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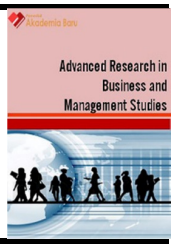

Factors Affecting the Adoption of Electronic Government in Algeria: A Proposed Framework

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ABSTRACT

Electronic government is the adoption of data knowledge-based technologies such as internet, Wide area networks and mobiles by the government bureaus. In addition, such types of government are more transparent, accountable and can govern effectively. Hence, it is imperative to organise considerable research to back the policy formulators, activists and academicians, having a significant comprehension of the e-government. This will assist to identify multiple factors influencing e-government in different circumstances, specifically in developing countries facing various challenges to adopting e-government such as Algeria. Henceforth, this study intends to examine the association between technological, organisational environment (TOE) and e-government. Therefore, to pursue this objective, the current study proposes a framework to examine the influence of TOE on e-government in Algeria. Moreover, the direct influence of explanatory variable has also been discussed. Hence, this study, by this way endeavours to fill the gap in prevailing literature.

Keywords:
Technological factors, organisation factors, environmental factors, TOE framework, E-government adoption

1. Introduction

The employment of modern technology such as the internet in government activities is considered as electronic government [98].In addition, Jayashree *et al*. [50] have revealed that electronic government is a mechanism the government use to operate and endeavours to obtain efficient communication with the businesses and people. This helps for efficient assessment, connectivity, ensuring more efficient systems and services. As compared to the traditional government mechanisms, the electronic government has shown; extensive utilisation of communication technology; the relatively easiest tool to organise information; employed and analysed by several agents and the informal character of the online settings. In e-government, government websites interact with modern and efficient technological infrastructure.

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Henceforth, during the previous years, numerous researchers and organisations have differently elucidated the concept of e-government. For instance, a previous study argued [72] that in the public sectors, the e-government is an auxiliary factor for modernisation. In addition, the e-government through more transparency, accountability and sensible governance are serving efficiently. In the same way, the e-government is making the governments more efficient, citizen-oriented and allowing the citizens to obtain government services more smoothly and efficiently. Moreover, the WorldBank [102] elucidated e-government as referring to the usage of data knowledge by government organisations such as the use of the internet, mobile networking and the Wide Area Networks. As it can alter the association with peoples, businesses, and various strata of the government. These technologies can help by multiple ways to achieve goals to possibly deliver much better allocation of government services to the people, enhancing the links with the trading firms and industry, permitting the citizens to obtain data and efficient government management. The accruing advantages could possibly be low corruption levels, more transparency, substantial convenience, income growth, and cost minimisation.

Moreover, the developed and the developing countries are equally adopting the e-government in the recent times [65]. The notion of e-government has widely emerged across the globe, and the employment of e-government has become one of the essential goals of the various countries across the globe [4]. Nonetheless, since the 1990s, UNDESA [93] the e-government has started projects in many of the developed countries. Notwithstanding, the Arab countries have begun to adopt e-government, at the beginning of 21st century. In addition, the Arab countries such as Syria Egypt, Jordan and UAE, after experiencing the benefits of e-government have encouraged other Arab countries to employ it in their countries.

Henceforth, in this research, developing country like Algeria is endeavouring to employ this project to accrue the advantages of the positive externalities produced by this UNDESA project. Undoubtedly, this project is expected to assert various benefits for Algerian government and the community. The Electronic Algeria Project, launched by the Ministry of Post, Information and Communication Technologies has called it as the Algerian e-program project in 2008 to 2013. A consultation was done concerning this project with various essential institutions, public administrations, and economic agents at different levels, academics, research organisations and professional associations, as they are actively taking part in information science and the communication technologies. Hence, more than three hundred people, for the six months took part to conduct the extensive discussion. This plan was assumed by the valuation of the sector of Algerian information science and communication technologies along with the respect of various indicators of the document. These indicators are digital access, feasibility, electronic preparation, and spread of information and communication technologies. The findings of the assembly directed the formulation of a national policy to establish the Algerian e-government [13]. Moreover, the Algerian government recognised the necessity to employ e-government to accrue benefits of the prospects proposed by the world trade. Algeria would require more efficient and enhanced, market-oriented custom‘s government to comply with requirements of the World Trade Organization (WTO) [10].

Further, the United Nations’s Department of Economic and Social Affairs (UNDESA) has mentioned that 193 member countries of United Nations (UN) contained public websites as by 2014. Nonetheless, UNDESA [96] reported that the employment of the majority was not quite high, only 50%. In fact, merely 15 % of e-government projects have embraced the success, while 35 % have failed and 50 % are partly unsuccessful. There is also evidence that substantial ratio of these unsuccessful projects has been reported from the developing countries [33,43,56].

Being a developing country, the assumption of the e-government in Algeria is still at the embryonic stage [38]. According to the UNDESA e-government reports, it is revealed that Algeria is still far to provide e-governmental services. UNDESA [93] in an anticipated E-Government Development Index (EGDI) ranked Algeria 131st among the 193 countries. With the passage of time, the e-government in Algeria has experienced a decline. For instance, Algeria ranked 132nd in 2010, among the 193 countries [94].However, in 2014, it ranked to 136th position [95]. Notwithstanding, Algeria experienced more declined further and ranked 150th [96].

This study intends to add to the existing literature and practices linked with this area of research. Hence, this study on the basis of the reviewed literature proposes a conceptual framework with suggestions and invites for further empirical investigation by the researchers for a significant contribution to the field of e-government in Algeria and to construct a model that can enlighten regarding e-government utilisation in developing Algeria. Moreover, the proposed conceptual model will support the e-government accepters and practitioners to recognize the crucial organisational issues, for instance; structuring it upon the old research on Information Systems and Technology (IS/IT); illustrative the likely technological, organisational and environmental concerns that can influence their utilization; back other research outcomes of their influences on the e-government adoption.

2. Review of the Literature

2.1 IT Infrastructure

In spite of the fact that the cost of IT is decreasing, appropriate technology infrastructure is quite essential for successful e-government utilisation, particularly in the developing countries such as Algeria. Al-Omari and Al-Omari [3] have argued that IT infrastructure consists of all the components of IT, for example, hardware, software, communication and networks infrastructure, software application, legacy systems and technology of the present organisation and electronic systems. Moreover, Joseph and Kitlan [52] emphasised the restricted availability of IT to construct the essential infrastructure that can perform as a deterrent to the employment of internet technologies.

It has been asserted that IT infrastructure is a central element for the association of information and knowledge amalgamation in e-government employment [55]. In the same way, Chango [23] opined that an accurate assessment of the country's movement towards complete e-government should begin with an enlightened idea of what in actual on the ground is concerning the infrastructure and policies. Nonetheless, technology solely is not the only pre-requisite for e-government accomplishment [77, 87]. Adequate resources, substantial infrastructure, management assistance, efficient IT employees, and essential IT preparation and assistance are also vital to ensure accomplishment in IS adoption.

Accordingly, Altameem *et al*. [7] asserted that IT infrastructure is considered quite essential of the e-government. According to some of the studies (see, for instance, [99, 7]) few of the server information includes data and tools such as content management; application development; and systems such as hardware and operating; and also the system management. Their outcomes indicate that in developing economies, IT infrastructure is quite an essential factor, while the technology amalgamation is highlighted to be the most crucial factor in the developed economies.

According to some of the previous researchers (see, for example, [29, 18, 17] several governments observed the deficiency of technical infrastructure as the major hindrance for the development of the e-governments. In addition, some of the other studies such as Dillon and Pelgrin [29] and Layne *et al*. [58] highlighted the significance of the efficiency of the

communications network and infrastructure as substantial a foundation for the integration of IS for the government institutions. Henceforth, IT infrastructure needs to be in place enough before the e-government services can be developed. In a similar study, IT infrastructure is one of the essential factors that positively impact firm's usage was also observed. This result is in line with the outcomes of another study by Zhu *et al*. [104] who observed that IT resources, such as IT infrastructure, have a significant role in IT utilisation.

Nonetheless, Pan and Jang [67] who measured IS adoption in Taiwan‘s ICT industry discovered that IT infrastructure failed to have any significant influence on ERP systems adoption by the firms operating in the ICT industry. Some of the other researchers have also observed the quite similar findings. For instance, studies by Premkumar *et al*. [68] and also Thong [89] has recommended that businesses that employ do not do so as a result of their current IT infrastructure. One probable explanation for this kind of result is that the modern IT infrastructure is already in place. Hence, this recommends that the impact of IT infrastructure on the firm‘s utilisation of any IT initiative will vary from country to country and from sector to sector.

Consequently, IT infrastructure seeks for further inquiry in the developing countries, precisely in Algeria. A detailed study done by Zhu *et al*. [106] on 1,857 firms across the 10 countries discovered the significance of IT infrastructure vary across the developing and the developed countries. Their outcomes indicate that in developing countries, IT infrastructure is the essential factor, whereas the technology integration is proved to be the most reliable element in the developed countries.

2.2 Security and Privacy

Nambisan and Wang [64], have observed the issue of security, in terms of both real and anticipated as fundamentals influencing the intention to employ an actual adoption behaviour. Security has been elucidated as both the anticipated, or judgment, and security of the conservation mechanisms for the movement and preservation of information by electronic databases, in addition, the transmission media.

Awan [9] has elaborated security concerns regarding the privacy, and confidentiality of information is significant for e-government also for the e-commerce. Security is an issue that recurred in the domain of e-commerce and e-government [12, 21, 45, 62, 103]. In the same, security is quite challenging to implement the e-government. For instance, there are genuine concerns regarding the citizens’ ‘rights to privacy against the state‘s national-security issues.

Nonetheless, on the one hand, there are understandings that the government may get ample information about people and could inappropriately employ that information. Accordingly, there are government reservations, which consists the easy access of information by the public could threaten the national security lines and as well as likely to destabilise the social stratum [3]. Melitski *et al*. [61] have evaluated the security of websites. The findings prescribed that security concerns must be taken into consideration in order to enhance the business's acceptance. Obstacles such as shortage of technology/web staff, financial resources, information about e-government services as well as security concerns, the pre-requisite to advance the technologies, convenience costs for online transactions issue and lacking the support from the elected officials, have been observed to be the crucial barriers to the e-government utilization [83].

Among these technical obstacles, the basic challenge in the utilization of technology specifically the internet, is linked to the security issues [17,36,51,91], Its inter-consecutiveness is highly at risk to be attacked by worms, virus, and some other kinds of denial of service attack hackers [57,76].

Lippert and Govindarajulu [60] have observed a positive link between security and innovation utilisation. According to some studies [46, 51, 73], the security concerns pose as a big problem to the usage of the internet and for the utilisation of the e-government.

2.3 Top Management Support

Slevin and Pinto [80] have elaborated the top management assistance as the inclination of top management to deliver the essential resources and experts or power for the project accomplishment. Sabherwal, Jeyaraj, and Chowa [74], in the context of e-government adoption, elaborated top management assistance as an appropriate approach towards e-government in general. Top management may offer various procedures to the managers in departments and business divisions regarding the potentials and risk technologies [11].

The perception of the top management regarding the e-government is essential as e-government delivers a strategic opportunity and performs as strong indications to the rest of society concerning the significance of management towards the use of the e-government. By the beliefs they hold, and participation, top management can consult legitimacy on the inclination of managers to dedicate their time and energy on web technology that possibly could be mirrored in business activities and operations [49].

According to Viana *et al*. [97], the top management support is a crucial element in e-government use. Such assistance is significant to ensure the dedication to the delivery of resources in addition to the organisational environment to move the adoption of the e government.

The assistance of top management is essential to tackle the barriers and resistance to change [86]. Moreover, assistance of top management was observed to be stable in the use of IT and innovation studies [69, 70] argued that top management is essential in the use, as it ensures appropriate resources for using the innovation, for instance, the e-government.

Somers and Nelson [82] have also argued that the top management is an essential predictor of the successful use of the e-government project. Top management involvement and their sustained assistance throughout all the stages of the project support in ensuring a smooth shift management and organising determination of the other stakeholders [2, 16, 82]. Welti [101] asserted that dynamic top management is significantly crucial to enable allocation of sufficient resources, rapid decisions and assistance for the approval of the project throughout the organisation. The top management ‘s participation at every phase of the e-government implementation will also permit for a dynamic shift throughout all the organisational levels [54]. Al-Qirim [5] argued that top management assistance is a motivating for e-government employment in Jordan, which on the surface has played a vital role in the adoption and dispersion of the e-government some of the other developing countries. The top management is crucial to driving required resources and impetus to employ the expensive e-government.

2.4 Organisation Culture

Generally, values and beliefs are referred to the culture of individuals within a social unit. It also indicates a collective sense, the socially transmitted behaviour patterns, social Institutions, common beliefs, and all other products of human endeavours and perception pattern of a community [32]. Hence, based on the unit, culture can be of different types, such as national culture, an organisational culture, professional culture, functional culture and team culture.

In the recent times, information system's researchers have begun to explore this influence of culture in the utilisation and diffusion of IS. Some other researchers have investigated the role of

organisational culture in IS strategy making process. In a nutshell, culture, both organisational and national, has fascinated researchers' 'interest in the domain of IS studies [75].

Some of the previous studies have been done with an aim to explore the influence of organisational culture on new technology utilisation that indicates culture is predictive of organisational technology utilisation [22, 30, 78]. For instance, according to Chanasuc and Praneetpolgrang [22], organisational culture can influence the utilisation of e-learning among the Thai undergraduate students. do Carmo Caccia-Bava *et al*. [107] demonstrates that culture affects the capability of hospital organisations to innovate by utilisation of the new technology. The findings indicate that an organisational culture as significant element in developing absorptive capacity, and the latter's influence in the utilisation of new technologies.

In the scenario of e-government utilisation, Dasgupta and Gupta [28] extended the TAM model by recognising the antecedents to technology acceptance to consider the role of Organisational culture in the acceptance, utilisation, and diffusion of e-government service for government organisations employees. The outcome observes that organisational culture has an influence on the individual's acceptance and usage of internet technologies in the developing country. Their results highlighted the essential role of organisational culture in encouraging adoption of technology.

As a matter of fact, another study by Shaukat and Zafar [78] have not explored the factors that possible can influence an organisation's decision to employ an innovation. These elements consist of organisational factors such as culture, structural, human resources. This also includes some sociological factors such as social, governmental, economic, and political factors. Their results have concluded that an organisation's decisions were affected by the aforementioned factors regarding the adoption new technologies. In the same way, the organisational cultural observed to be most essential. Nonetheless, Shaukat and Zafar [78] study have not considered the technological elements that may affect the innovation adoption.

Boynton and Zmud [19] have suggested that organisations should assess the significance of organisational culture and its influence on IT strategy. Some of the researchers have investigated the role of organisational culture in absorptive capacity and IT accomplishment [41] IT utilization and diffusion [27], IT implementation [35], IT infrastructure elasticity [84] and computer user efficiency [79]. While some other researchers have considered the impact of organisational culture on certain technologies, namely knowledge management [37] and implementation of data warehouses [31].

2.5 Rules and Regulations

The e-government system involves several regulations, and legislative acts to be dynamic with the changes come along with the e-government systems. These legislations based on electronic signatures, obtaining the data protection, avoiding the computer crimes and the Freedom of Information Act. Heeks [42] mentioned that regulatory changes are pre-requisite for many activities, from procurement to service provision.

Liang *et al*. [59] have considered the rules and regulations are effective templates that direct the individual values and attitudes in everyday affairs of life. This template could further extend to consider the methods and actions of public and private organisations and change the cultural-cognitive problems within an organisation to imitative rules and regulation of other the organisations in the field [69]. Soares-Aguiar and Palma-dos-Reis [81], considering the normative pressure, have considered the association between organisations and different rules and regulations; consequently, they explained that organisations tend to have some common values and behaviours as the political system that encourages the strength of these norms among

organisations. Thereafter, all other organisations will prefer to adopt these values as rules and regulations within the prevailing environment. Soares-Aguiar and Palma-Dos-Ries have termed it as “dyadic relations” [81].

2.6 Awareness

Generally, the majority of the population (or citizens) held inadequate consciousness about what actually e-government is and what advantages it offers [3]. This lacking of consciousness might avoid the general public from taking part in e-government services [71] Hence, the development and adoption of e-government will mainly depend upon marketing and alertness [15, 66, 71] In addition, Morris and Venkatesh [63] stipulate that senior citizens do not have awareness and hold a limited belief in technology. Furthermore, Fang [34] argued that governments usually tend to collaborate more with the senior citizens because of the generation gap and not having enough expertise in the usage of modern technology. Hence, it is indispensable that —the significance of e-government services are considered, and their advantages emphasised to the citizens [24]. In the following scenario, significant campaigns are required to encourage the e-government in order to obtain more citizen involvement and to gain successful adoption. These campaigns would encourage and enhance citizens ‘awareness of e-government initiatives. Instances of such kinds of campaigns may consider government-supported seminars and workshops, mailing newsletters, posters display and banners to for public in shopping malls, and so forth. In addition, advertising through public media services about e-government advantages would motivate the general public to be more involved, convinced them to use e-government, and enhance awareness about involvement in the e-government services [100].

3. Proposed Conceptual Framework

A framework is characterised as “a conceptual research model on how one theory makes logical sense of the relationship among several factors that have been identified earlier as relevant to the problems" [92]. Hence, this research framework used some factors such as organisational, technological and environmental to examine their influence on adoption of the e-government.
Early research framework developed includes the extensive literature review and supportive theories. Damanpour [26], have argued that innovation adoption be carried out to augment the effectiveness of the adopting organisation and is subjected to the impacts of individual, organisational, and external factors.

The detailed literature review exhibits that the TOE framework has been employed in the previous studies in the domain of ICT [47, 85]. Various other studies employed different particular factors every three contextual variables (technological, organisational and environmental factors). It indicates that TOE framework has earned consistent empirical backing by [105] in the domain of IS studies. Therefore, it can avail the basis to examine the factors linked with the adoption of e-government. It can be observed that TOE framework visibly reveals the influence of technological, organisational and environmental factors and e-government adoption.

3.1 TOE Framework

During 1990, the TOE framework was established [90]. It recognises three different aspects of an enterprise's scenario that impacts the process by which it utilises and enforces a technological innovation: technological context, organisational context, and environmental context. (a)

Technological context elucidates both the internal and external technologies linked to the firm. This considers the current practices and equipment endogenous to the organisation [44], as well as the set of available technologies exogenous to the firm [39, 53, 88]. (b) Organizational context is regarding the descriptive organisational measures such as scope, size, and managerial structure. (c) Environmental context includes the arena in which a firm operates its business, industry, competitors, and dealings [90].

Finally, the current research enhances the literature by developing a conceptual framework (see Figure 1) that hypothesised the direct influence of TOE Framework on the e-government adoption to augment more insights, into these effects mostly in the context of Algerian.

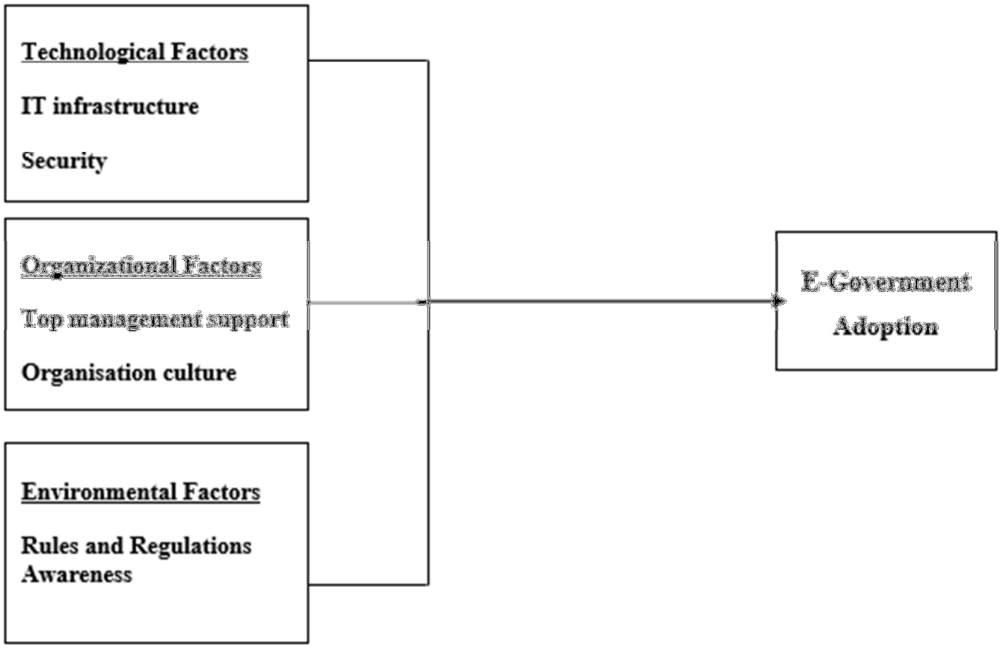

Fig. 1. Proposed conceptual framework

4. Methodology

This paper presents a framework on crucial factors influencing the adoption of e-government in Algeria. Hence, the quantitative approach has been employed by the researcher to measure this phenomenon. In fact, the unit analysis employed in this research is derived from the high-level managers, employees of an organisation that link to work with a strategy to use the e-government services in Algeria. More so, the measurements will be adapted from the existing literature. For selecting the appropriate sample size, this research uses G*Power technique, the extensively employed sample technique in social sciences [25]. However, the stratified random sampling technique is adopted in the current study. Stratified Random Sampling as its name implies, characterises a process of categorisation, followed by choice of subjects from each division by employing the simple random sampling method. Nonetheless, to estimate the proposed model, the partial least square-structural equation modelling (PLS-SEM) is employed to establish the validity and reliability of the measurements and to estimate the assumed hypothesis.

5. Conclusion

This study investigated the factors influencing the adoption of e-government in Algeria. Therefore, the current research is likely to support managers, practitioners and policymakers in their respective organisations to locate the real possible factors influencing the adoption of e-government. As the organisations set objectives to evade the low adoption of e-government in Algeria. The efficient way to do it by encouraging the level of adopting e-government in the organisations. Hence, the use of such proposed conceptual framework is likely to help in the early prediction of adopting e-government and deliver better know-how of the links between the vital variables and fill the research gap as highlighted by the previous researchers.

6. Recommendations for Future Research

Hence, it is highly suggested that the upcoming studies must estimate this model by putting other essential factors that are possible to be auxiliary predictors of adopting e-government such as; Web design, Training, Digital illiteracy to deliver the new dimensions to contribute to the already existing body of knowledge regarding the relationship between these variables. In addition, future studies should examine the adoption of e-government by employing diffusion of innovation theory that includes five dimensions: relative advantage, complexity, compatibility, trialability and observability to deliver an acute comprehension of the role of these variables in such research environment.

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