

Adopting Organizational Structuring for ICT-enabled Government Transformation: Perspectives of City Government Employees in Indonesia and the Philippines

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***Abstract* - e-government or the use of ICT and its application by the government for the provision of information and public services to the people is now the norm. Local governments, being at the frontline of public service delivery, have to keep up with e-government practice and development in order to satisfy the imperatives of good governance. A framework of transformational government identifies elements which are interrelated and are consequential to the utilization of new ICT systems: process redesign; organizational structuring; and, cultural and behavioral change. Using variables fetched from various technology acceptance models, this study investigates the factors for the adoption of organizational structuring by city government employees in the city governments of Surabaya, Indonesia and Davao, Philippines. Survey data gathered from 78 Surabaya and 82 Davao purposively-sampled employee respondents was quantitatively analyzed through structural equation modeling. It was found out that performance expectancy and attitude are the pivotal factors in influencing the intention of adopting organizational structuring. Moreover, age and length of work experience of the city government employees appear to have limited relevance as moderating variables.**

***Keywords* - local government, transformational government, organizational structuring**

I. INTRODUCTION

As a result of the advancement in information and communication technology (hereafter referred to as ICT), delivery of services to citizens is now by e-government. E-government or the use of ICT and its application by the government for the provision of information and public services to the people [1] is now the norm. In fact, as of 2014, e-government is practiced in all 193 member-states of the United Nations [2]. Such was the pace of the adoption mode of state bureaucracies. And this has trickled down to the lower bureaucratic levels. Local governments, being at the frontline of public service delivery, had to keep up with e-government practice in order to satisfy the imperatives of efficiency, effectiveness, social inclusion and transparency in governance ([3], [4], [5]).

While some states are still in the stage of adaptation and adoption of the technology, others are already in the stage of transformation. According to a 2012 United Nations report, “with public sectors offering an increased number of services, the focus is shifting from what kinds of services are provided to *how* they are provided” [6, p. 85]. Undoubtedly, e-government is now a worldwide bureaucratic feature. At present, the ‘*how*’ is basically the use of ICT systems. While technological changes such as new hardware and software and media may not be difficult to keep abreast with, there are related elements in the bureaucratic organization that need to be transformed as well. In a proposed framework of

transformational change [7], three other elements are identified, all of which are interrelated and are consequential to the utilization of new ICT systems: process redesign; organizational structuring; and, cultural and behavioral change. These are subsumed under two concepts which have been prominent in many scholarly works on e-government: integration and transformation ([8], [9], [10], [11], [12], [13], [14]).

E-government development is one plausible indicator that it is on the path of transforming into the way it should be practiced, designed and fitted to a state's context. The UN has, for a period covering eight years, surveyed and measured its member states using the e-government development index or EGDI [15]. This framework placed importance on three dimensions: availability of online services; telecommunication infrastructure; and human capacity. Generally, the series of findings show how a state has fared e-government-wise in terms of development and participation. Viewed simply, it tells a state's current state of e-government relative to other states, and a world region relative to other regions. Table 1 below shows the status of Southeast Asian states' e-government development according to the latest survey [16].

TABLE 1. 2014 E-GOVERNMENT DEVELOPMENT INDEX (EGDI) WORLD RANKING AND LEVEL OF SOUTHEAST ASIAN STATES

State	Rank (out of 193 states)	Level
Singapore	3	Very High
Malaysia	52	High
Brunei	86	High
Philippines	95	Middle
Vietnam	99	Middle
Thailand	102	Middle
Indonesia	106	Middle
Cambodia	139	Middle
Laos	152	Middle
Myanmar	175	Low

The data shows how the Southeast Asian states have progressed in relation to other states in terms of e-government development. Of particular interest to this study are the states of Indonesia and the

Philippines. Both states have scored on the index corresponding to the 'middle' level. The implications of these findings could be best appreciated in view of the suggestion that "with clear strategies, smart investment in ICT infrastructure, continued investment in primary, secondary and tertiary education, as well as through radical transformation in offering online public services, governments can achieve more to follow the upward trend" [17, p. 16].

It is therefore important to know what could account for Indonesia's and Philippines' present e-government state and what variables, aside from the UN index, could be pivotal for the 'transformation' necessary for development and to 'follow the upward trend' in e-government. Of course, any attempt to examine this at the state level would be a huge task. However, examining a whole through its parts could facilitate in shedding light to the larger picture.

The study of e-government development and transformation factors has been pursued by individual scholars and organizations ever since e-government was utilized by states. Two studies on a global scale highlight crucial factors in the transformation of e-government. According to the UNDESA [18], transforming government through a 'whole-of-government' approach require the following enabling factors: a) new forms of collaborative leadership and shared organizational culture manifested by re-shaped values, mindsets, attitudes and behaviors; b) new forms of institutional frameworks for effective coordination, cooperation and accountability across government, between governments and with relevant non-public actors; c) innovative coordination processes and mechanisms, which are inclusive and accessible, for service delivery, and citizen engagement and empowerment; d) citizen- and user-centric collaborative mechanisms to engage citizens in service delivery and decision-making; and, e) appropriate ICT management

strategies in harnessing the power of new technology for enhanced collaboration.

A longitudinal study of the world's e-governments, for a period spanning a decade, by the Waseda University-International Academy of Chief Information Officers (or Waseda-IAC) ranks e-governments utilizing nine main indicators: network preparedness /infrastructure; management organization /efficiency; online services/functioning applications; national portal/homepage; government chief information officer (CIO); e-government promotion; e-participation/digital inclusion; open government; and, cyber security [19]. The study's findings point out certain factors that explain the e-governments' development or lack thereof which include: a) the lack of ICT human resources, especially CIOs, development and capacity building; b) key for success of e-government projects is enough funding or financial resources; c) more encouragement of citizen engagement as digital inclusion in e-government initiatives; d) developed countries showcase progression of numerous online service applications; e) local e-government issues must be given more attention; f) high usage of mobile devices may be taken advantage of for the practice of 'mobile-government'; g) implementation of 'open government' /'open data' and sharing with 'big data'; and, h) because the digital gap has become wider in terms of accessibility, usability, and affordability, ways to narrow down the gap must be put in place. Evidently, the two studies yield several common factors observed from e-governments worldwide which are essential for transformation.

Transforming e-government necessitates a broad range of changes in the bureaucratic environment. It must be cognizant of new available ICT systems and applications. Steps to improve or totally change designs of service processes must be done considering largely the demands of citizens and the maximum provision to them. Elements of the organization, both

human (and their internal qualities) and structural, should be adaptable to change.

This study draws from the transformational change framework [20] which shows the process as moving from one state or situation ('as is') to another state or situation ('to be'). The 'to be' situation, as adapted from Hammer and Champy [21], should show basic developments and major change in the organizational structure, its culture, and processes driven by the introduction of new ICT in order to realize actual government transformation. This study is motivated by the idea and practice of e-government transformation as defined by the following constructs: new ICT systems; process redesign; organizational structuring; and, cultural and behavioral change [22]. This study focuses on organizational structuring as one of the characteristics of transformational government.

In transforming e-government, organizational structuring must be done in the following ways: establishment of ICT department; institutionalizing professional leadership and management of ICT through Chief Information Officer/Chief Data Officer; shifting of back-office activities to front-office; and vigorous human resource training and re-tooling ([23], [24], [25], [26], [27], [28], [29]).

Whether e-government is adopted or not by stakeholders in society is one question that has challenged many scholars. In e-government adoption literature, a wide range of theories and models have been used to determine which variables could account for the adoption and use of e-government by different stakeholders. In Appendix 1, recent scholarly works indicate that much attention has been focused on the adoption of e-government services and systems, and data have been collected mostly from citizen-users. There is a need for research which shall focus on other essential e-government aspects and stakeholders. To fill this gap, this study focuses on the intention of local government employees, a less-studied

population, to adopt practices and activities essential for e-government transformation.

A. Research Objectives

This study utilizes a research model that could: a) determine the associations of variables in the adoption of organizational structuring; and, b) determine which variables are pivotal in the adoption of organizational structuring from the perspective of city government employees in the cities of Surabaya, Indonesia and Davao, Philippines. Drawing from adoption models and theories, this research sought to answer the following questions: 1) how are performance expectancy, effort expectancy, social influence, facilitating conditions, anxiety, and attitude associated with the intention of adopting organizational structuring by local government employees in both cities? and, 2) how do age and length of work experience in the organization moderate these associations?

B. Significance of the Study

Aside from contributing to the research-based knowledge on e-government, this research is important for a number of reasons. Firstly, results can draw up practical implications to the cities in developing and transforming their respective e-government. Also, data from the research respondents could guide the appropriate authorized person/s or organization in crafting programs and strategies to thrust e-government further upward. Moreover, agencies mandated to support or build the capacity of local bureaucracies could understand and value the need for continuous transformational change.

In the literature, there is a lack of information on e-government change or transformational government from the use and adoption perspective. Also, as observed, although several theories and models have been developed and utilized to analyze e-government adoption, such theories have not been extensively used from an employee

perspective [30]. This study could, therefore, contribute to building up research-based knowledge in these aspects. Furthermore, this could generate more interest to conduct research on transformational government, or other concepts subsumed under e-government, among other researchers and students of politics, public administration and technology.

C. Conceptual and Theoretical Framework

This study is anchored on three theories of technology acceptance: the unified theory of acceptance and use of technology (UTAUT); the theory of reasoned action (TRA); and, social cognitive theory (SCT). Select core constructs are drawn from these theories to compose the linear regression model for this study. The UTAUT [31] consists of four main constructs: performance expectancy (PE), effort expectancy (EE), social influence (SI) and facilitating conditions (FC), which are variables hypothesized to influence the dependent variables behavioral intention (BI) and technology usage (TU). Behavioral intention is seen as a critical predictor of technology use. Gender, age, experience and voluntariness of use are moderating variables hypothesized to influence on behavioral intention by the independent variables. The range of technologies, application scenarios, and geographical settings for which technology adoption has been studied validates the generalizability of UTAUT's core constructs ([32], [33], [34]).

Attitude is an important construct of the theory of reasoned action (TRA) which theorizes that 'attitude' towards an innovation is hypothesized to be determined by the users' perceived usefulness and perceived ease of use [35]. Both the TRA and TAM (theory of acceptance model) argue that, all other conditions constant, individuals execute behaviors towards which they have a positive affect [36]. In the TPB (theory of planned behavior) model, Ajzen [37] proposes that attitude towards behavior

is generally found to precisely predict the individual's behavioral intentions.

This study also employs the social cognitive theory (SCT) as applied by Compeau and Higgins [38]. In particular, this study took the SCT construct anxiety and made it as a predictor variable, taking into consideration that the model permits it to cover the study of technology acceptance and use in general.

Performance expectancy is defined as the extent to which a person believes that using a system will help him or her to attain gains in job performance and it is a strong predictor of intention to use technology in voluntary scenarios (Venkatesh et al. 2003) and satisfaction with technology in mandatory settings (Chan et al. 2010). Although the extant literature on performance expectancy as a predictor of e-government adoption is prolific, its role as predictor of other e-government dimensions is scantily studied. In this study, performance expectancy is the extent to which a person believes that adopting organizational structuring will help him or her to attain gains in job performance.

H1. Performance expectancy is positively associated with intention to adopt organizational structuring.

Effort expectancy is defined as the degree of ease associated with the use of the system [39]. On a conceptual level, Carter and Belanger [40] argue that citizens' intentions to use a state e-government service will increase if citizens perceive the service to be easy to use, while Stamati et al. [41] posits that perceived ease of use (measured as effort expectancy) will have a positive effect on the behavioral intention to adopt transformational government citizens' services. Even though effort expectancy has been steadily observed as a predictor of e-government adoption, as well as of other technology platforms, its role as transformational government adoption predictor remains under-investigated. As used in this study, effort expectancy is the

degree of ease associated with adopting organizational structuring.

H2. Effort expectancy is positively associated with intention to adopt organizational structuring.

Social influence is defined as the degree to which an individual perceives that important others believe that he or she should use the new system [42]. While a lot of studies confirm that social influence significantly affects intention to adopt e-government and other ICT systems, studies need to be done in order to test it as a predictor of e-government transformation. In this study, social influence is the degree to which a respondent perceives that significant others believe that he or she should adopt organizational structuring.

H3. Social influence is positively associated with intention to adopt organizational structuring.

Facilitating conditions are defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system [43]. Despite the fact that facilitating conditions have significant effects on use intention and actual use of technology in government, its effects on intention to adopt transformation in e-government ought to be examined too. As used in this study, facilitating conditions are the degree to which a respondent believes that an organizational and technical infrastructure is available to support the adoption of organizational structuring.

H4. Facilitating conditions are positively associated with intention to adopt organizational structuring.

Even though extensive research has been done on anxiety in the fields of psychology and information systems, its role as a predictor of behavioral intention in the context of e-government adoption and

transformation has not been substantially investigated. In this study, anxiety is the city government employee's apprehension or fear when he or she is faced with the possibility of adopting organizational structuring.

H5. Anxiety is negatively associated with intention to adopt organizational structuring.

Attitude towards behavior is defined as the degree to which an individual makes a favorable or unfavorable evaluation or appraisal of the behavior in question [44]. The relationship between attitude and behavioral intention have been presented in several studies ([45], [46], [47], [48]). Although attitude has been substantively shown through studies as meaningfully affecting adoption and use of various e-government services, platforms and systems, it also has to be examined whether it is a predictor of transformational government adoption. As used in this study, attitude is defined as the degree to which a respondent makes a favorable or unfavorable evaluation or appraisal of adopting organizational structuring.

H6. Attitude is positively associated with intention to adopt organizational structuring.

Moderators are variables whose variation influences the strength or the direction of a relationship between an independent variable and dependent variable [49]. Moderator variables can either be metric (e. g., consumer psychological constructs like arousal or intelligence) or categorical (e. g., gender or social class) in nature [50]. The UTAUT model hypothesizes a moderating influence by age on the relationships among performance expectancy, effort expectancy, social influence, and behavioral intention to use technology and also on the relationship between facilitating conditions and usage behavior ([51], [52]). This study postulates

that age of city government employees moderates the relationships between the independent variables (effort expectancy, anxiety and attitude) and intention to adopt organizational structuring.

H7a. Age will significantly moderate the association between effort expectancy and intention to adopt organizational structuring.

H7b. Age will significantly moderate the association between anxiety and intention to adopt organizational structuring.

H7c. Age will significantly moderate the association between attitude and intention to adopt organizational structuring.

There is a lack of knowledge in e-government literature on the role of length of work experience in an organization. As Rana et al. [53, p. 419] have observed, "although the UTAUT is a unified model mapped created from eight established models of IS adoption research including the TAM (theory of acceptance model), the DOI (diffusion of innovation), and the TPB (theory of planned behavior), the UTAUT has not been widely used to analyze adoption of e-government services from an employee perspective". In view of this, this research includes length of work experience as a moderating variable for the basic reason that results will be extracted from local government employees, with the assumption that their work experience could influence their intentions towards adopting transformation in the workplace.

H8a. Length of work experience will significantly moderate the association between performance expectancy and intention to adopt organizational structuring.

H8b. Length of work experience will significantly moderate the association between effort expectancy and intention to adopt organizational structuring.

H8c. Length of work experience will significantly moderate the association between social influence and intention to adopt organizational structuring.

H8d. Length of work experience will significantly moderate the association between attitude and intention to adopt organizational structuring.

This research uses a linear regression model (Fig. 1) wherein the independent variables performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating conditions (FC) anxiety (ANX) and attitude (AT) are hypothesized to be associated with the dependent variable behavioral intention (BI) of adopting organizational structuring. Age (AGE) and length of work experience (LWE) are proposed as moderating variables.

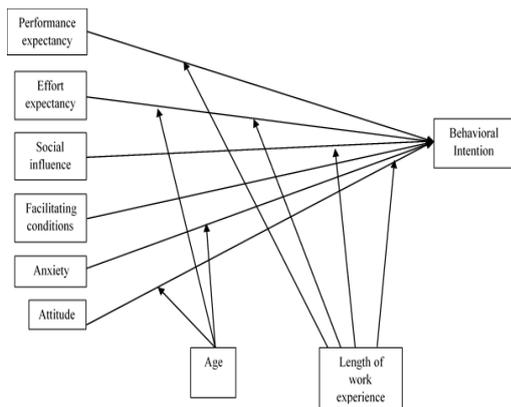


Fig. 1. Research model showing the hypothesized relationships between variables.

II. METHOD

This study surveyed government employees in Surabaya City, Indonesia and Davao City Philippines. Surabaya is Indonesia’s second largest city, it is Indonesia’s ‘other’ industrial heartland and metropolis next to Jakarta [54]. Surabaya is regarded as the leading ‘digital city’ in Indonesia since it has been awarded the Indonesia Digital Society Award (IDSA) in 2014, evidenced by yearly increases in ICT spending which has been induced by the

perceived benefits of giving greater attention to IT usage in providing citizen services [55]. In an e-government evaluation study of Indonesian cities, Surabaya came out first-ranked in the index of reform (IR) based on the following parameters: citizen service, business permission, planning transparency and finance transparency [56]. Further, it has been found out that the e-government of Surabaya has a significant effect in moderating reliability on the city government, and has a strengthening characteristic to community satisfaction with the city’s public services [57].

Davao City is the regional capital and largest city of Mindanao, Philippines [58]. Davao is deemed an interesting case of e-government transformation. The UNDESA [59] has cited the city as one of the examples of local portal features that are indicative of integration and transformation. Specifically, the UN study referred to the creation by the Davao Medical Center, as a result of gender and development mainstreaming efforts, of the Women and Children Protection Unit (WCPU) which is a one-stop family crisis intervention center that provides legal, psychiatric and medical services to its patients. This is line with the continuing transformation of the agency based on one of its transformation pillars: sound information technology, that is, the linking of systems and services using the most appropriate technology for their specific needs [60]. Moreover, Davao City is one of the cities in Southeast Asia which is developing a ‘smart city’ [61]. It is apparent that both cities show indicators of e-government transformation, hence their selection.

The respondents of this study are the purposively-sampled employees of the governments of the two cities. A total of 120 questionnaires per city were distributed to the city government employees. In Surabaya, Indonesia, these were handed out to 23 agencies/offices. Out of 120, 78 valid questionnaires were retrieved. While in Davao, Philippines, 82 were retrieved out of

120 questionnaires allocated to 12 departments/offices.

Data was gathered through a structured questionnaire. It consists of three parts: a) the first part to extract data for the variables age, length of work experience, and position in the organization; b) the second part explains the construct organizational structuring and identifies its operational meaning; and, c) the third part to draw responses on statements pertaining to the independent and dependent variables. A five-point Likert-type level of agreement scale [62] ranging from Strongly Disagree (1) to Strongly Agree (5) was used to measure responses on indicators of the constructs EE, PE, SI, FC, ANX, AT and BI (Appendix 2). Data was analyzed using licensed versions of IBM SPSS Statistics (version 19), and Smart PLS or Partial Least Square (version 3) for structural equation modeling tests.

III. RESULTS AND DISCUSSION

There is a notable difference between the Davao and Surabaya samples in terms of age. Although majority of the samples in both cities fall under the younger age brackets (21-45), more Surabaya employees belong to this group compared to the Davao employees. Conversely, while the minority of the samples in both cities fall under the older age brackets (46-65), more Davao employees fit in this group compared to the Surabaya employees. In terms of work experience in the city government, it appears that majority of the Davao employees have worked longer (11 years and more), while majority of the Surabaya employees have worked shorter (10 years and less). Samples from both cities consisted of a minority of department or division heads, and a large majority of staff-level employees, which is likely in the bureaucracy context. Table 2 below presents the demographic profile of this study's sample.

In assessing the relationships of the hypothetical constructs, regression weights should be significant at least at the .050

level ([63], [64]), and a weight or coefficient of at least .100 reports a certain impact within the structural model [65]. These are either positive (i.e. in the expected direction) or negative. Regression weight values of approximately 0.67, 0.33, and 0.19 are considered as substantial, moderate and weak, respectively, in terms of the level of explanatory power [66]. Table 3 below presents this analysis.

TABLE 2. DEMOGRAPHIC PROFILE OF SAMPLE (IN %)

Variable	Davao	Surabaya
Age bracket		
21-35	28	38.5
36-45	37.8	39.7
46-55	22	19.2
56-65	12.2	2.6
Length of work experience		
0-5 years	7.3	19.2
6-10 years	30.5	33.3
11-15 years	31.7	21.8
16 years plus	30.5	25.6
Position		
Department/Division head	9.75	16.66
Staff	90.25	83.33

The tests for the regression weights between performance expectancy (PE) and behavioral intention (BI) showed that there is positive association between the two variables in both Davao and Surabaya, with regression weights of .151 and .353 respectively. Results also showed that there is no positive association between effort expectancy (EE) and behavioral intention (BI) in both cities. Likewise, there is no positive association between social influence (SI) and behavioral intention (BI), although there is a remarkable negative association between social influence and behavioral intention for Davao. Tests also showed that there is no positive association between facilitating conditions (FC) and behavioral intention (BI) in Davao and Surabaya. Anxiety (ANX) is not negatively associated with behavioral intention (BI) in both cities. Results showed that attitude (AT) is significantly associated with behavioral intention (BI) in Davao and Surabaya, with regression weight values of .862 and .421 respectively.

TABLE 3. REGRESSION WEIGHTS AND HYPOTHESIS TESTING FOR DAVAO (D) AND SURABAYA (S)

Relationship	Standardized regression weight		Hypothesis supported?		Significance (p)	
	D	S	D	S	D	S
PE → BI	.151	.353	Yes	Yes	<0.05	<0.01
EE → BI	.050	-.018	No	No	Ns	Ns
SI → BI	-.172	-.025	No	No	<0.05	Ns
FC → BI	.103	.155	No	No	Ns	Ns
ANX → BI	.026	.018	No	No	Ns	Ns
AT → BI	.862	.421	Yes	Yes	<0.001	<0.001
R ² (BI)	.933	.673				

Legend: Ns=not significant

This study analyzed the interaction effects of two moderating variables, age (AGE) and length of work experience (LWE), on selected exogenous variables to the endogenous variable. Analysis was done using bootstrapping procedure in partial least square SEM. Researchers have suggested an interpretation of effect sizes: from 0.02 as weak, from 0.15 as moderate, and above 0.35 as strong [67].

The tests for moderating effects of age (AGE) revealed that it has no effect on effort expectancy in both the Davao and Surabaya samples. Age strongly and positively moderates the effect of anxiety on behavioral intention of the Davao sample, whereas it has no moderating effect for the Surabaya sample. Age does not appear to affect the association between attitude and behavioral intention of Davao and Surabaya city government employees.

The study found out that length of work experience (LWE) does not affect the performance expectancy of both Davao and Surabaya respondents. While it does not influence the associations between effort expectancy, social influence and behavioral intention of Surabaya respondents, it strongly moderates in the negative direction the associations between effort expectancy, social influence, and behavioral intention of Davao respondents. Length of work experience of both Davao and Surabaya respondents does not affect their attitudes towards adopting organizational structuring.

IV. CONCLUSIONS

This study sought to ascertain: firstly, what variables are associated with the intention of local government employees to adopt organizational structuring for ICT-enabled government; and secondly, whether their age and length of work experience moderate these associations. Based on the research model, the findings show that performance expectancy and attitude are the pivotal factors for adopting organizational structuring by employees of the Davao and Surabaya city governments. It also shows that there are no associations between the other variables, i.e. effort expectancy, social influence, facilitating conditions, anxiety, and intention to adopt organizational structuring.

Age appears to significantly moderate the positive association between anxiety and behavioral intention of the Davao sample, which implies that older employees tend to be anxious about adopting organizational structuring. Moreover, findings imply that employees who have worked relatively longer in the Davao city government had a tendency to suppose that adopting organizational structuring would require more effort, and to assume that social influences or factors are not important considerations in adopting organizational structuring.

V. RECOMMENDATIONS

For e-government transformation to be adoptable and efficacious, some conditions are necessary. Transforming so as to improve the city government's performance, hence become more effective and efficient, should always be instilled among the employees through regular orientations or seminars. The employees should be made to understand that doing so requires additional effort on their part being members of the organization. Moreover, they should also be made to realize that while technology is rapidly improving, at

the same time citizens' expectations of government service delivery are also rising and therefore adjustments have to be done. City government officials and decision-makers should see to it that financial, technical, and structural support are present through enactment of appropriate local policies. This necessitates sound political leadership and committed political will from city officials. The positive attitude towards the idea and practice of transformational government should be maintained and sustained among city government employees and officials, especially among the older ones.

Appendix 1. Recent e-government adoption literature

Author/s	Variables or key concepts	Adoption or use target	Sample population
Hung, S. -Y., Tang, K. -Z., Chang, C. -M., & Ke, C. -D. (2009) [68]	perceived usefulness, perceived ease of use, training, compatibility, external influence, interpersonal influence, self-efficacy, facilitating conditions	electronic document management system	Government employees
Aboelmaged, M. G. (2010) [69]	perceived usefulness, subjective norm, attitude, social influence, behavioral intention	e-procurement	Supply chain partners
Lin, F., Fofanah, S. S., & Liang, D. (2011) [70]	attitude, perceived usefulness, perceived ease of use, information system quality, information quality, behavioral intention	e-government initiatives (not specified)	Citizen-users
Carter, L., Schaupp, L. C., Hobbs, J., & Campbell, R. (2012) [71]	performance expectancy, social influence, facilitating conditions, optimism bias, perceived reputation, perceived risk	e-tax filing	Citizen-taxpayers
Bonsón, E., Torres, L., Royo, S., & Flores, F. (2012) [72]	Sophistication index, public administration style	Web 2.0 and social media	Local governments
Weerakkody, V., El-Haddadeh, R., Al-Sobhi, F., Shareef, M. A., & Dwivedi, Y. K. (2013) [73]	performance expectancy, effort expectancy, social influence, facilitating conditions, trust of the internet, trust of intermediary, behavioral intention, usage behavior	e-government services (not specified)	Citizen-users
Hung, S. -Y., Chang, C. -M., & Kuo, S.-R. (2013)	perceived usefulness, perceived ease of use, trust,	Mobile e-government services (not specified)	Citizen-users

[74]	interactivity, external influence, interpersonal influence, self-efficacy, facilitating conditions		
Alryalat, M.A.A., Rana, N. P., & Dwivedi, Y. K. (2015) [75]	perceived usefulness, perceived trust, self-efficacy, attitude, subjective norm	online PAN card registration system	Citizen-users
Rana, N. P., Dwivedi, Y. K., Williams, M. D., & Weerakkody, V. (2016) [76]	performance expectancy, effort expectancy, social influence, facilitating conditions, anxiety, attitude, behavioral intention	Online public grievance redressal system	Citizen-users
Dwivedi, Y.K., Rana, N.P., Janssen, M., Lal, B., Williams, M.D., & Clement, M. (2017) [77]	performance expectancy, effort expectancy, social influence, facilitating conditions, perceived risk, attitude, behavioral intention	online permanent account number card registration system	Citizen-users

Appendix 2. Indicators of variables

Variables	Indicators
Performance expectancy (PE)	PE1 completion of tasks in less time and at less cost
	PE2 achievement of set goals and objectives
	PE3 enhancement of service quality
	PE4 increase overall productivity
Effort expectancy (EE)	EE1 implementing would be easy
	EE2 using or adopting would be easy
	EE3 interaction with co-workers would be unproblematic
	EE4 adjustment would be uncomplicated
Social influence (SI)	SI1 must be done because other cities are doing it
	SI2 must be done because other departments/divisions are doing it
	SI3 must be done because citizens expect it
	SI4 must be done because citizens demand it
Facilitating conditions (FC)	FC1 having the knowledge and skill to use it
	FC2 technical support and assistance would be available
	FC3 financial support is available
	FC4 city administration supports it
Anxiety (ANX)	ANX1 feeling of hesitancy in using or doing it
	ANX2 feeling of worry that it will not work out as expected
	ANX3 feeling of being overwhelmed by it
	ANX4 feeling of concern that citizens will not like it
Attitude (AT)	AT1 it is a good idea
	AT2 it is a worthwhile thing to do
	AT3 it is likeable
	AT4 it is nice
Behavioral intention (BI)	BI1 intending to do it
	BI2 predicting that one would do it

(Venkatesh, et al. 2003) [78]	BI3 planning to do it very soon
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