

Adoption and Outcome of Digital Learning in B-Schools: A Conceptual Framework

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ABSTRACT:

An extensive literature review was performed to ideate and develop a conceptual framework required for the research study to validate objectives envisioned and outlined for the study. The conceptual framework seeks to establish the inter-relationship that exists between adoption of digital learning practice, the overarching outcomes, and B-School entities such as the faculty, students and the administrative staff. Through this paper, a research model can be accomplished by conceptualization of the issue under study through focused thinking of the related concepts and by examining the inter-relationship between its dimensions and indicators i.e.; variables. In this study the existing theories, concepts and models are taken into consideration to conceive ideas, design strategies, and make propositions to plan and build a framework which acts as a blueprint to be referenced for the purpose of research approach to be adopted and this will serve as a guide to other researchers who may want to analyse the study. The study adopted qualitative content analysis of information systems (IS) management research models and methods by selecting papers published in journals and conference proceedings relating to the Technology Acceptance, stakeholder readiness, and behavioural intention of use, and benefits/outcomes. The objective of the study is to develop a theoretical framework to encapsulate and extend the available knowledge by formulating related concepts into a logical structure which signifies inter-relationships among the concepts as an abstract generalization of the phenomenon derived through deductive reasoning to guide the research study.

Keywords: Technology Adoption, Technology Adoption models, Digital Learning, Behavioural Intention, User satisfaction and Benefits/Outcome.

INTRODUCTION

In today's age of technological innovation there has been a sudden surge in educational technologies worldwide to facilitate varied learning styles. As Gulbahar (2007) asserts that, despite huge educational ICT investments in teaching and learning, there is little evidence of their adoption. Use of technology for educational, personal and professional advancement has permeated all levels of society and with ease of access to internet through mobile devices such as tablets and smart phones, podcasts to listen to lectures, weblogs to support teachers and students creative content, learning through gamification of lessons, online discussion and feedback forums, multimedia elements blended in text presentations to accommodate varied content delivery have gained prominence in teaching and learning. In this study, we will critically review and analyse theories, concepts and models relating to acceptance of technology to list out factors that help adopt and facilitate digital learning in B-Schools since Information and Communication Technology (ICT) is a tool that supports the realm of digital learning. Siu & Song, (2016) stated that their research findings show that technical constraints were those mostly reported by the teachers, followed by personal factors and social factors. Among the technical constraints, WiFi infrastructure problems were the constraints most often identified for teaching and learning practices. Therefore, the present study explores the dimensions and variables relating to acceptance of technology in advancing the realm of digital leaning and its impact on the

indicators which showcase overarching outcomes of management learning programs and administration in B-Schools.

Business management institutions have seen distinctive challenges such as subsiding student engagement, growing diversity, redundant skills and limited resources which have hindered outcomes among graduates such as employment opportunities, better remuneration, skills and abilities for career success; these outcomes can be influenced by the adoption of digital learning strategies in B-schools. There are challenges and opportunities in adopting digital learning in enhancing the consequential outcomes of B-School programmes due to feeble understanding of ICT and Systems related services and globalization which has resulted in resistance for adopting technology in B-Schools as a means to enhance scholastic performance and improving outcomes.

The University is made up of people with different backgrounds in terms of needs, skills, talents, Status, competencies, knowledge, behavioural styles, interest and perceptions, (Nakpodia, 2003) . B-Schools need to utilize their resources to the optimum to bring about convergence of ICT and management education to create a new form of learning which will bring about educational improvement, enhance academic performance of graduates and reform in management education. Infusing technology in classrooms and blending it with the traditional learning modalities will enhance outcomes of students and will transform B-Schools as centres of excellence and merit in providing remarkable management education whereby creating opportunities for research and innovation, and will grow into storehouses of knowledge.

In the era of technology innovation and globalization of higher education the focus is on providing access to result based management education. There is scarcity of research on investigating the potential drivers that influence acceptance of technology and other empowering strategies in teaching-learning management learning programs to deliver business management education that have a reflective influence on different stakeholder outcomes in B-Schools.

To augment the realm of digital learning in higher education institutions vis-à-vis management institutions and bring about scalability in adoption of digital learning strategies, the acceptance and readiness of the stakeholders to embrace technology in creating an innovative, ubiquitous and novel learning environment in B-schools is a challenge that should be confronted to motivate, upskill, and keep the stakeholders engaged in life-long learning. Siu & Song, (2016) observed that the environment needs to enable the Bring Your Own Device to be employed in the environment; on the other hand, the intention and capabilities of the teacher in taking the pedagogical actions are also critical. Therefore, the stakeholders' technology acceptance, readiness and behavioural intention to use play an important role in creating a ubiquitous learning environment.

In the present study a novel conceptual framework for perceived outcome assessment of key stakeholders when digital learning interventions are adopted in B-schools has taken shape after reviewing, analyzing and comprehending models, theories and previous research done on similar paradigms. The conceptual framework developed for the study is an adaptation and extension of previously designed models for similar research studies. The system quality, service quality, and information quality have a moderating effect on performance and effort expectancy which are the

influencing factors of behavioural intention. Such studies are required in the higher education institutions (HEI's) to understand the factors affecting stakeholder's adoption, and to find out user's perception of having a technology driven learning environment and also a good task-technology fit is a major factor that affects adoption.

Digital learning:

The term digital learning includes and is not restricted to any pedagogical practice that effectively uses information and communication technology (ICT), digital technology, digital tools and resources for collaboration and communication, interactive learning software and simulations, data and information processing to develop curated content and prepare targeted supplementary learning by experts for providing a personalized learning experience with some element of control over place, time, and pace of learning. Digital learning should be leveraged to transform pedagogical practice from an instructivist to constructivist approach which is a learner-centric model to reinforce student learning experience by addressing the distinct learning needs of the learners.

Digital learning = Technology + Instructional practice + digital tools + software + simulations + online databases + personalized learning + MOOCs + Collaborative learning + Virtual Reality (VR) enabled learning + Animations + Presentations with multimedia elements + video & audio lecture files + podcasts + personal digital assistants (PDAs) & tablet PC's + online quiz and assessments + collaboration & communication + digital media & online media stored, accessed and transmitted over media channels.

Digital learning provides flexibility in learning through synchronous and asynchronous mode of learning. Therefore, greater importance has been given in adoption, augmentation and effective utilization of technology to implement an adept instructional practice to reinforce learning experience and advance outcomes which are: personally, professionally and financially rewarding for the stakeholders of B-Schools around the world. This study is to comprehend and conceptualize the influence of embracing innovative model of learning in business education through proficient use of technology that may provide greater accessibility to global resources and foster equity in quality of learning, besides the development of knowledge, skills and abilities required for achieving scholastic and career success in management education which is discrete with observable and measureable characteristics of students, faculty and administrative staff. Measurement of digital learning initiatives can help refine, strengthen, and build scalable pedagogical models. Studies have suggested that information and communication technology (ICT) seems to have a reflective influence in institutions of higher learning and plays a vital role to propagate innovative pedagogical practices and proliferate digital tools to improve quality of learning and advance stakeholder outcomes in B-Schools.

Digital Learning Strategy:

The digital learning strategy may include a mixture of or just merely any one of the digital learning concepts for the purpose of effective teaching-learning and the digital strategies may be formulated by technology integration specialists to enhance the learning environment. The digital learning strategies should be incorporated to improvise on the learning process and to advance standards of higher learning and quality of education to reduce skill disparities in indigenous

institutions and universities. The below concepts have been listed for the sake of brevity which are all inclusive to the realm of digital learning, since digital learning is often confused with online learning or e-learning among stakeholders.

- **Mobile Learning (ML)**– any learning that happens through interaction with content being accessible from anywhere via a handheld portable electronic device such as PDA's, smart phones, notebooks and other electronic devices. M-learning has grown as a popular learning aid with interactive online apps which provide digital content for self-learning at a cost effective rate.
- **E-learning** – a course or program that is delivered over the internet and is accessed by the learners utilizing electronic technologies outside of the traditional classroom. This form of learning can happen completely online by using collaborative tools to interact in real-time with teachers or can access curated content online presented by experts, coaches, and talent trainers.
- **Online Collaborative Learning (OCL)** – also known as computer mediated or networked learning, is a constructivist approach which is aided by the development of internet, which creates a collaborative environment for learning in which peers and teachers are encouraged to interact to seek conceptual knowledge and develop problem solving behaviour where learning building knowledge mainly through the discourse process.
- **Blended Learning (BL)** – learning that takes place over a combination of different delivery media and is usually a mixture of various instructional approaches such as web-based technology, face-to-face instructional practice, and classroom technologies.
- **Virtual Reality (VR) learning** – This is an advanced learning approach which provides remote access to learning content. Virtual Reality gives students a sense of practical experience as they are able to visualize complex things in the classroom as VR creates a virtual world that enriches the students learning experience. Virtual Reality enables a learning environment which provides an immersive experience that motivates the students to learn and keep them engaged by providing an interactive experience.
- **Adaptive Learning** – learning approach which is data-driven to adjust and enable the delivery of content as per the learners pace of learning and supports varied learning styles by providing a range of content formats to support the students. The adaptive learning systems gradually improve overtime with accumulation of data on more students as the systems learn from human interactions, these learning systems employ algorithms to cater to students with different learning abilities and maximise learning outcomes by providing personalized tutoring and timely student feedback.
- **Massive Open Online Courses (MOOCs)** – This web-based learning platform has courses for learners to enrol and complete them within a given timeframe where learners from around the world participate in studying structured, collaborative, distributed, open access courses and continue to be lifelong learners in a networked learning environment.
- **Digital tools** – digital infrastructure that enhance the learning environment by providing access to a number of tools and resources such as Dropbox, YouTube, Google+, Whatsapp, social media, open educational resources (OER's), Weblogs, Discussion forums, etc.

RESEARCH METHODOLOGY:

The study adopted qualitative content analysis of information systems (IS) management research models and methods by selecting papers published in journals and conference proceedings relating to the technology adoption, stakeholder readiness, and behavioural intention of use, user satisfaction and benefits/outcomes which were evaluated, analysed and reviewed in detail with regard to instructional practice and learning in educational settings by keeping the participants of the study in mind. This is an exploratory study and a conceptual work.

LITERATURE REVIEW

A literature review encompassing models and theories of technology adoption, stakeholders' satisfaction & outcome assessment were studied extensively and after extensive review of pertinent models and theories the proposed conceptual framework was developed in view of the factors such as: technology adoption, behavioural intention, user satisfaction and benefits/outcome.

An overview of Information Systems (IS) Management Theories and Models:

The theories and models relating to the adoption and outcome assessment have been studied to identify factors influencing actual system adoption and to predict the benefits of usage of systems in a given environment. Therefore, through deductive reasoning we have formulated a model for technology acceptance and outcome (net-benefits) assessment for an educational setting such as B-Schools. The theories of technology adoption are as discussed below:

Uses and Gratification Theory (UGT):

Blumler and Katz's (1974) posited the Uses and Gratification Theory (UGT) to show how people utilize media to fulfill their requirements, wants, and needs. The objective of this theory is to explore ways in which people use the media for their benefits and satisfaction. This theory states the audience are the gatekeeper of media and have control over media use. The UGT has been linked to motivation as media use and motivation have a reciprocal effect. The personal media choices by people have a significant effect on their needs as they seek to gratify through purposeful media use. According to the studies on the uses & gratification theory the expectancy variables have been identified as below:

Cognitive needs – people like acquiring information, knowledge, skills, and comprehension to fulfill their psychological and intellectual needs through use of media and internet.

Affective needs – It is about fulfilment of emotional, pleasant, or aesthetic experience of an individual by being able to connect to the emotions portrayed .

Personal integrative needs – people like to use media sources to enhance credibility, confidence, and status. This in particular is a self-esteem need as people reassure themselves about their status through media use.

Social Integrative needs – The need for people to enhance connections and collaborations with their near ones. It encompasses the need to socialize with relatives, friends, etc which positively influences their social interaction skills.

Tension release needs – people often use media to relieve from stressful tasks by finding an easy way out, it also helps an individual escape from mental stress and diversion from tensions as information is readily available on search.

The attitude of an individual defines the behavioural use of system for one's benefit and gratification, therefore gratification obtained on use of system has a reciprocal effect further strengthening the individual's attitude toward using the system.

Theory of Reasoned Action (TRA):

This model was constructed by Martin Fishbein and Icek Ajzen (1980) which explicitly shows the relationship between attitude, subjective norm and behavioural intention. TRA is a well-researched model in determining the behaviour in various domains.

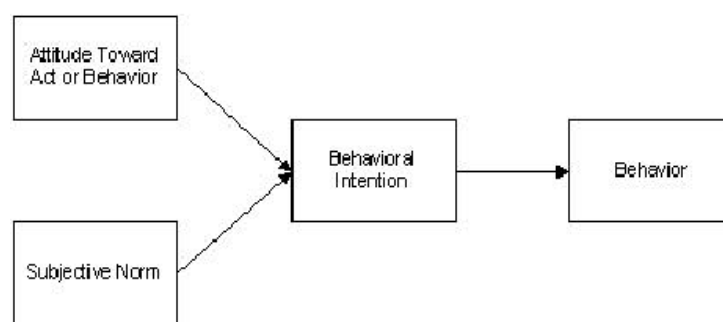


Figure.1. Theory of Reasoned Action (TRA) by Fishbein and Ajzen (1980)

Theory of Reasoned Action forecasts that the behavioural intent is affected by two components: attitudes and subjective norms. Behavioural Intention is the probability of performing a stated action to accomplish the behaviour. Myresten & Setterhall, (2015) mention in their study that TRA posits that it is one's behavioural intention (BI) that is the strongest predicting variable for a specific behaviour (B). BI does, in turn, consist of the two conceptually independent determinants of intention: Attitude toward the behaviour (Aact) and Subjective Norm (SN). Attitude toward a specific behaviour is defined as a person's beliefs, emotions, and behaviour towards a particular object, event, or things. Attitude has three components: affective, behavioural, and cognitive, these three components formulate and influence behaviour in a given situation to perform an act or behaviour which is favourable and unfavourable. Subjective Norm is a belief that one is expected to perform per the social pressures without the motivation to comply.

Theory of Planned Behaviour (TPB):

This behavioural model is an extension to the Theory of Reasoned Action and this theory explains how one's belief impacts the behavioural intention. Ajzen (2002) reflected that the behavioural intention is the readiness of an individual to perform a particular task, produced by a combination of attitude toward the behaviour, subjective norm, and perceived behavioural control. Behavioral control is similar to self-efficacy, and depends on the individual's perception of how difficult it is going to be to engage in the behaviour. Ajzen, (2002) also suggested that the more favourable a person's attitude is toward a recommended behaviour and subjective norms, the greater the perceived behavioural control, the stronger that person's intention will be to perform the behaviour

in question. Moreover, given a sufficient degree of actual control over the behaviour, people will be expected to carry out their intentions when the opportunity arises.

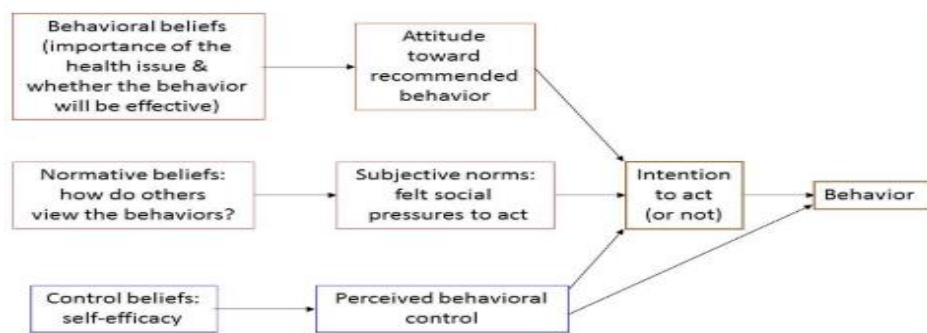


Figure.2. Theory of Planned Behaviour (TPB) by Icek Ajzen (1985)

Perceived Behavioural control can be seen as persons' intention of the ease or difficulty of performing the behaviour in question which in turn depends on the self-efficacy of executing courses of action required to be dealt under different situations. It can be seen that the perceived behavioural control has a direct effect on behavioural intention and behaviour. A measure of perceived behavioural control can predict accurately the behavioural intention to act or the actual behaviour, since perceived behavioural control is the lack of actual behavioural control and not a perception of actual behavioural control.

Social Cognitive Theory (SCT):

Albert Bandura originally developed the Social Learning theory and later transformed this into Social Cognitive Theory (SCT) (1986) and this theory contributes to the technology adoption theoretical framework. The SCT posits that learning happens through observations and is known as the learning theory since an individual's behaviour is influenced or modelled by observing the surrounding environment. The cognitive (personal), environmental and behavioural determinants are important factors in learning and development of people. The factors are dynamic in nature and are not independent of each other, in the way that an individual's behaviour changes as they acquire behaviour when subjected to reciprocal interaction between persons, behaviour and environment.

The figure below illustrates Bandura's triadic reciprocal determinism as portrayed by Wood and Bandura:

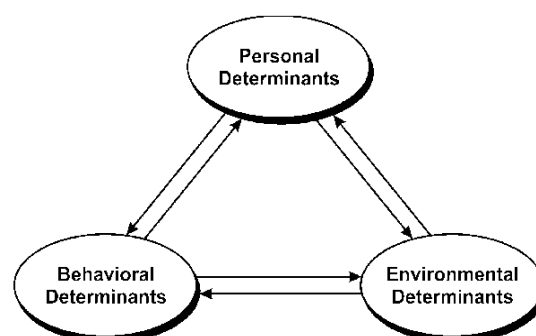


Figure.3. Social Cognitive Theory (SCT) by Bandura (1986)

The **Personal determinants** are also known as the Cognitive factors which are the knowledge, expectations, and attitudes which impact the actual behavioural use of system.

The **Environmental determinants** are the social norms, access to community (socio-cultural), and influences of people (subjective norms) are factors that contribute toward changes in one's own environment which impact the attitude and behavioural intention.

The **Behavioural determinants** are the skills, practice (habit), anxiety, affect and self-efficacy which impact the outcome expectations such as the motivation, performance and effort expectancy.

Technology Acceptance Model (TAM):

This Information systems (IS) model was developed by Davis et.al (1986) explains the perception of acceptance of a system under study and its actual use for the benefit of users. The acceptability or adoption of the system is determined by two main factors namely: perceived usefulness and perceived ease of use. Studies have suggested that the perceived usefulness and perceived ease of use are two different dimensions.

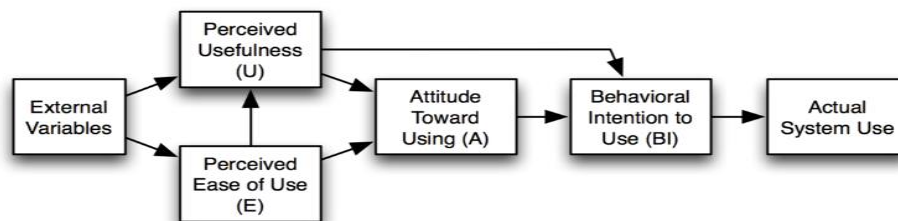


Figure.4. Technology Acceptance Model by Davis et.al (1986)

Perceived usefulness is the degree to which an individual believes that the system in use will have a positive effect on performance.

Perceived ease of use is the degree to which user believes that the use of system will be effortless.

Behavioural Intention is adapted from TRA model. External variables are self-efficacy, complexity, experience, etc.; the demographic information such as age, gender, experience, education is the moderators. Perceived ease of use has a direct link to the attitude, since attitude is a belief that is acquired through experience. It is the beliefs which get transformed into attitude and the beliefs are formulated through experience which influences a person's behavioural intention to use which has an effect on the actual use of the system.

Self-Efficacy Theory:

This theory was proposed by Bandura (1987), wherein these are beliefs' that individuals hold about their capabilities. Self-efficacy is an individual's competency or capability to accomplish a given task, thereby producing a favourable outcome and it's an important component in determining our chances of successful outcome. Self-efficacy beliefs are perceptions that form the basis of confidence and motivation toward behavioural intention to use a system which in-turn influences actual system use. Individuals perceive their self-efficacy in accomplishment of a task by interpreting information from four different sources as shown in the below figure.

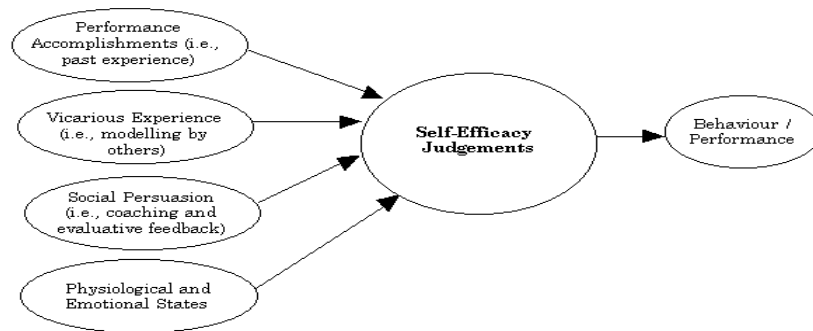


Figure.5. Self-Efficacy Theory by Bandura (1987)

The antecedents of self-efficacy are performance accomplishments, vicarious experiences, social persuasion, and emotional arousal.

Performance Experiences – The interpretation of previous performances whether success or failure experiences on similar tasks is the most influential source in forming self-efficacy belief.

Vicarious Experiences – Apart from interpreting personal performance experiences, self-efficacy beliefs are also formed through experience of observation of behaviours.

Social Persuasion – Individuals also form their self-efficacy beliefs by listening to social advice from others which could be encouraging or discouraging messages.

Emotional States – This can be interpreted as stimulation of anxiety, stress, enthusiasm, and other moods which impacts self-efficacy beliefs.

Model of Personal Computer Utilization (MPCU):

MPCU is a theory proposed by Thompson et.al. in 1991 and its roots are grounded in the work done by Triandis (1980) as he argued that behaviour is determined due to attitudes, norms and habits.

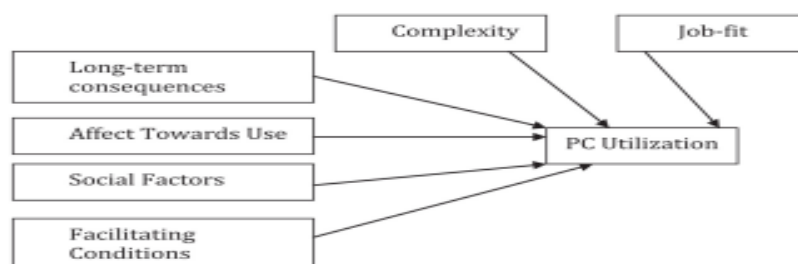


Figure.6. Model of Personal Computer Utilization (MPCU) by Thompson (1991)

Triandis (1980) explored the term ‘Social factors’ and defined it as a process of individual’s internalization of the groups’ subjective culture, and specific interpersonal agreements that the individual has made with others, in specific social situations. Subjective culture consists of norms (self-instructions to do what is perceived to be correct and appropriate by members of a culture in certain situations); roles (which are also concerned with behaviours that are considered correct but relate to persons holding a particular position in a group, society, or social system); and values (abstract categories with strong affective components).

Job-fit is defined as the measure of how well the technology suits the user's needs in performing his work every day. In simple words, how technology can enable what the user needs to enhance work. This construct is similar to TAM perceived usefulness and Task- Technology Fit model construct and its impact on performance and utilization.

Complexity in utilization of personal computing in enhancing an individuals' work performance, this factor indicates that the complexity of a system is perceived to have a direct impact on the adoption rate and utilization. Studies have shown that job fit is a stronger factor in predicting the technology utilization and the extent of effort in using the system for an individual's benefit.

Long-term consequences are a unique construct in this theory whose objective is to predict the use and outcomes of system utilization in future. According to Thompson et al., "for some individuals, the motivation to adopt and use PCs may relate more to building or planning for the future than to addressing current needs". For some users of systems it could be possible that their motivation toward adoption of a system lies in their awareness of future outcomes.

The utilization of personal computing has two other constructs which are the **affect towards use and facilitating conditions**. The affect towards system use is the pleasure or enjoyment in using the system which is free of effort and its feeling associated with utilization of system. Thompson et al. mentioned that the facilitating conditions are a construct similar to the construct validated in UTAUT research. The facilitating conditions are objective institutional factors that make an act, such as technology adoption, for the individuals easier to accomplish.

Diffusion of Innovation (DOI):

Roger's (1995) Diffusion of Innovation theory examine the factors that affect the adoption and utilization of technology in different settings and operationalizing these factors in an organization will assist in effectively adopt strategic planning in technology implementation, including the design and planning of actual system use through systemic thinking. Diffusion of Innovation (DOI) adoption factors adapted from Roger's (2003) which forms the basis of conceptual models of the adoption and use of new technologies. DOI theory is applied to the technology itself, rather than just the actual use of that technology.

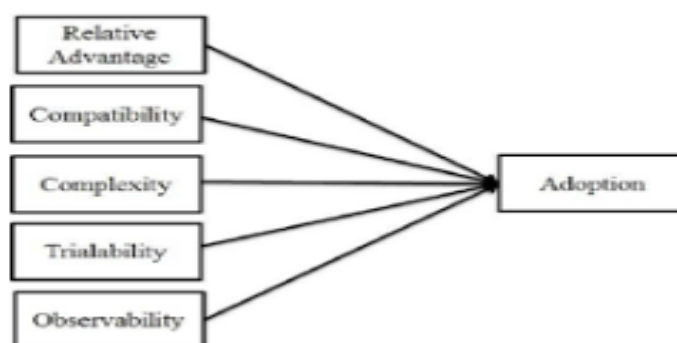


Figure.7. Diffusion of Innovation (1995)

Relative Advantage – The degree to which the innovation will offer benefits surpassing its predecessors in terms of performance.

Compatibility – The degree to which the new innovation will match the requirements of the predecessors and future adopters.

Complexity – The degree to which an innovation offers challenges in understanding and use. This is closely related to ease of use.

Trialability – The level at which innovation can be used and tested prior to adoption.

Observability – The degree to which the outcomes of adoption is evident to the external viewer. This theory suggests that innovations which have a greater degree of relative advantage, compatibility, trialability, observability and a lower level of complexity are more likely to be adopted by the consumer and these factors not only determine the stakeholder adoption of system for use, but also the rate at which the adoption will take place

Combined TAM and TPB (C-TAM-TPB):

Taylor and Todd (1995) created the C-TAM-TPB model which combines the determinants of TPB with TAM to formulate a hybrid model. The perceived usefulness and perceived ease of use from TAM model was an addition in this model as a predictor of IS success.

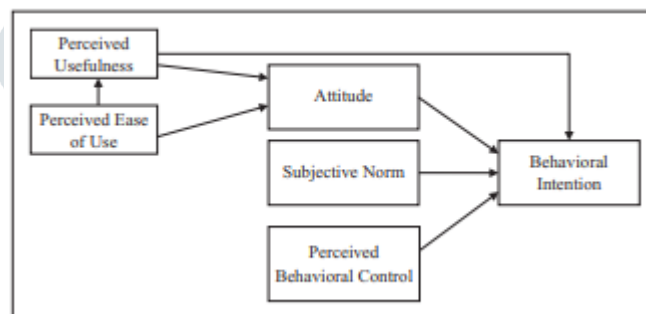


Figure.8. Combined TAM and TPB (C-TAM-TPB) by Taylor and Todd (1995)

The predictors of the model which are the core constructs in determining the behavioural intention have been adapted from TRA/TPB and TAM.

Technology Acceptance Model 2 (TAM2):

The extension of the TAM model was posited by Venkatesh and Davis in 2000. This model was postulated to examine the impact of determinants of perceived usefulness i.e.; social influence and cognitive instrumental. It is important to understand the determinants of perceived usefulness on usage intention because these determinants influence changes overtime with continued systems usage. The original TAM model was based on the dimensions perceived ease of use and perceived usefulness; both dimensions together posited the influence on behavioural intention to use through mediated relationship. The perceived usefulness enables organization to design interventions that will influence acceptance and usage of systems.

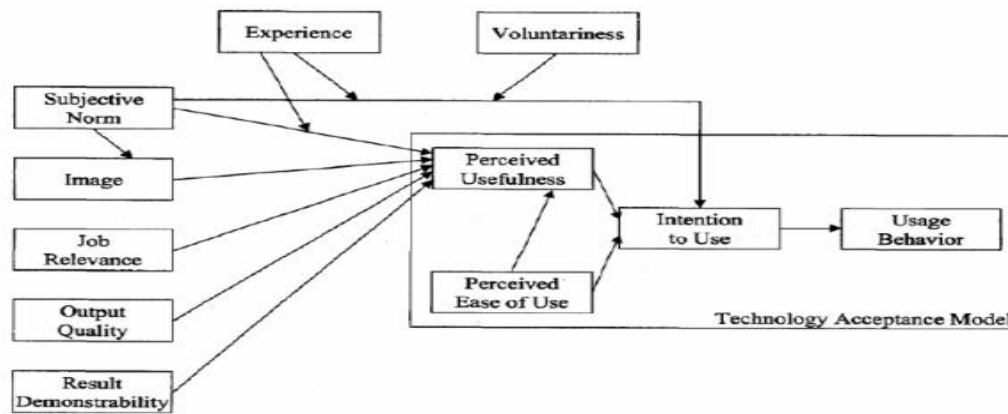


Figure.9. Technology Acceptance Model - 2 by Venkatesh and Davis in 2000

The theoretical constructs social influence and cognitive instrumental processes were added to extend the TAM model. The determinants of the social influence process are subjective norm, voluntariness of use, image and experience and the determinants of cognitive instrumental process are job relevance, output quality and result demonstrability.

Subjective norm – A person’s perception that people who are important to him/her should or should not perform the behaviour in question

Voluntariness of use – A person’s perception to the extent that decision to adopt technology is non-mandatory

Image – The degree to which use of an innovation or intervention perceived to enhance one’s social status

Experience – The subjective norm would have a deteriorating effect on behavioural intention overtime with increased use of system and expertise.

Job relevance – An individual’s perception regarding the actual system being able to support a user to accomplish his tasks

Output quality – The perceived outcome with perceived quality being an important aspect of work

Result demonstrability – The tangibility of outcomes on using innovation which are discrete with observable and measureable characteristics.

Theory of Planned Behaviour (TPB):

This behavioural model is an extension to the Theory of Reasoned Action and this theory explains how one’s belief impacts the behavioural intention. Ajzen (2002) reflected that the behavioural intention is the readiness of an individual to perform a particular task, produced by a combination of attitude toward the behaviour, subjective norm, and perceived behavioural control. Behavioral control is similar to self-efficacy, and depends on the individual's perception of how difficult it is going to be to engage in the behaviour. Ajzen, (2002) also suggested that the more favourable a person's attitude is toward a recommended behaviour and subjective norms, the greater the perceived behavioural control, the stronger that person's intention will be to perform the behaviour in question. Moreover, given a sufficient degree of actual control over the behaviour, people will be expected to carry out their intentions when the opportunity arises.

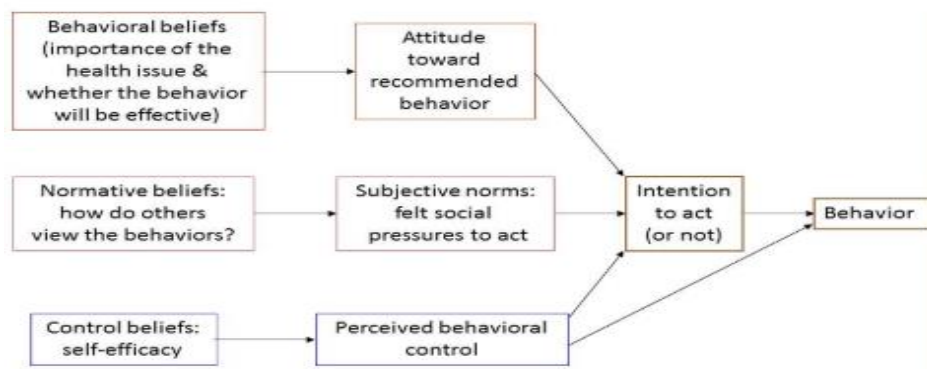


Figure.10. Theory of Planned Behaviour (TPB) by Icek Ajzen (1985)

Perceived Behavioural control can be seen as persons' intention of the ease or difficulty of performing the behaviour in question which in turn depends on the self-efficacy of executing courses of action required to be dealt under different situations. It can be seen that the perceived behavioural control has a direct effect on behavioural intention and behaviour. A measure of perceived behavioural control can predict accurately the behavioural intention to act or the actual behaviour, since perceived behavioural control is the lack of actual behavioural control and not a perception of actual behavioural control.

Motivational Model (MM):

Davis, Bagozzi, & Warshaw (1992) applied the motivational model to study and explain how extrinsic and intrinsic motivation can be used to understand new technology acceptance and users behaviour towards a system.

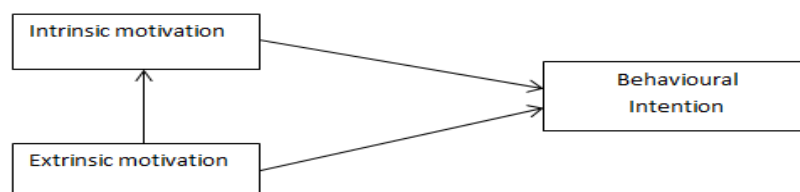


Figure.11. Motivation Model by Davis, Bagozzi, & Warshaw (1992)

Extrinsic motivations are defined as those external factors perceived to be instrumental in achieving outcomes that are distinct from the task performed such as increase in profitability, promotions, recognition, bonuses, rewards, fringe benefits and better remuneration. Social influence, performance expectancy, facilitating conditions, perceived usefulness, and subjective norm are examples of extrinsic motivation.

Intrinsic motivations are those factors that come from within such as effort expectancy, attitude, anxiety, ownership, engagement, curiosity, pride, effort expectancy, etc that influence behavioural use of system and leads to individuals' affect towards system use. The behavioural use of a system by people with high intrinsic motivation leads to greater productivity and performance, build career,

feeling of pleasure, sheer enjoyment - resulting in gratification are examples classified under intrinsic motivation.

Unified Theory of Acceptance and Use of Technology (UTAUT):

This theory was developed by Venkatesh, Morris, and Davis (2003) to understand technology adoption. This model aims to explain the direct/indirect impact of the determinants on the intention to use the system and its subsequent usage behaviour or the actual information systems usage. This model is synthesized by reviewing eight models and on further review it was found that there are two other models namely Self-efficacy theory and the Uses and Gratification Theory (UGT) having constructs similar to the UTAUT model. These eight models are the Theory of Reasoned Action (TRA), the Technology Acceptance Model (TAM), the Motivational Model (MM), the Theory of Planned Behavior (TPB), the Combined TAM and TPB(C-TAM-TPB), the Model of PC Utilization (MPCU), Diffusion of Innovation Theory (DOI), and the Social Cognitive Theory (SCT), the other two models are Self-efficacy theory and the Uses and Gratification Theory (UGT). The determinants of this model are the independent constructs which are performance expectancy (PE), effort expectancy (EE), social influence (SI) and facilitating conditions (FC). Upon reviewing models and theories in the build-up to the UTAUT model, there were other models that were found to have constructs similar to the UTAUT model which can be categorised under the determinants of UTAUT model as mentioned in the below table:

Model Name	Determinants (UTAUT model)			
	Performance Expectancy (PE)	Effort Expectancy (EE)	Social Influence (SI)	Facilitating Conditions (FC)
Technology Acceptance Model (TAM)	Perceived usefulness	Perceived ease of use/Voluntariness of use	–	–
Technology Acceptance Model 2 (TAM2)	Perceived usefulness/ Result demonstrability/ Output Quality	Perceived ease of use/Job relevance	Subjective Norm/Image	–
Theory of Reasoned Action (TRA)	–	–	Subjective Norm/Attitude	–
Theory of Planned Behaviour (TPB)	–	–	Subjective Norm/Attitude	Perceived Behavioural Control
Combined TAM and TPB (C-TAM-TPB)	Perceived usefulness	Perceived ease of use	Subjective Norm/Attitude	Perceived Behavioural Control
Model of Personal Computer Utilization (MPCU)	Job fit	Complexity/ Affect	Social factors	Facilitating Conditions
Diffusion of Innovation (DOI)	Relative	Complexity	–	Compatibility/

	advantage			Trialability
Social Cognitive Theory (SCT)	Outcome expectations	–	Subjective/Socio-cultural norm	–
Motivational Model (MM)	Extrinsic motivation	Intrinsic motivation	–	–
Self-Efficacy Theory	Performance accomplishment	Vicarious Experiences/Emotional states	Social persuasion	–
Uses and Gratification Theory (UGT)	Cognitive needs	Tension Release needs/ Affective needs	Personal/Social Integrative needs/	–

Table.1

This model is a result of investigation and consolidation of previous models that were used to research the information systems adoption and usage behaviour. Gender, age, experience, and voluntariness of use are postulated to moderate the influence of the four key determinants on behavioural intention (BI) and behaviour to use the system (UB). Deriving from Triandis’ original research about attitude and attitude change, affect is defined in MPCU as “the feelings of joy, elation, or pleasure, or depressing, disgust, displeasure, or hate associated by an individual with a particular act”. As its counterpart in UTAUT, facilitating conditions are objective institutional factors that make an act, such as technology adoption, for the individuals easier to accomplish. For example through proper tutoring and guidance some of the potential barriers and obstacles to acceptance and utilization of technology can be reduced or even removed completely.

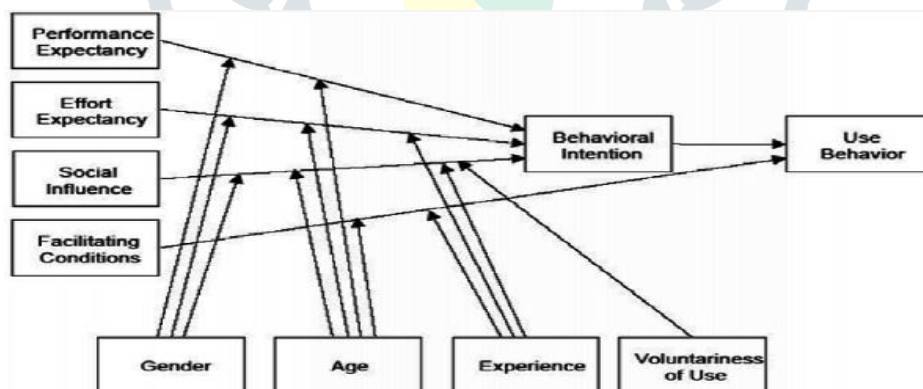


Figure.12. Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh, Morris, and Davis (2003)

Performance Expectancy (PE) is similar to the TAM construct perceived usefulness. Individual performance is highly important for an organization as a whole and for the individuals working in it (Sonnentag & Frese, 2002). Performance expectancy can be defined as the degree to which the user expects that the system will aid in improving the performance to bring about superior results and gains in work or task performance. Age and gender are the moderators of the relationship between

performance expectancy and behavioural intention. The dimensions that are related to this construct from reviewed models are Perceived usefulness, Result demonstrability, Output Quality, Job fit, Relative advantage, and Outcome expectations, Extrinsic motivation, Performance accomplishment, Cognitive needs

Effort Expectancy (EE) is similar to the TAM construct perceived ease of use. Effort Expectancy can be defined as the degree of ease in using information systems with required level of effort needed to operate and work through. The age, gender, and experience are the moderators of the relationship between effort expectancy and behavioural intention. The dimensions that are related to this determinant are from previously reviewed models are Perceived ease of use, Voluntariness of use, Job relevance, Complexity, Affect, Intrinsic motivation, Vicarious Experiences, Emotional states, Tension Release needs and Affective needs.

Social Influence is similar to the TPB construct subjective norm, which are the felt social pressures to comply with the expected behaviour. Social influence can be defined as the degree to which it is felt important for self and others to accept and use the information system to derive benefits of use. The variables age, gender, experience and voluntary use are moderators of the relationship between social influence and behavioural intention. The dimensions that are related to this determinant are from previously reviewed models are Subjective Norm, Image, Attitude, Social factors, Subjective/Socio-cultural norm, Social persuasion, Personal needs, Social Integrative needs.

Facilitating Conditions are the infrastructural settings that are perceived by individuals to be conducive for incorporation and utilization of technology. The age and experience are the moderators in relationship between facilitating conditions and use behaviour. The dimensions that are related to previously reviewed theories and models are Perceived Behavioural Control, Facilitating Conditions, Compatibility, and Trialability.

In their theory, Fishbein and Ajzen (1975) asserted that certain behaviour can be predicted by the intention for doing the behaviour in question. Therefore, adoption of technology aided learning in institutions can be predicted by taking behavioural intention into consideration.

Theory of Task-Technology Fit (TTF):

Goodhue defines task-technology fit (TTF) as the degree to which a technology assists an individual in performing his or her tasks, (Michael L. Irick, 2008). Studies have shown that the task-technology fit plays a significant role in measuring information systems effectiveness in utilization of technology in undertaking tasks and assessing its impact on performance and subsequently users' intention to adopt technology in a given environment.

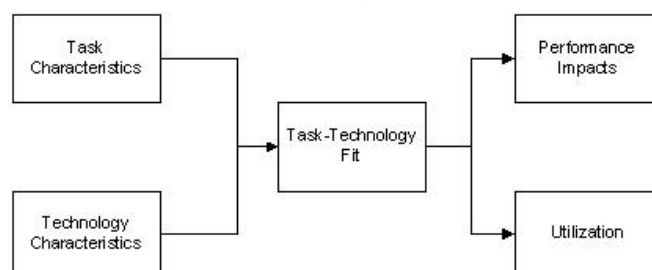


Figure.13. Task-Technology Fit model by Goodhue and Thompson (1995)

Task characteristics and technology characteristics are antecedents to task-technology fit dimension which is a mediator variable which is perceived to cause the effect on the dependent variables i.e., performance impacts and utilization. According to D. L. Goodhue & Thompson (1995)

the task technology fit (TTF) model argues that individuals will adopt a technology based on the fit between the technology characteristics and task requirements and also state that the task characteristics are those for which a user might use information technology and Technology characteristics is the tool (hardware, software, data) used by end-users in carrying out their tasks. It is possible that, although users perceive a technology as being advanced, they do not adopt it if they think this technology is unfit with their tasks and cannot improve their performance (Junglas Abraham, & Watson, 2008; Lee, Cheng, & Cheng, 2007). The results reveal that use and user satisfaction are important precedents of individual performance, and the importance of the moderating effects of TTF over usage to individual performance (Carlos Tam; Tiago Oliveira, 2016). Since the users will be utilitarian it is imperative to know the degree of perceived effectiveness, benefits and user satisfaction of having digital driven environment among stakeholders. This IS model observes the importance of TTF not only as a direct effect on individual or organizational performance, but also as the moderator effects of adoption, perceived benefits and user satisfaction. Therefore, adoption is not only determined by users' perception and attitude towards technology but also based on task-technology fit.

DeLone and McLean - Information System Success Model:

The model was first developed in 1992 and later revised and updated in 2003. The updated model consists of six determinants which is a measure of the effectiveness of information systems success and the six dimensions are information, system and service quality, behavioural intention to use, user satisfaction, and net benefits. DeLone and McLean evaluated existing definitions of information system success and proposed six interrelated dimensions to measure information system success. A system can be measured in-terms of independent characteristics such as the information, system, service quality which subsequently affect the intention to use and as an outcome of using system certain benefits and gratification is achieved by user. The user's satisfaction influences the dimensions - user intention and actual system use which has a direct impact on the net benefits. The arrows indicate the causal relationship between these interrelated dimensions of information systems success model. The measurement of information systems success or effectiveness of the IS management model is important so as to understand the value and efficacy it offers.



Figure.14. Information System Success Model by DeLone and McLean (2003)

Information Quality is a common dimension in measuring semantic success of IS model and it refers to the high standard of information that the system is able to store, retrieve, and produce. For Akter, D'Ambra, and Ray (2013) information quality plays a critical role in developing a positive attitude toward the benefits of using a specific information technology (IT). Information quality impacts user's satisfaction/gratification of the system after system use and influences user's intention to use the

system. Information quality should be clear, precise, concise, useful, reliable, timely, consistent, relevant and up-to-date.

Systems Quality is another dimension which helps to evaluate the technical success of systems. System quality is a feature which impacts the extent to which it delivers benefits through mediated variables such as behavioural intention to use/actual use and user satisfaction. The key features of system quality are perceived usability, accessibility, adaptability, reliability, convenience, customization, efficiency, flexibility and response time.

Service Quality is a dimension which evaluates the information systems on the quality of service being delivered to users. Information systems service quality has been cited by other researchers as an important measure in determining IS effectiveness. Service quality impacts the behaviour intention to use and user's gratification which has an impact on the benefits produced by the system and in-turn influences intention to use the system. The service quality can be measured in-terms of assurance, reliability, training, responsiveness, and empathy.

Intention to Use/Actual Use – The Intention to use and actual system use in literature are well established constructs in relation to technology acceptance models. Carlos Tam; Tiago Oliveira (2016) mention in their study that “Use must precede ‘user satisfaction’ in a process sense, but positive experience with ‘use’ will lead to greater ‘user satisfaction’ in a causal sense”. The dimensions information, system, service quality are the antecedents of intention to use which affect the system use. There exists a reciprocal relationship between actual use and user satisfaction and these constructs together is posited to influence net benefits. The intention to use is measured with characteristics such as usage, frequency of use, nature of use, actual system use, and dependency.

User satisfaction – This construct precedes the net benefits and is a mediational variable between the dimensions net-benefits and information, system, service. It is also seen from the IS success model that it posits influence on the intention to use and net benefits. The User satisfaction is characterised by efficiency, effectiveness, pleasure, and adequacy. The system quality, information quality, and service quality positively affect user satisfaction.

Net Benefits – The ‘impact measures’ or ‘success measures’ that the actual system use would have at an individual and organizational level in using an IS model are grouped under a single benefit category called “net benefits”. The benefits being measured will depend on the system or systems being evaluated and their purpose for using such systems.

Control variables – The moderators or control variables in this study could be age, gender, experience, designation, voluntariness of use, etc.

CONCEPTUAL FRAMEWORK

Proposed Unified Model for Technology Adoption:

To develop a comprehensive framework for the study, we have collated models that most significantly impact the behavioural intention, adoption of technology and Outcome (Net benefits). Through adoption of technology driven environment intended to provide digital learning solutions for management learning programs in B-Schools. The conceptual framework designed is an amalgamation of three different models – **Task-technology fit model, Delone & McLean model, and Unified Theory of Acceptance and Use of Technology (UTAUT) model.**

Although the three models discussed here can individually assess the adoption, however the outcome can be established through the coverage and combination of all three models providing a more holistic view. This comprehensive model is formulated based on literature review and the inter-relationships between these models can be found in the theory. The goal of the study is to identify the potential drivers that influence technology adoption and implementation of digital learning solutions, and also need to assess the stakeholders' perception of their learning experiences and capabilities which is the resulting outcome (net benefits) of having digital learning environment.

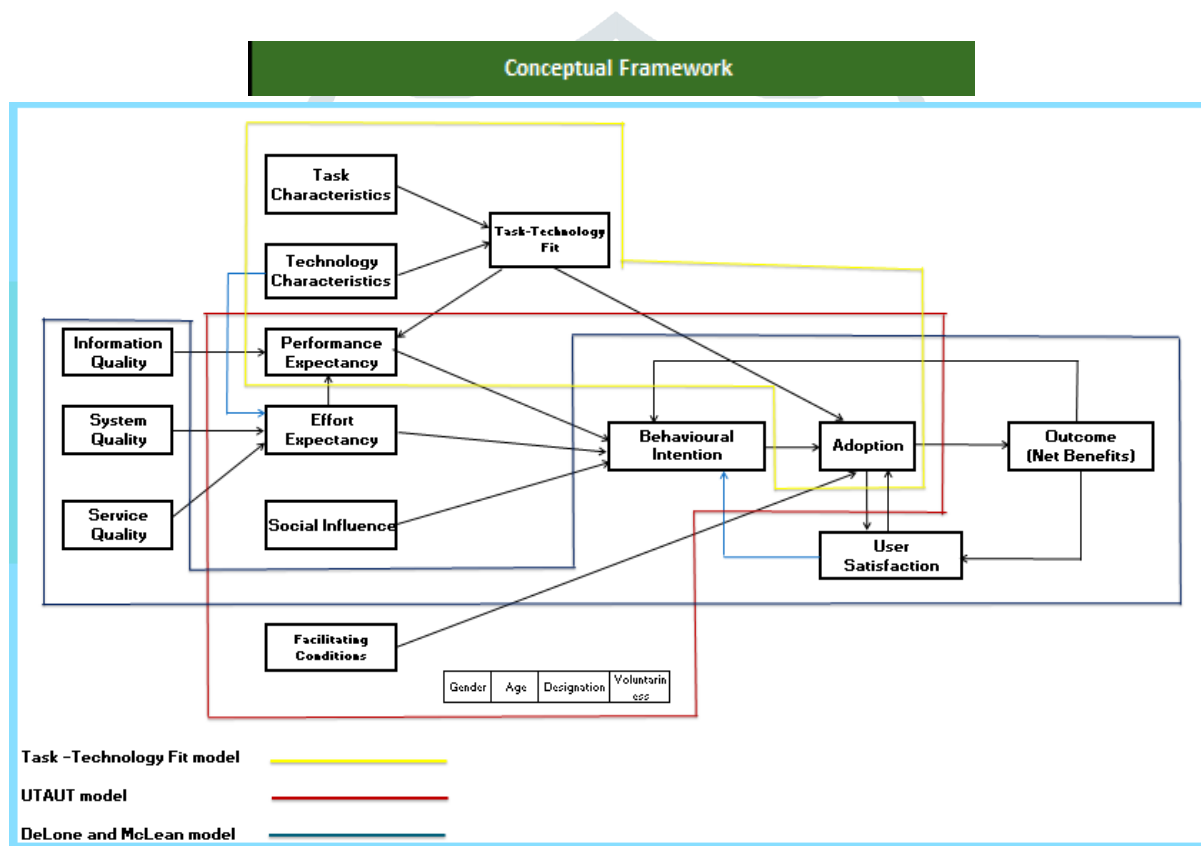


Figure.15 Proposed Unified Model for Technology Adoption – Conceptual Framework

CONCLUSION:

Several studies have revealed that technology adoption is not related to the aspects of technology alone but has evolved as a much more complex process involving dimensions of user attitude and personality (Venkatesh et al. 2012), social influence (Ajzen and Fishbein 1975), and numerous facilitating conditions (Thompson et al. 1991). It is necessary to understand the evolution and explore this research area in technology adoption and look at future research opportunities. Almost all theories and models have been an adaptation of the previous theories and models since technology is never stagnant. Each model has their unique strengths and weaknesses, and the weaknesses are offset by combining various models. Therefore, to ensure the new model is comprehensive in its nature and is

best fit for the situation, all three models are the integrated model was developed by incorporating and connecting three different models which were adapted for developing a new model for the research study overtime.

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