

Technology Readiness of Business School Students in Learning Advanced ERM Software Applications: A Sequential Multiple-Mediation Framework

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Abstract

The use of advanced Enterprise Resource Management (ERM) applications is becoming ubiquitous. As a result, organizations are prioritizing the hiring of graduates with working knowledge of such cutting-edge applications that incorporate new business intelligence capabilities through AI-driven algorithms that analyze large volumes of data. However, a chasm exists between the advanced technology skills that industry demands today from recruits and the actual knowledge that they bring with them after graduating from business schools. Some empirical evidence points to the possibility that part of the problem lies with insufficient understanding of whether perceptions of students in terms of complexity and benefits of learning such advanced ERM systems influences the relationship between their technology readiness and their behavioral intention to adopt such systems in their learning. Therefore, the goal of this study is to develop a conceptual framework to propose the possible mediating effects of Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) regarding advanced ERM applications, in the relationship between technology readiness of business school students and their behavioral intention towards actual usage of technology. The framework is developed with the support of the Technology Acceptance Model (TAM) leading to a set of propositions positing relationships between the constructs in the model. This study is likely to pave the path for further empirical research that may enable educators in business education programs at colleges and universities to determine pertinent factors that drive the behavior of students in adopting advanced ERM applications and thus close the gap between expectation of employers and the learning that students acquire through their business degree programs.

Keywords: Enterprise resource management, ERM, Technology readiness, User perceptions

1. Introduction

Advanced Enterprise Resource Management (ERM) applications have become so robust and versatile that they have practically eliminated most manual functions related to data input and preparing reports. Modern-day ERM applications not only link and update all records

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throughout the enterprise, but they also provide real-time information for managers to take proactive decisions [1][2]. Such evolution in functions of software applications has transformed how strategic and operational decisions are taken based on current information [3]. Nevertheless, the need for technology application skills needed by such companies, and the learning imparted to university students through conventional business degree programs are not in alignment with the needs of employers of tomorrow [4][6]. In this regard, a study by the McKinsey Global Institute indicates that companies are finding it more and more difficult to recruit industry-ready business graduates from universities and colleges that can effectively operate and manage these advanced ERM systems [6].

A study by Habashi [7] conducted on undergraduate accounting curricula at universities and colleges across several states in the USA, showed that the majority of them use very basic accounting software in teaching accounting information systems to their students. Many of these software applications are redundant and are hardly being used by large global companies. The analysis further shows that part of the reason for this gap between what employers need and what students learn in class is attributed to the possibility that business degree curricula rarely include courses that emphasize the importance of knowledge regarding advanced software applications. Additionally, the aforesaid study emphasizes the possibility that perceived usefulness and perceived ease of use among business school students regarding advanced ERM applications may play a significant role in determining their technology adoption behaviour. However, there appears to be a dearth of any conceptual framework that provides directions to researchers on how the technology readiness of business school students can be assessed in terms of their behavioural intentions to deploy such applications in their future careers.

In terms of technology readiness and technology adoption behaviour, the extant literature indicates that two pertinent variables are perceived usability and perceived ease of use of technology. Perceived Usability (PU) and Perceived Ease of Use (PEOU) have been studied extensively under various technology acceptance behavioural frameworks [8]. However, in the context of student technology readiness towards adoption of ERM applications in business degree programs in tertiary education, it seems that the application of theoretical models such as the Technology Acceptance Model (TAM) in the above context has been overlooked [9]. Additionally, the majority of the studies using such frameworks in the context of business and management education have been utilized to test PU and PEOU in the context of applications such as social media usage, mobile-assisted language learning, smart learning, online classes through video conferencing, etc. [10].

A study by Kaus et al. [11] on technology readiness in the adoption of E-learning, finds that students experience optimism and desire for use of new technologies when there is a diffusion of technology-driven platforms. They further assert that the positive attitude of students is enhanced when these technology platforms are student and teacher-friendly. The arguments made by Kaushik and Agrawal may also be extrapolated to the context of the current study to posit that the relationship between technology readiness of business school students and their adoption behaviour towards advanced ERM software applications are likely to be accounted for by their perceived usefulness and perceived ease of use of such software applications. Therefore, the goal of this study is to propose a conceptual framework based on a set of propositions that relate the readiness of students in adopting advanced ERM software applications to their adoption behaviour through perceived usefulness and perceived ease of use as mediators. The literature indicates that the connection between the above constructs may be established with the support of the Technology Acceptance Model (TAM) [12].

2. Literature review

The following sections present an overview of the literature related to the primary theory deployed in the current study, followed by conceptual definitions of the constructs used in the study.

2.1 Technology acceptance model

With the infusion of Information and Communication Technologies (ICT) into the modern educational system, research on user technology acceptance started receiving a fair amount of attention [13]. Academic researchers and educators devoted substantial attention to exploring the antecedents and outcomes of perceptions, beliefs, and behaviour of such smart learning systems [2]. A major impetus to the above stream of research emerged from the development of the technology acceptance model, known as TAM.

The origins of TAM can be traced to the doctoral dissertation by Davis [14], where the model evolved from the Theory of Reasoned Action (TRA) by Ajzen et al. [15]. The goal of the authors was to present a theoretical model that could explain the determinants of computer acceptance that is general, capable of explaining user behaviour across a broad range of end-user computing technologies and user populations, while at the same time being parsimonious and theoretically justified [12].

With the introduction of TAM, academic research on technology acceptance behaviour branched into two main streams: (i) Replication of TAM with other technologies along with longitudinal and multi-level studies to validate the model in contexts other than ICT, (ii) Comparing TAM to other theoretical models that were close to the idea of acceptable behaviour such TPB (Theory of Planned Behaviour), TRA (Theory of Reasoned Action), Motivation Model (MM), Combined Theory of Planned Behaviour-Theory of Planned Behaviour (C-TPB-TAM), Model of PC Utilization (MPCU), Innovation Diffusion Theory (IDT), and the Social Cognitive Theory (SCT), etc. to chart pathways for further expansion of this model [16]. It may be worth mentioning that the key dependent variable in all these models was intention or usage behaviour [13].

In terms of comparing TAM to other models related to behavioural psychology to expand and further improving upon it, the study by Davis applies both TAM and TRA on word processor use across a period (i.e., immediately after its introduction and 14 weeks afterward) and found that at the end of the period, TAM explained 51% of the variation in user acceptance behaviour ($R^2 = 0.51$), compared to TRA that recorded 26% of the variation ($R^2 = 0.26$) [12]. Therefore, the current study proposes to use TAM as the foundational theory to propose links between the constructs in the conceptual framework developed in this study.

With the passage of time and inputs from new research, TAM continuously evolved since its inception. The primary drivers of the TAM model were two variables, perceived usefulness (PU) and perceived ease of use (PEOU). The extensions to the TAM model came with the inclusion of external variables that included characteristics related to individuals, organizations, and tasks [16]. For example, prior empirical studies have included five new external variables along with PU and PEOU: training, prior experience, the role of the individual in the technology use, tenure at the workplace, and level of education [13]. The basic TAM framework is shown in Figure 1.0.

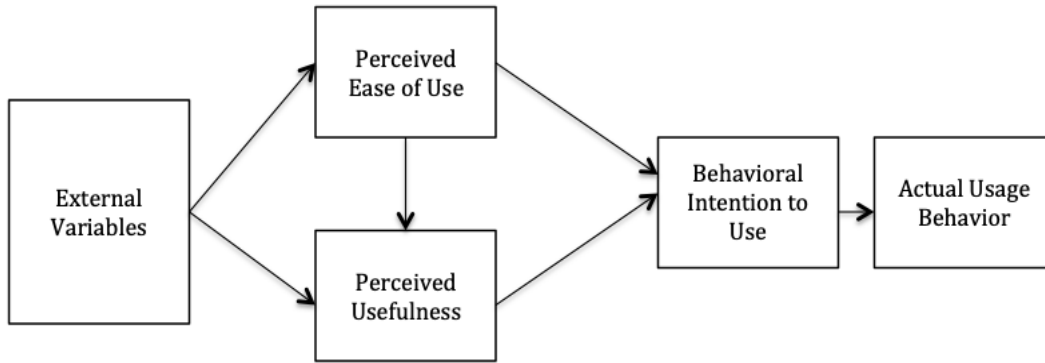


Figure 1. Technology acceptance model [18]

2.2. Perceived usefulness

Perceived usefulness is defined as the degree to which an individual believes that using the system will help them to attain enhanced job performance. This variable was constructed from previous constructs, such as performance expectancy, relative advantage from innovation diffusion theory, and outcome expectations from social cognitive theory by Bandura [34]. Venkatesh and colleagues assert that the perceived usefulness construct is expected to be the strongest predictor of intention and is consistently significant [17].

In the case of the application of technology in education and learning, several studies have looked at this construct in the context of usage of social media [19], mobile-assisted language learning [20][21], learning software applications [22], mobile applications in education [23]. Furthermore, a few studies have also looked at the perceived usefulness of accounting software [24], but most of these studies are from the perspective of individual or organizational users. Among the very few empirical studies that have examined the perceived usefulness of modern accounting software applications are by Le and Cao, who surveyed accountants in numerous business organizations [25].

2.3. Perceived ease of use

Perceived ease of use is defined as the degree to which an individual perceives that the system to be used is easy to use [18]. The development of this construct is primarily attributed to the work done by Venkatesh and colleagues, who developed it from three previous constructs: effort expectancy from TAM2, complexity from the Model of PC Utilization (MPCU), and ease of use from the Innovation Diffusion Theory (IDT). Prima facie, this construct appears to be the same as the other three constructs, but the narrative from the extant literature indicates that the constructs are quite distinct [16]. Similar to perceived usefulness, this variable was also used in different technology applications using TAM [23].

2.4. Technology readiness

Technology readiness has been defined as people's propensity to embrace and use new technologies for accomplishing goals in home life and at work [26]. This construct may be viewed as a state of mind that inhibits the disposition of a person to use new technologies. The aforesaid study explores the readiness of people to effectively embrace new technologies and the primary determinants of such readiness. With the wide proliferation of advanced

technological applications such as smartphones, empirical evidence indicates that euphoria and frustrations coexist among users with the rapid pace of the emergence of new technologies [27]. The readiness to embrace and use new technology ranges from negative to positive and the measure of readiness varies from one person to another [28].

The construct comprises four dimensions-optimism, insecurity, innovativeness, and discomfort- that collectively represent technology readiness [29]. Recent studies on technology readiness in the context of internet banking, use of social robots, self-checkout terminals, self-directed online learning, among others, indicate that technology readiness influences behavioural intentions towards such emerging technologies [11]. An exhaustive systematic review article by Blut and Wang indicates that although the relationship between technology readiness and adoption behaviour of technology are significant, there is a possibility that such a relationship is partially mediated by the perceptions of users regarding the complexity and usefulness of the technology [30].

2.4. Behavioral intention to use

Behavioural intention is defined as the measure of the strength of one's intention to perform a specific behaviour [15]. This refers to the motivational factors that influence a given behaviour where the stronger the intention to perform the behaviour, the more likely the behaviour will be performed. Correlational studies show that intentions are significantly associated with behaviour. For instance, in a meta-analysis of 185 studies that have used the TPB, Armitage, and Connor found that the sample-weighted average correlation between measures of intention and behaviour was significant. Based on the Theory of Planned Behaviour (TPB), the concept predicts an individual's intention to engage in behaviour at a specific time and place [31]. The theory was intended to explain all behaviours over which people can exert self-control. The key component to this model is behavioural intent; behavioural intentions are influenced by the attitude about the likelihood that the behaviour will have the expected outcome and the subjective evaluation of the risks and benefits of that outcome [15].

2.5. Usage behavior

Usage Behaviour defines the actual application of the system by the user in their workplace and tasks. This construct is better measured through observations, although, in some studies, the perceptions of the users have also been used by recording their statements on the extent to which, they use the system at the workplace. However, several scholars including the proponents of TAM and UTAUT have cautioned researchers about measuring this variable without actual observations [3]. Most empirical studies using these models have omitted any hypotheses connecting to actual usage behaviour due to measurement issues [32].

3. Theoretical framework

3.1. Direct relationships

Technology readiness is a reflection of a potential user's intention to apply a new technology [28]. Intention to use has been defined as an individual user's positive or negative feelings about performing a targeted behaviour. In the case of learning and using advanced ERM software applications by students, this variable would reflect the emotions of the learner towards the system and thus manifest in their attitude towards it. Ajzen and Fishbein have

strongly emphasized the influence of emotions on the intentions of people towards certain behaviour [15]. Therefore, in this case, if students have a strong and positive emotion (i.e., high levels of technology readiness), they are likely to develop strong intentions to perform such behaviour (i.e., intention to learn how to use the accounting software). Therefore, it may be posited that:

P-1: Technology readiness of students has a positive relationship with their behavioural intentions towards learning advanced ERM software applications.

The operational definition of technology readiness implies that individual users are on a continuum that ranges from a negative to positive attitude towards both the complexity and benefit of using a given technological system [33]. The negative views will draw people away from the new technology while a positive sense of readiness will attract people towards it. Furthermore, these emotions will be along the lines of optimism, innovativeness, discomfort, and insecurity [28]. Hence, it may be inferred that depending on where in the continuum each user is on the technology readiness scale, will impact both perceived usefulness and perceived ease of use of new technology such as advanced ERM software. Formally stated:

P-2a: Technology readiness of students has a positive relationship with their perceived ease of use regarding advanced ERM software applications.

P-2b: Technology readiness of students has a positive relationship with perceived usefulness regarding advanced ERM software applications.

Behavioural intention to commit to any action is influenced by whether the individual views the action to be free of complexity and difficulty in execution. This causal relationship is derived from the theory of reasoned action [15]. Perceived Ease of Use (PEOU) has been defined as the extent to which the users of a technological system perceive that the system is relatively easy to use in achieving their objectives [16]. In the case of this study, PEOU of accounting students regarding advanced accounting software indicates effort expectancy of the learner, which will reflect the degree to which users of the system view that the software application is quite easy to learn and use. One of the premises of the social cognitive theory [34], is that when human beings consider engaging in any action that they perceive as complex, they will automatically develop an attitude of avoidance. This means that if the level of effort to use a system appears to be difficult, then the users will be discouraged to use it. Therefore, it may be inferred that the opposite will be true when the perception of business school students shows that they feel that the software application is easy to use, and such feelings will lead to a positive attitude towards the system. Hence, it may posit that:

P-3: Perceived ease of use has a positive relationship with the perceived usefulness of learning advanced ERM software applications.

P-4: Perceived ease of use has a positive relationship with behavioural intention to learn advanced ERM software applications.

The original postulation of TAM was that whenever users of new technology view that the usefulness of the system is high, they tend to translate such perceptions towards intention to use the system [12]. Venkatesh defined perceived usefulness as the degree to which users of technology-based systems believe that using the system will help them to attain their performance goals [16]. Therefore, in the case of perceptions regarding the benefits of learning the use of advanced ERM software applications, the learners would harbour expectancies that the software system would enable them to rapidly attain mastery over ERM

applications and thus make them a more preferred candidate for recruitment by more sought after employers. Such performance expectancies regarding the system are likely to create a positive attitude towards the benefits of learning and using such technology. Thus, when individuals can see the clear usefulness of some action, they solidify their intentions to indulge in behaviour that leads to the benefits derived from such action [15]. Therefore, it may be posited that higher levels of perceived usefulness of advanced ERM software systems will lead to a more positive attitude towards such technology, thus inhibiting their intentions to learn and use such systems. Hence, the following proposition is presented:

P-5: Perceived usefulness regarding advanced ERM software applications among students has a positive relationship with their behavioural intention to learn advanced ERM software applications.

The relationship between behavioural intention and usage behaviour has been drawn from multiple social psychology theories such as Theory of Reasoned Action-TRA and Theory of Planned Behaviour-TPB, etc. For instance, TRA posits that an individual's actual behaviour is driven by the individual's intention, which in turn is a function of various factors such as attitude towards the behaviour and subjective norms [15]. In the development of TAM, Davis utilized the basic premise of TRA to propose that usage of information systems was driven by perceived ease of use and perceived usefulness, and the relationships are accounted for by the behavioural intention of the users [12]. Therefore, it may be posited that behavioural intention drives user behaviour. Formally stated:

P-6: Behavioural intention among students to use advanced ERM software applications will have a positive influence on their actual usage behaviour.

3.2. Mediation effects

A person's intentions to commit to certain behaviour may be shaped by the extent to which they feel inclined towards such behaviour (i.e., their readiness towards performing such actions) [35]. Hence, the influence of readiness of business school students to embrace and use new technologies such as advanced ERM software applications are likely to be shaped by intervening factors that influence their emotions, such as their perceptions of how easy the system is to use (i.e., views about the complexity of the system) and its performance in achieving desired performance objectives (i.e., the usefulness of the system) [13]. While the direct relationship between technology readiness with behavioural intentions has been posited to be significant, there is a strong likelihood that, part of the relationship between the above variables is accounted for by perceptions of students regarding the ease of use and usefulness of such technology. In two separate studies on the usage of mobile-assisted language learning by university students, by Rana et al. [35] and also by Dwivedi et al. [36], the relationships between factors that represent emotions of technology users and their behavioural intentions are mediated by their performance expectancy and effort expectancy towards such technology. Therefore, drawing a parallel with the aforesaid studies, it may be assumed that perceived ease of use and perceived usefulness at least partially mediate the relationships between technology readiness and behavioural intentions.

In addition to the preceding discourse, according to the technology acceptance model, the drivers of intentions to behave (e.g., intention to learn advanced accounting software) is driven by perceived ease of use and perceived usefulness. These relationships have been established by Davis et al. [12] and validated through numerous empirical studies in different technology contexts [36]. Therefore, the relationships between technology readiness and

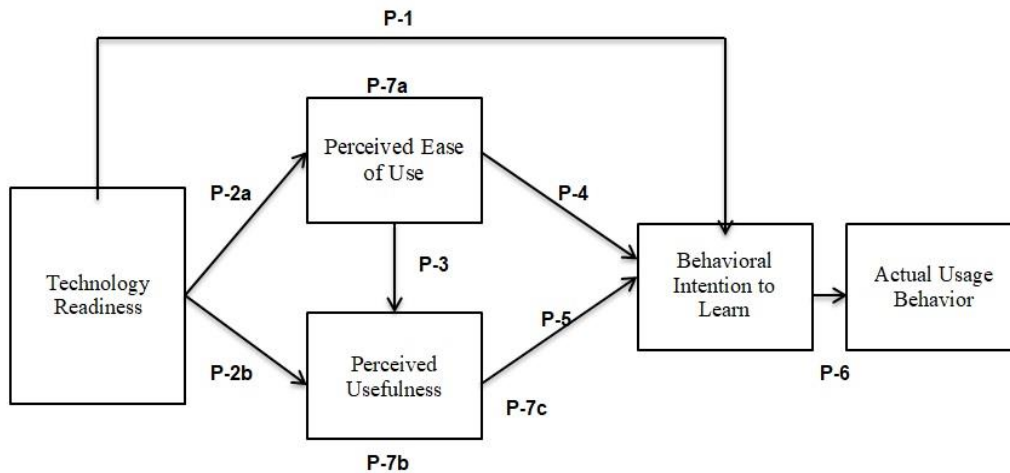
behavioural intentions to learn advanced ERM software applications are expected to be mediated by perceived ease of use and perceived usefulness, and also sequentially mediated by perceived ease of use and perceived usefulness serially. Therefore, the following propositions are made:

P-7a: *The relationship between technology readiness among students and their behavioural intention to learn advanced ERM software applications is mediated by perceived ease of use.*

P-7b: *The relationship between the technology readiness of students and their behavioural intention to learn advanced ERM software applications is mediated by perceived usefulness.*

P-7c: *Perceived ease of use and perceived usefulness act as sequential multiple-mediators in the relationship between technology readiness and behavioural intentions to learn advanced ERM software systems.*

Based on the above-proposed relationships, the following conceptual framework is developed (Figure 2.0).



4. Discussions and conclusion

The goal of this study was to develop a conceptual framework that establishes theoretically justified relationships between the readiness of business school students to adopt advanced ERM software applications and their behavioural intentions to learn and use them. With the support of the technology acceptance model, a set of propositions were justified linking technology readiness as an external variable with perceived ease of use and perceived usefulness of such advanced technological applications. Subsequently, both perceived ease of use and perceived use were posited to influence behavioural intentions towards usage and actual user behaviour. The framework also depicts perceived ease of use and perceived usefulness as mediators between technology readiness and behavioural intentions, both directly and also as sequential multiple-mediators.

The outcome of this study paves the path forward for further empirical validation. The conceptual framework may be tested with data from either senior graduating students or recent graduates from business schools in colleges and universities that offer 4-year undergraduate business degrees. A robust empirical validation will consider data from multiple institutions and preferably from multiple countries that offer equivalent business

degrees. The outcome of such research is likely to lead to the development of a model that explains the factors that drive effective learning and usage of advanced enterprise resource management software applications by students. As a result, the gap between university-based learning and employer-required skills is being bridged.

Numerous studies have shown that organizational employers these days are demanding significantly higher levels of technological skills from recruits. The investments that companies have to make in training freshly hired graduates are often considered a risky expense for the employer, as many recruits tend to switch employers once they receive the training. As a result, organizations are demanding that business schools do their part in preparing their graduates with sufficient skills they need to perform at work without significant training expenses. Without a doubt, colleges and universities need to revise their curricula to reflect contemporary developments in technological applications to enhance the employability of their students.

As policymakers and researchers continue to explore different ways to bridge the chasm between the learning outcomes of their business degrees and the expectations of employers, the emphasis needs to be directed towards knowledge of advanced technological applications such as ERM software applications. This is necessary because the job of managers today is not the same as it was several decades ago. For instance, organizations are now actively using systems such as AI-based algorithms to make sense of large swaths of data and how such information is likely to impact the growth and sustainability of the organization. Therefore in a highly digitalized world, business school graduates without sufficient understanding of how such technologies are to be used to make critical decisions in organizations will be of no use to future employers. This will render the conventional business and management degree programs redundant.

Many global organizations such as Google, Microsoft, and IBM have already moved forward to develop their own short online learning modules that enable individuals to be employable within a short period even without any formal university degrees. The trend seems to be that these online courses ranging from several weeks to a year are now more instrumental for potential jobseekers compared to a 4-year university degree. These online courses offer direct learning of specific usage of technological applications and result in certifications that allow employers to assess the skill levels of their potential recruits quite easily.

Some of the courses in accounting software being taught by organizations such as Coursera, Udemy, and IBM are witnessing phenomenal growth. This trend has been picked up by some top-tier universities such as Harvard and MIT that are now offering similar courses through their MOOCs (massive open online courses). Hence, the rapid growth of such online learning platforms may be a potential threat for conventional 4-year degree programs offered by colleges and universities, as their role in modern society may become less significant. Therefore, it is anticipated that the current study lays another brick in the path of further research in trying to understand how behavioural intentions and usage of new technological applications such as advanced ERM software applications can be effectively maximized among business school students. Such learning may be important in developing new initiatives in modernizing the course curricula in the 4-year management degree programs.

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