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User resistance in post enterprise resource planning implementation phase

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ABSTRACT: User resistance in post Enterprise Resource Planning (ERP) implementation phase is one of the main causes for failure of ERP systems. Existing research identified different factors that cause ERP failure in the post ERP implementation phase. However, existing research is fragmented without strong theoretical base. The main objective of this study is to identify factors that cause user resistance in the post ERP implementation phase using innovation resistance theory as a theoretical lens. The study used causal research design as a research method. Data was collected using Google's online form. The empirical data from this research revealed that risk barriers and usability barriers as main factors that increase user resistance in the post ERP implementation phase. The research also developed and validated data collection instruments to use innovation resistance theory for empirical investigation of user resistance in the post ERP implementation phase for other researchers. It has also practical implication for managers what intervention to undertake so as to increase success of ERP system implementation.

Key words/Phrases: information system; ERP failure; post ERP implementation; user resistance

INTRODUCTION

Organizations around the world are implementing Enterprise Resource Planning (ERP) software since the 1990s (Boltena and Gomez, 2012). ERP system is defined as a standard business management package that comprises of a set of independent, integrated and configurable software modules with common database (Aslam, 2010). It is an integrated information system, which is used to manage all information resources in the enterprise, streamlines and incorporates the business processes within and across functional departments in the organization (Raisian and Yahaya, 2014). There are 14 common modules in ERP system that fully automate organizational business processes (Madapusi and D'Souza, 2012). However, organizations implement either full or partial modules based on their business requirements. It has also plugin feature to integrate external software modules as per the needs of the organization.

Implementation of ERP systems provides five major benefits which include operational benefit, managerial benefit; strategic benefit, IT infrastructure, and organisational benefits (Annamalai and Ramayah, 2011). Operational benefits deals with improvement of internal operations through information availability, information quality, standardization, inventory management, and on-time delivery (Madapusi and D'Souza, 2012). Easy access to information enhances quality of managerial decisions and reduces a risk which is associated with decisions made with scant information. ERP also allows to generate information which is used not only for internal monitoring activities but also for strategic applications such as new product and service development (Sadrzadehrafiei *et al.*, 2013).

ERP cannot be implemented on outdated IT infrastructure. It helps organizations to update overall organization's IT infrastructure and reduces the cost of maintaining legacy systems (Annamalai and Ramayah, 2011). They also further explained the benefit of ERP system as empowerment of staff and increase employee morale and satisfaction. ERP also increases the organization's competitive capability in its business by creating a communication platform for organizations to easily interact with customers and suppliers (Boltena and Gomez, 2012).

Although ERP provides such benefits to the organization, its implementation and adoption is not smooth (Mo and He, 2015). More than 50 percent of ERP implementation were reported as failed projects due to system underutilization (Hawari and Heeks, 2010). The failure is higher in developing countries (Bitsini, 2015). The causes of ERP system failures are both technical and human related factors (Topi, Lucas and Babaian, 2005a; Bitsini, 2015; Klaus, Blanton and Wingreen, 2015; Al-taweel and Haithm, 2016). Human related factors such as user resistance are the main

causes for ERP system's failures (Aslam, 2010; Laumer and Eckhardt, 2012; Bitsini, 2015).

Most of the previous research focused on identification of factors that positively influence users' behaviour to adopt ERP system (Boltena and Gomez, 2012; Rajan and Baral, 2015a). Research that investigated why users develop resistance behaviour to use ERP system is underrepresented in the current literature. Even the available research is fragmented without any theoretical base (see Kim & Kankanhalli, 2009; Aslam, 2010; Venkatraman and Fahd, 2016; Haddara and Moen, 2017). Use of theory in research increases the meaningfulness of the research findings by linking to a set of more general and abstract concepts and statements of relationships. In addition, most of the studies on ERP system implementation were in the western societies which have little application to identify causes of ERP system implementation failure in developing countries (Bitsini, 2015) as behavioral factors differ by cultural contexts and technology use experience.

The purpose of this research is to identify factors that cause user resistance behaviour in post ERP implementation phase in selected Ethiopian organizations. It uses innovation resistance theory as a theoretical lens to identify factors that cause user resistance behaviour.

The findings of the research will have theoretical contribution by validating application of innovation resistance theory to identify factors that cause user resistance in the post ERP implementation phase. The research will have also practical contribution to managers in an effort to reduce user resistance behaviour and increase success of ERP system implementation.

The paper is organized: Section two reviews existing literature. Section three discusses materials and methods employed to undertake the research. Section four deals with discussion of research results. Finally, the paper concludes by discussing main findings of the research and future research direction.

MATERIALS AND METHODS

Theoretical Framework

Innovation resistance is defined as the opposition to a use of an innovation because of the possible changes brought by alterations to the existing status quo and deviations from the existing belief system (Kaur *et al.*, 2020). Users make rational thinking and decisions before they adopt innovation (Laumer and Eckhardt, 2015). They resist innovation if it creates potential changes from a satisfactorily established routines (Lian, Liu and Liu, 2012). Changing existing routine requires more effort and risks of failures. Innovation may bring loss of power for some users while it increases the power of others (Lapointe and Rivard, 2005). It also brings changes in the belief structure (Jagdish, 1989). It brings unlearning of existing knowledge and acquisition of new knowledge. But this process requires more effort and time to learn and use a new innovation. This is the main cause why every human resist new innovations.

User resistance is viewed as a multidimensional attitude towards change, comprising of affective, cognitive and behavioural components. According to Oreg (2006, p.76) the affective component regards "how one feels about the change (e.g. angry, anxious)", the cognitive component involves "what one thinks about the change (e.g. Is it necessary? Will it be beneficial?)" and the behavioural component involves "actions or intention to act in response to the change (e.g. complaining about the change, trying to convince others that the change is bad)". User resistance to innovation emanates from evaluation of these multiple effects of innovation (Hirschhwim and Newman, 1988).

Intensity of user resistance can vary from passive to active resistance (Laumer and Eckhardt, 2015). Passive resistance is rather mild; they include delay tactics, excuses, persistence of former behavior, and withdrawal (Lapointe and Rivard, 2005). On the other hand, active resistance is reflected by strong complaints but not destructive behaviors, such as voicing opposite points of view, asking others to intervene or forming coalitions (Jagdish, 1981). If the users perceive the innovation as highly risky, they may demonstrate even aggressive behaviors such as infighting, making threats, strikes and boycotts (Laumer and Eckhardt, 2012). Users resisting innovation have also a tendency to change jobs (Klaus, Blanton and Wingreen, 2015).

Resistance does not always have a negative consequence. It has a positive consequence. Users resist innovation because the innovation has limitation to meet their requirements (Laumer and Eckhardt, 2015). When users explain the reasons for rejecting innovation, it is used as a constructive feedback to improve the innovation functionality and usability. Such user resistance is used as a necessary check point on poor technology implementation (Ishak and Newton, 2018).

Innovation Resistance Theory (IRT) is a comprehensive model to explain users' resistance of innovations (Jagdish, 1981) including ERP system. Organizations acquire ERP because of its benefit to improve the overall organizational performance (Madapusi and D'Souza, 2012). It can be considered as one type of innovation adopted in the organization. Different researchers applied innovation resistance theory to investigate why users resist different IT systems such as online shopping (Lian, Liu and Liu, 2012), e-wallet services (Aransyah, Roy and Aprianti, 2020), online learning (Ma and Lee, 2017), internet banking (Arif, Aslam and Hwang, 2020) and mobile payment (Kaur et al., 2020). Innovation resistance theory can also be used to identify factors that predict users' resistance behaviour in post ERP implementation phase.

Research model and Hypothesis Development

Innovation Resistance Theory (IRT) classified possible barriers of innovation adoption into two categories as functional and psychological barriers (Jagdish, 1989). Functional barriers are related to product usage patterns, product value, and risks associated with product usage. On the other hand, psychological barriers arise from two factors: traditions and norms of customers, and perceived product image (Jagdish, 1989, p. 7). These barriers are considered as independent variables and user resistance to ERP use as dependent variable.

Usage barrier

Usage barriers refer to innovation which is not compatible with existing workflows, practices, or habits (Jagdish, 1989). When there is high incompatibility between innovation and existing work practices, users must learn how to work with the new innovation (Kaur *et al.*, 2020). This requires extra effort and hinders innovation adoption time. ERP is a complex system with many integrated modules (Hasheela-mufeti and Smolander, 2017). The modules were developed based on international best practices. Users are expected to learn not only technical operation of the system but also the new standardized business processes embedded with the system. Several users reported that finding specific functionality quickly within the system is difficult (Topi, Lucas and Babaian, 2005a). This challenge is more severe for users with low IT skills (Rajan and Baral, 2015a). Users do not have complete picture how the entire system works (Aslam, Olerup and Wärja, 2010). They have difficulty to easily navigate from one window to the other window. It is easy to generate standard reports from the system but reports did not usually meet the specific user's information requirements (Aslam, Olerup and Wärja, 2010). The system cannot also generate specific report as required by the end users (Topi, Lucas and Babaian, 2005b). They have to use other software to reformat report outputs from ERP system.

Usability problem in ERP system is documented in different literature (Topi, Lucas and Babaian, 2005a; Aslam, Olerup and Wärja, 2010; Al-taweel and Haithm, 2016). Previous studies have also shown that usage barriers and user resistance have a positive association in different IT systems research such as mobile payment (Kaur *et al.*, 2020), mobile banking (Yu, 2016), e-wallet services (Aransyah, Roy and Aprianti, 2020) and IT systems (Laumer and Eckhardt, 2015). Therefore, the above discussion leads us to the following hypothesis

H1: Usage barrier increases user resistance behaviour to use ERP system

Value barriers

Value barriers refer to a benefit and cost of innovation as compared to substituted products (Jagdish, 1989). If the cost is greater than the benefit, users are not interested to use innovation. The innovation must increase users' productivity, quality of work and reduce efforts to accomplish a task (Laumer and Eckhardt, 2015). ERP as new innovation in the organization provides many benefits to the users such as integrated database system, real time information access and easy integration of data from different departments (Rajan and Baral, 2015a). On the other hand, ERP implementation increases user task effort (Aslam, Olerup and Wärja, 2010). Users have more data entry task and this task is a must to do responsibility. If users do not enter data immediately as the transaction occurs, it will affect the work of others. ERP limits flexibility in accomplishing personal tasks. Its window is wide with many fields to be filled (Aslam, Olerup and Wärja, 2010). ERP is internationally standardized system that has design limitation to meet specific user information requirements and report outputs (Topi, Lucas and Babaian, 2005a). As a result, users incur more effort and time when they work on ERP system (Aslam, Olerup and Wärja, 2010) though it has more benefits to the organization. Challenges associated with ERP system use causes users to develop resistance behaviour to work on ERP system. Previous

research also reveals that value barriers have a positive association with user resistance behaviours to use IT systems in various contexts, namely online shopping (Lian and Yen, 2014), mobile banking (Yu, 2016), online learning (Ma and Lee, 2017) and mobile payment (Kaur *et al.*, 2020). This leads to the following hypothesis

H2: value barriers increases user resistance behaviour to use ERP system in the post ERP implementation phase

Risk Barrier

Risk barriers refer to uncertainties and potential side effects inherent in all innovations (Jagdish, 1989). This happens usually due to lack of adequate information about the innovation. There are several types of risk barriers to new innovation including physical risk, economic risk, functional risk, and social risk ((Jagdish, 1989). Physical barrier is associated to physical harm by innovation (Jagdish, 1981). ERP system brings different physical harm such as job transfer, increased data entry work and effort to learn new skills required to work on ERP system (Aslam, Olerup and Wärja, 2010).

Economic risk refers to the loss of economic advantage by innovation (Ram and Sheth, 1989). In the ERP system, data is stored in one central location. As a result, some users lose their power due to changes in the ownership of data by ERP system (Al-taweel and Haithm, 2016).

Functional risks refer to performance uncertainties (Ram and Sheth, 1989). ERP is a complex system which cannot be tested before it is acquired. Vendors and managers talk much about the benefit of the ERP system but when it is implemented, users do not find all functionalities they were promised by managers and vendors (Aslam, Olerup and Wärja, 2010). During pre-implementation phase, there was user requirement study. However, all user requirements were not included during customization of ERP system. If there is too much customization, it will be very expensive. In addition, when there is a new release of ERP version, it requires another customization which consequently makes ERP implementation expensive and unsuccessful. ERP system become more successful when there is limited customization (Topi, Lucas and Babaian, 2005a). When users actually work with ERP system, they find it below their expectation (Aslam, Olerup and Wärja, 2010). This expectation mismatch also leads users to develop a negative attitude about ERP system.

Social risks refer to a social rejection or disruption of existing social structures because of innovation adoption (Jagdish, 1989). ERP replaces existing business process by new internationally standardized business processes. Users are worried about the changes and its consequence on their life. When users work on integrated system like ERP, users can easily trace the performance others. This change in the work practice will not be socially acceptable as its exposes the individual privacy. ERP system also changes existing communication patterns in the organization. Most of the communication is handled through online channels rather than the traditional face to face communication. Changes to the existing patterns of culture will lead users to develop resistance behaviour to ERP system use (Hirschhwim and Newman, 1988).

Risks about ERP system is also associated with lack of relevant training (Aslam, 2010). Trainings provided on ERP system focuses only on technical issues (Aslam, Olerup and Wärja, 2010). Training on new business process is also necessary to develop users' knowledge and skills to work with the ERP system (Aslam, 2010; Elragal and Al-Serafi, 2011). Users with lower training about the capabilities and limitation of ERP system will develop resistance behaviour due to miscommunication and become reluctance to work with ERP system (Al-taweel and Haithm, 2016).

Previous literature confirmed that risk barriers is positively associated with user resistance in different information systems' implementation such as mobile banking (Yu, 2016), mobile payment (Kaur *et al.*, 2020), e-learning adoption (Ma and Lee, 2017) and technology adoption in construction organizations (Ishak and Newton, 2018). There are also different anticipated risks when using ERP system such as more efforts, new skills to work with ERP system and lack of employee's performance improvement. Therefore, it is hypothesized that

H3: Risk barriers is positively associated with increased user resistance behaviour to use ERP system in the post ERP implementation phase

Tradition barriers

Tradition barriers refer to changes to established beliefs and practices by the innovation (Ram and Sheth, 1989). Traditions are embedded in the society and people's life and any interventions against to this tradition will end up with creating conflicts and resistance (Kaur *et al.*, 2020). ERP system comes with standardized modules that require significant change in the existing business process and work culture

(Klaus, Wingreen and Blanton, 2007). Empirical research show that too much customization to align with organization business process is associated with failure of ERP system (Topi, Lucas and Babaian, 2005a; Rajan and Baral, 2015a). In order to utilize the benefit of ERP system, organizations make little change to the standardized ERP business processes. This has resulted in significant changes on users' job content and work practices. Implementation of ERP brings easy monitoring of employee performance, reallocation of some user tasks to ERP -embedded procedures and employees are easily watching each other's work (Benders and Schouteten, 2009; Salih, Razak and Hussin, 2013). As a result, users feel that their autonomy is threatened by ERP system.

ERP also brings significant change to work practices in the organization. It replaces the existing business processes by new business processes to which users are not familiar (Skoumpopoulou and Moss, 2015). It brings new management control over the user's work performance because of the integrated system modules (Benders and Schouteten, 2009). Users cannot schedule their task as they prefer because of tight linkage with other collages task (Aslam, 2010). Changes brought by ERP are against to the existing tradition thereby users develop resistance behaviour to work with the ERP system.

Other researchers also indicated that traditional barriers have a negative impact on technology adoption for different IT systems such as mobile banking (Yu, 2016), mobile payment (Kaur *et al.*, 2020), online courses (Ma and Lee, 2017) and e-wallet (Aransyah, Roy and Aprianti, 2020). Cultural changes by ERP implementation is also associated with user resistance behaviour (Al-taweel and Haithm, 2016). This leads to hypothesize that

> *H4: Traditional barriers increase users' resistance behaviour to use ERP system* in the post ERP implementation phase.

Image barriers

Image barriers are perceptions of users about the product which may be derived from stereotypes, word of mouth, media coverage, and other non-experiential sources (Kleijnen, et al., 2009). If any of these perceptions are a negative image, there is a barrier to adoption (Ram and Sheth, 1989). ERP is integrated system with many modules that create usability challenge (Hasheela-mufeti and Smolander, 2017). It also requires stable and high band width internet connection. Internet interruption creates inconveniency on users' task performance. ERP also requires new business process and IT skills to work with it (Hasheela-mufeti and Smolander, 2017). Trainings provided by ERP vendors do not meet users expectation to develop their skills to work confidently on the system (Topi, Lucas and Babaian, 2005a). These barriers of ERP create image barriers to use ERP system. Different empirical research also showed high failure rate of ERP implementation (Hawari and Heeks, 2010). Other researchers also empirically confirm that image barriers has direct influence on users resistance behaviour to use different IT systems such as mobile payment (Kaur *et al.*, 2020), online learning (Ma and Lee, 2017) and mobile banking (Yu, 2016). Business process changes, system complexity and interactivity limitation are the main factors for users resistance to use ERP system (Topi, Lucas and Babaian, 2005a; Al-taweel and Haithm, 2016). This leads to the following hypothesis

> *H5: image barriers directly influence users to develop resistance behaviour to use ERP system*

Research Method

Casual research design was used to measure the effect of the independent variables on the dependent variables (i.e user resistance to use ERP system). During literature review, relevant causal factors that increase user resistance were identified using innovation resistance theory. We used questionnaire survey as data collection method. Questionnaire survey is a preferred method to collect data from large sample population in a short time. It also depends on self-report so that it reduces respondent bias that will happen in face to face data collection method (Kothari, 2004).

Instrument Development

Data collection instruments were developed from previous literature (see Table 1). After the instruments developed, it was distributed to ten respondents who are working on ERP system as pilot testing. The main purpose of pilot testing was to check the content validity, instrument reliability and questionnaire format. The instrument reliability was 0.89 which is above the minimum requirement of 0.7 (Tabachnick and Fidell, 2013). Instrument reliability was also done at construct level. Three constructs value, tradition and image barriers have construct reliability which is below the minimum threshold of Cronbach alpha value. As a result, the questions which have negative

correlations were modified and additional instruments were also added for the final survey. Table 1 shows the final data collection instruments. The instruments were measured with 5 point Likert scale which is rated 1 as strongly disagree and 5 as strongly agree.

Table 1. Data collection instruments.

Constructs	*Operational definition*
User resistance	It is an opposition to a use of an ERP system because of the possible changes brought by alterations to the existing work practices and deviations from the existing belief system (adapted from Kaur *et al.*, 2020).
Usage barriers	It refers to a barriers that emerge from adoption of ERP system which is not compatible with existing workflows, practices, or habits (adapted from Jagdish, 1989).
Value Barriers	It refers to a benefit and cost of innovation as compared to substituted products (Jagdish, 1989)
Risk Barriers	It refers to uncertainties and potential side effects inherent in the use of ERP system (adapted from Jagdish, 1989)
Traditional Barriers	It refers to changes to established beliefs and practices by the use of ERP system (adapted from Jagdish, 1989)
Image Barriers	It refers to barriers emerge from perceptions of users about use of ERP system which may be derived from stereotypes, word of mouth, media coverage, and other non-experiential sources (Kleijnen, et al., 2009)

The questionnaire was designed on Google form and then respondents were invited to fill the questionnaire through e-mail. One contact person was identified from each organization to assist in the data collection. The contact person communicated the purpose of the research and collected the respondents' email addresses. The researcher sent reminder email to those respondents who did not fill the questionnaire after two weeks from the first invitation date. The data collection was undertaken during November and December 2020.

Data Sources and Sampling

Data was collected from Abay Bank S.C, Ethiopian Petroleum Enterprise, Ethiopian Shipping and logistic Service Enterprise and Oromia Credit and Saving Share Company (OCSSCO). A total of 120 questionnaires were distributed to users who are working on ERP system. The data was collected through online Google Form. The respondents were selected using purposive sampling method. One person is contacted from each institution to facilitate the data collection process. The contact person collects email address and explains to respondents about the purpose of the research and how to fill online questionnaire. The main criteria used to select samples were respondents who have a private email account, work on ERP system and willingness to fill the questionnaire. The samples were also selected to represent different mix of respondents. A support letter was written from the researcher's institutions to confirm that the research is used only for academic purpose.

Smart PLS was used as data analysis tool. This software is selected when the sample size is small and when the data does not meet statistical assumptions like normal distribution (Sun, Ji and Ye, 2018). It is also easy to use software for complex structural model with many constructs and indicators.

Data Analysis

Descriptive method and linear regression were used as data analysis method. The Descriptive statistics is used to generate frequency table about demographic characteristics. On the other hand, linear regression was used to test hypothesis. Smart PLS software was used for data analysis. As the research has small sample size, Smart PLS is a preferable tool than other data analysis software tools (Wong, 2013).

DATA ANALYSIS AND RESULTS

A total of 120 questionnaires were distributed to respondents. Of which 75 questionnaires were properly filled and used for the data analysis. The distribution of respondents by organization is given in Table 2.

Table 2. Selected organization for data collection.

Organizations	Respondents	Percent
Abay Bank S.C.	16	21.3
Ethiopian Petroleum Enterprise	21	28.0
Ethiopian Shipping and Logistic Enterprise	13	17.3
OCSSCO	19	25.3
Nib Bank	6	8.0
Total	75	100.0

With regard to characteristics of the sample population, 73.3% and 26.7% of the respondents were male and female, respectively. About 96% of the respondents were first and second degree holders. Of which 65.3% of the respondents were first degree holders. Most of the respondents have 5 to 10 years work experience. They accounted for 66.7% of the total respondents. They are followed by respondents with less than 5 years experience (18.7%), 15 – 20 years experience (8%) and 10 – 15 years experience (5.3%). With regard to positions, 66.7% of the respondents were non IT people who are domain experts while the remaining respondents were IT technical support staff. The following table shows distribution of respondents by organization. Respondents were selected from different sectors.

The data collection instrument was checked for its reliability using Cronbach alpha. The result of test is .951 which is above the minimum acceptable threshold for reliable instrument (Tabachnick and Fidell, 2013)

Smart PLS was used as data analysis tool. PLS involves two stages model analyses that include measurement model and structural model assessment. The measurement model is assessed using indicator reliability, internal consistency reliability, convergent validity and discriminate validity (Wong, 2013).

Indicator reliability is assessed by squaring each of the outer loadings to find the indicator reliability value. Values of 0.70 or higher is preferred. If it is an exploratory research, 0.4 or higher is acceptable (Wong, 2013). Internal consistency of measurement model is analyzed by using composite reliability. The cut-off score for composite reliability is 0.60 or higher is adequate reliability for exploratory research, 0.70 or higher is adequate for confirmatory purposes (Garson, 2016). All indicators satisfy the minimum requirement of composite reliability as shown in Fig. 2. Two indicators from ERP use resistance construct and one indicator from value barriers construct were removed as they do not meet the minimum requirement of composite reliability.

Convergent validity is assessed by using Average Variance Extraction (AVE). Convergent validity is the extent to which the construct converges to explain the variance of its items (Hair *et al.*, 2019). A construct has convergent validity if the AVE's value is 0.5 or higher (Wong, 2013). In this regard, all constructs' convergent validity values fall between 0.51 to 0.70. It indicates the presence of strong positive correlation among construct measurement items.

Discriminate validity is assessed by comparing the latent variable correlations with the square root of the AVE. It measures the extent to which a construct is empirically distinct from other constructs in the structural model (Hair *et al.*, 2019). All correlation values should be less than the square root of AVE. In this regard, each construct is distinct from other constructs of the model (see Table 3).

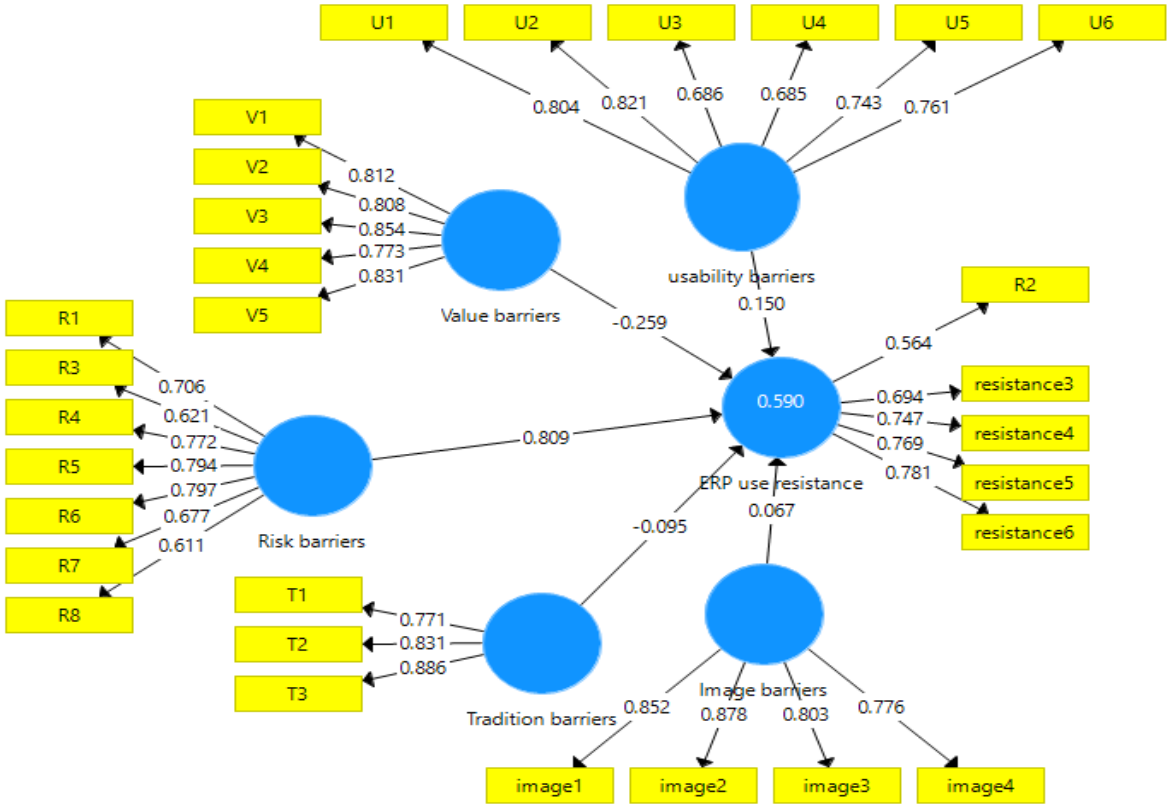

Figure 2. Structural Path Modeling.

Table 3. Discriminate validity.

	Image barriers	*Risk barriers*	*Tradition barriers*	*Value barriers*	*Usability barriers*	*ERP user resistance*
Image barriers	.825					
Risk barriers	.806	.713				
Tradition barriers	.485	.476	.834			
Value barriers	.712	.649	.664	.821		
Usability barriers	.743	.625	.625	.772	.749	
ERP user resistance	.550	.672	.186	.313	.396	.782

The final step is to assess the indicator weights' statistical significance and relevance (i.e. size). In this regard, Smart PLS can generate T-statistics for significance testing of both the inner and outer model, using a procedure called bootstrapping. Using a two-tailed t-test with a significance level of 5%, the path coefficient will be significant if the T-statistics is larger than 1.96. Accordingly, only the path from risk barriers to ERP use is statistically significant with a T-statistics value of 4.69. The other paths have values less than 1.96. This implies that other barriers have no influence on user resistance in post ERP implementation.

After assessing the relevance of measurement model, we assessed significance of the structural model. This is assessed using coefficient of determination (R^2), the blindfolding-based cross- validated redundancy measure Q^2, and the statistical significance and relevance of the path coefficients (Hair *et al.*, 2019). Before assessing the structural relationship, we have checked if there is a problem of collinearity problem by checking Variance Inflation Factor (VIF) values. VIF values above 5 indicate presence of collinearity problem (Wong, 2013). All indicators have values less than 5 for VIF and there is no collinearity problem.

If collinearity is not a problem, we assess the R^2 value of the endogenous construct(s). The R^2 measures the model's explanatory power (Hair *et al.*, 2019). As a rule of thumb, R^2 values of 0.75, 0.50 and 0.25 can be considered as substantial, moderate and weak (Henseler, Hubona and Ray, 2016). The R^2 value of this research model is .59 which is in the moderate range. This implies that all latent variables of the model explain 59.0% of the changes on user resistance of ERP system use in post ERP implementation phase. The other 41% is explained by other latent variables which were not considered in the model.

Another structural model assessment method is effect size (f^2) which shows how much an exogenous latent variable contributes to an endogenous latent variable's R^2 value (Hair, Sarstedt, Hopkins, and Kuppelwieser, 2014). It is a measure of the magnitude of an effect that is independent of a sample size (Benitez *et al.*, 2020). As a guideline, f^2 values of 0.02, 0.15 and 0.35 is gauged as having low, medium and large effect (Chin, 1998). Only risk barriers has medium effect size with a value of .335 and Value barriers has low effect size with .029.

The path coefficient estimates are essentially standardized regression coefficients. These coefficients show changes in the dependent construct or latent variable for one standard deviation change in the independent variable while keeping all other explanatory constructs constant (Benitez *et al.*, 2020). The structural model shows that a change by one standard deviation on risk barriers will bring an increase of .809 standard deviation on the dependent variable. It can be concluded that users develop resistance behaviour to ERP use mainly due to fear of risks that are associated with ERP system. Next significant effect comes from usability and image barriers with .15 and .067 path coefficient values. Users also have usability problem with ERP system because of its complex design and integrated modules. ERP is normally developed using international standard business processes so as to serve all institutions requirements. Users must adhere to functionalities offered by ERP system. Successful ERP implementation generally requires radical business process changes to avoid expensive system customization and future system maintenance challenges. This issue brings system usability problems and consequently user resistance to the ERP system in the post ERP implementation. Users also develop negative image about ERP system through information obtained from other colleagues who had experienced the challenges by working with ERP system.

On the other hand, the other two constructs, namely value and tradition barriers have negative influence on the dependent latent variable. Although value barriers and tradition barriers were identified as predictor of innovation resistance behaviour in the current literature, these constructs do not have influence in creating user resistance behaviour in post ERP system implementation. ERP system brings better value than legacy systems which are actually in use.

Another method used to assess the structural model in Smart PLS is the predictive accuracy by calculating Q^2 value. This metric is based on the blindfolding procedure that removes single points in the data matrix, assigns the removed points with the mean and estimates the model parameters (Hair et al., 2019). R^2 only indicates the model's in-sample explanatory power – it says nothing about the model's out-of-sample predictive power (Shmueli, 2010 cited in Hair et al., 2019). As a rule of thumb, Q^2 values higher than 0, 0.25 and 0.50 show small, medium and large predictive relevance of the PLS-path model (Henseler, Ringle and Sinkovics, 2009). The empirical result of this study showed that the structural model has medium level predictive relevance with Q^2 value of 0.25.

Discussion

This research identified different factors that cause user resistance in the post ERP implementation phase in selected Ethiopian organizations which implemented ERP system. The research revealed that risk barriers are the leading factor that causes user resistance in post ERP implementation phase. Main risk factors are loss of employee autonomy, job content change, more managerial control of employee's work performance, more effort to acquire new skills and loss of current position. This finding is also consistent to empirical research results in the current literature (Aslam, 2010; Salih et al., 2013; Al-taweel and Haithm, 2016).

Respondents claimed that ERP implementation require them to learn new job skills. This also demands them to put a lot of time and effort to master the new work routines on the ERP system. ERP is an integrated system that increases user's visibility to other colleagues. When an error is made by one user, it will affect all other users working on the system. Any user's failures are easily visible by managers and may be liable to organizational punishments.

The second factor that causes user resistance in the post ERP implementation is usage barriers. Main usage barriers in relation to ERP system includes finding

specific functionality quickly within the system is difficult because of many number of modules, significant business processes change, lack of comprehensive trainings on ERP system implementation and additional activities to generate customized reports with the required content and format. This findings were also mentioned by other researchers as factors that contribute to user resistance in the post ERP implementation (Topi et al., 2005; Rajan & Baral, 2015; Al-taweel and Haithm, 2016).

Although previous research empirically confirmed the effect of value barriers, tradition barriers and image barriers on adoption of new IT innovations (Jagdish, 1989; Topi, Lucas and Babaian, 2005b; Rajan and Baral, 2015b), this research did not identified a positive relationship between these variables and user resistance in post ERP implementation phase. ERP is integrated software that supports all organizational business activities. Adoption of ERP brings more value than the traditional legacy system. Though users put more effort to learn new IT skills and business processes in the ERP system implementation, these efforts are compensated by the benefits of the system.

CONCLUSION

The purpose of this research is to identify factors that increase user resistance in the post ERP implementation phase. Previous research on user resistance in post ERP implementation was highly fragmented without any sound theoretical base. This research uses user resistance theory for the first time to investigate factors that influence users' resistance behaviour in the post ERP implementation phase. The research identified risk barriers as the main factors that influence user resistance in the post ERP implementation phase. These risk barriers are associated with lack of good understanding about ERP system benefits and impacts. These risk barriers can be reduced by providing relevant training during pre and post ERP implementation. The variables identified in the research model explains 59% of changes on user resistance behaviour in post ERP implementation. This is a good model as it explains nearly 60 percent of the variability on user resistance behaviour to ERP system use.

This research did not found a positive influence of value, tradition and image barriers on user resistance in post ERP implementation. Although ERP brings many challenges and changes in the existing work practices, its benefits cancelled out the effect of value, tradition and image barriers on user resistance behaviour.

The research has theoretical contribution by testing the validity of user resistance theory for ERP implementation. The research also develops and validates data collection instruments which will be used by other researchers to undertake similar research to investigate user resistance in the post ERP implementation phase.

This research has also practical implication for managers to identify factors that cause user dissatisfaction to work with ERP system. Effective communication about the risks and benefits of ERP system, trainings that include both technical and business processes and user involvement in all phases of ERP implementation will help to reduce user resistance in the post ERP system implementation phase. ERP failure is mainly associated with people's related factors rather than technical factors.

One of the main limitations of this research is the small sample size of the study population. In addition, the samples were selected using purposive sampling method. Data was also collected from different ERP system. The study will have higher practical relevance if the data is collected from a single ERP system. If multiple ERP systems are selected, comparative analysis must be included to increase the quality of the research findings. As a result, this research finding cannot be generazable to other contexts.

Future researchers can undertake research what type of training to be provided for managers and users who are working on the system. Other researchers can also consider other theory to complement innovation resistance theory so as to increase the model's predictive power. In addition, this research was conducted on small size sample population, future researchers can undertake similar research on larger sample population using the research model developed in this researcher.

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Annex I

Constructs	*Indicators*
User resistance	ER1.I reflect the limitation of ERP system whenever I get opportunities to express my view (Ram and Sheth, 1989)
	ER2.I am discussing with my colleagues to complain on ERP system problems (Ram and Sheth, 1989)
	ER3.I use delay tactics to avoid working on ERP (Ram and Sheth, 1989)
	ER4.I try to withdraw myself not to work ERP system (Ram and Sheth, 1989)
	ER5.I do not show interest to collaborate and share ideas to improve the ERP system (Aslam, Olerup and Wärja, 2010)
	ER6.I want to change my job position to avoid stress working on the ERP system (Klaus, Blanton and Wingreen, 2015)
Usage barriers	U1. In my opinion, finding specific functionality quickly within the system is difficult (Topi, Lucas and Babaian, 2005a)
	U2. In my opinion, ERP is not easy to use system (Rajan and Baral, 2015a).
	U3. In my opinion, ERP brings significant business process change which create barrier to learn the system (Topi, Lucas and Babaian, 2005a; Rajan and Baral, 2015a)
	U4. In my opinion, trainings provided on ERP are not adequate to work on ERP system (Al-taweel and Haithm, 2016)
	U5. In my opinion, ERP require additional activities to generate reports in the required content and format (Topi, Lucas and Babaian, 2005a)
	In my opinion, ERP require different IT knowledge work comfortably with ERP system
Value Barrier	V1.In my opinion, ERP creates too much data entry task (Aslam, Olerup and Wärja, 2010)
	V2.In my opinion, ERP system require more effort to acquire new skills needed for ERP system (Topi, Lucas and Babaian, 2005a)
	V3.In my opinion, ERP system require more time to acquire new skills to work on ERP system (Topi, Lucas and Babaian, 2005a)
	V4.In my opinion, ERP system brings additional task burdens on my job (Topi et al., 2005; Al-taweel and Haithm, 2016)
	V5.In my opinion, ERP require more time to complete a task (Al-taweel and Haithm, 2016)
	V6.In my opinion, ERP does not produce reports with required content and format for my task (Topi, Lucas and Babaian, 2005a)
Risk Barrier	I fear that while I am using ERP, I might have more work and responsibility (Aslam, Olerup and Wärja, 2010)
	I fear that ERP may not have all functionalities I want for my task (Ram and Sheth, 1989)
	I fear that while I am using ERP service, I might lose control of my information (Arif, Aslam and Hwang, 2020)
	I fear that while I am using ERP, my job content might be changed (Al-taweel and Haithm, 2016)
	I fear that while I am using ERP, I might not able to acquire the required skills (Hirschhwim and Newman, 1988)
	I fear that I might lose my position due to ERP (Aslam, Olerup and Wärja, 2010)
	I fear that I might be transferred to other positions (Hirschhwim and Newman, 1988)
Tradition Barriers	In my opinion, ERP changes existing work routines and norms (Ram and Sheth, 1989)
	In my opinion, ERP is implemented without incorporating user requirements (Hirschhwim and Newman, 1988)
	In my opinion, ERP brings significant business process changes (Klaus, Blanton and Wingreen, 2015)
	In my opinion, ERP brings change to my job content (Benders and Schouteten, 2009)
	In my opinion, ERP brings uncomfortable work culture in the office (Topi, Lucas and Babaian, 2005a)
Image Barriers	I have an image ERP is often too complicated system to be useful (Topi, Lucas and Babaian, 2005a)
	I have a perception ERP is difficult to use system (Topi, Lucas and Babaian, 2005a)
	I have a negative perception about ERP system (Arif, Aslam and Hwang, 2020)
	I perceive that ERP require too much effort to learn the necessary skills (Hirschhwim and Newman, 1988)