



Environmental, Organizational and Managerial Determinants of Strategic IS Plan Implementation

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ABSTRACT

This paper reports on an empirical study which examined the effect of various environmental, organizational and managerial determinants on strategic IS plan implementation success. The paper presents the theoretical underpinnings of the study, together with the study's hypotheses and results. Data collected from 106 organisations in South Africa revealed that, amongst other factors, the external business and IT environments, as well as the level of CIO influence and the significance of IS within an organisation, are all variables which effect IS plan implementation.

INTRODUCTION TO THE STUDY

Strategic information systems plan implementation is the process of introducing into an organization the selected systems, applications and infrastructures identified in the long term strategic IS plan. The process also includes the implementation of the policies related to the governance and management of the IS function, and ideas related to the long term role and expected contribution of IS within the organization (Gottschalk, 1999). Associated with this implementation process is the concept of change (Markus and Benjamin, 1996) and the corresponding issues of organizational resistance together with external constraints imposed by budgetary and technical realities.

Earl (1993), however, indicates that even when the planning process is "judged successful...resultant plans are not always followed up or fully implemented." Others, e.g., Chan *et al.* (1998) and Ward and Peppard (2002) also describe how IS strategies are not always realized (implemented) as intended. Failure to implement strategic IS plans can result in significant wasted resources, poor investment decisions and numerous lost opportunities for the competitive use of IS (King and Raghunathan, 1987; Lederer and Sethi, 1991; Edwards *et al.*, 1991). In addition, failed implementation also leads to lack of integration or alignment between IS and the business (Lederer and Sethi, 1998; Reich and Benbasat, 2000), lost confidence by business management in the IS function and consequently their reluctance to support future IS efforts and to consider IS as a potential source of advantage. Moreover, the validity of IS strategic planning (ISSP) as a managerial activity is severely undermined if the implementation of resultant strategic IS plans cannot be assured. Implementation is thus a necessary and desirable outcome of an organization's ISSP process (Lederer and Salmela, 1996).

Yet despite its importance and recent reminders that IS researchers not overlook implementation in IS strategy research (Chan and Huff, 1992), a review of the literature reveals that attention to implementation remains limited and is in need of advancement. Some noteworthy progress has, however, been made in uncovering implementation problems (Lederer and Mendelow, 1986; Lederer and Sethi, 1991; Lederer and Sethi, 1992), identifying barriers to implementations (Wilson, 1991), and defining planning process variables, organizational practices and mechanisms that facilitate plan implementation (e.g., Premkumar, 1992; Premkumar and King, 1994; Lederer and Sethi, 1996). In addition, implementation is being recognized as a measure of planning success (e.g., Segars; 1994; Doherty *et al.*, 1999), and its importance in linking planning to performance has been examined (Raghunathan and King, 1988).

Furthermore both theoretical and empirical works have also begun to consider the relationship between plan content and implementation (e.g., Lederer and Salmela, 1996; Gottschalk, 1999).

While it is important to continue with these efforts, much also needs to be learned about the effect of other factors (environmental, organizational and managerial in nature) on the strategic IS plan implementation process, which hereto have remained untested. Gottschalk, for example, found that 81 percent of variation in implementation extent was left unexplained in his study of plan "content predictors" of implementation. This suggests the need to identify other important *determinants* of strategic IS plan implementation successes and failure. Implementation success may thus be influenced by factors not only in direct control of the ISSP process but also that lie outside of it. The purpose of this study is to explore those factors.

DEVELOPMENT OF HYPOTHESES

Drawing on various perspectives from strategic management and organization theory, this study recognizes the potential influence of selected environmental, organizational and managerial factors on strategic IS plan implementation. It is recognized that since the IS function and its management team are no longer "buffered" from the effects of the external business environment (see Lederer and Mendelow, 1990), the characteristics of the organization's external environment must be recognized for their possible effects of IS plan implementation. The ever changing external organizational environment, together with trends and developments in the "technical base" of IS (Venkatraman, 1986), and the corresponding need for constant change and flexibility, quickly make IS plans obsolete and hamper organizational efforts to implement IS plans. In addition to the external environment, the internal characteristics of the host organization, such as its size, complexity and strategic orientation, must be recognized together with the characteristics of the IS function as potential factors influencing IS plan implementation. Furthermore, the nature of the IS business relationship and demographic characteristics of the IS management team may also be important explanatory variables. Such variables play important roles in determining the ability of the IS management team to secure funding, gain organizational support and cooperation, and exercise the necessary influence required for effective implementation (see Enns *et al.*, 2001).

Thus the hypotheses of this study are as follows:

- H1: The greater the level of uncertainty, dynamism and hostility in the organization's **external business environment**, the lower will be the level of strategic IS plan implementation success.
- H2: The greater the level of perceived dynamism in the **external IT environment**, the lower will be the level of strategic IS plan implementation success.
- H3: The greater the level of **organizational complexity**, the lower will be the level of strategic IS plan implementation success.
- H4: The more prospector oriented the **organization's business strategy**, the lower will be the level of strategic IS plan implementation success.
- H5: The **larger and more experienced the IS function**, the greater will be the level of strategic IS plan implementation success.

- H6: The more significant IS is to current and future organizational success, the more complex will be resultant plans and thus the lower will be the level of strategic IS plan implementation success.*
- H7: The greater the business orientation (education), experience and length of organizational tenure of the top IS management team, the greater will be the level of strategic IS plan implementation success.*
- H8: The more influential the CIO, the greater will be the level of strategic IS plan implementation success.*
- H9: The greater the level of top managerial commitment to IS, the greater will be the level of strategic IS plan implementation success.*
- H10: The greater the degree of shared vision between IS and business management, the greater will be the level of strategic IS plan implementation success.*
- H11: The greater the focus of the IS strategic planning process on implementation, the greater will be the level of strategic IS plan implementation success.*

DATA COLLECTION

A pilot tested questionnaire measuring the study's constructs was mailed to the directors of IT in over 650 companies listed in the 2002 edition of "Who Owns Whom in South Africa" (a comprehensive publication of information on major listed and unlisted companies). As of January 2003, 118 questionnaires were returned for an 18% response rate. Questionnaires with missing data were eliminated, yielding 106 useable responses.

Measurement

Where possible, the study's explanatory variables (contextual determinants) were measured using multiple items adopted from the IS, organization theory and strategic management literature. Implementation was measured using multiple items capturing the extent to which the strategic IS plan is as a whole was being implemented as planned as well as in terms of the adequacy of resources provided. For all multi item variables, composite values were calculated except for IS managerial demographics (hypothesis 7), which were examined individually. Due to the number of respondents providing incomplete data on IS function size and number of years computing experience, hypothesis 5 was dropped from the study.

RESULTS

Based on a mean split, the sample was classified into two groups representing high and low levels of strategic IS plan implementation success. There were 63 cases in the successful implementers group and 43 in the unsuccessful group respectively. Step wise discriminant analysis was performed on the data with 12 environmental, organisational and managerial variables as predictors of membership in the high and low implementation success groups.

A significant discriminant function, Wilks' Lambda = .768, $\chi^2(10) = 21.97$ ($p < 0.01$), was extracted. All variables, except "strategic orientation" and the demographic variable measuring "tenure", entered the discriminant function (enter criterion of $F=1.0$). Thus providing some level of support for all but hypothesis 4. Sixty-seven percent (67%) of the cases were correctly classified by the discriminant model. This is high enough above the chance criteria of 51.8% for the model to be considered useful for predicting implementation success. Although most of the study's variables entered the analy-

sis, which suggests they were important for distinguishing between successful and unsuccessful implementers, the most significant variables were the strategic significance of IS to the organisation, CIO influence, external business environment and ability to cope with external IT dynamism, followed by a focus on implementation during ISSP. Organisational complexity and IS managers' business experience surprisingly related negatively to implementation success, a finding which deserves further exploration.

Correlation analysis reveals that the composite implementation success score is related, at $p < 0.1$ or better, to all independent variables except for "strategic orientation", "organisational complexity", "business experience of IS managers" and "length of organisational tenure". These variables may thus be less important in predicting implementation success. Although "CIO influence" also did not correlate significantly with the composite implementation success score, the successful and unsuccessful implementer groups differed significantly on this variable ($F=4.99$, $p < 0.05$) thus confirming its importance.

From a practical perspective, these results provide IS managers with an understanding of the relative impact of environmental, organisational and managerial variables on strategic IS plan implementation. Specifically, the results show the important effect that factors, both within and outside of the control of IS managers, can have on IS plan implementation. Although it may not be possible for IS managers to influence many of the environmental or organisational variables, they must make themselves aware of the mechanisms through which these factors influence IS plan implementation, i.e., understand the inherent problems that context presents, and thus be in a position to respond accordingly. IS managers wishing to improve plan implementation should ensure they are more comfortable with and able to reconcile external IT trends with their strategic plans. Furthermore, they should work on improving the strategic significance of IS and their own influence within their organisations. IS managers should also focus on implementation during their ISSP process and create an environment that facilitates shared vision with and commitment from business managers.

CONCLUSION

It is hoped that this study will add to the growing strategic IS plan implementation research stream by demonstrating that factors in the environmental, organizational and managerial context can influence strategic IS plan implementation. This research has thus helped to identify those contexts that are more conducive to strategic IS plan implementation and will benefit organizations looking to improve their strategic IS plan implementation efforts. Although not specifically addressing actions that can be taken to influence context or mitigate implementation problems it is hoped that results will help influence the development of contextually sensitive methodologies for strategic IS plan implementation. In addition, similar to other studies that address plan implementation, these results will aid researchers attempting to understand implementation successes and failures. This study included only selected variables, future research would do well to identify the effect of other environmental, organizational and managerial factors not included in this study.

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