

# User Resistance Factors in Post ERP Implementation

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**Abstract** — Enterprise resource planning (ERP) systems are becoming mature technologies to support inter- and intra-company business processes. However, one of the factors frequently cited as the major reason for the failure of ERP system in post implementation is “User Resistance”. ERP implementation doesn’t finish after Go-Live, instead the real test of system starts when user begins using the system. The main purpose of this study is to investigate user resistance factors in ERP post implementation stage and the influence between the factors associated with the research model. Correlation analysis is used to investigate the influence between user resistances. To achieve this objectives quantitative method were conducted with 95 ERP end users. The result shows Resistance due to change, Change in Job content, User Expectations, Increased efforts, Lack of Education and User training, Usability issues and resistance to technology, Lack of user involvement in the development process, and Lack of communication between top management and end users are the factors behind user resistance. Recommendations and guideline to avoid user resistance in ERP post implementation are also presented. The benefits and outcomes of this study shall aid organizations to overcome user resistance in post ERP implementation.

**Keywords – post implementation, enterprise resource planning, user resistance factor**

## 1. INTRODUCTION

Despite the advantages associated with ERP systems, their adoption is often problematic; approximately 50% of all ERP implementations fail to meet the adopting organizations’ expectations. In an article entitled “How to Overcome the Most Dangerous Issues Facing Corporations Today”, the DA Consulting Group states that one of the major reasons why SAP implementations fail to achieve the business goals intended is because many companies fail to address the user side of the equation. [1] identifies end-user resistance as one of the main contributing factors towards the failure of ERP adoption. User resistance is an issue that could result in problems for organizations [2]. According to [3] “Many ERP systems face implementation problems because of workers’ resistance”. People working within an organization are major stakeholders in post-implementation stage and without their support, smooth working of ERP system is nearly impossible. Often organizations spend major efforts in initial stages of the project’s implementation because of different complexities. However, their attention to post-implementation stage is not evident. There is a need to address the issues concerning post implementation of ERP systems. As described by [4] “One of the commonly cited reasons for ERP failures is end users reluctance to use the newly implemented ERP”.

The objectives of this paper is (1) To identify the factors and reasons which lead to user resistance in using ERP system in post implementation stage, (2) To identify the influence between the factors toward user resistance, (3) and to present recommendations and guideline to avoid user resistance in ERP post implementation. This research is intended towards finding the user resistance in post ERP implementation. Hence, the purpose is to identify the reasons behind user resistance after implementation. Therefore, in an attempt to explore user resistance issues in post ERP implementation stage, it is to be conceptualized and empirically validated as to what are dimensions that contribute to user resistance after ERP system implemented.

## 2. METHODOLOGY

This study aims to identify user resistance factors in ERP post implementations and the influence between the factors toward user resistance flowed by presenting recommendations and guideline to organizations to avoid user resistance in ERP system after go-live. To achieve the objective of this study, a quantitative research methodology was used. This research involved surveying a respondent of 95 of ERP end users. The survey involved a number of predefined questions and was conducted by means of an online survey and getting the answers back in the form of online responses. Twenty four closed-ended questions provide quantitative data and required a participant to choose from a given set of responses. The collected data have been analyzed by using (SPSS) technique as statistical tools.

### 3. DERIVING RESISTANCE FACTOR OF ERP POST IMPLEMENTATION

User resistance factors founded and collected from several IS publications, MIS journals and articles, as well as IT literatures are presented in the following table.

TABLE 1: User resistance factors found from IS publications and MIS journals

<b>Factors</b>	<b>Definitions</b>
Resistance Due to Change [5]	People resist because they resist all change. One explanation therefore is that those users have bad experiences with other systems.
Change in Job Content [6],	Employees do not understand in what way ERP transform business processes in an organization.
Low Experience on Previous Legacy System [7]	Enlarged experience on the legacy system clearly contributes with high believe in the advantages of the new system and more experience gained users will obtain more trust in their ability to follow from employees' point of view.
User Expectations [8]	Roles of user and what they have to give to the system is not communicated by the vendor.
Different assessment [9]	Employees view more cost than benefits beside those initiating the change view the negative. It contains different other attributes such as limit motivation and position change,
Lack of Educations and Trainee [10]	Training are delayed until the completion of the project life cycle, hence users get opportunities to learn and come to be longer opposition to change.
Gender [11]	The detected ease of use that females view in the system is smaller than that of males.
Usability Issues and Resistance to Technology [12]	Navigation problems seemed to be typical. The users do not provide much help in reaching out the exact transaction screen to perform specific transactions. User needs desired reports in the specific formats.
Increased Effort [13]	Effort is defined as the extent of ease connected with the use of the system.
Lack of user Involvement in the Development Process [14]	Developing a highly unstructured system like ERP system, user involvement will become very important for improving user acceptance
Lack of Communication Between Top Management and End user [15]	Organizations' need to justify the ERP system to end-users as communication of the system benefits can lead to a shared belief in the benefits of the system. Justification must be communicated to end-users when the decision to implement the ERP system is made.
User Age [16]	Older users find it hard to change technical environments.

### 4. DATA COLLECTION AND FINDING

In order to investigate this research, questionnaire has been used to gain information from ERP users was conducted at (Protasco Berhad) company in Kuala Lumpur city in Malaysia via online form, a copy of the questionnaire with identification from the researcher's institution has been sent to 161 respondent of the company only 95 forms has been received. Protasco is a diversified infrastructure company their business is mainly on IT infrastructure solutions, road construction, maintenance, buildings and specialized construction and education. This company was implemented oracle R/12 as form of enterprise system on end of December 2011. The ERP system modules have been implemented in this company is Oracle Financial Analytics, Oracle Human Resources Analytics, Oracle Procurement, and Oracle Supply Chain.

From the above table, there are eight factors identified in this study, which are labeled as user resistance factors in ERP post-implementation, they are as follows:

- |                             |   |
|-----------------------------|---|
| 1- Resistance due to change | 5- Lack of Education and User training                        |
| 2- Change in Job content    | 6- Usability issues and resistance to technology              |
| 3- User Expectations        | 7- Lack of user involvement in the development process        |
| 4- Increased efforts        | 8- Lack of communication between top-management and end users |

The reason for selecting eight factors out of fourteen factors is that the other six factors which are low experience on previous legacy system, different assessment, gender, user age, education level and lack of organization support are found to be technical and organization factors which are out of the scope for this study, as the main purposes of this research are resistance factors of ERP post implementation from user perspective not technical nor organization perspective. In discussing the findings of this study, we shall deal with each factor and questions associated with its Statistics analysis.

#### A. Factor A: Lack of User Education and Training

Table 2 Shows that the percentage of the strongly agree and agree total respondents, composed of 55.8%, this indicated that the majority of respondents stand with the phrase that agree with the factor (lack of user education and training) and the training provided to them were not enough, but those who are not agree their percentage total to 38.6% and those who have answer (neutral), their percentage out of the sample is 5.6%.

TABLE 2: Frequency distribution for lack of user education factor

Summary of the Statement	S. disagree		disagree		Neutral		agree		S. agree	
	F	P %	F	P%	F	P%	F	P%	F	P%
1- There were insufficient training provided to me prior to the ERP implementation (pre-implementation)	3	3.2	25	26.3	6	6.3	36	37.9	25	26.3
2- There were insufficient training provided to me after ERP system goes live (post-implementation stage)	1	1.1	57	60	4	4.2	18	18.9	15	15.8
3- I did not get a clear idea of the nature usage and the rationale for implementing the ERP system because of insufficient trainee	2	2.1	22	23.2	6	6.3	37	38.9	28	29.5
<b>Total</b>	<b>6</b>	<b>2.1</b>	<b>104</b>	<b>36.5</b>	<b>16</b>	<b>5.6</b>	<b>91</b>	<b>31.9</b>	<b>68</b>	<b>23.9</b>

#### B. Factor B: Change in Job content

Table 3 below shows that the percentage of the strongly agree and agree total respondents, composed a percentage of 60.7%, this indicated that the majority of respondents stand with the phrase that agree with the factor (change in job content) but those who are not agree their percent total to 30.5% and those who have answer (neutral), their percentage out of the sample is 8.8% as shown in the following table.

TABLE 3: Frequency distribution for factor change in job content

Summary of Statement	S. disagree		disagree		Neutral		agree		S. agree	
	F	P %	F	P%	F	P%	F	P%	F	P%
1- ERP implementation has totally changed my daily task activities	2	2.1	33	34.7	8	8.4	37	38.9	15	15.8
2- The use of the ERP system required my current job skills to be changed	1	1.1	21	22.1	10	10.5	35	36.8	28	29.5
3- there are a lot of time and effort to mastering the current way of my daily assigned task to deal with ERP system	1	1.1	29	30.5	7	7.4	31	32.6	27	28.4
<b>Total</b>	<b>4</b>	<b>1.4</b>	<b>83</b>	<b>29.1</b>	<b>25</b>	<b>8.8</b>	<b>103</b>	<b>36.1</b>	<b>70</b>	<b>24.6</b>

### C. Factor C: Lack of communication between top-management and end users

Table 4 shows that the percentage of the completely agree and agree total respondents composed a percentage of 54.4%, this indicated that the majority of respondents stand with the phrase that agree with the factor (lack of communication between top management and end user) which indicate that there were no communication between them and their managers in pre implementation stage, but those who are not agree their percent total to 41.8% and those who have answer (neutral), their percentage out of the sample is 5.6%.

TABLE 4: Frequency distribution for factor Lack of communication between top-management and end users

Summary of Statement	S. disagree		disagree		Neutral		agree		S. agree	
	F	P%	F	P%	F	P%	F	P%	F	P%
1- prior to ERP implementation my manager did not talks to me about where my tasks fit in the "big picture" of the ERP environment and how ERP will impact on my work processes	11	12.1	26	27.4	4	4.2	32	33.7	30	33.7
2- There were no communication line between me and my manager regarding the justification of implementing ERP system.	12	11.6	31	39.6	7	6.2	28	35.7	18	16.8
3- My manager has not arranged meeting sessions after ERP implementation that address broader ERP issues and the software usage	11	10.6	36	37.9	4	4.2	30	29.5	16	16.8
Total	30	12.3	84	29.5	16	5.6	90	34.4	64	67.3

### D. Factor D: Lack of user involvement in the development process

Table 5 shows that the percentage of the strongly agree and agree total respondents, composed percentage of 55.1%, this indicated that the majority of respondents stand with the phrase that agree with the factor (Lack of user involvement in the development process) which indicate that the employees were not involved in ERP adoption, but those who are not agree their percentage total to 38.2% and those who have answer (neutral), their percentage out of the sample is 6.7%.

TABLE 5: Frequency distribution for factor Lack of user involvement in the development process

Summary of Statement	S. disagree		disagree		Neutral		agree		S. agree	
	F	P%	F	P%	F	P%	F	P%	F	P%
1- I have not been involved in ERP package selection and customization during the development process	11	11.6	30	30.6	7	7.4	38	40.0	9	9.5
2- I have not been involved in decision to adopt the ERP system from the beginning as well as receiving critical updates regarding the implementation and instructions for go live	9	9.5	24	25.3	7	7.4	34	35.8	21	22.1
3. I have not been involved on the project activities, milestones, timelines, and sessions on how the new system will change my jobs	9	9.5	26	27.4	5	5.3	46	48.4	9	9.5
Total	29	10.2	80	28.1	19	6.7	118	41.4	39	13.7

### E. Factor E: Usability Issues and Resistance to technology

Table 6 Shows that the percentage of the completely agree and agree total respondent age composed equal to 51.2%, this indicated that most of respondents did not get sufficient training and they stand with the phrase that agree with the factor (Usability Issues and Resistance to technology) but those who disagree, their percentage total up to 39% and those who have answer (neutral), their percentage out of the sample is 9.8%.

**TABLE 6: frequency distribution for the factor usability issue**

Summary of Statement	S. disagree		disagree		Neutral		agree		S. agree	
	F	P%	F	P%	F	P%	F	P%	F	P%
1- Using new technology offered by ERP is difficult to me because of user interface in ERP system is complicated	6	6.3	36	37.9	10	10.3	30	31.6	13	13.7
2- Data gathering, data migration, navigation and performing transactions in ERP system is complicated to me	7	7.4	32	33.7	12	12.6	36	37.9	8	8.4
3- Reporting tools provided by ERP system is complicated; I cannot easily export data in required report formats	4	4.2	26	27.4	6	6.3	46	48.4	13	13.7
<b>Total</b>	<b>17</b>	<b>6.1</b>	<b>94</b>	<b>32.9</b>	<b>28</b>	<b>9.8</b>	<b>112</b>	<b>39.3</b>	<b>34</b>	<b>11.9</b>

### F. Factor F: User expectations

Table 6 shows that the percentage of the completely agree and agree total respondents, composed a percentage of 47.7%, this indicated that the respondent expectations was different which is that new ERP system found to be such complex system unlike their expectation. This is due to the fact ERP implementation were not expected to be such complex system, the respondents who are disagree their percentage total to 37.9% and those who have answer (neutral), their percentage out of the sample is 10.9%.

**TABLE 7: Frequency distribution for User expectation factor**

Summary of Statement	S. disagree		Disagree		Neutral		agree		S. agree	
	F	P%	F	P%	F	P%	F	P%	F	P%
1- ERP system offered the same benefits as I expected.	23	24.2	27	28.4	8	8.4	30	31.6	7	7.4
2- New ERP system does not met my expectation regarding ease of use, UI design and reduce my work load	3	3.2	25	26.3	12	12.6	45	47.4	10	10.5
3- I thought the ERP system will reduce my work load and ease them, but it is not the case instead it proved to be complex system	3	3.2	27	28.4	11	11.6	47	49.5	7	7.4
<b>Total</b>	<b>29</b>	<b>10.2</b>	<b>79</b>	<b>27.7</b>	<b>31</b>	<b>10.9</b>	<b>112</b>	<b>39.3</b>	<b>24</b>	<b>8.4</b>

### G. Factor G: Increased efforts

Table 7 shows that the percentage of the strongly agree and the percentage of respondents who agree is 52%. This indicated that the most of the respondents agree with the factor; (Increased efforts) the reason is that ERP adoption increased their work load due to the sophisticated technology offered by the system and more data entry load. The percentage of those who disagree is 38.6% and those who have answered (neutral), their percentage out of the sample is 9.5%.

### H. Factor H: Resistance due to change

Table 9 shows that the percentage of the strongly agree and agree total respondents, composed a percentage of 50.5%, this indicated a clear resistance to new ERP adopted system and their answers was showing that they will not cooperate to the change as these changes may alter their job structure and power from their point of view. Meanwhile, 39% do not agree with all statements and 10.5% their answers were neutral. The findings of the eight resistance factor have been analyzed via (SPSS) to get their mean and rank. List of the eight user resistance factors are listed in below table associated with their rank and mean.

TABLE 8: Frequency distribution for factor increased effort

Summary of Statement	S. disagree		disagree		Neutral		agree		S. agree	
	F	P%	F	P%	F	P%	F	P%	F	P%
1- Implementation of new ERP system increased my work load	6	6.3	29	30.5	9	9.5	40	42.1	11	11.6
2- I have already put a lot of time and effort on learning the new system to mastering the current way of working	8	8.4	22	23.2	7	7.4	45	47.4	13	13.7
3- Considering the time, effort and extra new skills that I have to develop, the change to the new way of working with the ERP system is not beneficial to me	9	9.5	36	37.9	11	11.6	32	33.7	7	7.4
Total	23	8.1	87	30.5	27	9.5	117	41.1	31	10.9

TABLE 9: Frequency distribution for factor Resistance due to change

Summary of Statement	S. disagree		disagree		Neutral		agree		S. agree	
	F	P%	F	P%	F	P%	F	P%	F	P%
4- I am not satisfied with ERP system implementation because of technology-related factors	7	7.4	29	30.5	9	9.5	39	41.1	11	11.6
5- I am not satisfied with organization technical need and sophisticated skills required after ERP implementation	6	6.3	38	40	11	11.6	31	32.6	9	9.5
6- I am not willing to cooperate with the changes because it alter my social structure, job structure and my power	7	7.4	34	35.8	10	10.5	29	30.5	15	15.8
Total	20	7.1	91	31.9	30	10.5	109	38.2	35	12.3

## 5. RESEARCH MODEL AND HYPOTHESIS

According to the Table 10, from the ERP technical and user perspective, the most critical and meaningful resistance factor in ERP post implementation are Change in job content, Lack of User Education and Training, Lack of user involvement in the development process, User Expectations, and Usability Issues and resistance to technology. The other resistance factors in this research do not seem to have a significant effect on the ERP post implementation.

TABLE 10: User resistance factors in post ERP implementation ordered by their mean

Rank	Factors	Mean
1	change in job content	3.53
2	Lack of User Education and Training	3.39
3	Lack of user involvement in the development process	3.34
4	User Expectations	3.34
5	Usability Issues and Resistance to technology	3.18
6	Increased efforts	3.16
7	Resistance due to change	3.09
8	Lack of communication between top-management and end users	3.02

This section shows statistical analytical results to test hypothesis base on the aim of this paper. Here the authors performed interpretation for each hypothesis separately.

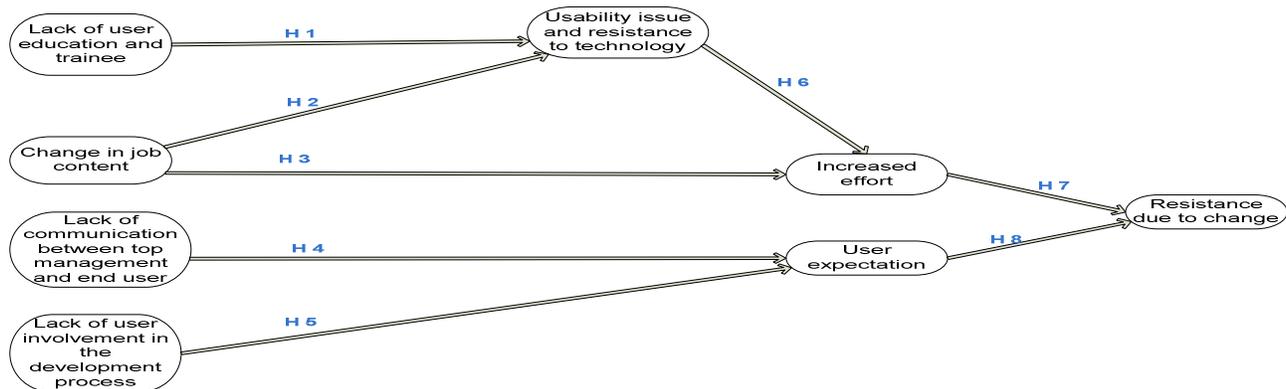


FIGURE 1: Model of user resistance in ERP Post implementation

Correlation coefficient (CC) is a statistical tool used to study correlations between set of variables. For example, a CC is used to learn a relationship between two variables, and then the user can take a decision upon a learnt relationship. Pearson's, Kendall and Spearman's correlation coefficients are well known CC types. In this research, the Pearson's -CC were used in order to assess the influence between the factors of the research model.

- Hypotheses 1:** Lack of user education and training lead to (Usability issues and resistance to technology). Relationship analysis = 0.87 that indicates strong correlation between lack of education and training and usability issues and resistance to technology. This is due to 55.8%, respondent replies were agreed with statement that they did not have trainee in ERP pre implementation stage and the trainee was only in post implementation. This supports the research hypotheses which lack of user education and training for ERP adopted system may lead to usability issues and resistance to technology, this indication has come from empirical data which show that the user was facing difficulty with the interface of ERP system for the reason which is that there was insufficient trainee provided to them in post implementation stage. User answers show that the training was only in pre implementation stage and there was not any kind of trainee during post implementation stage.
- Hypotheses 2:** (changes in job content) leads to (usability issue and resistance to technology) From analysis of empirical data, it shows the correlation between changes in job content with usability issue and resistance to technology has a strong correlation which is (0.85) as the respondent are replying that the system has altered their job, they have to develop new skills to use such new technology, and there is definite increase in workload as user replies shows, in return this changes has negatively reflected on ERP usage. Users were assigned new responsibilities after ERP system implementation, work tasks are altered and workload is increased. The changes in decision making and more responsibilities were found as the impact of ERP implementation and when user are faced with more responsibilities in their work tasks they show reaction to this.
- Hypotheses 3:** (change in job content) leads to (increased effort). Analysis of correlations between change in job content and increased effort has found to be = 0.87 which is strong interrelationship between the two factors. Due to work task alteration the work load is increased therefore users were clearly upset by ERP implementation. More time doing the work and working under pressure is reply of most of respondent to the questions. The work tasks also become more hectic as responsibility is increased due to building checks and monitoring in ERP system.
- Hypotheses 4:** (Lack of communication between top management and end users) negatively effects on (user expectations). Relationship analysis = 0.97 which indicates very strong correlation between Lack of communication between top management and end users with user expectations. The percentage of user's answers were 49.5% agree with statement that there were no communication line between them and their superior regarding the justification of implementing ERP system and information about the new business process. As analysis findings regarding user expectations show that the there are indications the users' expectations for the system were different to the actual features of the implemented system. Most of users' replies were that they expecting the system could reduce the workload and the responsibilities would be reduced due to integrated nature of ERP system as stated by top management to them. This lack of communication between top managing and end users contributes significantly in user expectations and lead to user resistance.
- Hypotheses 5:** (lacks of user involvement in development process) negatively affect on (user exceptions). Analysis result shows very strong correlations between lacks of user involvement in development process with user exceptions which found to be = 0.98. this result has come from users answers as their percentage were 55.1%, agree and strongly agree with all statement which they were not involved in ERP package selections, decision to

adopt ERP system, project activity and time line as well as sessions on how new system will change their job, lack of those process may negatively affect on user expectations. There are two areas for user involvement when the company decides to implement an ERP system: (1) user involvement in the stage of definition of the company's ERP system needs, and (2) user participation in the implementation of ERP systems. The functions of the ERP system rely on the user to use the system after going live.

- **Hypotheses 6:** (Usability issues and resistance to technology) leads to (increased effort). Surprisingly to researcher, the relationship analysis between usability issues and resistance to technology with increased effort has found to have very strong correlation which is = 0.99, this is due to implementation of ERP system result to a real technical shift. ERP system offers new technology, which is difficult to adopt by the users. 51.2%, of respondent answers were agreeing that there are usability issue in data gathering, performing transactions, and navigation. Increased effort is inevitable due to data entry load, migration of reports, approval hierarchies, finding the correct way to execute the transaction. The issues in ERP system in term of getting output of reports in desired formats is required for employee in their daily use, which are not provided to them built-in with the system and they are forced to develop these reports for their usage which is increased effort because ERP systems have completely different report formatting tools.
- **Hypotheses 7:** (Increased efforts) leads to (Resistance due to change). Relationship analysis = 0.97 that indicates very strong correlation between Increased efforts and resistance due to change. Many users stay agree (52%) to the factor (increased effort) but those who are not agree their percent total to (38.6%). comparing to (50.5%) whom their answers was disagree with the factor (resistance due to change) which indicate that the employees are satisfied with organization overall business process as well as changes to the new way of working with the ERP system because it change their social structure, job structure and power. This is due to the fact that user perceives implementation of the ERP system would reduce their work and ease them in their daily activities however it is not the case instead it proved to be complex system for them. a commonly expressed perception was that this particular ERP system was a very complex one to understand and use for a large portion of the users.
- **Hypotheses 8:** (User expectation) leads to (Resistance due to change). Relationship analysis = 0.97 that indicates very strong correlation between user expectation and resistance due to change. Correlation analysis specified tight correlation between user expectation and resistance due to change relationship = (0.97), furthermore people answers were mostly agree with fact that they are not satisfied with ERP system implementation because of technology related factors such as the user interface, performance, security, ease of use, and degree of centralization which was not been expected to be such complex system. User expectations are the direct cause of resistance.

The general findings show that the strongest correlation is = (0.99) between the factor (usability issue and resistance to technology) with (increased effort), it follows with correlation (0.98) between (lack of user involvement in development process) with (user expectations). Then (0.97) for (lack of communication between top managing and end user) with (user expectation), the same correlation (0.97) has also found between (increased effort) with (resistance due to change) as well as (0.97) for (user expectation) with (resistance due to change). The correlation between (lack of user education and trainee) with (usability issue and resistance to technology) found to be (0.87).

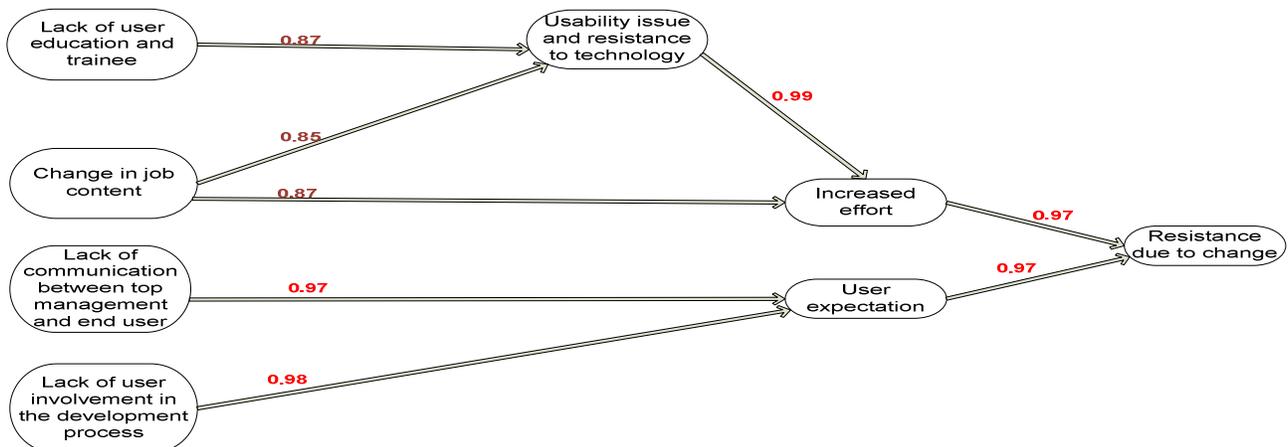


FIGURE 2: Model of user resistance in post ERP implementation and the influence percentage between the factors

## 6. CONCLUSION AND FUTURE WORK

An equally important future direction is a psychological understanding of the users' perspectives. For example previous research discussed Attitude Strength, Attitude Structure, and Resistance to Change. For a user, there may be negative perceptions towards the ERP system in post implementation stage and the change; however, the attitude strength and structure has not been examined. It is possible that if an attitude is not strong enough, even though users may have negative perceptions, resistant behaviors will not exist. On the other hand, users with negative perceptions and a strong attitude may exhibit a greater degree of resistance. This study provides a foundation upon which future research on user resistance can be built. One future direction for this line of research is developing a model of user resistance based on the key drivers for user resistance; this line of future in user resistance research would also examine and identify which reasons are the most important in the determination of resistance behaviors.

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