

# VALIDATING UTAUT MODEL FOR E-GOVERNMENT ADOPTION AMONG EMPLOYEES: A PILOT STUDY

Nur Syuhaini Abdul Wahid<sup>0000-0002-9638-6563</sup> <sup>1\*</sup> and László Berényi<sup>0000-0003-0596-9315</sup> <sup>2</sup>

<sup>1</sup> Doctoral School of Public Administration Sciences, Ludovika University Public Service Budapest, Hungary

<sup>2</sup> Department of Public Management and Information Technology, Ludovika University Public Service Budapest, Hungary

<https://doi.org/10.47833/2023.2.ECO.009>

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## Keywords:

E-government adoption  
UTAUT  
Employees  
Pilot study  
Instruments validation

## Article history:

Received 15 October 2023  
Revised 20 October 2023  
Accepted 30 October 2023

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## Abstract

*E-government has been proven to be a powerful tool to achieve the objective of better performance in the public sector. Technological advancement has accelerated the development of ICT in the public sector worldwide, thus affecting the structure and work process of government staff. Implementing e-government requires a holistic understanding of the adoption and usage factors. Several studies are available in this field, mainly focusing on citizens. The contribution of this study is investigating the adoption of e-government among employees. The goal is to check the usability and validity of an instrument based on the Unified Theory of Acceptance and Use of Technology (UTAUT) model in the Malaysian public sector. The analysis of a five-pillar model, including Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Condition, Use, shows Cronbach Alpha values greater than 0.9 for each pillar. The Kaiser-Meyer-Olkin values are greater than 0.7 for four pillars, and it is 0.5 for the Use. Moreover, the Bartlett's sphericity test is significant in each case. The principal component analysis confirmed the usability of the planned structure of the survey items.*

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## 1 Introduction

Worldwide, the government has made tremendous efforts to shift the traditional way of service delivery in public sectors to digital [1]. The utilization of information and communication technology (ICT) in the public sector has transformed how government interacts with citizens, businesses, and employees [2]. As a result, a new form of government emerged through this transformation, known as e-government [3]. E-government refers to the use of technology by the government, notably web-based internet applications, to improve access and delivery of government information and services to citizens, businesses, employees, and government bodies [4]. E-government can improve the activities of public sector organizations through the usage of information and communication technologies (ICT) [5].

In Malaysia, e-government aims to improve public services for the people. The government has actively invested in developing ICT, and significant investment was made to improve ICT and e-government initiatives in government agencies [6]. Despite the desire to move forward with e-government, it comes with challenges. Traditional attitudes to service delivery as being over-the-counter are deeply entrenched in many officials' and citizens' minds [7]. Nevertheless, the conventional method of service delivery in the public sector has been criticized due to delays in processing documents and inefficient feedback mechanisms [8]. Heeks [9] suggested that the use of ICT can help improve public service performances, but civil servants are criticized for being too slow to adapt to emerging technology and are reluctant to change their attitude [7], [10].

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\* Corresponding author.  
E-mail address: [abdulwahi.nursyuhainibinti@uni-nke.hu](mailto:abdulwahi.nursyuhainibinti@uni-nke.hu)

Successful e-government initiatives depend largely on citizens' and employees' willingness to adopt and use e-government services [11]. However, previous scholars have emphasized the citizen's perspectives as a subject matter [12], [13], ignoring the potential importance of civil servants' readiness and adoption behavior of e-government. After all, public servants' involvement and engagement are vital to the success of e-government [14]. Recent literature related to the use of e-government among employees in Malaysia is also insufficient. Only a few studies were conducted to study employee adoption in Malaysian public sectors [8], [15]. Considering the importance of adopting e-government by public sector employees as a crucial first step toward successful e-government implementation and delivery of services to citizens [9], [17], this study intends to contribute to e-government adoption among government employees studies.

To provide systematic support, technology acceptance models were considered for customization. There are numerous theories related to the acceptance and use of information technology. Researchers commonly utilized the Technology Acceptance Model (TAM) developed by Davis in the 1980s until a comprehensive, unified model was developed by Venkatesh et al. (2003) named Unified Theory of Acceptance and Use of Technology (UTAUT). Therefore, this study used UTAUT, an updated, comprehensive model, to demonstrate the adoption of e-government in local government from the viewpoint of the employees.

## 2 Theoretical Model

Venkatesh et al. [16] created the Unified Theory of Acceptance and Use of Technology (UTAUT) model (Figure 1) to address the shortcomings of Davis' Technology Acceptance Model (TAM). Therefore, eight major theories in the study of technology acceptance, including the TAM, Theory of Reasoned Action (TRA), Theory of Planned Behaviour (TPB), combined TAM and TPB, Model of PC Utilisation (MPCU), Diffusion of Innovation (DOI), Motivational Model, and Social Cognitive Theory (SCT), were combined to create the UTAUT. After analyzing the similarities and differences between the theories, Venkatesh et al. developed the UTAUT theory, which has been shown to be 70% more successful than TAM (30%) and TAM2 (40%). Subsequently, researchers frequently employ this theory to determine the adoption of technologies since it has been proven that the UTAUT is suitable and provides valid results in IT-related studies.



Figure 1. The unified theory of acceptance and use of technology by Venkatesh et al. (2003)

Over the decades, UTAUT was regarded as the most appropriate framework for investigating the factors that may influence the continued use of the government website in the short and long term. Consequently, UTAUT become one of the popular theories to measure employees' intention to adopt e-government [17]. The UTAUT focuses on four main determinants to predict the acceptance of technology performance expectancy, effort expectancy, social influence, and facilitating conditions, as shown in Table 1, along with four moderators such as gender, age, experience, and voluntariness of use.

Table 1. The primary construct of the UTAUT Model [16]

Items	Definition
<b>Performance Expectancy</b>	Individuals believe that using the system will help him or her achieve better performance on daily working tasks or working positions.

<b>Effort Expectancy</b>	An individual views that they are more likely to use the system if it is easy to use.
<b>Social Influence</b>	An individual believes that important people (leaders or co-workers) use the system and encourage him or her to adopt it.
<b>Facilitating Conditions</b>	Individual views that resources and assistance are available to support them using the system.

### 3 Research Methodology

#### 3.1 Instrument Development

The purpose of this paper is to examine e-government adoption among government employees in Malaysia. To test the UTAUT theory, a questionnaire-based survey was applied. There are two sections to the questionnaire: Part A consists of demographic questions, and Part B consists of 16 questions based on the UTAUT model. The UTAUT construct items such as performance expectancy, effort expectancy, social influencing, and facilitating condition were adopted from Venkatesh et al. [16]. Meanwhile, use items were adopted from Mellouli et al. [18], as shown in Table 2. All questionnaire items were reviewed by two experts and translated into Malay language. The constructs were measured on a five-point Likert scale, with 1 denoting strongly disagree to 5 strongly agree.

*Table 2. Constructs and scales*

<b>Construct</b>	<b>Questionnaire items</b>
<b>Performance Expectancy</b>	Using the e-government system enables me to accomplish tasks more quickly. Using the e-government system enables me to achieve a set of goals and objectives. Using the e-government system increases my productivity.
<b>Effort Expectancy</b>	My interaction with the e-government system would be clear and understandable. It would be easy for me to become skillful at using the e-government system. I find it easy to use the e-government system Learning to operate the e-government system is easy for me
<b>Social Influence</b>	My supervisor and colleagues think I should use the e-government system Leaders in my organization use the e-government system The senior management of this organization has been helpful in the use of the e-government system. In general, the top management in the organization has supported the use of the e-government system.
<b>Facilitating Condition</b>	I have the resources necessary to use the e-government system. I have the knowledge and skills necessary to use the e-government system. Technical support and assistance are available for assistance with e-government system difficulties.
<b>Use</b>	You are dependent on the e-government system The frequency of use of e-government is very high

#### 3.2 The procedure of the pilot study

The study was conducted in the local municipalities in Malaysia. Non-probability and voluntary sampling techniques were used in data collection. The data was collected via purposive sampling. The data were collected anonymously and voluntarily via an online form and distributed to all participants who met the criteria through an institutional email. The inclusion criteria for participants include the users of the e-government system and staff in local municipalities.

The data collection process was conducted in July of 2023. An email request was sent for the pilot process to 40 municipalities; 40 participants working at 11 municipalities responded to the questions. The first contact with the participants was through a phone call and email, including a cover letter and the link to the survey.

The main question of the pilot study was to pre-test the usability of the survey instrument [19] and to check the internal validity of the questions. Browne [20] advised that a pilot study has at least 30 participants. SPSS version 25.0 was used to analyze the pilot study. For testing the construct reliability, the value of Cronbach’s alpha coefficient for all the constructs must be greater than 0.70.

#### 4 Findings of Pilot Study

23 respondents are female, and 17 are male in the pilot survey. The demographic profiling shows that 22 respondents are aged 31-40 years old, 10 are 21-30 years old, 6 are 41-50 years old, and only two are between 51-60 years old. 16 respondents have a diploma, 14 have bachelor’s degrees, and 10 have secondary school qualifications. 36 respondents work in local municipalities, and only 4 are department/unit leaders in their organization. 17 respondents have less than 5 years of work experience, ten have 6-10 years, 8 have 11-15 years, and 5 have more 16 years of work experience. Most of the respondents work in district municipalities (21 respondents), followed by 18 respondents from town municipalities and one from city municipalities. Table 3 shows the result of the reliability test. The instrument is acceptable since the values are greater than 0.7 for each question group.

Table 3. The Reliability Statistics (Survey Data, 2023)

<b>Variables</b>	<b>Cronbach’s Alpha</b>	<b>No. of Items</b>
<b>Performance Expectancy</b>	0.968	3
<b>Effort Expectancy</b>	0.928	4
<b>Social Influence</b>	0.947	4
<b>Facilitating Condition</b>	0.952	3
<b>Use</b>	0.929	2

To ensure the instrument’s validity, an Exploratory Factor Analysis (EFA) using SPSS 25 was conducted. Each scale was examined based on Kaiser-Meyer-Olkin (KMO) and Bartlett’s Test of Sphericity, Eigenvalue, and factor loading. KMO and Bartlett’s Test of Sphericity are examined to check whether the data set is appropriate for factor analysis. Table 4 shows that all KMO values are more than 0.5 and ranging between 0.500 and 0.832 are good for analysis. The Bartlett’s sphericity test was also significant at  $p < 0.001$  [19]. The finding of the KMO test of more than 0.5 and the Bartlett test of sphericity at 0.000 portrayed a high relationship among variables and indicated that each variable truly measured what it was supposed to be measured.

Table 4. KMO and Bartlett’s Test, Eigenvalues, and Factor Loading Values (Survey Data, 2023)

<b>Construct</b>	<b>Items</b>	<b>KMO</b>	<b>Bartlett’s Test</b>	<b>Eigenvalues</b>	<b>Factor Loading Value</b>
<b>Performance Expectancy</b>	<b>Performance Expectancy 1</b>	0.784	0.000	2.819	0.890
	<b>Performance Expectancy 2</b>				0.857
	<b>Performance Expectancy 3</b>				0.869
<b>Effort Expectancy</b>	<b>Effort Expectancy 1</b>	0.832	0.000	3.311	0.902
	<b>Effort Expectancy 2</b>				0.813
	<b>Effort Expectancy 3</b>				0.728

	<b>Effort Expectancy 4</b>				0.706
<b>Social Influence</b>	<b>Social Influence 1</b>	0.812	0.000	3.455	0.834
	<b>Social Influence 2</b>				0.899
	<b>Social Influence 3</b>				0.868
	<b>Social Influence 4</b>				0.818
<b>Facilitating Condition</b>	<b>Facilitating Condition 1</b>	0.714	0.000	2.747	0.690
	<b>Facilitating Condition 2</b>				0.586
	<b>Facilitating Condition 3</b>				0.692
<b>Use</b>	<b>Use 1</b>	0.500	0.000	1.867	0.905
	<b>Use 2</b>				0.918

Additionally, factor analysis shows that one component is identified for each construct with the eigenvalues of more than 1 for performance expectancy (2.819), effort expectancy (3.311), social influence (3.455), facilitating condition (2.747), and use (1.867). Eigenvalues greater than one show the validity of the scale [21]. Furthermore, factor loading values (see Table 4) for performance expectancy (0.890 to 0.857), effort expectancy (0.902 to 0.706), social influence (0.899 to 0.834), facilitating condition (0.692 to 0.586), and use (0.918 to 0.905). The values of factor loading more than 0.4 confirm the validity of the scale [22]

## 5 Conclusion

This study is the first attempt to evaluate the UTAUT model's feasibility among Malaysian government employees. To ensure the instrument's reliability and validity, a multi-stage development process was undertaken. Firstly, the measurement was crafted using insights from prior literature focusing on e-government adoption by employees. Secondly, experts meticulously reviewed and assessed the content. Thirdly, a pilot study involving 40 participants was carried out, gathering actual data. Subsequently, an analysis was performed to determine the instrument's reliability and validity. The findings of the pilot study showed that the 16 items from 5 variables have good reliability and validity in measuring the relationship between variables. Based on the results, the developed model is ready for broader data collection on a national level, and it can be recommended to local municipalities to explore their development opportunities in Malaysia. The main limitation of the study is that data collection is focused on one country, and the generalization of the results is not feasible. This study is open for improvement in the future. First, future research can enhance the construct and measures model to assess the intricate link between independent and dependent variables. Second, future studies can be carried out in other countries that are more developed or less developed than Malaysia, potentially yielding more intriguing findings.

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