

## Toward the Success of eGovernment Initiatives: Mapping Known Success Factors to the Design of Practical Tools

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### Abstract

This paper introduces a strategy for assessing the practical frameworks that government managers use to guide government investment decisions. A gap analysis strategy is outlined here and a preliminary application of the analysis is presented using a single egovernment investment decision making framework. The gap analysis strategy serves two purposes; to inform the design, development, and use of egovernment investment decision making tools and processes; and to propose a strategy for informing the ongoing debate about information systems research relevance.

### 1. Introduction

As the interest in and pressure for new and expanded egovernment increases, government managers are finding themselves making decisions about information and information technology for which they are unprepared or ill-equipped. Recognition of the complexity and risk of IT decisions and of the broad range of public managers involved in making these types of decisions has spurred the development of many structured and rigorous IT business case analysis and investment strategies. These strategies, recommended in some government agencies, and required in others, provide frameworks for decision making within a particular organizational context.

It is important for both practitioners and researchers that these frameworks be grounded in the latest information systems research and practice. At this point however, there is no empirical evidence that this goal has been achieved. The extent to which practitioners have

found the results of years of IS research relevant to their efforts to produce tools that limit the risk of IT investments is unclear. However, a continuing high level of systems failures encourages practitioners and research to invest in an examination of the relationship between practice and research.

The latest debate about the relevance of information systems research was presented in the March 2001 issue of the *Communications of the Association for Information Systems* (CAIS). This issue presented the thoughts, concerns, and recommendations of a wide range of researchers in the field. The 26 articles included discussions about expanding the notion of relevance [19] the question of *relevance to whom* [9] and the need for better matches between academic research goals and goals of constituents [25]. Paul Gray, the editor of CAIS, in his introduction to the special issue describes the relevance issue as one that “concerns the importance of academic IS research to the practitioner community”. [16] According to Gray, the authors of the 26 papers in the special issue, seem to have consensus that published work is not being read by practitioners. The explanations presented for this gap between research and practice include abstractedness of writing, lack of practical experience of faculty, latency of publication of academic research, and a failure to focus on applications for non-business constituencies such as the public sector and the community use of computing. [16]

The trigger for this special issue was a discussion on the ISWorld listserv. This discussion [2], launched by Deepak Khazanchi of the University of Nebraska at Omaha generated a range of responses – both emotional and otherwise. One posting in particular, challenges the discipline to go after this question. This

respondent, who requested anonymity, called for empirical research that examines the extent to which research has contributed to IS practice. This research might provide a empirical foundation for claims of non-relevance by practitioners and might spur change. Or, it might provide evidence that research is informing practice. Either way, as a number of the authors of the special issue state, relevance to practice needs to be studied.

A number of surveys have asked respondents to consider relevance of IS research. The summary concern stated from these surveys is that practitioners aren't reading research – the inference being therefore, it isn't informing their practices. The premise of this paper is that an examination of the frameworks they have created to structure their decision making processes will be more informative.

The Federal Government's Information Technology Investment Portfolio Management System (I-TIPS), in place in over twenty federal agencies as of January 2001, structures what federal government IT decision makers pay attention to. This system provide an opportunity to examine the extent to which research has informed practice. A gap analysis strategy represents an opportunity to do a component-by-component analysis to determine the extent to which the design reflects awareness of IS research. This strategy could also inform determinations about whether a framework itself is flawed in some fundamental way. This work might also inform future efforts to conduct an empirical study of egovernment investment decision making frameworks in international, national, state, and local governments in terms of IS research achievements.

## 2. A proposed research strategy

A gap analysis between I-TIPS and success factors of IT initiatives has the potential to inform questions about the relationship between research and practice and to explore fundamental flaws in investment frameworks in use by practitioners. The gap analysis involves a five step process outlined below.

First, factors informing the success of IT initiatives will be selected for their contribution to research in the area of IT investment decision making. Second, a set of frameworks in place and used for government IT investment decision making will be identified and described. Third, a

comparison of the factors list against the framework descriptions will be conducted. Fourth, an identification of the gaps and an analysis of the implications will be completed. Fifth, a follow-on examination with framework designers to explore the source of the gaps between the design of practical tools and the insights generated by IS research.

## 3. Success factors of IT initiatives

A number of studies have been conducted over the years to categorize and generate models of the factors which influence information systems development success and failure. [6, 7, 21, 28, 29, 31]. DeLone and McLean reviewed 180 articles dedicated to success factors. They created six categories of IS success: (1) system quality, (2) information quality, (3) use, (4) user satisfaction, (5) individual impact, and (6) organizational impact. [11] More recent efforts have enhanced this model through the addition of "sociotechnical" factors. Lytinen et al., for example, present a model of ISD that incorporates four interdependent elements of (1) actors, (2) structure, (3) technology, and (4) task. These authors introduce the notion of interdependencies among factors and begin to introduce strategies to reduce the risks introduced by these interdependencies. [23] Five specific factors were selected from these studies for use in the preliminary application of the gap analysis. The five factors are mapped to the Lytinen et.al.'s four interdependent elements.

<b>Table 2.</b> <b>Selected success factors in</b> <b>of IT initiatives</b>	
<i>Success Factor</i>	<i>Interdependent Element</i>
Top management commitment	Actors
Linkage to business	Task
Technical alignment	Technology
Knowledgeable personnel	Task
User involvement	Actors

**4. The Information Technology Investment Portfolio System (I-TIPS)**

The Clinger-Cohen Act [1] of 1996 requires federal agencies to clearly define and implement a capital planning and investment control process for assessing information technology investments. In response to this legislation the Department of Energy spearheaded the development of a portfolio management system designed to ensure that IT investments are driven by agency business objectives. The system, initially funded through an award from the Government IT Services Board and Interagency Management Council's IT Innovation Fund<sup>1</sup>, and in association with the U.S. Department of Agriculture was developed by Booz, Allen based on the GAO (General Accounting Office)'s and OMB's (Office of Management and Budget) IT lifecycle guidelines [12].

I-TIPS is managed as a self-sustaining activity. Ongoing operation is funded through an annual Service Level Agreement (SLA). The SLA is jointly developed and agreed to by all participating agencies. It is used for maintenance and enhancement of the system, and to provide technical support services for participating agencies. According to the I-TIPS Resource Center (<http://www.itips.gov/cgi/I-TIPS.cfm>), "I-TIPS is a tool that is used in conjunction with an existing IT capital planning process in order to strengthen and improve an organization's IT capital planning process."

I-TIPS is designed to help agencies select, control, and evaluate IT investments through the use of five different phases. phases one, two, and three that have to do with investment prioritization, selection, and evaluation. The final two phases focus on formal reporting of project activity. (See Table 1).

1. Selection
2. Control
3. Evaluation
4. Enhanced Analysis and Reporting
5. OMB Budget Exhibit Reporting

<sup>1</sup> The IT Innovation Fund is intended to provide seed money for innovative projects that benefit multiple organizations.

This preliminary gap analysis focuses on phases one, two, and three.

The *Selection* phase focuses on the assessment and prioritization of current and proposed IT initiatives and creates an optimal portfolio of IT initiatives. In the *Control* phase, IT managers review initiatives for cost, schedule and consistency with the organization's information architecture and decide whether to continue, modify, or cancel a project. The objective of the *Evaluation* phase is to refine the IT selection criteria to better correspond to organizational needs by comparing actual data with projected data. Each phase is conducted as a part of continual, interdependent management effort.

<b>Table 1. I-TIPS Phases</b>	
<i>I-TIPS</i>	<i>Tasks</i>
Selection	<ul style="list-style-type: none"> <li><input type="checkbox"/> Filter and screen IT projects for mission needs</li> <li><input type="checkbox"/> Analyze the most accurate and up-to-date cost, benefit, risk, and return information</li> <li><input type="checkbox"/> Create a ranked list of prioritized projects</li> <li><input type="checkbox"/> Determine the most appropriate mix of IT projects</li> </ul>
Control	<ul style="list-style-type: none"> <li><input type="checkbox"/> Use a set of performance measures to monitor the developmental progress</li> <li><input type="checkbox"/> Decide to continue without adjustment, modify to improve performance, or cancel the project</li> <li><input type="checkbox"/> Take action to correct discovered problems</li> </ul>
Evaluation	<ul style="list-style-type: none"> <li><input type="checkbox"/> Compare actual project cost, benefit, risk and return information against earlier projections</li> <li><input type="checkbox"/> Modify the organization's investment process based on lessons learned</li> </ul>

**4.1. Top management commitment**

Top management commitment is regarded as a critical success factor for IT initiatives [17, 33, 35]. I-TIPS does not explicitly describe how to obtain top management commitment, nor does it address the need for it by requiring investment

options to present or demonstrate that top management commitment exists. However, the design of I-TIPS has allowed agencies who recognize the criticality of top management support to add a requirement that explicit commitment from top management be addressed in the investment analysis. For example, the USDA (United States Department of Agriculture) has modified I-TIPS and added a *Pre-Select* phase before the standard I-TIPS *Select* phase. In the USDA *Pre-Select* phase, a project must have a sponsor identified. USDA has demonstrated awareness that IT investments championed by a business leader have the best chance for successful deployment. The addition of the project sponsor to their implementation of I-TIPS has also added accountability aspects to the sponsor for downstream reporting activities. The design of I-TIPS clearly reflects understanding that different agencies assess factors contributing to success differently. This in itself raises questions about which factors were considered for inclusion in the framework and why were certain ones left out.

#### 4.2. Linkage to business planning

IT investment should be aligned with the business and mission of organizations [3, 20, 22, 27]. Farragher et al. [10] found that 93% of respondents to a survey on investment decision making agreed strategic alignment is a very important component of capital investment decision-making process.

The *Selection* phase in I-TIPS requires agencies to express how IT projects will meet mission needs. This requirement forces IT managers to formulate and assess the impacts of alternative IT investment scenarios. For example, the Department of Veterans Affairs, the U.S. Customs, and the Department of Agriculture use I-TIPS to conduct mission analysis to identify critical needs in the organization and to identify business objectives and alternatives to support mission need and business objectives [13].

It is important to align an organization's strategic mission and the implementation of IT systems [4, 20, 32, 34]. Das et al. [10] cited an A.T. Kearney study showing that organizations that integrated business plans with IT plans generally outperform those that do not. In the *Select* phase, individual projects are evaluated in terms of technical alignment with other IT systems.

I-TIPS can be tailored to accommodate a fairly wide range of agency IT planning strategies [13]. For example, the U.S. Customs uses I-TIPS to compare existing systems with proposed systems through an architecture review, verification, and validation.

#### 4.3 Knowledgeable personnel

IT investment projects affect entire organizations. Therefore, it is essential to have project team members from different functional units, such as IS (Information Systems), financial, and human resources, involved in projects. They know their job functions very well so that they can identify IT investment issues across units and provide alternatives in a coherent way [5, 26, 34, 35]. However, I-TIPS does not identify the right people or address how to recruit them.

Beath [5] shows that champions need information for evaluation and persuasion, technical resources, and political support. However, the four types of training in I-TIPS are only offered for system administrators, investment managers, portfolio managers, and executives. The training program does not address the need for knowledgeable champions.

#### 4.4. User involvement

User involvement in developing information systems is a component of successful IT initiatives [17, 18, 35]. The design of I-TIPS reflects awareness of the need for user involvement by providing a collaboration-working environment through a discussion forum, a documentation repository, an event calendar, and activity tracking. It also provides a common architecture to share IT investment information for users. User involvement is also facilitated by an investment in accessibility. Users can access information at anytime and anywhere via a Web interface. The I-TIPS reference paper (<http://www.itips.gov/cgi/I-TIPS.cfm>) also states that the I-TIPS system provides government managers and staff with ready and shared up-to-date information about individual IT capital planning initiatives.

### 5. Gap Analysis Summary

The table below shows the extent to which the design of I-TIPS responds to research on success factors of IT initiatives. I-TIPS

incorporates features that ensure that *linkage to business planning, technical alignment, and user involvement* are attended to by project teams. I-TIPS does not address factors such as *top management commitment, expectation of output, and knowledgeable personnel* to the same extent. The design of I-TIPS allows for agencies who recognize factors beyond its original design to modify or expand.

I-TIPS and success factors identified by IS research	
Success Factors	I-TIPS
Top management commitment	Low
Linkage to business planning	High
Expectation of output	Low
Technical alignment	High
Knowledgeable personnel	Low
User involvement	High

**6. Discussion**

This preliminary gap analysis presents a possible strategy for conducting an empirical study on the incorporation of IS research into practice. It generates a set of questions about and refinements to the strategy.

The identification of factors and the analysis of those factors against practical frameworks requires specification of how individual organizations and researchers express IS success factors and the concepts that underlie them. For example, in some cases stakeholder involvement refers to all possible stakeholders, in other cases, stakeholders are viewed more narrowly to include only those who are direct users or direct recipients of the benefits of a system. How research and government managers identify and express the stakeholders of e-government varies within a single organization, and to an even greater degree, across organizations.

Refinements to the strategy will allow the gap analysis to be applied more generally across practical frameworks. A refined strategy could inform the efforts of practitioners to provide and use practical frameworks for investments in e-government and the efforts of those researchers who strive to inform practice with their efforts.

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