# Technological Factors Influencing the Adoption of E-government by Lectures in Yemeni Universities

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**Abstract**—The object of this stud is to suggest a conceptual hypothetical model for Technical Factors Affecting E-Government Adoption in Yemeni Universities through lectures, which is one of the least researched aspects of e-Government. Technology acceptance, as well as the spread of ICT-related-novelties, are all concepts that are incorporated into the proposed theoretical model. The model contains three independent variables: machine self-efficacy, knowledge quality, and system quality, as well as one dependent variable, E-government adoption, and two moderators: age and education level. This model lays the groundwork for more empirical studies in developing countries such as Yemen, which is grappling with practical issues related to e-government implementation. It also aims to provide key policies and strategies to aid in the adoption of e-Government, especially among lecturers in higher education.

**Index Terms**—ICT; Theoretical Model; E-government; UTAUT; Technology

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## 1 INTRODUCTION

IN recent years, the development of the Internet and Information Technology has been the primary force and catalyst for change in most of the world's industry and service sectors. By establishing new service styles such as e-banking, e-commerce, and e-voting, new technologies and concepts have changed government engagement with businesses, agencies, organisations, and people [1] [2].

Information and communication technology (ICT) advancements have drastically changed the way we live and work as a society. These developments have changed not only the way knowledge is exchanged and transmitted, but they have also enabled new channels through which we can now access entertainment, healthcare, commerce, and e-governance [3]. E-Government initiatives have risen dramatically in recent years, especially in developing countries, in order to provide better services to citizens [4]. E-government in developing countries is a burgeoning area of research, and many countries are now investing heavily in developing and implementing successful e-government systems [5]–[7]. Every government strives to offer the best services and goods to its citizens in order to gain acceptance and facilitate successful dealings and transactions in order to increase the country's overall service efficiency [1], [8], [9]. As a result, governments are spending a lot of money on e-Government electronic services like websites, payments, e-applications, e-systems, and other stuff. [10], [11], and [12]. These projects typically provide a forum for government and citizens to connect, strengthen the relation-

ship between society and government, and alleviate people's suffering, especially those who live far away from government offices. [5–7], [10–15], [10–15]. Government to people (G2C), government to company (G2B), government to government (G2G), and government to employee (G2E) are the four types of e-government [2], [16]–[24].

## 2 REVIEW OF LITERATURE

### 2.1 Definition of E-Government

In order to achieve the best GOE for the nation, a sophisticated literature on E-governance and E-government in terms of concepts, models, classifications, categories, and more of best practices and effective approaches must be developed.

When it comes to the changing nature of E-governance, there is a lot of evidence in the literature that the advancement of information and communication technology takes center stage. Organizations and organisations nowadays provide their services online and use e-governance as one of their strategic options for reaching a large number of people (Burgess & Russell, 2003). Citizens' adoption of e-governance is critical to their progress in obtaining the services they need. It is a priority for government agencies to offer the best possible service to their constituents. Citizens need some clarification on the E-governance framework in order to embrace it. People would have to depend on previous knowledge about E-governance framework acceptance to do so.

E-government, according to Heeks [25], is an information system that employs information technology to provide ser-

vices to the general public through the Internet. These technological aspects are crucial in assessing the feasibility and efficiency of the e-government system that has been implemented (UN, 2012). Despite the widespread adoption of e-government systems, Moon [26] asserted that the reach and efficacy of each e-government differ significantly between countries. Most counties have set up an e-government project on the Internet with a website, but the interactivity and usability for users varies from one-way to two-way communication, depending on the system's quality and people's willingness to implement such technology.

Efficient implementation and adoption of e-government initiatives, according to Hood and Margetts [27], are dependent on the effective resources offered by the e-government itself in terms of information quality, privacy, and accessibility. Planning and controlling the e-government process in its early stages, according to Bhatnagar [28], necessitates an understanding of ICT and information management. Several obstacles, according to Al-Shehry et al., [29], obstruct the successful implementation of e-government, despite the numerous benefits of e-government for individuals, businesses, and organizations. As a result, many countries are still having trouble introducing and embracing successful e-government [7], [30]. E-government meanings can differ depending on different perspectives such as market, method, technical, person, government, or functional, as many scholars have pointed out [31]–[34].

Depending on the type of perspective used, such as technical, enterprise, method, person, government, or functional, the results can differ. According to the literature, there is no universally agreed-upon concept of e-government. E-government, according to Zakaria and Gebba [35], is a public system of communication and information technology used to perform various e-government functions such as filing, processing, and receiving information.

## 3. E-GOVERNMENT ADOPTION INFLUENCED BY TECHNOLOGICAL FACTORS

### 3.1 Variables in Technology Quality

I. Self-efficacy in front of a computer

Computer self-efficacy is regarded as a key factor in determining citizen acceptance of e-government systems [36], [37]. It is also regarded as a form of self-efficacy that has an effect on users' technological behavior. It is characterized as an individual's ability to mobilize the cognitive resources, motivation, and course of action necessary to deal with a specific situation or mission, and it determines an individual's ability to use a computer in a variety of circumstances [38], [39].

II. Information Quality

People are influenced to implement such technologies by the quality of knowledge generated by e-government projects. Indeed, website quality, system features, usability, protection, and accurate information all influence user adoption of new technology [36], [37].

III. System performance

System quality is described as the information processing system's speed of delivery, ease of use, control, and enjoyment, and it is a significant variable [40]–[42]. System quality assesses how well an e-government system or program performs in terms of functionality, resource availability, speed, cost, and uniqueness. Users will interpret all of these device characteristics when choosing to use and implement new technologies [41], [43].

## 4 THEORIES AND MODELS OF ADOPTION

Individual embrace of emerging technologies is a critical component of effective e-government system adoption and use. Scholars have looked into the tendency of users to communicate with technology, and many hypotheses have been suggested [44]. There is no universal model in the field of e-government research that incorporates the main constructs relating to citizens' adoption of e-government. The Theory of Acceptance and Use of Technology (UTAUT) [44], the Diffusion of Innovation Theory (DOI) [45], the Theory of Reasoned Action (TRA) [46], the Technology Acceptance Model (TAM) [3], and the Theory of Planned Behaviour (TPB) [47], [48], are the theories in question.

These theories, which are discussed in the following pages, are considered the backbone of this study in order to identify the key factors influencing e-government adoption among Yemeni people.

## 5 REASONED ACTION THEORY (TRA)

One of the fundamental psychology theories that can be used to evaluate human actions is the Theory of Reasoned Action (TRA) [49]. According to Lean et al., [50], TRA is an important principle to evaluate people's attitudes toward computer use and acceptance. According to the theory, an individual's beliefs have an effect on their intentions and behaviour (Fig. 1).
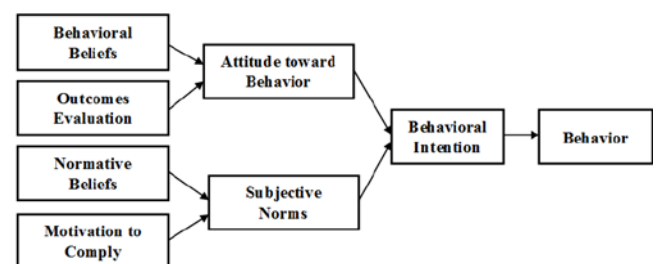


Fig. 1. TRA model.

## 6 THEORY OF PLANNED BEHAVIOR TPB

Ajzen proposes TPB as a way to apply and resolve the weaknesses of TRA theory to people who have little influence over their actions (1991) In 1988, Ajzen proposed the principle of expected action. The theory of planned action can be summarized as follows: "The idea of the behavioral aim; an individual's proposition of performing given conduct is the best indicator of whether the individual will perform the conduct". This theory focused around commence that the best

indicator of real conduct is the conduct individual aims to do. The behavioural control construct is defined as how a person perceives their ability to take on a particular task.
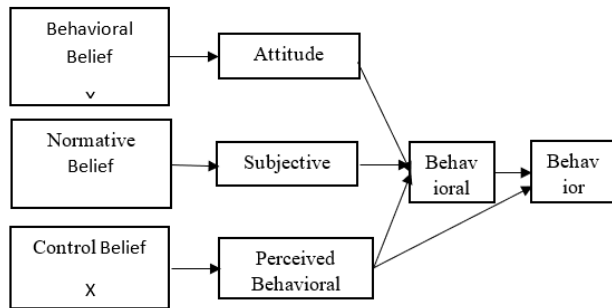


Fig 2. TPB model

## 7. THEORY OF INNOVATION DIFFUSION (DOI)

According to Rogers (1995), diffusion is the process by which new innovation is transmitted through channels among members of social society over time, with innovation described as a method, concept, or object that is viewed as novel by a person or other unit of adoption. (See Figure 3) [51]
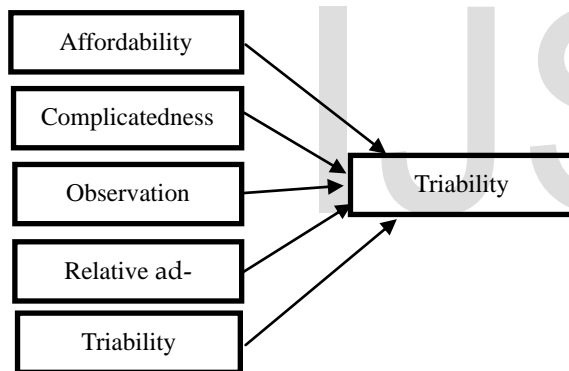


Fig 3. Theory of Diffusion of Invention (DOI) (Rogers, 2003).

## 8 MODEL OF TECHNOLOGY ACCEPTANCE (TAM)

As shown in the Figure (4) Fred Davies in 1989 came up with TAM model, as per another discussion this model was adapted from TRA and TPBTAM proposes that external variables such as perceived ease of use (PEU) and perceived usefulness influence purpose, by to Davis (1989). In 1985, Davis Bagozzi and Washaw, TAM suggested that Intention is directly proportional to the Actual Usage Behaviour.

TAM was initially created to comprehend the causal connection between external variables and client acknowledgement of PC-based applications. TAM has been broadly utilised as a hypothetical schema in the late studies to clarify innovation acknowledgement, including the web and World Wide Web.
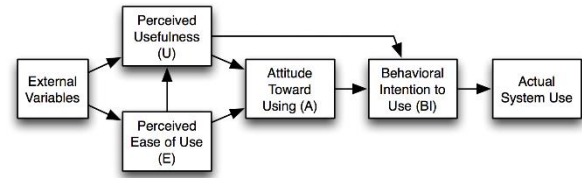


Fig 4: TAM model

Technology and the Unified Theory of Acceptance Model (UTAUT)

In light of the numerous adoption models developed, [44] proposed the use of a cohesive structure based on a review of previous work by other writers in the field. Using current adoption models and structures as a starting point [44]) aimed to improve on existing models' prediction rate, which, according to [3]Davis (1989), (stood at 40 %). Existing structures, such as Roger's Diffusion of Innovations, are a good place to start. The Technology Adoption Model [3] , The Model of PC Use (Thompson et al., 1991), Theory of Planned Behaviour (Ajzen, 1991), and theories such as Communal Cognitive Theory (Compeau & Higgins, 1995), and The Motivational Model (MM) [3] were unable to predict adoption rates of information technology in 60% of instances, accounting for just 40% [44].The aim was to create a model that could increase this to 70%, with a particular emphasis on employee adoption in businesses. (Fig 5).
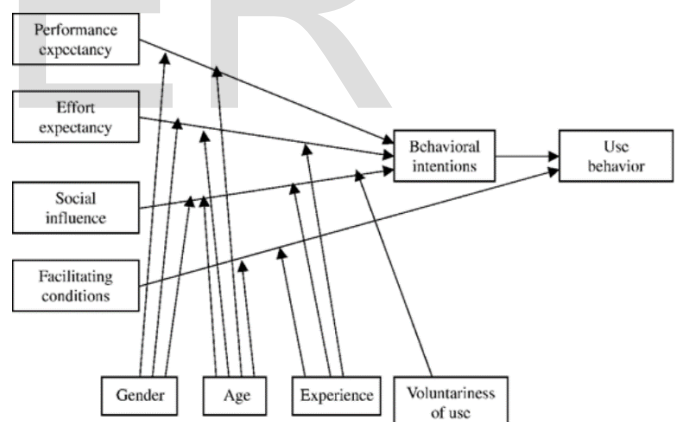


Fig 5. UTAUT model (Venkatesh et a., 2003).

## 9 METHODOLOGY

Application Methodology Proposed There is room for conceptual research into the factors that affect e-government adoption among lecturers in Yemen's public universities, based on the literature. As a result, the scope of this study is restricted to G2C in developing countries, especially Yemen.
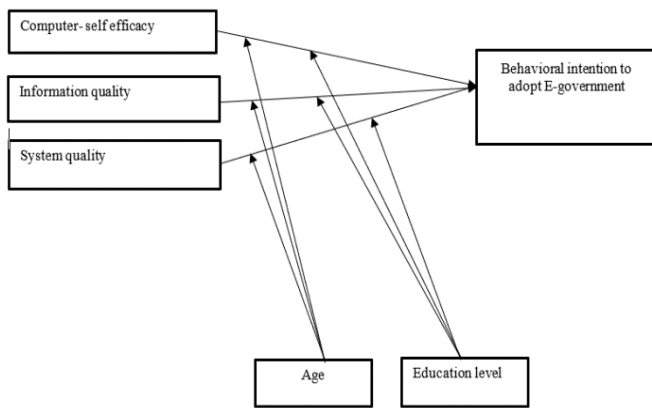
Fig 6: Hypotheses Testing and Research Conceptual framework .

Hypotheses

H1: Computer self-efficacy has a significant and optimistic effect on lecturers' adoption of e-government in Yemeni public universities.

H2: The quality of information has an important and positive effect on lecturers' adoption of e-government in Yemen's public universities.

H3: The efficiency of the system has an important and positive impact on the adoption of e-government by lecturers in Yemen's public universities.

H4: The relationship between technology factors and E-government adoption is moderated by age.

H5: The relationship between technology factors and E-government adoption is moderated by education level.

Sampling Method

Quantitative research design is appropriate for the current study. This is because it hopes to assess academics in Yemeni universities to adopt E-government by employing hypothesise testing that requires a quantitative technique to deal with the data.

The data for this study will be collected using a self-administered survey and a random sampling process.

Design of the Questionnaire

The survey approach was used to collect primary data for this analysis. The survey is divided into two parts. The first section contains demographic data on the respondents. The second part of the survey will ask respondents about the study's variables, which include (1) e-government adoption (2) machine self-efficacy, (3) knowledge quality, (4) system quality, (5) age, and (6) educational level. The first factor is a dependent variable, and factors 2-4, as well as factors 5 and 6, are moderators.

## 10. CONCLUSION

The aim of this paper was to provide a conceptual framework for investigating the Technological Factors Influencing Yemeni Lectures' Adoption of E-Government. The TRA and the UTAUT theories were considered for integrating the key components of the proposed scheme. This theoretical contribution lays the groundwork for determining the factors that influence the adoption of e-government projects, especially at higher levels of government. This study has practical implications for assisting the Yemeni government, as well as other developing countries, in improving their e-government systems to meet the needs of their people. It can act as a roadmap for future study in higher education and the public sector because it incorporates two important ideas and catalyzes several important constructs.

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