

Assessing Users' Resistance towards a New Information System: An Empirical Study based on Status Quo Bias

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Abstract. Upgrading IT infrastructure to enable additional business benefits is increasingly common and critical today, accelerated by the Covid-19 pandemic and the shift towards digitization, especially in medium and large enterprises. Change often entails challenges from the user perspective, which we call user resistance. In this paper, we therefore examine the drivers of user acceptance and resistance to the introduction of a new information system in order to recommend better ways of managing the implementation process. We do so by developing a model to test user resistance in a large enterprise with global setting for a large-scale CRM information system change by integrating the literature on technology acceptance and user resistance with the status quo bias perspective. The status quo bias theory can help understand the user decision-making process that results in acceptance or rejection of change. Our results show that switching costs, switching benefits, and organizational support play key roles in the user decision-making process. Switching costs have a positive effect on user resistance towards a new information system, switching benefits have a positive effect on perceived value and a negative effect on user resistance, while organizational support has an indirect effect on user resistance through its negative effect on switching costs.

Keywords: Information system, Digitization, CRM, User resistance, User acceptance, Status quo bias theory, Change management

1 Introduction

Change and change management is an increasingly hot topic across disciplines. Organisations are initiating various changes, including changes to IT systems, to remain competitive. Although enterprise information systems bring so many benefits such as more efficient processes, additional functionality or lower operating costs, users may show resistance to using them [26]. The introduction of a new information system (IS) or a new version of an IS induces changes that,

in many cases, provoke user resistance. A worldwide survey of over 300 organizations found that user resistance is the number one barrier to the adoption of large information systems in large and medium-sized enterprises [27].

In order to exploit the benefits of business information systems (BIS), these systems must be effectively implemented in the organization and accepted by the employees of the respective organization [28]. Understanding these resistance factors is critical for a change to take place and essential for companies to benefit from the change as soon as possible and avoid the negative effects of user resistance such as exceeding budget of implementation, delays and under-utilization of the new system [29, 30].

1.1 Enterprise Information Systems

Medium and large companies often rely on a complex set of information systems to manage business processes and create value, and these systems are receiving increasing attention because they have a direct impact on company performance, including employees productivity, cost levels and other efficacy indicators. Modern and well-functioning information systems enable companies to excel and have a competitive advantage, and they also increase the employees and customer satisfaction, as many information systems facilitate interaction between internal and external parties, including customers and third parties [35, 2].

There are different ways to categorize enterprise information systems, in general there are two main types of enterprise information systems [36]: (1) transaction or operational support systems and (2) management support systems. Operational support systems are designed to process transactions and the data originating from these transactions, in which they go through different phases such as analysis, update and output generation. Examples of the data processed might be sales, inventory or financial data. This type forms the core of the business and includes regular transactions that are necessary for the operation of the business. While management support systems provide managers with regular reports at specific intervals such as daily, weekly or monthly reports, these reports cover diverse internal aspects of the company. Examples of these reports might be performance analysis or production trends, a well-known category of management support systems is decision support systems that help managers make decisions by utilizing large amounts of data from a variety of sources.

1.2 Customer Relationship Management System

The purpose of the CRM process is to manage customer relationships and communications, which includes topics such as Product and Service Agreements (PSA), entered into and managed by internal customer teams as part of CRM process [37]. This process is the core of the company's business and is the key point of contact for managing customer relationships. It aims to provide a single source of information about customers and on-demand content such as product or service availability, delivery dates, releases, updates and order status [37].

While every company defines its core and important processes, which are usually standardized across industries, these processes need to be managed with advanced information systems so that they can be well monitored and easily used by all parties, especially for large organizations with multiple stakeholders [63]. A key process such as CRM is often managed by advanced information systems to facilitate the entire process across different phases and stakeholders, mainly to improve the customer journey and help them make certain decisions or gain additional insights [9]. In our study, we focus on CRM system change to investigate user resistance to information system change and to test the hypotheses for our conceptual model.

In the new global economy, CRM information systems have become a key enabler for multinational enterprises by making the acquisition, development and maintenance of customer relationships a more effective process [21]. Factors of CRM system adoption is therefore of paramount importance. [22] showed that enterprise size, IS and knowledge management staff capabilities are significant determinants of the CRM adoption. Furthermore, understanding and communicating CRM benefits across the organization were found to be critical success factors of CRM adoption [23]. [24] revealed other important determinants of CRM system adoption, such as organizational strategy and IS maturity. A systematic review of the determinants can be found in [25]. However, previous related work failed to address the user resistance behaviour.

1.3 User Resistance

User resistance is caused by the attitude that the user develops towards change [31], which can be explained by the theories based on social and cognitive psychology, such as the theory of reasoned action, unified theory of acceptance, the theory of planned behaviour, and use of technology or technology adoption model [32, 6]. Grounded in these theories, earlier related studies introduced, among others, a security diffusion model for the adoption of computer security systems [34], the internet banking acceptance model [33, 8], user acceptance of blockchain technology [62, 7], smart systems acceptance [5], big data adoption [4], acceptance of chatbots in workplaces [3], and technology acceptance and resistance model [31, 69, 15, 17]. The latter model is particularly effective for change management in the context of information systems implementation because it extends the user evaluation-based approaches by considering user resistance behaviour [20]. This is also illustrated by its recent application in examining the switching behaviour of mobile payment users [1, 19], smart homes [13], and telehealth services [18]. We therefore designed our study to assess user resistance to large-scale CRM information system changes in a large multinational enterprise setting, and established a psychological basis for our empirical research supported by the status quo bias theory.

In this study, we aim to assess user decision making process in terms of acceptance and resistance to a new information system by uncovering not just the rational part, but also the irrational part of habitual human behaviour that unconsciously influence the decision making process of a user when being exposed

to a new information system. This effect is often ignored or not given enough attention, hence We designed our study to address this topic by leveraging the status quo bias theory which integrates several constructs including rational decision making in addition to other constructs such as cognitive mis-perception and psychological commitment. We run our study by evaluating selected factors based on the status quo bias perspective to investigate users' resilience to the new information system. We assess the perceived value and its determinants in terms of switching benefits and switching costs. We also assess factors that are behavioural in nature and contribute to self-efficacy and organizational support. This paper aims to answer the following research question: How do the factors that cause status quo bias influence users' resistance towards a new system? with CRM system as a use case. In other words, this study aims to investigate why companies can be reluctant to adopt new information system solutions, how existing systems and organizational status quo may affect a company's deployment pace to a new information system implementation, and how they can react.

We designed our study with a similar approach to [31] having it as a reference point to examine the users' resistance and validate the status quo bias theory in a different context of an information system introduction and different nature of the information system change. The system we are examining in our study is a CRM-oriented system, more complex and critical as it interacts with various internal and external stakeholders, including customers, unlike the internal-only "New Office Plus" collaboration system that was addressed by [31]. In addition, we are examining a much larger multinational organization of ~100K employees versus the population of mid-sized companies covered in Kim's study. Finally, the users approached in Kim's study had a pre-set negative opinion of the new system due to the observed bugs and errors that occurred, whereas the system we address here is driven by a more stable and structured change with a new and more advanced system, hence we also focus on the perceived value aspect resulting from the net switching costs being offset and out-weighted by the switching benefits. Therefore, we believe that our study will provide an additional evidence with respect to assessment of user resistance towards a new information system.

The remainder of the paper is organized as follows. Section 2 presents the theoretical background with more elaboration on user resistance and status quo bias. Section 3 develops a conceptual model and poses hypotheses. In Section 4, the research methodology is outlined. Section 5 presents the empirical results of the proposed structural equation model. In Section 6, the contributions of this study are discussed, and Section 7 concludes the paper with implications and future research directions.

2 Theoretical Background

2.1 User Resistance and Status Quo Bias

Effective organizations are constantly building, renewing and transforming their capabilities, which include information systems and processes. They often strive

to do so with a clear vision and organisational support that minimises user resistance [60].

Users develop a perception of the value the system can provide based on their hands-on experience with the system, and then decide whether to accept or reject the new system [64, 69]. While there is a difference between the action of initial use and the continued use, in this study we assess the action of initial use since the information system was recently introduced. After a certain period of time, another study could be done to assess the continued use such as the one done by [70]. In addition, the intended use of the information system in our study is taken place in a workplace setup, in which we could consider it as a mandatory environment where users do not have many options.

User resistance to an information system can be defined as "opposition of a user to change associated with a new IS implementation" [31]. Based on our literature search, we found various theoretical approaches that attempt to explain the existence and justification of user resistance; we first briefly review these and then outline the theoretical basis we have chosen for our study. The first approach we discuss is based on [38], where user resistance was portrayed as the interaction of system properties with the surrounding social context. This approach focuses on changes in organizational power induced by a change in the information system, where users will resist the loss of their power or the fear of losing power by resisting the change in the system.

Another approach to explaining user resistance is based on the net equity assessment [39], the concept of net equity deals with the increase and decrease of inputs and outputs from the previous state (old system) towards the future state (new system), and if the evaluation results in net inequality towards the new system, it will cause resistance to user behavior. This is very similar to a cost-benefit comparison, where users compare the difference between the costs and benefits of the new system and the old system, in which user resistance will occur if the new system corresponds to higher costs and/or lower benefits.

[40] link the behaviour of users who resist to the threats and concerns they may associate with the new system. The study by [40] explains user behaviour towards a new information system as the result of internal and external sources of influence, where the user can be influenced either positively or negatively based on the expectation settings they create for themselves. User resistance arises when the user has a negative expectation setting towards the new information system.

Finally, [41] addressed user resistance to the new information system with the following five starting points: initial conditions, interactions, threats, behaviour and object of resistance; the initial conditions and the object of resistance (e.g., inadequate system features) create threats to the user (e.g., lower benefits) that lead to the emergence of user resisting behavior.

When viewed from the perspective of status quo bias, the status quo bias theory informs the end-user's decision-making process from a cognitive perspective of the extent to which the user chooses to resist or embrace change [65, 10]. As an integral component for the basis of our study, we have chosen the status quo

bias theory to explain that a user’s resisting behavior may stem from (1) rational decision-making that will be guided by facts, e.g. based on cost, speed, or ease of use, (2) cognitive mis-perception, e.g. when a user overestimates a specific feature loss, or (3) psychological commitment, e.g. anything that psychologically blocks the user from making a switching decision, e.g. loss of knowledge and skills of the existing system [42].

We developed our model to examine user resistance from a psychological perspective, drawing on the status quo bias theory. The theory was first conceptualized by [42]. At that time, the study defined status quo bias as ”doing nothing or maintaining one’s current or previous decision” [42]. Further, the paper provided experimental evidence for the existence of status quo bias principles in terms of the context of decision making in several cases where an individual must decide between alternatives, often one of the alternatives represents the status quo, which is staying with the current or default scenario.

According to the theory of status quo bias, as described by [42], people may make decisions based on three main categories: (1) Rational decision making, where a decision may be made based on historical situations with similar settings; an individual tends to repeat the same decision, or based on facts, e.g. if a change is associated with a cost of change, the individual assesses whether the cost of the change has a greater or lesser impact than the benefits that the change will bring. (2) The cognitive mis-perception [43] explains that another cause of the status quo bias may be loss aversion, where the individual perceives the weight of the losses to be greater than the gains that the change brings, while this is only a perception. (3) Psychological commitment, which may be caused by (3.1) prior commitments, where the individual subsequently makes decisions based on old commitments or investments in an incremental approach, described here as ”sunk costs”, another cause could be (3. 2) the individual’s fear of making a wrong decision and thus avoiding possible unpleasant consequences, which is described here as ”regret avoidance”, the third type is (3.3) ”efforts to feel in control”, where the feeling of control correlates with the individual’s perception of decision making. Since then, this theory has often been used to model the behaviour of information system users [20, 16, 65].

Here we use the status quo bias theory to develop a user resistance model for a new CRM system. To do so, we adopt the conceptual model framework defined by [31] and develop a battery of hypotheses to demonstrate its validity for the new information system introduced by a large multinational company.

3 Model Development & Hypotheses

In our study, we extend research on technology acceptance and user resistance applied to a novel CRM information system implementation scenario to show how resistance to a large information system can be assessed and further understood.

In our model, we consider six constructs to assess the consequences of information system change, these six constructs are as follows: switching costs,

switching benefits, perceived value, organizational support, self-efficacy, and user resistance. Switching costs and switching benefits measure the net costs and benefits resulting from change by comparing the costs and benefits of the new system with the costs and benefits of the legacy system. They are then translated into the perceived value of the new system. Thus, both are induced by a change from the status quo (current or legacy system) to a future state (new system), where switching benefits indicate the advantages associated with changing to the new system and switching costs indicate the disadvantages associated with the change [44].

In addition, we include the constructs of self-efficacy and organizational support used to assess the internal and external factors affecting the management of the changed situation. Perceived self-efficacy is defined as "people's beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives" [45]. While user resistance was added as the main sixth construct in which all previous constructs were influencing, we developed hypotheses to evaluate the corresponding relationships for each of the five constructs. Figure 1 shows the model we developed and how our hypothesized relationships linking the six constructs were built.

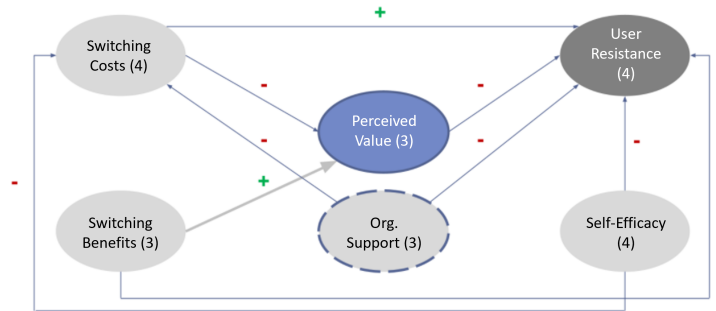


Fig. 1. Model framework

We developed a number of hypotheses to link the model constructs (Figure 1) to the theoretical basis discussed earlier. At the core of our model is the perceived value construct, which consolidates the net benefits and net costs from switching benefits and switching costs, respectively, in addition to the three direct indicators that feed the construct of user resistance [43]. Below, we discuss in more detail the 9 hypotheses developed and to be examined for our model.

H1: Switching costs have a negative effect on perceived value.

In this first hypothesis, we evaluate the effect of switching costs on perceived value, according to the status quo bias theory, switching costs consist of three components, switching costs and uncertainty costs, which result from rational decision making, and sunk costs, which result from psychological commitment [42]. Switching costs represent the direct costs incurred as a result of switching,

including the permanent losses caused by switching. The more costs and losses that are perceived, the more likely users will encounter resistance to change in order to avoid these losses [43]. Regarding the second factor "uncertainty costs", users will try to distance themselves from anything that involves uncertainty in order to avoid making decisions based on their incompetent feelings [46]. Therefore, uncertainty costs lead to negative psychological consequences [47] that push users to stay on the status quo [42]. Finally, sunk costs are related to users' tendency to remember their previous investments they made in the legacy system. One of the effects arising from switching costs that we expect is an indirect impact through the perceived value construct on user resistance. The higher the switching costs, the less net benefits users would perceive from the new system under rational decision making principles, since net benefits are the result of the sum between the benefits received and the costs incurred as a result of the change.

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

In the second hypothesis, we evaluate the effect of switching costs on user resistance, besides the negative effect that switching costs have on perceived value, they are also expected to have an effect on user resistance, as already mentioned, one of the factors affecting switching costs is sunk costs, which is related to the tendency of users to remember their previous investments they have made in the legacy system and try to protect them, which could lead to user resistance to change to the new system [42]. Additionally with a new system, it is expected to have system issues such as new features, different ways of doing certain tasks, which may lead to unexpected outcomes resulting into psychological effects [67]. Therefore, we expect switching costs to have a positive effect on user resistance.

H3: Switching benefits have a positive effect on perceived value.

In this hypothesis, we evaluate the impact of switching benefits on perceived value; switching benefits are the advantage resulting from a change in the system that the user perceives compared to the status quo (legacy system). Switching benefits may take the form of helping users to increase productivity, which will induce higher satisfaction and potential rewards that may motivate the user to be in favor of the change and increase the perceived value of the new system [57]. Thus, we expect that switching benefits will have a positive effect on the perceived value of changing to the new system.

H4: Switching benefits have a negative effect on user resistance.

As stated earlier, switching benefits are the benefits that users recognize due to the change in the system compared to the status quo (legacy system), such as the increased performance and productivity that the new system enables. These benefits can help the user to perform tasks in a more efficient or easier way. Perceived benefits of the new system, such as increased productivity or increased performance, would lead to higher user satisfaction with the new system and therefore could lead to less resistance. Therefore, we expect switching benefits to have a negative effect on user resistance to change to the new system. [65]

H5: Organizational support has a negative effect on switching costs.

In this hypothesis, we evaluate the effect of organizational support on switching costs. In addition to the internal factor of self-efficacy that we evaluate, we consider here the construct of organizational support as an external factor affecting user resistance. This factor measures an individual's sense of control in such a change situation. Organizational support in this context refers to how the leadership of the organization supports and facilitates employees' adaptation to change. This support may take the form of the provision and availability of training materials to enable users to become familiar with the new system and to acquire any necessary knowledge or skills of the new system. The aim of such organisational support is to facilitate a smooth transition. The greater the organisational support, the greater the influence users will have on the adoption of the technology [48]. In addition, the greater the organisational support for the new system, the less cost expected for users to carry when switching to the new system, such as time or effort spent learning and adapting to the new way of working with the system. Thus, we expect organizational support to have a negative direct effect on the cost of switching to a new system.

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

In this hypothesis, we evaluate the effect of self-efficacy on switching costs, in which we have another hypothesis measuring the effect of self-efficacy on user resistance. The effect of self-efficacy on switching costs may also have some effect on user resistance, indirectly. If an individual's self-efficacy is high, it is expected to lead to a positive attitude towards change and exhibit proactive behaviour in learning and adapting to the new system. And as a result, users will be less likely to be fearful or uncertain about change. Therefore, high efficacy could lead to lower feelings of anxiety and lower switching costs because individuals will be self-motivated to learn, use, and accept the change [49]. We therefore expect self-efficacy to have a negative impact on switching costs.

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

Switching to new systems often triggers a change in the way of operating, where users would seek additional training and sufficient communication to cover these changes and potential gaps. Therefore, it is necessary to have organizational support at the time of changeover to guide users through the appropriate training materials and resources, which can retrospectively influence how users react to the change and use the new system [50]. The higher the organizational support, the less likely individuals are expected to resist the change to the new system and exhibit any negative behavior towards its implementation. Therefore, we expect that organizational support will have a negative effect on users' resistance towards the new system [72].

H8: Self-efficacy has a negative effect on user resistance.

In this hypothesis, we evaluate the effect of self-efficacy on user resistance as an intrinsic factor. We include the construct of self-efficacy to account for the influence of the user's motivation and sense of control on their behaviour towards acceptance of or resistance to change. This construct addresses the user's confidence in their ability to adapt to change (e.g., comfortable using a new system). Changing an information system will bring uncertainties, challenges,

and difficulties. Depending on how an individual views these, the behavior may be determined by either a challenging attitude to learn, adapt, and overcome these challenges or a protective and defensive attitude to avoid them. This will be driven by individual self-efficacy [51]. As a result, users with low levels of self-efficacy are expected to be more likely of exhibiting user resistance through resistance to change, while on the other hand, users with high self-efficacy might be less likely to resist change and more likely to accept and adapt to change. Therefore, we expect self-efficacy to have a negative effect on user resistance towards the new system [72].

H9: Perceived value has a negative effect on user resistance.

Here we examine the influence of the construct of perceived value. An assessment of perceived value will tell us whether the incoming benefits of the new system justify the costs incurred in changing the older system. Thus, if the perceived value of the new system achieves a high rewards, users are not expected to have significant resistance to changing the new system. On the other hand, if the perceived value of the new system is low, then we expect users to show overt resistance according to the status quo bias theory [42]. This confirms other views in the literature which outline that users tend to seek maximum value in their decision making and are therefore unlikely to oppose changes associated with high perceived value [52]

4 Methodology

4.1 Study Design

To answer the research question we are investigating by assessing the stated hypotheses, a web-based survey was developed. Data to empirically test our hypothesis were collected through an internet survey in a large multinational enterprise setting. Initially, we approached several departments to identify a potential use case where an unusual change to an information system was being prepared and planned for implementation. We spoke with several key stakeholders, including business owners, IT representatives, and change managers, and based on our discussions with them, we identified a large-scale information system change that is planned for implementation in the near future. After investigating this opportunity, we saw the potential fit given the large scale and impact of the change, with several thousands of users having to migrate to the new system after many years of using a legacy system.

Based on the feedback received, the new system is something desired as it provides simplification, improved user interface and new features. Nevertheless, we expected some level of resistance at the beginning of the adoption as it is something new and requires additional efforts from the users to train and get used to. We targeted to test and measure the level of user resistance in an early stage of the system implementation while users have limited or no experience at all with the new system, as most of user resistance studies we observed were during or after the implementation of the system where users have already concluded a perception on the new system.

The system chosen is a customer support portal in which it facilitates the interaction with the customers through various stages before, during and after the purchase of a product which is followed as part of the CRM process. The target new system was intended to replace two or more legacy systems in which it consolidates several thousands users from different departments and roles around the organization globally who interact with different customers. The new system would simplify and automate certain customer-facing activities and provide a seamless customer experience within a single platform. This will trigger a change in the workflows and processes that users were used to perform, requiring them to train, learn and get used to the new system. The change took 6-9 months to prepare for and was split into several phases of pilots and roll outs. We focused on one of the largest roll outs planned for the launch of our research and implementation study.

From a technical perspective, the staff had to migrate from two or more separate legacy systems to one integrated cloud-based system with additional functionality. Therefore, staff tasks and workflows needed to be redesigned to include automation and other features in place to speed up and further streamline the tasks performed. Ultimately, users had to learn and adapt to this change quickly.

4.2 Survey Development

Our survey consisted of twenty-one questions with a five-point Likert scale for rating (1-5). The questions were mostly developed based on existing validated indicators from our literature review. Limited changes occurred, where we made minor adjustments, keeping the same pattern and content as relevant and consistent as possible.

We had a total of six constructs that fed by twenty-one indicators, starting with the switching costs construct, which had four indicators that were based on theory and validation from the following literature [53] (SC1, SC2, SC3, and SC4). This was followed by the construct of switching benefits, which had three indicators that were based on [54]. The third construct is perceived value, which had three indicators and was adopted from [52].

The next construct is organizational support, which had three indicators and was adopted from [58]. The second last construct in our model was the self-efficacy construct and had four indicators to feed into it and was based on [59].

The last construct was the user resistance construct which had four indicators that were based on the framework of resistance behaviour developed by [55]. The framework divides the constructs into 4 squares (categories), ranging between (overt-covert) and (active-passive). We integrated one indicator representing each category, hence our four indicators represent resistance behavior as following: (1) “not comply” covering passive and covert, (2) “not cooperate” covering active and covert, (3) “do not agree” covering passive and overt, and (4) “oppose” covering active and overt. Table 1 shows a summary of the constructs in our model and the corresponding indicators.

Table 1. Summary of developed model constructs and supporting indicators

Category	Item	Indicator	Reference
Switching Costs	SC1	I understand the impact the new system will have on my day-to-day work activities	Jones et al. (2000)
Switching Costs	SC2	I have already put a lot of time and effort into mastering the legacy way of working	Jones et al. (2000)
Switching Costs	SC3	Switching to the new system could result in unexpected hassles	Jones et al. (2000)
Switching Costs	SC4	It would take me a lot of time and efforts to switch to the new way of working	Jones et al. (2000)
Switching Benefits	SB1	Changing to the new way of working with the new tool would enhance my effectiveness on the job than working in the old way	Moore & Benbasat (1991)
Switching Benefits	SB2	Changing to the new way of working with the new tool would enable me to accomplish relevant tasks quicker than in the old way	Moore & Benbasat (1991)
Switching Benefits	SB3	Changing to the new way of working with the new system would improve the quality of the work I do than in the old way	Moore & Benbasat (1991)
Perceived Value	PV1	I believe this change will provide benefits to my group	Sirdeshmukh et al. (2002)
Perceived Value	PV2	I believe I will personally benefit from this change	Sirdeshmukh et al. (2002)
Perceived Value	PV3	Considering the time and effort that I have to spend, the change to the new system is worthwhile	Sirdeshmukh et al. (2002)
Org Support	OS1	I am confident that leadership is committed to ensuring the success of the new platform	Thompson et al. (1991)
Org Support	OS2	I have received sufficient information regarding the new system	Thompson et al. (1991)
Org Support	OS3	I have been provided the skills and knowledge to prepare me for the change (i.e. Training and Communications)	Thompson et al. (1991)
Self Efficacy	SE1	I look forward to the change	Taylor & Todd (1995)
Self Efficacy	SE2	Based on the information I have received, I support the change	Taylor & Todd (1995)
Self Efficacy	SE3	I am able to change to the new way of working with the new system on my own	Taylor & Todd (1995)
Self Efficacy	SE4	Based on my own knowledge, skills and abilities, changing to the new way of working with the new system would be easy for me	Taylor & Todd (1995)
User Resistance	UR1	How would you rate your non-compliance towards the change to the new tool	Bovey & Hede (2001)
User Resistance	UR2	How would you rate your non-cooperation towards the change to the new tool	Bovey & Hede (2001)
User Resistance	UR3	How would you rate your opposition towards the change to the new tool	Bovey & Hede (2001)
User Resistance	UR4	How would you rate your disagreement with the change to the new tool	Bovey & Hede (2001)

4.3 Data Collection

We sent our survey at a relatively early stage of the implementation of the new information system. Our data collection focused on employees who had little or no experience with the new system, which led to the majority of our survey respondents having no previous experience with the new system. We gave participants two weeks to respond to our survey. With the help of the IS implementation project manager and appropriate contacts within the IT department, we were able to invite over 1,000 individuals to participate in the survey, and after various steps of filtering out disqualified responses, we concluded with 237 complete and valid responses. Participants were across different departments of the organization and with different roles.

Although we left the survey open for two weeks, the majority of valid responses were received within one day of the survey launch, adding up to a large percentage of 75% of the total valid responses being considered. When we made comparisons between early and late responses, we found no significant difference in terms of age, gender, years of experience, or geographic location.

5 Results

After checking the integrity and validity of the data, we used SmartPLS to examine our structural model. The results of our structural model assessment are shown in Figure 2. We started with confirmatory factor analysis (CFA), for which we used the SmartPLS algorithm method. Mixed results can be seen from Figure 2. However, they were mostly in line with the expectations of our model, which we briefly describe further in the following paragraphs.

We also examined our model's variance inflation factor (VIF) to identify any multicollinearity in the model that may affect our results. We looked at the collinearity statistics after running the PLS algorithm calculation, and all reported VIF values were less than 3 points, as shown in Table 2.

Table 2. Collinearity testing results (VIF)

	Org. Support	Perceived Value	Self-eff.	Switch. Benefits	Switch. Costs	User Resistance
Org. Support					1.500	2.168
Perceived Value						2.187
Self-efficacy					1.500	1.834
Switching Benefits		1.152				2.777
Switching Costs		1.152				1.169
User Resistance						

We then conducted a bootstrapping analysis to assess how significant the weights of our factor analysis model were, in which four of our hypotheses were shown to have significant values. The P value was less than 0.05 for the effect of switching benefits on user resistance and less than 0.01 for both the effect of organizational support on switching costs and the effect of switching costs on user resistance. In addition, the P value was fully significant below 0.001

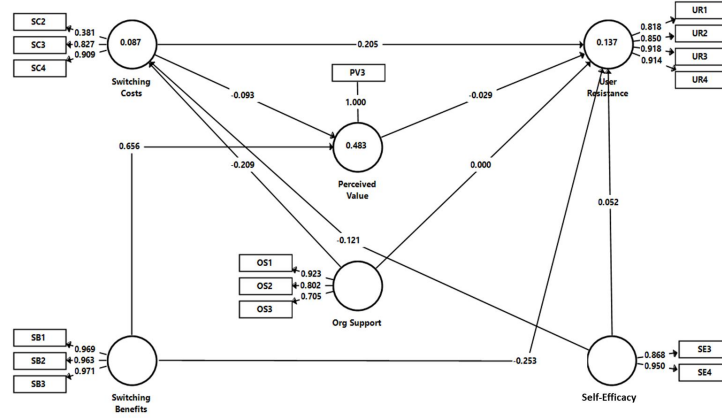


Fig. 2. Results of structural model

and with a value of 0.000 for the effect of switching benefits on perceived value. The values of the *T* statistic also yielded robust results. The full results of the bootstrapping analysis are presented in Table 3.

Table 3. Results of bootstrapping analysis

	Original Sample	Sample Mean	Std. Deviation	<i>T</i> Statistics	<i>P</i> Values
Org. Support → Switching Costs	-0.209	-0.215	0.078	2.678	0.008
Org. Support → User Resistance	0.000	-0.011	0.095	0.004	0.996
Perceived Value → User Resistance	-0.029	-0.026	0.103	0.280	0.780
Self-efficacy → Switching Costs	-0.121	-0.132	0.086	1.411	0.159
Self-efficacy → User Resistance	0.052	0.046	0.090	0.576	0.565
Switching Benefits → Perceived Value	0.656	0.654	0.057	11.541	0.000
Switching Benefits → User Resistance	-0.253	-0.248	0.111	2.278	0.023
Switching Costs → Perceived Value	-0.093	-0.096	0.068	1.365	0.173
Switching Costs → User Resistance	0.205	0.207	0.069	2.971	0.003

We also did a discriminant validity analysis for our model constructs, the results of the fornell-larcker criterion testing showed that the correlation between a construct and itself showed the highest score across compared to any other two constructs correlations, full results are shown in Table 4.

Continuing with the analysis of discriminant validity, when looked at Heterotrait-Monotrait Ratio (HTMT), all values were below 1.0 and more than half of the values were below the 0.5 threshold, indicating high differentiation and discriminability between constructs. Full results are presented in Table 5.

After several rounds of testing and validating the indicators that translate into our model constructs, we decided to remove selected indicators, namely PV1 and PV2, which translate into perceived value, SC1 (an indicator of switching

Table 4. Results of discriminant validity

	Org. Support	Perceived Value	Self-eff.	Switch. Benefits	Switch Costs	User Resistance
Org. Support	0.815					
Perceived Value	0.640	1.000				
Self-efficacy	0.577	0.461	0.910			
Switching Benefits	0.662	0.690	0.641	0.967		
Switching Costs	-0.279	-0.331	-0.241	-0.363	0.743	
User Resistance	-0.212	-0.247	-0.173	-0.313	0.293	0.876

Table 5. Results of Heterotrait-Monotrait Ratio (HTMT)

	Org Support	Perceived Value	Self-eff.	Switch. Benefits	Switch. Costs	User Resistance
Org. Support	0.642					
Perceived Value	0.730	0.511				
Self-efficacy	0.685	0.701	0.720			
Switching Benefits	0.265	0.299	0.257	0.348		
Switching Costs	0.178	0.237	0.188	0.318	0.316	
User Resistance						

costs), and SE1 and SE2 (indicators of self-efficacy). We excluded these indicators for consistency and data integrity purposes.

Using the PLS algorithm allowed us to continue with the regression analysis of our model. All the results of the loading analysis for the structural model were in line with our expectations and defined hypotheses, except for the effect of organizational support on user resistance, which showed no correlation (H7), and the effect of self-efficacy on user resistance (H8), both were not significant. All other hypothesis testing results were consistent with our original assumptions. Switching costs had a negative effect on perceived value (H1) with the regression coefficient of -0.093. Hypothesis H2 was not rejected, since switching costs had a positive effect on user resistance with the coefficient of 0.205. Switching benefits positively affected perceived value, H3 was therefore not rejected. This effect was statistically significant, in fact the most significant in our model. Additionally, switching benefits had a significantly negative effect on user resistance, hence H4 was not rejected. Similar effects were observed for organizational support on switching costs (H5 not rejected), and for self-efficacy on switching costs (H6 not rejected). Perceived value had a negative effect on user resistance (H9 not rejected). The complete results of the model testing are shown in Figure 2 and Table 6.

6 Discussion

Unlike previous studies focusing on the adoption of an information system such as CRM systems by [24, 22, 23], here we focus on users' resistance to the new information system. We showed that user resistance is a major barrier in successful new information system implementation. We identified several major sources of user resistance towards new information system, with switching costs and switching benefits being the most important determinants of system adoption. These findings support the results of previous research on user resistance in IS implementation [?, 65].

Two findings of our study are consistent with those reported by [31], which are the positive effects of (1) switching costs on user resistance which was also

Table 6. Summary of model path coefficients

	Org. Support	Perceived Value	Self-eff.	Switching Ben.	Switching Costs	User Resistance
User Resistance						
Switching Costs		-0.093				0.205**
Switching Benefits		0.656***				-0.253*
Self-efficacy					-0.121	0.052
Perceived Value						-0.029
Org. Support					-0.209**	0.000

shown on [67] results in the form of system issues based on the semi-structured interviews conducted. And (2) switching benefits on perceived value. In contrast to the compared study, we added and proved that switching benefits have a significantly negative effect on user resistance. This different result can be attributed to different technology examined in this study. As opposed to simple and individually oriented IS studied by [31], here we used a more complex information system crucially affecting corporate performance.

We also found that switching costs can be significantly reduced by efficient organizational support, suggesting that the more an organization supports change through for example communication, training, and guidance, the less struggle users are likely to have to undergo, which will reduce switching costs and increase ease of use, as reported in earlier research provided by [48] and [67].

For our hypothesis on the effect of organizational support on user resistance, we expected a negative effect according to [50] in order to smoothly handle any change in mode of operation. However, the evaluation of our study did not confirm this and showed a neutral effect. This may have been due to the early stage of the transition when our study was conducted or the fact that there were no significant changes to the mode of operation that required organisational support to facilitate.

Another externally influenced construct we assessed in our model was the user's self-efficacy towards change. The first finding is related to our assessment of the effect of self-efficacy on switching costs; the results showed a relationship between the two constructs but this effect was not statistically significant in our evaluation. However, this finding corroborates those observed for complex managerial information technologies in earlier research [56].

This leaves us with the final construct we had in our model, perceived value and its direct effect on user resistance. Perceived value was a key construct in our model by evaluating net benefits, since it had inputs from both switching costs and switching benefits, thus coordinating their indirect effects on user resistance, which is similar to [68] approach of perceived usefulness effects on user resistance behaviour coordinating a relationship with ease of use construct as well. Our results showed that perceived value had a negative effect on user resistance, with switching benefits and switching costs significantly contributing to this relationship, although the direct effect on user resistance was not statistically significant based on our assessment.

In a similar setup for an organization mandatory IS use, [73] analyzed user resistance in the context of enterprise information system. The reported results were similar to ours in which perceived usefulness, ease of use, and social in-

fluence had an impact on user resistance. These results are in line with our findings on perceived value and the importance of addressing users' perception of the system's benefits. While organizational support is a key to leverage social influence by certain practices such as encouraging early adopters or champions per team to promote benefits and best practices while facilitating change and creating positive perceptions to the wider audience.

This study has a number of limitations. First, a number of our hypothesis were not confirmed as they had low levels of significance, therefore future research would need to consider further fine-tuning to our developed model and the supporting indicators. Second, our discriminant validity results showed high correlation between some of the differentiated constructs, e.g., switching benefits on organizational support, perceived value, and self-efficacy, suggesting that these constructs might be overlapping in nature, which could negatively impact the regression coefficients of the model and its significance results, in alignment with the first limitation. Third, this study was run in a single information system change case, and in a single company, hence extending and testing in other circumstances, e.g. different system and/or different users might lead to different results. Another promising direction of future research might be the inclusion of the user resistance model into more complex user adoption models to consider the factors of behavioral intention [14]. Fourth, our study is a one time cross-sectional assessment, in which the data was collected at a specific point in time, capturing users' perceptions and experiences at that moment. While the perception can evolve over time as users become more familiar with the system or as organizational factors change. Hence future studies could consider rather a longitudinal forms of studies that follow the implementation process in different points in time which can result into a more solid understanding of user resistance and how it evolves and changes over time.

7 Conclusion

Understanding user resistance is essential in ensuring successful information system implementation and in taking advantage of its benefits. This study was designed to examine the factors of user resistance towards new information system implementation. To do so, we developed a conceptual model based on the status quo bias theory. Here we studied user resistance as a complex issue being affected by a number of factors within an organization. By identifying these factors, actions can be taken to reduce user resistance.

This study provides practical implications for organizations implementing change in large-scale information systems on how to better manage change, understand and minimize potential user resistance. In agreement with the posed hypotheses, we found that (1) switching benefits positively impact perceived value, (2) switching costs positively impact user resistance, (3) switching benefits negatively impact user resistance, and (4) organizational support negatively impacts switching costs. This leads us to the following recommendations: management and change makers in organizations should pay attention to how users

perceive the value of new information systems. On the one hand, organizations should enable, facilitate and maximize the benefits of the transition and, on the other hand, minimize the potential costs of the transition to the new system they are seeking, which will help users understand the value of the new information system and motivate them to adopt the change as well as ensure a smooth transition. Managing the switching costs and benefits is therefore key to building a perceived value perspective in the mindset of users and mitigating user resistance. The organization's management and responsible change managers should make an effort to provide, explain, and leverage the benefits of the transition to the new system, for example, communicating and making it visible to users how the new system will increase their productivity or how the new system will have additional features not previously available that will simplify or automate some tasks which users struggled with in previous systems. As a result, the increased benefits of switching to the new system will lead to higher perceived value, leading to a lower user resistance.

Furthermore, organizations should equally make efforts to minimize the potential switching costs induced by the change in the information system, for example, to enable users to make a smooth transition to the new system without worrying about things they may miss or lose in the old system or unnecessary activities they have to complete. We would strongly recommend that organisations manage switching costs in line with switching benefits. Similarly, we would like to mention that organisational support is directly related to the switching costs of the new system. We would therefore recommend that organisations undertaking a change in their information systems should demonstrate and provide strong organisational support before and during the change, which may take the form of ongoing regular communication about the change itself, how it will impact users and how users can prepare for it. Providing sufficient training and support materials will enable users to be better prepared for the change and hence avoid resistance.

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