

# **BUILDING A TIMELY INFORMATION TECHNOLOGY STRATEGY: A PROCESS TO EFFICIENTLY ACQUIRE USEFUL INFORMATION REGARDING EMERGING INFORMATION TECHNOLOGIES**

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## **ABSTRACT**

*The body of knowledge that is information technology strategy contains numerous theoretical models with practical applications from which executives may formulate, align, and implement cohesive corporate information technology strategies. Specifically missing in many popular technology strategy models is a practical initial process to guide executives in their attempt to collect data regarding emerging information technologies. This research presents an efficient process through which technology executives may continually acquire data regarding new technologies. For the executive, the process 1) reduces the time required to assess the compatibility of a new technology with current and future organizational directions and 2) creates a proactive organizational culture regarding the value placed upon emerging information technologies.*

**Keywords:** Emerging Information Technology, Information Technology Strategy, Innovation Diffusion

## **INTRODUCTION**

Information technology (IT) is evolving at an increasingly rapid pace. In fact, formerly astute observations regarding the evolution of IT, such as Moore's Law are subject to revision due to the various improvements in computing efficiencies. During the last decade, IT advanced at such a frenzied pace that the useful life of many technologies seemed to shrink from years to months (14). In a global business environment dominated by shrinking timeframes, the timeliness of an information technology strategy is increasingly important (4). For the technology executive charged with the prima facie responsibility of developing corporate IT strategy, the rapid evolution of information technology injects an additional degree of complexity into the process (3, 11, 12). Specifically, IT strategists face a heretofore unseen dilemma: the potential of planning an IT strategy with currently available commercial technologies that become obsolete by implementation (1). Thus, the purpose of the research described herein is to 1) explore current industry practice for collecting data regarding information technologies applicable to corporate IT strategy and 2) suggest a process through which technology strategist may avoid the aforementioned obsolescence dilemma while planning and implementing an IT strategy.

## BACKGROUND

An a priori theory as to factors contributing to the previously described dilemma involves 1) the level of maturity of technologies traditionally considered by executives for adoption into IT strategy and 2) the process through which technology executives collect information regarding potential technologies for corporate strategy. Specifically, the generalized proposition examined in this research is summarized below.

- Information technology executives consider only currently available commercial information technologies when planning an information technology strategy

## THEORITICAL FOUNDATION

The proposition presented in the current study centers upon the decision-making processes in which information technology executives engage while building an IT strategy. Specifically, the focus of this research examines the extent to which executives evaluate new or *emerging information technologies* (EIT), as potential components of an IT strategy. This study defines emerging information technologies as a distinct category of IT innovation. Information technologies classified as EITs are tangible products in the early stages of development that are neither widely available nor disseminated via commercial marketing channels. Defining characteristics of EITs often include incomplete product standardization and limited availability (i.e. beta versions of software and prototypes of hardware). The most appropriate theoretical perspective from which to extend the current study is the sociological research domain of innovation diffusion. For this reason, the following sections include a brief overview of the research tradition of innovation diffusion.

### Innovation Diffusion Research

Using meta-analytical techniques, Rogers (8) reported that the cumulative efforts of thousands of scholars in numerous fields of study who collectively examined innovation diffusion theory totaled more than 3,800 published research articles. In terms of volume of published works on a topic, innovation diffusion is among the most widely studied aspect of the behavioral sciences. Although the scope of the collection of innovation diffusion research is expansive, scholars typically agree that innovation diffusion is the process by which an innovation is communicated through certain channels over time among the members of a society (6). Incorporated in the theory are four specific elements (1 the innovation, 2 the channels of communication, 3 time, and 4 the social system. The current research is interested in only one element of the definition - the innovation.

### Innovation

An innovation is an idea, practice, or an object that is perceived as new by an individual (2,7). It is important to note that it does not matter whether the idea, practice, or object is new by the measure of time that has lapsed since its discovery (13). The perception of newness by the potential adopter determines the reaction to the idea, practice, or object. Thus, if an idea, practice

or object is perceived as new to an individual, it is innovation. Newness can be expressed as one’s knowledge regarding an innovation (5).

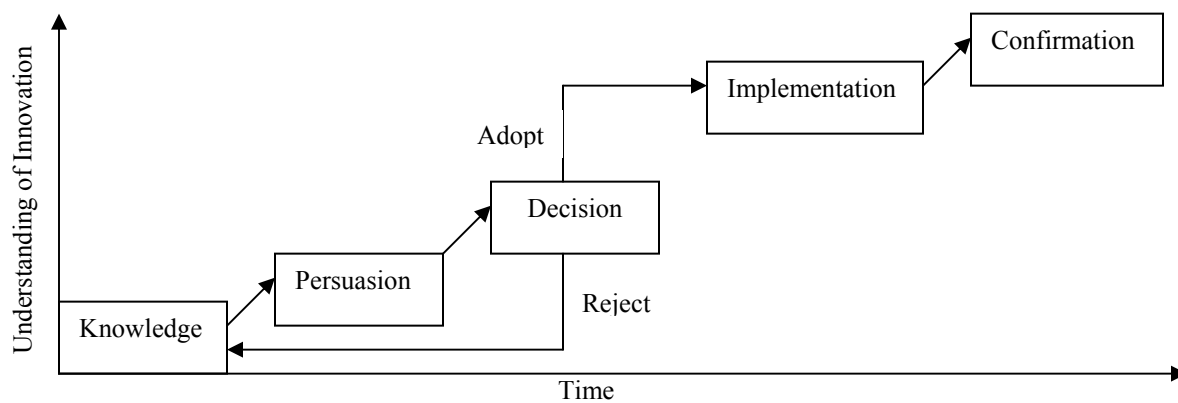
**Forms of Innovation**

In many instances, innovation assumes the form of technology. Technology is a design for action that reduces the level of uncertainty in the cause and effect relationship involved in achieving a desired result (9). Technology has two potential forms - hardware and software (10). In innovation diffusion research, hardware and software have much more encompassing definitions than those definitions popularly employed in information systems research. Hardware is the tool that embodies the technology in physical form. Software is the information basis of the tool. Examples of hardware as technology, like the airplane or the television, are very common, as they manifest in tangible form. Technology embodied as software may be less obvious to casual observation. Political theories like Marxism and religious ideologies such as Calvinism are examples of technologies that are composed exclusively of information, and thus described in innovation diffusion research as software. Most often, technology is a combination of hardware and software. Because generalized information technology is the artifact of interest in the current study it is important to understand that both information technology hardware (i.e. workstations, routers, servers, printers) and information technology software (any coded program) are, in the broader constructs of innovation diffusion research, forms of hardware.

**The Innovation-Decision Process**

Potential adopters of an innovation follow a well-defined decision process in order to arrive at an adoption decision regarding an innovation (8). In fact, the evaluation process, referred to as the innovation-decision model (Figure 1), involves five steps (Table 1), and for most adopters evaluating an innovation, the innovation-decision process will include some common criteria (Table 2).

**Figure 1.** The Five Steps of the Innovation-Decision Process (Adapted From Rogers, 1995)



**Table 1.** The Five Levels of Adopter Understanding Regarding an Innovation

<b>Level</b>	<b>The point in the Adoption Decision Process when an individual</b>
Knowledge	learns of the existence of an innovation and accumulates some understanding of its function.
Persuasion	formulates of an attitude (favorable/unfavorable) toward the innovation.
Decision	undertakes activities (impact analysis) leading to a choice to adopt or to reject the innovation.
Implementation	utilizes the innovation.
Confirmation	seeks reinforcement for the innovation-decision that has already occurred.

The current study investigates the specific events that occur during the Knowledge stage of the Innovation-Diffusion Process as they relate to the IT executive and the acknowledgement and acquisition of information regarding innovations that are classified as emerging information technologies.

**Table 2.** Adopter Evaluation Criteria for an Innovation (Adapted from Rogers, 1995)

<b>Criteria</b>	<b>Definition</b>	<b>Impact on Adoption Decision</b>
Relative Advantage	The degree to which an individual perceives an innovation to be better than a previously-accepted idea.	Innovations perceived to have a greater degree of relative advantage are more likely to be adopted.
Compatibility	Perception of an innovation as consistent with existing norms, values, experiences, and needs of the potential adopter.	Innovations that conflict with an existing social system are less likely to be adopted.
Complexity	The degree to which an innovation is perceived as difficult to understand or use.	Innovations that are simpler to understand are more likely to be adopted.
Trialability	The degree to which an innovation can be experienced on a limited basis.	Innovations that can be employed on a partial-use or limited-use basis tend to be more readily adopted.
Observability	The degree to which the results of adopting an innovation are visible to others.	Innovations with demonstrative results are more apt to be adopted.

## THE CURRENT STUDY

### Methodology

Two-hundred and twelve executive-level (titled as senior manager or higher) IT personal at 164 Fortune 1000 firms received and email soliciting participation for the current study. The email, which contained a link to a web-based exploratory survey instrument, requested that the recipient participate in a brief university study examining the practices of IT professionals responsible for developing corporate IT strategy.

### **Analysis**

Seventy-five of the 212 (35%) information technology executives from Fortune 1000 firms who received the email solicitation responded. Analysis of the data collected via the exploratory web-based survey revealed that only 32% of the respondents had, in fact, evaluated an emerging information technology during their most recent IT strategic planning session. Of the responding executives who stated that they had not explored an emerging information technology during their most recent IT strategy planning session, 68% indicated that they lacked sufficient time during strategy planning to explore and acquire knowledge regarding EITs as potential components of their respective IT strategy. More importantly, 83% of those executives who reported not having considered EITs in their recent strategic planning sessions stated that the consideration of those types of technologies would contribute to the development of a more timely IT strategy.

Additionally, only 16% of the responding executives indicated that they felt strongly or very strongly that their organization is technologically progressive with regard to evaluating EITs as potential components for corporate IT strategy. Each of those executives provided a statement detailing their organization's proactive nature regarding EITs as potential strategy components. Thus results (adapted from IT executive feedback) are provided here as a practical guide to support the construction of a more timely information technology strategy.

### **THE DOs**

- **DO** review new technologies on a continuous basis – each week allocate time to investigating what's new.
- **DO** create lasting resource files – a new technology may not provide potential value to your organization today; however, tomorrow may be a different story, so keep your research handy.
- **DO** define your existing business process and supporting IT for each process – one executive says “drawing a diagram [of your systems] works because it creates a ‘drag and drop’ overview of your entire infrastructure. From that drawing I know what might work for each process.”
- **DO** create a collection of trade journals and online publications for quick references – “I can find most of my preliminary information at two sites - CIO.com and ZDNet.com.” says the CIO of a public utility in the southeastern United States.
- **DO** listen to your people in the trenches – your organization's frontline programmers, analysts and other techies are a valuable source insight into emerging technologies.

### **THE DON'Ts**

- **DON'T** become a victim of information overload – this is a preliminary data gathering process, not a final analysis. Get an overview of the new technology. After a cursory review suggests the new technology applicable for your organization, do additional research.

- **DON'T** forget to ask questions – when collecting data on a new technology, correspondence with the product's developers are often the most expeditious means of getting the facts.

## CONCLUSION

Analysis of the data overwhelming supports the proposition that the majority of IT executives consider only currently commercially available technologies when planning corporate IT strategy. Reliance on only technology that is currently available in the consumer market place is detrimental to the overall useful life of an information technology strategy. As confounding as this inclination may seem to IS researchers, most IT executives freely trade the time required to research EITs on the front end of IT strategy planning for an ultimately shorter useful life of the IT strategy that is implemented. As a means of prolonging the useful life of an information systems strategy, and there for building a more timely strategy, executives should integrate the suggestions provide herein and focus some time in the strategy planning stage evaluating emerging information technologies.

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