A Bibliometric Analysis of the E-government Studies with (UTAUT)

Khaled I. A. Amrouni
Faculty of Computer Systems and Software Engineering
Universiti Malaysia Phang
Gambang, Pahang, Malaysia
Amroni558@gmail.com

Ruzaini Abdullah Arshah
Faculty of Computer Systems and Software Engineering
Universiti Malaysia Phang
Gambang, Pahang, Malaysia
ruzaini@ump.edu.my

Abstract- this bibliometric study aims to present most important literature of the *unified theory of acceptance and use of technology* (UTAUT) used in the field of electronic government (e-government). This study relied on the Web of Science Database (WoS) which index an elite of publications with ISI standard only. WoS was used to inspect the literature which utilized the UTAUT theory with in the subject of e-government, 41 publications were found and analyzed to extract the bibliometric parameters which are as following; Citation report, Production report and Methodological characteristics report. The study is to be considered as a milestone within the mention fields, where it provide help and guidance to new scholar, saving their effort and time by summarizing and reporting the most important (Cited) articles, authors, Journals, and countries that are publishing in the field of e-government using UTAUT as a research theory, as well as the most productive authors, Journals, and academic institutions. In addition to an in-depth report for the Methodological characteristics of the studied publications, to identify gaps and recommendations for further studies.

Keywords- bibliometric survey; UTAUT; e-government, web of science

1. INTRODUCTION

The electronic government concept was first presented in1979 by two French scholars Simon Nora and Alain Mine. They submitted a report to the French president about the precise way to create a civil and political society by utilizing telematics which is a blend of computer technology and telecommunication [1]. Whereas in the United States, the Management and Budget Office issued a 25 point implementation plan to reform the federal information technology (IT) management [2]. The plan was based on a study suggested that there have been frustrations in executing IT at the federal government level. So, the government authorities tried to adopt the best practices to implement IT systems: From the Raines Rules during 1990s, through the Clinger Cohen Act [3] and the acquisition regulations that came later. In any case, hindrances have acted as a burden. The motivation behind this implementation plan was to create more effective IT strategies in order to better achieve and oversee IT programs. According to Venkatesh and his colleague [4] to increase technological outputs, the users must accept and use these technologies. There are many considerations and potential ramifications of the implementing and planning for the e-governments, which includes multiple disintermediation of the government and its citizens, effects on politics, and economic and social factors. The entire features of e-government will be considered once the most of the general population gain admittance and support to the online and electronic administration channels [5].

Due to the expanding use of information technology, many theoretical frameworks and models have been proposed to illuminate determinants of technology adoption such as D&M IS Success model [6]. In Parallel, the (UTAUT) model was introduced by Venkatesh, Morris, Davis, and Davis [4]. This model has been empirically tested since its inception and has been utilized across many disciplines including technology, psychology and education. This widely utilized model represents only 56 percent of variance in individuals' behavior intention to utilize technologies; therefore, the new version of UTAUT2 was made to improve the first version and take into consideration more variance [by 74%] [8]. Nonetheless, little research exists pertaining to the updated (UTAUT2) model.

This study is presented by six sections. Within the introduction, there will be background information on the subject of e-governments and UTAUT. In the literature review portion, there will be an overview of previous studies within a ten year time frame. The third section introduces methodology used in this study. Whereas the forth section will follow by the analysis of the outcome. The fifth portion of this paper will be the discussion, whereby the findings are checked and future research recommendations of the examined works are uncovered. The last and final component is the conclusion which will present final remarks and comments.

2. LITERATURE REVIEW

Venkatesh and others perceived that, there is a large similarity among the determinants of IT theories [4]. This impacted the arrangement of an investigation in which they evaluated eight frameworks and models of implementing IT. This was accomplished to build and validate a combined theory of factors that impact the adoption of recently implemented technology.

After matching the frameworks and models of: (TRA) Theory of Reasoned Action, (TAM) Technology Acceptance Model, (MM) Motivational Model, (TPB) Theory of Planned Behavior, (C-TAM-TPB) Combined TAM and TPB, (MPCU) Model of PC Utilization, (IDT) Innovation Diffusion Theory and (SCT) Social Cognitive Theory, Venkatesh and his colleagues observed thirty two determinants. All of thirty two constructs and determinants were compared and combined in order to create four constructs and determinants of intent to adopt technology. They are as follows: performance expectancy, effort expectancy, social influence and facilitating conditions. Taking these factors into mind, a research model was formed from that to create their own propositions [8]. From this model, it was realized that were four moderators (age, gender, experience and voluntariness) which was anticipated to affect the use intention of technologies mutual to the eight theories.

In 2012, UTAUT2 was created as a modified version of UTAUT by Venkatesh, Thong, and Xu. It has been comprehensively used to test technology adoption as the model of choice for several of studies across various disciplines and technology. Once amended, the UTAUT2 explained 74 percent of variance related with behavioral intention and 52 percent related with technology use. To deploy such a radical change, three new constructs were added to the new model: hedonic motivation (HM), price value (PV) and habit (HAB) [11].

3. METHODOLOGY

This bibliometric study chose the WoS database with its ISI indexed publication only, conducting a title search with the combination of the two Keywords “E. Government” & “ UTAUT” since 2007, and as a results of this search 41 article came to the screen and were considered to conduct this research upon them. The scope of these articles was adequate compared to the SCOPUS database where it had 60 results only, so the gap was minor, so this study limited its search to the WoS results only.

In the first phase, the abstracts of these articles were analyzed, and it was found that all of them were relevant and considered to be analyzed for the bibliometric aspects, in the second Phase, the Citation report was extracted from the WoS data base, and the relative Productive information was produced. Finally, a thorough analysis of these articles were conducted to extract the methodological characteristics.

4. ANALYSIS OF RESULTS

Before presenting the bibliometric results, a gap was identified between the huge amount of publications in the fields of e-government, and UTAUT theory and between the combined researched of these two concepts together. The first search that was conducted used the terms “UTAUT” or “UTAUT2” or “Unified Theory of Acceptance and Use of Technology”: the result outcome was 639 articles. Then, the second search within the database that was conducted under topics (“e-government” or “electronic government”) produced a result of 3647 titles in journals and conferences. Finally, to fine tune the search and narrow down the focus to the subject of this review, the two sets of keyword strings mentioned above were combined. This combination resulted in 41 journal articles and proceeding papers which can be found in Table 1. This low number of academic papers indicates that there is still a lack of knowledge in this area and more work has to be done in this regards

Table 1: Identifying the gap between the researches addressing the subjects of UTAUT and e-government individually compared to the researches addressing the two subject combined according to disciplines

NO.	Web of Science Categories	UTAUT & E-GOVERNMENT 41		UTAUT 639		E-GOVERNMENT 3647	
		Record Count	Percentage	Record Count	Percentage	Record Count	Percentage
1	IT/IS	15	36.58%	135	21.12%	883	42.21%
2	Computer Science	20	48.780 %	460	71.98%	3595	98.57%
3	Engineering	9	21.95%	103	16.11%	912	25.00%
4	Management and Business	10	11.43%	155	24.25%	1083	29.69%

5	Psychology, Social and Education	7	17.07%	171	26.76%	266	7.29%
6	Other Fields	3	7.31%	216	33.80%	675	18.50%

This work seeks to provide bibliometric analysis on subjects that link between utilization of UTAUT with e-government adoption that were published in a high impact factor publication. Fig. 1 shows the trends of articles and citations per year from the beginning publication up to now.

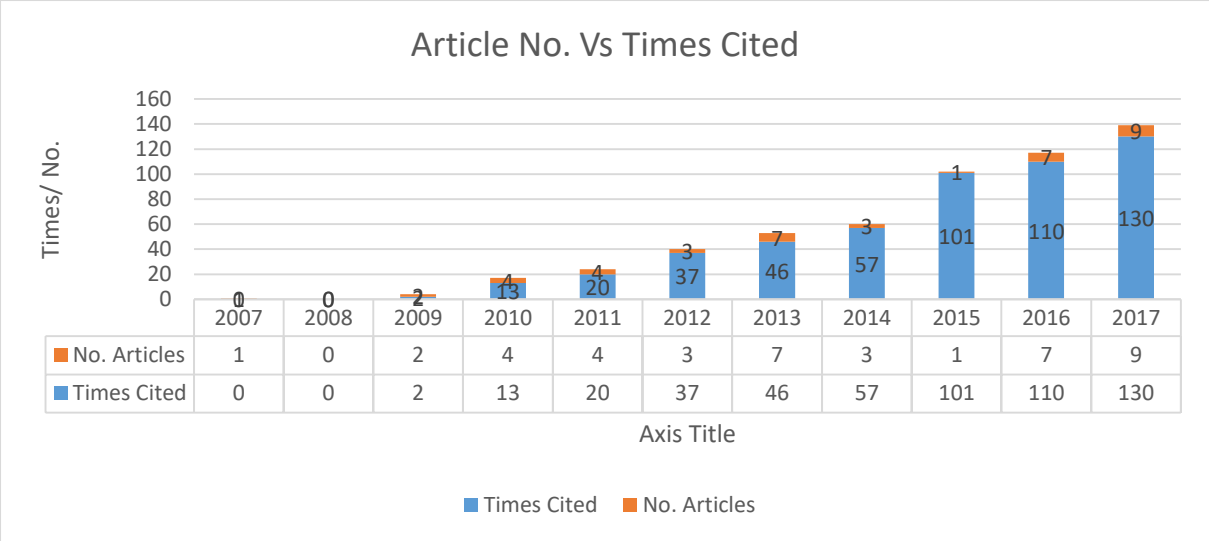

Figure 1: Sum of Times Cited and Articles Published per year

By tracking the published articles each year, it is noticeable that the number of published articles and citations are constantly increasing. Although in 2015, only 1 article was published but the citation during the same year kept increasing. Geographical distribution of e-government studies by UTAUT shows that developed countries (England, USA & Portugal) monopolize the total number of research papers (approx.40%). Followed by Asian countries such as Malaysia & China which is 21% of the papers. No papers were available from Middle Eastern countries as shown in Table 2.

Table 2: Regional distributions for the studies of UTAUT theory with in the subject of e-government

NO.	Countries/Regions	Record Count	% of 41
1	ENGLAND	8	19.51%
2	USA	6	14.63%
3	MALAYSIA	5	12.19%
4	PEOPLES R CHINA	4	9.75%
5	PORTUGAL	3	7.31%
6	SOUTH KOREA	3	7.31 %
7	TAIWAN	3	7.31 %
8	WALES	3	7.31 %
9	GERMANY	2	4.87 %
10	QATAR	2	4.87 %

After analyzing 41 articles, the following ones were most cited in this study. Table 3 appears the 5 most cited articles with average citations per year.

Table 3: The most cited articles of 41 publications

No.	Article	Authors & Year	Count	Average Citations/ Year
1	Extending the two-stage information systems continuance model: incorporating UTAUT predictors and the role of context	Venkatesh, V; Thong, JYL; Chan, FKY; Hu, PJH; (2011)	136	17.00
2	Why do people use information kiosks? A validation of the Unified Theory of Acceptance and Use of Technology	Wang, YS; Shih, YW; (2009)	87	8.70
3	Modelling Citizen Satisfaction with Mandatory Adoption of an E-Government Technology	Chan, FKY; Thong, JYL, Venkatesh, V; Brown, SA; (2010)	79	8.78
4	E-file adoption: A study of US taxpayers' intentions	Schaupp, LC; Carter, L; McBride, ME; (2010)	71	7.89
5	Determinants of end-user acceptance of biometrics: Integrating the "Big 3" of technology acceptance with privacy context	Miltgen, CL; Popovic, A; Oliveira, T; (2013)	40	6.67

In other side, table 4 identifies the most 5 journals that published articles in this area as well as the names of these articles.

Table 4: List of most 5 journals published of 41 publications

No.	Journal	Count	% of 41	Article
1	COMPUTERS IN HUMAN BEHAVIOR	3	7.317	Adoption of e-government services in Turkey. Adoption of online public grievance redressal system in India: Toward developing a unified view. E-file adoption: A study of US taxpayers' intentions.
2	INTERNATIONAL CONFERENCE FOR INTERNET TECHNOLOGY AND SECURED TRANSACTIONS	3	7.317	Security Challenges of E-Government Adoption Based On End Users' Perspective. Evaluation of the UTAUT Model for Acceptable User Experiences in Identity Access Management Systems. Towards a UTAUT-Based Model for Studying the Integrating Physical and Virtual Identity Access Management Systems in E-Government Domain.
3	INTERNATIONAL JOURNAL OF INFORMATION MANAGEMENT	3	7.317	Content design of advertisement for consumer exposure: Mobile marketing through short messaging service. Critical factors for cloud based e-invoice service adoption in Taiwan: An empirical study. Examining the influence of intermediaries in facilitating e-government adoption: An empirical investigation.
4	GOVERNMENT INFORMATION QUARTERLY	2	4.878	User acceptance of Malaysian government multipurpose smartcard applications. Why do people use information kiosks? A validation of the Unified Theory of Acceptance and Use of Technology.
5	LECTURE NOTES IN COMPUTER SCIENCE	2	4.878	PA Meets IS Research: Analysing Failure of Intergovernmental Information Systems via IS Adoption and Success Models. What Is the Issue with Internet Acceptance among Elderly Citizens? Theory Development and Policy Recommendations for Inclusive E-Government.

The review of 41 publication articles demonstrated that the vast majority of articles were empirical, quantitative and cross-sectional studies and the source of data collection were based on questionnaires. This majority of articles utilized data analysis by structural equation modelling. As mentioned at table 4 the *Computers in Human Behaviour* journal and the I*nternational Journal of Information Management* published most of their literature regarding this subject. Having analysed the references, there is diversity found in statistical tools and software's that were used in these researches such as: Structural Equation Modelling "SEM" and Regression as well as Amos, Smart PLS and SPSS. More details are displayed in Table 5. The recent trend of tools is using Smart PLS, while most studies used the cross-sectional approach.

Table 5: The analysis of 41 publications

Evaluation Criteria	Frequency	F. %	Evaluation Criteria	Frequency	F. %
Methodological approach			**Study type**		
Theoretical	1	2.43	Cross-sectional	40	97.56
Empirical	40	97.56	Longitudinal	1	2.43
Research method			**Source of data collection**		
Qualitative	2	4.87	Documents	1	2.43
Quantitative	38	92.68	Interviews	2	4.87
Mixed	1	2.43	Questionnaires	40	97.56
Data analysis techniques and Software's			Observations	0	0
SEM by Smart PLS	17	41.46	Mixed	1	2.43
SEM by AMOS	9	21.95	**Data source**		
SPSS	8	19.51	Primary	40	97.56
Descriptive Statistics	11	26.82	Secondary	1	2.43
LISREL	2	4.87	Primary & secondary	0	0
Case Study	2	4.87			
SEM by Warp PLS	1	2.43			

Once this theory was introduced, the model applications have been used for studies on new technology implementation in education [9], healthcare [10] [11] [12] and psychology [13]. Additionally, variable like intrinsic and extrinsic motivation goal expectancy, trust and security have been added as research variables [14]. Table 6 presents independent variable findings related to UTAUT from 41 different articles, which clearly it shows the increasing use of these variables in this type of studies.

Table 6: Independent variables that utilized in UTAUT studies

⊃ ⊢	Independent Variable	Freq.	⊃ ⊢	Independent Variable	Freq.

	Performance Expectancy (PE) “Perceived usefulness” “Accuracy”	37		Trust	25
	Effort Expectancy (EE) “Ease of use”	34		Security, Risk	7
	Social Influence (SI)	33		Anxiety, Compatibility, Quality, Benefits	4
	Facilitating Conditions (FC)” Availability“ “Facilities”	34		Credibility, Privacy	5
	Price value (PV) “Perceived cost”	7		Acceptability, Self-efficacy	2
	Hedonic Motivation(HM)	6		Awareness, Convenience	3
	Habit (H)	6		Task Technology Fit (TTF), Self-actualization need, Personalization, Resistance to Change, Self-concept, Perceived Competence, Civic Engagement, Innovativeness, Acquaintance, Flexibility, Avoidance of Personal, Interaction,	1

5. DISCUSSION

The gap between reality and theory in new innovation is perceived as the key issue in the developing nations. Nonetheless, the massive majority of e-government projects fail either absolutely or in part [15]. The fundamental reasons for the projects failing was as a result of oversized gaps between the design of project and reality [8]. The implementation of e-government is complicated because it involves so many aspects and relies on so many unpredictable variables. Examples of aspects of government that make implementation difficult are legislative issues, social, organizational and technological features. Also, when dealing with the populace and relying on their support and understanding of these technological changes; problems that are difficult to foresee are bound to occur. According to Venkatesh and others [11], e-government accomplishment and disappointment depends upon the gap size that exists between the current situation and plan of the e-government venture.

Doing more research with comparative issues is proposed as an approach to validate if the developments explained here will be available to discover new research opportunities. Future studies are recommended in a broader e-government populace to look at between the discoveries and worldwide articles. Extra work could be achieved by modifying the UTAUT model to contrast it with different models.

Overall, the information covered within this study highlights key findings in UTAUT and e-government with the goal of gaining an understanding of what works in implementing e-government technology. First, the bioliometric review resulted in this study showed that there is still much effort should be done to bridge the gap between the reality and hoped.

6. CONCLUSION

Based on the review of past studies which has been done regarding UTAUT and e-government, this paper proposes and justifies the applicability of (UTAUT) by Vankatesh and others [4] in the e-government field. The target of this article was to do a bibliometric survey of works that address and link between the topics of UTAUT and e-government by analysing articles distributed in the Web of Science database. Utilizing this resource to refine the focus of this topic, a sample of 41 articles were collected, of which, 40 were empirical and only one was purely theoretical. Among the most pertinent outcomes from the analyses, it is accentuated that the reviewed articles center around the sub-topics of e-government and different subjects such as smartcards, e-voting and e-learning. Directing future research with comparable issues later on is recommended; keeping in mind the end goal to confirm if the trends described here will remain available and to discover new research openings. Further work could also include comparisons between international articles because of the different aspects and diversity (e-filing, e-voting, m-government and e-learning and differences in study environments) in developed and undeveloped nations. As for the UTAUT model, it is recommended to either validate it in different situations or develope the model by extending or integrating it with other models. Furthermore, from the many distinguishable gaps in this area, it is seen that there is an expansive opportunity for more research tending to link between UTAUT and e-government with the intent to add knowledge to the existing body of knowledge on this topic of investigation.

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