Trust Model in Online Information of Smart Government: A Conceptual Framework

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Abstract
Online information has gained significant importance in management and holds great value creation potential for public services. A pressing issue in this regard is how public organization can adapt their traditional structures and processes to the innovative field of online information to create public trust. This study aims to provide a new trust model of online information in smart government system to improve the public trust. The proposed conceptual model for evaluating publics' acceptance to use online information constructs from Technology Acceptance Model. The proposed model will improve the service delivery of UAE government departments by enhancing the trust of public towards the online information usage.

Keywords—Trust, acceptance, public organization, online information.

I. INTRODUCTION

The use of online information has brought innovation and potential to create value in the cities that are represented by the interconnected citizens, businesses, different modes of transport, communication networks, services and utilities. Also, the online information has continuously disrupted the administrative landscape of public departments around the world [1]. Organizations and public departments have leveraged severally on new technologies such as Internet of Things and cloud computing to build a connected and sustainable service delivery, high quality information, efficiency transactions, better decision making and global competitiveness [1]; [2]; [3]; [4]; [5]. The online information plays a significant role in the context of what is often referred to as smart and intelligent government and is among the key trends that government need to follow in the near future.

Cities are increasingly aware of the concept of "smart government" actively developing strategies towards the goal of becoming smart and manage the inclusion challenges [6]. Smart government is regarded as "the highest modernization phase of the public organizations" [7] and contains "elements of reflection, information-gathering and processing, and a reliance on ICT […] and relies on principles of openness, participation, and improvement of public sector services" [8].

Motivated by the high number of registered mobile devices, a number of Smart App for smart government has been developed, such as Abu Dhabi City guard [9] smart Fujairah [10], Abu Dhabi Gateway [11] and mobile apps for healthcare [12].

The Abu Dhabi City guard allows Abu Dhabi residents to report incidents and connected with several government departments. This helps citizens engaged to improve security and general safety of Abu Dhabi. The Abu Dhabi Gateway provides services of government-to-customer and government-to-business. Through these two gateways, services like health, interior affairs, education and paying traffic fines are made available in real-time.

Public departments should rediscover the role of online information as a source of growth and innovation for designing and creating effective and efficient performance of public tasks and value [13]. AlAwadi and Scholl (2013) suggested that the online information in the public context is intended to enhance the efficiency of use of public resources and increase the effectiveness of public services [14]. To date, many works have been done to overcome the challenge face in smart government to ensure the efficiency of usage that includes legislation and standard data policy [2]; [15]; [16], security protocols [17], interoperability [15]; [18], robust technology infrastructure [15]; [19] and open data.

However, there has been limited number of works that systematically study to create the public trust on online information. Gaining public trust becomes one of the most urgent issues to cultivate the acceptance of public with government through online information to provide better services and to gain a good understanding of their communities [1]. To successfully implement online information on the context of smart government and deliver public trust in this way requires to take account of various aspects, in particular, developing new business and operation model, as well as establishing information infrastructure and respective decision support system.

Therefore, in this study, the public from different background will be evaluated in term of the public trust level in smart government. It would add value in establishing better understanding of public acceptance that would strengthen the government initiative in shaping the smart government specifically in Abu Dhabi, UAE. It will provide the

Abu Dhabi government public administrator feedback on how close they are in accomplishing their goals and visions.

II. RESEARCH METHODOLOGY

The study was conducted by using search engine like Google Scholar database. The search string used were (trust model) AND (user acceptance OR acceptance) AND (online information) to ensure all related papers are included. The database was search for articles published in 2010-2019. By examining the title and abstract of the primary identified studies, 87 articles were selected as they are relevant studies. Furthermore, we accessed and evaluated the articles by checking the content of the articles. Irrelevant studies will be rejected at this stage and the relevant studies will be examined further. Out of 87 articles, there are only 76 articles considered for further review.

III. LITERATURE REVIEW

A. Online Information in Smart Government

The notion of smart government has grown popular over the past few years. It embracing the extensive use of the technology that leads to big data, open government data, social networking, blogs, Really Simple Syndication (RSS) feeds, web design and programs (e.g., html5, xhtml, SQl, and more), mobile government, smartphone applications, cloud computing, sensors etc.) [20].

From a similar viewpoint of service co-production, government are generating large-scale online information sets on a range of topics, including climate change, traffic patterns, health and disease data, purchasing behaviour, and social behaviour through social media interactions [21]. Chen et al., (2015)[22] identified data is created form e-government services offered to the citizens to increase effectiveness, efficiency and convenience of the government.

Li et al., (2016) [23] introduce smart government characteristics which mainly has perception, collaborative, intelligence and service-orientation. The perception refers to the changes in the online information data sources, collaborative refers to the

use of high-tech to break the boundaries between government departments and change collaboration efficiency, intelligence is the change in the use of information, servitization refers to the transformation of government departments and management of smart service delivery.

Zoonen (2016) [24] discussed a deep analysis on variation of information that emerges from a wide variety of governmental departments, from private and public stakeholders, from individual citizens and visitors, and are collected, analyzed and stored without any kind of central coordination or collaboration. He categorized the six sources of information for a smart government: infrastructure, sustainability, health, cohesion, commerce and experience (Table 1). Also, online information diversifies and multiplies at unprecedented and unplanned speed, requiring ever bigger and multiple storage facilities and diverse and combined analytic techniques, while engaging different actors who tend to lack knowledge of each other let alone collaborate [25].

TABLE 1. ONLINE INFORMATION IN A CITY [24]

Sector	Domain	Kind of data	Example of application
Infrastructure	Transport and asset management, built environment	Monitoring data, registration data, geo data	Traffic and congestion patterns, real time dashboards
Sustainability	Energy usage, water, environment, weather	Sensor and monitoring data, civic measurement data	Air quality monitoring and pollution warnings
Health	Health, quality of life, well-being, life expectancy	Health data, survey data, lifelogging	Location specific noise levels and social or health problems in specific neighbourhoods
Cohesion	Education, social capital, migration, neighbourhoods, housing, crime	Survey data, civic and community web presence data	School quality in specific neighbourhoods
Commerce	Business opportunities, marketing, location-based services	Social media data, open government data	Investment maps for attracting new business
Experience	Events, leisure, nightlife, tourism, heritage	Social media data, archive data, sensor data	Real time social media analytics for crowd control

ICT is the backbone for information revolution in smart government. The use of ICT has helped redefine and redesign traditional formats of process and structural organization specifically the digitization of information. Information needs to be shared, reused and integrated in facilitating the smartness and public participation [20]; [26]; [27]. With the development of web 2.0, Social media includes social networking applications is seen as one of the components in smart government [1][1]

S. Al-Shami, A. H. Al-Hammadi, A. Al Hammadi, N. Rashid, H. Al-Lamy, and D. Eissa, "Online social networking websites in innovation capability and hotels' performance in Malaysia," *J. Hosp. Tour. Technol.*, 2019.

[28]. It has been accepted in literature as a way to engage citizens, improve social consciousness, exchanging opinions, provoking debate and sharing information about social and political problems [28]. Further, social media benefits government in terms of increase participation of citizens, solicit innovative ideas from the masses, and improve decision making and problem solving [29]; [30]; [31]. An example of the use of social media (Twitter and Facebook) for 30 municipal public administrations in State of Mexico to provide information, improve their citizens relationships, create interactions and improve inter-department process [32].

Scholars have focused on norms and policies [33], [34], conceptual framework [35]; [36], smart government measurement [37]; [38]; [39], information sharing in smart government [40], and quality of information in smart government [41]; [5]. Unfortunately, the research about trust of online information of users in smart government, is still highly tentative and exploratory. Trust in the growing role open Information (open data) is central for smart government to share and reuse information cannot be ignored**.**

B. Technology of Acceptance Model

Researches on the concept of trust in online environment have begun in late 1990s [42]. With the advent of information technologies, many organizations engage their customer in online social media to get the information, feedback and increase customer satisfaction on the products and services

[43], [44], [45]. Prior research has employed various models to examine the user acceptance and trust on information technologies includes Technology Acceptance Model (TAM). TAM is the most widely used model that provides user acceptance on technology. TAM was proposed by Davis [46] and it presented two imperative ideas – perceived usefulness (PU) and perceived ease of use (PEOU). The PU indicates to how much an individual trust a system would upgrade his/her activity execution by utilising it. The PU indicates to how much an individual trust the used system would be free of physical and mental endeavours. In TAM, an individual's trust determines the behaviour towards using the system and, thus, the behaviour helps to develop the intention to use.

The TAM has been applied various distinctive research disciplines whereby researchers embraced a positivistic perspective, expanding the TAM with external factors distinguished exclusively from previous literature. However, Sun and Zhang [98] claimed the overwhelming utilization of quantitative strategies within TAM research and called for a 'methodological shift' to augment the comprehension of factors that may impact new technologies.

C.Related Models of Trust on Online Information

Kim et al., (2011) [44] studied factors that influence trust and how trust has relation with customer loyalty of online shopping for tourism products and services. They use a structural equation modelling to examine the relationship of navigation functionality, perceived security and transaction cost (as exogenous variables), trust and satisfaction (as mediating variables), with loyalty as a dependent variable. Their results show that transaction cost has positive relation with satisfaction but no significant effect on trust. Trust and satisfaction is related to loyalty which influences customer behaviour.

Another studied of online information in online shopping domain conducted by [47]. They focused on building trust in virtual communities. The degree on how communities trust online shopping websites is examined by assessing the communities'

intentions to get online information and purchasing information from these websites. In their study, trust of a website refers to trust towards information provided by vendors. The relationships between trust dimensions and trust in members were identified. Results show that in building trust in virtual communities, trust in members plays a more important role in fostering trust in the vendor that further affects communities' intention to get information form the virtual communities. It suggested that, online forum would help the virtual communities in which member provides topic- or interest-oriented information in its online community. In relation with trust on online information provided by vendor and members, [48] proposed conceptual model that behaviour of member have significant effect in purchasing intention on online shopping.

In the domain of online banking or e-commerce, the extended TAM model was shown by [49]. The online information provided in the bank website is the key determinant of trust of e-commerce. Zhou [50] examined the effect of flow experience on user behaviour of mobile banking user adoption. Yap et al. (2010) [51] proposed a model that identified relationship of online attributes of the e-banking web site and structural assurance cues (size and reputation of the bank, and quality of traditional service at the branch) in a consumer's evaluation of the trustworthiness of e-banking and subsequent adoption behaviour.

Previous research studies are summarized in Table 2. The Technology Acceptance Model (TAM) has proven to be a reliable model that explains technology system acceptance. Also, It is found that trust is an important determinant whether user decide to use online services and/or to adopt the online services. In research years, there is a lot of research concerning online service i.e. commerce, banking, tourism, and health. However, smart government is the next level of government in which variety applications of newly rising technology and innovating the activities, are still lacking of research for understanding the trust factors and intention to use online information.

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IV. CONCEPTUAL FRAMEWORK

This study attempts to extend TAM and focuses on trust. TAM extension has generally taken one of the three approaches: by introducing factors from related models, by introducing additional or alternative belief factors, and by examining antecedents and moderators of perceived usefulness and perceived ease of use. Amin (2007) suggested the need for acceptance models which are tailored to specific technologies. They argued that generic models may not be adequate to explain the adoption and use of different types of technologies and service channels where specific features of the technology may play an important role. Therefore, it is important to include other explanatory variables into TAM. Relating to the specific nature and uniqueness of behavioural intention to use online information in smart government, trust and new variables have been included in the model.

A. Trust

In literature, a massive information and components related to technology in government are considered as smartness in a government [35]. It is argued that the information in smart government will be useful if information is shared between departments in organizations and organizations and citizen. However, trust the shared information and trust in government becomes one of the most urgent issues to prevent unauthorized disclosure and leakage information [35], [52]. Trust is proposed in this study as an antecedent variable to the acceptance to use online information in smart government. It has been defined as the belief the capability of product and/or service provider in smart government will perform some activity in accordance with customers' expectations [4]. Trust is an important determinant whether customers decide to accept and use the online information. Since trust toward online information is an important determinant for customers who decides their acceptance to use, this study inducts that trust toward online information positively affect customers' acceptance.

TABLE I. LITERATURE ON TRUST MODEL

Model	Domain	Purpose	Findings	Source
Trust as mediating variable and has relation with navigation functionality, perceived security and transaction cost.	Commerce and Tourism	Customer loyalty	Customer satisfaction influence trust and has significantly effect on loyalty.	[44]
Integration of perceived of risk to TAM model. Trust as independent variable.	Banking	Behavioural Intention to use	A well-designed web will be minimizing the perceived risk	[49]
Trust as independent variable and has direct relation with public activities.	Social media	Public engagement	online civic engagement is required to enhance the trust among public	[54]
TAM model and trust and flow is classified as mediating variables.	Mobile banking	Behavioural Intention to use	Both trust and flow experience should be taken into mobile service providers consideration in order to facilitate user adoption and usage of mobile banking service	[50]
Trust (mediating variables) classified as trust in members and trust in website.	Social media	Customers' purchase intention	Trust in other members influence members' purchase behaviour.	[47]; [55]
Trust can be mediating and moderating variable of privacy concerns.	Social media	Online self-disclosure behaviours	Trust plays central role in online disclosure of social network.	[56]
Trust as mediating variables.	e-Banking	Willingness to adopt e-banking	Traditional service quality at the bank still required in promoting the e-banking.	[57]
Perceived of communication (Gratification theory)	Health	Internet usage	Trust in online health information was also found to be a significant predictor of online health activities.	[58]
Trust as independent variables and it is classified as trust in the website, the vendor, the auction initiator and group members.	Online shopping	Purchase intention	A safe, user-friendly shopping environment and satisfaction can enhance the decision making process in online shopping.	[59]
Model of trust for expanding the banking service in a	Mobile banking	Adoption and usage	The adequate use and construction of arguments	[60]

developing country.			disclosed by banks about how secure MB can be is also a factor that banks need to observe.	

B. Reputation:

Merriam Webster Dictionary online defined reputation as recognition by other people of some characteristic or ability. Reputation have considerable influence on trust either in traditional commerce or online commerce [60]. Reputation is a factor of trust according to Fong et al. (2012) [61] is based on the customer's profile and activity history. There are researchers refers reputation as the product and service provider's ability and honesty [61]; [62]. For example, brand recognition has long been signalling effect to gain customers' trusting beliefs and trusting intentions [63]. This study establishes one hypothesis as follows:

H1: Customer perceived reputation toward online information in smart government is positively moderates related to trust.

C. Word-of-mouth

Generated from or reliant on oral publicity is the definition of word-of-mouth provided by Merriam Webster Dictionary online. Word-of-mouth play important role in inducing customer's trust in online shopping using social media (so called s-commerce) [64]; [65]. S-commerce users are likely to trust other users' experiences and opinions concerning certain products and services or s-commerce sites. This study establishes one hypothesis as follows:

H2: Customer perceived word-of-mouth toward online information in smart government is positively moderates related to trust.

D. Ease-of Use

A modified definition of ease-of-use for social media is presented by [66] the degree to which S-commerce site is perceived as easy and effortless. In a study of mobile shopping, [67] ease-of-use is related to convenience. They express the

convenience as the easiness of customer to use mobile utility

for online shopping. This study establishes one hypothesis as follows:

H3: Customer perceived security toward online information in smart government is positively moderates related to trust.

E. Knowledge & experience

Knowledge is the information, understanding and skills that you gain through education or experience [68]. Experience is the knowledge and skill that you have gained through doing something for a period of time [68]. Internet users who have greater experience with using online information i.e social media, e-commerce, etc., or users who engage in creating user-generated content more extensively, than users with less of these experiences because they may be more familiar or comfortable with using aggregated online information, and thus be more trusting of it. This study establishes one hypothesis as follows:

H4: Customer perceived knowledge and experience toward online information in smart government is positively moderates related to trust.

F. Security

In the nature of online information, it is seen that if the customers can feel a sense of security and are confident that their privacy is being protected, their level of trust in the site will be enhanced accordingly [42]; [69]; [70]. In this in line from the Merriam Webster dictionary online whereas security is defined as the quality or state of being secure, protected or freedom from anxiety. This study establishes one hypothesis as follows:

H5: Customer perceived security toward online information in smart government is positively related to trust.

G. IT quality

IT quality includes the concept of information quality, service quality and system quality

specifically quality of website that will significantly affect customer's trust in the website [69]; [62]. Ponte et al., (2015) details the characteristic of IT quality such as website should provide accurate information on the product and/or service, sufficient information, enough depth of information, helpful in purchasing process, clear information and up-to-date information [62]. In oxford Dictionary online, quality is defined as the standard of something when it is compared to other things like it. This study establishes one hypothesis as follows:

H6: Customer perceived IT Quality toward online information in smart government is positively related to trust.

H. Supporting system

In the context of social media health care applications, social support refers to the health communities in which information and support can be valuable for people who seek to better understand health [71]. Some literature refers supporting system in online information as feedback. Feedback is the leakage in privacy when the server handles more private users' information [72]. Feedback system is proposed in [72] to evaluate their delivered services. This study establishes one hypothesis as follows:

H7: Customer perceived supporting system toward online information in smart government is positively related to trust.

I. Privacy

Conceptual definition on privacy is the ability of an individual to control personal information about one's self [73]. Privacy refer to a website's taking appropriate measures to protect customers' personal information from being misused [74]. The measures include security characters, defences mechanisms and information protection. Privacy is the willingness of consumers to share information via the Internet that allows purchases to be decided [75]. This study establishes one hypothesis as follows:

H8: Customer perceived knowledge and experience toward online information in smart government is positively related to trust.

J. Culture

It would be interesting to consider other variables that may affect publics' trust in the acceptance of online information of a smart government. One of them is culture. In a study of [76] show that, there is a requirement to study the effect of culture towards trust. Therefore, the next hypothesis is:

H9: Culture toward online information in smart government is positively related to trust.

The anticipated relationships are depicted in Figure 2-1. The online environment certainly encapsulates several factors includes risk, uncertainty and interdependence [51]. Increased trust will mean that a user's attitude towards a particular behaviour increase a person's willingness to perform that behaviour. Yap et al. (2010) demonstrated that trust leads to accept and usage intentions in online environment [51]. Therefore, the following hypothesis is:

H10: Trust has positive effect to accept online environment in smart government.

V. CONCLUSION AND FUTURE RESEARCH DIRECTION

This study explored the relevant factors surrounding the smart-government adoption by publics, and their acceptance to use the online information in Abu Dhabi. A research framework based on TAM model was proposed and need to be tested. The research framework offered a list of factors of trust in accepting to use the online information for a smart government. Interestingly this study found one factors that would be to explore further into the public's trust in accepting the online information, namely culture. Understanding all the factor of trust in the view of Abu Dhabi citizens will enable practitioners to introduce online information related to public services more effectively. Further, empirical research is needed to validate the conceptual model using the UAE context, and subsequently facilitate in confirming the factor of trust to ensure the successful smart-government services acceptance in the UAE.
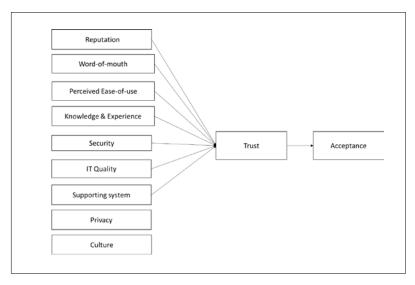
Fig. 1. The proposed conceptual framework

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