

12-15-2013

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Bui, Quang "Neo", "What is being Reinvented? Toward a Conceptual Model of Reinvention" (2013). *DIGIT 2013 Proceedings*. 10.
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WHAT IS BEING REINVENTED? TOWARD A CONCEPTUAL MODEL OF REINVENTION

Completed Research Paper

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Abstract

Reinvention is a key process in innovation diffusion, but often underexplored compared to other innovation concepts. Several theoretical issues emerge, such as the perception of a reinvention black box, or the ambiguity of reinvention processes. This theoretical paper looks into those issues, specifically focusing on the nature of the reinvented innovation, and the processes involved. Innovation is conceptualized to include three elements: ideas, objects, and practices. Furthermore, three prominent reinvention processes are suggested: translation, modification, and adaptation. A conceptual model of reinvention is proposed to outline the relationships between innovation ideas, objects and practices under reinvention processes over time. The paper contributes to prior studies on post-adoption behaviors, as well as general innovation adoption studies and their quest for breakthroughs and new paradigms.

Keywords: Reinvention, Innovation ideas, Innovation objects, Innovation practices, Translation, Modification, Adaptation

Introduction

Reinvention is one of the central concepts in innovation research, studied across multiple settings under various terms (Majchrzak, Rice, Malhotra, King and Ba (2000); Rice and Rogers (1980); Rogers (2003); Sun (2012)). Past studies indicate that reinvention is a key process in innovation diffusion (Hays 1996), one that can increase the likelihood of positive outcomes (Bauman, Stein and Ireys 1991; Majchrzak et al. 2000), explain the link between interorganizational diffusion and intraorganizational variations (Ansari, Fiss and Zajac 2010), and reveal insights to post-adoption behaviors (Ahuja and Thatcher 2005; Sun 2012).

Compared to other innovation concepts, reinvention is relatively understudied, leaving several theoretically significant issues underexplored. First, it is unclear what reinvention entails, as the literature offers undefined or sometimes contradicting accounts of reinvention (c.f., Ansari et al. (2010)). This ambiguity, unfortunately, creates a perception of a reinvention black box. Theoretical confusion arises, such as the debate on what is being reinvented: innovation concepts or innovation practices (Majchrzak et al. 2000). Second, the ambiguity results in a knowledge gap on how reinvention processes unfold over time into different outcomes. As many innovation studies explored post-adoption behaviors (Sun 2012) and their consequences (Jasperson, Carter and Zmud 2005), understanding the processes and mechanisms of reinvention would provide important insights on how innovation adoption leads to intended and unintended consequences.

This paper contributes to addressing those theoretical gaps by examining the nature of the reinvented innovations, as well as different processes involved. The questions of interest are:

- What is being reinvented? That is, what is the nature of the reinvented innovation?
- What are the processes involved? That is, how does reinvention unfold over time?

The phenomenon of interest is the reinvention processes carried out by the adopting organizations during their adoption and implementation lifecycle. Built on reinvention concepts found in organizational studies, Information Systems (IS) literature, and sociology, I clarify three innovation elements often being reinvented: innovation ideas, innovation objects, and innovation practices. In addition, three processes are involved throughout reinvention: translation, modification, and adaptation. Together, these concepts and processes propose a conceptual model of reinvention regarding how it unfolds and creates value over time. This theoretical paper contributes to prior innovation theories on adoption and post-adoption behaviors and provides managers exploratory insights on steps that are involved throughout the reinvention process.

Reinvention defined

For some time, innovation researchers have noticed the discrepancies in innovation adoption due to user modification. Such a phenomenon is referred to as “reinvention” and is defined as “the degree to which an innovation is changed or modified by a user in the process of its adoption and implementation” (Rogers, 2003)(p. 180). Reinvention, in general, refers to the changes made to an innovation that are different from original intentions or designs. Thus, one way to measure reinvention is to identify the number of elements in an implementation that are different from “core elements” of the innovation, features that are considered to be responsible for its effectiveness (Glick & Hays, 1991; Rice & Rogers, 1980; Rogers, 2003). For example, policy reinvention can be measured by the liberalization of existing provisions or addition of new provisions to existing laws (Glick & Hays, 1991). Others have measured reinvention as how much the adopted innovation departs from the mainstream version of the innovation as promoted by a change agent (c.f., Rogers (2003)).

Why does reinvention occur? To date, scholars have identified a plethora of reasons: better fit to organizational needs and structures, lack of know-how, insufficient instruction, attempt to simplify innovations or to clarify conceptual components, need to customize a general-purpose tool, local pride of ownership, encouragement of change agents, response to competitors’ threats, or budget constraints (Fedorowicz and Gogan 2010; Larsen and Agarwala-Rogers 1977; Rice et al. 1980). As such, there are many factors that can trigger the reinvention of an innovation. What’s more, reinvention can also occur at

many stages, not just implementation: various perceptions affect the adoption decision, different interpretation schemes drive innovation uses, or numerous ways an innovation can be adapted and aligned to organizational structures (Leonardi and Barley 2010). The implication is that reinvention can occur at a more frequent rate than one would expect.

On one hand, the frequency of reinvention draws a number of researchers from various fields to examine the phenomenon. On the other hand, due to the differences in research designs, considered artifacts, and theoretical frameworks, those studies examine reinvention under different names in an inconsistent manner (Majchrzak et al. 2000). Consequently, the reinvention literature is littered with numerous terminologies. Some examples include mutual adaptation (Leonard-Barton 1988), feasible fidelity (Bauman et al. 1991), modification (Lewis and Seibold 1993), appropriation (DeSanctis and Poole 1994), translation (Czarniawska and Joerges 1996), editing (Sahlin-Anderson 1996), adaptation (Ansari et al. 2010; Majchrzak et al. 2000), alteration and optimization (Damanpour and Evan 1984), or tailoring (Creed, Scully and Austin 2002). Table 1 shows in details how reinvention and similar terms are defined and conceptualized in the literature.

Unfortunately, such conceptual proliferation turns reinvention into a black box. Theoretical confusion arises, as illustrated below by the debate on what is being reinvented.

The debate on what is being reinvented. Innovation diffusion studies have argued that there are two innovation elements—an innovation concept and an innovation practice (Newell, Swan and Galliers 2000; Strang and Meyer 1993; Wang 2009). The diffusion process, essentially, can be considered as a process in which innovation concepts travel across organizations and are translated or objectified into innovation practices within particular settings (Newell et al. 2000). Thus, it can be argued that reinvention occurs not only to innovation practices, but also to innovation concepts.

However, empirical evidence so far has been inconsistent. While some claim only innovation practices (e.g., technology features) are changed, others argue that any structures can be modified, including both innovation concepts (e.g., technology spirit) and innovation practices (c.f., Majchrzak et al. (2000)). Further evidence is found in the innovation literature where researchers focused on the use of discursive devices and strategies to shape the course of adoption, and in the process alter the meanings and interpretations of the innovation—subsequently refreshing innovation concepts (Heracleous and Barrett 2001; Markus, Dutta, Steinfield and Wigand 2008; Munir and Phillips 2005; Sillince 2005; Zbaracki 1998).

The debate goes on, but this example shows how different conceptualizations of reinvention can dilute theoretical conclusions. To fully understand reinvention, one will need to investigate what is really being reinvented here, that is, to understand the nature of the reinvented innovation.

Table 1: Reinvention concepts in the literature

Article	Reinvention and similar terms defined	Theories used	Innovation type
Rice et al. (1980)	Reinvention is “the degree to which an innovation is changed by the adopter in the process of adoption and implementation after its original development” (p. 500-501).	Rogers’ diffusion of innovation	Any type
Blakely, Mayer, Gottschalk, Schmitt, Davidson, Roitman and Emshoff (1987)	“reinvention could occur either as an addition to the original model or as a modification of existing program components” (p. 259)	Rogers’ diffusion of innovation	Social program innovations
Leonard-Barton (1988)	Implementation is a dynamic process of <i>mutual adaptation</i> between the technology and its environment	N/A	Technology innovations
Glick and Hays	“reinvention is the modification by a user of a core innovation during the diffusion process;	Diffusion of innovation in	Policy

(1991)	[extension of innovation] is the degree of adoption of a 'constant' innovation" (p. 837)	policy research	innovation
Bauman et al. (1991)	<i>implementation loosely</i> defined as "maintain the basic integrity of a program model while matching the innovation to the unique features of the setting and the preferences/reactions of the relevant setting" (p. 623) <i>mutual adaptation</i> is a process in which "both the intervention itself and the setting were changed" (p. 623)	Rogers' diffusion of innovation	Program innovations
Lewis et al. (1993)	"Modification of the innovation ... are produced through the user's role involvement and structuring interaction. Feedback from modifications of the innovations, in turn, affects organizational structure and users' perceptions and over time produces continued variation in the form of the innovation"	Structuration theory	Program innovations
DeSanctis et al. (1994)	Appropriation is defined as "the mode or fashion in which a group uses, adapts, and reproduces a structure" (Poole and DeSanctis 1990)(p. 184).	Structuration theory, social-technology view	GDSS and advanced IT in a small group
Czarniawska et al. (1996)	Translation is viewed as "the spread in time and space of anything--claims, orders, artifacts, goods--is in the hands of people" (Latour, 1986, p. 267).	Scandinavian institutionalism	Any kind of innovation
Sahlin-Anderson (1996)	As success stories are being circulated, they go through an <i>editing process</i> . This process is a process of social control, conformism, and traditionalism. It is similar to the process of translation.	Scandinavian institutionalism	Management innovations
Hays (1996)	Reinvention "refers to purposeful changes made to innovations as they diffuse" (p. 631)	Rogers' diffusion of innovation	Policy innovation
Majchrzak et al. (2000)	"Adaptation is a process of modifying existing conditions in an effort to achieve alignment" (p. 572)	Structuration Theory	Collaborative technologies
Ferneley and Sobreperez (2006)	Workaround defined as "informal temporary practices for handling exceptions to work-flows" (p. 346)	N/A	Workplace innovations
Ansari et al. (2010)	Adaptation refers to "the process by which an adopter strives to create a better fit between an external practice and the adopter's particular needs to increase its 'zone of acceptance'...this adaptation process may involve change in how a practice is 'framed' over time...or it may involve change in the actual implementation of the practice" (p. 71)	N/A	Any innovation
Fedorowicz et al. (2010)	"Reinvention" refers to the changes or modifications made to an innovation following its adoption and the processes by which the innovation is changed by its adopters (p. 81)	Rogers' diffusion of innovation	Inter-org. IS innovation

Nevo and Nevo (2011)	Reinvention refers to “applying a specific innovation in a context other than originally intended” (p. 2)	N/A	Virtual worlds
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What is being reinvented?

Rice et al. (1980) suggested that reinvention can be categorized into three types: managerial reinvention which affects the conceptual approaches of the innovation; technical reinvention which involves changes made to technical components like hardware and specific systems; and operational reinvention which concerns changes to operational components such as innovation routines, procedures, and processes. Specifically, these types of reinvention refer to changes that can possibly be made to three innovation elements: innovation ideas, innovation objects, and innovation practices.

Innovation ideas refer to the central concepts and ideas upon which innovations are built. What make ideas novel and attractive depends on their innovativeness, or the extent that they appear more effective or efficient than the alternatives. Writing about the transfer of innovation ideas across firms, Czarniawska et al. (1996) defined ideas as “images which become known in the forms of pictures or sounds (words can be either one or another)” (p. 20). Images here include graphical as well as mental and verbal images. The important point is that in order to generate changes and actions, ideas need to be materialized (e.g., pictures can be written or painted). Once materialized, these ideas can provide theoretical models of the usefulness of the innovation, making it possible for potential adopters to evaluate and decide on the innovation (Strang et al. 1993). Thus, innovation ideas can be conceptualized as linguistic artifacts such as labels, metaphors, platitudes, or as designs such as frameworks and models.

Innovation objects are the material and physical components in the innovation. For technological innovations, that means hardware components such as CPUs, metal frames, and electronic components, as well as software components that provide rules and instructions for hardware components (Rogers 2003). Together, the hardware and software components provide adopters with functions and capabilities to solve certain problems. Those technological components are separate from innovation ideas, but not entirely independent from them. Innovation objects are real things, made by humans, and their existence does not depend on human’s perceptions (Markus and Silver 2008). As a result, the causal potential of innovation objects come from more than functionalities but also from other properties such as packaging, arrangement, and appearances.

Defined loosely, innovation practices are the implementation and use of the innovation by the adopters. They are the result of innovation ideas being materialized into local contexts, as well as the outcomes of innovation objects being used by the adopters. Innovation practices are socially constructed because of the involvement of the users, as well as materially constructed due to the uses of innovation objects. In organizational contexts, innovation practices can be conceptualized as innovation uses in situated activities—the organizational routines, processes, and structures that come about as the enactment of the innovation (Orlikowski 2000).

Implication. During the adoption process, reinvention can possibly occur to the three elements of the innovation: innovation ideas, innovation objects, and innovation practices. Depending on the nature of the innovation and the organizational contexts, reinvention processes would occur differently. Innovations that are made up from mostly objects would see more reinvention of innovation objects and innovation practices. For example, the concept of data warehouses focus on providing an enterprise-wide repository of key organizational data using central data warehouses, with the primary purposes of doing data mining. However, organizations have been reported to use data warehouses for other purposes such as decision support, system integration, and delivery of new data products (Bashein and Markus 2000). While the concept of a central data repository remains unchanged, the use of data warehouses and their configurations have been modified.

Similarly, for innovations that have a high composition of innovation ideas and concepts such as IT management innovations, reinvention will more likely occur to innovation ideas and practices rather than innovation objects. For example, Total Quality Management (TQM) involves three principles: customer focus, continuous improvement, and team work. In reality, adoption of TQM is often characterized by variation or prototypical implementation of TQM principles and practices such as the use of customer

surveys and focus groups, flow charts, Pareto analyses, statistical process control, and team building methods (Ansari et al. 2010; Westphal, Gulati and Shortell 1997). Organizations vary in how they combine these different TQM techniques—either with low or high-extensive adaptation.

Thus, to fully understand reinvention, one will need also to clarify different processes out there, besides understanding the nature of the reinvented innovation. Given the focus of this paper, in the next section, I open the black box of reinvention to identify the processes involved.

Reinvention Processes: Translation, Modification and Adaption

Reinvention can start as soon as a firm pays attention to a particular innovation idea for potential adoption and last as long as the firm continues to use the innovation. However, reinvention literature diverges and seems to focus on different stages and processes of reinvention. By engaging in different aspects of the overall reinvention process, one faces the risk of losing important insights to the organizational struggles as well as the evolution of the innovation practices for better-fit into an organization's settings. Thus, in this paper, I consider reinvention not simply as a singular event, but rather a process that spans throughout innovation adoption and implementation life cycle—from initiation to infusion (Saga and Zmud 1994; Zmud and Apple 1992).

What distinguishes reinvention and regular adoption and implementation is that reinvention focuses on the changes made to the innovation in comparison to prior adoptions (Ansari et al. 2010; Lewis et al. 1993) or to normative adoption templates (e.g., dominant designs, innovation designs promoted by change agents) (Rogers 2003). Thus, reinvention studies emphasize the processes that alter the innovation elements from the expected templates, as well as the subsequent outcomes of those processes (Ansari et al. 2010; Fedorowicz et al. 2010; Majchrzak et al. 2000; Rice et al. 1980). While on the other hand, adoption and implementation studies focus on the factors that support or hinder adoption, or how the adoption and implementation process are carried out over time (Fichman 2004).

Although reinvention literature is proliferated with terminologies, there are common themes and processes found in the literature, in spite of being defined differently and used in different situations (see Table 1). In this section, I review the reinvention literature and identify three dominant processes that are often used. They are the translation process, found in the Scandinavian institutional research as well as actor-network studies, the modification process, associated with diffusion of innovation studies, and the adaptation process, often used with structuration theory.

The translation process focuses on how innovation ideas travel across organizations and get translated into local practices (Czarniawska et al. 1996). Under the Scandinavian institutionalism, researchers of the translation process focus on how ideas are objectified and travel across organizations. The primary focus is innovation ideas and their interpretations. For example, (Mueller and Whittle 2011) used discursive analysis to understand the translation of a quality management initiative in a UK public-private organization. They identified several discourse devices by which ideas are translated through a process of 'co-creation' with audiences in organizations.

The translation of ideas often follows an editing process with certain rules that act as social control for the reformulation and translation (Morris and Lancaster 2006; Sahlin-Anderson 1996). Three rules have been identified: rule of context, rule of formulation, and rule of logic. The rule of context states that when innovation ideas are applied in a new setting, local contexts such as time, space, and scale need to be added to the ideas. This re-contextualizes the ideas, disconnecting them from the previous contexts and making them appropriate for the new ones. Rule of formulation is the second rule which posits that innovation ideas need to be labeled in an appropriate way to make them familiar to the audience (Sahlin-Anderson 1996). This can be done by the way ideas are framed or by linking ideas to the audience. Lastly, once ideas are relabeled, the rule of logic suggests that causal models are needed to clarify causes and effects, and provide an application process or implementation plan (Sahlin-Anderson 1996). This step establishes a logical order that motivates actions from prospective adopters, such as how-to guidelines or recipes.

Translation is also used in actor-network theory to illustrate how actors' interests are translated to align with interests in the network (Sarker, Sarker and Sidorova 2006; Walsham 1997). Studies have utilized translation as part of a process through which ideas are transmitted from one level to another: as

generalized ideas at the community level into articulated concepts at the organizational level. Under this stream of research, translation is viewed as an invention process—a mechanism that allows many ideas at the community level get filtered, combined, and even selectively chosen or discarded to generate the organizational level concepts. For example, Nielsen, Mathiasen and Newell (2013) illustrated how the field-level ideas of mobile IT usage in the Danish home care were translated differently into organizations: as a way to increase efficiency and cost saving, as a way to improve communication and modern image of home care, and as a way to comply to political demand.

The concept of modification has hardly been clarified in the literature. Some scholars have focused on the changes made to the innovation artifacts (Fedorowicz et al. 2010), others focused on alterations to the innovation components (Blakely et al. 1987), or to the innovation ideas (Mamman 2002). Nevertheless, most of these studies share a common concern for the changes that are made to the innovation compared to a normative implementation template or design. Thus, the focus is particular alterations made to the innovation, and much less on the changes of organizational processes and procedures. For example, Mamman (2002) suggested three possibilities of idea modification: addition—new components are added into original ideas, omission—existing components are taken out from original ideas, and hybridization—combination of different ideas. Others measure modification using a prototypical approach in which the core principles of the innovation are identified, and organizational adoptions are examined for their fidelity from those prototypes (Ansari et al. 2010; Lewis et al. 1993).

The adaptation process focuses on how innovations are adapted over time to achieve better-fit with local contexts (e.g., structures, strategies) (Leonard-Barton 1988; Majchrzak et al. 2000). The primary objective is the ongoing organization's struggles to better fit the innovation, and much less on the innovation itself. Thus, adaptation can be best described as a process to change innovation practices given the local contexts. Many adaptation studies lend themselves to structuration theory as a way to examine changes in both organizational structures and innovation practices. User involvement is also featured in adaptation studies as the mechanism that brings about changes, often for the purpose of better alignment between structures and practices (Leonard-Barton 1988; Majchrzak et al. 2000).

During adaptation, both organizational structures and innovation practices are changed to address misfits. Three kinds of misfits have been identified: technical, cultural, and political misfits (Ansari et al. 2010; Leonard-Barton 1988). Technical misfits refer to the incompatibility between the innovation practices and current technologies used in the organization; cultural misfits are the conflicts between the innovation practices and the current cultural beliefs and values; and political misfits imply the misalignments due to different interests and agendas of the adopters. As these misfits occur, organizations are inclined to adapt their organizational structures and innovation practices to increase the innovation's zone of acceptance, thus achieving better alignment (Ansari et al. 2010).

Implication. This section spells out the three dominant reinvention processes found in the literature. (See Table 2 for a summary.) A few important notes should be pointed out here. First, the three processes are not exhaustive, and there are possibly other processes that occur in reinvention. They are, however, three very common processes that appear in the literature and possibly represent a fair amount of activities during reinvention. (Refer to Table 1 for the conceptualizations of these processes in the literature.)

Second, conceptually, one would expect that translation occurs first where the adopting organization works out the meanings and interpretations for the innovation ideas in the local contexts. Once the innovation gathers sufficient support, the innovation is adopted and goes through a modification process in which innovations are modified from the normative approach. During implementation and use, the adaptation process occurs to better fit the innovation practices and organizational structure.

While the sequence translation-modification-adaptation is plausible, it is likely that these processes overlap and can occur in an iterative fashion. For example, during the adaptation process, translation can reoccur to adjust the innovation ideas if substantial adjustments are needed, and subsequent modification is needed to adjust the innovation. Furthermore, depending on different types of innovation, the sequence and combination of these three processes can be different too. For instance, IT management innovations with mostly idea elements would require less modification of innovation objects, and more translation, modification, or even adaptation to innovation ideas and practices than other types of innovation.

	Translation	Modification	Adaptation
Definition	The process of translating innovation ideas into local settings	The process by which innovation are changed from normative templates during implementation	The process to change innovation practices given the local contexts, usually for better fit
Focus	How innovation ideas are objectified and traveled across organizations	How the modified innovations are different from the original design or normative templates	How the organizational structures as well innovation are changed to address misfits
Features	Editing rules: <ul style="list-style-type: none"> • Rule of context: local contexts need to be added to the ideas to re-contextualize the ideas • Rule of formulation: ideas labeled in a way that makes them familiar to the audience • Rule of logic: causal models are needed to clarify causes and effects, and provide an implementation plan 	Modification types: <ul style="list-style-type: none"> • Addition: new components are added into the original innovation objects • Omission: existing components are taken out from the original • Hybridization: different objects are combined 	Types of misfits: <ul style="list-style-type: none"> • Technical misfits: incompatibility between the innovation practices and current technologies • Cultural misfits: conflicts between the innovation practices and the current cultural beliefs and values • Political misfits: misalignments due to different interests and agendas of the adopters
Underlying theory	Scandinavian institutionalism; Actor-network theories	Diffusion of innovation theories	Structuration theories
Key citations	Czarniawska et al. (1996); Morris et al. (2006); Nielsen et al. (2013)	Bauman et al. (1991); Lewis et al. (1993); Fedorowicz et al. (2010)	Leonard-Barton (1988); Majchrzak et al. (2000); Ansari et al. (2010)

A Conceptual Model of Reinvention

Having clarified the nature of reinvented innovations, as well as the processes involved, in this section, I propose a conceptual model of reinvention. Figure 1 depicts the model which entails the following:

- Reinvention involves the changes that are made to innovation ideas, objects, and practices (Rice et al. 1980). Depending on the types of innovation, the degree of change for each element varies. Three processes are involved in reinvention: translation (Czarniawska et al. 1996; Nielsen et al. 2013), modification (Fedorowicz et al. 2010; Lewis et al. 1993), and adaptation (Leonard-Barton 1988; Majchrzak et al. 2000).
- There are inherent relationships between reinvention processes: translation of innovation ideas can lead to localized innovation practices such as changes in organization structures and practices (Nielsen et al. 2013); interpretation of innovation ideas can result into modification of innovation objects (Fedorowicz et al. 2010), which subsequently lead to localized innovation practices. Over time, the outcomes of reinvention cause organizational changes and can eventually can lead to more reinvention: feedback from adapted practices can trigger changes to innovation ideas (Majchrzak et al. 2000); modified objects lead to new concepts and ideas (Bashein et al. 2000); and changes in practices require some modification to innovation objects (Leonardi 2011).

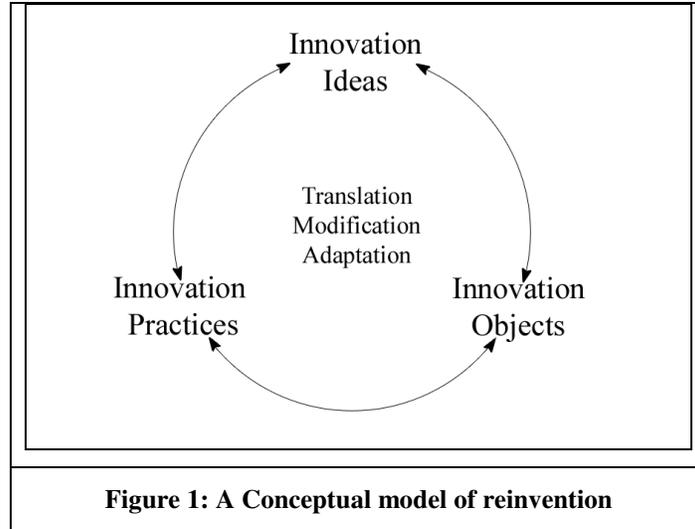


Figure 1: A Conceptual model of reinvention

Discussion and Conclusion

In this theoretical paper, I reprise reinvention concepts to address the questions: what is being reinvented? and what are the processes involved? I argue that reinvention can occur to three innovation elements: ideas, objects, and practices (Rice et al. 1980). Innovation ideas are novel concepts of the innovation, often materialized into linguistic and graphical artifacts. Innovation objects are technological artifacts and their component parts, which provide affordances and constraints to adopters. And innovation practices are social production of the implementation and use of the innovation in situated activities. Each innovation varies by the extent of some or all three elements, which in turn affect its adoption mechanisms, diffusion patterns, and reinvention processes.

From the reinvention literature, three common processes are identified: translation, modification, and adaptation. Translation is the process of translating innovation ideas from community-level into organizational concepts at local settings, modification is the process by which innovation are changed from normative templates during the implementation lifecycle, and adaptation is an ongoing process to change innovation practices given the local contexts, usually for better fit. A conceptual model of reinvention is suggested, showing the relationships between innovation ideas, objects, and practice under reinvention processes over time (see Figure 1).

The suggested model proposes several implications to research. First, while the conceptual model can be generalized to most innovations, there is a range of innovations that do not possess all three elements. Examples of those atypical innovations include innovations that are composed mostly of ideas such as Marxism, democracy, New Public Management, Enterprise Architecture, or Total Quality Management. Those innovations have little or no innovation objects, resulting into a difficulty to illustrate their effects and results, something Rogers referred to as low observability (Rogers 2003). Adopters, therefore, have more flexibility to interpret and implement the innovation, a high degree of subjective interpretation (Birkinshaw, Hamel and Mol 2008). Such a situation requires a revision of prior innovation theories. For example, in the case of Enterprise Architecture, we may expect alternative designs instead of dominant design or witness the use of rhetorical strategies to contextualize Enterprise Architecture (Bui 2013).

Second, the model does not encompass external elements such as environmental contingencies or organizational infrastructure. This presents a research opportunity as studies have shown how external elements can play a significant role for innovations. Again, certain types of innovation can be more susceptible to outside influences. For example, iPhone, as an innovation composed mostly of innovation objects, owns its success to a vast ecosystems of Apple's App Store (Ghazawneh and Henfridsson 2013), something referred to as digital infrastructure by others (Tilson, Lyytinen and Sorensen 2010). Understanding the relationship between the nature of the innovation and the external influences would advance our understandings of innovation adoption.

Lastly, the model focuses on one innovation, but in reality, innovations can be adopted in packs or clusters. As Rogers put it, “past diffusion research has generally investigated each innovation as if it were independent from other innovations. This is a dubious assumption ... In reality, a set of innovations diffusing at about the same time in a system are interdependent. It is much simpler for diffusion scholars to investigate the spread of each innovation as an independent event, but this is a distortion of reality” (Rogers 2003)(p. 15). Thus, we can see situations in which idea-innovations are complemented by object-and/or practice-innovations that can generate social movements or technological transitions. By looking at innovations in packs, or technology cluster (Rogers 2003), researchers can examine diffusion at community level (e.g., (Sun and Wang 2012; Wang and Ramiller 2009)) or societal effects of adoption (Markus, Jacobson, Bui, Mentzer and Lisein 2013a; Markus, Jacobson, Bui, Mentzer and Lisein 2013b).

The research also has several limitations. First, it is a theoretical paper, and further empirical evidence is needed to validate the model. A few research potentials have been identified earlier, which can help to test as well as enhance the model (e.g., reinvention for idea-innovations such as IT management innovations). Second, as mentioned earlier, the model is not comprehensive, and there are possible reinvention processes not included, as well as the missing influences of external factors.

Nevertheless, the model provides the first stepping stone for those who are serious about understanding reinvention. By understanding the nature of the innovation under study, as well as the involved reinvention processes, one can outline a clearer agenda to investigate innovation in uses and their effects in organizations. As students of innovation adoption have increasingly called out for breakthroughs and new paradigms (Dearing and Meyer 2006; Fichman 2004; Lyytinen and Damsgaard 2001; Tilson et al. 2010), the paper offers, hopefully, a sound point of departure into new and exciting innovation studies.

Acknowledgement

This research is supported by the National Science Foundation, under Grant No. SES-0964909. The author is grateful for their support, and notes that any opinions, findings, and conclusions, expressed in this material are those of the author and do not necessarily reflect the views of the National Science Foundation.

References

- Ahuja, M.K., and Thatcher, J.B. (2005) Moving beyond intentions and toward the theory of trying: Effects of work environment and gender on post-adoption information technology use, *MIS Quarterly*, 29, 3, 427-459.
- Ansari, S.M., Fiss, P.C., and Zajac, E.J. (2010) Made to fit: How practices vary as they diffuse, *Academy of Management Review*, 35, 1, 67-92.
- Bashein, B.J., and Markus, M.L. (2000) Data warehouses: More than just mining. Morristown, NJ: Financial Executives Research Foundation, Inc.
- Bauman, L.J., Stein, R.E.K., and Ireys, H.T. (1991) Reinventing fidelity: The transfer of social technology among settings, *American Journal of Community Psychology*, 19, 4, 619-639.
- Birkinshaw, J., Hamel, G., and Mol, M.J. (2008) Management innovation, *Academy of Management Review*, 33, 4, 825-845.
- Blakely, C.H., Mayer, J.P., Gottschalk, R.G., Schmitt, N., Davidson, W.S., Roitman, D.B., and Emshoff, J.G. (1987) The fidelity-adaptation debate: Implications for the implementation of public sector social programs, *American Journal of Community Psychology*, 15, 3, 253-268.
- Bui, Q.N. (2013) Rhetorical persuasion throughout the diffusion process: Creating a compelling cognitive-institutional account for widespread adoption in Academy of Management, Orlando, Florida.
- Creed, W.E.D., Scully, M.A., and Austin, J.R. (2002) Clothes make the person? The tailoring of legitimating accounts and the social construction of identity, *Organization Science*, 13, 5, 475-496.
- Czarniawska, B., and Joerges, B. (1996) Travels of ideas, in B. Czarniawska and G. Sevón (eds.) *Translating organizational change*, Walter de Gruyter: New York.
- Damanpour, F., and Evan, W.M. (1984) Organizational innovation and performance: The problem of "organizational lag", *Administrative Science Quarterly*, 29, 3, 392-409.

- Dearing, J.W., and Meyer, G. (2006) Revisiting diffusion theory, in A. Singhal and J.W. Dearing (eds.) *Communication of innovations: A journey with ev rogers*, Thousand Oaks, CA: Sage Publications, 29-60.
- DeSanctis, G., and Poole, M.S. (1994) Capturing the complexity in advanced technology use: Adaptive structuration theory, *Organization Science*, 5, 2, 121-147.
- Fedorowicz, J., and Gogan, J.L. (2010) Reinvention of interorganizational systems: A case analysis of the diffusion of a bio-terror surveillance system, *Information Systems Frontiers*, 12, 1, 81-95.
- Ferneley, E.H., and Sobreperez, P. (2006) Resist, comply or workaround? An examination of different facets of user engagement with information systems, *European Journal of Information Systems*, 15, 4, 345-356.
- Fichman, R.G. (2004) Going beyond the dominant paradigm for information technology innovation research: Emerging concepts and methods, *Journal of the Association for Information Systems*, 5, 8, 314-355.
- Ghazawneh, A., and Henfridsson, O. (2013) Balancing platform control and external contribution in third-party development: The boundary resources model, *Information Systems Journal*, 23, 2, 173-192.
- Glick, H.R., and Hays, S.P. (1991) Innovation and reinvention in state policymaking: Theory and the evolution of living will laws, *The Journal of Politics*, 53, 3, 835-850.
- Hays, S.P. (1996) Influences on reinvention during the diffusion of innovations, *Political Research Quarterly*, 49, 3, 631-650.
- Heracleous, L., and Barrett, M. (2001) Organizational change as discourse: Communicative actions and deep structures in the context of information technology implementation, *Academy of Management Journal*, 44, 4, 775-778.
- Jasperson, J., Carter, P.E., and Zmud, R.W. (2005) A comprehensive conceptualization of post-adoptive behaviors associated with information technology enabled work systems, *MIS Quarterly*, 29, 3, 525-557.
- Larsen, J.K., and Agarwala-Rogers, R. (1977) Re-invention of innovative ideas: Modified? Adopted? None of the above?, *Evaluation*, 4, 136-140.
- Leonard-Barton, D. (1988) Implementation as mutual adaptation of technology and organization, *Research Policy*, 17, 5, 251-267.
- Leonardi, P.M. (2011) When flexible routines meet flexible technologies: Affordance, constraint, and the imbrication of human and material agencies, *MIS Quarterly*, 35, 1, 147-168.
- Leonardi, P.M., and Barley, S.R. (2010) What's under construction here? Social action, materiality, and power in constructivist studies of technology and organizing, *The Academy of Management Annals*, 4, 1, 1-51.
- Lewis, L.K., and Seibold, D.R. (1993) Innovation modification during intraorganizational adoption, *The Academy of Management Review*, 18, 2, 322-354.
- Lyytinen, K., and Damsgaard, J. (2001) What's wrong with the diffusion of innovation theory?, in M.A. Ardis and B.L. Marcolin (eds.) *Diffusing software product and process innovation*, Norwell, MA: Kluwer Academic Publishers.
- Majchrzak, A., Rice, R.E., Malhotra, A., King, N., and Ba, S. (2000) Technology adaptation: The case of a computer-supported inter-organizational virtual team, *MIS Quarterly*, 24, 4, 569-600.
- Mamman, A. (2002) The adoption and modification of management ideas in organizations: Toward an analytical framework, *Strategic Change*, 11, 7, 379-389.
- Markus, M.L., Dutta, A., Steinfield, C.W., and Wigand, R.T. (2008) The computerization movement in the us home mortgage industry automated underwriting from 1980 to 2004, in M.S. Elliott and K.L. Kraemer (eds.) *Computerization movements and technology diffusion: From mainframes to ubiquitous computing*, Medford, New Jersey: Information Today, Inc., 115-144.
- Markus, M.L., Jacobson, D.D., Bui, Q.N., Mentzer, K., and Lisein, O. (2013a) It centralization and enterprise-wide it capabilities and outcomes: A public sector study in European Conference on Information Systems (ECIS), Utrecht, Netherlands.
- Markus, M.L., Jacobson, D.D., Bui, Q.N., Mentzer, K., and Lisein, O. (2013b) Organizational and institutional arrangements for e-government: A preliminary report on contemporary it management approaches in us state governments in Hawaii International Conference on System Sciences, Maui, HI.
- Markus, M.L., and Silver, M.S. (2008) A foundation for the study of it effects: A new look at desanctis and poole's concepts of structural features and spirit, *Journal of the Association for Information Systems*, 9, 10/11, 609-632.

- Morris, T., and Lancaster, Z. (2006) Translating management ideas, *Organization Studies*, 27, 2, 207-233.
- Mueller, F., and Whittle, A. (2011) Translating management ideas: A discursive devices analysis, *Organization Studies*, 32, 2, 187-210.
- Munir, K.A., and Phillips, N. (2005) The birth of the 'kodak moment': Institutional entrepreneurship and the adoption of new technologies, *Organization Studies*, 26, 11, 1665-1687.
- Nevo, S., and Nevo, D. (2011) Re-invention of applicable innovations: The case of virtual worlds in 44th Hawaii International Conference on System Sciences (HICSS), Kauai, HI.
- Newell, S., Swan, J.A., and Galliers, R.D. (2000) A knowledge-focused perspective on the diffusion and adoption of complex information technologies: The bpr example, *Information Systems Journal*, 10, 3, 239-259.
- Nielsen, J.A., Mathiassen, L., and Newell, S. (2013) Theorization and translation in information technology institutionalization: Evidence from danish home care, *MIS Quarterly*, x, x, x-x.
- Orlikowski, W.J. (2000) Using technology and constituting structures: A practice lens for studying technology in organizations, *Organization Science*, 11, 4, 404-428.
- Poole, M.S., and DeSanctis, G. (1990) Understanding the use of group decision support systems: The theory of adaptive structuration, in J. Fulk and C. Steinfield (eds.) *Organizations and communication technology*, Thousand Oaks, CA: Sage Publications, Inc., 173-193.
- Rice, R.E., and Rogers, E.M. (1980) Reinvention in the innovation process, *Science Communication*, 1, 4, 499-514.
- Rogers, E.M. (2003) *Diffusion of innovations*, (5th ed.). New York, NY: Free Press.
- Saga, V.L., and Zmud, R.W. (1994) The nature and determinants of it acceptance, routinization and infusion, *Diffusion Transfer and Implementation of Information Technology*, 45, A-45, 67-86.
- Sahlin-Anderson, K. (1996) Imitating by editing success: The construction of organization fields, in B. Czarniawska and G. Sevón (eds.) *Translating organizational change*, Walter de Gruyter: New York.
- Sarker, S., Sarker, S., and Sidorova, A. (2006) Understanding business process change failure: An actor-network perspective, *Journal of Management Information Systems*, 33, 1, 51-86.
- Sillince, J.A.A. (2005) A contingency theory of rhetorical congruence, *The Academy of Management Review*, 30, 3, 608-621.
- Strang, D., and Meyer, J.W. (1993) Institutional conditions for diffusion, *Theory and Society*, 22, 4, 487-511.
- Sun, H. (2012) Understanding user revisions when using information system features: Adaptive system use and triggers, *MIS Quarterly*, 36, 2, 453-478.
- Sun, J., and Wang, P. (2012) Community ecology for innovation concept: The case of cloud computing, in: *International Conference on Information Systems (ICIS)*. Orlando, FL.
- Tilson, D., Lyytinen, K., and Sorensen, C. (2010) Digital infrastructures: The missing is research agenda, *Information Systems Research*, 21, 4, 748-759.
- Walsham, G. (1997) Actor-network theory and its research in IFIP TC8 WG 8.2 International Conference on Information Systems and Qualitative Research, A.S. Lee, J. Lieubenau and J.I. DeGross (eds.), Philadelphia, Pennsylvania, pp. 466-480.
- Wang, P. (2009) Popular concepts beyond organizations: Exploring new dimensions of information technology innovations, *Journal of the Association for Information Systems*, 10, 1, 1-30.
- Wang, P., and Ramiller, N.C. (2009) Community learning in information technology innovation, *MIS Quarterly*, 33, 4, 709-734.
- Westphal, J.D., Gulati, R., and Shortell, S.M. (1997) Customization or conformity? An institutional and network perspective on the content and consequences of tqm adoption, *Administrative Science Quarterly*, 42, 2, 366-394.
- Zbaracki, M.J. (1998) The rhetoric and reality of total quality management, *Administrative Science Quarterly*, 43, 3, 602-636.
- Zmud, R.W., and Apple, L.E. (1992) Measuring technology incorporation/infusion, *Journal of Product Innovation Management*, 9, 2, 148-155.