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## **A PROPOSED MODEL FOR THE INVESTIGATION OF IMITATION BEHAVIOR ON ERP ADOPTION**

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### **ABSTRACT**

In the proposed project, we will investigate the imitation effect on technology adoption using Enterprise Resource Planning (ERP) systems as an example. This approach will offer a completely new perspective on IT adoption as a less rational behavior, even for critical ERP investment at the organizational level. Along with this investigation of the imitation-adoption relationship, our research will evaluate the moderating effect of experience on imitation behavior. We believe that imitation behavior will be strongest when an organization is considering ERP for initial adoption. However, when an organization has accumulated ‘experience’ of ERP over time, its adoption of subsequent ERP modules will probably follow a more rational decision process, as explained by traditional adoption theories.

*Keywords:* Imitation model, ERP Adoption

### **INTRODUCTION**

In the last two decades, various well-tested models, such as the technology adoption model (TAM), task-technology fit (TTF) model, diffusion of innovation (DOI) theory and Triandis model, have been applied to explain the information technology (IT) adoption behaviour. Many researchers (such as Chau [5], Mathieson et al. [33], and Venkatesh and Davis [47]) then attempted to further expand and/or modify the original models to make them more complete theoretically. However, by nature of their assumptions, these models still focus primarily on the logical side of human behavior: that all adoption processes are systematically conducted and followed a rational path, i.e. they assume that a person or an organization has a complete picture of the situation and is able to anticipate the consequences that will follow each choice [30, 41]. Furthermore, they presume that there are rules by which one can follow to select the best alternative [20]. Yet, they are only able to describe a portion of the adoption behavior, and it is also well known that a lot of the IT adoption initiatives failed wasting millions of dollar in the process [26, 48].

In reality, it is simply impossible to obtain perfect information for a rational evaluation of new or emerging ITs. Without perfect information, and the awareness of the lack of it brings forth uncertainty. When uncertainty occurs in a decision making process, the logic sequence failed as it would not be possible to anticipate the consequences and to select the best alternative accordingly. In situations with uncertainty, sometimes the “best alternative” may not be the direct result of logical deduction described in the various adoption models, instead we may turn to sometime different all together – we imitate. Imitation does not remain only on an individual level, it occurs at an organizational level as well. DiMaggio and Powell [11] argued that initial adoption of innovation was largely caused by the desire to improve performance. However, as the innovation gains increasing popularity, a threshold is reached and beyond that adoption of innovation becomes a pursuit for legitimacy rather than necessity. From this perspective, imitation can also be regarded as an optimal response to a particular type of uncertainty [3].

In this paper, we evaluated the direct impact of the rational and imitation behaviours on the beliefs of ERP systems. The imitation model adopted in this research is based on the framework proposed by Haunschild and Miner [18], which is comprehensive in its classification of imitation modes. Furthermore, we chose to use DOI as a reference model for the rational IT adoption behavior due to its maturity and theoretical completeness, along with its capacity to investigate organizational ERP systems. Our research also evaluated the moderating effect of adoption experience on imitation and ERP belief, along with the moderating effect of uncertainty, competition, and innovativeness on the relationship of the imitation-rational behaviors in the ERP adoption process.

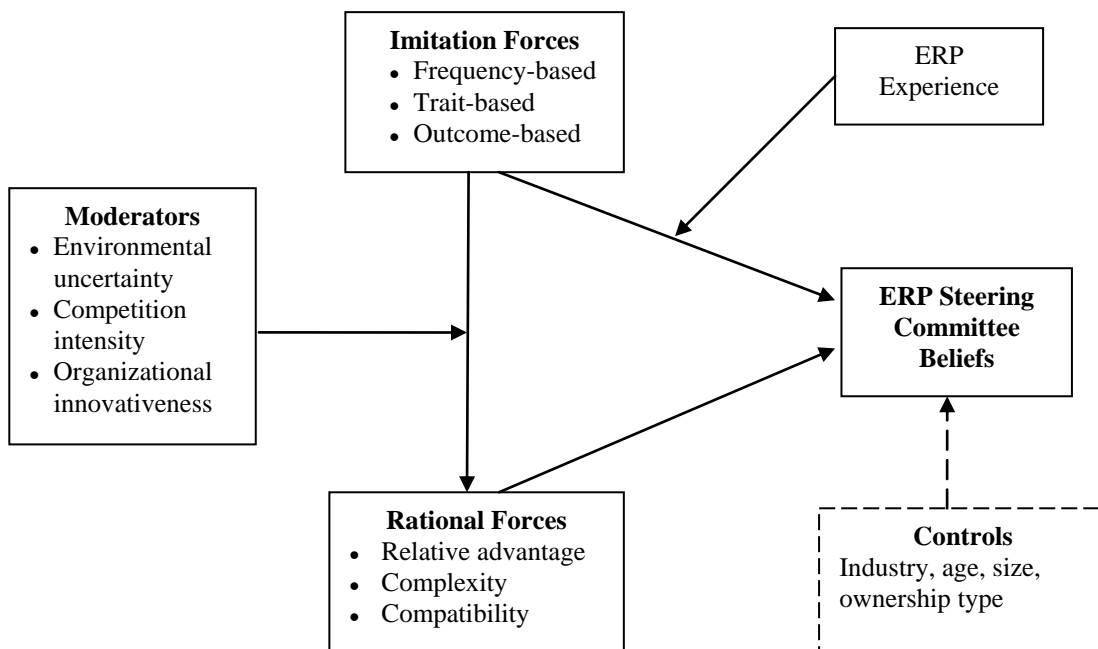
### **THEORETIC BACKGROUND**

Drawing on the institutional and learning theories, Haunschild and Miner [18] distinguished three distinct modes of inter-organizational imitation – frequency-based, traits-based, and outcomes-based. The *frequency-based imitations* proposed by March [30] suggests that if there is enough social actors to do a particular action, this action will be taken for granted and other social actors will take similar action. The *trait-based imitation* can be seen as a more selective form of imitation [28]. Organizations often identify themselves with other organization which they view is more legitimate or successful, because it is what they are all striving to achieve. In doing so, they mimic their course of action due to the belief that actions taken by successful organizations will more likely to yield positive outcome. Trait-based imitation is based mostly on social, rather than technical, consideration, because it is often the “trait” that influence the decision making process

and not the potential outcome. The *outcome-based imitation* is based primarily on technical consideration, since this type of imitation arises from the perceived consequences of the practice, therefore outcome-based imitation is more likely to be a technical process than a social one. It is commonly believe that, in outcome-based imitation, organizations will tend to adopt practices of other organizations that yield positive or successful outcome.

### RESEARCH MODEL

The purpose of this research is to identify and understand the interaction of rational and imitation behaviors on ERP evaluation and to offer a completely new way to look at technology adoption at an entirely different angle. Our proposed research model adapted Haunschild and Miner's [18] three forms of imitation behavior: frequency-based, trait-based, and outcome-based, in an attempt to evaluate their effects on the belief of the ERP Steering Committee, and subsequently the adoption decision. Moreover, ERP experience is proposed as a moderating variable of this imitation-belief relationship. The term ERP experience in here represents whether the company has already adopted an ERP module prior to our research.



### RESEARCH HYPOTHESES

#### *Effects of Imitation*

Frequency-based imitation suggests that organizations are more likely to imitate a certain action if that action has been taken by a large number of other organizations. The massive introduction of ERP systems to organizations is bound to have critical implication to those that are still considering or have not adopted ERP. The sixty-seven percent adoption rate of ERP among the mid- and large-size organization [26] enhances the legitimacy of the ERP practice and suggests the technical value of ERP, which in turn causes more adoption consideration by others. The increase in the frequency of ERP adoption directly creates positive externality and change the landscape of competition. Consequently, companies were “forced” to adopt ERP because their major clients did; while others decided to do so because many of their rivals in the same industry have already done so. In many cases, companies are afraid that they will lose their competitive advantage without the technology or that they will be deemed “old fashioned” or “layback” if they do not follow the current trend and risk losing support from their stakeholders. Hence, frequency of ERP adoption may serve as a valid proxy indicator of its technical value, which in turn could shape the beliefs of top management favourably for its subsequent adoption. These phenomena have been described in the theories of Bandwagon [1] and validated in studies such as Fligstein [12] and Palmer et al. [36]. Therefore, we postulate that:

*Hypothesis 1: The perceived number of organizations using a particular ERP system will have a positive impact on the belief of the Steering Committee in the ERP adoption process.*

Trait-based imitation refers to a set of more specific imitation behavior. Organizations may selectively imitate practices that have been used by a certain type of organizations, namely higher-status, larger, and more successful organizations [3]. ERP is seen to be a good way of cutting cost and increase profit margin [39] as demonstrated by Wal-Mart, Dell etc which is crucial for their success and turn them into the leader in their respective industry. Unfortunately, many ERP initiatives fail because

organizations do not understand the resources and commitment required for an ERP implementation and plunge themselves in just because other big players already have it [40, 49]. Despite these failures, management still believes the effectiveness of imitating the large and successful organizations in reducing the chances of ERP failures. Liang et al. [26] argue that top management succumb to imitating their successful peers or competitors to maintain the legitimacy of their ERP adoption decisions and avoid any potential loss of face. Hence, members of ERP Steering Committee mediate the impact of trait-based imitation forces on ERP adoption. In other words, they serve as a gatekeeper to evaluate the ERP practices and benefits from the leading organizations for a favourable or unfavourable belief that could be translated into actions for adoption decision and implementation. Consequently, we posit that:

*Hypothesis 2: The perceived size and success of organizations using a particular ERP system have a positive impact on the belief of the Steering Committee in the ERP adoption process.*

Outcome-based imitation refers to the practice when organizations use the outcomes that occur in other organizations as a basis to determine if, they too, should adopt the same practice [17, 18, 25]. ERP systems have emerged as complete business software systems that, ideally, facilitate enterprise-wide integration of information worldwide without geographical restrictions [38]. In practice, however, ERP implementation is complex and ERP success is even harder to achieve [49]. Therefore, potential ERP adopters have to imitate successful ERP adopters, by analyzing their adoption outcomes, and evaluate these possible outcomes in their own context. Hence, ERP vendors often publicize the positive outcome of their customers, as a marketing strategy to change the perceived ERP values, particularly in the turmoil of low success rate of ERP. Copy organizations from their successful ERP use generates a second-mover advantage of unexpected or unsought unique benefits, including the accrual of an external referent of prestige. These unanticipated benefits, along with the expected benefits of lower adoption risks and costs, could become a driver for the management to favourably shape their beliefs of ERP systems for their eventual adoption. Therefore,

*Hypothesis 3: The perceived performance of organizations using a particular ERP system has a positive impact on the belief of the Steering Committee in the ERP adoption process.*

In this research, experience is proposed as a moderating variable of the imitation-belief relationship to understand the effects of ERP experience, in term of its adoption and use, on changing the imitation behavior and belief of ERP among the Steering Committee members. Since ERP systems can be adopted in modules, therefore in the initial adoption stage, an organization will perhaps only consider a few critical ERP modules for implementation. At this stage of adoption, the effects of imitation might be stronger. This could be because the users still perceive ERP to be vague and ill informed (uncertainty), and are thus motivated to imitate others as a basis of their decision [11]. However, it is also possible that the direct effect of imitation on ERP adoption may subside over time as the organizations become more familiar with the ERP system and its operations. When the ERP Steering Committee members are more informed of the risks, benefits, and acceptance associated with the continued use of ERP, their decisions on the subsequent ERP system upgrade will rely more on the usefulness, ease of use, and other information that have been accumulated from the earlier ERP experience. In other words, the Committee will perceive and evaluate ERP systems independently of other organizations, which suggests that their adoption decision are less susceptible to the imitation forces. Hence:

*Hypothesis 4a: Organizations that have not adopted any ERP systems are more likely to imitate because their Steering Committee has a weaker belief in the ERP systems.*

*Hypothesis 4b: Organizations that have adopted at least one ERP module are less likely to imitate because their Steering Committee has a stronger belief in the ERP systems.*

### ***Effects of Innovation Characteristics***

The findings from DOI research have identified a strong correlation between an innovation's relative advantage and the user's attitude towards its use. Chau and Lai [7] and Liao et al. [27], for example, have empirically confirmed that relative advantage has a significant direct effect on attitude towards the use of Internet banking. In so far as intention to adopt and actual system use are concerned, Tan and Teo [44] also provided evidence to support the criticality of relative advantage to intention to use and the eventual use of an innovative IT. It is obvious that the benefits of ERP supersede most of its competing systems, which in turn could favourably influence the belief of the steering committee for possible ERP adoption. Hence:

*Hypothesis 5: The relative advantage of ERP has a positive impact on the belief of the steering committee in the ERP adoption process.*

The incompatibility of ERP to the existing values, past experience, and needs have negative effects on its adoption and diffusion. An incompatible innovation would inhibit further innovation use and implementation due to adoption resistance and implementation complexity. Prior DOI research (for example, Moore and Benbasat [34] and Tornatzky and Klein [46]) have already validated that practical compatibility and value compatibility are both essential for enhancing adoption decision and incompatibility of either consideration could significantly negatively affect the innovation's use and adopters' attitude. Chau and Hu [6] also validated that when users are accustomed and entrenched in a particular working habit, it is unlikely that they will accept a technology that is

perceived to be incompatible with their practices. Subsequently, it is likely that the ERP incompatibilities will have an adverse effect on the steering committee's beliefs which in turn will lead its members to evaluate ERP negatively for adoption.

*Hypothesis 6: The compatibilities of ERP have a positive impact on the belief of the steering committee in the ERP adoption process.*

ERP systems are difficult to understand, use and implement [13, 19, 21], though they exhibit higher performance across a wide variety of financial metrics [35]. When the new system or tasks performed with the new system is complex, an individual will spend more time learning and understanding the new system, thereby adversely affect their attitude towards the system. In other words, when there is less or little extra cognitive learning effort required for the use and implementation of ERP, the steering committee's belief on ERP may be more favorable. The association between learning, complexity, and IT adoption has also been validated in prior TAM and DOI investigations. These studies have identified the positive effects of perceived ease of use [5, 10, 32] and negative effects of perceived complexity [2, 14, 22, 37, 46] on the innovation's attitude, intention to use, and its eventual adoption. Hence, we postulate our hypothesis as follow:

*Hypothesis 7: The complexity of ERP has a negative impact on the belief of the steering committee in the ERP adoption process.*

### ***Effect of Imitation Behavior on Rational DOI Behavior***

Plenty of research has been conducted on the cognitive biases in managerial decision making and it has been consistently shown that managers are boundedly rational and not perfectly rational [e.g. 4, 15, 41]. Managers make biased decision because they can only handle a fraction of the available information during the decision-making process [15, 31, 42]. Therefore, based on the theory of bounded rationality, a manager (or a group of them) will be unlikely to digest the large amount of statistical reports, financial analyses and case studies while trying to make an ERP adoption decision; and at the same time relates to every single piece of the available information (thus the manifestation of bounded rationality). Instead, he/she will likely be focused on only a few salient subsets of the entire available information, such as if other companies have been using it with very good results. Hence, we are proposing that the imitation force has an impact on the effort being put into evaluating ERP adoption because once managers regard that imitating bigger, more profitable competitors is "satisficing" (under the bounded rationality concepts), this will be enough to stop further investigation into the matter.

*Hypothesis 8: The three-mode of imitative forces will have a direct impact on the rational evaluation of ERP's characteristics. More specifically, higher levels of frequency-, trait-, and outcome-based imitation will lead to less emphasis on the relative advantage, compatibility, and complexity of ERP in the adoption process.*

*Environmental uncertainty* does not only have a direct cause of imitation, it can also assert a moderating effect on the imitation-rational ERP evaluation relationship. The fundamental idea behind this argument is due to the belief that in an uncertain environment where organization has very limited information to judge whether their adoption decision could provide a favorable result, and that the result of the adoption cannot be immediately apparent, organizations simply do not have enough data to base their logical judgment on. Along with the increase pressure to find a way to better manage the current uncertain situation, the "logical" action to take is to imitate (in this case, frequency, traits, or outcomes) and less on the rational evaluation of the ERP system, since the contrary cannot be ascertained with any degree of confidence. As such, high environmental uncertainty suggests difficulty in appraising the means-ends relationship of ERP acquisition and the consequential reliability of the appraisal. In fact, the greater the uncertainty, the more the organizations model themselves upon others as a social comparison to base their decisions on ERP adoption. Thus, we propose:

*Hypothesis 9: The more uncertain the business environment is, the more the imitation behavior and the less the rational evaluation behavior in ERP adoption.*

*Competition intensity* refers to the degree of competitive strength within the industry. It is generally agreed and empirically shown that the more intense competition is, the higher adoption rates of innovation [24, 45]. We believe in an ERP adoption decision, the intensity of competition will moderate the interaction between the imitation and rational force by increasing the dependency of imitation force in relation to its rational counterpart. When competition is intense, organizations will have more pressure and less time to evaluate ERP rationally to respond to the competition challenges. This coercive competitive pressure within the industry or market segment, according to the DiMaggio and Powell [11], forces organizations to imitate leading competitors, thus making them less likely to make rational decisions. If the successful companies within the industry have already adopted ERP to boost their efficiency in order to improve the profit margin, the remaining companies will run a very high risk of losing their competitiveness or cutting small their profit margins. Even if the Steering Committee does not regard adopting ERP as the best solution to survive the competitive arena, it will still recommend adoption in order to level out the playing field. Hence:

*Hypothesis 10: The more intense the competition is with the industry, the more the imitation behavior and the less the rational evaluation behavior in ERP adoption.*

The effect of *organizational innovativeness* on the relationship of imitation-rational technology evaluation has been widely discussed and explored in the DOI literature. Innovativeness, in the context on IT adoption, can be measured by the number of new innovations adopted and the relative earliness of their adoption [9, 37]. ERP promises a single, integrated platform to fulfill the basic information needs to all the functional areas within an organization, but this system is expensive, complex and difficult to operate, thus resulting in a low success rate [49]. These problems, associated with the uncertainty about the consequences of ERP, have restrained organizations from the adoption of this innovation. Innovative organizations, however, have a higher degree of slack resources, which provide the time and resources for the scanning, experimentation, and learning of ERP systems [23, 43]. They are also larger, more open, and with a greater extent of norms that encourage change [23, 37]. Hence, they are able to perform the gate-keeper's role and rationally evaluate and exploit ERP to create additional competitiveness. By the time the followers evaluate ERP for adoption, this innovation may have become a necessity due to economic or social pressure. Thus, we believe that an innovative organization is more likely to implement an ERP system ahead of its peers. Since an innovative organization is among the first mover and does not have others to model itself on, the steering committee must based their decision heavily on the rational force.

*Hypothesis 11: The more the innovativeness of an organization, the less the imitation behavior and the more the rational evaluation behavior in ERP adoption.*

### **Control Variables**

To fully account for the differences among organizations, this research also included four control variables that had potential impact on ERP adoption as suggested by prior literature. These controls include organization size, age, ownership type, and industry type.

### **CONCLUSION**

The above is only a proposed theoretical model. It needs further refinement and thorough operationalization in order to be tested empirically. Besides, the considerations given in this theoretical model is of limited caliber. We only consider DOI as the representation of the rational-evaluation force, while only imitation force was considered on the irrational side. However, this paper, we believe, could open up a new area of research in the MIS field probing into the intrinsic behavior of individual(s) and how it effects the organization as a whole.

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