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RESEARCH NOTE

INVESTIGATING USER RESISTANCE TO INFORMATION SYSTEMS IMPLEMENTATION: A STATUS QUO BIAS PERSPECTIVE[1]

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Abstract

User resistance to information systems implementation has been identified as a salient reason for the failure of new systems and hence needs to be understood and managed. While previous research has explored the reasons for user resistance, there are gaps in our understanding of how users evaluate change related to a new information system and decide to resist it. In particular, missing in the explanation of user decision making is the concept of status quo bias, that is, that user resistance can be due to the bias or preference to stay with the current situation. Motivated thus, this study develops a model to explain user resistance prior to a new IS implementation by integrating the technology acceptance and resistance literatures with the status quo bias perspective. The results of testing the model in the context of a new enterprise system implementation indicate the central role of switching costs in increasing user resistance. Further, switching costs also mediate the relationship between other antecedents (colleague opinion and self-efficacy for change) and user resistance. Additionally, perceived value and organizational support for change are found to reduce user resistance. This research advances the theoretical understanding of user acceptance and resistance prior to a new IS implementation and offers organizations suggestions for managing such resistance.

Keywords: User resistance, IS implementation, status quo bias theory

Introduction

Information systems implementation projects have historically been plagued by failures for which user resistance has consistently been identified as a salient reason. A survey of 375 organizations from around the world indicated that user resistance is the first-ranked challenge for the implementation of large-scale IS, such as enterprise resource planning (ERP) systems (ITtoolbox 2004). User resistance becomes particularly significant in such IS implementations due to the multifarious changes in social as well as technical systems that result (Gibson 2003). In response to the changes, users may resist the new IS and cause delays in the project duration,

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budget overruns, and underutilization of the new system (Beaudry and Pinsonneault 2005; Kim and Pan 2006). In particular, user resistance prior to IS implementation (i.e., when the system is first being deployed) is widespread and critical for project success (Markus 2004).

Despite the importance of understanding and managing user resistance for the success of an IS implementation, few studies (e.g., Joshi 1991; Lapointe and Rivard 2005; Martinko et al. 1996) have proposed theoretical explanations of user resistance. Further, with a dominance of case studies in this area, there is a lack of theoretically grounded approaches with quantitative empirical validation (e.g., through surveys). While losses and threats have been noted as causes of user resistance in previous studies (e.g., Lapointe and Rivard 2005; Markus 1983), there are gaps in our understanding of the psychological and decision making mechanisms underlying resistance to the new IS.

Thus, the objective of this study is to derive and empirically test a theoretically grounded model of such factors leading to user resistance. Our theoretical development focuses on the pre-implementation stage. For this purpose, we draw from previous literature that identifies various antecedents for technology acceptance or resistance. However, missing in the explanation of user decision making is the concept of status quo bias, that is, that user resistance can be due to the bias or preference to stay with the current situation. The status quo bias perspective (Samuelson and Zeckhauser 1988) is relevant since it can provide theoretically driven explanations of new IS-related change evaluation and the reasons for user resistance. Our model, derived by integrating this perspective with the previous literature, is validated through a survey in the context of a new enterprise system implementation. In this way, this research aims to advance the theoretical understanding of user resistance to new IS implementations as well as offer organizations practical insights for managing user resistance.

Theoretical Background and Framework

Technology Acceptance

When a new information system is implemented, users may decide to adopt[2] or resist it based on the evaluation of change associated with the system (Joshi 2005). This suggests that a common theoretical basis is possible for explaining user acceptance and resistance (e.g., Joshi 2005; Martinko et al. 1996). For this reason, this study leverages the technology acceptance literature in examining user resistance. Technology acceptance research has attracted several theoretical perspectives including the technology acceptance model (TAM), the theory of planned behavior (TPB), and, recently, the unified theory of acceptance and use of technology (UTAUT) (Agarwal 2000; Venkatesh et al. 2003).

The TAM (Davis 1989) posits that two beliefs (usefulness and ease of use) predict an individual's technology usage intention. The TPB (Ajzen 1991) is considered as a comprehensive foundation to explain the major influences on acceptance behavior (Taylor and Todd 1995). According to this perspective, human behavior (e.g., acceptance of an IS) is guided by three kinds of considerations: *behavioral beliefs* about the likely outcomes of the behavior and the evaluations of these outcomes; *normative beliefs* about the normative expectations of others and motivation to comply with these expectations; and *control beliefs* about the presence of factors that may facilitate or impede performance of the behavior and the perceived power of these factors. Control beliefs have been further elaborated as internal and external controls based on the TPB (Ajzen 2002). More recently, Venkatesh et al. (2003) developed the UTAUT, which attempts to unify previously identified antecedents of technology acceptance. UTAUT explains how *performance expectancy* and *effort expectancy* (behavioral beliefs), *social influence* (normative beliefs), and *facilitating conditions*(control beliefs) affect behavioral intention and use behavior. While these beliefs have been used to explain user evaluation of a new IS for technology acceptance, we extend these concepts to understand user resistance behavior.[3]

User Resistance

User resistance in IS research has been conceptualized as an adverse reaction (Hirschheim and Newman 1988) or the opposition of users to perceived change related to a new IS implementation (Markus 1983). Accordingly, this study defines user resistance as *opposition of a user to change associated with a new IS implementation*. We reviewed the previous IS literature with the aim of uncovering existing theoretical understanding about user resistance. Lapointe and Rivard (2005) found four studies (Joshi 1991; Marakas and

[2]User acceptance does not necessarily mean no user resistance for mandatory IS (Nah et al. 2004). Here users must adopt the new IS but they may still harbor resistance to it and can jeopardize the implementation, for instance, through underutilization.

[3]Although several theories exist for explaining technology acceptance (e.g., TAM, TPB, UTAUT), we chose to use TPB for our integrative framework due to its comprehensiveness. Future research could make use of other technology acceptance theories as the integrative lens.

Hornik 1996; Markus 1983; Martinko et al. 1996) that proposed theoretical explanations of user resistance.

Among the theoretical explanations, Markus (1983) explains user resistance in terms of the interaction between system characteristics and the social context of its use. The interaction is mainly seen in the change in intra-organizational power distribution with the new system, where loss of power can lead to resistance by the group of users. Marakas and Hornik (1996) explain resistance behavior as a response to threats that an individual associates with a new system. Martinko et al. (1996) posit that individuals make a causal attribution of a new IS based on internal and external influences. The attribution then leads to outcome and efficacy expectancies of which negative expectancies lead to user resistance. More recently, Lapointe and Rivard (2005) have proposed a process model of resistance to IS implementation based on the five dimensions of initial conditions, interaction, threats, and behavior, with respect to the subject and object of resistance. Initial conditions interact with the object of resistance (e.g., system features) to develop a perception of threats (e.g., loss of power) that determine resistance behavior. Subsequently, actual experience of the system outcomes and external triggers drive the next set of interactions and behaviors. In summary, while all the models highlight the concept of loss or threat as key to user resistance, it is not clear how loss or threat due to a new system is evaluated by users to cause resistance.

Of the theory-driven studies, the closest in objective to our study is the equity-implementation model (EIM) (Joshi 1991). According to EIM, users evaluate the change related to a new IS implementation based on the net equity. The net equity is estimated based on the difference between changes in outcomes (increase in outcomes – decrease in outcomes) and changes in inputs (increase in inputs – decrease in inputs) with the new IS. If net inequity is perceived, users would be resistant to the change. Essentially, EIM proposes a cost-benefit analysis of the change where costs are represented by decrease in outcomes and increase in inputs while benefits are represented by increase in outcomes and decrease in inputs.

While EIM informs about change evaluation, we propose two ways to enhance the understanding of how change related to a new IS is assessed beyond EIM. The first way is by considering additional influences (normative and control beliefs) on the change evaluation. The second way is by considering theoretically driven explanations of the costs or threats associated with a new IS, which drive user resistance. These explanations are based on status quo bias theory (Samuelson and Zeckhauser 1988).

Status Quo Bias Theory

Status quo bias theory aims to explain people's preference for maintaining their current status or situation. Samuelson and Zeckhauser (1988) describe status quo bias explanations in terms of three main categories: rational decision making, cognitive misperceptions, and psychological commitment. *Rational decision making* implies an assessment of relative costs and benefits of change (i.e., net benefits) before making a switch to a new alternative. Greater costs than benefits lead to status quo bias. From the rational decision making viewpoint, two types of costs are identified: transition costs and uncertainty costs. *Transition costs* are the costs incurred in adapting to the new situation. Samuelson and Zeckhauser further categorized different subtypes of transition costs: transient costs that happen during the change and permanent costs that are a result of the change. In the context of our study, transient costs include learning costs and permanent costs include the loss of work due to the new IS. *Uncertainty costs,* representing the psychological uncertainty or perception of risk associated with the new alternative, can also cause status quo bias. Switching to a new IS can inflict uncertainty costs on users because they may be unsure and anxious about the resulting changes.

The *cognitive misperception* of loss aversion also explains status quo bias (Samuelson and Zeckhauser 1988). Loss aversion is a psychological principle that has been observed in human decision making (Kahneman and Tversky 1979) in that losses loom larger than gains in value perception. Loss aversion can result in status quo bias because even small losses of changing from the current situation could be perceived as larger than they actually are.

The third category of status quo bias explanations is based on *psychological commitment*. Three main factors contribute to psychological commitment: sunk cost, social norms, and efforts to feel in control (Samuelson and Zeckhauser 1988). *Sunk costs* refer to previous commitments, which cause reluctance to switch to a new alternative. In the context of our study, these costs include skills related to the previous way of working, which will be lost as a result of switching to the new IS. *Social norms* refer to the norms prevailing in the work environment about the change, which can either reinforce or weaken an individual's status quo bias. For example, a colleague's opinion may influence people to accept or resist a system. Efforts to feel in *control* stem from individuals' desires to direct or determine their own situation (Samuelson and Zeckhauser 1988). This desire can result in status quo bias because individuals do not want to lose control by switching to an unknown system or unfamiliar way of working. Social norms and controls in status quo bias theory

Table 1. Mapping Causes of User Resistance and Relevant Technology Acceptance Constructs to Explanations of Status Quo Bias

	Cognitive Misperception	Rational Decision Making			Psychological Commitment		
Previous Research	Loss Aversion	Net Benefits	Transition Costs	Uncertainty Costs	Sunk Costs	Social Norms	Control
DeSanctis and Courtney (1983)			Changes in job content and relative power				
Hirschheim and Newman (1988)	Innate conservatism		Resource redistribution, poor technical quality	Uncertainty			Lack of management support
Jiang et al. (2000)			Changes in job, loss of power and status	Uncertainty			
Joshi (1991, 2005)		Net inequity	Decrease in outcomes (reduced power), increase in inputs (more effort)	Increase in inputs (fear)	Decrease in outcomes (loss of value of marketable skills)		
Keen (1981)		Greater costs than benefits					
Krovi (1993)			Perceived threats to job security and power	Uncertainty			Lack of management commitment
Lapointe and Rivard (2005, 2007)		Perceived threats (inequity)	Perceived threats (loss of status and power)	Perceived threats (fear)			
Marakas and Hornik (1996)	Rigidity (inflexible behavior)			Resentment (fear)			
Markus (1983)	Inertia	Greater costs than benefits	Loss of power, poor system quality				
Martinko et al. (1996)	Attributional style	Outcome expectation	Poor technical characteristics			Coworker behavior	Efficacy expectation, lack of management support
Constructs from TAM/ TPB/UTAUT		Attitude	Effort expectancy, perceived ease of use	Behavioral beliefs (but not yet included in models)		Social influence, subjective norm	Facilitating conditions, behavioral control beliefs

are analogous to normative and control beliefs respectively in the technology acceptance literature (Ajzen 1991).

Table 1 positions status quo bias theory with respect to the causes of user resistance identified in previous IS research. An individual's innate conservatism (Hirschheim and Newman 1988), rigidity (Marakas and Hornik 1996), inertia (Markus 1983), or attributional style (Martinko et al. 1996) contribute to the cognitive misperception of loss aversion. Analogous to net benefits in status quo bias theory, previous research suggests net inequity (Joshi 1991; Lapointe and Rivard 2005), greater costs than benefits (Keen 1981; Markus

1983), or negative outcome expectations (Martinko et al. 1996) as reasons for user resistance.

Under the category of transition costs, previous research suggests several negative transitions such as loss of power (DeSanctis and Courtney 1983; Jiang et al. 2000; Joshi 1991; Krovi 1993; Lapointe and Rivard 2005, 2007; Markus 1983), more effort (Joshi 1991) sometimes due to poor system quality (Hirschheim and Newman 1988; Markus 1983; Martinko 1996), or changes in job nature/security necessitating the learning of new ways of work (DeSanctis and Courtney 1983; Jiang et al. 2000; Krovi 1983) as reasons for user resistance.

Uncertainty costs proposed by previous research as causes of user resistance include uncertainty itself (Hirschheim and Newman 1988; Jiang et al. 2000; Krovi 1983) and fear (Joshi 1991; Lapointe and Rivard 2005; Marakas and Hornik 1996). Under the category of sunk costs, previous research (Joshi 1991) suggests loss of value of marketable skills as a reason for user resistance.

As part of social norms, a coworker's reaction to the new system (Martinko et al. 1996) has been proposed as a cause for resistance. Previous studies also identify external (i.e., lack of management support—Hirschheim and Newman 1988; Krovi 1993; Martinko et al. 1996), and internal (i.e., efficacy—Martinko et al. 1996) controls as reasons for resistance. Table 1 shows that status quo bias theory provides explanations that comprehensively categorize the causes of user resistance identified in previous studies. Table 1 additionally shows how relevant constructs from TAM, TPB, and UTAUT map to the status quo bias perspective.

Integrative Framework

We now describe how we make use of the TPB, an important theoretical foundation in the technology acceptance literature, to integrate and add to relevant concepts from status quo bias theory and EIM in order to explain user resistance prior to a new IS implementation. In this way, we extend previous research on technology acceptance and user resistance and enhance the understanding of how change related to a new IS is assessed. According to the TPB, behavioral beliefs produce a favorable or unfavorable *attitude toward the behavior*; normative beliefs result in perceived social pressure or *subjective norms*; and control beliefs give rise to *perceived behavioral controls*.

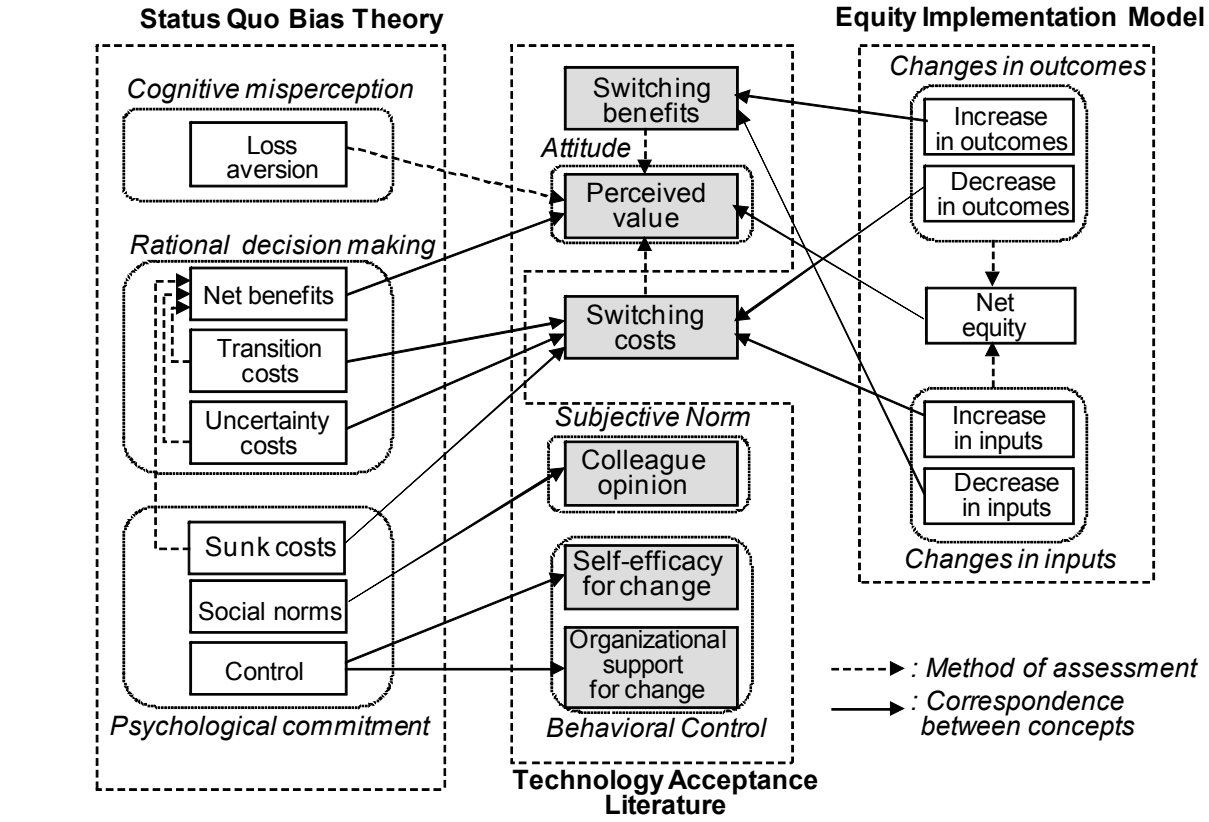
Attitude toward a behavior is the degree to which performance of the behavior is positively or negatively valued (Ajzen 2002). Attitude will be positive if the behavior is perceived to offer relative advantage or value over and above the present situation of the individual. Accordingly, attitude is represented by *perceived value* in our model, which refers to the overall evaluation of change related to a new IS implementation based on the comparison between benefits and costs (Kahneman and Tversky 1979). It corresponds to the *net benefits*concept in the rational decision-making explanation of status quo bias and the *net equity* concept in EIM. The loss aversion principle from status quo bias theory qualifies how the perceived value of change is assessed (i.e., losses appear larger than they are).

In our study, the benefits and costs compared for perceived value are referred to as switching benefits and switching costs, respectively, because they apply to the switch (change) from the status quo to the new IS. While *switching benefits* imply utility associated with switching to a new alternative, *switching costs* refer to the disutility associated with switching (Chen and Hitt 2002). Switching benefits in our study correspond to the increase in outcomes (e.g., improved quality of work) and the decrease in inputs (e.g., performing tasks more quickly) in EIM. Switching costs in our study correspond to the increase in inputs (e.g., more time and effort to do the work) and the decrease in outcomes (e.g., loss of previous work) in EIM. Based on status quo bias theory, switching costs consist of a combination of transition costs, uncertainty costs, and sunk costs.

Regarding subjective norms of the TPB (social norms of status quo bias theory), colleagues are usually the important referents for individuals in work-related issues. Therefore colleague opinion has been considered as the salient social norm individuals subscribe to in work environments (Lewis et al. 2003). Perceived behavioral controls of the TPB (controls of status quo bias theory) are accounted for by both external and internal controls in our study. Self-efficacy for change and organizational support for change respectively represent the internal and external means of achieving control of the changed situation (Ajzen 2002). Figure 1 shows how the technology acceptance literature (i.e., TPB in our study), status quo bias theory, and EIM concepts correspond to our model constructs.

Model Hypotheses

As per the theoretical foundations in the previous section, we develop hypotheses relating our model constructs (see Figure 1). We conceptualize perceived value as *the perceived net benefits (perceived benefits relative to costs) of new IS-related change* following previous research (Kahneman and



Notes: Shaded boxes represent constructs in the current study.
Switching costs are not part of the technology acceptance set of constructs.

Figure 1. Integrative Framework

Tversky 1979). According to status quo bias theory, perceived value evaluates whether the benefits derived are worth the costs incurred in changing from the status quo to the new situation (i.e., the new IS implementation). If the perceived value of the change is low, users are likely to have greater resistance to change (Samuelson and Zeckhauser 1988). Conversely, if the perceived value is high, users are likely to have lower resistance to the implementation of the new system. These arguments agree with previous literature, which indicates that people have a strong tendency to maximize value in their decision making (Sirdeshmukh et al. 2002) and consequently are less likely to resist changes with higher perceived value.

H1: ***Perceived value has a negative effect on user resistance.***

Switching costs refer to *the perceived disutility a user would incur in switching from the status quo to the new IS* and consist of three components, transition costs, uncertainty costs, and sunk costs, as per status quo bias theory (Samuelson and Zeckhauser 1988). Transition costs include transient expenses and permanent losses associated with the change. As the expenses and losses increase, people are more likely to be reluctant to the change because they are motivated to cut losses (Kahneman and Tversky 1979). People also tend to be averse to uncertainty in their decision making and behavior because of the feeling of incompetence in the uncertain situation (Brown and Venkatesh 2005). Uncertainty thus causes negative psychological reactions (Inder and O'Brien 2003), which bias users toward the status quo (Samuelson and Zeckhauser 1988). Sunk costs (Whitten and Wakefield 2006) may also lead to user resistance because people do not want to forgo their past investment made in the status quo (Samuelson and Zeckhauser 1988). Hence, switching costs are likely to have a direct impact on user resistance.

H2: Switching costs have a positive effect on user resistance.

Apart from the direct effect of switching costs on user resistance, we also expect an indirect effect mediated through perceived value. As per rational decision-making principles, higher switching costs would decrease the net benefits or perceived value of the change to users because net benefit is assessed by weighing benefits relative to the costs of change.

H3: Switching costs have a negative effect on perceived value.

Switching benefits refer to *the perceived utility a user would enjoy in switching from the status quo to the new IS.* The switch to a new IS could result in benefits in the form of performance enhancement in an individual's tasks. The potential of enhancing performance and the corresponding rewards could, therefore, increase the perceived value of the change. Thus, higher switching benefits would increase the perceived value of change to the new system.

H4: Switching benefits have a positive effect on perceived value.

Self-efficacy for change is considered an internal factor that can enhance feelings of control. Following Bandura (1995), this study defines self-efficacy for change, as *an individual's confidence in his or her own ability to adapt to the new situation* (i.e., ways of working with the new IS). The difficulties faced during IS-related change will be viewed as challenges to be mastered or threats to be avoided depending on the individual's self-efficacy (Bandura 1995). Users with a high level of self-efficacy face the change confidently. However, users with a low level of self-efficacy feel discouraged and may be more inclined to resist the change. Therefore, as self-efficacy decreases, the level of user resistance may increase.

H5: Self-efficacy for change has a negative effect on user resistance.

Self-efficacy for change may also influence user resistance indirectly through its effect on switching costs. If users have a high level of self-efficacy for change, then they will be less likely to experience anxiety and uncertainty regarding the change (Bandura 1995; Compeau et al. 1999). Instead, they may feel confident in performing the focal behavior (i.e., adapting to and learning to use the new IS). High self-efficacy for change, therefore, implies a lower perception of uncertainty costs and transition costs like learning. Therefore, self-efficacy for change may lower the overall perception of switching costs.

H6: Self-efficacy for change has a negative effect on switching costs.

Apart from internal efforts to gain control of a new situation, external efforts in the form of organizational support for change can serve the same purpose. In the context of our study, organizational support for change is defined as *the perceived facilitation provided by the organization to make users' adaptation to new IS-related change easier.* Changing to a new way of working with a new system requires guidance and relevant resources for learning. Facilitation of change through mechanisms such as training and providing resources could affect users' reactions to new IS-related change (Hirschheim and Newman 1988). As the level of organizational support for change increases, users may react less negatively and develop less resistance to the implementation of a new IS.

H7: Organizational support for change has a negative effect on user resistance.

Just as management support for a technology increases the ease of use of the technology (Lewis et al. 2003), organizational support for change in the form of training and resources is likely to reduce the perceived difficulty of adapting to the new IS. Greater organizational support for change could reduce users' switching costs of time and effort required to learn the new way of working. Therefore, apart from its direct effect, organizational support for change may indirectly lower user resistance by lowering the perception of switching costs.

H8: Organizational support for change has a negative effect on switching costs.

Colleague opinion has been considered as a salient social influence that individuals subscribe to in their work environment (Lewis et al. 2003). In this study, colleague opinion is defined as *the perception that colleagues favor the changes related to a new IS implementation.* Due to the need for social companionship as well as the fear of sanction for non-compliance, users have the tendency to conform to their colleagues' opinions (Ajzen 2002; Lewis et al. 2003), that is, normative influence. Thus, colleagues' favorable opinion toward the IS-related change may lower user resistance.

H9: Favorable colleague opinion has a negative effect on user resistance.

Colleague opinion could also affect user resistance indirectly through its influence on switching costs and benefits. As users internalize colleagues' opinions about the change to a

new IS, their original perceptions about switching costs and benefits would be altered (e.g., have informational influence—Bunkrant and Cousineau 1975). Colleagues' favorable opinions toward the new IS-related change can serve to reduce users' uncertainty and lower their perceptions of switching costs. Positive colleague opinion about the system-related change would also lead to a greater perception of switching benefits among users.

H10: ***Favorable colleague opinion has a negative effect on switching costs.***

H11: ***Favorable colleague opinion has a positive effect on switching benefits.***

Research Methodology

Data to empirically validate the hypotheses were collected through a field survey of users of a new enterprise system. We approached several organizations that were about to roll out a new enterprise system. We then spoke to management in these organizations to find out about users' attitude to the new system. The target organization was chosen since there was indication from the management that users were apprehensive about the new system and might resist it.

Target Organization and System

The target organization is a major IT service company with more than 5,800 employees. It provides a full range of IT services to client organizations, including IS consulting, IT solutions, and IS development. The company deployed a new enterprise system called "New Office Plus" (NOP), which took about 12 months to customize. NOP is a combination of an enterprise portal and knowledge management system. It serves several key functions, such as enterprise-wide communication and task processing, collaboration with colleagues, personal scheduling, and knowledge management. As part of the NOP project, the company redesigned and automated its workflows and integrated the workflows with the relevant application systems for task processing by implementing a business process management system. Consequently, implementation of the NOP system brought substantial changes to the organization in terms of technology (e.g., new IS), tasks (e.g., new workflows), and people (e.g., change in monitoring). All employees had to use the NOP system for processing their tasks and thus encountered the multifarious changes.

In terms of technology, employees had to switch from using existing stand-alone applications for their tasks to using the new integrated NOP system. As part of the workflow redesign, there were several changes in the overall tasks. First, unnecessary tasks (e.g., unnecessary reporting) were removed from the workflow. This changed work assignments for employees who were previously in charge of these activities. Second, the business process management system manages the workflow and also monitors it. Hence, it can check where a bottleneck is located in the task workflow and who is responsible for it. In terms of people-related change, the NOP system did not result in job losses. However, users were anxious about the new system as their work would be monitored by the system.

Prior to the system release, users appeared apprehensive about the system implementation. When the system was rolled out, there were numerous integration errors and frequent system breakdowns. Users complained that they would like to go back to the old system. In response to users' feedback, the project development team focused on solving the problems. They provided more detailed information to the users about the new workflow and allayed their fears regarding performance losses due to learning the new system and abandoning the old way of work. Subsequently, the system stabilized and was gradually accepted by users.

Instrument Development

Existing validated scales were adopted where possible and, elsewhere, new scales were developed based on previous literature. Scales for perceived value were modified from the value construct of Sirdeshmukh et al. (2002) to the context of new IS-related change. They were measured as the perceived benefits with respect to the costs involved in such change (i.e., time and effort, hassles, and losses).

We developed the measurement items for switching benefits based on the definition and by referring to the items of relative advantage (Moore and Benbasat 1991). Similar to many previous studies, switching costs were conceptualized as a single-dimensional construct, with scales adapted from Jones et al. (2000) to reflect transition costs (SWC2 and SWC4), uncertainty costs (SWC3), and sunk costs (SWC1). We developed the measurement items for colleague opinion based on the definition and by referring to the items of subjective norm (Venkatesh and Davis 2000). To measure self-efficacy for change, we adapted scales from Taylor and Todd (1995) and added an extra item on knowledge, skills, and abilities to adapt to change (SFC1). We developed measure-

ment items for organizational support for change based on the definition and by referring to the items of facilitating conditions (Thompson et al. 1991).

To measure user resistance, we self-developed the scales based on Bovey and Hede's (2001) framework of resistance behaviors. This classification distinguishes between overt (open and expressive) and covert (concealed or hidden) resistance and between active (originating action) and passive (inert or not acting) resistance.

The degree of resistance is considered to increase from covert passive (e.g., ignoring or indifference) to overt active (e.g., obstructing) behaviors. Following the framework, we developed four items representing resistance behavior with each item corresponding to a category of the framework: "not comply with" (passive and covert), "not cooperate" (active and covert), "do not agree" (passive and overt), and "oppose" (active and overt). The measurement items were anchored on seven-point Likert scales (1 = strongly disagree, 7 = strongly agree). All items were phrased with respect to the NOP system under study. The instrument was reviewed by both IS researchers and practitioners. The final version of the questionnaire is shown in Table 2.

Data Collection

We collected data from the employees during the last five days before the NOP was put into operation since our objective was to study resistance prior to the system implementation. In addition to the survey data, we also conducted interviews with users and the project manager. With the help of the human resource management unit of the company, we randomly selected 500 employees across different business units and different organizational positions to whom we distributed the survey questionnaires. A total of 202 complete and valid responses (40.4 percent of response rate) were collected across 10 business units (finance, human resource, procurement, research, consulting, manufacturing business, financial business, public business, IT solution, and training center) (see Table 3).

We assessed nonresponse bias by comparing early and late respondents (i.e., those who replied during the first two days and during the last two days). We found no significant difference between the two respondent groups based on the sample attributes (gender, age, tenure, and position). The sample's representativeness was also supported, as no significant demographic differences were found between the sample and population figures supplied by the company's human resource management unit.

Data Analysis and Results

Instrument Validation

To validate the survey instrument, we assessed its convergent and discriminant validity. Convergent validity can be established by examining the standardized path loading, composite reliability (CR), Cronbach's α, and the average variance extracted (AVE) (Gefen et al. 2000). We first performed confirmatory factor analysis (CFA) using LISREL. The standardized path loadings were all significant (t-value > 1.96) and greater than 0.7 except for OGS1 (0.60), which was close to the threshold. The composite reliability (CR) and the Cronbach's α for all constructs exceeded 0.7. The average variance extracted (AVE) for each construct was greater than 0.5. By and large, the convergent validity for the constructs was supported.

Next, we assessed the discriminant validity of the measurement model. As shown in Table 4, the square root of AVE for each construct (diagonal term) exceeded the correlations between the construct and other constructs (off-diagonal terms). Hence, discriminant validity of the instrument was established.

We took a number of steps to reduce the common method bias due to a single source of data. These included appropriate instrument design and data collection procedures suggested by Podsakoff et al. (2003). We also tested our data for common method variance using the Harman's single-factor test (Harman 1967).Results of the test indicate that our data do not suffer from common method variance.

Hypotheses Testing

After establishing the validity of the measurement instrument, we examined the structural model using LISREL. The results of testing the structural model are shown in Figure 2. All the fit indices meet the recommended guidelines (Gefen et al. 2000) except for GFI (0.86), which is close to the threshold. Thus the structural model has an adequate fit with the data.

The results indicate that perceived value (H1), switching costs (H2), and organizational support for change (H7) had significant effects on user resistance, explaining 62 percent of its variance. Switching costs (H3) and switching benefits (H4) had significant effects on perceived value, explaining 49 percent of its variance. Self-efficacy for change (H6) and colleague opinion (H10) had significant effects on switching costs, explaining 37 percent of its variance. Colleague opinion (H11) also had a significant effect on switching benefits,

Table 2. Measurement Instrument

Construct	Item	Wording	Reference
User resistance	RTC1	I will not comply with the change to the new way of working with the NOP system	Self-developed based on Bovey and Hede (2001)
	RTC2	I will not cooperate with the change to the new way of working with the NOP system	
	RTC3	I oppose the change to the new way of working with the NOP system	
	RTC4	I do not agree with the change to the new way of working with the NOP system	
Perceived value	PVL1	Considering the time and effort that I have to spend, the change to the new way of working with the NOP system is worthwhile	Sirdeshmukh et al. (2002)
	PVL2	Considering the loss that I incur, the change to the new way of working with the NOP system is of good value	
	PVL3	Considering the hassle that I have to experience, the change to the new way of working with the NOP system is beneficial to me	
Switching benefits	SWB1	Changing to the new way of working with the NOP system would enhance my effectiveness on the job than working in the current way	Moore and Benbasat (1991)
	SWB2	Changing to the new way of working with the NOP system would enable me to accomplish relevant tasks more quickly than working in the current way	
	SWB3	Changing to the new way of working with the NOP system would increase my productivity than working in the current way	
	SWB4	Changing to the new way of working with the NOP system would improve the quality of the work I do than working in the current way	
Switching costs	SWC1	I have already put a lot of time and effort into mastering the current way of working	Jones et al. (2000)
	SWC2	It would take a lot of time and effort to switch to the new way of working with the NOP system	
	SWC3	Switching to the new way of working with the NOP system could result in unexpected hassles	
	SWC4	I would lose a lot in my work if I were to switch to the new way of working with the NOP system	
Colleague opinion	CGP1	Most of my colleagues think the change to the new way of working with the NOP system is a good idea	Venkatesh and Davis (2000)
	CGP2	My peers are supportive of the change to the new way of working with the NOP system	
	CGP3	Most people whom I deal with in my job encourage my change to the new way of working with the NOP system	
Self-efficacy for change	SFC1	Based on my own knowledge, skills and abilities, changing to the new way of working with the NOP system would be easy for me	Taylor and Todd (1995)
	SFC2	I am able to change to the new way of working with the NOP system without the help of others	
	SFC3	I am able to change to the new way of working with the NOP system reasonably well on my own	
Organizational support	OGS1	The company provides me guidance on how to change to the new way of working with the NOP system	Thompson et al. (1991)
	OGS2	The management provides the necessary help and resources to enable me to change to the new way of working with the NOP system	
	OGS3	I am given the necessary support and assistance to change to the new way of working with the NOP system by the company	

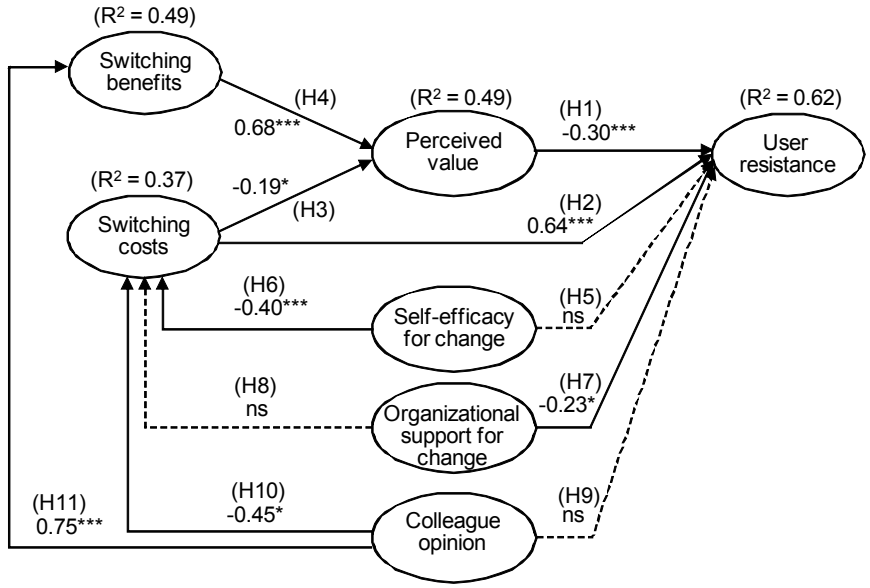
Table 3. Descriptive Statistics of Respondents

Demographic Variable		Data
Gender	Male	133 (65.8%)
	Female	69 (34.2%)
Age (years) (mean = 32.2, s.d. = 4.7)	< 25	6 (3.0%)
	25–29	56 (27.7%)
	30–34	88 (43.6%)
	35–39	36 (17.8%)
	40–44	11 (5.4%)
	> 44	5 (2.5%)
Tenure (years) (mean = 4.8, s.d. = 3.9)	0–3	82 (40.6%)
	4–6	80 (39.6%)
	7–9	16 (7.9%)
	> 9	24 (11.9%)
Position	Frontline employee	108 (53.5%)
	Middle manager	82 (40.6%)
	Manager	12 (5.9%)
Total		202 (100.0%)

Table 4. Correlations Between Latent Variables

	Mean	S.D.	RTC	PVL	SWB	SWC	CGP	SFC	OGS
RTC	2.58	1.12	**0.82**						
PVL	4.85	1.10	-0.48	**0.85**					
SWB	4.68	1.04	-0.43	0.62	**0.88**				
SWC	3.37	1.17	0.63	-0.38	-0.38	**0.78**			
CGP	4.25	0.98	-0.38	0.62	0.61	-0.42	**0.84**		
SFC	5.21	1.10	-0.37	0.24	0.21	-0.41	0.23	**0.88**	
OGS	4.29	1.18	-0.28	0.22	0.34	-0.19	0.36	0.20	**0.82**

(Note: Leading diagonal shows the squared root of AVE of each construct)



Normed χ^2 = 1.44, RMSEA = 0.047, GFI = 0.86, AGFI = 0.82, CFI = 0.98, NFI = 0.95
(*p < 0.01; **p < 0.01, ***p < 0.001; ns: insignificant at the 0.05 level)

Figure 2. Testing Results of the Structural Model

explaining 49 percent of its variance. However, 3 hypotheses (H5, H8, and H9) out of 11 were not supported. We additionally included four control variables (gender, age, tenure, and position) but none of them had a significant effect on user resistance.

Discussion and Implications

Discussion of Findings

There are several significant findings from this study. Most importantly, switching costs increase user resistance both directly and indirectly through their effect on perceived value. This study indicates the salience of switching costs in determining user resistance by its own effect as well as mediating the effect of other factors (colleague opinion and self-efficacy for change) on resistance. Further, self-efficacy for change reduces users' resistance to change indirectly through reducing switching costs. This result extends previous findings that self-efficacy increases ease of use (Venkatesh 2000) since switching cost not only includes ease of use but also ease of learning the new IS. The study also found that both perceived value and organizational support for change reduce user resistance to new IS-related change. These results are consistent with previous research (Joshi 1991; Keen 1981) that changes where costs exceed benefits (i.e., low perceived value) are likely to be resisted. They also agree with previous findings that lack of management support for change increases user resistance (Krovi 1993; Martinko et al. 1996).

Additionally, colleague opinion toward change reduces switching costs and increases switching benefits. Prior research (Lewis et al. 2003) has argued that individual users incorporate colleague opinion as part of their belief structure in the presence of uncertainties and potential losses. Our study extends this idea by suggesting that colleagues' favorable opinions toward a new IS-related change cause users to reform their perceptions about switching costs and switching benefits.

However, the model has three insignificant relationships. First, self-efficacy for change has no direct impact on user resistance. Rather, the effect of self-efficacy for change on user resistance is mediated through switching costs. This result indicates that self-efficacy for change decreases user resistance by reducing the perception of costs for switching from the status quo to the new system.

Second, our study found that organizational support for change has no effect on switching costs, but reduces user

resistance directly. This could be due to the fact that organizational support may reduce some components of switching costs (e.g., transition costs in terms of additional inputs) but not other components (e.g., sunk costs). To test this argument, we conducted a *post hoc* analysis by using only SWC2, which represents transition costs in terms of additional inputs. The results show that organizational support for change indeed has a significant effect on this cost.

Third, colleague opinion has no direct impact on user resistance. This could be because colleague opinion represents more of an informational influence than a normative influence (e.g., enforcement) on people's decision making and behavior (Burnkrant and Cousineau 1975). While normative influence (more likely from a superior) could have a direct effect on resistance behavior, informational influence (e.g., from a colleague) is likely to impact user resistance mediated through perceptions of switching costs and switching benefits.

Theoretical Implications

This research offers several implications and contributions to theory. A primary contribution is in combining technology acceptance and resistance theories to examine how users assess overall change related to a new IS. By making use of technology acceptance literature (TPB) to integrate and add to relevant concepts from resistance theories (EIM) and theories not used previously in this context (status quo bias theory), this study provides a deeper understanding of user resistance prior to new IS implementation. Also, the study contributes by operationalizing and testing the developed model through survey methodology, which has little precedence in user resistance literature.

Second, as a result of combining technology acceptance and user resistance theories along with the status quo bias theory, this study adds to both acceptance and resistance literatures. While much of the user acceptance research (e.g., Compeau et al. 1999; Taylor and Todd 1995) has focused on beliefs about the target technology, this study examines the overall changes associated with a new IS implementation. A more holistic view may be obtained in technology acceptance studies by considering the overall changes related to a new IS anchored on users' current situations. Further, we were able to identify a key construct (i.e., switching costs) that determines user resistance in our study. While some aspects of switching costs have been studied in previous acceptance research,[4] the overall concept is novel in this context.

[4]Some aspects of switching costs, such as ease of use or complexity in using a new system, are captured under effort expectancy (Venkatesh et al 2003) in technology acceptance research but other components, such as sunk costs and permanent transition costs (e.g., losses), are not.

This study also adds to the user resistance literature. Our model extends the previous understanding of new IS-related change appraisal offered by EIM (Joshi 1991) in several ways. The first way is by considering additional influences (normative and control beliefs) on the change evaluation that are drawn from the technology acceptance and status quo bias literature. The second way we add to the overall user resistance literature is by considering theoretically driven explanations of the costs or threats associated with a new IS, as per status quo bias theory.

This study has a third key theoretical implication in terms of status quo bias theory. This theory was developed for explaining bias toward maintaining the status quo in human decision making and behavior (Samuelson and Zeckhauser 1988). Since then, it has been applied to explain human decision making in general (Inder and O'Brien 2003) as well as in specific areas such as resistance to reform in government (Fernandez and Rodrik 1991). As an extension of previous research, this study has demonstrated how status quo bias theory can be applied in IS research to explain user resistance to new IS-related change.

Practical Implications

The results of this study offer suggestions to management about how to alleviate user resistance in IS implementation. First, management should be aware of the critical effect of switching costs on user resistance. Management can attempt to reduce switching costs by enhancing colleagues' favorable opinions toward new IS-related change and increasing users' self-efficacy for change. To enhance colleague opinion, management can attempt to publicize the necessity of the new IS and persuade key users (especially opinion leaders) to accept the change first (Massey et al. 2001). These leaders can then serve as champions of the change to their colleagues. Apart from developing favorable opinions, management should also provide training to employees to enhance their skills and confidence (i.e., self-efficacy for change).

Second, management should aim to increase the perceived value of change and organizational support for change to reduce user resistance. To increase the perceived value, the advantages of a new IS should be emphasized from the viewpoint of the user. Switching benefits, therefore, need to be communicated clearly to users before the new system release. Management can further attempt to increase switching benefits by enhancing colleagues' favorable opinions toward new IS-related change.

To enhance organizational support for change, management should provide users with training, guidance, time and

resources to learn the new system, and also make the relevant business process modifications, as was done in the organization we studied. Top management commitment to IS implementation would also be important to enhance organizational support for the change.

Limitations and Future Research

The results of this study should be interpreted in the context of its limitations. First, the data was collected from a single organization with a particular information system. It would be useful to replicate this study across other systems and in organizations in different sectors to establish the robustness of the model results. Second, this study has examined user resistance prior to IS implementation. Future research could examine other stages of IS implementation because system evaluation will vary over pre and post implementation (Karahanna et al. 1999). The transient part of switching costs will likely disappear once the system has been fully implemented and employees are using it.

Third, while we assume that loss aversion is one of the reasons for status quo bias (as per the theory), the principle is not actually tested in this study. Future work may attempt to empirically validate this principle in user resistance. Fourth, this study does not consider superiors as important referents regarding social norm. Future studies need to consider the influence from superiors as well that may be more normative than the influence from colleagues.

Fifth, future studies could conceptualize switching costs as a multidimensional construct to examine in-depth effects of different dimensions of switching costs on user resistance. The subtypes of switching costs could also have different antecedents. Finally, future studies could extend this study by considering the coping model of user adaptation (Beaudry and Pinsonneault 2005). The coping model suggests that people evaluate threats and opportunities of an information technology event, which could be mapped to switching costs and benefits in this study. The coping model explains what adaptation strategies are chosen, which can lead to different outcomes by users based on the evaluation. While this study focuses on exit outcomes (i.e., user resistance), future studies could examine how the evaluation of switching benefits and costs leads to different strategies and outcomes.

Conclusion

This research is among the limited studies that attempt to explain user resistance to new IS-related change prior to implementation of the system from the theoretical perspective with empirical validation. Going beyond previous research, this study develops a theoretical model for user resistance by combining technology acceptance and user resistance theories and bringing the status quo bias perspective to the forefront. This study highlights the significance of switching costs as a key determinant of user resistance. It also identifies colleague opinion and self-efficacy for change as antecedents that reduce switching costs. Furthermore, the study indicates the role of the perceived value of IS-related change and organizational support factors in reducing user resistance. This study thus makes contributions both to the user resistance and technology acceptance research by providing richer explanations of the mechanisms and additional influences on evaluation of change related to a new information system. The findings offer organizations suggestions for managing user resistance with the aim of mitigating the failure of IS implementations.

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