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Economic Research-Ekonomska Istraživanja

ISSN: 1331-677X (Print) 1848-9664 (Online) Journal homepage: http://www.tandfonline.com/loi/rero20

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To cite this article: Aleš Popovič (2017) If we implement it, will they come? User resistance in post-acceptance usage behaviour within a business intelligence systems context, Economic Research-Ekonomska Istraživanja, 30:1, 911-921, DOI: 10.1080/1331677X.2017.1311232

To link to this article: http://dx.doi.org/10.1080/1331677X.2017.1311232

Published online: 09 May 2017.

ECONOMIC RESEARCH-EKONOMSKA ISTRAŽIVANJA, 2017
VOL. 30, NO. 1, 911–921
https://doi.org/10.1080/1331677X.2017.1311232

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ABSTRACT

The aim of this article is to examine individual, corporate and technology-related factors that shape user resistance in business intelligence systems (BIS) post-acceptance usage behaviour. The author develops a conceptual framework and a series of propositions, grounded on previous studies of user resistance to information systems (IS) and post-acceptance usage. The framework proposes that three individual-level variables (loss of power, change in decision-making approach, change of job or job skills), four corporate-level variables (information culture, communication, user training, service quality) and a technology-related variable (system issues) can be attributed to fuel user resistance towards BIS post-acceptance usage stages. A series of propositions is offered that aims to stimulate empirical research in this topical subject. Despite wide acknowledgement of the importance of user resistance for IS implementation success, this area has been under-researched in the field of BIS. This article draws insights from theoretical and empirical studies to shed some light on this area. A framework is presented which transcends previous works on user resistance to IS by looking at the context of BIS use within the voluntary use environment.

ARTICLE HISTORY
Received 30 July 2015
Accepted 20 July 2016

KEYWORDS
Business intelligence systems; post-acceptance use; user resistance

JELS CLASSIFICATIONS
D80; O14; O32

1. Introduction

Today's increasing market pressures and environmental uncertainty call for implementation and utilisation of information systems (IS) capabilities having the potential of providing high quality information to inform decision-making to achieve firm performance (Popovič, Hackney, Coelho, & Jaklič, 2012). Recognised as one of the four major technological trends in the 2010s, business intelligence systems (BIS) have been of great interest to several industries (Chen, Chiang, & Storey, 2012; Işık, Jones, & Sidorova, 2013). These systems are most commonly identified as technological solutions that provide users with timely access, effective analysis and intuitive presentation of the information from enterprise-wide IS (Popovič et al., 2012). BIS are considered enterprise-wide solutions that have some noteworthy

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features that distinguish them from traditional IS (for a detailed overview, see Popovič et al., 2012): first, while traditional systems are application-oriented, BIS are data oriented. Second, the structuredness of the business process where BIS are used is generally lower compared to the process where operational IS are used. Third, for operational IS, information needs are identified at the process level whereas for BIS these needs are identified in the context of process and performance management. Moreover, the methods for identifying information needs for operational IS are well established while for BIS they are less established. Next, the level of voluntariness of IS use is higher in the context of BIS compared to operational IS. Furthermore, operational IS are integrated at the process level and employ data sources mostly from within the process. BIS, on the other hand, are integrated at the enterprise level with additional data sources being used. Last, but not least, the level of required reliability of the IS much higher with operational IS than with BIS.

BIS primarily support analytical decision-making in knowledge-intensive activities, particularly on the tactical and strategic levels. Nevertheless, the success of BIS continued use depends largely on the extent and ways in which users are willing to embed them in their decision-making routines (Grublješič & Jaklič, 2013).

There is broad agreement that acceptance and resistance are vital determinants in IS acceptance and usage (Klaus & Blanton, 2010; van Offenbeek, Boonstra, & Seo, 2013). Moreover, van Offenbeek et al. also observe that 'IS research focusing on resistance is much scarcer than that on acceptance' (2013, p. 435). User resistance is defined as an individual's behavioural reactions indicating reluctance to a situation perceived as being negative, as a threat or as a stressful sensation (Lapointe & Rivard, 2005; Meissonier & Houzé, 2010). Among key issues linked with IS implementation failures, users' resistance is one of the most salient as it is associated with human resistance to change (Jiang, Muhanna, & Klein, 2000). Users can expound resistance towards IS actively or passively (Meissonier & Houzé, 2010), at both the group level and the individual level (Lapointe & Rivard, 2005; Markus, 1983). This work focuses on active user resistance at the individual level.

A typical IS implementation in a firm generally evolves through six stages, from initiation through adoption, adaptation, acceptance and routinisation, to infusion (Cooper & Zmud, 1990). While the first three stages primarily deal with activities at global levels (e.g., firm or departmental levels), the latter three stages are manifested also at micro levels (Li, Hsieh, & Rai, 2013). At an individual level, following the commitment to IS use, routinisation depicts the state in which IS use is integrated as a normal part of the users' work processes, whereas infusion refers to embedding IS deeply and comprehensively in work processes (Cooper & Zmud, 1990). Routinisation and infusion have been typically considered together as the post-acceptance stage (Po-An Hsieh & Wang, 2007).

From a BIS implementation success perspective, resistance towards BIS use draws attention from academia for two main reasons, i.e., a largely voluntary usage context (Popovič et al., 2012) and the ability to address a wide range of evolving user information needs (Yeoh & Koronios, 2010). Moreover, evidence suggests that enterprise-wide decision support systems and operational IS are resisted for different reasons (Jiang et al., 2000), thus suggesting that promotion of IS acceptance also differs. In IS research, an often-emphasised aspect of IS usage behaviour in the post-acceptance stage is the degree of perceived volitional control that users have over IS usage. Voluntary and mandatory usage contexts have been previously highlighted as important factors affecting IS acceptance and usage (Karahanna, Straub, & Chervany, 1999; Venkatesh & Davis, 2000). Moreover, IS literature often argues

that meeting or exceeding user information needs reinforces user IS satisfaction, yet failing to meet current and future user information needs leads to dissatisfaction with an IS and ultimately results in discontinued use (Bhattacherjee, 2001). Focusing on practice, managers are, more than ever before, concerned about enabling well-informed decisions through BIS utilisation (Chen et al., 2012) to organise internal activities, steer inter-firm relationships and reconfigure internal and external resources to sense and respond to market opportunities with agility (Dinter, 2013; Işık et al., 2013). Understanding the forces fuelling the resistance towards BIS use is, therefore, important for firms that rely profoundly on BIS to achieve their performance goals.

Drawing upon extant models of resistance to IT (for an overview of these models, see Lapointe & Rivard, 2005), this article presents a conceptual framework of post-acceptance user resistance to BIS. The resulting conceptual framework attempts to open the black box of a long-avoided side of BIS implementation success, namely user resistance to BIS. We encourage scholars to empirically test our propositions in different contexts to advance theory in this IS domain.

2. User resistance in enterprise-wide system implementation

User resistance has been reported as a significant motive for system implementation failures (Barker & Frolick, 2003; Robey, Ross, & Boudreau, 2002). Studies of enterprise-wide IS implementation failures indicate that a better understanding of user resistance is needed (Klaus & Blanton, 2010; Shang & Su, 2004) so as to apply appropriate promotion strategies for the implemented system (Jiang et al., 2000). User resistance must be curtailed in order to realise benefits from enterprise-wide IS and reduce the risk of failure (Klaus & Blanton, 2010).

Prior IT resistance studies have explored certain areas of resistance and can partially explain user resistance in IS implementations. Resistance determinants previously examined in this literature include job insecurity (Krovi, 1993), loss of power (Smith & McKeen, 1992), lack of appropriate communication (Marakas & Hornik, 1996), mismatch of the system with the organisational goals (Gosain, 2004), perceived adoption risk (Zmud, 1979), process changes (O'Leary, 2000), lack of understanding (Joshi, 1991) and other issues (Shang & Su, 2004).

Markus (1983) identifies three viewpoints for investigating user resistance: (1) system-oriented; (2) people-oriented; and (3) interaction-oriented. The system-oriented perspective suggests that resistance occurs because of technology-related factors (e.g., user interface, performance, ease of use). The people-oriented perspective suggests that user resistance occurs because of individual or group factors (e.g., traits, attitude towards the technology). The interaction-oriented perspective suggests that perceived social losses caused by interaction between people and the technology affect resistance (e.g., changing power relationships, job structure) (Jiang et al., 2000; Markus, 1983).

3. Determinants of user resistance in post-acceptance usage behaviour within a business intelligence systems context

This study develops a framework of user resistance in BIS post-acceptance use that expands on Markus's (1983) viewpoints to take into consideration BIS specifics. The factors that shape

user resistance in BIS post-acceptance use are, for the purpose of this study, grouped into three broad categories: corporate determinants, individual determinants and technological determinants. Through corporate-level factors, the firm itself is seen as the main factor that fuels users' resistance, whereas by individual-level factors this work identifies characteristics that relate to the individual as additional determinants of user resistance. Technology factors relate to the characteristics of the system and its output that draw users towards resisting post-acceptance use. Such categorisation allows better fit of previously proposed perspectives with the context under study, namely BIS.

3.1. Corporate-level factors

Organisational culture continues to be cited as an important factor in the success or failure of IS implementation projects (Cooper, 1994; Jackson, 2011; Leidner & Kayworth, 2006). On such a subset of organisational culture, particularly relevant for the BIS post-acceptance context is **information culture**. Within it, the value and utility of information in achieving operational and strategic success is recognised and information forms the basis for organisational decision-making (Curry & Moore, 2003). Early research has established a developed information culture to be positively associated with organisational practices, such as information utilisation, that lead to successful firm performance (Ginman, 1988). To foster the development of information culture, firms must nurture such values, norms and practices that have an impact on how information is perceived, created and used (Choo, Bergeron, Detlor, & Heaton, 2008; G. Oliver, 2003). These information behaviours, norms and values echo the firm's environment towards the use of information in a trustful manner, the willingness to use and trust institutionalised information over informal sources, the extent to which information about performance is continuously presented to people to manage and monitor their performance, the openness in reporting and presentation of information, the willingness to provide others with information in an appropriate and collaborative way, and the active concern to think about how to obtain and apply new information in order to respond quickly to business changes and to promote innovation in products and services (Choo et al., 2008; Hwang, Kettinger, & Yi, 2013). Once a BIS is deeply embedded into work activities and decision-making, the lack of appropriate cultural values, as depicted above, can decouple users' motivation towards post-acceptance BIS use from the understanding of the importance and value BIS bring to firms (Li et al., 2013), resulting in increased likelihood of user resistance. I, hence, propose that:

P_1. Low levels or absence of information culture will increase the chance of user resistance towards BIS use.

Through the lens of psychological contract theory, Klaus and Blanton (2010) emphasise **communication** as an important corporate-level determinant of user resistance in the implementation of enterprise-wide systems. Specifically, a common part of the psychological contract between employees and the firm is a belief that management will keep employees informed (Guest & Conway, 2002). Yet, in an enterprise-wide implementation, a lack of communication often exists, not informing the users about the benefits of the system and the reasons for change (D. Oliver & Romm, 2002). However, by communicating a clear vision, the psychological contract of users becomes more aligned with the reality of the firm (Klaus & Blanton, 2010). Moreover, frequent communication in post-acceptance stage

leads to the psychological contract changing incrementally, which is less likely to lead to a psychological contract breach in the form of user resistance. Therefore, the following proposition is suggested:

P_2. It is expected that lack of communication from management will lead to user resistance towards BIS use.

Training is another organisational issue relevant for deriving the most value from post-acceptance BIS use. Prior IS research looking at the causes of user resistance to IS implementation suggests training can be tricky when users perceive training to be a waste of time, that trainers are inept, the timing of training is unsuitable, or if there is a lack of training (Kim & Kankanhalli, 2009; Klaus & Blanton, 2010; Krovi, 1993). Users may expect that suitable training will complement new job requirements while problematic training may be considered a cause for resistance (Hirschheim & Newman, 1988). Hence, the following is proposed:

P_3. Lack of appropriate training will likely lead to user resistance towards BIS use.

Last, but not least, IT adoption literature emphasises IS service quality as an important factor when considering continued IS use and IS effectiveness and has been extensively investigated over the past three decades (Pitt, Watson, & Kavan, 1995). DeLone and McLean (Petter, DeLone, & McLean, 2013) extended their IS success model by highlighting the importance of service quality in IS success. **Service quality** is often regarded as a multidimensional construct that mimics responsiveness (i.e., willingness to help customers and provide prompt service and help when needed), assurance (i.e., knowledge and courteousness of support staff and their ability to inspire confidence), empathy (i.e., individualised attention the support staff gives to BIS users) and reliability (i.e., the ability to perform the promised service dependably and accurately) (Pitt et al., 1995; Xu, Benbasat, & Cenfetelli, 2013). When users perceive service quality to be at insufficient levels, they may put less trust in BIS solutions to readily service their information needs. Users may expect that good service quality will complement their BIS use experience while deprived service quality may be contemplated as a cause for resistance (Pitt et al., 1995). I, hence, propose that:

P_4. Lack of appropriate BIS service quality will likely lead to user resistance towards BIS use.

3.2. Individual-level factors

Resistance theory suggests that for resistance of an individual to occur, some threat has to be perceived. The IS-business relationship literature and resistance literature have long emphasised perceived **loss of power** as a significant determinant of user resistance towards IT use (e.g., Jiang et al., 2000; Lapointe & Rivard, 2005; Smith & McKeen, 1992). From a decision support system perspective, integrating the system in work processes will likely result in increased access to information and information sharing that, in turn, draws control over information and decision influence away from certain individuals (Borum & Christiansen, 1993; Kim & Kankanhalli, 2009; Robey, 1987). Although IT-enabled information sharing is generally regarded as a positive contributor to performance (Mithas, Ramasubbu, & Sambamurthy, 2011), it can also be potentially perceived as curbing an individual's position of control within the decision-making process and further breaking down established

monopolies linking to the dissolution of existing power structures (Griffiths & Light, 2006). I therefore formulate the following proposition:

P_5. If an individual perceives the threat of losing power as a result of routinisation and infusion of BIS in business processes, user resistance towards BIS use will form.

Another issue concerning the embeddedness of enterprise-wide IS into organisational processes is the **change in decision-making approach** (Smith & McKeen, 1992) they bring about. There might be problematic changes to existing decision-making approaches and new approaches not working as expected. Integrating a BIS into some processes may fit some firms well and not others, forcing them to change their organisational structure to fit the technology. BIS not fitting well with organisational processes might spark an affective and emotional experience of disappointment, frustration or even resentment (Klaus & Blanton, 2010), leading to resistance towards employing BIS in the latter stages of IS implementation. Hence, the following research proposition is suggested:

P_6. Changes in existing decision-making approaches resulting from BIS routinisation and infusion in organisational business processes will spark user resistance towards BIS use if there is lack of fit between the technology and the processes.

Adoption and further deep integration of BIS in work processes has been suggested to also have an important impact on decision-makers' jobs and/or skills (Laursen & Thorlund, 2010). BIS often require that users perform different job tasks or develop new skills and new ways of thinking for the job. Since employees have certain expectations of their jobs, a considerable job or job skills change is likely to be considered a burden by the employees (Jiang et al., 2000; Markus, 1983). **Change of job/job skills** in post-adoptive IT usage has been further fought against by users since frequently performed behaviours tend to become habitual and automatic over time and are hard to adjust (Limayem, Hirt, & Cheung, 2007). Consistent with this reasoning, it is proposed that:

P_7. If an individual perceives the threat of considerable change of job or job skills due to routinisation and infusion of BIS in his/her work processes, user resistance towards BIS use will arise.

3.3. Technology-related factors

While corporate-level and individual-level factors contribute to a large portion of user resistance towards BIS use in post-acceptance stages, technological issues also need to be considered when evaluating user resistance at the implementation phases. Specifically, prior studies of enterprise-wide IT implementation success emphasise **system issues** as a significant determinant of user resistance (e.g., Hirschheim & Newman, 1988; Markus, 1983; Martinko, Zmud, & Henry, 1996). It is important to note, however, that system issues have been considered both through the technological aspect, i.e., the desirable characteristics of the IS (Petter et al., 2013), as well as in regard to the quality of the information the system provides, i.e., the desirable characteristics of the IS outputs (Petter et al., 2013). Although the quality of an IS and its outputs are assessed at the earlier implementation phases (e.g., at the acceptance stage), additional challenges may surface at a continuous, deeper level of use, once the IS gets applied to the full extent of anticipated use (Martinko et al., 1996; Zhu, Li, Wang, & Chen, 2010). While most of the quality-related problems are accounted for and addressed, some hidden problems might only appear as the depth and range of use develops. When BIS become comprehensively integrated into business processes and

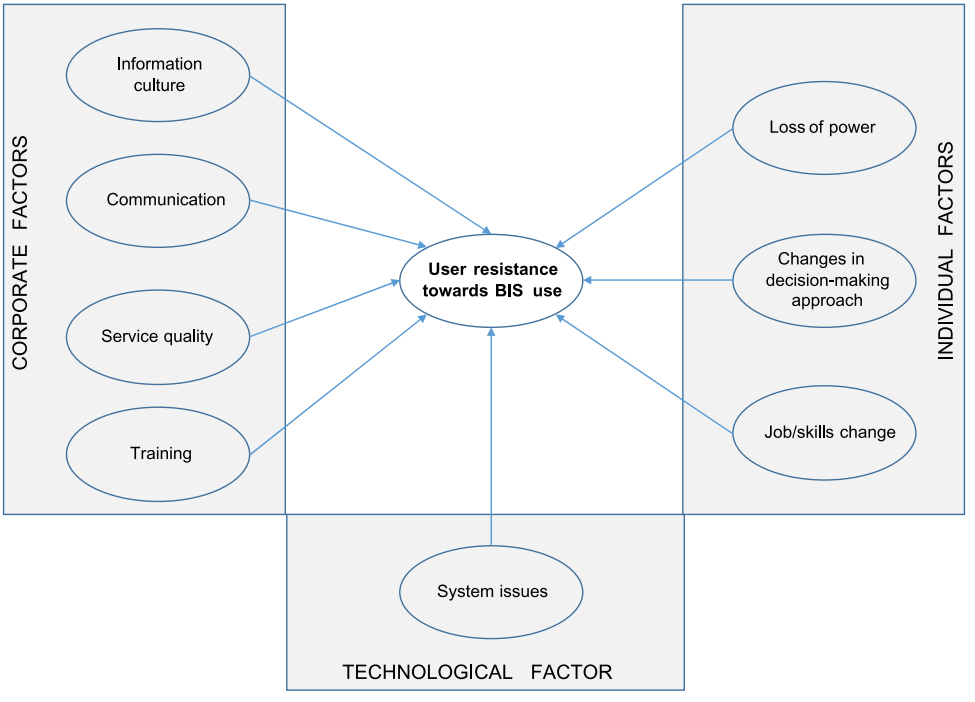

Figure 1. Conceptual model of the influence of individual, corporate and technology-related factors on user resistance in post-acceptance business intelligence systems use. Source: Author's own.

decision-making routines, their ability to efficiently integrate data from various sources, provide access to it, perform reliably and deliver relevant information that is complete, accurate, current and in the desired format tend to become important characteristics of BIS value (Işık et al., 2013; Popovič et al., 2012). Failing to meet user needs and requirements in the post-acceptance stage will likely result in user frustration and a decrease in use commitment (Kim & Kankanhalli, 2009). In the BIS context, this is particularly relevant since user needs are deeply knotted with process management and performance management practices (Popovič et al., 2012). This leads us to formulate the final proposition:

P_8. System issues promote the development of user resistance towards BIS post-acceptance use.

The conceptual framework is presented in Figure 1.

4. Discussion

In developing the proposed framework, the focus has been placed on theory development rather than theory testing. I believe that earlier presented propositions will serve as the basis to stimulate empirical studies and move this field of research forward. Researchers are urged to test these propositions across different firms, yet a series of potential challenges need to be considered. First, researchers need to ensure that the antecedent condition is met (that respondents are aware of the BIS post-acceptance stage) when testing the propositions in practice. One way forward would be through a free association technique to reveal the phases that come to individuals' minds when they think of the post-acceptance stage as

defined in this work. A second challenge is that it might be argued that representing a firm as a closed system (Scott, 2003) does not properly capture the fact that firms are 'open to and dependent on flows of personnel, resources, and information from outside' (Scott, 2003, p. 28). While it has been suggested that various environmental conditions may have an effect on user resistance (Rivard & Lapointe, 2010), I contend that the aim of the proposed framework is to provide an initial understanding of the effect of individual, corporate and technology-related factors on user resistance to BIS rather than to provide a comprehensive explanation of the determinants of user resistance to BIS.

Nevertheless, the proposed framework also raises a series of opportunities. For instance, the dynamic and complex nature of individual, corporate and technology-related characteristics influencing the IS post-acceptance stage suggests that user resistance, as depicted in our framework, may change over time. Therefore, future studies may seek to track this influence through the use of rich and longitudinal data. Also, in some cases, where voluntary IS use is shifting more towards mandatory use, effect size of individual and corporate factors will be smaller than in firms with a prevailing voluntary nature of IS use (Karahanna et al., 1999). Last, but not least, recognising the proposed set of factors is not exhaustive, further research may incorporate additional determinants that shape user resistance (e.g., country-level determinants).

The proposed work also has several implications for practice. If a firm's management aims to take a proactive approach for regular BIS use among decision-makers and act as a BIS ambassador, it should convey its support through providing an auspicious environment for BIS. The degree of user resistance to IT is effectively controlled by establishing a milieu of implementers' responsiveness to resistance (Rivard & Lapointe, 2012) that is backed up by pertinent strategies (Jiang et al., 2000). If a firm plays up the significance of continued BIS use for firm performance, users will be more likely to establish a link between the value of BIS and decision outcomes. For firms, it is sensible to pay greater attention to issues relating to power, social status and job security when implementing BIS. When considering ways of promoting BIS, 'participative' strategies – where users are actively involved in the process and in making decisions – were previously identified as being most desirable; in contrast, 'direct management' methods, such as arranging job transfers and giving separation pay, were viewed negatively by employees (Jiang et al., 2000). In addition, a sensible user training strategy, such as conducting orientation sessions and retraining employees to successfully use BIS, are also important.

Furthermore, lessons learnt from user resistance to BIS can be leveraged to accommodate a higher level of employee resistance, namely resistance to organisation-wide change. The ability of BIS to tie various levels of decision-making and performance make them an almost ideal candidate to identify resistance risk factors, analyse them and set up appropriate actions to ensure that resistance does not result in major organisational disruptions.

5. Conclusion

The effect of user resistance on IS implementation success is one of the most intriguing, yet still inadequately addressed fields in IS research. Recently, the need to explore user resistance factors in different IS contexts and within different IS implementation stages has been increasingly highlighted. However, user resistance to IT in the post-acceptance BIS usage behaviour context, has received limited attention. To address this gap, this work

contributes to the understanding of enterprise-wide IS resistance by offering a conceptual framework that sheds more light on the resistance factors influencing post-acceptance BIS usage behaviour. The article identifies individual, corporate and technological determinants that influence user resistance, and offers a series of relevant propositions grounded in previous conceptual and empirical studies in IS success, technology acceptance and resistance to IT literature. On a practical side, several possible strategies to mitigate resistance are also proposed and discussed.

Disclosure statement

No potential conflict of interest was reported by the author.

Funding

This work was supported by Javna Agencija za Raziskovalno Dejavnost RS [grant number J5-7287]; and the Croatian Science Foundation [grant number IP-2014-09-3729].

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