Dimensions of Computer System Success in Business

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Abstract

The perceptions of business executives concerning computer system success and its dimensions are examined. The success dimensions studied are based on users' needs. An analysis of marketing executives suggests five dimensions as significant indicators of perceived computer system success. From these findings, the importance of the information systems group cooperating with end-users to develop systems consistent with these success dimensions is stressed. Further, significant and positive relationships between perceived computer system success and the organizational variables of system access and the end-user's enjoyment of computer use are identified.

Introduction

Metamorphic evolutions in the technological environment have made it increasingly difficult to assess the success of such innovations. This is particularly true of information systems (Singleton, McLean, & Altman, 1988), where success is complicated by the variety of environments (e.g., marketing, human resources) and tasks (e.g., analysis, quality control) where technologies are employed. Such diversity has lead investigators to conclude computer success should be measured through the users of the technology (Edelman, 1981; Paddock & Swanson, 1986-87). One important group employing technology is the marketing organization. The importance of this user group is due to their vital contribution to the firm and their belief that information is a critical element (Menon & Varadarajan, 1992) fostering computer dependency (Shocker, Srivastava, & Ruekert, 1994). Hence, marketers are a meaningful group to examine regarding their perceptions of computer system success.

Readers with comments or questions are encouraged to contact the authors via e-mail.

Specifically, the research examines computer system success as a multidimensional construct based on several factors. Consistent with previously established criteria (Delone, 1988), the dimensions selected for study reflect the context of computer use for the examined marketers. Four of the dimensions (i.e., improved decisions, improved operations, financial positioning, and new/strategic opportunities) are based on the need for marketers to have a competitive advantage (Day and Nedungadi, 1994). The fifth dimension (i.e., system usability) is grounded in marketers' historic resistance to computers (Goslar, 1987). In addition, the relationships of four variables (i.e., computer system access and use as well as the marketer's training and enjoyment using the system) with perceived computer system success are also explored. Notice that these variables are under at least partial control of the organization. However, while the study is theoretically based on computer information systems and marketing literature, it is exploratory. Its goal is the identification of perceived success dimensions and relationships of organizational variables to this success and not the antecedents of success. A second rationale for its exploratory nature is that the estimation is for operational end-users from a single context of computer use (i.e., marketing).

The organization of the article is as follows. First, the perceived success dimensions are discussed in the framework of marketers. Second, hypotheses, the perceived success dimensions model, and the analysis of this model are presented. Third, hypotheses and a model examining the relationships between four organizational variables and perceived computer system success are presented and analyzed. Finally, managerial implications and conclusions are offered.

Computer System Success In Marketing

Understanding computer and information system performance is particularly difficult (Singleton, McLean, & Altman ,1988) due to the mix of users and operating environments (Lucas, 1981). Yet, despite such constraints, computers are consistently identified as vital organizational (Wightman, 1990) and marketing tools (Mayros & Dolan, 1988). Hence, the understanding of computer success has received significant attention (DeLone & McLean, 1992). Importantly, Delone's (1988) contention that success factors should focus on the outcome of the system (e.g., the contribution to the firm's core business areas) and the user's interface (e.g., the magnitude to which the system is used) incorporates end-user needs.

Marketing activities can historically be explained by marketing's need for competitive advantage (Bharadwaj, Varadarajan, Fahy, 1993; Day and Nedungadi, 1994). The search for an advantage is consistent with the conviction that information is critical to success (Dickson, 1992; Menon & Varadarajan, 1992). Consequently, as marketers have increased computer usage (Plank, Reid, Kijewski, and Lim, 1992; Taylor 1991) the focus has remained on gaining a competitive advantage (O'Callaghan, Kaufmann, and Konsynski, 1992). Based on this orientation, four dimensions were selected (i.e., improved decisions, improved operations, new/strategic opportunities, and financial improvement) that provide a process to exploit competitive advantage. The marketing literature consistently acknowledges the importance of these dimensions in the context of desired outcomes (i.e., decision-making: Bunn, 1993; operations: Cronin and Taylor, 1992; new and strategic opportunities: Frankwick, Ward, Hutt, and Reingen, 1994; and financial positioning: Dickson, 1992).

System usability as a success dimension is based on the historic integration of technology within marketing. While the adoption rate for computerization by marketers was originally slow (Goslar 1987; Kurtz and Boone, 1987; Steinberg and Plank, 1987), the general nontechnical orientation of many managers (Barrow, 1990) suggests system friendliness influences usage (Plank et al., 1992). Thus, a usable system should represent success to a generally nontechnical population such as marketers.

The Dimensions of Computer System Success Model

The Hypotheses

The model depicting the dimensions of perceived operational success for a computer system in the marketing organization is summarized by a series of hypotheses. The dimensions are hypothesized as perceptions of overall computer system success. The hypotheses and their rationale are stated below and numbered H1-H5.

H1: System usability is perceived in a positive manner to be a dimension of general computer system success.

Although computerization represents a major element in technological evolution (Rochell, 1988), not all users make use of such systems (Mawhinney and Lederer, 1996) or have immediate access and abilities to use such tools (Morris, Burns, & Avila, 1989). Because only a small number of potential users actually use computers (Lundgren and Lundgren, 1996), coupled with differences between technical and nontechnical users (Barrow, 1990), usability should influence the marketer's perception regarding the quality of a system. Therefore, the ability to access and easily use a computer system represents a vital aspect of its perceived success. The importance of system usability (i.e., a computer system's ease of use and accessibility) is particularly germane in an environment where computers may not have previously been accepted. For example, if an individual is unable to use a computer, it would not likely be perceived to enhance success. Previous studies associating end-users and success perceptions (Doll & Torkzadeh, 1988; Tait & Vessey, 1988) fortify the suggestion that marketers employing computers will likely understand their role in enriching productivity. Hence, the first step to perceptions of a successful computer is having a usable system.

H2: Improved decisions are perceived in a positive manner to be a dimension of general computer system success.

Managers are typically evaluated based on their organizational productivity. Because productivity is fostered by effective decision-making, good managers seek out mechanisms enhancing this process. The importance of decision-making is particularly crucial in the marketing organization where the development and maintenance of a competitive advantage impacts the perceived success of the entire firm. Computerization utilized to improve decision-making has previously been identified as a potentially important contributor to marketing organizations (Rogers, Williams, & McLeod, 1990). Still, while the general consensus is that technology enriches decision-making processes of marketers (Morris, Burns, & Avila, 1989), an association between decision-making and computerization in an operational environment remains unknown. Thus, the purpose of this hypothesis is to determine if perceived computer system success is reflected in improved decision-making in a competitive environment.

H3: Improved operations are perceived in a positive manner to be a dimension of general computer system success.

A primary use of a computer is based on operational productivity (Zeffane, 1989). The influence of the computer on the marketer is evident through the operational advantages marketers develop and maintain with computers (Taylor, 1991). This hypothesis is based on the belief that computers effectively synchronize and coordinate operations (Burch, 1986). Consequently, since operational requirements represent a significant portion of the marketer's duties, it is logical for operational productivity to influence perceptions of computer system success.

H4: New/strategic opportunities are perceived in a positive manner to be a dimension of general computer system success.

In a unique application to the marketer, the importance of a computer technology is often its usefulness in providing a competitive marketplace advantage (Morris, Burns, & Avila, 1989). While the user is not guaranteed such an advantage (Vitale, 1986), its anticipated benefits (Franz & Robey, 1986) drive usage. For the marketer, this translates into the use of computers as a strategic component to exploit competitive advantage (El Sawy & Nanus, 1989).

H5: Financial improvement is perceived in a positive manner to be a dimension of general computer system success.

A primary role of the marketer is to generate performance (Cavusgil and Zou, 1994). Consequently, the historic importance of financial outcomes (Webster, 1992) suggests this responsibility is a crucial marketing outcome (Kohli and Jaworski, 1990; Narver and Slater, 1990). Methods used by marketers to enhance financial performance can be rooted in computerization (Morris, Burns, and Avila, 1989). For example, the increasingly expanded application of computers as part of cost tracking supports the use of technology to improve financial performance (West and Courtney, 1993).

The Research Design

A questionnaire was developed to empirically examine these hypotheses. The questionnaire included demographic questions aimed at obtaining information about the respondents and their firms. Items measuring the dimensions of computer system success and several organizational variables were also included. Each item measuring computer system success began with the phrase "I personally consider a computer system a success if it:". For all but the demographic questions, respondents were given a five-point Likert-type scale upon which to respond, using the following scale and weights: 1-Strongly Disagree; 2-Disagree; 3-Neutral; 4-Agree; 5-Strongly Agree. In order to verify, in the context of marketing executives, the perceived success dimensions as well as the items measuring these dimensions, the questionnaire was first discussed with five marketing executives familiar with the marketing use of computers and information systems. Using input from these executives, a draft questionnaire was developed and pretested on a sample group of 15 marketing managers. From these 20 marketing executives, the perceived success dimensions and items measuring these dimensions within a practical marketing setting were identified and developed into the final questionnaire.

The final questionnaire was mailed to 1500 marketers who had classified themselves as executives. These individuals were selected in a systematic random fashion from a national mailing list. A systematic random sampling design was used to avoid any geographic bias in the sample since the mailing list was ordered by zip codes. Due to mailing list restrictions, no attempts were made to contact the individuals after the questionnaires were mailed. From the 1500 mailed surveys, 225 usable responses were received, producing a 15% response rate. The response rate and empirical approach compare favorably with similar research of end-users of computers and information systems (Moncrief, Lamb, & MacKay, 1991; Rogers, Williams, & McLeod, 1990; Mentzer, Schuster, & Roberts, 1987; Berry, 1983). Also, consistent with similar projects investigating marketers' perceptions about computers, the survey was administered across multiple organizations (Plank et al., 1992) to increase the overall ability to generalize the empirical results across firms.

Response Bias

As in any survey research, response bias (i.e., meaningful differences between the questionnaire respondents and those who do not respond) may be a concern. In order to examine the potential for response bias, a cutoff date for returned questionnaires was established. All questionnaires returned after this date were excluded from the sample. The 41 observations in the hold-out group were used to simulate nonrespondents in the target population. The remaining respondents and the simulated nonrespondents were compared using t-tests (Rainer and Harrison, 1993). Any meaningful differences between the respondents and simulated nonrespondents on any characteristic would imply the presence of response bias. The t-tests comparing the demographics of these groups found no meaningful differences for the firms' sales ($t = -1.61$), number of sales representatives ($t = -0.20$), number of employees ($t = -1.63$), and percentage of international sales ($t = -0.56$). From these t-tests, it appears that the respondents and the simulated nonrespondents are relevantly similar, indicating that response bias should not present a serious problem for the study (Rainer and Harrison, 1993).

In order to further confirm the absence of a meaningful response bias, these same demographics as well as the summated values for the five constructs were compared between early and late respondents. The late respondents simulated nonrespondents and were defined as the upper quartile of the responses when ordered by response date. The early respondents simulated the respondents and were identified as the lower quartile of order responses (Armstrong and Overton, 1977). The comparisons between the simulated nonrespondents and respondents showed no meaningful differences for the demographic variables of sales ($t = 0.91$), number of sales representatives ($t = 0.21$), number of employees ($t = 0.91$), and the percentage of international sales ($t = 0.34$). Further, no meaningful differences between late and early respondents for the summated measures of improved decisions ($t=0.59$), system usability ($t=-0.29$), improved operations ($t=-0.23$), new/strategic opportunities ($t=-1.23$), and financial improvements (t=-1.37) were found. Thus, response bias should not present a serious problem for the study.

The Measures

The measures of the computer system success dimensions were developed based upon 13 questionnaire items. These 13 items were developed, with the help of 20 marketing executives, to measure perceived computer system success within the context of marketers. Each item was theoretically implied to measure only one of the five dimensions of perceived computer system success. In order to empirically confirm the grouping of these questionnaire items into these five dimensions, a structural equations confirmatory factor analysis was performed. The estimation was performed using the previously discussed 184 questionnaire responses (i.e., excluding the hold-out group) and questionnaire items using CALIS (i.e., Covariance Analysis of Linear Structural Equations) in PC SAS version 6.08. The estimation method was maximum likelihood.

The fit of the confirmatory factor analysis to the data was good as described by several statistics. The Goodness of Fit Index was 0.94, while this value corrected for degrees of freedom was 0.90. The Root Mean Square Residual was 0.04. The Chi-Square Statistic was 77.51 with 55 degrees of freedom which was statistically significant at a 2% level. The Normed Chi-Square statistic was 1.41. Bentler's Comparative Fit Index was 0.98, while Bentler and Bonett's Non-Normed and Normed Indices were 0.97 and 0.94, respectively. The good fit of the confirmatory factor analysis to the data implies that the items measure the perceived success dimensions as anticipated. The five dimensions of perceived computer system success, the questionnaire items which formed them, and the factor loadings for each are displayed in Table 1.

The first psychometric property examined was the reliability of each measure. The reliabilities ranged from a low of 0.76 for system usability to 0.91 for new/strategic opportunities. Since all the reliabilities are greater than 0.70, the measures display satisfactory reliability (Hair et al., 1992). The second psychometric property examined was the average percentage of shared variance for each measure. These values ranged from 54% for improved operations to 77% for new/strategic opportunities. Because the percentage of shared variance was greater than 50% for each measure, these measures demonstrate satisfactory values of shared variance. Each reliability and average percentage of shared variance is reported in Table 1.

Discriminant validity was also examined. If a pair of constructs demonstrates discriminant validity, the squared correlation between the constructs is less than the average percentage of shared variance for both (Igbaria and Greenhaus, 1992). These squared correlations were: 0.10 for improved decisions and new/strategic opportunities; 0.13 for improved decisions and financial improvement; 0.20 for new/strategic opportunities and financial improvement; 0.27 for improved decisions and improved operations; 0.22 for new/strategic opportunities and improved operations; 0.37 for financial improvement and improved operations; 0.08 for improved decisions and system usability; 0.04 for new/strategic opportunities and system usability; 0.18 for financial improvement and system usability; and 0.29 for improved operations and system usability. Comparing these squared correlations to the average percentage of shared variances shown in Table 1 indicates that all the measures display discriminant validity.

From these results, the psychometric properties and one aspect of the quality of these measures can be evaluated. Since each indicant's standardized path coefficient was greater than 0.60, item reliability is satisfied (Igbaria & Greenhaus, 1992). Further, because each reliability coefficient was greater than 0.75, the measures display satisfactory composite reliability (Nunnally, 1978). These results, coupled with the average percentage of shared variance for each measure being greater than 50%, imply that the measures satisfy convergent validity (Igbaria & Greenhaus, 1992). As previously discussed, discriminant validity was satisfied. Because convergent validity and discriminant validity were satisfactory, it is

Table 1
The Computer System Success Dimensions Measures

Questionnaire Item	Standardized Path Coefficient	Percentage of Shared Variance	Reliability Coefficient
I personally consider a computer system a success if:			
Improved Decisions		64%	0.78
1. helps decisions take less time.	0.76		
2. helps make better decisions.	0.83		
System Usability		61%	0.76
3. is available when needed.	0.78		
4. is easy to use.	0.78		
Improved Operations		54%	0.78
5. improves the accuracy of data available in the organization.	0.78		
6. corrects data throughout the organization.	0.78		
7. allows strategic price adjustments.	0.64		
New/Strategic Opportunities		77%	0.91
8. leads to the identification of new products or services	0.81		
9. leads to the identification of new markets.	0.97		
10. leads to the identification of new ways to compete.	0.84		
Financial Improvement		69%	0.87
11. reduces costs.	0.72		
12. increases revenues.	0.86		
13. improves the financial status of the organization	0.90		

implied that the success dimensions display construct validity (Rainer & Harrison, 1993). Thus, the measures possess desirable psychometric properties implying that the measures for the constructs are of high quality. The correlations among each indicant were also computed. These correlations are displayed in Table 2.

Estimating the Dimensions of Computer System Success Model

The proposed model was estimated using structural equations with latent variables. The questionnaire items were the indicants of the latent variables forming the success dimension measures. The latent variable of perceived general computer system success had no indicants. The developed model was estimated based upon the previously discussed 184 responses, corresponding success dimension measures, and questionnaire items using the procedure CALIS in PC SAS version 6.08. The estimation method used was maximum likelihood.

The Results

The summary statistics for the fit of the model to the data are shown in Table 3. The

Table 2*
The Correlations Between the Questionnaire Items

Item	1	2	3	4
1	1.00			
2	0.63	1.00		
3	0.21	0.19	1.00	
4	0.19	0.10	0.62	1.00
5	0.35	0.38	0.39	0.38
6	0.24	0.30	0.24	0.29
7	0.27	0.26	0.23	0.17
8	0.17	0.18	0.11	0.03
9	0.21	0.26	0.14	0.12
10	0.21	0.25	0.06	0.10
11	0.22	0.26	0.26	0.30
12	0.21	0.26	0.32	0.31
13	0.24	0.24	0.26	0.25

Item	5	6	7	8
5	1.00			
6	0.56	1.00		
7	0.44	0.54	1.00	
8	0.12	0.34	0.29	1.00
9	0.31	0.40	0.34	0.79
10	0.24	0.36	0.26	0.68
11	0.32	0.30	0.31	0.28
12	0.35	0.34	0.34	0.32
13	0.41	0.44	0.43	0.27

Item	9	10	11	12
9	1.00			
10	0.81	1.00		
11	0.29	0.25	1.00	
12	0.39	0.39	0.60	1.00
13	0.60	0.34	0.63	0.77

Item	13
9	
10	
11	
12	
13	1.00

* Item numbers correspond to those used in Table 1.

Goodness of Fit Index was 0.94, while the same index adjusted for the degrees of freedom had a value of 0.91. The Root Mean Square Residual was 0.05. The Chi-Square Statistic had a value of 84.17 with 60 degrees of freedom. It was significantly different from zero at a 1% level. The Normed Chi-Square Statistic had a value of 1.40. Other measures also provide an indication of the quality of the fit between the model and the data. Bentler's Comparative Fit Index was 0.98. Four incremental fit indexes (i.e., Bollen's Normed and Non-normed Indexes and Bentler and Bonett's Normed and Non-normed Indexes) ranged from a low of 0.91 to a high of 0.98. Based upon these overall fit results, the described model depicting the computer system success dimensions provides a good fit with the data. As a result, the model appears to be an appropriate description of computer system success dimensions among operational end-users (i.e., marketers) of such systems.

The details of the estimated model and the empirical results are shown in Figure 1. The estimates for all the indicants of the perceived success dimensions were significantly different from zero with standardized path coefficients having the expect signs and being sufficiently large to be meaningful. The standardized path coefficients between the general computer system success measure and the individual success dimensions are also displayed in

Table 3
The Summary Statistics of the Dimensions of Computer System Success Model's Fit

Goodness of Fit Index	0.94
Adjusted Goodness of Fit Index	0.91
Root Mean Square Residual	0.05
Chi-Square Statistic Degrees of Freedom 60	84.17*
Normed Chi-Square Statistic	1.40
Bentler's Comparative Fit Index	0.98
Bentler & Bonett's Non-normed Index	0.97
Bentler & Bonett's Normed Index	0.93
Bollen's Normed Index	0.91
Bollen's Non-normed Index	0.98

*statistically significant at the 0.01 level

Figure 1. All five path coefficients were significantly different from zero at a 1% significance level. All also had meaningfully large standardized path coefficients with the expected signs. It was also the case that all the estimates of the error terms were significantly different from zero. All the estimates are shown in Figure 1.

The Organizational Variables and Computer System Success Model

The identification of perceived general computer system success dimensions is interesting. However, also of interest is the potential for relationships between computer system success and other important variables. In order to investigate these interrelationships, an exploratory study was performed. This investigation examines correlations between four exogenous organizational variables (i.e., computer access, training, frequency of use, and enjoyment from computer use) to general computer system success.

These variables were selected for several reasons. First, managers in organizations can influence, directly or indirectly, these variables. Secondly, difficulties experienced by nontechnical users (Barrow, 1990) suggest the need to closely examine how receptive such a group is to computer use. Thirdly, as noted earlier, marketers initial resistance to computer adoption (Goslar, 1987; Kurtz and Boone, 1987; Steinberg and Plank, 1987) implies such variables are important. Additionally, computer usage is influenced by a variety of factors (Bergeron and Begin, 1989; Raymond, 1990) significantly impacting firm success (Guimaraes, Igbaria, and Lu, 1992). These organizational variables recognize such impacts. Specifically, the role of training (Amoroso and Cheney, 1982; Guimaraes, Igbaria, and Lu, 1992), computer use (Doll and Torkzadeh, 1988), and previous computer experiences (Delone, 1988) suggest the need to incorporate such exogenous variables into a model examining perceived computer system success.

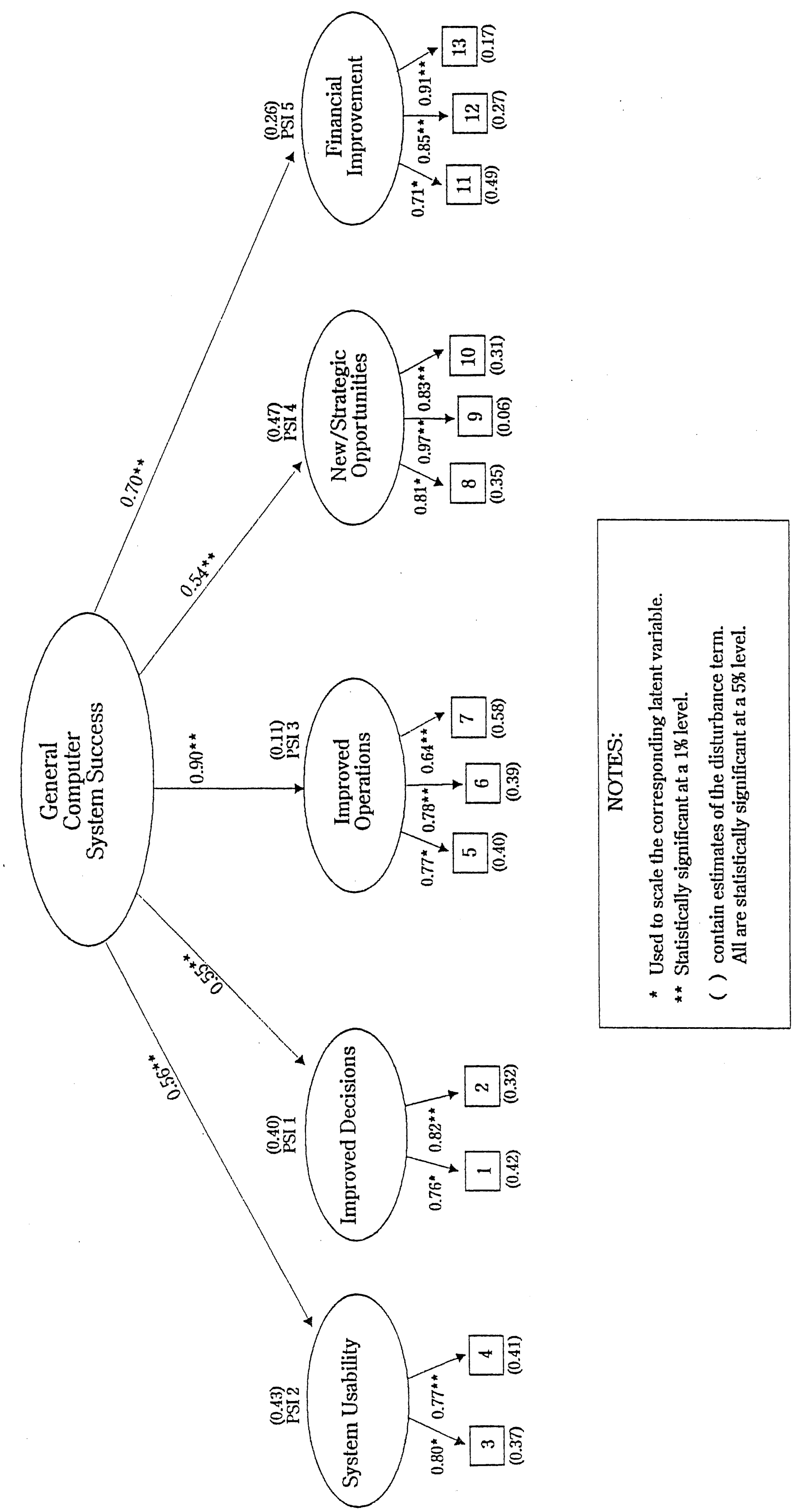
The four exogenous variables are measured by single questionnaire items using the previously described scales and weights. The respondent's access to a computer system was measured by "I have ready access to a computer." The individual's computer training was captured by the question "I have ready access to computer training provided by my company." The degree of computer use was measured by the respondent's answer to " I use a computer regularly." The final variable was the degree of enjoyment the respondent receives from computer use. It was captured by the response to the question "I enjoy using computer systems." Notice that computer access and training are fully controllable by the organization and its managers. Further, computer use is at least partially controllable through mandating nonvolitional system use for all or some job tasks. In addition, computer enjoyment can be influenced through management actions in terms of developing computer systems with desirable characteristics (e.g., easy to use systems which perform meaningful tasks).

The Hypotheses

It is expected for each of these exogenous

Figure 1

The Dimensions of Computer System Success Model with Standardized Path Coefficients



variables to be positively correlated with perceived general computer system success, as described in the hypotheses presented below. Further, pair-wise intercorrelations between these four variables are predicted to be significant and positive.

H6: The respondent's computer access has a significant, positive correlation with perceived general computer system success.

H7: The respondent's company provided computer training has a significant, positive correlation with perceived general computer system success.

H8: The respondent's degree of computer use has a significant, positive correlation with perceived general computer system success.

H9: The respondent's degree of enjoyment using computers has a significant, positive correlation with perceived general computer system success.

Estimating the Organizational Variables and Computer System Success Model

As in the previously estimated model, structural equations with latent variables was the empirical technique employed. The changes made to the previous model were the inclusion of computer access, training, respondent use and enjoyment. The correlations between each of the four exogenous variables and perceived general computer system success were estimated. The six possible correlations between these four exogenous variables were also estimated. The developed model was estimated based upon the 184 questionnaire responses using CALIS in PC SAS version 6.08. Maximum likelihood was the estimation method.

The Results

The statistics summarizing the quality of the fit between the model and the data are shown in Table 4. The Goodness of Fit Index had a value of 0.92 while the same index adjusted for the degrees of freedom was 0.89. The Root Mean Square Residual was 0.05. The Chi-Square Statistic had a value of 129.05 with 108 degrees of freedom. Its value was not statistically significant at a 5% level. The Normed Chi-Square Statistic was 1.19. The values of the other fit measures included Bentler's Comparative Fit Index and Bentler & Bonett's Non-Normed Index both at 0.98, Bentler & Bonett's Normed Index at 0.91, Bollen's Normed Index at 0.89, and the corresponding Non-Normed Index at 0.98. These values indicate a good fit between the model and the data.

Table 4
The Summary Statistics
of the Organizational Variables
and Computer System Success Model's Fit

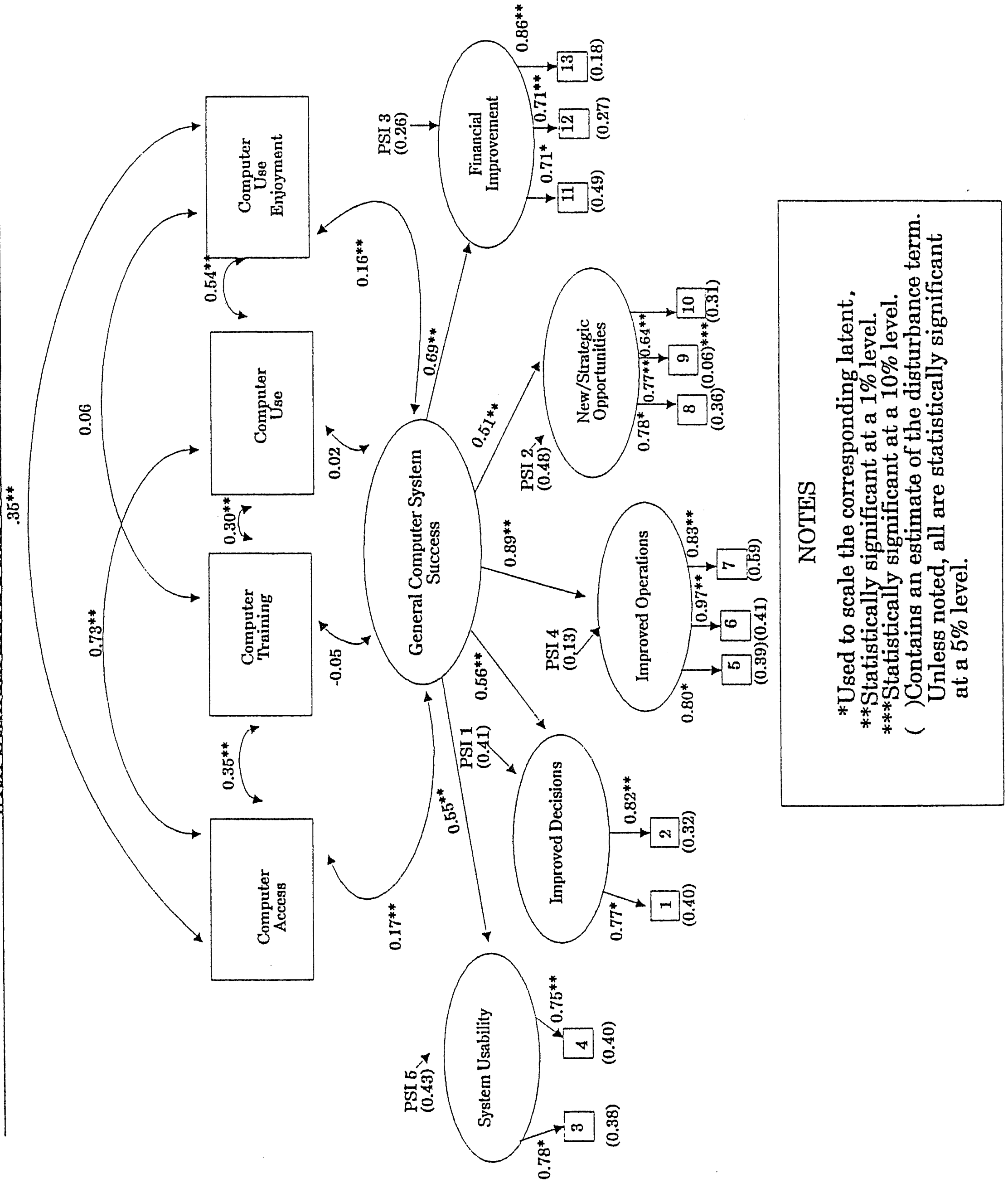
Goodness of Fit Index	0.92
Adjusted Goodness of Fit Index	0.89
Root Mean Square Residual	0.05
Chi-Square Statistic Degrees of Freedom 108	129.05+
Normed Chi-Square Statistic	1.19
Bentler's Comparative Fit Index	0.98
Bentler & Bonett's Non-normed Index	0.98
Bentler & Bonett's Normed Index	0.91
Bollen's Normed Index	0.89
Bollen's Non-normed Index	0.98

+statistically ***insignificant*** at a 0.05 level.

The complete model and the details of its estimation are shown in Figure 2. All the indicants of the latent variables were statistically significant at a 1% level. Further, the five paths between general computer system success and the success dimensions were significantly different from zero at a 1% level. The results of primary interest in this analysis are the individual correlations between computer access, training, use, and computer use enjoyment to perceived general computer system success. These results demonstrate that computer access and computer use enjoyment are significantly and positively correlated

Figure 2

The Organizational Variables
and Computer System Success Model
with Standardized Path Coefficients



with general computer system success at a 1% level. However, the correlations of computer training and computer use to perceived general computer system success were statistically insignificant. Further, the pair-wise correlations among the four exogenous variables were all statistically significant and positive at a 1% level except for one correlation. This correlation was between computer training and computer use enjoyment.

Managerial Implications

Investigations relating technology and performance are scarce (Sinclair & Cohen, 1992), with only limited operational applications (Zinkhan, Joachimsthaler, & Kinnear, 1987). As such, this investigation demonstrates the advantages of viewing performance measures beyond departmental boundaries (Good, 1992). The multiple dimensionality of perceived computer success indicates success is jointly dependent upon the needs of the end-users and the cooperation of the CIS (computer information systems) group. Thus, success is not a constant variable composed of static terms. Unlike the accountant who often has consistent operational rules, the CIS manager must satisfy many needs which are conditional upon the user's responsibilities. In addition, these conditions frequently change. Consequently, computer information systems managers must constantly assess the needs of clients, or in this case, marketers.

To assess the diversity of computer needs that likely exists in many organizations, CIS managers must first have access to gathering, and then understanding this information within the specific context in which it is utilized and needed. For example, the focus in this study was on marketers. As such, to determine how these users uniquely assess successful computer systems, the CIS manager must have meaningful access to these individuals. While such assessments can be made in a variety of ways, one method would be for the computer information system manager to get approval, and then accessibility to marketers through the marketing manager. Subsequently, a marketing "interpreter" or interface may also be needed to help frame the requirements of the marketing organization for computer personnel. Irrespective of the functional area assessed, the need exists to recruit the approval and participation of functional managers responsible for the areas impacted by computerization, as well as those who have resources available to assist in such a project. Failure to do so will result in computer systems that are not reflective of the specific demands of the users group.

Accordingly, as is evident in the specific nature of this study, the framework of computer success can not be viewed broadly. The interpretation of success measures (e.g., new and strategic opportunities) must be within the specific framework of particular (e.g., marketers) users. Hence, understanding and implementing successful computer systems is a broader issue than what is reflected in any single organizational discipline (e.g., information systems). Instead, the commitment and resources required to engage in such a computer system assessment suggests that the success of computer systems has to be viewed from an organizational perspective. This suggests that CIS managers should consider petitioning other organizational entities for resource support and commitment in accomplishing tasks impacting other functional areas. Under this premise, computer systems truly reflect an organizational resource impacting the entire firm.

Drawing from the results of this study, marketers are found to view successful computer systems as having dimensions that improve decision-making, allow for system usability, improve operations, enhance new/strategic opportunities, and improve financial positioning. Interestingly, all the dimensions share a common element of requiring the integration of the marketing and computer information system staffs to be successful. For example, system usability is the result of the marketing manager determining when, where, and for whom, ease of use and access to computer systems are needed. In conjunction with the marketing manager, it is the responsibility of the CIS manager to operationalize this installation.

The other four perceived success dimensions (i.e., improved operations and decisions, identifying new/strategic opportunities, and financial improvement) are also the results of the marketing manager working in cooperation with the CIS manager to determine available information and how it can best be distributed to appropriate users. In an organizational context, these results endorse cooperative linkages between the CIS group and end-users. For information to be useful, it must be disseminated to appropriate end-users in a suitable format (Menon & Varadarajan 1992). Therefore, while users will likely have different contexts for computer use and criteria for computer system success, the integration between the end-user and the CIS group remains crucial. Thus, it is the responsibility of the CIS manager to encourage peaceful and cooperative alliances between the CIS group and all end-users so opportunities for organizational success are enhanced.

Study Limitations

As in any research, this study possess characteristics limiting the application and extension of its findings. One such limitation is the relatively few questionnaire items used to measure the dimensions of perceived computer system success. Even though these items were developed for the marketing context with the assistance of practicing marketing executives, the few used questionnaire items raises concerns regarding the ability to generalize these results beyond marketers. Additionally, because this study examines computer use in marketing, the success dimensions reflect their perceptions. The ability to generalize these findings related to computer system success beyond marketing may be limited.

Conclusions

The purpose of the study was to examine dimensions of perceived computer success as viewed by one specific user group and to examine the interrelationships between system success and several organizational variables. While the findings suggest these users have specific perceptions of what constitutes a successful system, the implications reach beyond these dimensions. The highly specific needs of these users suggest that other organizational units and groups with different contextual needs regarding computer use will probably have different perceptions of computer system success. Thus, information systems managers who seek to satisfy their constituents must look beyond common computer offerings and examine the specific contexts of the user group being served.

Implications For Future Research

From an academic perspective, an important implication from the study, while exploratory in nature, rests in the view of perceived computer system success as a construct with multiple dimensions. Consequently, these results provide directions for future research. For example, can these specific dimensions of computer system success among marketing end-users be verified in a different setting? Are there other success dimensions as perceived by marketers who use computer systems? Finally, once the dimensions of perceived computer system success are more clearly established, what are their antecedents?

The examination of the relationships between the organizational variables and perceived computer system success model must be interpreted carefully due to the study's exploratory nature and the use of correlations among these variables. In all cases, these implications form the basis for future research of a nonexploratory nature. First, computer access and general computer system success move together in a meaningful, positive fashion. The pertinent question is whether computer access improves perceived system success and/or does success encourage demands for access? From a managerial perspective, the former result is desirable due to the ability to control computer access. The latter implies that when a successful system is implemented, the demands for access must be considered in the system's planning.

Secondly, computer use enjoyment is correlated with perceived general computer system success in a significant and positive fashion. The issue for resolution by future research is whether the user's level of computer use enjoyment positively impacts success perceptions, or whether a system perceived as successful is more enjoyable to use. Further, the possibility of a multi- directional relationship must also be examined. If it can be established that the enjoyment in the use of a computer improves perceived success, management can impact system success through improving user enjoyment. Possibly, systems which are easy to use may be more enjoyable to use and thus be viewed as more successful. This may well provide at least a partial explanation for the popularity and use of graphical user interfaces. It also would place a greater managerial emphasis on building systems which are enjoyable to use.

Because many potential users never actually use computers (Lundgren and Lundgren,

1996) and questions still remain as to what influences usage (Mawhinney and Lederer, 1996; Ford, Ledbetter, and Roberts, 1996), a great deal still needs to be understood about use within a variety of constructs. Additional research is required to fully understand the interactions among computer access, training, use, and computer use enjoyment and their implications for perceived general computer system success. For example, if it can be shown that computer training positively impacts computer access and then perceptions of success by providing computer training, management can encourage general system success. Similarly, if it can be shown in future research that computer training impacts computer use, which influences in a positive fashion computer use enjoyment, then perceived general computer success would be improved. Indirectly, management provided training could impact perceived system success. Following similar logic, if computer use can be shown to impact computer use enjoyment, positive improvements in perceived general computer system success are possible. Further, computer use may be shown to encourage computer access and, consequently, general computer system success. In this way, nonvolitional systems, if well developed, can further perceptions of system success. Finally, computer access has a meaningful relationship with computer use enjoyment. Possibly, providing appropriate computer access improves the enjoyment from using the system. Also, an enjoyable computer system to use may encourage demands for computer access.

Since this study was limited to marketers, opportunities exist to broaden the framework of this investigation to include a more functionally diverse group of users. For instance, while the criteria for success in this study (e.g., improved decisions, financial improvement) are reasonable given that marketers were studied, what factors would production, human resources, accounting, or other functional area end-users utilize in assessing successful computer systems? This study raises questions as to the specific criteria for successful computers beyond the functional area of marketing. The CIS manager is faced with understanding the many different criteria of success. Thus, a need exists to study more closely criteria deemed important for successful computer systems across a wide venue, extending beyond marketers.

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