning, but they can be discovered at a later stage.

Literature review

Institutional theory

IT is seen by many as an enabling factor, which can create new business opportunities. As a matter of fact, IT innovation can actually lead to a sustained competitive advantage [2]. The IT artifact on itself is easy to imitate. However, the capabilities that firms develop to effectively use the IT artifact are difficult to duplicate. For instance, ERP systems are readily available for purchase, but many firms failed to successfully assimilate ERP due to the lack of capabilities [6].

However, firms do not always make rational decisions. Social and organizational pressure can lead to less than rational decisions [7]. Authors like [8], for instance, discussed that firms react differently to similar changes under different environments. The different reactions are a consequence of the institutional pressure under different environments, suggesting that institutional pressure often affects the rational decision [9]. Furthermore, the lack of capabilities can lead to isomorphic behavior, as firms start to mimic each other due to coercive pressure. Studies suggest that firms using popular techniques due to institutional pressure do not exhibit a higher economic performance [10]. Moreover, [11] argues that in the long term the competitive advantage with the IT innovation decreases and the competitive advantage dissipate. Therefore, the literature suggests that institutional pressure and isomorphism in particular can have a negative impact on the results of the IT innovation.

Mindfulness

Firms can either innovate with IT mindful or mindless [5]. Mindful organizations evaluate technologies firms evaluate technologies to verify whether it fits the firm's environment, whilst mindless firms innovate with IT disregarding the technology fits their firm or not. Mindfulness

especially occurs when a technology has promising perspectives, as a bandwagon effect might be created [12], leaving firms with a notion that they have to adopt the new technology to stay abreast. Firms act mindlessly where firms jump on the technology bandwagon without evaluating whether the technology implementation fits the firms. However, past IT innovation showed that firms tend to move from mindless to mindful when they get more acquainted with the technology and more successful cases are apparent [5].

The relevancy of the mindfulness theory has been emphasized by several authors. Fichman [13] proposes that technological innovation not only depends on perceived benefits or the innovational characteristics, but he argued that mindfulness is a key moderator for the aforementioned factors to influence technological innovation. Butler and Gray [14] argue that mindfulness is required to achieve reliable outcomes out of our current "complex and fragile" systems. Thus being mindful is basically a pre-requisite for being successful in a complex IS environment.

Dynamic isomorphism

Institutional theory suggests that coercive pressure can lead to isomorphism. Moreover, isomorphic IT innovation might initially lead to competitive advantages, but in the long term these competitive advantages will dissipate. We argue that this is not necessarily true, as the mindfulness theory suggests that mindlessness can turn into mindfulness and vice versa in each IT innovation process. Thus albeit a firm mindlessly jumps on the bandwagon and mimics the competition, the firm can still break free from mindlessness and change the IT innovation into a mindful one in a later stage. Swanson and Ramiller [5] argue that IT innovation gradually gets more mindful as the IT innovation matures, as the firm and the environment get more familiarized with the IT innovation and can make better judgments on how the IT innovation can bring them competitive advantages.

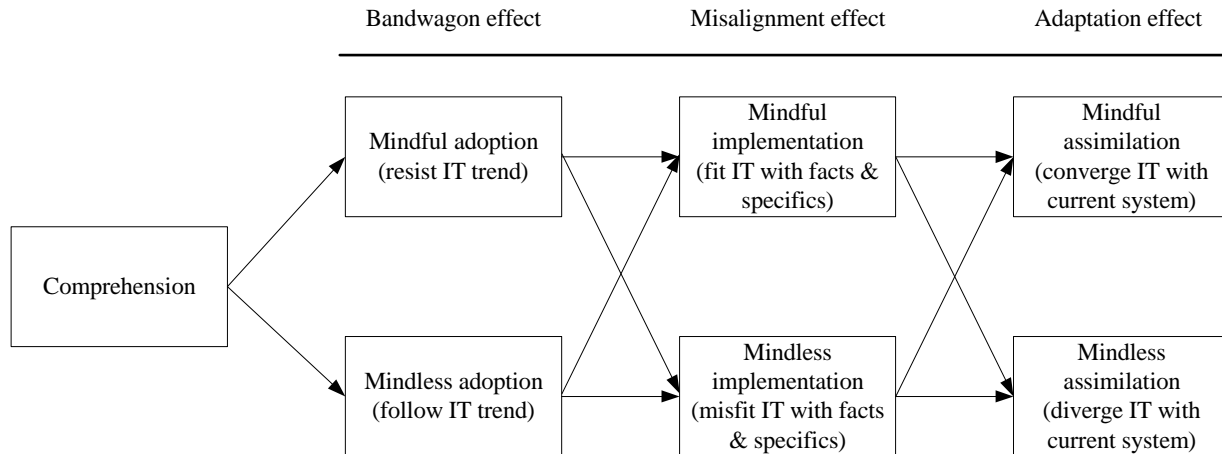


Figure 1. Mindfulness effects of innovation of IT (extracted from [4])

In IT innovation, firms first familiarize themselves with a new technology (see Figure 1). The coercive pressure can be felt during the adoption phase, where firms decide whether the technology should be adopted or not. The mindful firm, will not adopt the technology blindly and will consider whether the technology suits the firm. The mindless firm, tend to decide to jump on the bandwagon to stay abreast. Subsequently, the firm can either mindfully or mindlessly implement the technology. At this phase the mindful firm investigate whether the technology fits their facts and specifics, whilst the mindless firm implement the technology disregarding the firm’s facts and specifics. Finally, the firm needs to adapt to the new technology, where the mindful firm find a synergy between the firm’s system and the new technology and whilst the mindless firm does not. Thus firms need to develop capabilities to utilize the technology or the technology needs to be designed in such a way that it complements the existing capabilities.

Wal-Mart, for instance, were one of the pioneer in RFID technology. They used RFID to revolutionize their supply chain visibility by requiring their key suppliers to attach RFID to the shipping cases and pallets in 2004. This is a prime example of a mindful technology innovation [4] where the technology is used to enable better supply chain performance. This resulted in abilities to reduce out of stock by 21% and achieve up to three times faster replenishment for out of stock orders [15]. Wal-Mart is in 2010 still seeking to improve their supply chain by expanding their RFID applications.

The top suppliers of Wal-Mart, on the other hand, had to adopt RFID due to the coercive pressure of Wal-Mart’s mandate. Numerous top suppliers were mindlessly adopting RFID and used a ‘slap and ship’ approach, where the suppliers just attach RFID tags to the shipping pallets and cases before shipping to Wal-Mart’s facilities [16]. This approach is strictly for meeting the mandate and brings no additional benefits to the supplier.

Shaw Industries were also one of Wal-Mart’s suppliers, who had to subject to the RFID mandate. They mindlessly used the ‘slap and ship’ approach initially. However, in 2007 Shaw industries got more familiarized with the technology and adapted and redesigned the RFID application in such a way that it also improves the internal processes. The mindful adaptation process led to improved shipping accuracy, shorter lead times, and better customer services [17]. This example illustrates that coercive pressure catalyzes firms to use a certain technology and when dealt wisely the technology can lead to comparative advantages over time.

We therefore propose in this study to investigate the adaptation process and the firm’s performance after an isomorphic IT innovation. We call this dynamic isomorphism for now. We argue that institutional pressure can stimulate IT innovation and firms can create competitive advantages after an isomorphic IT innovation. As a matter of fact, we believe that firms can develop a sustained competitive advantage after an isomorphic IT innovation.

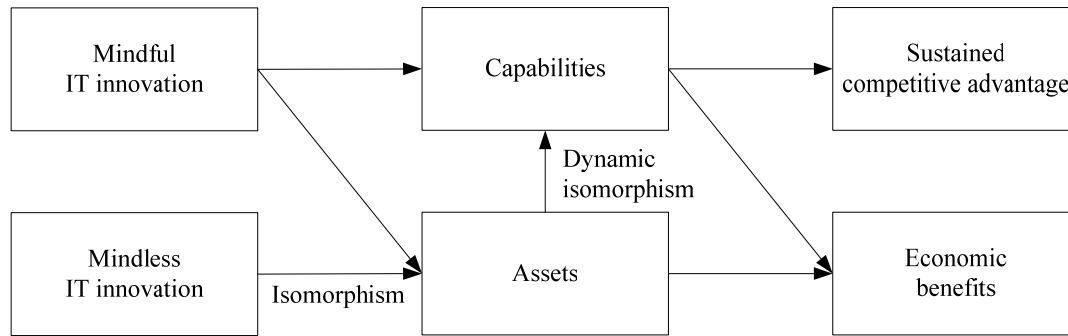


Figure 2. Dynamic isomorphism in IT innovation (Based on [5])

Rational decisions and mindful IT innovation can have a positive effect on assets and capabilities, e.g. the Wal-Mart case. Assets can provide short term economic benefits, but can be easily copied by competitors. Capabilities, on the other hand, can provide sustained competitive advantage, as it is hard to imitate and can therefore provide long-term economic benefits [2], see Figure 2. We propose that mindless IT innovation due to institutional pressure, causes firms to isomorphically invest in certain technologies. These technologies are assets in Figure 2. Naturally these assets do not lead to competitive advantages per se, e.g. the ‘slap and ship’ approach. After all, the technology needs to be assimilated in the existing or new system. In other words, in order to create a competitive advantage out of a isomorphic technology innovation, the firm needs to develop matching capabilities to utilize the assets (dynamic isomorphism), e.g. the Shaw industries case. The right combination of capabilities and assets can contribute to a competitive advantage. In general, the assets are fairly easy to obtain. However, the capabilities are more difficult to mimic [2] and using the general assets without having the appropriate capabilities can lead to disappointing outcomes [4]. When these capabilities, and less likely the assets, can satisfy the VRIN (Valuable, Rare, In-imitable, and Non-substitutable) criteria, the IT innovation can lead to a sustained competitive advantage [18].

We therefore propose that at an early stage of dynamic isomorphism (institutional pressure) has a direct positive relationship on the assets, as the firm directly invests in the technology. The dynamic isomorphism in a later stage can contribute to the firm’s capabilities, as the firm gets familiarized with the technology and develop competences to use the assets.

Methodology

Dynamic isomorphism is a newly proposed concept, which has not been tested before and is based on the nascent mindfulness theory. Albeit the mindfulness theory has been much discussed, little to no research provided any empirical support. We therefore propose to use case studies to investigate dynamic isomorphism in-depth. The case study methodology is well suited for our research, as it can bring out problems and unforeseen elements of dynamic isomorphism. Moreover, case studies can provide information for a specific context and can eventually propose nascent theories [19].

For this study we will investigate into a recent much discussed topic, namely RFID. This technology has surely created the bandwagon effect, as it is heralded as the silver bullet for supply chain management. Wal-mart and other large retailers started the RFID inertia in 2004 and many experts envisaged large benefits because of the RFID. Leung et al. [4] investigated in the RFID adoption and suggest that RFID indeed created a bandwagon effect and many firms are currently mindlessly adopting RFID due to institutional pressure.

Moreover, we include large enterprises and SMEs in our case studies, as the mindfulness theory suggests that large companies tend to make more mindful decisions, which can quicken the dynamic isomorphism process [5]. We consider firms with less than 50 employees as SME and for manufacturers the cutoff point is at 100 employees. Moreover, we investigate both the technology leaders and the followers, in order to investigate whether it affects the competitiveness. We consider firms adopting RFID between 2004 and 2005 as pioneers and firms adopting RFID after 2005 as followers [4], see Table

1. We intend to find at least one case study in each cell of Table 1, which fits in the recommended number of case studies, four to ten, as proposed by [20].

Table 1. Proposed cases

	Pioneers	Followers
Large enterprises		
SMEs		

A semi-structured questionnaire will be developed to probe for dynamic isomorphism. Moreover, case studies have the advantage to look into the phenomenon in-depth, which in our case include: why firms mindlessly adopt new technologies, why firms are hopping on bandwagons, what the major factors are for successfully shifting from mindless to mindful, and what type of firms are more prone to mindlessness.

Discussion

This study investigates in dynamic isomorphism, the longitudinal effect of institutional pressure and the subsequent adaptation effect after an isomorphic IT innovation. We propose that institutional pressure does not necessarily reduce competitive advantages over time, as discussed by existing literature. As a matter of fact, institutional pressure can have a positive effect on a firm's assets at the early adoption and implementation processes of IT innovation, and over time a firm can develop capabilities to supplement these assets in the adaptation process. These capabilities can lead into sustained competitive advantages. Dynamic isomorphism is already apparent in RFID adoption, where Wal-mart's suppliers are starting turn the RFID mandate into their own competitive advantages.

We believe that dynamic isomorphism contributes to the IT innovation literature. It explains how institutional pressure can lead into sustained competitive advantages, while the literature usually discusses how competitive advantages can create institutional pressure [12]. Besides, it extends institutional theory by including a longitudinal aspect. Finally, this study is one of the first to empirically test the mindfulness theory.

This study does not only try to provide insights to academicians, but also provide managerial

implications. Managers often need to make quick decisions whether to adopt new technologies or not. Often these decisions determine the destiny of the technology assimilation and acceptance. However, dynamic isomorphism proposes that decisions and expectations can be adjusted over time. Moreover, IT adoption should be considered as a learning process and companies should not be discouraged by initial deployments, as firms should learn from the lessons and transform the knowledge into capabilities, which can lead to sustained competitive advantages.

One of the limitations of this study is that it focuses on RFID. This limits the study's applicability in other technical contexts. However, we believe that RFID is a prime example of a recent technology that has caused a bandwagon effect and poses institutional pressures on many firms. We therefore stimulate other researchers to investigate in the applicability of dynamic isomorphism in for other technologies. Moreover, case studies will be used and therefore only limited firms are analyzed. However, dynamic isomorphism is a proposed nascent concept based on mindfulness, which has not been empirically tested yet. We therefore advocate that a more in-depth analysis of the phenomenon would be beneficial to get a both better understanding of mindfulness and dynamic isomorphism. This way the study can provide a better foundation for further research and ensure that it reflects the actual way of reacting upon institutional pressure.

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