Organizational Context and Information Systems Success: A Contingency Approach

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ABSTRACT: Previous research suggests that organizational factors can be as important as individual factors for the success of information systems. This paper proposes a contingency approach relating selected organizational factors, namely organizational size, maturity, resources, time frame, and IS sophistication to user satisfaction and system usage. The model is tested through an empirical investigation of 34 small and medium-sized manufacturing firms. Data analysis results indicate that while organizational time frame and IS sophistication have a direct effect upon satisfaction and usage, the effect of size, maturity, and resources is mediated by IS sophistication.

KEY WORDS AND PHRASES: organizational context of MIS, information systems success, organization size, IS sophistication, organizational success factors.

Introduction

SEMINAL STUDIES OF A THEORETICAL AND EMPIRICAL NATURE by researchers such as Schultz and Slevin [34] and Ein-Dor and Segev [11] were among the first in pointing to the organizational context as a determinant of information systems (IS) success. The latter in fact proposed a series of hypotheses relating various organizational factors such as size, maturity, resources, and time frame to the successful implementation of information systems. They later found IS structure to be significantly correlated with organizational structure [12], concluding that "different MIS structures naturally fit different organizational contexts" and that "success depends on the extent to which the particular values fit the organizational environment."

While the importance of the organizational environment of information systems is acknowledged a priori in the literature, the empirical research stream on this class of variables has been much less extensive than the research stream focusing on individual

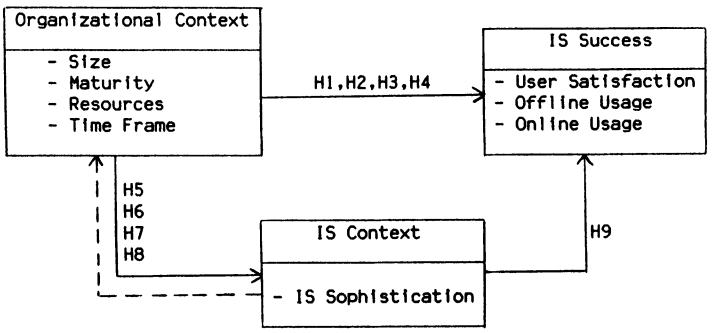

Figure 1. Research Model of the Relationship between the Organizational Context and Information Systems Success

and system-related differences [32, 36]. Indeed, while some studies of the organizational context have concentrated on the relationship between size, structure, and the sophistication or structure of the IS function, they have neglected to relate these constructs empirically to IS success [12, 20, 28]. Other studies that have included success as a dependent construct have focused on the immediate information systems context, i.e., on the characteristics of systems development, operation, and usage [9, 22, 23], rather than on the more global organizational context.

This paper focuses on selected variables of the organizational context based on the theoretical framework proposed by Ein-Dor and Segev [11], namely organizational size, maturity, resources, time frame, and IS sophistication. The aim is to strengthen and extend the previously cited research on the organizational context of IS by proposing and validating a model that relates these variables to systems success. This model and its associated hypotheses are tested through an empirical investigation, conducted in 34 organizations.

Research Model and Hypotheses

IN VIEW OF THE RESEARCH AIMS, THE ORGANIZATIONAL VARIABLES SELECTED reflect relationships originating for the most part in Ein-Dor and Segev's theoretical framework. Since other studies have used this framework [8, 12, 36], and as a lack of common underlying theory is often seen to be a problem in empirical IS research [17], it was felt that this was an appropriate way to confirm prior claims and provide additional insight on the impact of the organizational context upon IS success. A pictorial representation of the research model is presented in Figure 1.

Organizational Size

Ein-Dor and Segev's initial proposition was that IS success was less likely in smaller organizations than in larger ones. Smaller organizations are generally resource poor in human and financial terms, and less developed in terms of structure and functions.

Small firms are thus thought to be more prone to IS failures because they have not acquired sufficient managerial and technical expertise in regard to the development, operation, and usage of a computer-based information system. Note, however, that in the ten years that followed this proposition, technological advances related mainly to microcomputers and fourth-generation software have allowed smaller firms to increase their levels of IS sophistication and success.

In empirical studies, neither Gremillion [14] nor Raymond [30] could find a direct link between size and user satisfaction or system usage. Additionally, results regarding the relationship between organizational size and IS sophistication have been somewhat mixed [20, 30], in that significant associations were not found for many sophistication criteria. Thus, while organizations have been shown to react to growth by various mechanisms such as increased formalization, planning, and resource allocation [10, 25], the effect of size on information systems is less clearly understood. Yet, it is still plausible to expect that the greater human, technological, and financial resources generally available to larger organizations will allow them to be more sophisticated and successful in their use of information systems.

Organizational Maturity

Ein-Dor and Segev also proposed that more mature organizations were more likely to implement IS successfully. As used by these researchers, the principal dimension of organizational maturity is the degree to which organizational processes are systematized and formalized through rules, procedures, and management practices; this concept is known as formalization in the organization theory literature [15]. Formalization has been related to greater decentralization of IS development, greater control of IS project selection and management [28], and better user attitudes toward an information system [31].

Formalization requires that organizational processes be well understood, if explicit rules, procedures, instructions, and communications are to govern them. Increasing the maturity of the organizational IS function can lead to increased formalization, as this necessitates more formal data and models of the object systems that this function aims to support. Organizations that are run more formally are also those in which management applies techniques such as inventory control, quality control, project management, budgeting, cost accounting, and financial analysis; this in turn requires the support of a more sophisticated organizational information system. Thus, as mature organizations provide a more compatible environment for the development and usage processes associated with computer-based systems, it is assumed that such organizations will attain higher levels of IS sophistication and success.

Organizational Resources

The budgeting of sufficient resources is an additional success factor proposed in Ein-Dor and Segev's conceptual scheme. They argued that organizations tend to incur greater IS failures due to understaffing, underpowered hardware, or inadequate soft-

ware when the information systems function is not accorded the importance it merits. Empirical results in this regard have been mixed. Bean et al. [5] found no relationship between OR/MS budget size and user satisfaction, and a negative relationship between budget size and usage rate. Ein-Dor et al. [13] also found no effect of IS investment upon satisfaction, but a positive effect upon utilization. In a study of 32 organizations, Srinivasan and Kaiser [36] could not confirm that increased financial resources had a significant impact upon various user attitudes.

Organizations have also been posited to increase their IS investment as they progress through the various stages of IS development [27]. While empirical results on the nature of the relationship between investment and systems growth have been somewhat inconclusive [21], it would seem fairly evident that organizations wishing to increase their IS sophistication must allocate more resources to the information function, related for instance to the acquisition of more powerful hardware and systems software, and the development of more varied and complex applications software. Allocating more resources is also a visible sign of top-management support, such support being a determinant of IS success [9]. One would thus expect increased allocation of organizational resources to result in a more sophisticated and effective systems function.

Organizational Time Frame

Defining organizational time frame basically in terms of the length of the enterprise's strategic decision cycle, Ein-Dor and Segev proposed that organizations with a shorter time frame were less likely to implement IS successfully. In their later empirical study [12], these researchers did not attempt to verify this hypothesis, and they also could not confirm their other hypothesis, that organizational time frame is directly associated with size and IS structure. Furthermore, Cheney, Mann, and Amoroso [8] have proposed that end-user computing success, contrary to organizational IS success, is more congruent with a shorter time frame.

Evidence of the strategic decision cycle is given by the processes and mechanisms evolved by the organization to cope with growth or increasing environmental complexity and uncertainty, of which planning is the most important [15]. Increasing the organization's IS sophistication can lead to a longer planning horizon through greater availability of computer-based planning tools and techniques, and thus greater possibilities of IS intervention in the strategic decision process. Organizations with a longer time frame would also look at their information function in the longer term, and thus be more congruent with the planning horizon required by the strategic management of information resources and the systems development life cycle. Again, in view of its greater compatibility with IS development and managerial usage processes, a longer organizational time frame should lead to higher levels of IS sophistication and success.

IS Sophistication

The organization's managerial and technical sophistication in implementing, operating, and using its information system obviously should be a primary determinant of

success. Ein-Dor and Segev included only a particular structural aspect of this concept within their theoretical scheme, positing that an IS function independent from other organizational functions and located higher in the hierarchy would increase the likelihood of IS success. The thrust of their argument was that the development of the IS function, in terms of Nolan's [27] stage model, was required to match the overall development of the organization's structure and functions. In empirical research, Saunders and Keller [33] used an organization–system fit approach to relate patterns of interdepartmental communications to the sophistication of the IS function. Cheney and Dickson [7] found information satisfaction and perceived utilization to be directly influenced by the managerial sophistication of the IS department. Finally, a weak but significant relationship between information satisfaction and various benchmark variables of Nolan's stage model was obtained by Mahmood and Becker [22]. Since the IS function determines the strategies, policies, and technologies that basically condition the use of computer-based systems in an organization, one thus assumes that greater IS success will result from increasing the sophistication of this function.

As pictured in the research model (Figure 1), this study takes a contingency approach to the effect of IS sophistication on systems success. Given the absence or inconclusiveness of prior empirical results on the direct effect of organizational size, maturity, resources, and time frame upon IS success, it would seem plausible that the effect of the global organizational context could be moderated by the more immediate effect of the information systems context. In fact, this approach is implicit in Ein-Dor and Segev's conceptual scheme in that organizational size, maturity, resources, and time frame are considered to be uncontrollable or partially controllable variables, whereas IS sophistication is fully controllable. These researchers explicated the need for such a contingency approach in their later empirical study [12], as did other researchers on organization–system interaction [7, 24, 37].

IS Success

The fundamental aim of an organizational IS is to improve individual decision-making performance, and ultimately organizational effectiveness. The difficulty in empirically assessing system effectiveness in this way has led researchers to adopt surrogate constructs that are more easily measurable. Of the two main approaches for evaluating IS success, the first one is behavioral and focuses on systems usage. This approach was the one proposed by Ein-Dor and Segev and has been often used in empirical research [4, 7, 13, 14, 30]. Furthermore, systems usage can be subdivided into offline usage, where user–system interaction is limited to the use of printed reports output by the system or to accesses through an intermediary, and into online usage, where the user interacts himself with the system through a terminal; these are fundamentally different types of user behaviors that are not necessarily related [35].

The second approach in evaluating success centers on user attitudes, more specifically on user satisfaction with various aspects of an information system. This approach is now the most common in the literature [22, 30, 36, 37]. Results of empirical studies have, however, been somewhat mixed in regard to the relationship between system usage and information satisfaction. While some researchers did not find the two types

of measures to be associated significantly [7], others have [13, 30]. In particular, Baroudi, Olson, and Ives [4] found satisfaction to influence usage positively rather than usage influencing satisfaction. The latter also suggested that the use of both approaches to measure system effectiveness is warranted in most research situations.

Hypotheses

Given the preceding analysis of the selected organizational factors, the hypotheses associated with the research model in Figure 1 can be formally stated. A first set of four hypotheses is taken from Ein-Dor and Segev's initial model, in which the organizational context is posited to have a direct effect upon IS success. These hypotheses basically state that usage levels and user satisfaction are determined not only by individual differences and technical system characteristics, but also by the "benevolence" of the global context in which information systems are used. This benevolence is expressed by the level at which the selected organizational context variables are a priori favorable to the implementation of computer-based systems.

H1: The larger the organization, the higher the level of IS success.
H2: The higher the level of organizational maturity, the higher the level of IS success.
H3: The more organizational resources allocated to IS, the higher the level of IS success.
H4: The longer the organizational time frame, the higher the level of IS success.

A second set of four hypotheses is derived from Ein-Dor and Segev's initial assumptions and later empirical findings on the existence of relationships (possibly reciprocal in certain cases) between organizational structure and IS structure, namely that the maturation of the IS function tends to match the overall maturation of the organization. Hence, the corresponding hypotheses state that the benevolence of the organizational context, as expressed by the selected variables, is associated not only to IS success but also to the IS function's level of sophistication.

H5: The larger the organization, the higher the level of IS sophistication.
H6: The higher the level of organizational maturity, the higher the level of IS sophistication.
H7: The more organizational resources allocated to IS, the higher the level of IS sophistication.
H8: The longer the organizational time frame, the higher the level of IS sophistication.

Finally, a last hypothesis states that usage levels and user satisfaction are also determined by the organization's level of IS sophistication. This is basically an extension or generalization of Ein-Dor and Segev's hypotheses regarding specific characteristics of the IS function, such as the presence of a steering committee and the rank and location of the responsible executive.

H9: The higher the level of IS sophistication, the higher the level of IS success.

Note that an implicit hypothesis of the research model presented in Figure 1 is that the effect of the organizational context variables on IS success is both direct and indirect, IS sophistication acting as a moderating variable in the latter case.

Method

Sample

The sample consists of 34 manufacturing firms located in three geographical regions of the province of Québec, Canada. Firms in the wood and metal products sector were randomly chosen from a government repertory and initially contacted, until a sufficiently broad range of organizational and information systems contexts characterized the sample. Of these firms, 18 can be considered to be small (10–50 employees), whereas 16 are medium-sized (51–250). All have implemented a computer-based organizational information system, the median computer experience being three years. The typical hardware configuration consists of a small business computer (mini), a hard-disk unit, a printer, and terminals. Data collection consisted of structured interviews with the help of a questionnaire. An average of three direct users were interviewed in each firm, including CEOs, accounting/financial, and production managers. The individual responsible for the systems function was also interviewed to obtain IS sophistication data.

Measures

The measures used for this research have either been formally validated in previous methodological studies or, failing this, have been used previously in more than one empirical study.

Size: The number of employees is the size criterion most often used by researchers [9, 12, 20, 30] and also by governments, particularly in the manufacturing sector. Note that this measure was highly correlated to another potential measure of size, i.e., sales ($r = 0.76, n = 34, p < 0.001$).

Maturity: The measure of the one dimension of organizational maturity that was operationalized in the study—formalization—was taken from a set of organizational measures validated by Pugh et al. [29] and previously used by Olson and Chervany [28].

Resources; Following the approach taken by two previous studies [13, 36], a financial measure of organizational resources allocated to IS was used, i.e., the organization's investment in computer hardware and software (acquisition and development costs).

Time frame: This variable was operationalized by measuring the organization's planning horizon, using Ein-Dor and Segev's [12] approach, the actual measure having been developed by Jones [18] specifically for small and medium-sized businesses. The sampled firms were thus classified either as short-term planners, or as medium- to

long-term planners, based on the CEOs' responses to a question on planning emphasis. The latter were requested to describe the extent to which their planning was oriented toward the goals and strategies of the immediate future, as compared to those of the long-term future.

IS sophistication: While there is some controversy regarding the overall validity of Nolan's stage model, as fully discussed by Benbasat et al. [6], it has nonetheless been found useful by many researchers to categorize organizations in terms of IS sophistication [7, 22, 33], particularly in regard to the first stages (initiation, contagion) where the model's validity is considered to be higher. The sampled small and medium-sized enterprises were categorized as being either in the initiation stage or in the contagion stage, based on the number of administrative (as opposed to transactional) applications in their portfolio, the size of their EDP staff, and the location of the individual responsible for the IS function (reports to the controller vs. to the chief executive). All intercorrelations of the stage criteria were significant and in the right direction. A total of 18 firms were thus categorized as being in the initiation stage, while 16 were in the contagion stage.

IS success: The measures of offline usage (average number of report consultations per month) and online usage (average number of system accesses per month) are based on Srinivasan's approach [35]. User satisfaction was measured by using an adapted and shortened version of the instrument validated by Bailey and Pearson [3], as suggested by Ives, Olson, and Baroudi [16]. The internal consistency (Cronbach's alpha) of the satisfaction scales was greater than 0.8, which is the minimum level generally required.

Confirming the results of most studies that have used the two types of outcome measures, user satisfaction was positively associated to both offline usage ($r = 0.25$, $n = 34$, $p < 0.1$) and online usage ($r = 0.32$, $n = 34$, $p < 0.05$). The relative weakness of the first relationship could be explained by the fact that offline usage is usually more mandatory than online usage for managers in small and medium-sized firms; the provided reports would be used even if the organizational IS was perceived as unsatisfactory [7]. Also, the rather weak association between offline and online usage ($r = 0.23$, $n = 34$, $p = 0.1$) would seem to justify the distinction made between these two types of system utilization.

As the unit of analysis implied by the research model is at the organizational level rather than at the individual user level, an organizational value for each of the success variables was obtained by averaging the individual user–manager values within each firm. Langbein and Lichtman [19] argue that the aggregation of measures does not necessarily result in bias, if it can be justified on a theoretical basis. Here, in view of the small business context, users constitute the top management of the sampled firms and, as such, would have a global perspective on their organization's IS. Their usage levels also constitute the total managerial use of IS within their firm. Analysis of variance results showed significantly greater variance between organizations than within them for the satisfaction measure. However, this was not the case for the usage measures. Aggregation of the satisfaction data thus seems appropriate, whereas it might be questionable for the usage data. In the latter case, Alexander and Randolph

Table 1 Descriptive Statistics of the Research Variables ($n = 34$)

variable	*operationalization*	*mean*	*s.d.*	*range*
size	number of production employees	87	64	6–226
maturity	formalization (0–6)	2.3	1.9	0–6
resources	IS investment (hardware and software × $1,000)	60	53	0–200
time frame	planning horizon (short vs. medium or long term)	.59	–	0.1
IS sophistication	IS growth stage (initiation vs. contagion)	.47	–	0.1
information satisfaction[a]	7-point scales (1–7)	5.2	0.9	2.2–6.3
offline usage[a]	average no. of report consultations per month	17	13	2–55
online usage[a]	average no. of system accesses per month	6	8	0–24

[a] Organizational measure, i.e., averaged across an organization's user–managers.

[1] indicate that the testing of hypotheses through correlation analysis is nevertheless allowable, if the standard deviations of the variables are high enough.

Data Analysis

The research model and associated hypotheses were tested by calculating product-moment correlation coefficients (Pearson's r). Correlation analysis using 0.1 as the level of statistical significance is deemed acceptable in organization theory and information systems studies when the unit of analysis is the organization and sample sizes are relatively small [2, 36]. The measurement level of the research variables is interval, with the exception of organizational time frame and IS sophistication, which are dichotomous. Nie et al. [26, p. 5] have pointed out that a dichotomy can be treated as though it were an interval-level measure, including its use with the correlation coefficient. The operationalization and descriptive statistics of the research variables for the sampled organizations are presented in Table 1.

Results

ZERO-ORDER CORRELATIONS WERE FIRST CALCULATED to test the relationships hypothesized by the research model, as presented in Table 2.

Organizational Context and IS Success (H1–H4)

The results provide support for Hypothesis 1 in that size was positively related to the organizational measures of user satisfaction and online usage. As expected, user–man-

Table 2 Zero-order Correlations of the Context Variables with Is Sophistication and Is Success ($n = 34$)

	Is sophistication	*user satisfaction*	*offline usage*	*online usage*
size	.28*	.31**	−.02	.31**
maturity	.44**	.36**	.26*	.06
resources	.60****	.00	.18	−.11
time frame	.01	.51***	.11	.41***
IS sophistication	–	.50***	.37**	.19

* $p < .1$ ** $p < .05$ *** $p < .01$ **** $p < .001$

ager perceptions and behavior toward computer-based systems were found to be more favorable in larger enterprises. However, the lack of relationship between size and offline usage could possibly be attributed to the dominant presence of the standard accounting applications within the reporting systems of all small and medium-sized businesses [30], and the obligatory nature of their use.

Hypothesis 2 was supported by the positive association of organizational maturity with satisfaction and offline usage. This would confirm that the greater understanding of organizational processes, which exists in more mature organizations, constitutes an environment in which users can better perceive the usefulness of IS, and in which data for planning and control of these processes is more readily available. However, greater organizational formalization does not necessarily relate to the individual decision processes being mostly supported by online usage, which could explain the absence of any significant relationship in this case.

No evidence could be found to confirm Hypothesis 3, as the financial resources allocated to organizational information systems had no significant influence on any of the IS success variables. In view of previously cited inconclusive results in this regard [5, 13, 21, 36], it appears that greater investment in computer hardware and software has no direct effect upon either user satisfaction or system usage. Instead, one might argue that it is the investment in human resources that is crucial to successful implementation, as the availability and quality of such resources would be determinant in actually realizing the greater potential provided by hardware and software.

A positive and very significant association was found between organizational time frame and two of the success variables, namely, satisfaction and online usage. This support for Hypothesis 4 provides added confirmation that the planning orientation and culture of the enterprise affects the way in which managers view and use information systems. The result that a longer time frame was not significantly associated with a higher level of offline usage could be attributed to the nature of most batch reporting systems. Managers use the printed outputs provided by these systems mostly for control purposes, whereas computer support of planning tends to be much more interactive, including online interrogation and analysis capabilities.

Organizational Context and IS Sophistication (H5–H8)

The results shown in the far left column of Table 2 provide support for three out of four hypotheses linking the organizational context to IS sophistication. The testing of Hypothesis 5 confirmed that larger firms tend to have a more sophisticated IS function. As size has no explanatory power by itself, one could argue, as others did previously [11, 30], that the effect of this variable is in reality indirect, larger firms being more sophisticated because they have more resources to allocate to their IS function. Organizational size and resources were in fact significantly correlated in the present study ($r = 0.36$, $n = 34$, $p < 0.05$).

Hypothesis 6, which predicted that more mature organizations would exhibit a higher level of IS sophistication, was supported. This is in line with previous findings on the reciprocal relationship between organizational structure and IS structure. The use of more formal administrative techniques requires more sophisticated information support; in turn, applying information technology to certain organizational processes requires the formalization of these processes. Also, the existence of such a "fit" between the organization's maturity and the maturity of its IS function, whatever the level of IS success, would support Markus and Robey's [24] contention that the concept of fit, while useful in a descriptive sense, should not necessarily be used normatively.

Strong support is shown for Hypothesis 7, as there is a highly significant association between resources and IS sophistication. This confirms that the first development stages of the IS function require progressively larger investments in hardware and software, as more users, administrative units, and functions other than accounting are supported. Managing the increased systems complexity resulting from these investments requires in turn a more autonomous IS function and more specialized personnel.

Contradicting Hypothesis 8, firms with a longer time frame were not found to have a more sophisticated IS function. This could possibly be related to the "organic" rather than "mechanistic" nature of planning in small and medium-sized enterprises [18]. These organizations could increase their planning horizon simply by making more direct use of their existing organizational IS rather than by increasing its sophistication.

IS Sophistication and IS Success (H9)

The results presented on the bottom line of Table 2 provide confirmatory evidence for Hypothesis 9, stating that a higher level of IS sophistication positively influences the level of systems success within the organization. This is true here in terms of user satisfaction and offline usage, but less in terms of online usage. Users perceive the better quality of information output and services associated to a more mature IS function. Reporting systems provide greater managerial control not only in the accounting/finance function but also in production and marketing. However, the more voluntary nature of online systems use by managers could explain why IS sophistica-

Table 3 Partial Correlations of the Context Variables with IS Success ($n = 34$)

	user satisfaction	*offline usage*	*online usage*
size (controlling for IS sophistication)	.20	–.14	.28*
maturity (controlling for IS sophistication)	.19	.11	–.02
resources (controlling for IS sophistication)	–.42***	–.06	–.29*
time frame (controlling for IS sophistication)	.58****	.11	.41***
IS sophistication (controlling for size, maturity, resources, time frame)	.59****	.34**	.33**

* $p < .1$ ** $p < .05$ *** $p < .01$ **** $p < .001$

tion has less influence in this case, especially when organizational time frame is short and there is less opportunity for computer-supported planning and analysis.

Contingency Analysis of the Contextual Variables and IS Success

Returning to the research model presented in Figure 1, the implicit assumption was that the effect of IS sophistication on IS success could be contingent upon organizational size, maturity, resources, and time frame. Inversely, as the relationship between the organizational context and IS sophistication is thought to be reciprocal, one could view the effects of size, maturity, resources, and time frame on IS success as being contingent upon systems sophistication. An attempt was made to verify these assumptions by calculating partial correlation coefficients. In the first case, the potential intervening effect of IS sophistication was removed from the relationship between the organizational context variables and IS success. In the second case, the potential intervening effect of the organizational context variables was removed from the relationship between IS sophistication and IS success. The partial correlation values thus obtained are presented in Table 3 and can be compared with the initial zero-order correlations in Table 2.

One can see that positive relationships between size and user satisfaction, maturity and user satisfaction, and maturity and offline usage become nonsignificant when the effect of IS sophistication is removed, thus qualifying the support given Hypotheses 1 and 2 in that part of the effect of size and maturity on IS success is indirect rather than direct. Secondly, significant but negative relationships appear between resources and user satisfaction, and resources and offline usage, contradicting Hypothesis 3. In view of previously cited results on the effect of IS investment [5, 13, 36], cumulative empirical evidence suggests that this variable by itself should not be considered as an IS success factor; on the contrary, increased resource allocation would seem to have a negative impact, if it were not accompanied by a corresponding increase in IS sophistication.

Added confirmation for Hypothesis 4 is given by the fact that relationships between organizational time frame and IS success remained significant, when IS sophistication

was controlled. Firms that plan more and plan for the longer term should be more successful in their use of computer-based systems, whatever their level of IS development. These results thus single out the importance of this specific factor from a normative point of view, when compared to other contextual factors whose effects are more contingent.

Finally, added support is given for Hypothesis 9 by the values presented on the bottom line of Table 3. One can see that a strong positive relationship exists between IS sophistication and all three IS success variables, including online usage, when the effect of organizational size, maturity, resources, and time frame is removed. This can be interpreted as evidence that the organization's level of systems sophistication causally precedes size, maturity, and resources in determining systems success. Overall, these findings seem to justify a contingency rather than direct approach to the impact of the organizational context on computer-based information systems. Further insight has thus been gained by taking into account that the global organizational environment interacts with the immediate functional environment in which information systems are developed and used.

Limitations

THE NATURE OF THE SAMPLE EVIDENTLY LIMITS the generalization of the preceding results to organizations other than small and medium-sized manufacturing firms. The level of statistical power of the tests employed, resulting from the small size of the sample, reduces the probability of detecting weak yet significant relationships. Also, the cross-sectional rather than longitudinal nature of the study implies that causality can only be inferred, particularly as some of the relationships in the research model may be reciprocal, especially those between the organizational context variables and IS sophistication. The measures of organizational time frame and IS sophistication have not been fully validated, and additional dimensions of organizational maturity (other than formalization) could have been used. Finally, the true organizational measure of IS success should be organizational effectiveness rather than the surrogate measures used in the present study.

Conclusions

USING EIN-DOR AND SEGEV'S CONCEPTUAL FRAMEWORK as a theoretical foundation, this study has provided empirical evidence to support prior claims on the importance of the organizational context for information systems success. This has implications both for information systems researchers and practitioners. At the research level, the fact that contextual variables were found to have a significant influence on user satisfaction and online usage confirms the need to strengthen further the research stream focusing on organizational factors, as opposed to individual or technical factors. In particular, a contingency approach based on the interaction between the global organizational context and the more immediate IS context should be fruitful. Using such an approach to conceptualize and measure the interaction

between computer-based systems and their organizational environment could provide greater explanatory power as to the actual impact of this interaction upon IS success. Other factors that should be studied more thoroughly in relation to IS success include the uncertainty of the extra-organizational environment, and other dimensions of organizational maturity or structure such as centralization and integration. The results of this study also point out the need for researchers to validate further work in this area by sampling organizations that differ in size and context rather than sampling only large organizations with high levels of maturity and IS sophistication.

At the systems practice level, while the limitations of the study warrant prudence in drawing valid normative conclusions, the findings nevertheless have implications for user–managers, systems personnel, and consultants whose task it is to implement information systems in small and medium-sized enterprises. Taking into account the importance of the organizational context at the outset, IS implementation should really be viewed as an "organizational design" activity, which requires not only increased systems sophistication but corresponding formalization, resources, and planning. More specifically, IS implementors should make small and medium-sized business management more aware of the greater explicitness of procedures and decision processes, of the greater investment in information and human resources, including services such as training, and of the planning process required to increase IS sophistication and success. These managers will then have a more comprehensive view of information systems within their organization, and thus will be in a better position to manage effectively the assessment, adoption, and utilization of information technology.

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