

5. MODELS OF TECHNOLOGY ACCEPTANCE

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5.1 Introduction

Emergence of technology has changed the horizon of the world. There is no area of human intervention is untouched of technology. Quest for knowledge and development of human being resulted in technological revolutions. From ages human develop and accept new techniques to evolve as a superpower on earth. As Charles Darwin describes in his law “survival of the fittest” Human accepted new technique to survive and then make his life comfortable. In this race to survive so many techniques has been invented by humans but to accept right one and use it for sustain and survive and optimal utilization of oneself. These theories of evolution also describe natural selection of nature. So to be fittest human have to select right techniques and technology. To check impact of any technology various technology acceptance models have been invented by various researchers.

This chapter will discuss Various Models and theories of technology acceptance and use. Theoretical framework is very much important to as the theory redefine our ideas and concepts in a proper way. It is also useful to check whether study was done in proper way or in research language to check reliability and validity of tested hypothesis. This chapter describe various theories started from Theory of Reason Action of 1975 to Unified Theory of Acceptance and use of technology, which is selected for our study.

In present chapter we have evaluated Theory of Reasoned Action, Theory of Planned Behaviour theory of interpersonal behaviour, Technology Acceptance Model, extension of Technology Acceptance Model or TAM2, Igarria’s Model, Social Cognitive Theory, Diffusion of innovations Theory, Perceived Characteristics of Innovating Theory, Motivational Model, Uses and Gratification Theory, The Model of PC Utilization, Unified Theory of

Acceptance and Use of Technology. It is very significant that any new theory or technique's success is dependent of acceptance of its end-users. Acceptance is define as "an antagonism to the term refusal and means the positive decision to use an innovation"

In Social Science Research where any research is based on theories and behavioural studies, it is very important to approach more than one theoretical framework to complete understanding of any issue. This will help to construct Social science Theory. During this development of theory each approach is treated as individual. Therefore, an overview on available general adoption model is necessary in this field. In this paper adoption theories and models are presented to give an overview for better understanding of these models and theories. Below are the theories or approaches which help in development of Unified Theory of Acceptance and use of technology.

5.2 Theory of Reasoned Action (TRA)

Theory of Reason Action or TRA is developed by Fishbein and Azjen in 1975. It is primarily developed for sociological or psychological research. But it has put foundation for the theory for information technology usage. Fishbein and Azjan define their theory is "an individual's positive or negative feelings (evaluative affect) about performing the target behavior"

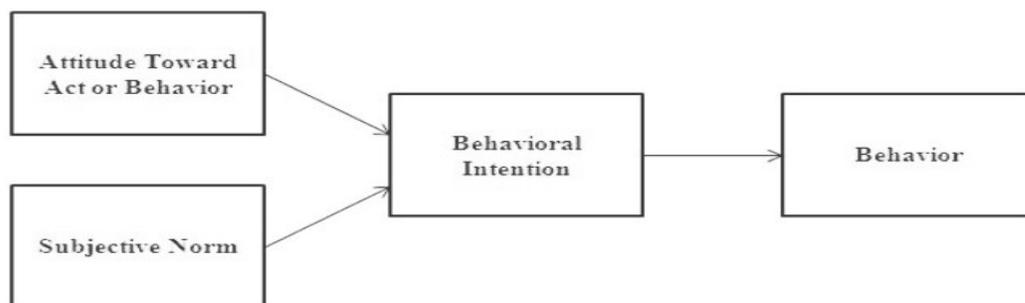


Figure 5-1 Theory of Reasoned Action

This model has been developed with assumption on three main cognitive components which includes attitudes, Social norms and Intentions. Where attitudes stands for unfavourableness or favorableness of person's feeling for a behavior, social norms as social influence and intentions stands for Individual's decision do or don't do a behavior. This is based on variable of nature of Human behavior which should be volitional, systematic and rational. Moreover, three boundaries factors, volitional control; intention stability over time; and measurement of intention in terms of target, time, context, action and specificity, are defined to test and evaluate the TRA. Some methods such as generality, target, action, context, and time horizon are established to improve the robustness between corresponding intention and attitude.

5.3 Theory of Planned Behavior (TPB)

Theory of Planned Behaviour (1991) is extension of Theory of Reasoned Action. This theory is proposed by Ajzan. This theory added new variable perceived behavioural control (PBC) to old Theory of Reasoned Action. Where perceived behavioural control is determined by the availability of resources, opportunities and skills, as well as the perceived significance of those resources, opportunities and skills to achieve outcomes. This theory describes that attitude, subject norms, and perceived behavioural control, together shape an individual's behavioural intentions and behaviours.

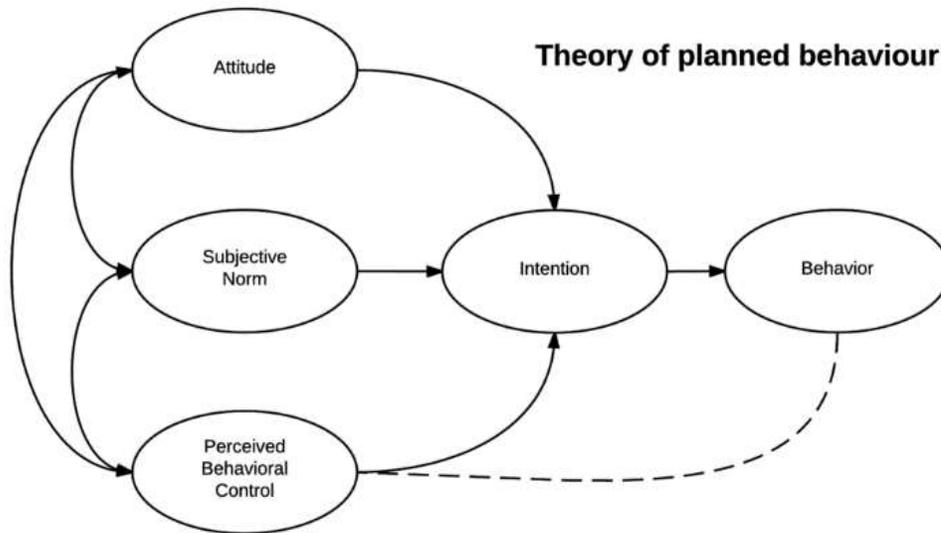


Figure 5-2 Theory of Planned Behaviour

Both TPB and TRA assumed person’s behavioural intention (BI) is affecting individual’s behaviour; TPB is using the PBC for individual’s actions which are not under volitional control. PBC, not only accurate boundaries is composed but also, a self-efficacy type factor is achieved. Moreover, PBC has the direct influence on actual behaviour as well as the indirect affect through the behavioural intentions.

5.4 Theory of Interpersonal Behaviour (TIB)

The Theory of Interpersonal Behaviour is adding new variables of habits, facilitating conditions and affects in order to improve the prediction power to previously described TRA and TPB.

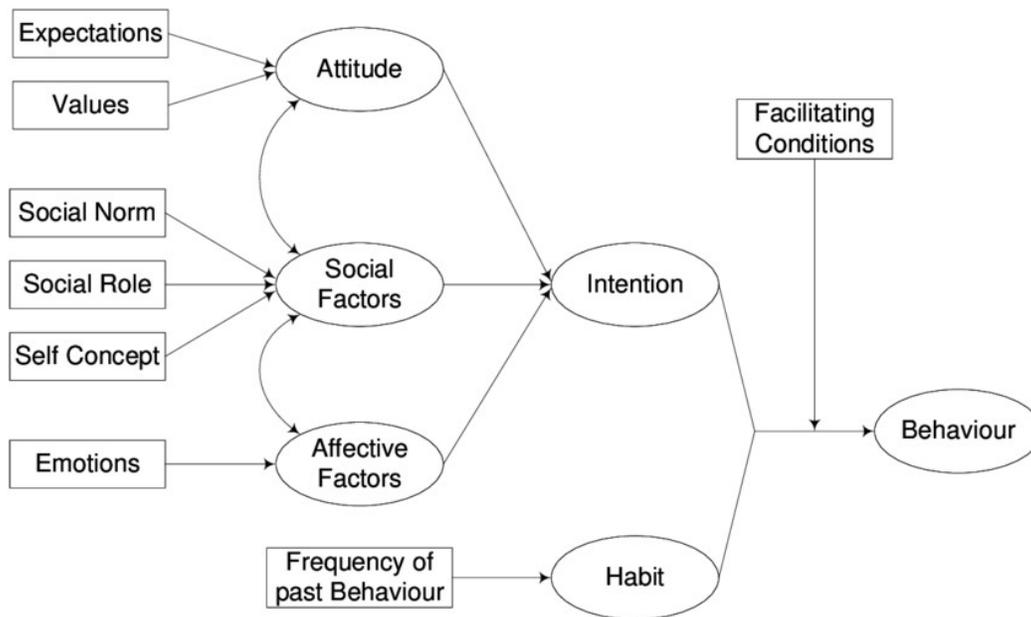


Figure 5-3 Theory of Interpersonal Behaviour

Here in this theory, the concept of social factors which is similar to the subjective norms construct in TRA. In other word Theory of Interpersonal Behaviour states that Individual is neither fully deliberative nor fully automatic, further, neither fully autonomous nor entirely social. This theory has three levels to argue the behaviour. In the first level, personal beliefs, attitudes and social factors related to the behaviour is shaped by personal characteristics and previous experiences. The second level describes how affect, cognition and social determinants plus personal normative beliefs effect on intentions to a particular behaviour. In the third level, possibility of performing a specific behaviour is predicted by behavioural intentions, situational conditions and past experience.

5.5 Technology Acceptance Model (TAM)

The limitation of TRA has resulted in development of Technology Acceptance Model. Most difficult part of TRA is uncertain theoretical and psychometric status. This has been eliminated user's subject norms and interestingly. TAM

(1989) has been developed by Davis, Fred D in his research article published in MIS Quarterly.

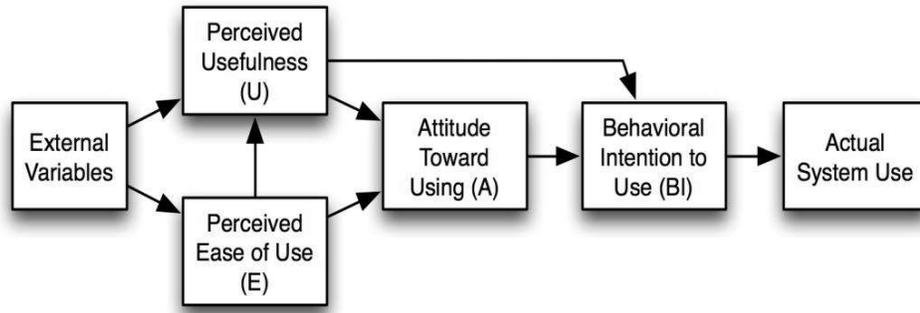


Figure 5-4 Technology Acceptance Model

The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it. They are Perceived usefulness (PU) Perceived ease of use (PEOU). An external variable such as social influence is an important factor to determine the attitude. TAM is probably one of the most widely cited model in the field of technology acceptance.

5.6 Extension of TAM (ETAM) or TAM2

In This theory of extension of TAM or TAM2 (2000) , some new factors are added to TAM in order to improve adaptively, explanatory power and specificity of TAM. The above theory is proposed by developer of Davis, Fred D and his team mate Venkatesh, Viswanath. The both have change the world's perception towards technology acceptance theory. TAM2 was proposed by adding two groups of constructs; social influence and cognitive to TAM.

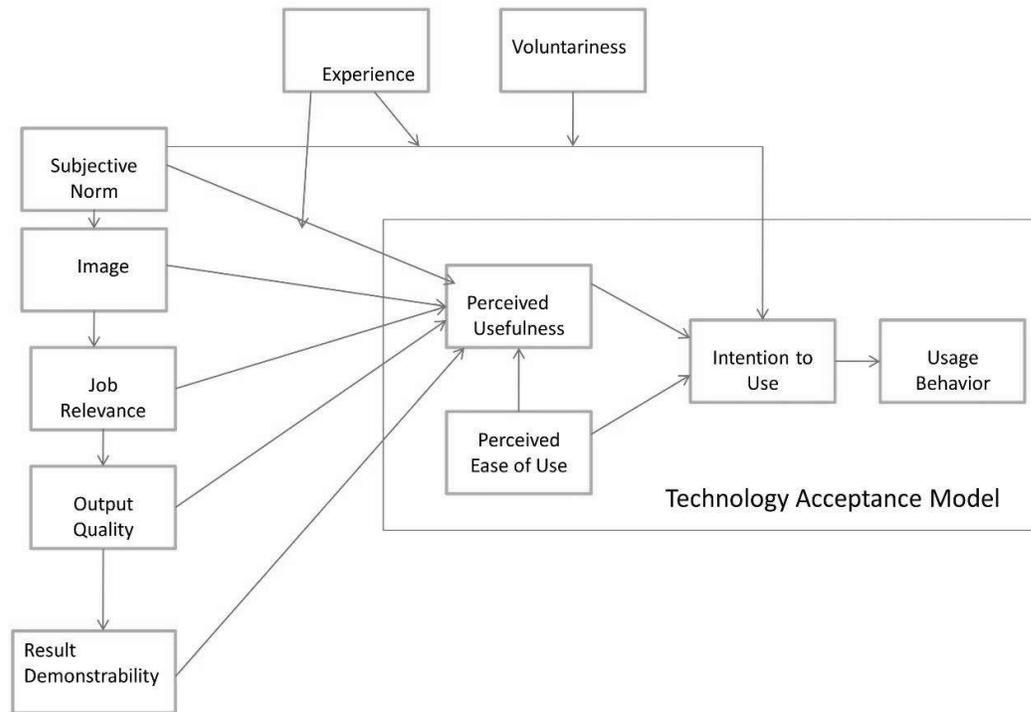


Figure 5-5 TAM2

Above image is clearly showing all variable that have been added to TAM.

5.7 Social Cognitive Theory (SCT)

Social cognitive theory is a learning theory developed by the renowned Stanford psychology professor Albert Bandura. SCT was proposed based on three main factors; behaviour, personal, and environment which are interacted bi-directionally in order to predict both group and individual behaviour. The most favourable thing in this theory is it can identify methods which can change and modify behaviour. The theory provides a framework for understanding how people actively shape and is shaped by their environment. In particular, the theory details the procedures of observational learning and modelling, and the influence of self-efficacy on the production of behaviour.

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

Venkatesh and Morris and others (2003) compared the similarities and differences among the eight models which previously used in the context of information system, all of which had their origins in sociology, psychology and communications. UTAUT consists of four constructs: facilitation conditions, efforts expectancy, performance expectancy, and social influence. These constructs were derived from the eight well-known models and directly addresses the intention of behavior to use technology. These models are Technology Acceptance Model, Theory of Reasoned Action, combined TAM and TPB, Theory of Planned Behaviour, Model of PC Utilization, Diffusion of Innovation, Motivational Model and social Cognitive Theory. Below is the figure which can describe UTAUT in model.

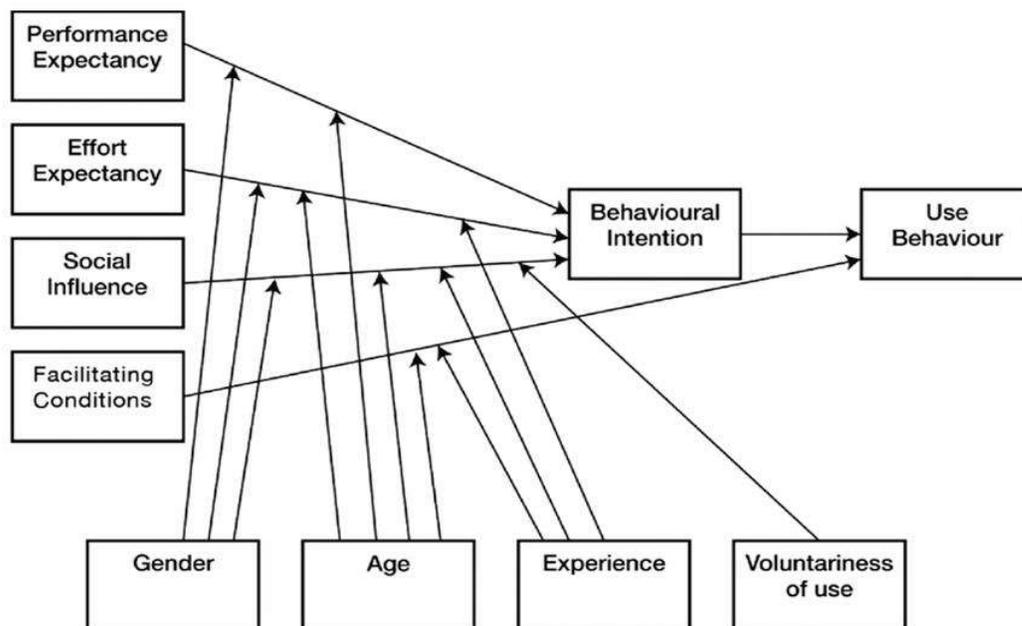


Figure 5-6 UTAUT

The four constructs of UTAUT defined by Venkatesh et al. are:

- **Performance expectancy:** Performance expectancy widely known as PE is the level a person considers that the use of a new technology would help to improve their work performance. This construct is included as perceived usefulness in TAM.
- **Effort expectancy:** Effort Expectancy which is also known as EE is the degree to which the user perceives the system as easy to use. This construct includes scale items from TAM.
- **Social influence – Social Influence** is the degree to which the user perceives that others who are important to the user believe that the user should use the system. Social Influence is known as SI. The construct includes scales from subjective norms in TAM.
- **Facilitating conditions:** Facilitating Conditions is the degree to which the user believes that conditions are adequate for effective use of the system, including organizational readiness and infrastructure adequacy. This construct encompasses perceived behaviour control, TAM and other variants of Cognitive Theory.

This four constructs have been affected by four variables of age, gender, experience and voluntariness to use any technology.

Past research studies have used the UTAUT model to test a variety of areas involving the acceptance of technology. For instance, Robinson applied the UTAUT model to a study of students' adoption of technology in marketing education. So many researchers have conducted research which have used the UTAUT model in Internet technologies and virtual communities. Further, Koivumaki, Ristola, and Kesti used the UTAUT model to study the adoption of

mobile technology thereby adding to the literature on technology acceptance. Nassuora has conducted study on student's acceptance of mobile learning for higher education in Saudi Arabia.

AS per literature reviewed for using of UTAUT in field of library and information science we have come across very few studies. Sununthar, Vongjaturapat; Singha, Chaveesuk; Nopporn, Chotikakamthorn & Sakesan , Tongkhambanchong (2015) have conducted study on “Analysis of Factor Influencing the Tablet Acceptance for Library Information Services: A Combination of UTAUT and TTF Model”. Mohammad A. Alajmi & Jamella H. Alotaibi (2020) has conducted study on Reconceptualization of system use in the context of the digital library: what are the roles of UTAUT and its success model?

5.9 Conclusion

Libraries are the entity which is regularly updates their operations and management systems with development of new techniques and as per users demand. It is very necessary to use the model for the same. The Unified Theory of Acceptance and Use of Technology provides preface to validate any new technology before applying in policy of libraries. We have gone through varies characteristics and benefits of web 2.0 technology and its importance in usage in library. It is necessary to check its significance with the help of tested model of UTAUT.

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