Diffusion of Innovations in Organisations

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INTRODUCTION

During the past two decades, the world has witnessed a significant change in the nature of the technological and administrative practices and processes faced by organisations in different areas of their operations, such as manufacturing processes, operation technologies, and information systems (Shields, 1997). To keep pace with other competitors in the global market, organisations are keen to be able to use the best and the latest ideas, techniques, practices, and processes in different aspects of their activities. This has placed a greater emphasis on the diffusion of innovation as a solution to cope with the requirements of such changes. This view is consistent with systems approach theory that suggests that all parts of a system are related to each other, and any change in one part of a system may require the consideration of appropriate change(s) in other parts of the organisation, otherwise, the system may not work properly (Kellett & Sweeting, 1991).

An overview of the diffusion of advanced techniques and the recognition of factors influencing the diffusion of such innovations is expected to facilitate the implementation of recently developed, advanced, and up-to-date techniques and practices in organisations. Given this, the current chapter explains a diffusion model applicable to studies investigating the diffusion of advanced techniques (both technological and administrative innovations). The model incorporates most of the innovation factors addressed in the diffusion and advanced techniques literature. An "advanced technique" is referred to as an innovation in this overview.

BACKGROUND

Rogers (1995) defined an innovation as "an idea, practice, or object that is perceived as new by an individual or other unit of adoption." Further, he suggested that if the individual has no perceived knowledge about an idea and sees it as new, it is an innovation. Likewise, Damanpour and Gopalakrishnan (1998) defined innovation as "the adoption of an idea or behaviour new to the organisation." The common criterion in any definition of innovation is newness. According to Rogers (1995), newness in an innovation might be expressed not only in terms of new knowledge, but also in terms of first persuasion, or a decision to adopt. The second element that needs some clarification is diffusion: Wolfe (1994) explained diffusion of an innovation as a way new ideas are accepted (or not) by those to whom they are relevant. Rogers (1995) extended this definition to consider diffusion as a process by which an innovation is communicated through certain channels over time among the members of a social system.

A clear understanding of the complexities of the innovation process and of alternative diffusion methods is central to any innovation diffusion study. Depending on the source of innovation, the diffusion of the innovation might follow different stages, so that alternative approaches and perspectives might be applicable under different innovation diffusion processes.

According to Damanpour and Gopalakrishnan (1998), diffusion of innovations in organisations takes place in two ways: generation and adoption. In the case of generation, innovations are generated by organisations for their own use or for export to other organisations. In the case of adoption, innovations are imported into the organisation for adoption. The process of adoption of an innovation is a very long and difficult process, especially because many innovations need a long period of time to become widely adopted (Rogers, 1995). Rogers further emphasised that increasing the diffusion rate of an innovation is a common problem for potential adopters of that innovation.

The process of innovation diffusion is different when the innovation is generated by the organisation; in this case, the main stages include the stages of idea generation, project definition, design, development, and marketing and commercialisation (Cooper & Kleinchmidt, 1990). In the case of adoption of an innovation, which has been developed outside the organisation, the stages will be awareness of innovation, attitude formation, evaluation, decision to adopt, trial implementation, and sustained implementation (Zaltman, Duncan, & Holbek, 1973). Furthermore, Wolfe (1994, p. 411) added that when innovation is generated in the organisation, the stages "tend to be mulled and overlapping," while in the case of adoption, the stages "tend to occur in the expected order." Depending on whether the innovation is generated within or adopted by an organisation, two alternative general models can be formulated to describe the diffusion process.

Contributing to the diffusion of innovation literature,

Rogers (1995) suggested that there are six phases for the diffusion of an innovation: recognition of a problem or need, basic and applied research, development, commercialisation, diffusion and adoption, and consequences. Given this explanation, Rogers emphasised that these six phases are somehow arbitrary, as they might not always occur in order, and some of them might be skipped in the case of particular innovations. An innovation development consists of all decisions and activities and their impacts that occur during these phases. These suggested stages for innovation development are largely consistent with the generation approach of Damanpour and Gopalakrishnan (1998).

However, Zahra and Covin (1994) adopted a different perspective, suggesting that there are three major sources of innovation: imitative, acquisitive, and incubative. They defined these three major sources of innovation as follows. Imitative sources are those innovations that are first introduced by other firms and then copied by organisations. Acquisitive sources also include those innovations that have been developed by other firms but are acquired through purchase, licensing, acquisition, or merger. Finally, incubative sources are those innovations that have been developed in organisations for their own use. This categorisation is compatible with the generation and adoption approach of Damanpour and Gopalakrishnan (1998) in that "imitative innovations" and "acquisitive innovations" can be classified as "adopted" innovations and "incubative innovations" as "generated" ones.

From a process point of view, Rogers (1995) divided the innovation process in organisations into two subprocesses: an initiation process and an implementation process. The initiation process includes two stages: agenda setting and matching. These two stages involve all activities such as information gathering, conceptualising, and planning for the adoption of an innovation. The implementation process includes three stages: redefining/restructuring, clarifying, and routinizing. These three stages contain all of the actions, events, and decisions involved in implementing an innovation. This classification is again consistent with the adoption method explained by Damanpour and Gopalakrishnan (1998). However, regardless of types, phases, or sources of innovations, there are a variety of factors influencing the diffusion of advanced techniques in organisations. Reviewing the diffusion literature, Askarany (2003) summarised a variety of influencing factors and established a diffusion model applicable to studies investigating the diffusion of advanced techniques.

A DIFFUSION MODEL

Addressing the diffusion of advanced techniques, Askarany (2003) classified all influencing factors into three main categories: factors related to attributes of innovations, to adopters of innovations, and to the social system.

Following Rogers (1995), attributes of innovations include five categories: relative advantage, compatibility, complexity, trialability, and observability. These five categories include a variety of influencing factors, such as the degree of uncertainty associated with the innovation; the amount of investment required to adopt the innovation; the extent of economic advantage of an innovation; continuity of the innovation progress; overall benefit of an innovation (including economic and noneconomic advantage of an innovation); reinventing and dynamics aspects of innovations; profitability, flexibility, and capability of modification of an innovation; availability of an innovation and the information about it for potential adopters; and the type of innovation.

Factors related to the adopters of innovations include three categories: organisational strategy, organisational structure, and organisational culture. In other words, most characteristics of organisations can be explained by these three categories. These categories might include factors such as size of organisations, aggressiveness and innovativeness of their managers, level of information of organisations about the innovation, learning perspectives of organisations, resistance to change, technical skills of the users of an innovation in organisations, competition, and awareness of an innovation as a possible solution or as an available technique for progress.

Factors related to social system include the level of development of a society, communication channels in a society, social concerns, change agents, opinion leaders, and social norms. It might also be possible to include all of the influential factors that could not be related to the innovation category or the adopter's category under a social system category.

Given the above classification, Askarany (2003) suggested that the following general diffusion model (Figure 1) can be developed. This diffusion model is highly likely to be applicable to any diffusion study with minor modifications. Under this model, in general, what makes a diffusion research different from other diffusion research is the type or group of influencing factors and the kind or the number of advanced techniques. So, depending on the type of influencing factors and kind of advanced techniques, a more detailed model can be adopted from the

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