Chapter II

Literature Review

This chapter provides a review of past research in the area related to the research objectives of the present study. Relevant studies from the two paradigms of research are reviewed in order to provide the theoretical background of the topics being investigated. Further, the theoretical models and the Technology Acceptance Model (TAM) in the stream of user acceptance are reviewed. A discussion regarding the theories concerning resistance to change follows, and the chapter ends with the theoretical foundation of user attitude.

2.1 User Acceptance

Information System (IS) researchers have sought to understand what contributes to the success and failure of IS implementation. User acceptance is regarded as the pivotal episode of implementation since it is a process in which users form their attitude towards system use and behavioral intention to use (Davis, 1989; Davis, Bagozzi, and Warshaw, 1989; Venkatesh and Davis, 2000). Among the studies focusing on user acceptance, it seems that significant attention has been given in order to verify and modify TAM. Originally, this model was adapted from the Theory of Reasoned Action (TRA), the theory that explains individual intention to perform a specific voluntary behavior. TRA theorizes how an individual intention is determined by a person's attitude and subjective norm (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975). Attitudes are influenced by salient beliefs concerning the outcomes of the behaviors in evaluation. Perceived Usefulness (PU) and Perceived Ease of Use (PE) are two salient beliefs theorized as determinants of users' attitudes towards using a system (Davis et al., 1989). The original version of TAM is illustrated in Figure 1. This earlier version of TAM prompted IS researchers to broaden the body of knowledge concerning user acceptance. Various variables, such as training, management support, result demonstrability, computer self-efficacy, and so forth, were included to augment the explanatory power of TAM (Legris, Ingham, and Collerette, 2003).

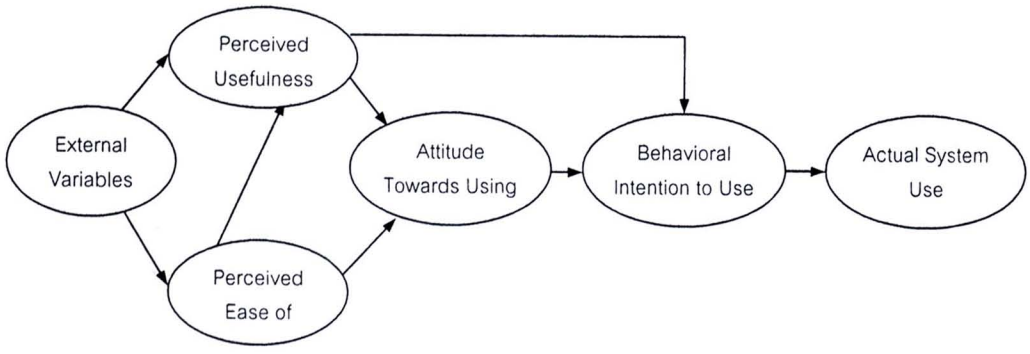

Figure 1 Original TAM (Davis et al., 1989)

As TAM was being empirically tested in many studies, there were on-going concerns regarding determinants of PU with the aim to provide a viable way for organizational interventions during the IS implementation process, which would help to gain user acceptance. To address this concern, Venkatesh and Davis (2000) extended TAM into TAM2, as shown in Figure 2, by including the influence of social influence processes (subjective norm, voluntariness, and image) and cognitive instrumental processes (job relevance, output quality, result demonstrability, and perceived ease of use). The findings showed that empirical data from four organizations measured at three different points of time strongly supported TAM2. Interestingly, contradictory results between voluntary and mandatory settings were found. Subjective norm, which was one of the three immediate determinants, was not found to have a direct significant relationship with behavioral intention in a voluntary setting. On the other hand, this construct appeared to significantly influence intention in a mandatory context during early stages of implementation but not after three months after implementation. This is consistent with the Theory of Planned Behavior (TPB), dealing with the situation that individuals have no control over their behaviors. The inclusion of voluntariness and social influence processes seems to provide a clearer picture. The distinctiveness of these two contexts should be recognized as pivotal factors in terms of gaining user acceptance. When users are required to use the system, social influence processes can be used to promote acceptance among users.

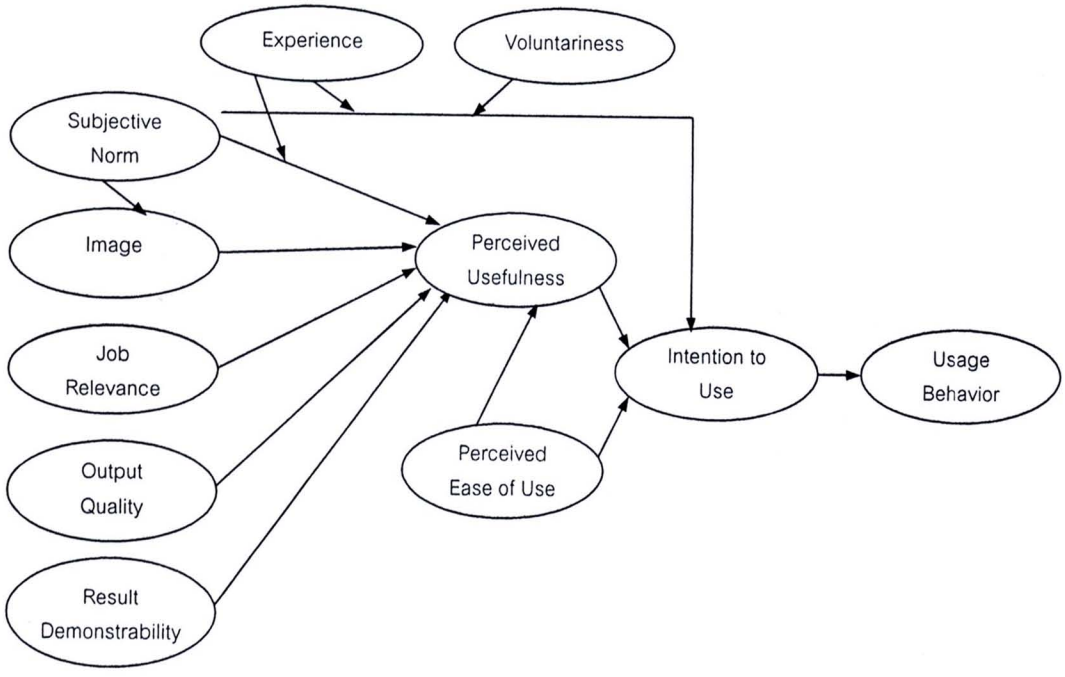

Figure 2 TAM2 (Venkatesh and Davis, 2000)

Later, Venkatesh et al. (2003) proposed the Unified Theory of Acceptance and Use of Technology (UTAUT). The authors reviewed a stream of user acceptance research theorized using intention or usage as a dependent variable. Eight competing models - TRA, TAM, Motivational Model, TPB, the combined TAM and TPB, the model of Personal Computer (PC) utilization, Innovation Diffusion Theory, and Social Cognitive Theory – were identified from prior studies. Their determinants of intention or usage were then empirically tested in order to formulate the unified model. From the test results, performance expectancy, effort expectancy, social influence, and facilitating conditions were theorized to be direct determinants of behavioral intention and usage behavior having gender, age, experience, and voluntariness of use as moderating variables, as depicted in Figure 3. Similar to TAM2, UTAUT confirmed the important role of social influences in determining usage behavior in a mandatory setting. Moreover, the results showed a significant relationship between system usage and facilitating conditions defined as an individual belief concerning an organizational and technical infrastructure to support the use of the system available. In a nutshell, the advancement

of this stream of research provides a clear understanding of how various factors and their interaction explain the technology usage behavior. Apart from the current determinants of system usage included in UTAUT, it was suggested that more attention should be paid to the link between user acceptance and individual or organizational usage outcomes. This is an interesting direction of this research stream since it provides a more holistic picture of user acceptance. Not only should users use the system as intended, the system usage should contribute to the organizational performance as well. It would not be favorable if the system usage could hurt individual or organizational efficiency.

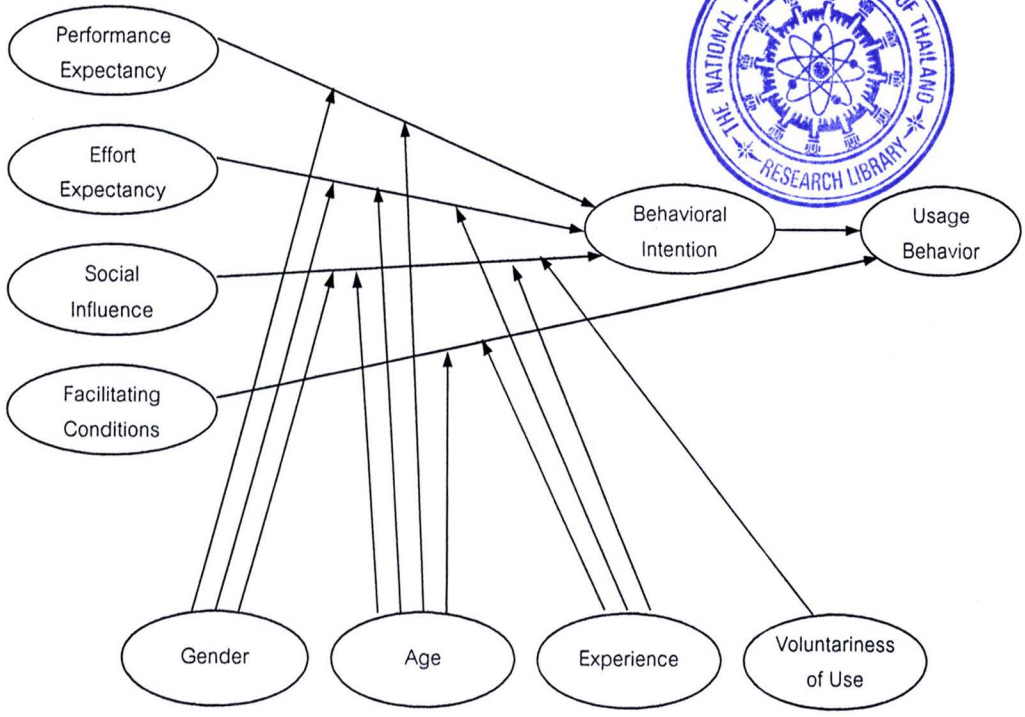

Figure 3 Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003)

2.2 User acceptance within an ERP Context: A Mandatory Use Environment

Enterprise resource planning (ERP) can be defined as a business software system that allows an organization to share common data and practice across business functions (Marnewick and Labuschagne, 2005). It consists of several generic modules such as finance, human resources, supply chain management, supplier relationship management, customer relationship management, and business intelligence. One of the important components of ERP is the process flow since the ultimate goal of an ERP is, in general, the seamless integration. All business functions will be modeled and linked to create a smooth integration. Ultimately, data will be entered once into the system and shared across the entire organization. This helps to eliminate the problems of data inconsistencies and redundancies. On the other hand, it creates interdependencies among business functions using the same data. If data are not entered correctly or completely, it will disrupt the whole chain of business process. In this case where user tasks are integrated with other users, they are required to use the system in order to support other users' functions. Hence, the usage within an ERP context seems to be mandatory (Brown et al., 2002).

In view of technological diffusion, a model of the IT implementation process depicted the process as combining six stages; initiation, adoption, adaptation, acceptance, routinization, and infusion (Cooper and Zmund, 1990). The acceptance was defined as the process in which organizational members are encouraged to commit to system usage. Apparently, the sphere of research in TAM emphasized only the role of system usage. But in an ERP context where system usage is mandatory, it seems to be incomplete to place the usage as a dependent variable. In order for users to commit to system usage, the level of system usage is most likely to provide a limited view of user acceptance. To illustrate the problem of system usage as a dependent variable in a mandatory context, Brown et al. (2002) compared three theoretical models: parsimonious TAM (a user attitude construct excluded), original TAM, and TPB, in the context of mandated technology. It was hypothesized that attitude would play a crucial role in understanding mandated use settings. The relationships in parsimonious TAM

were found to be consistent with previous studies (Davis et al., 1989; King and He, 2006). PU and PEU were significantly related to a behavioral intention. When user attitude was included into TAM as a mediator between these two perceptions and behavioral intention, PU was not significantly correlated with an intention to use but it was a significant predictor of user attitude. In the case of TPB with subjective norm and perceived behavioral control included, the relationship between attitude and the behavioral intention was not significant. Only perceived behavioral control and subjective norm were found to be positively significant related to the behavioral intention.

The findings of this study showed a different pattern of relationships in the mandated usage context, as previous research had suggested (Venkatesh and Davis, 2000; Venkatesh et al., 2003). The authors of this study argued that users could possibly use a mandated system without positive attitudes or satisfaction. They could have negative attitudes which could negatively affect outcomes of individuals or an organization. Another study concerning the issues in predicting and explaining usage behaviors with TAM and TPB in a mandatory context conducted by Rawstorne et al. (2000) also found similar results. With the inclusion of attitude, subjective norm, and perceived behavioral control, TPB tended to be marginally better than TAM in terms of predicting the behavioral intention and actual behaviors.

The appropriateness of the system usage as a dependent variable in a mandated usage environment seems to be skeptical. Rawstorne et al. (1998) argued that measuring user intention in this particular setting would be unusable and unsuitable. In the situation where user intention, which is actual adoption, does not seem to be tenable, symbolic adoption was hypothesized to be more pertinent (Karahanna, 1999; Rawstorne et al., 1998). This reflects a mental acceptance process where users agree to an idea of using a system (Klonglan and Coward, 1970). Having been argued to be justifiable as a dependent variable in a mandatory environment, symbolic adoption will be used as a proxy in determining user acceptance (Rawstorne et al., 1998). When usage is mandated, it would be a nuisance to measure the system usage, as the level

would be unrealistically high. It would be provocative to have the system usage represent the level of user acceptance.

A new system introduced to an organization can be viewed as an innovation. Assuming that an innovation has two components, the idea about innovation and its artifact, the adoption process will involve at least two decisions: whether to accept the idea and whether to use the innovation (Klonglan and Coward, 1970). This provides an alternative view of user acceptance of IS implementation. In a mandated use environment, users have no control over the decision whether to use the system, but they have full authority to either welcome or deny the idea of the new system. Hence, symbolic adoption seems to provide a complementary view in this unique environment. It was defined as the degree to which users mentally accept the idea of the new system implemented voluntarily when they are required to use the system involuntarily (Karahanna, 1999; Nah et al., 2004). Users with a positive attitude are most likely to accept the idea regarding the new system. Nah et al. (2004) empirically tested the model by employing symbolic adoption as a dependent variable for measuring user acceptance in an ERP context. Survey data showed that symbolic adoption and user attitude were two different constructs where symbolic adoption was determined by attitude.

2.3 Resistance to IS Implementation

When organization members anticipate an undesirable outcome from a change initiative, they will endeavor to hinder the organizational change process. Like any change initiative, an implementation of an information system is most likely to bring a change into an organization. This change can affect the organization at different levels. At an individual level, a new system can improve job performance. On the other hand, it can be a threat to some individuals. Undesirable outcomes will prompt individuals to impede the implementation process.

Resistance to IS implementation has been recognized as a main barrier to the success of the system. IS researchers have recognized the importance to

understand this phenomenon. Heretofore, only five models have been proposed to provide theoretical explanations of this so-called resistance phenomenon (Joshi, 2005; Lapointe and Rivard, 2005; Marakas and Hornik, 1996; Markus, 1983 ; Martinko, Henry, and Zmud, 1996). The following section will examine definitions of resistance discussed in these five models in order to conceptualize the concept of resistance to IS implementation. Despite the fact that there have been a few studies regarding resistance to IS implementation in IT and IT-related journals, resistance to change in general has been studied to a great extent in the stream of organizational change research. Thus, definitions of resistance to change described in organizational theories will be discussed to gain a broader perspective and to shed light on the understanding of this concept. After reviewing definitions of resistance in the context of IS implementation in its specific form and organizational change in general, resistance to IS implementation will be conceptualized in order to develop a research framework for this research.

Markus (1983), in her pioneer work of resistance to IS implementation, evaluated three basic types of resistance theories with data of a single case. Three divergent types of theories are: people-determined theory, system-determined theory, and interaction theory. The underlying assumption of a people-determined theory is that people resist change because of factors internal to them, such as characteristics, cognitive style, and so on. However, a system determined theory suggests technical factors. From the standpoint of this theory, people perceiving a system with technical flaws will resist change. An interaction theory assumes the causes of resistance differently. An interaction between characteristics of people and characteristics of systems causes people to resist change.

Since there are many aspects of interaction theory, Markus' study (1983) focuses only on a political variant caused by an IS implementation. When a new system is implemented, it could alter the distribution of power in an organization horizontally and vertically. When organization members feel the loss of power, they tend to resist the new system implemented. A single case of an implementation of a financial information

system was used to validate the aforementioned theories in her study. The comparison between resisters and non-resisters revealed no difference in their cognitive or psychological styles. Although a non-resister was rotated into a position of resisters, resistance did not disappear as predicted by the people-determined theory. The implemented financial system was initially criticized of having technical problems. Later, changes in technical functions were made to resolve the problems. Even though all technical problems were fixed, resistance still persisted. By no means did rotating people or technical improvement reduce resistance since it was found that this financial system modified the power distribution by causing gain and loss of power among groups of employees. It was the political variant that caused the resistance among employees. In the light of the interaction theory, it appeared that this theory better explained events of resistance in this organization.

Joshi (1991) introduced an equity-implementation model (EIM) built upon equity theory, a well-defined theoretical framework concerning judgment of fairness in a social context. He argues that an individual or a user is likely to evaluate the change that the system implementation brings to them at three levels: self, self and the employer, and self and other users. It is believed that the greater the inequity, the greater the distress and vice versa. This model implies that individuals will evaluate most changes before they begin to resist a change. This is to say, individuals will adopt changes and later resist changes perceived unfavorable. At the first level of this model, users determine a net change in an equity status of self by comparing outcomes and inputs required by a new system. They welcome a change with the positive net gain (Δoutcomes - Δinputs) and decline a change which they perceive to be inequitable. Possible inputs regarding an information system implementation include workload, skills, cognitive or mental effort, time, learning and so forth. Possible outputs are job satisfaction, work environment, job security, job performance, power in an organization, etc.

At the second level of this model, users compare relative outcomes of self with their employers since they are likely to feel that the gains should be shared

fairly in proportion to expected deservingness of each party. Deservingness is defined as weighted average of outcome expected based upon criteria such as contributions, merit, equality, or other criteria. Users would decline a change if their employer was considered to gain greater relative outcomes compared to them.

At the third level, users would compare self with other users in their reference group in terms of relative outcomes. A perception of fairness would determine an assessment of change consequences. Users would evaluate whether benefits were shared fairly among user groups. When they felt that some groups of users obtained greater benefits even though they had not benefited much, they would not welcome a change and would resist it. Joshi's (1991) model provides insights into how users evaluate a change in terms of its impact on their equity status. The evaluation of net gains determined by changes in their inputs and outcomes and a comparison between self and the employer and the other users will lead users to resist the change if they perceive the loss of their equity.

Marakas and Hornik (1996) posited that resistance can manifest itself in a covert manner and may not be motivated by either criminal intent or personal gain. On the other hand, resistance to change can be a recalcitrant, covert behavior resulting from the fear and stress that challenge users' status quo. The authors defined this form of resistance to change as Passive Resistance Misuse (PRM). Passive-aggressive (P-A) behavioral theory and action science's espoused theories vs. theories in use are two theoretical foundations supporting their claims. P-A behaviors represent actions intending to be insubordinate or refusing to follow orders. These behaviors are considered as a pattern of active-ambivalence to gain social or occupational performance through passive resistance behaviors such as procrastination, stubbornness, and so forth. In a model of P-A behavior proposed by Fine et al. (1992), five elements including rigidity, resentment, resistance, reactance and reversed reinforcement are believed to interact as a continuum. Rigidity and resentment are assumed to lead to resistance and reactance, consequently leading to reversed reinforcement. This model suggests that individuals with rigidity and resentment will be

likely to express resistance and show reactance behaviors. Finally, they will try to achieve reversed reinforcement by causing problems in order to gain a sense of power and gratification.

Despite a large majority of studies viewing resistance behaviors as expressed overtly, one possible alternative to expressing anger and frustration may be cover resistance according to the concept of this model. This can happen since individuals may act differently from what they say they do. Users might extensively participate with all activities in an IS implementation project but covertly resist an implementation. In the light of the theory of action, espoused theories are what individuals claim to follow and theories-in-use are what they do. It is possible for these two theories to be inconsistent. Marakas and Hornik (1996) stated that these inconsistencies are a conscious decision of a recalcitrant user, of which espoused theories are covert actions while theories-in-use are covert actions. Although the form of passive resistance behaviors is difficult to be observed, it should be recognized as a factor affecting the success of IS implementation.

Martinko et al. (1996) proposed the attributional model of reactions to information technology (AMRIT) building upon concepts of attribution theory and learned helplessness (LH). Attribution theory suggests that individuals' beliefs about their outcomes are most likely to determine their subsequent behaviors. LH theory is one aspect of attribution theory found to be relevant to the issues of actions to an IS implementation. LH is defined as passive behaviors resulting from prior failure. Individuals' future behaviors are determined by their attributions regarding their prior failures and successes. The ARMIT model proposes that external and internal influences would affect individuals' casual attribution process, which, in turn, influences behavioral and affective reactions to information system through expectations. According to the model, individuals are possibly influenced by their co-workers and supervisors, technology characteristics, and management support. Moreover, individual differences about their past experiences and attributional style are stimulate attributions regarding the anticipated outcomes with IS implementation. The model adopted the

most-accepted attribution framework combining locus of causality and stability as two dimensions of individuals' beliefs about their potential achievement. The anticipation of future outcomes would lead not only to behavioral reactions classified into three categories; acceptance, resistance, and reactance, but affective reactions as well. The relationship between the casual attributions and reactions is medicated by expectations referring to individuals' beliefs about their ability to accomplish a task. These expectations can be both efficacy expectation and outcome expectations. Even though the AMRIT model has not yet been empirically validated, an extensive set of possible variables are included into the model in an attempt to open the black box of resistance phenomenon.

Applying the theory of resistance to IS implementation, Lapointe and Rivard (2005) summarized definition of resistance in IT literature as shown in Table 1. From these definitions, they used semantic analysis to define resistance to IS implementation. The analysis indicated five basic primitives: resistance behaviors, an object of resistance, perceived threats, initial conditions, and a subject of resistance. Employing case study, their study discovered the pattern of resistance to change as the emergence process of group resistance behavior. The model of resistance to IT implementation proposed in this study suggested that the interaction between initial conditions and an object of resistance would result in perceived threats inducing resistance behaviors.

It can be posited that resistance occurs when the implementation of a new system provokes a change which then alters routine behaviors of individuals. If the change is undesired, an individual will try to maintain the status quo by exhibiting various forms of behaviors ranging from covert activities to aggressive actions. Resistance behaviors can vary greatly from ignorance, negligent or avoidance to aggressive resistance behaviors such as strikes, boycotts, or sabotage, etc. Definitions shown in Table 1 suggest behaviors are a key aspect of resistance.

Since the concept of resistance to IS implementation was adapted from other disciplines, the literature in organizational change is included to gain a much

broader perspective in understanding this phenomenon. Some representative sampling views of resistance to change are shown in Table 2. In general, resistance refers to any attempts that try to slow, impede, hinder or reject change in order to maintain the status quo. Despite the fact that resistance was mostly seen as individuals' actions or responses, some researchers apprehended it differently. Although many studies are behavior research in nature, organizational change research offers the attitudinal aspect of resistance to change.

The components of attitude have been empirically investigated to explain why individuals resist change. The attitudinal aspect of resistance to change could enlighten understanding resistance to change since resistance behaviors might not be able to be directly observed. A view that reflects resistance to change beyond individual behaviors could capture the complexity of this phenomenon and provide more understanding about how individuals respond to change (Piderit, 2000).

With the complex nature of the resistance to change, Piderit (2000) argued that resistance to change should be conceptualized as combining three important components of attitudes. Resistance to change was defined as multidimensional attitudes responding to change which include cognitive, affective and intention.

As a cognitive component, individuals are not ready for change and hold negative thoughts about the change. Argyris (1997) described an obstacle to change as cognitive impairment which is the result of a striving for control to legitimize power. It is defensive reasoning that limits learning and action. In general, individuals tend to develop faulty, irrational ideas or a negative schema (Bovey and Hede, 2001b). As a consequence, their interpretation of change is likely to be the process of cognitive distortion. For instance, they select ideas that are consistent with their expectation and tend to overgeneralize their knowledge.

Table 1 Definition of Resistance in IT literature (Adopted from Lapointe and Rivard (2005))

Source	Definition
Keen (1981)	The tactical approach to implementation sees resistance as a signal from a system in equilibrium that the costs of change are perceived as greater than they likely benefits
Markus (1983)	Behaviors intended to prevent the implementation or use of a system or to prevent system designers from achieving their objectives
DeSanctis and Courtney (1983)	Resistance to the MIS sometimes occurs when people experience Changes in the content of their jobs and their relative power
Joshi (1991)	Equity theory suggests that the greater the inequity or decline the net gain, the greater the resulting distress would be, individuals who experiences the distress of inequity are likely to resist it by attempting to minimize their inputs and outers' outcomes as well as attempting to increase others' inputs
Ang and Pavri (1994)	Resistance to change is a normal psychological reaction when the perceived consequences (e.g., loss of power) are negative
Martinko et al. (1996)	User resistance to the implementation of IT can take on a wide variety of behavioral forms
Marakuas and Hornik (1996)	A recalcitrant, covert behavior resulting from both fear and stress stemming from the intrusion of the technology into the previously stable world of the user
Lee and Clark (1996/1996)	The resistance may be nothing more than inertia, but it also stems from a healthy suspicion of new and unproved market systems. Furthermore, parties affected adversely by the change are expected to fight reengineering efforts
Enns et al. (2003)	Resistance is displayed when the target avoids performing the requested action by arguing, delaying, etc.

Table 2 Various views of Resistance to Change

Source	Description
Costee (1999)	Opposed energies and powers aimed to impede, decline, or stop change for positive or negative purposes
Labianca et al. (2000)	Cognitive barriers to any attempt trying to increase power sharing among employees and management
Piderit (2000)	Attitude towards change consisting of three components – cognitive, affective, and intention
Bovey and Hede (2001a)	Physical actions or mental process engaging in either supporting or resisting organizational change
George and Jones (2001)	Results of dynamic interplay between cognition and affect during individual change process
Ford et al. (2002)	Responses to change as social constructed reality derived from past successes and failures
Zell (2003)	Needs of human systems to keep the existing order to avoid powerful feelings triggered by change
Val and Fuentes (2003)	Any efforts or inertia trying to maintain the status quo or hindering change

As an affective component, individuals feel frustrated and anxious when experiencing the change. It is generally a mental process that cannot be seen or heard (Bovey and Hede, 2001a). They process new information based on pre-existing knowledge or prior expectations (George and Jones, 2001). The discrepancies between the new information and their beliefs trigger an emotional reaction such as fear and anxiety. Change often brings anger, sadness, and anxiety to individuals.

As an intention component, individuals behave undesirably against the change. Undesirable behaviors are considered as physical actions that can be seen or heard (Bovey and Hede, 2001a). Individuals may openly express or conceal them.

During organizational transformation, they can avoid, ignore or engage in activities, ranging from peaceful boycotts and strikes to sabotage and terrorism (Coetsee, 1999).

According to Fishbein and Ajzen (1975) in their renowned work, the theory of reasoned action and the theory of planned behavior, it is believed that individual attitudes will determine their course of actions. It is reasonable to posit that the attitudinal aspect allows researchers to understand how individuals form their attitudes which will eventually develop into resistance behaviors. Thus, in this study, resistance to IS implementation is defined as attitude towards an implementation of a system within an organization consisting of cognitive, affective, and behavioral attitudes which aim to impede the implementation for positive or negative purposes.

Piderit (2000) asserted that a view reflecting resistance to change beyond individual behaviors could capture the complexity of this phenomena and provide more understanding about how individuals response to change. The multidimensional view of resistance to IS implementation will reflect individuals' responses to an IS implementation in both physical actions and mental processes. Thoughts and feelings can be examined to show individual intention to resist the implementation. With a multidimensional approach, the complexity of how users respond to the implementation can be examined in broader meaning.

2.4 User Attitudes

Attitude appears to be a central argument in TAM and resistance to IS implementation. It refers to a summary of evaluation of a psychological object (Ajzen, 2001). Based on TRA, user attitude in TAM was hypothesized as the attitude towards using the system which would affect behavioral intention to use (Davis et al., 1989). It appears that user attitude in TAM refers a system usage to a psychological object. When users evaluate system usage during the course of an IS implementation, they seem to evaluate the functionality of the system since no actual usage is available. On the other hand, a psychological object of resistance to IS implementation can be patterns of interaction or new routines introduced by the system, input and output of

change process, and characteristics of the system (Lapointe and Rivard, 2005). To gain a richer meaning of the role of attitude, two psychological objects are conceptualized as two main drivers in determining user acceptance and user resistance. Hence, there are two attitude-based constructs to be examined in this study, including attitude towards system usage and resistance attitude. TAM generally refers to object-based attitude (Wixom and Todd, 2005). Thus, resistance to IS implementation symbolizes context-based attitude.

Even though it was suggested that attitude should include three main components: cognition, affect, and intention, in TAM literature, a behavioral intention was separated as being a main construct (Davis et al., 1989; Venkatesh et al., 2003; Yanga and Yoo, 2004). In this current study, behavioral intention is also treated separately from user attitude since its concept is close to an actual behavior. It could be controversial to treat a behavioral intention as one of user attitude components. And user attitude will include only cognitive and affective elements.

2.5 Phases of ERP Implementation Life-Cycle

This research focuses specifically on the ERP implementation process. In a practical way, users learn about the idea of the system through training sessions or participation in the implementation process. Based on existing life cycle models, vendor implementation methodologies, and previous studies, Ahituv et al. (2002) proposed a generic model for ERP implementation life cycle. This included four important phases: selection phase, definition phase, implementation phase, and operation phase. These four phases are explained in greater detail below.

2.5.1 The Selection Phase

This phase is the process of selecting and identifying the ERP package most suitable for an organization for which it has identified the objectives of ERP adoption. ERP has proved to bring a wide array of benefits to an organization. Shang and Seddon (2000) have provided a comprehensive framework in understanding ERP

benefits. It is believed that ERP benefits can be categorized into five dimensions: operational, managerial, strategic, IT infrastructure, and organizational.

1. Operational benefits: ERP may help to automate business processes and allow process changes which, in turn, reduce cost, reduce cycle time, improve productivity, improve quality, and improve customer services.
2. Managerial benefits: With the ability to integrate and centralize data, management will have timely and complete information to better manage resources, plan and make decisions wisely, and improve organizational performance.
3. Strategic benefits: ERP can also support an organization strategically by offering a new opportunity for executing strategies such as business growth, business innovations, cost leadership, product differentiation, and external linkages.
4. IT infrastructure benefits: The ERP infrastructure is believed to provide business flexibility for current and future changes, reduce IT costs, and increase IT infrastructure capability.
5. Organizational benefits: ERP can potentially support organizational changes, facilitate business learning, empower organization members, and lead to common visions.

An organization will seek prospective ERP vendors and consulting firms. Information about ERP and the implementation process will initially be acquired during this process. The vendors and consulting firms will be required to submit their proposal. They will be evaluated based on the criteria preferred by the organization. Mostly, technological, economical, and organizational aspects are three focuses in the evaluation process. When the organization considers the ERP implementation feasible and the most suitable ERP has been identified, the implementation project will be awarded to the selected vendor and consulting firm. Finally, contracts are negotiated and signed by all parties involved.

2.5.2 The Definition Phase

This phase includes all preparatory tasks for the implementation. It begins with the scope definition. The scope of work in the project is defined and the implementation method selected. Further, this phase covers the formation of the implementation team. The ERP implementation involves a considerable number of parties. Somers and Nelson (2004) identified the key players that have a vital role during ERP implementation, including:

1. Top management – it is widely known that management support is one of the most critical success factors determining the success of ERP implementation (Gargeya and Brady, 2005). The support and commitment from top management define the level of resources. They can also direct the view of users.

2. Project champion – the role of project champion helps to promote the success of implementation by leading, facilitating, and marketing the implementation project and the system.

3. Steering committee – Consisting of senior management from different business functions and key stakeholders, a steering committee is involved from the selection phase and then also plays a pivotal role in monitoring project activities.

4. Implementation consultants – In general, outside consultants are hired to install and implement the ERP system. It is suggested that positive relationships with consultants lead to the success of ERP implementation (King, 2005).

5. Project team – Skills and knowledge of project team members are crucial to the ERP implementation success. The team should be a good mixture between business professionals and technological experts.

6. Vendors – There are various aspects of vendors affecting the ERP implementation. A good partnership between the software vendor and the

organization contributes to the project success. Additionally, vendor support ensures long-term success, as the organization will requires technical assistance, maintenance, or updating in the near future.

In addition, for team mobilization implementation teams are trained in order to work in forthcoming activities with adequate skills and knowledge. Even though this phase is probably the shortest of all phases, it lays a good foundation for the later phases of the implementation since it sets forth the scope of work for an implementation project. Efforts for the project are estimated, and if the amount of effort is underestimated, it could lead to resource shortage or project delay, for instance.

2.5.3 The Implementation Phase

This is the main phase of the life cycle establishing the ERP system into an organization. Within the implementation phase, nine important steps are identified.

1. Gap analysis – this is the process to identify the gap between the existing process and the process recommended by the ERP system. After the gaps are detected, a recommendation is given to handle the gaps.
2. Business process reengineering – it is not mandatory to reengineer the business process when ERP is implemented. However, the implementation tends to bring drastic change to the organization and leads to business process reengineering.
3. Identification complementary solutions – It is quite impossible for ERP to fulfill every need of an organization. Sometimes, it may need additional development, acquisition of further modules, or additional manual work processes.
4. Construction of a prototype – A prototype helps to illustrate the designed work flow of the new ERP system. It indicates to the users of the new business processes whether their expectations are matched.

5. Data conversion – During the implementation process, data from the old system is converted into the format corresponding with the new ERP. This is generally a painstaking process.
6. Definition of work procedures – Work procedures need to be updated to match with the new ERP system. A work procedure manual is recommended to be developed for users.
7. Full implementation of the system – After the completion of previous activities, the full-scale implementation is executed.
8. Training of users – In order to be able to use the system effectively, users are provided with various kinds of training, for example, classroom training, on-the-job training, and so on.
9. User acceptance test – Actual data are used to test the system to ascertain whether it is performing up to the desired level. The acceptance test is normally conducted using test cases or real business scenarios.

2.5.4 The Operation Phase

The last phase is the operation phase where ERP is used to support the operation of an organization. There are five steps included in this phase:

1. Establishment of support centers – Support centers are established to facilitate users with learning materials and technical assistance.
2. Performance of changes and enhancements – Change seems to be inevitable for an organization. ERP is refined to cope with changes that will visit the organization.
3. Upgrading the system – Mostly, a maintenance agreement is available for the organization in order to keep the ERP updated with the new technology.
4. System audit – An audit is performed periodically to ensure that the system meets users' requirements.

5. System termination – The organization can decide to terminate the ERP system when the system is no longer useful or the cost of operation is higher than the replacement or termination cost.

2.6 The Stage of ERP Implementation in Thailand

Chandrachai et al. (2006) conducted a survey of the stages of ERP implementation in Thailand. The survey covered 471 companies listed in the Stock Exchange of Thailand in 2004 and 571 companies were known to have adopted an ERP system. A total of 170 companies returned the questionnaire providing information about the investment, usage, and success of ERP systems. Key findings of this study are shown below in Figure 4 - Figure 7.

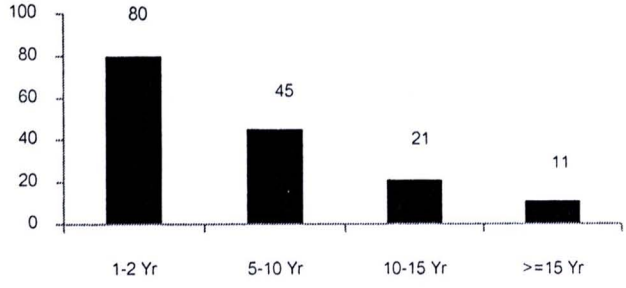

Figure 4 Years of ERP usage

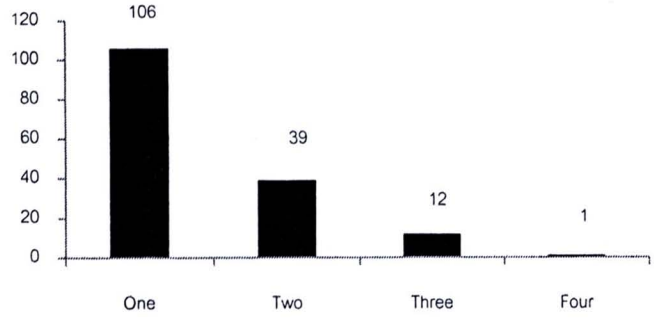

Figure 5 No. of ERP(s)

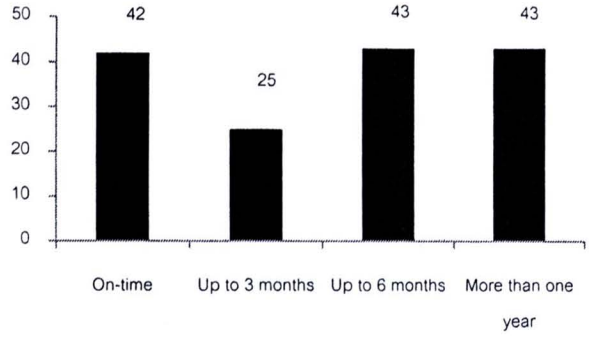

Figure 6 No. of projects delayed

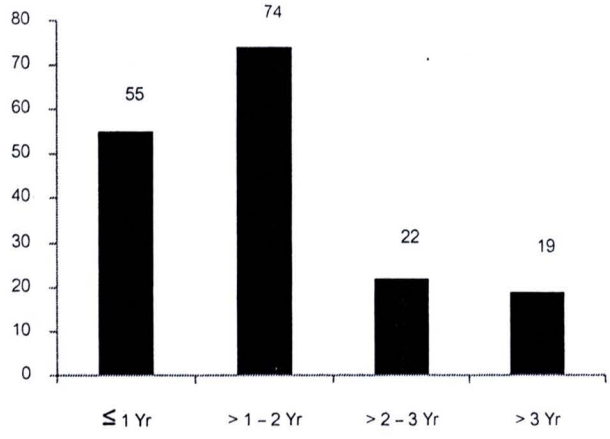

Figure 7 Years of implementation

Evidently, a large number of companies in Thailand had already implemented ERP and had used the system during a certain period. Interestingly, despite the fact that most of the ERP projects followed the well-proven implementation methodologies, the survey data show a high rate of projects delayed - around 82.5%. Further, the findings show that more than a half of responding companies took more than one year to implement the ERP system.

2.7 Conceptual Framework

Derived from prior works in different areas of research, including user acceptance, resistance to change, and organization theories discussed previously, the framework for this research is conceptualized as shown in Figure 8.

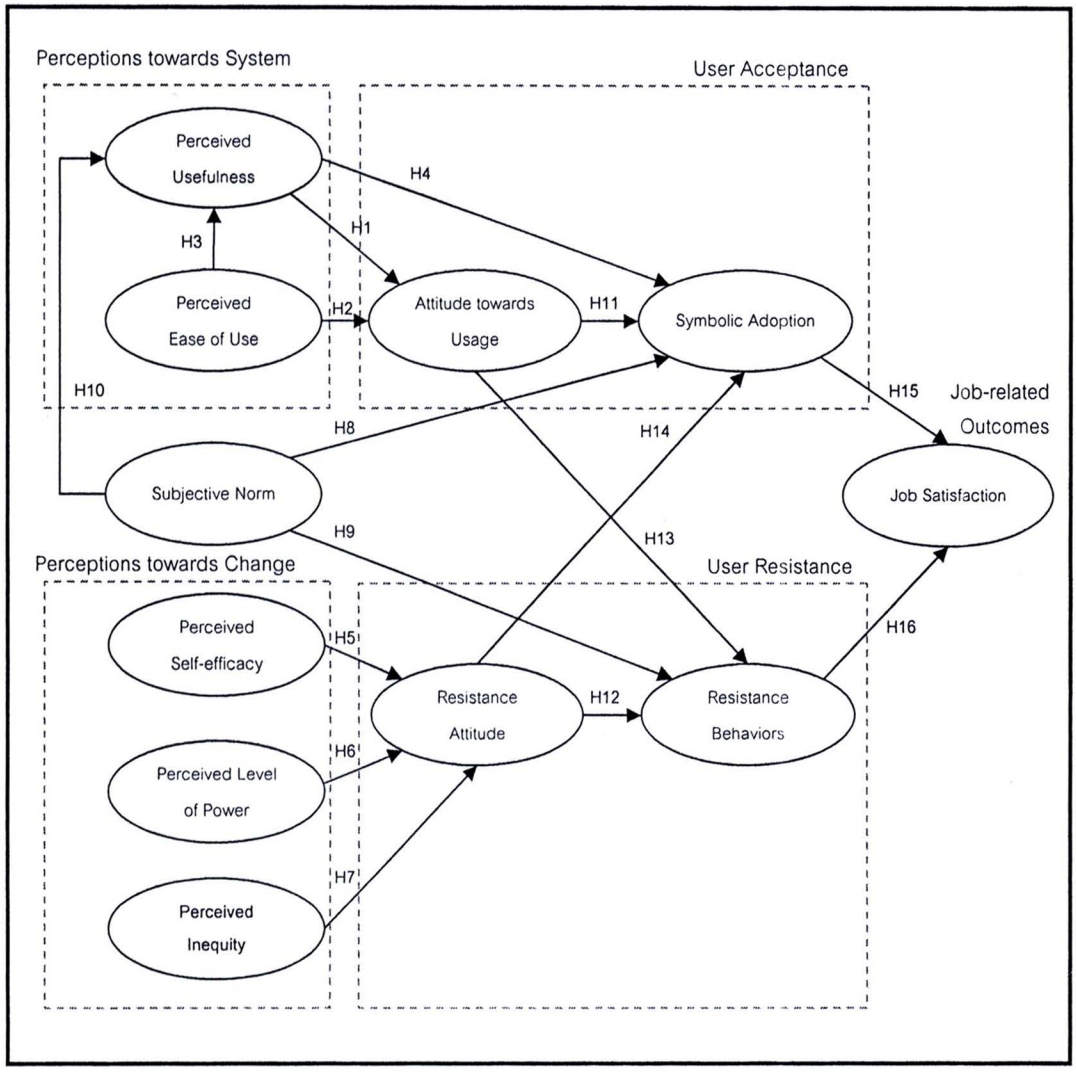

Figure 8 A theoretical model linking user acceptance and user resistance in a mandatory use environment

This model represents the linkage between user acceptance and user resistance in a mandatory-use context. The essence of this model involves the two sets of attitudes important to users in this particular setting, namely, attitude towards usage and resistance attitude. Users with a positive attitude towards usage will be more

accepting, whereas users with a high resistance attitude will exhibit resistance behaviors. This models all occurrences in which an individual possesses a positive attitude towards usage and has a high resistance attitude, because user acceptance and user resistance are not conceptualized to be located on opposite ends of a continuum.

Attitude towards usage would be determined by perceptions towards system. On the other hand, resistance attitude would be affected by perceptions towards change. Consequently, these two attitudes together with subjective norm will influence symbolic adoption and resistance behaviors, representing user acceptance and user resistance, respectively. Expectedly, the consequences of user acceptance and resistance would impact job-related outcomes.

2.7.1 Perceptions towards System

PU and PEU are the salient beliefs that have been found to determine user attitude during IS implementation. 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). PEU refers to "...the degree to which the prospective user expects the target system to be free of effort..." (Davis et al., 1989). According to TAM, PU and PEU are two object-based beliefs predicting behavioral dispositions by influencing attitude towards a system (Davis et al., 1989; Nah et al., 2004; Wixom and Todd, 2005). This represents the way in which users evaluate a system. It primarily focuses on its characteristics. Users perceiving a new system to be useful and easy to use will develop a good attitude towards the system. Most studies have found a significant relationship between PU and user attitude in both voluntary and involuntary settings (Davis, 1993; Venkatesh and Davis, 2000; Venkatesh et al., 2003). On the other hand, the results indicating a relationship between PEU and attitude were found to be inconsistent. A meta-analysis conducted by King and He (2006) concluded that the major effect of PEU is mostly through PU rather than directly on behavioral intention. However, the study suggested

that the sample size may have accounted for the inconsistencies of the findings. Hence, to retest previous findings, this study hypothesizes:

Hypothesis 1: Perceived usefulness will have a positive direct effect on attitude towards usage.

Hypothesis 2: Perceived ease of use will have a positive direct effect on attitude towards usage.

Hypothesis 3: Perceived ease of use will have a positive direct effect on perceived usefulness.

In addition, PU was originally hypothesized to influence intention to use. When symbolic adoption substitutes the behavioral intention to use, the relationship has not been tested. Thus,

Hypothesis 4: Perceived usefulness will have a positive direct effect on symbolic adoption.

2.7.2 Perceptions towards Change

Self-efficacy was considered as an important variable affecting beliefs and behaviors (Igbaria and Iivari, 1995). It refers to the comprehensive summary of perceived capability to mobilize the motivation, cognitive resources, and courses of action needed to perform a specific task (Gist and Mitchell, 1992). While expectations are believed to be a theoretical underlying foundation of research on user acceptance (Davis et al., 1989; Fishbein and Ajzen, 1975), self-efficacy was predicted to affect individuals' outcome expectation. Based on empirical data, Compeau and Higgins (1995a) argued that self-efficacy influenced individuals' expectations regarding performance outcomes and personal outcomes. Calvert (2006) argued that an ERP user who has a lack of self-efficacy might not accept the system (See also; Compeau and Higgins, 1995a; Venkatesh and Morris, 2000). This indicates that ERP users with a low level of perceived self-efficacy could develop resistance attitude which would lead them

to resist the ERP implementation. Although it could be argued that perceived self-efficacy could be one of resistance antecedents, there have been only a few studies attempting to versify this argument. Thus to examine the role of perceived self-efficacy as an antecedent to resistance to IS implementation, this study hypothesizes:

Hypothesis 5: Perceived self-efficacy will have a negative direct effect on resistance attitude.

Various causes of resistance to IS implementation have been identified by previous research. Of all the studies focused on the resistance phenomenon, most employed a qualitative research method and identified various causes of resistance behaviors. Given the paucity of research in this area, there is scarce empirical evidence of the relationship between causes of resistance and resistance behaviors. Despite the diverse reasons why users resist the implementation, resistance occurs because users perceive threats brought by a system (Klaus, Wingreen, and Blanton, 2007; Lapointe and Rivard, 2005). In general, users will perceive threats in the situation where they anticipate negative outcomes (Lapointe and Rivard, 2005; Martinko et al., 1996) such as a loss of power (Markus, 1983) or a loss of equity (Joshi, 1991). Perceived threats can be defined as the degree to which the prospective users consider that the system being implemented will yield negative outcomes. Bhattacherjee and Hikmet (2007) proposed the dual-factor model theorizing the perceived threats to be a determinant of user resistance. The empirical data showed a positive significant relationship between perceived threats and resistance to change.

In this study, two main threats identified from previous studies in IS literature are loss of power (Markus, 1983) and loss of equity (Joshi, 1991). An introduction of a new system could possibly modify the distribution of power in an organization. Markus (1983) illustrated the case of organization members with a high level of power affected by the change brought by the new system implemented. They were identified as resisters. It could be reasonable to expect that an individual with a high level of power in an organization would be most likely to resist IS implementation. In addition, Joshi (1991) argued that organization members will evaluate fairness derived

from changes in their inputs and outcomes. Moreover, they will compare net changes between self and the employer and others. If the result of the evaluation is perceived to be inequity, resistance to change is most likely to occur. Therefore, this study hypothesizes:

Hypothesis 6: A high level of power in an organization will have a positive direct effect on resistance attitude.

Hypothesis 7: Perceived inequity will have a positive direct effect on resistance attitude.

2.7.3 Subjective Norm

Subjective norm is defined as a perception of social pressure to perform the specific behavior (Ajzen, 1991). Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB) theorized subjective norm as a determinant of a behavioral intention. It implies that users will evaluate the judgment of people who are important to them in order to use the system. If these people think that they should use the system, they will be persuaded to do so. TAM, which was developed based on these two theories, also included subjective norm into the model in order to explain individual intention to use a system (Venkatesh and Davis, 2000; Venkatesh et al., 2003). Even though a survey of literature in TAM revealed the inconsistencies in the role of subjective norm as the antecedent of intention (Sun and Zhang, 2006), studies in the context of a mandatory usage environment found a significant role of subjective norm in a user acceptance process (Venkatesh and Davis, 2000; Venkatesh et al., 2003). Generally, subjective norm will influence behavioral intention whether through compliance, internalization, or identification process.

In this study, although behavioral intention to use was excluded, symbolic adoption was substituted. Rawstorne et al. (1998) suggested that subjective norm would influence individual symbolic adoption. However, there was no empirical

evidence to support the claim. It is probable that social influence would lead ERP users to agree more with the idea of using the system. Hence, to verify this:

Hypothesis 8: A high level of subjective norm will have a positive direct effect on symbolic adoption.

In addition, resistance behaviors, as mentioned previously, are also expected to be affected by subjective norm. Through the compliance process, the normative pressure would keep users restrained from resistance behaviors if people who are important to them think that they should use ERP. Subjective norm would cause a mechanism influencing an individual to comply with the ERP adoption decision. Thus, the study hypothesizes:

Hypothesis 9: A high level of subjective norm will have a negative direct effect on resistance behaviors.

Furthermore, the effect of subjective norm on perceived usefulness was found significant in a mandatory setting (Venkatesh and Davis, 2000). It was explained that users internalized social influences which, in turn, promote usefulness perceptions. This lead to:

Hypothesis 10: A high level of subjective norm will have a direct effect on perceived usefulness.

2.7.4 User Attitude

With the aim to investigate the role of user attitude in predicting user acceptance and user resistance, there are two sets of user attitudes in attention: attitude towards usage and resistance attitude. Nah et al. (2004) conducted an empirical investigation on user acceptance of an ERP system. The results of their work showed that attitude towards usage was a key determinant of symbolic adoption. Through a process of internalizing perceptions related to an ERP system, attitude towards usage was formed and predicted a degree of symbolic adoption. Therefore:

Hypothesis 11: A high level of user attitude towards usage will have a direct effect on symbolic adoption.

Following TRA theoretical ground, resistance attitude would be expected to predict resistance behaviors. Fishbein and Ajzen (1975) postulated attitude as a predictor of behaviors in evaluation. Bovey and Hede (2001b) found that the relationship between attitude components and intention to resist was significant in their study on organizational change. Irrational ideas and emotion would lead an individual to resist a change. An individual with a high level of resistance attitude would be most likely to express resistance behaviors. Hence:

Hypothesis 12: Resistance attitude will have a direct effect on Resistance behaviors.

As mentioned earlier, one of the main aims in this study is to explore the connection between user acceptance and user resistance through the role of user attitude. Since there has been a lack of empirical evidence showing that attitude towards usage affects resistance behaviors or resistance attitude would negatively influence symbolic adoption, this study empirically assesses these two relationships. Since symbolic adoption and resistance behaviors are hypothesized to be influence by their attitudinal predictors, it could be possible that attitude construct of user acceptance could affect user resistance behaviors and vice versa. Based on conceptualization of TRA that an attitude is a theoretical predictor of behaviors, this study follows this precept by arguing that high attitude towards usage will decrease resistance behaviors. On the other hand, high resistance attitude will decline a level of symbolic adoption. Thus, this study hypothesizes:

Hypothesis 13: A high level of attitude towards usage will have a negative direct effect on resistance behaviors.

Hypothesis 14: Resistance attitude will have a negative direct effect on symbolic adoption.

2.7.6 Job-related Outcomes

Brown et al. (2002) argued for the need for the right dependent variable for a mandated IS use environment and also indicated that user negative attitudes potentially influence individual perception of job and organization such as job satisfaction and loyalty towards the organization. As well, Venkatesh et al. (2003) encouraged future research to pay more attention to the link between user acceptance and job-related outcomes, for instance, organizational commitment. Oreg (2006) empirically tested consequences of resistance to change on job satisfaction, intention to leave the organization, and organizational continuance commitment, finding that the effects of resistance to change on these particular outcomes were significant. As with the research in the IS context, attention paid to the effects of information system on job-related outcomes has been increasing. Joshi and Rai (2000) developed and tested a causal model of the relationship between IS characteristics and users' job-related outcomes. Job satisfaction was used to determine the level of impact on users' job. It was believed that ERP would potentially change the jobs of employees (Davenport, Javenpaa, and Beers, 1996; Mullarkey et al., 1997). Potentially, ERP would affect users' job-related outcomes. Job satisfaction and organizational commitment are theoretical constructs that have been used extensively in the organizational behavior literature (Anderson, Coffey, and Byerly, 2002; Boswell, Boudreau, and Tichy, 2005; Cuong and Swierczek, 2008; Kankaanranta et al., 2007; Tett and Meyer, 1993; for instance). This current study investigates how ERP affects job-related outcomes of users' new job using ERP. It is expected that the alteration of individual job by ERP will impact on job satisfaction. Job satisfaction refers to one's affective attachment to the job (Tett and Meyer, 1993). The authors viewed the level of analysis as a particular job which an individual was contracted to do by the organization. This job was believed to be immediate, local, and concrete source of experience. Therefore, job satisfaction will be adopted to be job-related outcomes to examine the individual impact at job level.

Symbolic adoption and resistance behaviors are conceptualized to be dependent variables of user acceptance and user resistance, respectively, in this

proposed model. These two constructs present the degree to which individuals accept and resist a new IS being implemented. In order to assess the individual impact on job-related outcomes, this study hypothesizes:

Hypothesis 15: A high level of symbolic adoption will have a positive direct effect on job satisfaction.

Hypothesis 16: Resistance behaviors will have a negative direct effect on job satisfaction.

2.8 Summary of Chapter II

Research in the two lines of literature has been reviewed to provide the theoretical background for the present research. User acceptance and user resistance were seen to share common theoretical fundamentals. Then, the theoretical framework is proposed with the aim to examine the linkage between these two research paradigms as well as their effects on job-related outcomes. The next section will discuss the research methodology employed to validate the proposed model.