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User resistance and strategies for promoting acceptance across system types

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Abstract

Understanding the factors that contribute to the success of systems implementation efforts is a central concern in the field of information systems (IS). One key factor to which many implementation problems have been attributed is user resistance to change. Different types of systems tend to be associated with different organizational functions and classes of users, and thus may be resisted for different reasons. This paper reports the results of a study investigating the link between resistance reasons and system types and assessing managerial perceptions of the relative importance of various strategies for promoting acceptance in the context of those types. Surveying 66 managers in a variety of organizations, our results suggest that decision support systems (DSS) and transaction processing systems (TPS) are resisted for different reasons, and that promotion strategy effectiveness also differs. Additionally, our study attempts to make explicit, based on system type, key reasons for user resistance and the remedies designed to promote acceptance. This improves our overall understanding of the resistance phenomenon and guides analysts in selecting an appropriate strategy for a given system type.

Keywords: Systems implementation; Resistance to change; User acceptance; MIS success

1. Introduction

Understanding the factors that contribute to the success of systems development efforts is a central concern in the field of information systems (IS). A significant body of literature examining the complex implementation process has emerged during the last two decades [4]. While individual studies have identified a number of independent variables associated with success [26], there is no broad consensus in the field on an explanation of successful implementation or a single implementation strategy.

One key factor to which many implementation problems have been attributed is users' resistance to change [20]. Clearly, there is no fundamental resistance to every change on the part of users, which argues for some segregation by system characteristics [17]. Further, IS researchers have noted that systems implementation is not an entirely rational

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process [5,29,40] and that resistance is not necessarily an irrational response or a misguided and selfish reaction to a necessary innovation [24]. At the same time, IS researchers also recognize users' acceptance of a system as a major objective of system implementation and the organizational change it entails [14,42]. Understanding and effectively managing resistance are, therefore, important determinants of the success of systems and of IS professionals as change agents.

The issue of user resistance to change has received considerable attention in the literature, e.g., [43]. Researchers have adopted a variety of perspectives to explain user resistance and a number of strategies have been suggested to promote system acceptance. Factors identified by MIS researchers as sources of employee attitudes toward change include individual characteristics, ease of use and usefulness, prior expectations, magnitude of the change, equity perceptions, and the dynamics of implementation as a political process.

However, research examining user resistance has not investigated (a) whether the reasons for resistance, at all levels of an organization differ across system types; and (b) whether strategies for promoting acceptance are equally effective across system types. Systems typologies, as classification abstractions, provide organizing frameworks for structuring, communicating, and applying research findings [7]. The fact that different types of systems are typically associated with specific functions and users, suggests that the reasons for resistance might be different across system types. A delineation of resistance by system type would allow IS managers to apply mitigation strategies more accurately and economically.

In this paper, we report the results of a survey study investigating the link between resistance reasons and system types and assessing users' perceptions of the relative importance of various strategies for promoting acceptance with respect to those types. We focus our attention on two distinct types of systems: transaction processing systems (TPS) and decision support systems (DSS). Our research objective is to empirically explore, based on system type, key reasons for user resistance and the remedies designed to promote acceptance. From a practical standpoint, this is important, because it guides managers in selecting an appropriate strategy.

2. Background

2.1. Resistance theory

Researchers view resistance from one of three different theoretical perspectives [24]: (1) people-oriented; (2) system-oriented; and (3) interaction theories. The perspectives differ in their assignment of the causal agent for the outcome observed. The people-oriented theory suggests that resistance to systems is created by factors internal to users as individuals or groups. Some research supports the notion that certain characteristics (e.g., age, gender) as well as varying background, value and belief systems contribute to an individual's attitude towards technology [6,38].

The system-oriented theory posits that resistance is induced externally by factors inherent in the design of the system or the technology being used. Such factors include user interface and other system's characteristics (e.g., realization of requirements, performance, reliability, and the degree of centralization, distribution, or decentralization). A significant body of literature concerned with designing systems for usability has emerged [39]. From this perspective, strategies for minimizing or overcoming resistance center around techniques for proper system design.

Table 1
Summary of the reasons of employees' resistance to new technology

Reasons	Representative source
R1. Change in job content	Ginzberg [9]
R2. Loss of status	Keen [20]
R3. Interpersonal relationship altered	Hussain and Hussain [11]
R4. Loss of power	Smith and McKeen [40]
R5. Change in decision-making approach	Smith and McKeen [40]
R6. Uncertainty/unfamiliarity/misinformation	Janson, Woo, and Smith [15]
R7. Job insecurity	de Jager [13]

by computers, believing that systems restrict choice. For example, some local managers resent having daily goals defined, the action to achieve these goals specified, and performance evaluated by a computer system in which personal relationships play little role [18]. Perhaps the main reason managers oppose new IS is that computers alter the decision making process. Decisions are no longer based on intuition but on data provided by the system and supplemented by human judgment and experience. The DSS researchers have found that many managers feel that their former style of decision making is under attack and are unable to adjust to the new technology [1]. Apart from dysfunctional system design, a variety of reasons for resistance have been cited in the literature; the most important are shown in Table 1.

To overcome resistance, researchers have proposed a variety of strategies, which can be classified into two categories: *participative* and *directive* [10]. Participative strategies include training in the use of the new system [2], establishing user support services [37], allowing time to experiment with the new system [44], praising new system use [23], encouraging open communication between management and employees [13], incorporating user participation into the design process [31–33], and documenting standards for the new system [34]. Directive strategies, on the other hand, are those imposed by management, including the provision of financial incentives for new system use [27], job reassignment [23], user rights directives [19], role modifications [30], job elimination for those who do not learn to use the new system [23], power redistribution [28], top management support [41], job title modification [35], and job counseling [12]. Table 2 lists the strategies investigated and provides a brief description of each. The perceived effectiveness of these particular strategies to mitigate resistance is examined for each system type.

2.2. System typology

Gorry and Scott–Morton's framework [8] for IS describes the distinguishing characteristics of the information needed at various organizational levels, providing a good basis for system classification. One such widely used classification, first articulated by Zmud [43], distinguishes between TPS and DSS. We recognize that the boundary between these two categories is not always clear in practice, since some tightly integrated systems combine the characteristics of both types. Nevertheless, we believe the distinction is useful in structuring understanding of various systems.

While there is no single, accepted definition of DSS, most authors would agree that DSS are interactive computer-based systems that help decision-makers utilize data and models to solve semi-structured and unstructured problems. Consistent with the literature, we use the term TPS to refer to computerized systems designed to keep track of elementary activities and routine transactions of the organization. TPS are clearly major producers of information for other systems, but they are fundamentally operational-level systems whose principle purpose is to answer routine questions. Further, although the unstructured and semi-structured tasks that DSS are designed to support do arise at all levels of the organization, DSS are generally intended to serve the management level of the organization, where such tasks are the norm rather than the exception. Consequently, the information needed generally differs along a number of dimensions, as suggested in Table 3.

Table 2
Strategies to promote acceptance of information systems

Strategy	Representative source
A1. Involve employees in development of new systems to encourage a feeling of ownership	Mumford [31]
A2. Open lines of communication between employees and management	Land [26]
A3. Provide employees with information regarding system changes to preserve ownership	de Jager [13]
A4. Initiate morale-boosting activities, e.g., company parties and newsletters, to promote community	Nord and Tucker [34]
A5. Pace conversion to allow readjustment period to new system	Zuboff [44]
A6. Redevelop modularly to better target user types and functions	Hussain and Hussain [11]
A7. Reward ideas that will improve throughput to encourage usage	Lawler and Mohrman [27]
A8. Document standards so new procedures are easy to learn and reference	Nord and Tucker [34]
A9. Clearly establish in advance the demarcations of authority that will exist following changeover to clarify role definitions	Martinsons and Chong [30]
A10. Upgrade work environment following change, e.g., more space and design for comfort, to improve atmosphere	Swanson [42]
A11. Conduct pilot study to examine impact of change to avoid unseen complications	Anderson [3]
A12. Alter job titles to reflect increased responsibility to clarify job roles	Rivard [35]
A13. Show sympathy and be receptive to complaints following conversion to maintain user contact and trust	Nord and Tucker [34]
A14. Conduct orientation sessions to prepare for change	Rivard [35]
A15. Arrange job transfers to avoid users with no interest in new procedures	Klein, et al [23]
A16. Give separation pay to those eliminated to preserve attitudes of the remaining users	Rousseau [37]
A17. Call a hiring freeze until all displaced personnel are reassigned in order to avoid layoffs	Rousseau [37]
A18. Give job counseling to help users adjust	Holmes and Holmes [12]
A19. Organize group therapy to help users adjust	Hussain and Hussain [11]
A20. Retrain employees to be effective users of the new system	Aggarwal [2]

Table 3
Gorry and Scott–Morton's system attributes

Attributes	Low anchor	High anchor
Source	internal	external
Time horizon	historical	future
Currency	current	old
Frequency	frequent	infrequent
Aggregation	detailed	aggregate
Scope	narrow	very wide
Accuracy	high	low
	TPS ←	→ DSS

Our use of an organizationally based system typology is motivated by a number of factors. Firstly, specific types of systems are associated with particular groups of users. The people-determined and system-determined theories are clearly divergent; nevertheless, IS researchers often implicitly hold both theories simultaneously, believing that resistance is determined both from internal and external factors. Both the intended target users (e.g., middle managers, operational staff) and specific system features (e.g., functions, user interface) should be considered simultaneously.

Secondly, the purpose of each system type is clearly identified in the typology. A fruitful way to examine resistance, therefore, is to assess the intention of the system. Third, the reasons for resistance can be examined by controlling the system type and user group. Interaction theory argues that neither the system nor the people's characteristics themselves are the causes of resistance, but that the 'real reasons' for resistance are users perceived values and social content gain or loss.

2.3. Research hypotheses

Do reasons for resistance differ by type of system? Which strategies are perceived to be more effective for promoting the acceptance of each type? Different types of systems have different characteristics and are typically associated with specific organizational tasks/functions (e.g., management control versus operational control) and specific classes of users. According to interaction theory, the reasons for resistance would differ depending on differences in the intended purpose of the system and the characteristics of its target set of users. Owing to these basic differences, the theory also suggests that different strategies

may be more effective for promoting acceptance. More specifically, we examine the following four general null hypotheses:

H1o: Managers perceive resistance reasons to be equally applicable in the context of any system type (TPS or DSS).

H2o: There are no significant differences in the

implementing the proposed system. Subjects were then asked to indicate whether or not they believed each listed strategy should be applied to promote the acceptance of the proposed system.

3.2. Sample

The target respondents were selected from a database of managers (outside the IS area) in the mid-western region of the United States. The contact database was obtained from an Economic Development Center at a major university in the mid-west. Three hundred, randomly selected, managers were first contacted by research assistants acting on behalf of the authors via telephone during 1997 and asked to participate in the survey. Ninety-eight agreed to do so. Seventy-three questionnaires were completed and returned. Of this total, seven were found to have many missing values. The remaining 66 responses (from managers in a wide variety of industries) were used in the data analysis. Table 4 summarizes the diverse demographic characteristics of the final set of respondents.

To verify the potential confounding effects on the sample's demographics and research variables, we tested for bias in the sample population by conducting a separate χ^2-test on each of the demographic variables. The dependent variables were the frequency of the seven resistance reasons and the two promotion strategy categories. Each demographic variable reported was treated as the independent variable in separate χ^2 models. No significant relationships were found in any model, indicating a lack of confounding on the part of the sample demographics.

Table 4
Demographic characteristics

Managerial positions:	
Executive	8
Manager/director	28
Business supporting staff	14
Technical supporting staff	10
Omitted	6
Total	66
2. Use of computer as a regular part of performing job	
Yes	60
No	1
Omitted	5
Total	66
Work experience	
7 years or less	18
>7 and <15 years	13
>16 years	31
Omitted	4
Total	66
4. Gender	
Male	37
Female	23
Omitted	6
Total	66
5. Age	
30 years/old or less	20
> 30 and < 40	20
> 40	21
Omitted	5
Total	66
6. Organization annual revenues:	
Under 10 million	10
10 million to 50 million	12
50 million to 100 million	14
100 million to 250 million	3
> 250 million	16
Omitted	1
Total	66
7. Experienced resistance to information technology in practice:	
Yes	54
No	11
Omitted	1
Total	66

4. Data analysis

To examine the first hypothesis (**H1o**), two independent χ^2 goodness-of-fit tests were conducted. The results are shown on Table 5. The χ^2 values suggest the rejection of **H1o**, which states that in a TPS (DSS), there is no difference in the resistance reasons perceived by the subjects. To further examine which reasons were perceived the most/least likely to apply in a TPS (or DSS) setting, a total of seven independent Binomial tests were conducted for each type of system. The results are also shown in Table 5. A significant statistic indicates that the observed frequency was not obtained by chance. In the case of TPS, the uncertainty (R6) and change in job content (R1) were the most significant reasons of resistance cited by our subjects. With respect to DSS, the change in decision

Table 5
Data analysis results for reasons of resistance

Reason (abbreviated)	TPS No. of yes	Binomial Tests *Z*-value	DSS # of yes	Binomial *Z*-value	Difference: TPS versus DSS two-tails *T*-tests
R1: Change job content	58 (0.88)	6.16[a]	56 (0.85)	5.67[a]	0.50
R2: Loss of status	35 (0.53)	0.49	15 (0.23)	−4.45[a]	3.33[b]
R3: Relationship altered	39 (0.59)	1.48	26 (0.39)	−1.72	2.22[b]
R4: Loss of power	34 (0.52)	0.25	22 (0.33)	−2.71[a]	2.11[b]
R5: Change DM	42 (0.64)	2.22	60 (0.91)	6.65[a]	−3.38[b]
R6: Uncertainty	60 (0.91)	6.65[a]	51 (0.77)	4.43[a]	2.02
R7: Job insecurity	38 (0.58)	0.23	21 (0.32)	−2.96[a]	2.89[b]
χ^2 45.48 (6)		χ^2 67.27 (6)			
P-value < 0.001		*P*-value < 0.001			

[a] Note: indicates significant at p 0.01 level.
[b] Indicates significant at p 0.05 level. ( ) represents the 'proportion' value.

making approach (R5), change in job content (R1), and uncertainty (R6) were the most significant reasons. Furthermore, the loss of status (R2), job insecurity (R7), and loss of power (R4), were the least significant reasons for resistance of DSS.

To evaluate hypothesis **H2o**, relating to differences in the perceived reasons for resistance across the two types of systems, we performed a total of seven independent two-tailed *t*-tests, one for each of the seven resistance reasons. The results, shown in the last column, indicate that the change in decision making approach (R5) is perceived to be a more significant reason for resisting DSS (60/66 0.91) as compared with TPS (42/66 0.64). On the other hand, the loss of status (R2), job insecurity (R7), interpersonal relationships altered (R3), and loss of power (R4) are significantly more likely to be applicable in the context of TPS than DSS. No differences across system types were observed with respect to the applicability of the remaining two reasons. Both appear to be strongly significant in the context of both types of systems. So we reject the null hypothesis **H2o** in favor of differences across system types.

To test hypothesis **H3o**, that there are no differences in the perceived importance of various promotion strategies for TPS (DSS), we conducted two independent χ^2-tests, one for each system type. As shown in Table 6, the results suggest the rejection of **H3o**. We, therefore, conclude that differences exist in the promotion strategies perceived to be applicable and effective in the context of different types of system.

To further examine which promotion strategies were more/less significant for TPS and DSS, a total of 20 independent Binomial tests were conducted for each system type. Strategies entailing employees involvement (A1), open communication (A2), providing information to employees (A3), pacing conversion (A5), rewarding ideas (A7), documenting new procedures (A8), establishing the demarcations of authority (A9), showing sympathy (A13), conduct orientation (A14), and retraining employees (A20), were perceived to be more effective with respect to TPS. On the other hand, strategies that fall in the directive category were perceived to be less effective in the context of TPS. These include strategies involving the arrangement of job transfers (A15), giving separation pay (A16), reassigning personnel (A17), and organizing group therapy (A19). In the context of DSS, user involvement (A1), open communication (A2), providing system information (A3), rewarding ideas (A7), documenting new procedures (A8), and retraining employees (A20) were the strategies perceived as most effective. Strategies perceived not to be particularly useful in the context of DSS include initiating morale-boosting activities (A4), modular system development (A6), alteration of job title (A12), job transfer arrangements (A15), giving separation pay (A16), reassigning personnel (A17), giving job counseling (A18), and organizing group therapy (A19).

To evaluate hypothesis **H4o**, relating to differences in promotion strategies across system types, a total of 20 two-tailed *t*-tests were conducted. The promotion strategies, in general, were perceived to be relatively

Table 6
Data analysis results for promotion strategies

Strategy (abbreviated)	TPS: No. of yes	Binomial *Z*-value	DSS: No. of yes	Binomial *Z*-value	Two tails *T*-difference TPS versus DSS
A1: Involve employees	61 (0.92)	6.89[a]	53 (0.80)	4.93[a]	2.00
A2: Open communication	62 (0.94)	7.14[a]	51 (0.77)	4.43[a]	2.83[a]
A3: Provide change info	62 (0.94)	7.14[a]	55 (0.83)	5.42[a]	2.20[b]
A4: Initiate moral boosts	32 (0.48)	0.25	16 (0.24)	−4.19[a]	3.00[a]
A5: Pace conversion	50 (0.76)	4.19[a]	34 (0.52)	0.25	3.00[a]
A6: Redevelop modularly	29 (0.44)	−0.99	13 (0.20)	−4.93[a]	3.00[a]
A7: Reward ideas	59 (0.89)	6.40[a]	50 (0.76)	4.19[a]	1.86
A8: Document standards	62 (0.94)	7.14[a]	59 (0.89)	6.40[a]	1.00
A9: Clear authority	52 (0.79)	4.68[a]	36 (0.55)	0.74	3.00[a]
A10: Upgrade environment	36 (0.55)	0.74	24 (0.36)	−2.22[b]	2.11[b]
A11: Pilot study	35 (0.53)	0.49	29 (0.44)	−0.99	1.00
A12: Alter job titles	26 (0.39)	−1.72	19 (0.29)	−3.45[a]	1.25
A13: Show sympathy	56 (0.85)	5.67[a]	42 (0.64)	2.22[b]	2.63[a]
A14: Orientation	59 (0.89)	6.40[a]	41 (0.62)	1.97	3.86[a]
A15: Job transfers	17 (0.26)	−3.94[a]	15 (0.23)	−4.43[a]	0.38
A16: Separation pay	8 (0.12)	−6.16[a]	9 (0.14)	−5.91[a]	−0.33
A17: Hiring freeze	20 (0.30)	−3.20[a]	15 (0.23)	−4.43[a]	0.88
A18: Job counseling	32 (0.48)	−0.25	18 (0.27)	−3.69[a]	2.63[a]
A19: Group therapy	13 (0.20)	−4.93[a]	3 (0.05)	−7.39[a]	2.50[a]
A20: Retrain employees	59 (0.90)	6.40[a]	44 (0.67)	2.71[a]	3.29[a]
χ^2 243.75 (19)		χ^2 175.15 (19)			
P-value < 0.001		*P*-value < 0.001			

[a] Note: indicates significant at p 0.01 level.
[b] Indicates significant at p 0.05 level. ( ) represents the proportion value.

more important for a TPS than a DSS. Thus, we reject **H4o** and accept differences across systems. In other words, TPS implementations call for more extensive use of strategies for promoting acceptance; however, there were no observed differences across system types with respect to following strategies: user involvement (A1), rewarding ideas (A7), documenting standards (A8), conducting pilot study (A11), altering job titles (A12), arranging job transfers (A15), giving separation pay (A16), and reassigning personnel (A17).

5. Discussion and implications

Users resistance to change is a key factor to which many IS implementation difficulties have been attributed. The results of this study indicate that there are significant differences in the reasons users resist TPS as compared to DSS. While the change in job content (R1) and uncertainty (R6) were equally likely reasons in the context of both TPS and DSS, change in decision-making approach (R5) appears to be the most significant reason for resisting DSS. Others, such as loss of status (R2), job insecurity (R7), and loss of power (R4) were perceived to be less likely applicable in a DSS context, but should be considered in the context of TPS. These results are consistent with the literature evaluating the impacts of system on users' decision making and job content in a TPS [1,16]. For IS practitioners, our study suggests a greater attention to issues relating to power, social status, and job security when implementing DSS. Table 7 summarizes the findings with respect to the reasons. Both

Table 7
Summary of reasons for resistance by system type

TPS	DSS
R1: Change job content R6: Uncertainty	R1: change job content R5: change DM R6: uncertainty

systems significantly change the work environment and lead to uncertainty, but only the systems directed at decision making (DSS) alter the decision making process.

With respect to promotion strategies, the results indicate that, irrespective of system type, 'participative' strategies were most desired by the subjects. In contrast, the 'direct management' methods, such as, arranging job transfer, giving separation pay, reassigning personnel, and organizing group therapy, were viewed negatively by the subjects, especially for a DSS. These findings support many previous studies that have found a positive relationship between participation and satisfaction involving end users [14,26,36]. For example, managers are accustomed to participating in decisions and expect that their inputs to decisions will be sought and used: they may regard open communication and participation as a condition for acceptance and a source of motivation.

In addition, user training related strategies, such as, conducting orientation sessions (A14), pacing conversion to allow adjustment (A5), and retraining employees (A20), were perceived to be more critical in the context of TPS than of DSS. Requiring operational-level employees to alter their existing skill sets or to try new procedures can be difficult to achieve, and attention to user training can help overcome those difficulties. This is consistent with previous studies on the potential contribution of education and training to successful systems implementation [3]. Table 8 summarizes the overall perceptions of mitigating strategies. Here it is noted that DSS systems do not have any unique strategies in spite of having an additional reason for resistance. However, some of the strategies for TPS are unique and could be bypassed in a DSS implementation.

Table 8
Summary of results for promotion strategies by system type

TPS	DSS
A1: Involve employees	A1: involve employees
A2: Open communication	A2: open communication
A3: Provide change info	A3: provide change info
A5: Pace conversion	A7: reward ideas
A7: Reward ideas	A8: document standards
A8: Document standards	A13: show sympathy
A9: Clear authority	A20: retrain employees
A13: Show sympathy	
A14: Orientation	
A20: Retrain employees	

To summarize, our study examined the linkage between user resistance and system type. Our analysis makes explicit, based on system type, key reasons for user resistance and the remedies designed to promote acceptance. We make no claim that the list of reasons identified is exhaustive, and further recognize that other situational factors (e.g., equity perception, proper system design, ease of use, perceived system utility) might influence users' attitudes towards a new system. Additional research is needed to examine the influence of such situational factors. The items identified in this study as important reasons for each type of system are those that IS management can target. From a practical standpoint, the findings improve our understanding of the resistance phenomenon and guide analysts in selecting an appropriate strategy for a given system type.

Appendix A. Survey instrument

That employees might resist new computer technology should come as no surprise to business managers. From your perspective, how likely would each of the following reasons for resistance arise with the potential end-users when implementing the proposed system described above? Please circle 'yes' if that reason is applicable to the case; otherwise circle 'no.' (Repeated for the second scenario.)

Reason for resistance	
Loss of status	yes no
Economic insecurity	yes no
Interpersonal relationships altered	yes no
Change in job content	yes no
Change in decision making approach	yes no
Loss of power	yes no
Uncertainty/unfamiliarity /misinformation	yes no

From your perspective, how important is each of the following strategies to promote acceptance of the above proposed system? Please circle 'yes' if that strategy should be applied to the case; otherwise circle 'no.' (Repeated for the second scenario.)

Strategies to promote acceptance of change

1	Involve employees in development of new systems	yes no
2	Open lines of communication between employees and management	yes no
3	Provide employees with information regarding system changes	yes no
4	Initiate morale-boosting activities, e.g., company parties and newsletters	yes no
5	Pace conversion to allow readjustment period to new system	yes no
6	Redevelop modularly	yes no
7	Reward ideas that that will improve throughput	yes no
8	Document standards so new procedures are easy to learn and reference	yes no
9	Clearly establish in advance the demarcations of authority that will exist following changeover	yes no
10	Upgrade work environment following change, e.g., more space and design for comfort	yes no
11	Conduct pilot study to examine impact of change	yes no
12	Alter job titles to reflect increased responsibility	yes no
13	Show sympathy and be receptive to complaints following conversion	yes no
14	Conduct orientation sessions	yes no
15	Arrange job transfers	yes no
16	Give separation pay	yes no
17	Call a hiring freeze until all displaced personnel are reassigned	yes no
18	Give job counseling	yes no
19	Organize group therapy	yes no
20	Retrain employees	yes no

Demographic Information:

1. What is the best description of your managerial level with the firm?
   ____Executive as part of the top management level with the firm
   ____Manager or director of department, division, center, etc.
   ____Business supporting staff
   ____Technical supporting staff
2. Do you use computers as a regular part of performing your job? yes____ no____
3. How much professional work experience do you have?
   ____1–3 years ____4–6 years ____7–10 years
   ____11–15 years ____16–19 years ____20 years or more
4. Do you have involvement with a transaction processing systems (TPS) in your organization?
   TPS: It supports day-to-day operation activities that do not require selection between alternatives. The objectives of this system is to process routine company transactions in an efficient and cost-effective manner.
   ____1–3 years ____4–6 years ____7–10 years
   ____11–15 years ____16–19 years ____20 years or more
5. Do you have involvement with a decision support system (DSS) in your organization?
   DSS: it supports decision-making activities that are unstructured and non-situational and involve choosing from a number of alternatives.
   ____1–3 years ____4–6 years ____7–10 years
   ____11–15 years ____16–19 years ____20 years or more
6. What is your gender? ____male ____female
7. What is your age group? ____25–30 ____31–35 ___36–40
   ____41–45 ____46–50 ____50 or above

8. What is your educational background?
____High School ____Associate (Professional) Degree
____Bachelor Degree ____Master Degree or above
9. Approximate the annual gross revenue of your organization:
____under 1 million ____1 million–10 million
____10–50 million ____50–100 million
____100–250 million ____250 million–1 billion
____1–5 billion ____5 billion and over

10. Do you have involvement with implementing an information systems in your organization?
____yes ____no
11a. Have you experienced resistance to information technology change in your organization?
____yes ____no
11b. If your answer is 'yes' in question 11a, was the system abandoned at the end? ____yes ____no
11c. If 'no' in 11b, what actions have been taken by the management? Please specify:

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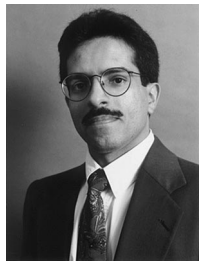

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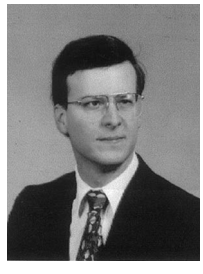

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