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# Mutual relations in ERP implementation: the impacts of work alienation and organizational support in state-owned enterprise

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**Abstract**

Although using ERP should be mandatory in an organization, but implementing ERP involves an organizational process reengineering, whether employees really accept the system still affects their resistance and the success of ERP implementation. Compared with employees in private companies, employees in State-owned enterprises will have more resources for resisting, and therefore will have more power in affecting ERP success. There are mutual relations between an organization and its employees. Whether the employees will support the organization should be affected by whether the employees perceived they are part of the organization and whether the organization supports them. This study based on technology acceptance mode to propose a model to test the effects of employees' perceptions of work alienation and organizational support on their intention to use ERP in a State-owned enterprise. The results show the effects of the relations between organization and its employee on ERP implementation and some implications of this result should be notice.



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*Keywords: work alienation, enterprise resource planning, intentions to use, implementation success*

## 1. Introduction

The importance of ERP has been viewed, especially in the business sector, where corporations have recognized the benefit of using ERP to provide cost-effective for their competitive advantage (Matende & Ogao 2013). Institutions have devoted abundant resources in adopting and implementing distinct brands of ERP. Despite though the implementation phase, ERP has a higher drop-out rate (Lee 2010). Since the success implementation of ERP is a way

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to enhance business competitive advantage, how to successfully implement ERP become managers' strategic trepidation.

One avenue in understanding this issue is concerning employee's usage intention to ERP (Matende & Ogao 2013). Usage intention is the premise for employees to accept ERP to the fullest potential and realize their performance. No matter how ERP is well designed, will not realize the promised return on investment if it is not keeping use. Many theories such as theory of planned behavior (Huh et al. 2009), hybrid model with expectation confirmation model and task technology fit (Larsen et al. 2009), Technology Acceptance Model (TAM) (Lee 2008; Lee 2010; Liu et al. 2010) have been used in explaining the derivation of ERP adoption. TAM has been widely considered to be the most popular theory in ERP acceptance literature (Matende & Ogao 2013). It has been extended and tested with different external variables and in various applications (Revel et al. 2010; Venkatesh et al. 2012; Amoako-Gyampah & Salam 2004; Yi et al. 2006; Burton-Jones & Hubona 2006; Zhu & Martochhio 2014; Visinescu et al. 2015). This study will explore the role of work alienation, which may have significant influence on implementation success at ERP system but are rarely explored by scholars in IS discipline.

The perception of work alienation commonly exists in employee's minds. The generation of alienation usually accompanied with process of social and organizational change, which requires people to adapt, and transit to a new mindset to fit the new environment. Employees may feel meaningless and powerless to change the ongoing phenomenon, hence be alienated from the organization (Seeman 1975). For example, new ERP may decrease the sense of job control, which may cause severe work alienations (Ollman 1976). The changes of organizational structures accompanied with IS implementation such as the enforcement of formalization and centralization may cause a perception of alienations (Allen & Lafollette 1977). Therefore, to force employees use ERP system may entail a phenomenon of work alienation. Only a few researches investigated the role of computer alienation (Abdul-Gader & Kozar 1995; Akkirman & Harris 2005), However, provides limited knowledge regarding how work alienation affects the usage of ERP. Although evidences reveal that organizational support policies may mitigate the negative effects of alienation on communications among members of virtual team (Akkirman & Harris 2005), the same effects are still not recognized in case of ERP success. This study tries to mitigate this gap and further our understanding regarding the success of ERP system. A theoretical model based on the TAM, taking into account of the effects of work alienation and organizational support, will be developed, hoping to conferring different factors in decision process and predicting ERP success.

## 2. Literature review and hypothesis

### *2.1. Work alienation*

Alienation refers to the deviation of values, behaviors and expectations between an individuals and the society (Seeman 1975). Marx (1844) is the pioneer came up with the idea of alienation. He posited mass production makes labor's workforce became a commodity, yet they had no or few rights to make decisions relates with their jobs, which will reduce their volition (Ollman 1976). In sum, one's self-identity, sense of belonging, self-esteem or self-cognition is affected when changes are introduced to organizations, which in turn will affect his/ her psychological states. Seeman (1959) has brought order out of this chaos with his five-fold classification: Powerlessness, Meaninglessness, Normlessness, Social isolation and Self-estrangement.

Work alienation reflects a feeling of meaningless and dissatisfaction of the assigned jobs, and inability to show up and highlight one's identity (Kanungo 1979; Tummers & Laura 2013). From these results, people may also feel alienated from technology. This is because people cannot comprehend the rapid progress of technology by his/ her knowledge or experiences, hence, is unable to realize the values and meanings of technology to economics, society or personal career, such that he/ she could not fully understand the relationship between technology and personal welfare (Dean 1961). While the subject of technology is IS, people is alienated from computer, which would cause people subjectively against using IS (Minch & Ray 1986). Users alienated from computer will have negative attitudes towards purchasing and using IS (Abdul-Gader & Kozar 1995).

Prior study regarding the effects of alienation on organizational behaviors is relatively abundant. Vickers & Parris (2007) posited that contingent workers are very likely having a strong feeling of work alienation, and therefore won't be flexible enough to fit the needs of the organizations. Furthermore, work alienation represents a feeling of

meaningless to the job, which will inhibit one from engaging in job (Hirschfeld & Field 2000; Mottaz 1981), then productivity may decrease, and the intention to resign may intensify (Comer & Dubinsky 1985). However, IS studies know little about the alienation. To the best of our knowledge, Abdul-Gader & Kozar (1995) and Akkirman & Harris (2005) are the few scholars in extant literature. Abdul-Gader & Kozar studied the impacts of computer alienation on IS investment decision; while Akkirman & Harris investigated the effects of alienation on communication satisfaction in virtual workplace. The effects of work alienation on employees' behavior intention is worthy of further research.

Alienated employees may incline to perform behaviors violating social norms such as using systems passively, idly and distractingly (Seeman 1975). Normless behaviors may damage the performance of organization. Organizations can and must adjust these behaviors through proper policies (Akkirman & Harris 2005). People's perception of system is developed gradually from knowledge and experience of system use. While using IS to fulfill missions, users perceive and evaluate the pros and cons of the system, then learn and remember advantageous experiences, and set up their perspectives in regard to the system (Venkatesh et al. 2012). To use system effectively, they must learn knowledge relate to new technology, conquer the obstacles and barriers from using the system, such as solving technical problems from system crash, and routinize system usage in their work (Cooper & Zmud 1990; Silverberg 1991). If users, after trial and error, encountered a plentiful complex functions, they may naturally feel that system is uneasy to learn (Dishaw & Strong 1999). People hence need supports from organization, like supplementing hardware/ software, more training, technical supports, etc. The more these needs are satisfied, the higher the probability of system success (Son et al. 2012).

### *2.2. Organizational support*

Igbaria et al. (1997) classified three kinds of organizational support: senior management support, training, and computing support. The latter includes promotion, technical support, manuals, and help desk etc. Policies of organizational support will help users IS usage and accumulate knowledge and experiences. For instance, aggressive management support may enrich resources, and urge more users to aggressively adopt IS; Training may benefit learning and accumulating experiences; Computing support will help to solve problems. Once enough good usage experiences were accumulated, users will understand more clearly about the values and meanings of the system, consequently, will produce more positive perceptions. Hence, Son et al. (2012) claimed that the three policies can benefit users to generate positive beliefs about the system. Previous researchers also found that organizational support could be an antecedent to ease of use and usefulness (Son et al. 2012; Davis et al. 1989). Lin and Wu (2004), based on the model of Igbaria et al. (1997), conducted a replication research in Taiwan and concluded that the above three organizational support policies all have positive impact on system implementation success.

### *2.3. Technology acceptance model*

TAM is widely deployed by studies of ERP to explain users' usage intentions (Lee 2008; Lee 2010;). It posits that an individual's beliefs about IS influence attitude, which reflects intention and in turn lead to behaviour (Davis et al. 1989). It TAM regards Perceived Usefulness (PU) and Perceived Ease Of Use (PEOU) as the two key beliefs about IS usage (Davis et al. 1989; Revel et al. 2010). PEOU is defined as "the degree that the prospective users expect that using a specific IS will be free of effort" (Davis et al. 1989). PEOU can affects PU (Zhn & Morosan 2014; Visinescu et al. 2015). PU is defined as: "the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organizational context" (Davis et al. 1989). Previous research found that PU is the main determinant of system use, especially in companies demanding for superior performance (Igbaria 1997).

TAM has been composed with distinct external variables and tested in various contexts, such as training (Son et al. 2012; Amoako-Gyampah & Salam 2004), organizational support (Igbaria et al. 1996; Son et al. 2012). Besides, personal innovativeness (Yi et al. 2006), knowledge or prior experiences (Burton-Jones & Hubona, 2006), the level of voluntariness (Venkatesh et al. 2012) or intrinsic motivations like cognitive absorption (Zhn & Morosan 2014; Visinescu et al. 2015) are widely investigated. The application of TAM is extended to e-business recently, including mobile services (Revel et al. 2010), Personal Digital Assistant (Yi et al. 2006), ERP (Wang et al. 2006; Teo et al. 2009), e-recruitment (Tong 2009), and electronic medical records (Seeman & Gibson 2009). Findings from study

indicated that the explanatory power of TAM is satisfactory.

A just adopted system may be perceived as new by members of an organization to some certain extend (Rogers 1983). Hence, it is argued that Innovation Diffusion Theory (IDT) can be used to further improve the explanatory power of TAM (Chen et al. 2002; Amaro& Duarte 2015). Chen et al. (2002) considered TAM and IDT compensating with each other. It considers relative advantage and usefulness as the similar concept. Besides, an innovation is perceived to be complexity to use, users are harder to get a sense of ease of use. Hence, complexity and ease of use can be viewed as similar concept (Chen et al. 2002; Amaro & Duarte 2015). Chen et al. suggest researchers to integrate compatibility into TAM.

## 3. Hypotheses

Research model is showed in Figure 1. By using a system that is PEOU, users may accomplish much tasks, they may then believe that advantages result from system usage. As a result, PEOU should directly influence PU (Davis et al. 1989; Revel et al. 2010; Son et al. 2012). Thus, this research proposes the following hypothesis:

Hypothesis 1: The higher the perceived ease of use, the higher the perceived usefulness.

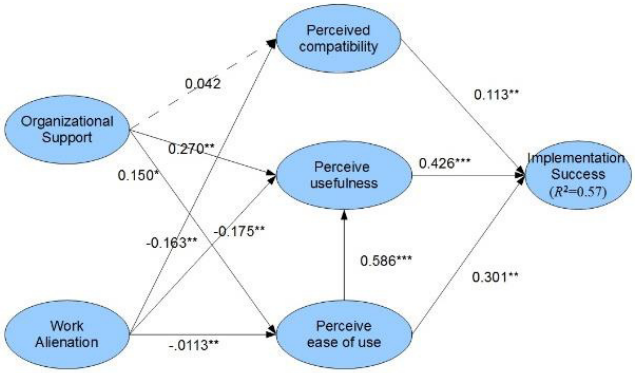


Figure1. Research model

According to the notion of performance expectancy, an individual's preference for different behaviors (such as using old or new systems) partly depends on his/ her belief about possible outcomes (e.g. new IS improves job performance) and expected results (e.g. one actively improve his/ her job performance) (Chau 1996; Son et al. 2012). In short, people will evaluate the degree of usefulness of different behaviors, then choose their behaviors based on their preferences of usefulness. Thus, this research proposes the following hypothesis:

Hypothesis 2: The higher the perceived usefulness, the stronger the implementation success.

According to the argument of effort expectancy, people will subjectively evaluate their ability before taking actions. If they believe that they are capable of completing the task, their attitude towards performing action will become positive, and vice-versa (Son et al. 2012). Since attitude leads to intension, the intention of people with high perception of ease of use will be stronger than those without such perception. Thus, this research proposes the following hypothesis:

Hypothesis 3: The higher the perceived ease of use, the stronger the implementation success.

Inferior performance or unexpected outcomes may more or less result from system usage. The higher the a priori perception of uncertainty, the more suspicious user will be in applying new technology. If an innovation is compatible with user's value, demand and experience, the uncertainty perceived will be relatively less (Rogers 1983); and the rate of adoption will be higher than that of the user who perceived incompatibility (Hu et al. 2009; Rogers 1983). Theoretically, attitude towards and intention to use system for who tend to adopt systems quickly should be more positive and stronger than those who don't. Empirically, evidence shows that compatibility is positively related to implementation success (Chen et al. 2002; Amaro & Duarte 2015; Hu et al. 2009). Hence, this research proposes the following hypothesis:

Hypothesis 4: The higher the perceived compatibility, the stronger the implementation success.

Work alienation reflects a feeling of dissatisfaction with supervisors and fellows, and isolation from, and less belonging to organization; normally, a sense of incongruence in values between an individual and the organization will exist (Aiken & Hage 1966). The higher the work alienation, the less the meanings of ongoing phenomena, such as implementing IS (Seeman 1972). Hence, for highly work alienated employee, whether the ERP system is easy to use or useful is meaningless. Such careless attitude may lead to a perception of ease of use and usefulness lower than who are not alienated from organization. In addition, the demand, value, and expectation of high work alienated employees may easily depart from target ERP system, therefore the compatibility they perceive should be lower than that of low work alienated employees. Hence, this study proposes the following hypothesis:

Hypothesis 5a: Work alienation will negatively affect perceived compatibility.

Hypothesis 5b: Work alienation will negatively affect perceived usefulness.

Hypothesis 5c: Work alienation will negatively affect perceived ease of use.

According to Triandis'(1977) IS success model, facilitating conditions are critical conditions to IS usage behavior. A comprehensive facilitating environment, such as sufficient training, computing technique support, satisfactory provision of resources etc., would improve users'voluntariness of applying new technology (Thompson et al. 1994). According to previous studies, the learning and training facilities offered by organizations (Amoako-Gyampah & Salam 2004; Son et al. 2012; Thompson et al. 1994), or the policies supported by organizations (Davis et al. 1989; Son et al. 2012) is beneficial to improve the belief of systems, such as ease of use and usefulness. Accordingly, this research proposes following hypothesis:

Hypothesis 6a: Organizational support will positively influence perceived compatibility.

Hypothesis 6b: Organizational support will positively influence perceived usefulness.

Hypothesis 6c: Organizational support will positively influence perceived ease of use.

## 4. Methodology

### *4.1 Questionnaire and measurements*

Items used in the questionnaire were adapted from prior research when appropriate. PEOU was measured by four items and PU was measured by two items adapted from Revel et al. (2010). Fourteen items measuring work alienation adapted from Mottaz (1981) whereas Organizational support was measured by two items adapted from Chen and Luo (2014). ERP implementation success adapted from Wang et al (2008). All items were measured on a 5-point Likert scale except questionnaire for respondent demographic. For content validity of the instrument, two professors were invited to review the questionnaire. All the questionnaire are listed in Appendix A.

### *4.2 Data analysis*

Data was collected from a state-owned enterprise (abbreviated as S company) located in Taiwan. S company was promoting the new ERP which optimal from SAP, employees are either beginning or about to use the ERP. The new system, built on the Web infrastructure, offers comprehensive functions to assist work process. Compared with the substantial separated 23 e-system, the new one offers much more abundant functions; the manual with several hundred pages was provided to help users to guide operating this ERP system.

Respondents are drawn from employees of stated-owned power company, S. Compared with employees in private companies, employees in State-owned enterprises will have more resources for resisting, and therefore will have more power in affecting ERP implementation. There are mutual relations between an organization and its employees. Whether the employees will support the organization should be affected by whether the employees perceived they are part of the organization and whether the organization supports them. Convenient sampling was used to collect data. The survey lasted for around one months (from 2015/5/14 to 2015/6/28). In total, 200 respondents were delivered and retrieved afterwards.

Table 1. Confirmatory Factor Analysis Results

| | PU[a] | IS | PEOU | OS | AL |
|---|---|---|---|---|---|
| PU1 | 0.93 | -0.21 | -0.01 | -0.1 | -0.41 |
| PU2 | 0.95 | -0.14 | -0.06 | -0.04 | -0.41 |
| IS1 | -0.21 | 0.91 | 0.15 | 0.33 | 0.12 |

| | | | | | |
|---|---|---|---|---|---|
| IS2 | -0.07 | 0.93 | 0.15 | 0.33 | 0.08 |
| IS3 | -0.2 | 0.94 | 0.14 | 0.33 | 0.1 |
| IS4 | -0.14 | 0.92 | 0.16 | 0.35 | 0.12 |
| IS5 | -0.25 | 0.93 | -0.08 | 0.1 | 0.08 |
| PEOU1 | -0.05 | 0.15 | 0.92 | 0.08 | -0.04 |
| PEOU2 | -0.03 | 0.17 | 0.95 | 0.12 | -0.04 |
| PEOU3 | -0.03 | 0.14 | 0.94 | 0.11 | -0.05 |
| PEOU4 | 0.01 | 0.11 | 0.9 | 0.06 | -0.09 |
| OS1 | 0.02 | 0.06 | 0.13 | 0.72 | 0.12 |
| OS2 | -0.08 | 0.37 | 0.1 | 0.87 | 0.17 |
| AL1 | -0.12 | 0.24 | 0.06 | 0.09 | 0.89 |
| AL2 | -0.1 | 0.29 | 0.15 | 0.14 | 0.88 |
| AL3 | -0.15 | 0.27 | 0.14 | 0.1 | 0.91 |
| AL4 | -0.32 | 0.13 | 0.09 | 0.02 | 0.8 |
| AL5 | -0.41 | 0.16 | 0.16 | -0.06 | 0.86 |
| AL6 | -0.23 | 0.19 | 0.01 | 0.09 | 0.63 |
| AL7 | 0.35 | -0.06 | -0.07 | -0.01 | 0.73 |
| AL8 | 0.28 | -0.1 | -0.08 | -0.06 | 0.77 |
| AL9 | 0.33 | 0.01 | -0.03 | 0.04 | 0.81 |
| AL10 | 0.29 | 0.03 | -0.09 | -0.01 | 0.49[b] |
| AL11 | 0.4 | -0.02 | -0.27 | -0.02 | 0.7 |
| AL12 | -0.14 | -0.02 | -0.12 | -0.13 | 0.86 |
| AL13 | -0.22 | -0.2 | -0.31 | -0.18 | 0.81 |
| AL14 | -0.01 | 0.14 | -0.21 | -0.22 | 0.9 |
| AL15 | -0.31 | -0.13 | -0.33 | -0.25 | 0.82 |
| AL16 | -0.36 | 0.04 | -0.17 | -0.3 | 0.37[b] |
| AL17 | -0.14 | -0.02 | -0.12 | 0.1 | 0.83 |
| AL18 | -0.22 | -0.2 | -0.31 | -0.28 | 0.85 |
| AL19 | -0.01 | 0.14 | -0.21 | -0.22 | 0.81 |
| AL20 | -0.1 | 0.26 | 0.01 | -0.01 | 0.88 |
| AL21 | 0.11 | 0.13 | 0.09 | 0.02 | 0.84 |

[a]: IS: Implementation success; PEOU: Perceived Ease Of Use; PU: Perceived Usefulness; OS: Organizational Support; AL: work ALienation

## 5. Results

All scales were assessed in terms of reliability, convergent validity, and discriminant validity. We used Composite reliability to verify the reliability of the survey instrument. According to Bagozzi & Yi's suggestions (1988), all of the constructs obtained a composite reliability score greater than 0.7, indicating the internal consistency of the measurement. Convergent validity can be assessed against two standards: (1) the items coefficient should be greater than 0.7; and (2) the average variance extracted (AVE) should be greater than 0.5 (Fornell& Larcker, 1981). As seen from the CFA results in Table 1, all items exhibit coefficient (>0.70) on their respective concepts, except two items (AL10, AL16). After deleting these two items, all item coefficients were greater than 0.7 and all AVE were larger than 0.5, confirming the convergent validity is sufficient. According to Bagozzi & Yi"s suggestions (1988), based on the square root of AVE assessment of discriminant validity, all concepts share more variance with their indicators than with the other concepts, which reinforces the discriminant validity of our model (Table 2).

Table 2. Correlation Matrix

| | IS | PEOU | PU | OS | AL |
|---|---|---|---|---|---|
| IS | 0.91* | | | | |
| PEOU | 0.20 | 0.85 | | | |
| PU | 0.47 | 0.39 | 0.89 | | |
| OS | 0.32 | 0.38 | 0.31 | 0.87 | |
| AL | -0.38 | -0.33 | -0.32 | -0.26 | 0.73 |

*: Diagonals represent the square root of AVE, while the other matrix elements indicate the correlations among constructs.

Partial Least Squares (PLS) is appropriate for comprehensively testing the proposed model. Consistent with the distribution free, predictive approach of PLS, the structural model was evaluated using the R-square for the dependent constructs and the size, t-statistics and the structural path coefficients (Chin 1998). We used Smart PLS 3.0 to test the hypotheses (Ringle et al. 2015). The results of the hypotheses testing were shown in figure 1.

The variance explained ($R^2$) for implementation success is 0.57, indicating that the research model has satisfy explanatory power. Hypotheses 1 predicted that PEOU positively affect PU. The effects of PEOU and PU on implementation success are consistent with the hypotheses, both of them reveal positive correlations, and therefore the results support hypothesis 2 and 3. Hypothesis 4a and 5a predict that work alienation and organizational support have negative and positive effects on PU. Work alienation, consistent with the prediction, negatively affect PU. Organizational support positively influences PU. In sum, the analyses tend to support H4a and t H5a. Hypothesis 4b and 5b predict work alienation and support have negative and positive effects on PEOU. Work alienation negatively affect PU. Organizational support positively affects PU. In sum, the analyses tend to support both H4b and H5b.

## 6. Conclusions

PU is the most influential antecedent to ERP implementation success and its effect is more crucial than PEOU. To exert the greatest performance of ERP, the enhancement the PU in particular, become essential and critical issues. More, organizational support positively affects PEOU but work alienation affects PEOU negatively.

The organizational support does not affect perceived compatibility. One possible reason is the ways of working in S company is by staffs' personal skill, experience, and organizational support networking to achieve. The new ERP is using as a platform to control and assist work process. Some workflows on ERP are first attempt. Staffs using ERP were just because forced by management-level. The new ERP system is more complexity then prior e-system, and it is still in early stage of implementation, hence, the organizational support may still be insufficient; which may lead to unfamiliarity of the new system. The statistics of system usage support the above argument. Among all the respondents, there are 55% staff use ERP only once per week, and the rest of the staff use ERP four to five times per week. There are 81% staffs use ERP less than half an hour per time.

The findings from this research may open some opportunities for future researches. Since it is harder for highly work alienated employees to perceive the meaning for what is happening in surrounding, employees usually conduct behavior deviated from social norm such as gambling to serve their purposes (Trevorrow & Moore 1998). Therefore, work alienation may somehow make system users deviate from normal behaviors. Work alienation is a psychological state which may exist in most people to a certain extent. This perception may impact personal beliefs and behaviors. Therefore, alienation may not only affect the success of IS, but may also impact various behavior intentions induced by the usage of systems. In other words, we can regard work alienation as an antecedent to individual's behaviors related with IS, and try to discover the role of alienation in various related theories.

Though this study provides several new insights into the work alienation effect on ERP implementation, our results should be treated with caution for several reasons. We used a convenient sampling approach to collect data. For this reason, it should be kept in mind when drawing conclusions based on our results. Data was collected from a state-owned enterprise located in Taiwan. Thus, the set of results are specific to a specific mentality. Therefore, the valid of results obtained could limited.

## Appendix A. items (*Please request from d93725009@ntu.edu.tw)*

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