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A Critical Review of Innovation Adoption and Diffusion

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Abstract:
The innovation diffusion and adoption literature explores multiple topics including stages of innovation decision-making, diffusion networks, rate of innovation adoption, categories of adopters but there are still opportunities for continued theory building and research on diffusion and adoption within and across organizations. This paper will discuss the innovation diffusion and adoption literature focusing on diffusion models, adoption categories, the adoption process, and innovation adoption and diffusion in organizations.

Keywords: *Innovation diffusion, innovation adoption, diffusion models*

1. Introduction

Innovation is sought for many reasons. Some organizations may adopt innovations to deliver better services and products to users, while others may do it for the purpose of institutional legitimacy. Whatever the reason, all innovations must be adopted and diffused throughout the organization in order for them to make an impact. The concept of innovation is a complex process through which new ideas, objects, and practices are created, developed, or reinvented. Innovation can begin in two ways: (1) by the speculations or discoveries of scientists or craftsmen (i.e. engineers, R&D employees) in pursuing their activities and (2) by the perception of an environmental or market need or opportunity (Martin, 1994, pg. 18). Once the innovation has been created attention should be directed to its diffusion. Diffusion is the process by which an innovation spreads from its source of invention to its ultimate adopters. This paper will discuss the innovation diffusion and adoption literature focusing on diffusion models, adoption categories, the adoption process, and innovation adoption and diffusion in organizations.

2. Concept 1: The Innovation Diffusion Process

While there is an abundance of literature on consumer innovation diffusion and adoption, research on the diffusion of technological innovation among organizations has developed slowly. Technological innovations tend to place more emphasis on the characteristics of the innovation itself and on the adopting organization, while consumer innovation has tended to give more attention to the communication or information flow process (Brown, 1981, p. 152). The diffusion of technological innovations is explicitly characterized as involving the replacement of an old technology with a new one. Thus, diffusion rates are often measured in terms of the proportion of organizations using the new technology compared to those using the old one. The original diffusion models presented by Bass and Rogers both explain the consumer innovation process, focusing on the flow of information. Rogers (1995) also introduced the innovation-decision process for organizations, which focuses on the process organizations will move through as they begin implementing an innovation.

This section will present an analysis of innovation diffusion models and discuss other factors that influence the diffusion of innovations. According to Mahajan, Muller, and Bass (1990) the objective of a diffusion model is to present the level of spread of an innovation among a given set of perspective adopters over time. The Bass diffusion model assumes that the adopters of an innovation are either influenced by the mass media (external influence and known as the "innovators" group) or by word-of-mouth (internal influence and known as the "imitator" group). Bass' description of the diffusion process assumes the existence of two groups of individuals: innovators and imitators, with inherently different responses to innovation. Innovators adopt innovation independently of the influence of others in the social system while imitators are influenced by those who have already adopted the innovation. Mahajan, Muller, and Bass (1990) posits all individuals in the social system must be assumed to have an intrinsic innovative or imitator tendency. However, Bass does not describe the behavioral interaction of innovators and imitators. The basic premise of the Bass model is that part of the adoption influence depends on imitation or learning and part of it does not. This model provides a description of the innovation diffusion process purely from the adoption perspective, with no information regarding the existence of innovator-imitator subgroups within the social system.

Rogers' (1995) diffusion of innovation theory identifies four main elements that come together to form the diffusion process: the innovation, communication, time, and the social system (figure 1). According to Rogers (1995) an innovation is an idea, thing, procedure, or system that is perceived to be new to its adopters. In the diffusion theory, communication is the process by which people develop and share information with each other to achieve common understanding. The third element of the theory is time, which is comprised of the following three components: innovation-decision process, adopter categories, and the rate of adoption. The innovation-decision process considers the

timeframe from when the potential adopter first becomes aware of the innovation through the point when the adopter either accepts or rejects the innovation. Throughout this process potential adopters will experience five phases: knowledge, persuasion, decision, implementation, and confirmation (Rogers, 1995). The next time component is adopter categories which measure how inclined one individual is to adopting a new idea compared to other members of the social system. The last time component, rate of adoption explains the speed that an innovation is adopted within a social system. The last element of the diffusion of innovation theory is the social system which can include individuals, groups, organizations and subsystems that share a common goal or objective. The diffusion process maps the response to the innovation overtime, providing a framework for analyzing the movement of an innovation through a social system and is illustrated by Rogers as a bell-shaped curve.

This diffusion of innovation theory presents a clear and thorough picture of its four elements (innovation, communication, time, and social system). However, it does not provide a detailed explanation of the interactions that are assumed to occur between these elements within organizations. Rogers' diffusion of innovation model primarily focuses on individuals rather than groups or organizations, which limits the applicability of this theory. However, Rogers (1995) does offer a five-stage innovation-decision process model that explains the stages organizations will go through in the process of innovation decision-making. These five stages include: (1) agenda-setting, (2) matching, (3) redefining/restructuring, (4) clarifying, and (5) routinizing (see figure 1). The first two steps comprise the initiation stage when information is gathered and planning occurs, after which the innovation is either accepted or rejected. If the innovation is adopted the next three steps occur in the implementation stage, in which the actions and decisions involved in putting the innovation into practice within the organization take place. In an organizational setting, there are three types of innovation-decisions: optional, collective, and authority (Lundblad, 2003). Optional innovation-decision making occurs when individuals in an organization are able to freely choose to decide whether to adopt of reject the innovation. When individuals in an organization make a joint decision to adopt or reject the innovation, they are practicing collective innovation-decision making. Lastly, authority innovation-decision making occurs when a few individuals in an organization make the decision to adopt or reject the innovation on behalf of the entire organization. Lundblad (2003) posits that the fastest rate of adoption is associated with authority innovation-decisions. However, innovations adopted under this decision making practice may be less effective in the implementation stage.

Rogers (1995) clearly discusses the need to begin innovation implementation with redefining/restructuring such that the potential for acceptance is maximized. Particularly, if the innovation was imported some amount of reinvention may occur as organizational members align the innovation with the organizational culture. The clarifying stage emphasizes communication to ensure proper spread of the innovation so that it can reach the final stage of routinizing, when it is no longer new but a normal part of the organization. Rogers' model offers a concise overview of many considerations in the innovation diffusion process for organizations but it leaves significant room for development.

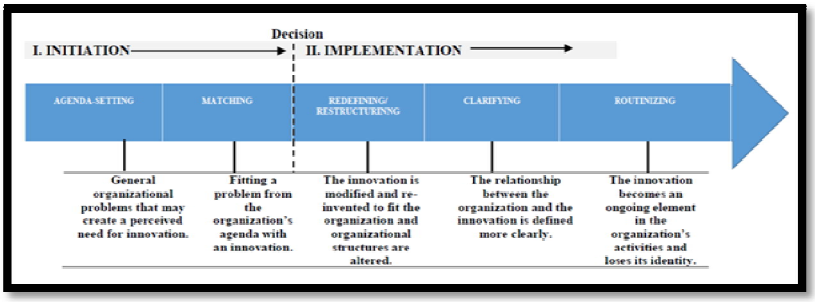

Figure 1: Rogers' (1995) Five Stage Innovation-Decision Process in Organizations

Both, Bass and Rogers present the diffusion process from a micro perspective based on individual-level adoption decisions. Furthermore, the use of the Bass model for forecasting the diffusion of an innovation requires the estimation of three components: the external influence, internal influence, and the market potential. While Rogers considers diffusion to be the process by which an innovation is communicated through certain channels over time among members of a social system. Rogers (1995) gives very little thought to the need for a planned examination of the internal diffusion process itself, post-creation and adoption decision.

Schumpeter (1980) defines diffusion as the progressive distributional change in the spread of an innovation or technology. His description of the innovation diffusion process, what Schumpeter calls the "bandwagon effect" explains that innovation begins with a few originators and a slowly growing number of imitators follow. Bandwagons are diffusion processes wherein adopters choose an innovation not because of its technical benefits but because of the sheer number of other organizations that have already adopted it. As more organizations adopt innovations, pressure increases for other firms to do the same. This pattern of diffusion is generally pictured as an s-shaped curved, very similar to Rogers' (1995) diffusion of innovation curve. However, Schumpeter's work is based on technological innovations within an organization, while Rogers' early work was based on individual consumers. Schumpeter's (1980) work on innovation diffusion was based on economic theory literature. His work focused on the effect of technological innovation on the dynamics of a capitalistic economy. Additionally, Schumpeter contends that there is an above average innovation intensity among large organizations, with over 10,000 employees and a growing innovation intensity among small companies (between 100-500 employees).

Schumpeter (1980) proposed that the probability of an innovation being imitated depended on the proportion of firms already adopting the imitation (i.e. bandwagon effect), along with the profitability of using the innovation and the investment required to install the innovation. Schumpeter's research on bandwagon effects is relevant because it focuses on both the innovation and how it is diffused through an industry. Thus, it provides a rich foundation for hypothesizing relationships between the characteristics of innovation and the rate of industry diffusion. Additionally, Abrahamson and Rosenkopf (1993) discussed a model in which bandwagon effects occur at an organizational level, identifying two types of bandwagon effects: institutional and competitive. Institutional bandwagon effects arise from social legitimacy, while competitive bandwagon effects arise from the threat of lost competitive advantage.

Having reviewed the literature presented above, the following are concepts that emerged from the literature on innovation diffusion: (1) innovation diffusion will exist differently for individuals and organizations; (2) innovation diffusion can be visually depicted as an S-shaped or bell-shaped curve; (3) the innovation decision-making process will determine how the innovation diffuses through the organization; (4) the way information is communicated about the innovation in the social system will influence its diffusion; (5) the bandwagon effect will influence some organizations to adopt an innovation because of competitive and social pressures and (6) the extent to which the innovation is compatible with the organization will determine how well it diffuses throughout the organization.

3. Concept 2: The Innovation Adoption Process

Innovation adoption is a process that results in the assimilation of a product, process or practice that is new to the adopting organization (Damanpour and Schneider, 2008). Damanpour and Schneider (2008) posit that the innovation adoption process has two major phases: initiation and implementation. The initiation phase represents pre-adoption decisions to accept or reject and the implementation phase reflects the post-adoption decision to put the innovation into use. These authors contend that an innovation is not truly adopted when it has been initiated but instead when it has been put to use in the adopting organization and with implementation the intended objectives of the innovation cannot be met.

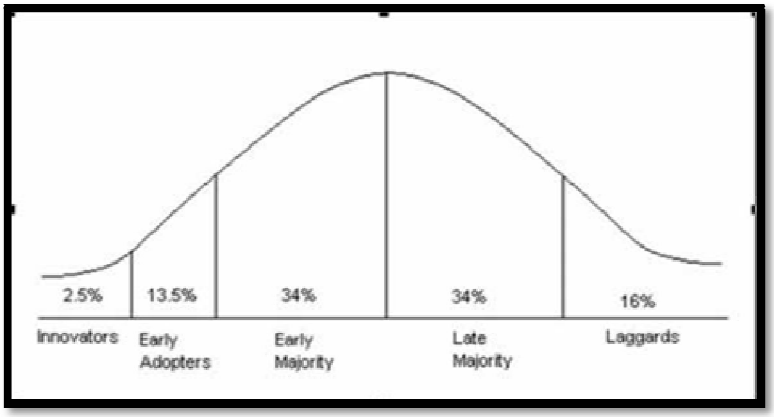

Figure 2: Rogers' (1995) Diffusion of Innovation Curve

According to Rogers (1995) innovation adoption tends to follow a bell-shaped curve, which depicts that only a few individuals initially adopt an innovation and as time passes more individuals will adopt the innovation and the rate will increase. Eventually the adoption rate levels off and begins the decline. Rogers (1995) has proposed an adopter categorization scheme dividing adopters into five categories: (1) innovators; (2) early adopters, (3) early majority, (4) late majority; and (5) laggards (figure 2). Because some innovations are more difficult to adopt than others, Rogers describes characteristics which he expects will predict the ease (speed) of adoption, including:

- Relative advantage: the degree to which an innovation is perceived as being better than what is currently available.
- Compatibility: the degree to which an innovation is perceived as consistent with the existing values of the potential adopters.
- Complexity: the degree to which an innovation is perceived as difficult to understand and use.
- Trialability: the degree to which an innovation may be experimented with on during a given time period.
- Observability: the degree to which the results of an innovation are visible to others.
- Robertson (1971) also proposed a model of the adoption process, which includes the following eight stages:
- Problem perception- the time when an individual recognizes a need for change.
- Awareness- the point when the individual becomes aware of the innovation.
- Comprehension- the learning period during which an individual explores the characteristics and functions of the innovation.
- Attitude formation- the result of a period of evaluating the innovation.
- Legitimation- an optional stage during which the individual seeks additional information about the innovation.
- Trial- the stage of experimenting with the innovation.
- Adoption- the ownership stage.

- Dissonance- a stage that occurs only when the individual questions the adoption decision and seeks reassurance.
- The Robertson model (1971) is different from the Rogers' model (1995) in that it recognizes that potential adopters may skip steps, double back to an earlier stage, or reject the innovation at any point in the process. Both adoption processes presented by these authors gives future scholars an avenue for finding more detailed explanations about the adoption process on a macro-level.

Additionally, cost variables can be examined. Cost variables relate to monetary and nonmonetary direct and indirect costs, or risks associated with the adoption of an innovation. Direct costs include such costs as patents of industrial innovation, computer-operated machines, or reform of social policies. While indirect costs are not often clearly identifiable as outcomes of innovations, they can add to the cost or risk of adoption and can significantly modulate the rate of adoption (Wejnert, 2002). Indirect costs may manifest itself as a social cost related to the outcome of adoption or represent nonmonetary actions, such as time spent on re-training employees to use an innovation. Direct and indirect costs of innovations often inhibit adoption, especially when costs exceed the potential adopter's resource potential (Wejnert, 2002).

Based on his review of the innovation literature, Jensen (2004) contends that larger firms tend to adopt innovations sooner than smaller firms because large firms expect a greater return (i.e. cost savings) from adoption than small firms. However, Jensen points out that in every case, large firms do not always adopt first. This study presents a model of innovation adoption and diffusion that explains why larger firms tend to adopt first but admits conditions under which small firms adopt first. The analysis focuses on the adoption of an innovation of uncertain profitability when a firm's size is measured by the number of plants it operates. Theoretically, the operation of multiple plants can allow savings in nonproduction costs (i.e. transportation, distribution, and inventory). However, multi-plant operation can also result in greater information costs. Given these conflicting results, the analysis in this article assumes that, if there are multi-plant economies, they take the form of savings in nonproduction costs. However, the existence of nonproduction cost economies can reduce the incentive of a large firm to adopt first. Adoption requires converting a plant to the new technology, which can succeed or fail to reduce production costs. An initial adopter must spend a period experimenting with the new technology to learn about it. This initial learning cost provides an incentive to wait and learn about the innovation from the rival's adoption.

Jensen (2004) presents a two-stage adoption model, which posits the following assumptions: each plant (large or small) can be operated with the new technology, operated with the old technology, or shut down. The findings of this study show that diffusion must occur: (1) if firms are not identical in size; (2) if a plant must be shut down to adopt initially to learn about the innovation; and (3) if adoption reveals success or failure to all after the learning period. This study also provides reasoning for why large firms tend to adopt first, but sometime choose not to do so. In a multi-plant scenario, because the large firm still gains more from adoption in both plants, it is more likely that it will lead unless multi-plant economies give it a large learning cost disadvantage.

Nooteboom (1994) asserts that the relationship between large and small organizations is complementary, explaining that they are good at different things and in different ways, in different stages of the innovation process. The strength of a large organization lies in its ability to achieve high levels of specialization in people and equipment, science-based knowledge, and acquire larger financial resources, which enables them to take more risk. This suggests that large organizations are likely to be better in the generation of fundamentally new and science based technologies. In contrast, the strength of a small organization lies in its ability to the entire innovation project, engage in informal communication along shorter communication lines within the organization, and greater proximity to the market and their own production. Thus, small organizations are likely to be better at small scale applications of fundamental technologies, improvements to existing products, and novel product-service combinations

On one hand, the small organization is at an advantage due to greater proximity to and closer interaction with customers. However, Nooteboom (1994) explains that an organization's decision to develop an innovation, take it into production, and introduce it to the market, is riskier for small businesses due to the lesser spread of risk (due to fewer markets and fewer products). Based on this line of reasoning, Nooteboom asserts that if returns increase with organization size while risk is constant or decreases with organization size, small businesses can be expected to lag in adoption.

Additionally, organizational leadership serves as a factor in explaining the adoption process in organizations. According to Daft (1978) leaders have a great impact on the adoption of organizational innovations, but the role that they play in the innovation process is not clear. Daft contends that the innovation literature provides little insight about the activity leading to adoption including where ideas enter the organization, who proposes them, and why. Daft's study examined the role of administrators and technical employees in the process leading to innovation adoption, in an attempt to gather evidence that can explain more fully the innovation process in organizations. This study is based on the premise that the process of innovation includes, starting with the conception of an idea, then a decision is made to adopt, and finally the innovation is implemented. Daft (1978) explains that organizations can maximize adoptions by having innovative ideas originate at both ends of the hierarchy, where administrative innovations would come from the top and trickle down and technical innovations would come from the bottom of the organization and trickle up.

Daft (1978) explains two separate groups in organizations, an administrative core and a technical core. They represent separate functional and hierarchical paths within an organization largely concerned with either managing (administrative) or product/service creation (technical). The dual-core perspective that Daft presents is centered on the understanding that different types of personnel initiate different types of innovations and that organizational size and degree of professionalism and specification may affect the initiation process. However, Daft assumes that the creation of an

innovation will be internal to the organization and does not mention the implementation of the innovation within the organization.

Having reviewed literature from the authors presented in this section, the following factors have been identified as influencing innovation adoption: organization size, organizational leadership, adopter categories, innovation complexity, cost and risk associated with the innovation, type of innovation (i.e. incremental, radical, administrative, technical), and the environmental context (i.e. organizational culture, societal culture) in which the adoption will take place.

4. Concept 3: The Diffusion and Adoption of Innovation in Organizations

An innovation can be considered new to an individual, group, organization, industry, or the larger society. At the organizational level, innovation is defined as the adoption of a new product, service, process, technology, policy, or structure. Innovation adoption is a means of creating change in an organization to ensure adaptive behavior and is intended to change the organization so that it maintains or improves its level of performance. Organizational innovation requires both financial and human resources and is facilitated by organizational leaders (Davies, 1979).

Dewett, Whittier, and Williams (2007) explored the post-adoption behavior of organizations and developed a framework specifying the major variables defining the environment through which internal diffusion operates (figure 3). These authors suggest that there are not only different types of innovation but complementary types of internal innovation diffusions. The three modes of innovation presented in this paper include the external mode, internal pre-adoption, and internal post-adoption. In the context of an organization, the external mode is concerned with the diffusion of innovations among a population or organizations. Internal pre-adoption is characterized by the activities aimed at the creation of ideas and products, the internal environmental scanning necessary to identify and foster innovation, and the construction of an organizational culture conducive to the production of innovations. The final mode of innovation, internal post-adoption, encompasses all the events required to move the innovation from the adoption decision to successful implementation. These may include activities like corporate communication activities and employee training (Dewett et al, 2007). Dewett et al. (2007) proposed a model of the internal diffusion process in organizations, presenting a group of variables, which define the infrastructure including organizational, innovation, and human factors.

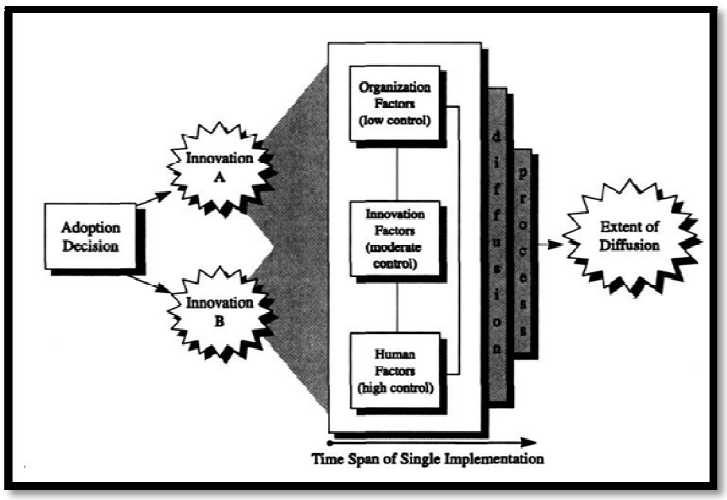

Figure 3: A Model of the Internal Diffusion Process in Organizations (Dewett, Whittier, and Williams, 2007)

These authors posit that an innovation can be followed from the adoption decisions to the relationships between the three factors and throughout the organization in the diffusion process. In the model, innovation A and B emphasize the fact that organizations often experience more than one innovation at a time. Each of the three factors discussed has several categories which can be manipulating to some degree by management. For example, one of the organization factors discussed is innovation density, which is the degree to which an organization is simultaneously implementing multiple innovations. This organization factor can determine if an organization is more or less innovation dense, affecting the diffusion and adoption of current and future innovations. Although the model presented by Dewett et al. (2007) provides an overarching framework that can be used to organize innovation implementation research, it does not address the issue of level analysis. Clearly, as an innovation spreads post-adoption, it spreads vertically and horizontally across the organization affecting many different levels. Therefore, the model should make provisions to include individual, group, and organizational level interactions, which will have an influence on the innovation process.

Brown (1981, p. 161) presents an innovation adoption model for firms (figure 4), emphasizing the relationship between firm size and time of adoption, in which each works in opposite directions. The time of adoption is presented as a function of firm size, where size is simultaneously a surrogate for cost and risk constraints, as well as management aggressiveness and innovativeness. The model considers the greater ability of larger firms to bear the cost and risk associated with adoption. Overall, adoption propensity is high among smaller organizations because they are more anxious to grow and increase their industry share. However, the effect of cost and risk considerations favors larger firms, resulting in larger firms having the highest adoption propensities. In the final scenario discussed, if the effect of the two

sets of factors are balanced in that each varies in the same way with firm size, except in the opposite direction, then medium size firms will have the highest propensity to adopt (Brown, 1981).

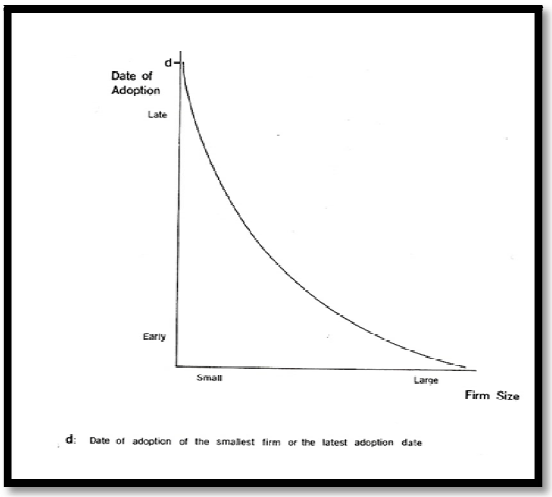

Figure 4: Brown's (1981) Model of Innovation Adoption in Firms

Damanpour and Schneider (2008) explored the association between innovation characteristics and innovation adoption in the public sector (U.S. local governments). Organizations can experience several barriers to innovation including insufficient funding, lack of incentives, and need for public/consumer support. These authors argue that the adoption of an innovation in organizations is influenced by the characteristics of the innovation including cost, complexity, and relative advantage or impact. Innovation cost is expected to negatively affect innovation adoption, where the less expensive the innovation, the more likely it will be adopted by the organization. Innovation complexity explains the degree to which the innovation is difficult to understand and use. Damanpour and Schneider (2008) posit that those innovations which are more difficult to implement are less likely to be adopted by the organization because of higher uncertainty of their success and lower likelihood of their contribution to organizational performance. Innovation impact can be expressed as economic profitability where it can positively influence innovation adoption because the greater the innovation's impact, the greater its capacity to help the organization meet is performance goals.

Additionally, authors believe organizational leaders influence the adoption of innovation because they are able to motivate employees, create a work environment that can facilitate innovativeness, and reward innovation and change. Thirteen hypotheses were tested relating to the characteristics of innovation (cost, complexity, impact), management characteristics (gender, education, political orientation, pro-innovation attitude), and innovation adoption. A survey was used to collect data from 725 local government agencies and a regression analysis was used to examine the data. The results of this study suggest that innovation characteristics play an important role in determining innovation adoption. Managers' personal characteristics had a significant, direct effect on innovation adoption but did not moderate the influence of innovation attributes on innovation adoption. Additionally, innovation characteristics were found to increase the predictability of innovation adoption. However, innovation cost and complexity had no significant effect and did not inhibit innovation adoption in organizations. The findings of this study add to the growing literature on innovation in public organizations by focusing on the role of innovation characteristics and managers' discretion on the adoption of innovation.

Damanpour and Gopalakrishnan (2001) examined the dynamics of the adoption of product and process innovations in an organization and implications of the patterns of adoption of product and process innovations for organizational performance. This study was guided by two research questions: (1) What are the relative rate and speed of the adoption of product and process innovations in organizations; and (2) Does the adoption of these innovations occur in observable patterns across organizations? An organization's rate of adoption is based on the number of innovations the organization adopts from an available pool of innovations within a given period of time.

The speed of adoption reflects an organization's readiness and propensity to innovate and its ability to adopt innovations quickly. When discussing product and process innovations a distinction must be made because their adoption requires different organizational skills. Product innovations are defined as new products and services introduced to meet market needs and require that organizations assimilate customer need patterns, design, and manufacture the product. Process innovation is defined as new elements introduced into an organization's production or service operations and require organizations to apply technology to improve the efficiency of product development and commercialization. This study tested the following hypotheses: (H1) the rate of adoption of product innovations would be higher than the rate of adoption of process innovations; (H2) the speed of adoption of product innovations would be faster than the speed of adoption of process innovations; (H3) A product-process pattern of adoption of innovations would be more likely than a process-product pattern of adoption; and (H3a) high performance organizations would follow a product-process pattern of adoption more than a process-product pattern.

A survey was used to collect data from 101 commercial banks in the U.S. between 1982 and 1993. The results of this study revealed that the banks adopted product innovations at a greater rate and speed than process innovations and

that the congruent adoption of product and process innovations was positively associated with bank performance. Damanpour and Gopalakrishnan (2001) suggest that organizations may choose to invest in product innovations because such innovations could have a greater appropriability than process innovations. Additionally, the study revealed that the synchronous adoption of product and process innovations has positive implications for organizational performance.

Dewar and Dutton (1986) examined and tested the efficacy of developing theoretical models for the adoption of two different types of technological innovations involved in a firms' production process. Theoretical arguments are made for the differential effects of organizational variables on the adoption of radical and incremental technical process innovations. Radical innovations are fundamental changes that represent revolutionary changes in technology. They represent clear departures from existing practices. Incremental innovations are minor improvements or simple adjustments in current technology. This study focused on correlates of the adoption of technologies that incorporate different levels of new knowledge. Dewar and Dutton (1986) assert that for radical innovations which incorporate a large degree of new knowledge, organizational complexity and the depth of the organization's knowledge resources should strongly relate to their adoption. In contrast, complexity and knowledge depth should be less important for incremental innovations because adoption of these types require less knowledge resources in the organization for development.

The relationship between managerial attitudes and innovation is complex, since the effect of attitudes toward change depends on whether management retains the power to make adoption decisions. Data for this study was collected from a sample of domestic footwear and food packaging manufacturers. The results of this study revealed that depth of knowledge resources was an important predictor of the adoption of radical and incremental innovations. Additionally, organization size was found to be important only for radical innovation adoption.

5. Proposed Framework of Innovation Adoption & Diffusion

This section presents a framework for organizational innovation adoption and diffusion that evolved from the literature presented in this paper (figure 5). The first portion of the framework presents innovation adoption, which is based on the empirical observations of Jensen (2004) and Brown (1981) who assert that large organizations usually adopt sooner, although there are notable exceptions. In this section, the dotted lines demonstrate the fact that both large and small organization can fluctuate between Rogers' adopter categories. In the framework large firms are labeled as early adopters but for each individual innovation large organizations will consider adopting, they may adopt at an earlier stage (i.e. Innovators) or a later stage. The same is true for small firms who represent the late adopters but can enter the innovation adoption process as innovators or early adopters under other circumstances (i.e. able take more risk).

The second half of the proposed framework represents the diffusion of an innovation throughout an organization. The two main components of the diffusion section come from Roger's innovation decision-making process model and Dewett, Whittier, and William's model (2007) of the internal diffusion process in organizations. Dewet et al. (2007) present three factors in their model. The human factor represents communication among potential adopters, the innovation roles each potential adopter will play in the diffusion process, the amount of power each potential adopter possesses, and top management support). The characteristics of the innovation factors include innovation type, cost, utility, visibility within the organization, and the relationship between multiple innovations. Organization factors include organizational structure, size, resources, professionalism, and innovation density. The three factors (human, innovation, organization) from the Dewett et al. (2007) model are constantly affecting the diffusion process through interactions between each step of Rogers' model (innovation initiation, redefining/restructuring, clarifying, and routinizing) with the final step being innovation diffusion.

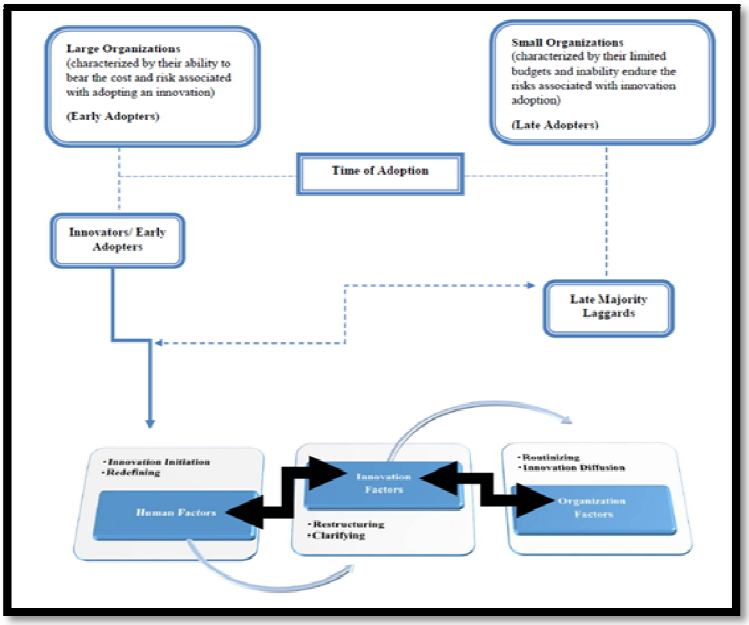

Figure 5: A Conceptual Framework of Innovation Adoption & Diffusion in Organizations

6. Conclusion

The innovation diffusion and adoption literature explore multiple topics- stages of innovation decision-making, diffusion networks, rate of innovation adoption, categories of adopters –but there are still opportunities for continued theory building and research on diffusion and adoption within and across organizations. While much of the innovation has focused on individual innovation diffusion and adoption, future research could further explore the diffusion and adoption of innovations within organizations through the following research questions: (1) how are innovations diffused across organizations? (2) Do Rogers' individual adopter categories apply to organizations as an indicator of organization innovativeness? (3) Does it vary based on organization size, type, or industry? (4) What are the factors that determine successful diffusion and adoption of innovation in organizations? (5) Within an organizational setting what is the relationship between innovation adoption and diffusion? (6) What is the relationship between the adoption of an innovation and organization size? Continued research in this area will add more relevant literature to the current body of literature that exists on innovation adoption and diffusion and further develop the complex, ever-changing concept of innovation.

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