The Evolution of Technology Acceptance Theories

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Abstract

Technology acceptance has become one of the most significant subjects in software engineering field. Many theories and models proposed over the years to explain the individuals' usage behaviour towards technologies. This research paper focuses on the evolution of the technology acceptance theories and models by reviewing and comparing them. This study reviews a group of ten technology acceptance theories that were analysed and arranged according to their chronological order of evolution. This study reveals that these theories and models are similar in their structure, but different in their explanation for the behaviour and usage. It considers that the best theory should be comprehensive and less complexity according to the number of the constructs and moderators represent their structure. This will make the theory more applicable and understandable especially for studying the acceptance behaviour for any new technology or information system.

Keywords: technology acceptance, adoption, behavioural intention, usage behaviour.

1. Introduction

Nowadays, understanding the reason of accepting or rejecting any new technology by users has become one of the most important areas in the information technology field. Studying individuals' adoption, acceptance, and use of information technologies (IT) and information systems (IS), as a part of software engineering field from computer sciences, has been recognized since the 1970s, because it is a prerequisite for technology's utilization and realization. For organizations, it means continue to increase their investment in IT [1]. Davis, Bagozzi, and Warshaw [2] defined the technology adoption as: the implementation of the software and hardware technology in an organization to increase productivity, competitive advantage, improve processing speed, and make information readily available.

Technology acceptance theories and models aim to convey the concept of how users may understand and accept the new technology and how they may use it. For any new technology, there are many variables affect the individuals' decision-making process about how and when they will use it [3]. These variables have been studied and analyzed in several researches [4]–[13]. Although much work has been done to date, more studies need to be conducted to ascertain the suitable theory to use in studying the individual acceptance to any new technology.

Accordingly, it is important to make some related researches within the history of technology acceptance and usage in order to understand how they developed and evolved throughout the years, revealing similarities and differences between them. To address this issue, this paper reviews the most important, famous, and widely used ten theories for technology acceptance. In addition to studying the limitations for each one of them which shows the reason from this evolving, and showing the relations between them by studying their major constructs, variables and moderators. This research work is identified as being of importance to researchers in technology acceptance field for providing them with the necessary background towards their studies.

2. Theories and Models of Technology Acceptance

In this scope, the theories and models which developed to study the acceptance by users and their adopting new technology are presented herein. These theories have been developed over the years and resulted from the extension of each other. Thus, the most important and famous used ten theories are reviewed as follows: The Theory of Reasoned Action (TRA) [5], which was extended to the Theory of Planned Behavior (TPB) [7], which also had an extension to the Decomposed Theory of Planned Behavior (DTPB) [14]. The information systems had a contribution to the existence of the Technology Acceptance Model (TAM) [10], which is an extension of TRA; that also has an extension to TAM2 [12]. In addition to combination form of TAM and TPB (C-TAM-TPB) [11]. The Model of PC Utilization (MPCU) [4], the Innovation Diffusion Theory (IDT) [6], the Motivational Model (MM) [8], and the Social Cognitive Theory (SCT) [9] are developed in several scientific and social fields and are reviewed as well.

All technology acceptance theories are designed to measure the degree of acceptance and satisfaction to the individual users against any technology or information system but from different points of view depending on the constructs or determinants which represent their structure. Table 1 displays definitions of the whole constructs that are

shown in all theories reviewed in this paper as defined by their theories' developers. Some of these constructs have been uniquely used in one theory, and the others have been adopted by more than one theory.

Table 1
Definitions of all constructs related to the theories

Constructs	*Definition*
Attitude Toward Behavior	"An individual's positive or negative feelings (evaluative affect) about performing the target behavior" [3, p 216].
Subjective Norm	"The person's perception that most people who are important to him think he should or should not perform the behavior in question" [3, p 302].
Beliefs	"The individual's subjective probability that performing the target behavior will result the consequence *i*" [2, p 984].
Evaluation	"An implicit evaluative response" to the consequence [3, p 29].
Normative Beliefs	"Normative beliefs refer to the perceived behavioral expectations of important referent individuals or groups" [15].
Perceived Behavioral Control	"The perceived ease or difficulty of performing the behavior" [16, p 188]. In the context of information systems research, "Perceptions of internal and external constraints on behavior" [14, p 149].
Actual Behavioral Control	"It refers to the extent to which a person has the skills, resources, and other prerequisites needed to perform a given behavior" [15].
Behavioral Beliefs	"A behavioral belief is the subjective probability that the behavior will produce a given outcome" [15].
Control Beliefs	"Control beliefs have to do with the perceived presence of factors that may facilitate or impede performance of a behavior" [15].
Perceived Usefulness	"The degree to which a person believes that using a particular system would enhance his or her job performance" [17, p 320].
Perceived Ease of Use	"The degree to which a person believes that using a particular system would be free of effort" [17, p 320].
Image	"The degree to which use of an innovation is perceived to enhance one's status in one's social system" [12].
Job Relevance	"Individual's perception regarding the degree to which the target system is relevant to his or her job" [12].
Output Quality	"The degree to which an individual believes that the system performs his or her job tasks well" [12].
Result Demonstrability	"Tangibility of the results of using the innovation" [12].
Experience	The degree knowledge or skill that individual has in using technologies or particular technology in addition to the period of time with this skill.
Voluntariness	"The extent to which potential adopters perceive the adoption decision to be non-mandatory" [12].
Job-fit	"The extent to which an individual believes that using (a technology) can enhance the performance of his or her job" [18, p 129].
Complexity	"The degree to which an innovation is perceived as relatively difficult to understand and use" [18, p 128].
Long-term Consequences	"Outcomes that have a pay-off in the future" [18, p 129].
Affect Towards Use	"Feelings of joy, elation, or pleasure, or depression, disgust, displeasure, or hate associated by an individual with a particular act" [18, p 127].
Social Factors	"The individual's internalization of the reference group's subjective culture, and specific interpersonal agreements that the individual has made with others, in specific social situations" [18, p 126].
Facilitating Conditions	Objective factors in the environment that observers agree to make an act easy to accomplish [13]. For example, returning items purchased online is facilitated when no fee is charged to return the item. In an information system context, "Provision of support for users of PCs may be one type of facilitating condition that can influence system utilization" [18, p 129].
Relative Advantage	"The degree to which an innovation is perceived as being better than its precursor" [19, p 195].
Ease of Use	"The degree to which an innovation is perceived as being difficult to use" [19, p 195].
Image	"The degree to which use of an innovation is perceived to enhance one's image or status in one's social system" [19, p 195].
Visibility	The degree to which one can see others using the system in the organization [19].
Compatibility	"The degree to which an innovation is perceived as being consistent with the existing values, needs, and past experiences of potential adopters" [19, p 195].
Results Demonstrability	"The tangibility of the results of using the innovation, including their observability and communicability" [19, p 203].
Voluntariness of Use	"The degree to which use of the innovation is perceived as being voluntary, or of free will" [19, p 195].
Extrinsic Motivation	"The perception that users will want to perform an activity because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself, such as improved job performance, pay, or promotions" [13, p 448], [20, p 1112].
Intrinsic Motivation	"The perception that users will want to perform an activity for no apparent reinforcement other than the process of performing the activity per se" [13, p 456], [20, p 1112].
Outcome Expectations-Performance	The performance-related consequences of the behavior. Specifically, performance expectations deal with job-related outcomes [21].
Outcome Expectations-Personal	The personal consequences of the behavior. Specifically, personal expectations deal with the individual esteem and sense of accomplishment [21].
Self-efficacy	"Judgment of one's ability to use a technology (e.g., computer) to accomplish a particular job or task" [13, p 432].
Affect	"An individual's liking for a particular behavior (e.g., computer use)" [13, p 432].
Anxiety	"Evoking anxious or emotional reactions when it comes to performing a behavior (e.g., using a computer)" [13, p 432].
Usage	The degree of use of the technology [21].

2.1. Theory of Reasoned Action (TRA)

TRA is the earliest technology acceptance theory. It was developed in the field of social psychology by Ajzen and Fishbein in 1967. Its history returned to the period from 1910's to 1960s. This period was the beginning of studying the individuals' behavior through the impact of attitude. Attitude has either a direct or an indirect effect on behavior, and it is either one-dimensional or multidimensional factor. Ajzen and Fishbein [5] mentioned that TRA was designed to explain virtually any human behavior.

TRA is a general model, not designed for a specific behavior or technology. It is one of the most fundamental theories of human behavior. Ajzen and Fishbein's model was as a result of a research program that started in the late of 1950s on the Persuasion Models of Psychology. Their aim was to develop a theory that could predict, explain, and influence human behavior [5]. They considered that this theory is moderated by two main constructs; attitude toward behavior and subjective norm (see table 1 for definitions).

2.2. Theory of Planned Behavior (TPB)

TPB is an extension of TRA done by Ajzen [7]. It was extended by adding a new construct which was perceived behavioral control (defined in table 1). It is theorized to be an additional determinant of intention and behavior. TPB has been successfully applied to the understanding of individual acceptance and usage of many different technologies. Ajzen [7] considered that this theory is moderated by three main constructs; attitude toward behavior and subjective norm which are adopted from TRA, and the new one, the perceived behavioral control.

2.3. Decomposed Theory of Planned Behavior (DTPB)

The DTPB has been discussed two times in separate studies by Taylor and Todd [11], [14]. It decomposes attitude toward behavior, subjective norm, and perceived behavioral control into multi-dimensional belief constructs within technology adoption contexts. As an extension to TPB, which was an enhancement of TRA, the DTPB expanded the TPB by including three factors from the Innovation Diffusion Theory (IDT) viewpoint which are: relative advantage, compatibility, and complexity. The relative advantage and compatibility were joined together in order to make some effect on perceived behavioral control [14]. According to Taylor and Todd [22] examination to TRA, TPB, and DTPB, they found that TRA and TPB are good in predating the behavior, but DTPB proved effective in explaining the behavior.

Another study done by Taylor and Todd [14] that compared TPB and DTPB with the Technology Acceptance Model (TAM) in order to extract a more effective application to DTPB in technology usage. They joined the factors of TAM and IDT to get a new form of DTPB. The new form exchanged the complexity form IDT by ease of use form TAM. Also, it exchanged the relative advantage from IDT by perceived usefulness form TAM. Knowing that these factors are related to same characteristics and they did not change the use of the construct "attitude". Ease of use is opposite to complexity, and perceived usefulness is similar to relative advantage. DTPB has a good ability to predict the IT usage behavior by decomposing the belief structure and adding some factors from TAM. This is because of decomposing subjective norm to peer influence and supervisor influence, and including perceived behavioral control to resource and technology factors of facilitating conditions.

2.4. Technology Acceptance Model (TAM)

TAM is also an extension of TRA done by Davis [10]. It replaced TRA's attitude toward behavior with two technology acceptance measures which are: perceived usefulness and perceived ease of use. TAM didn't include the TRA's subjective norms in its structure. It was developed after the introduction of information systems into organizations. It is developed in information technology field while TRA and TPB developed in the psychology field, so that it is less general than TRA and TPB [2]. The development for TAM comes through three phases: adoption, validation, and extension. In the adoption phase, it was tested and adopted through a huge number of information system applications. In the validation phase, researchers noted that TAM uses accurate measurement of users' acceptance behavior in different technologies. The third phase, the extension, where there are many researches introducing some new variables and relationships between the TAM's constructs.

2.5. Extended Technology Acceptance Model (TAM2)

TAM2 was developed in information technology field. It had been extended from TAM by Venkatesh and Davis [12] in order to explain perceived usefulness and perceived ease of use from the social influence and cognitive instrumental processes' viewpoints. Social influence processes refer to: subjective norm, voluntariness, and image, while cognitive instrumental processes refer to: job relevance, output quality, result demonstrability, and perceived ease of use. Unlike TAM, Venkatesh and Davis inserted subjective norm as an additional construct by adopting from TRA and TPB models. Subjective norm has direct relations with perceived usefulness and intention of use. Its relation with perceived usefulness is moderated by the user experience, while its relation with intention of use is moderated by the user experience and voluntariness of use. Extending TAM to TAM2 by including some constructs from older theories in addition to some moderators to perceived usefulness and perceived ease of use will enhance the performance to the model. As an example, the existence of experience moderator will show the increase in the level of users' experience in technology over the time, and this will cause a tangible change in technology acceptance to them.

2.6. Combined TAM and TPB (C-TAM-TPB)

Taylor and Todd developed this combined model in 1995 by combining the TPB model from social psychology field with TAM from information technology field to achieve a better use of TPB in technology acceptance. This model combines the predictors of TPB with perceived usefulness from TAM to provide a hybrid model [22]. TAM and TPB theories supposed that behavior is determined by the intention to perform the behavior. Intention itself is determined by the attitude towards behavior. The constructs of TAM do not fully reflect the specific influences of technological and usage-context factor that may change user's acceptance [23]. Davis [17] noted that the future technology acceptance researches need to address how other variables affect usefulness, ease of use, and acceptance.

Taylor and Todd hypothesized that perceived ease of use is positively influencing on perceived usefulness. Both perceived usefulness and perceived ease of use are positively influencing on attitudes. Thus, attitudes, subjective norms and perceived behavior control are positively influencing on usage behaviors.

2.7. Model of PC Utilization (MPCU)

Some technology acceptance theories such as TPB and TAM developed over the TAR concept in order to explain the individual usage behaviors [5], [7], [10], [12], [17]. TPB and TAM adopted TRA with the majority of its advantages and limitations. The research work of Triandis [4] resulted a framework that described how the behavior happened, and what are the variables that encourage the individual to do the behavior while using the personal computer (PC).

According to Triandis [4] explanation for his framework, the behavior has an objective consequences which are interpreted by individual. The result of these interpretations revealed that the individual feels reinforced. This reinforcement affects in two ways on the perceived consequences of the behavior: "it changes the perceived probabilities that the behavior will have particular consequences, and it changes the value of these consequences" (p.198). Some other determinants such as: habit, relevant arousals, facilitating conditions, and social factors are effecting on the intention of the behavior.

After a time, Thompson, Higgins, and Howell [18] adapted and refined Triandis's model for information systems contexts and used it to predict PC utilization [13]. The nature of the model makes it suitable to predict individual acceptance and the use of many information technologies. They noted that the PC utilization may be influenced by individuals' feelings toward using PCs, social norms, expected consequences, habits, and the facilitating conditions. They proposed that the behavior is directly affected by the social factors, perceived consequences, effect, and facilitating conditions. The intention of usage is not included in the model because this model is studying the actual use of PCs depending on the habit, not the predictive use. Complexity and job fit are added to the model to explain the perceived consequences aspect. This model supposed that the users are having the experience required to use PC, such as professionals or managers who usually use the PCs voluntarily in their jobs. In 1994 the authors continued their work by considering the role of experience with PC usage. They proposed that the experience has a direct, indirect, and moderating influences on using PCs.

2.8. Innovation Diffusion Theory (IDT)

IDT which developed by Rogers in 1962 is one of the oldest social science theories to study any kind of innovations [24]. This theory was a result of several diffusion studies which had been done in 1950s and focused on individuals' differences in innovativeness. Rogers [25] proposed the following four major factors for determining the behavior: innovation, communication channels, time and social systems. The terms diffusion, innovation, and communication defined by him as follows: Diffusion: is the process in which an innovation is communicated through certain channels over time among members of a social system. Innovation: is an idea, practice, or object that is perceived by an individual. Communication: is a process that leads to create and share information with others in order to get a common understanding. Rogers stated that there are five innovation attributes which effect on individuals' behaviors and explain the rate of innovation adoption. These attributes are: relative advantage, compatibility, complexity, trialability, and observability [6].

For the application of IDT in information technology field, Fichman [26] mentioned that IDT is of a good application for studying technology adoption, evaluation, and implementation. In addition to assessing both quantitative and qualitative studies of diffusion of technology. For the extension work of the IDT in information technology done by Moore and Benbasat [19], they adapted the five attributes of innovations presented in IDT and refined a set of constructs that could be used to study individual technology acceptance [27]. This work contributes in individuals' initial adoption of IT in organizations and technology diffusion within organizations. They added the voluntariness of use and image to the Rogers model's constructs. As a consequence, the factors compatibility, perceived usefulness (relative advantage) and ease of use (complexity) were the most influential factors on usage decisions, while demonstrability result, image, visibility, and trialability were not significantly influencing in determining individuals' usage.

2.9. The Motivational Model (MM)

Since 1940's, many theories have been resulted from motivation research. Self-Determination Theory (SDT) developed by Deci and Ryan [8] is one of them. SDT proposed that self-determination is a human quality that involves the experience of choice, having choices and making choices [8]. Deci, Vallerand, Pelletier, and Ryan [28] mentioned that the regulatory process is choice when behavior is self-determined, but when it is controlled, the

regulatory process is compliance, or defiance in some cases.

Motivation theory has supported the researches in psychology as an explanation for behavior. These researches emerged the result that the motivational theory contains two major factors of motivations: extrinsic motivation and intrinsic motivation. SDT represents the extrinsic motivation and consists of four types of self-determinations as follows: external, introjected, identified and integrated form of regulation, while the intrinsic motivation refers to intrinsic regulation. It also represents how the social environment influence on motivated behaviors. In addition to that, the amotivation behavior must be considered to understand human behavior fully [8]. Amotivation behavior is non-regulation and not extrinsically or intrinsically motivated.

As contributions for SDT within the information technology domain, the SDT theory was examined and adapted by several studies. Davis, Bagozzi, and Warshaw [20] applied motivational theory to understand new technology adoption and use [29], [30]. Davis et al. [20] tested the extrinsic and intrinsic motivation to use technology in workplace and found that they are key drivers of an individual's intention to perform the behavior of technology usage. They explained the extrinsic motivation to use technology as perceived usefulness from using the technology, and intrinsic motivation to use technology as perceived enjoyment of using the technology. They noted a relation between usefulness and enjoyment. Enjoyment strongly effects on intentions when information systems are perceived to be more useful, which means that the enjoyability of the information system is enhancing the acceptance of useful systems, but in the same time, it has less effect on acceptance of useless systems [20].

2.10. Social Cognitive Theory (SCT)

SCT idea started in 1941 by Miller and Dollard with the name of Social Learning Theory (SLT) for the purpose of introducing the modelling into the principle of learning. Over the years, many researchers worked on developing SLT, and one of the most contributions was by Bandura. In 1986, Bandura had developed SCT as a result of his continued work started in 1960s to expand SLT to become one of the most powerful theories of human behavior [31]. The major feature of SCT is the social influence and its effect on external and internal social reinforcement. SCT also cares about the previous experiences for individuals. These previous experiences are influencing on reinforcements and expectancies with no matter if the individual engages in a specific behavior or not, and exposing the reasons why the individual engages in that behavior. SCT believes that previous experiences create expectations of outcomes related to performing certain behavior.

The study of Compeau and Higgins [32] resulted a modified form to the SCT. This modified form aimed to make SCT more suitable for studying the context of computer usage. They extended it to a model for acceptance and use of information technology in order to measure the self-efficacy and its impact on behavior. The model of Compeau and Higgins [32] utilizes the usage factor as a dependent variable with individual's predicting. They proposed that the self-efficacy has three distinct characteristics but with interrelated dimensions which are: magnitude, strength, and generalizability. They assumed three main constructs of usage behavior stated as: outcome expectations, emotional reactions to computers, and self-efficacy [21], [32], [33]. Outcome expectations are explained to performance outcome expectations and personal outcome expectations, emotional reactions to computers explained in affect and anxiety [34].

3. The Limitations of Reviewed Theories

The ten theories and models mentioned and reviewed here have discussed the individuals' behaviors and their acceptance ability to adopt new technologies according to some constructs and variables. These theories have been focused on the psychological and behavioral viewpoints for the users of technology. But each one of them has its limitations and boundaries which are considered as the main reason for the development operations to some of them and the adoptions of others from each other. As an example, the theories of TPB, DTPB, and TAM are developed from the TRA. But there are some problems still exist within these theories.

Qingfei, Shaobo, and Gang [35] mentioned that there are two main issues related to acceptance theories; first, each theory uses different terminologies in their constructs, but they are essentially within the same concepts. Second, according to the complexity of behavior research and the limitation of the researchers, there is no single theory that covers all behavioral factors. In other words, each theory has its own limitations and does not complement to each other. It is explained below the limitations of the aforementioned ten theories separately:

TRA: It is very general model and not designed for a specific behavior or technology [2]. Correspondence is the main limitation for it [7]. It predicted specific behavior, attitude, and intention to be agreed on action, target, context, and time frame [36], [37]. It is still limited with no mention to other variables that affected on behavioral intention like fear, threat, mood, or previous experiences.

TPB: It is an extension to the limited model TRA. It suggests that the behaviors are already planned by adding a new construct which is the perceived behavioral control [37]. It does not show the planning mechanism of individuals and how it relates to TPB with no mention to other variables that affected on behavioral intention and motivation, such as fear, threat, mood, or past experience. It does not take into account the environmental or economic factors that may influence the individuals' intention to perform a behavior [38].

DTPB: It decomposed the constructs of TPB in detail with all their characteristics. It is identical to TPB. It still

has the same limitation as TPB with an idea that the behaviors are already planned before [39], [40].

TAM and TAM2: Many researches were done over TAM and its adoption and validation. These researches showed that TAM provides feedback on two factors: (1) usefulness and (2) ease of use. But, it doesn't provide any feedback on some factors that may enhance the adoption like integration, flexibility, completeness of information, and information currency [41]. In addition, TAM and TAM2 do not specify how expectancies are influencing on behavior [42]. By studying the major constructs of both of the models, and the relationships between these constructs, some results of these studies showed the relations were statistically significant, and indicating that TAM and its extension as powerful models, while others concluded opposite finding [43]. By studying the cultural dimension, TAM and TAM2 in the same way cannot predict user behavior within culture.

C-TAM-TPB: Although the combined model is integrated with the advantages of TAM and TPB, but the factor of planning for individual's behaviors is not taken into account. Collecting the subjective norm form TPB and ease of use from TAM is useful but does not fix everything. It still does not take attention for fear or threat about use [44], [45].

MPCU: It is successful in understanding and explaining the acceptance and computer usage behavior with a voluntary causative [46], [47]. But in the same time, the complexity factor has computer and technology usage and an indirect impact on perceived short-term consequences.

IDT: This theory explains the decision of innovation and predicts the rates of the adoption factors of innovation [48], [49]. But it does not mention how the attitude affect on accepting or rejecting the decisions, or how innovation factors affect on decisions [50], [51]. In addition, this theory doesn't care about an individual's resources or social support to adopt the new behavior.

MM: This model has many applications on the motivational studies, learning, and health care. But its application on technology usage and acceptance is not effective [52], [53]. It still needs many factors to be adopted by it to become more suitable to study technology usage [54]–[56].

SCT: It is not strongly organized, especially while trying to study the relations between individual, behavior, and environment. It is not understandable yet, which one of them is more influential than the other. For instance, it is not always true when supposing that the change in the environment will automatically cause to change in the individuals' behaviors. SCT originally focuses on learning process not on motivation or technology acceptance that may affect on behaviors without taking previous experience and expectations in account [57].

4. Discussion

The technology acceptance theories and models were designed to predict the individuals' behaviors and measure the degree of acceptance and satisfaction for these individuals against any technology or information system. The prediction and measurement have been done from different viewpoints depending on the constructs or variables that present the structure and the field which the theories and models have been developed in.

Some of these theories were developed depending on some previous studies. These studies could be some theoretical or conceptual works for older researchers [4], [5], [8], [25], [31]. The developers of this type of technology acceptance theories had extracted the knowledge from these previous studies in order to produce their theories and models. While some other technology acceptance theories have been developed by adopting some older theories, one or more, in order to develop the new one [10]–[12], [22]. These adoption operations resulted some technology acceptance theories. For instance, TPB adopted TRA [7], [58]. DTPB adopted TRA and TPB [11], [14]. TAM also adopted TRA and TPB [2], [10], [44]. TAM2 adopted TAM and all previous adoptions [12]. C-TAM-TPB is a combined form from TAM and TPB which adopted all characteristics form them [22].

Depending on the previous literature, it is possible to summarize the evolution stages for all mentioned technology acceptance theories and models in form of the chronological graph, as shown below in Fig. 1. This chronological graph illustrates this evolution over the years in four main ways depending on the scientific field of development and time line for this evolution. As shown clearly, these theories and models have been resulted from the human behavioral studies which are branched out into two ways, the psychological and sociological studies.

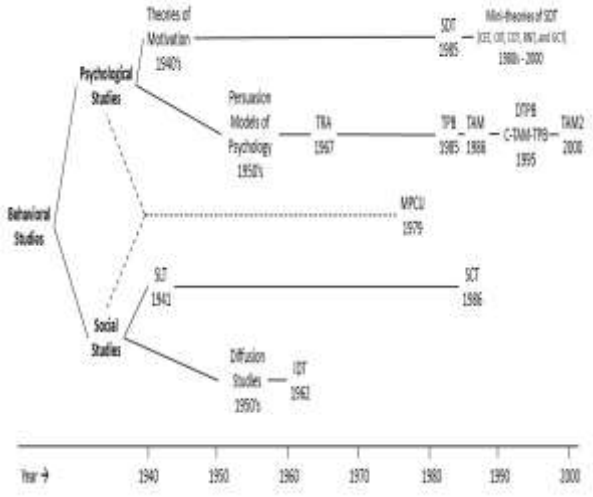

Fig. 1. Chronological graph for the evolution of technology acceptance theories..

5. Conclusion

This paper discussed and reviewed the most famous and widely used ten technology acceptance theories and

models, and summarized the chronological evolution stages of them through years. It revealed that these theories and models are similar in their structure, but different in their explanation for the behaviour and usage. According to this review, there are two main types of theories and models as per their tenor; (1) models that are trapped and restricted to consider that they are comprehensive or complete, such as TAM, and (2) models that are comprehensive because of containing a lot of constructs contributing to the acceptance behavior that cause them more complex and difficult to apply, such as TAM2. Depending on these cases, to be far away from complexity through containing a limited number of constructs and moderating variables in order to be more applicable and understandable specially for studying the acceptance behaviour to any new technology or information system.

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