

The Role of E-Government as a Stimulus for Economic Growth

Riem M. Hamdi Abdel Azim^{1*}, Omar Salman², Ibrahim El Henawy³

¹PhD Student at Business Information Systems (BIS), Faculty of Commerce and Business Administration, Helwan University, Egypt

²Faculty of Commerce and Business Administration, Helwan University, Egypt

³Faculty of Information and Computers, Zagazig University, Egypt

Abstract

This research paper reviews existing literature of two domains, Electronic Government (e-Government) and Economic Growth. Information and Communication Technologies (ICT), Technology Acceptance Models (TAM), and Neoclassical theory are all discussed to help develop an integrated view of both domains. More specifically, in terms of theory, it is hoped that this paper may extend its explanatory power beyond current limits. This paper presents, for the benefit of decision makers, a practical framework held together by a logical cohesion between the units of analysis, structures, and processes. This framework is derived from the basic theories and models and latest research done in these fields. It is found that the key variable linking e-Government portals to the economic growth is Competitiveness. In this conception, competitiveness becomes the mediator through which the antecedent variable of e-government leads to a change in the consequent variable of economic growth. Simply put, e-government may stimulate economic growth via enhancing the competitiveness of economic actors. Hence, decision makers in different governmental bodies, may use this integrated framework as a tool to promote technology-based economic growth in the context of competitiveness goals.

Keywords: Competitiveness, Economic growth, Electronic Government portals, ICT, Neoclassical theory, TAM

I. Introduction

The purpose of this paper is to review the literature on the topics of both electronic government portals and economic growth, identify the most compelling theory for each, and produce an integrated view of e-government and economic growth. The aim is that this new synthesis contributes to both theory and practice. It should be simple enough to serve as a cognitive schema, that is, as a set of mental categories and relationships that allows people to process information with a sense of purpose or direction. Yet this framework captures as much complexity, nuance as possible, so that decisions are made only after having factored in, and considered a vast array of possibilities.

Such an approach should enable a “Macro-Level” understanding of how e-Government may fit into longer-term economic trends, along with a “Micro-View” of how e-Government may be especially effective for stimulating particular economic policies at particular levels. Here, socio-technical theory offers insight into how e-Government reflects a kind of ongoing interaction between government and citizens that stimulates their further engagement, strengthens knowledge management systems, encourages accountability, transparency, and decentralized decision-making, ultimately enhancing competitiveness. Here, this section considers the Technology Acceptance Model and its success factors. This should enhance the capacity of e-Government to help create the preconditions for economic growth and development.

Similarly, this review identifies the drivers of economic growth and analyzes their features, so that e-Government may more effectively facilitate or even encourage the most promising growth factors.

* Corresponding author email: r.abdelazim@commerce.helwan.edu.eg

According to a vast array of economic theories, technology is an important factor in economic growth. Neoclassical theory emphasizes the progress, diffusion, and accessibility of existing technology.

We hope that our integration of the two theories has the potential to make a difference. This can contribute to the field not just conceptually but also practically, such that its proposed theoretical framework becomes a policy instrument. In other words, certain e-Government and the strategic decisions that make them effective—putting theory into practice—should reinforce economic growth, particularly in smart cities and other focal points identified by the United Nations and other international organizations..

II. Literature Review

1.1. E-Government and Socio-technical Theory

It was only natural that the power and the promise of the digital revolution would somehow manifest in the practice of government. Interestingly, back in the 1980s and 1990s, many if not most people expected that computers would make an impact on the economy and on society; few imagined that computers might someday transform government itself—computers are starting to, but as of yet there has been no fundamental change in how an entire society or its individuals relate to the state. It's the economic domain that has witnessed the more profound transformation.

At this point, a definition of terms is appropriate, and that of the United Nations reflects a general understanding that is worldwide. The official UN definition of e-Government is as follows: "The employment of the Internet and the world-wide-web for delivering government information and services to the citizens" [1]. This definition captures the basic idea that computers bring citizens and the government into closer proximity, allowing for more intense engagement, by creating a link that is usually instantaneous and by granting citizens greater access to information that had previously required much time to secure. It includes the details regarding grant applications, financial statements about retirement pensions, tax information, and a wide variety of data. In the main, the ideal purpose e-Government was summed up: "E-government services aims to provide citizens with more accessible, accurate, real-time and high-quality services and information". Likewise, the promise of e-Government has been reported in Gershon, Prince, and Opoku [2]: "A cursory look at the Ghana e-Government initiatives reveals that Ghana is making considerable strides in allowing citizens and businesses to access and pay for services through an online network infrastructure. Renewal of driving licenses, clearing of goods at the port, business registrations, paying of taxes, public procurement, and NABCO applications..."

Nevertheless, it is safe to conclude that governments the world over have applied newly developed technologies at a much slower pace than have business and industry, and that is understandable. One reason behind this conservative approach is that government—in contrast to industry—needs to be more cautious and mitigate risk because the interests of the general public are at stake. After all, many e-Government projects have actually failed or fallen flat, as observed by Kumar, Sachan, and Mukherjee [3]: "High failure rate of e-Government projects brings severe direct and indirect financial costs. Further, it damages morale, credibility and trust, preventing the benefits of e-Government from being delivered. One primary reason for failure is the lack of access by citizens to these online-delivered government services".

In some developing contexts, the failures noted above speak to the minimum preconditions for e-Government not being met. This fact was noted in a recent study by Sabani, Deng, and Thai[4] "There are various obstacles to the development of e-Government in Indonesia including poor ICT infrastructure, inadequate human resources, lack of readiness among citizens to use e-Government services, and unsupportive environment". Davis et al. [5] also recognized similar impediments when integrating ICT into local government in an African context: "The results show that low skill base to use existing equipment, inability to repair.., inadequate operational fund.., uncoordinated ICT initiatives, power fluctuations.., are among the most common challenges to the successful ICT integration in the Ugandan ministry of local government".

There have indeed been e-Government initiatives that have performed inadequately; making those earlier predictions of its transformative potential appear overly optimistic. It is interesting to note that research has shown some fluctuation in its own approach to e-Government. A movement along the

spectrum of optimism-pessimism was noted by Madsen, Berger, and Phythian [6], who observed the following: “Findings indicate that the papers are still somewhat optimistic regarding the impact of e-Government, but no longer as technologically deterministic”. The authors also noted that there was a brief era, from 2007 to 2008, when scholars displayed relatively more pessimism (Table 1).

Studies	Partially pessimistic or critical
D Coursey, F Norris, Models of E-Government: Are They Correct? An Empirical Assessment. <i>Public Administration Review</i> 68(3), 2008, 523-536	Critical of e-government stage model, and suspect that e-government may ‘simply reinforce existing power arrangements.’ [7, p. 534].
T Schuppan, : E-Government in developing countries, Experiences from sub-Saharan Africa. <i>Government Information Quarterly</i> 26(1), 2009, 118-127	Critical of assumptions that e-government may be easily applied to developing countries
R Heeks, S Bailur.: Analyzing e-government research: Perspectives, philosophies, theories, methods, and practice. <i>Government Information Quarterly</i> 24(2), 2007, 243-265	Imagines that e-government may widen technological gaps in society
M Yildiz, E-government research: Reviewing the literature, limitations, and ways forward. <i>Government Information Quarterly</i> 24(3), 2007, 646-665	Critical of general trends in the e-government research field

Table 1: List of studies from 2007 to 2008 displaying pessimism

Scholars that are more recent continue to reflect the ambitious and hopeful expectations that were seen in an earlier era, likely due to a plethora of new technologies. Consider, for instance, this bold statement by Engin and Treleaven [8] in their paper on “Algorithmic Government”: “The data science technologies of artificial intelligence (AI), Internet of Things (IoT), big data and behavioral/predictive analytics, and blockchain are poised to revolutionize government and create a new generation of GovTech start-ups,”. Furthermore, the authors even discussed “automating the courts using AI-based judicial system” (448-449).

These advantages of e-Government have already been demonstrated in many studies. For example, Majeed and Malik [9] conducted a study that was especially important because it drew on cases worldwide, using the datasets of 147 countries and as the authors reported:

“Empirical findings suggest that growth impact of e-Government is positive and significant... The study concludes that the economies of the world can significantly benefit from financial development, if satisfactory quality of e-government services can be assured” (107).

Quite clearly, despite some earlier problems with the implementation of e-Government, research has demonstrated that this technology is effective, especially when oriented toward economic growth. Considering the context above, it is time to identify the theories on e-Government available, so that we have a clear framework or schema.

Theories about e-Government are important because they matter greatly in terms of the design, implementation, impact, benchmarking, and evaluation of government websites. It might be fair to describe the current paradigm of research and practice as one in which no one single theory prevails. As a result, this field is one that sees research and practice proceed along the lines of stakeholder theory, social exchange theory, and others. The longevity of these theories and their applicability to e-Government is sufficient evidence of their explanatory power.

However, while it is important to note all of the above, yet this paper does not delve into those theories in any detail. This is because it is mainly looking for a theory –or a combination of theories that have- that has both 1) a wider, more macro-level orientation that can also bring into focus more specific or micro-level phenomenon; and 2) the capability of being linked, conceptually and practically, to a compelling economic theory even more closely than the theories listed above.

While most of the aforementioned theories were borrowed from other disciplines, and sometimes from remote ones, there are several theories that have emerged in tandem with long-term technological and industrial change. One of those older approaches is systems theory, which is described as follows: “Systems theory proposes that technology should be used to create a more rational society. Applied to technology management,

The Role of E-Government as a Stimulus for Economic Growth

the systems theory perspective holds that public organizations should be managed in a more scientific manner..." Such an approach, however, relies on top-down management, as if society was a factory, and could lead to dehumanizing outcomes.

Another approach sounds like it is compatible with the more optimistic proponents of e-Government. This is the theory of technical determinism, which "... asserts that technology is sought as a solution because it represents newness and change. Technical determinism suggests that technology is a tautological goal to itself". Unfortunately, this approach may lead some to forget that service quality and positive economic effects are the ultimate goals of e-Government, not the use of new technology for its own sake.

However, Cornell and Nwoka [10] do identify a much more promising theory, one speaking to the importance of public engagement, and one that has confidence in humanity's ability to just work things out. This theory –called socio-technical theory- does not offer up easy answers or solutions; instead, it considers e-Government as a kind of open-ended experiment in which the outcome is uncertain. This approach relies on the interaction between humans and technology. Below is an elegant description of the normative dimension of this theory.

"Sociotechnical theory is akin to participatory technology management strategies where managers seek to engage citizens, build trust, and ultimately increase accountability with government through technology-mediated means. Participatory management of technology involves utilizing technology networks for the egalitarian purposes of increasing equity and democratic discourse. It espouses greater organizational integration, breaking-down cultural barriers between stakeholders and engaging in decentralized decision-making".

This theory–socio-technical theory–is one that conceives of e-Government not so much as delivery vehicles for free goods, services or money; instead, these become forums, arenas, town halls, committee boardrooms, and other places that foster a combination of cooperation and competition. As shown in the (Fig. 1) below, socio-technical theory balances the essential elements of technology and human resources.

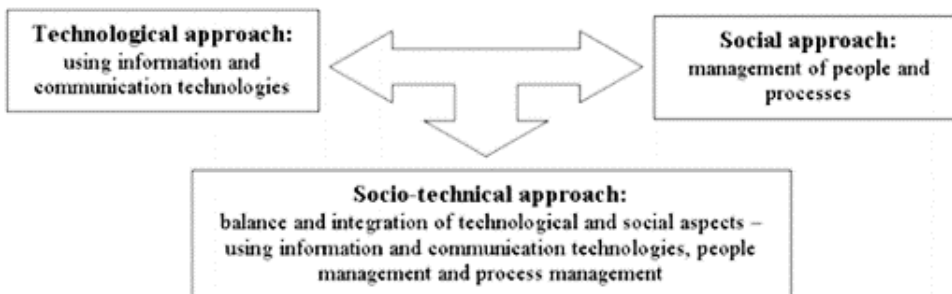


Fig (1) – Main approaches to knowledge management

Sociotechnical theory defines e-Government as the “means” and not the “ends”. This view is compatible with the idea that citizens, businesses, and organizations are able to make the most of their resources and contribute to sustainable economic growth. One useful perspective is found in Alter [11] whose socio-technical approach considers technology-human interfaces such as e-Government to be “work system” in which it becomes important to consider how environmental influences and the life cycle of projects influence efficiency. Indeed, efficiency is just one of the values or qualities that to be better understood requires in-depth measurement or thorough assessment. Crucially, this idea of a work system transcends and includes both public and private spheres, which indicate the relevance of what is known as “cloud computing” with its potential to connect government with all its stakeholders. Nanos Manthou, and Androutsou [12]. “...cloud computing can contribute to the successful deployment of e-Government services”.

It becomes important, based on the observation above, to have a model for evaluating e-Government that addresses the steps of design, implementation, operation, and performance. One model for evaluating e-Government programs that is entirely compatible with the socio-technical approach is the Technology Acceptance Model (TAM), which complements human-centric socio-technical theory. TAM was developed by Davis et. al. [13] as an extension of Ajzen and Fishbein's [14] theory of reasoned action. The model

maintains that users of a technology, in this case e-Government, accept and use it after considering its perceived usefulness and perceived ease of use. Here, Venkatesh and Bala [15] offer good definitions of both “perceived usefulness, defined as the extent to which a person believes that using an IT will enhance his or her job performance and perceived ease of use, defined as the degree to which a person believes that using an IT will be free of effort”.

As a model, TAM has demonstrated its durability and performed favorably when tested against other models. Rana et. al. [16], using the lens of citizen centric adoption of e-government, concluded as follows: “The findings of this research indicate that TAM is by far the best suited model for analyzing citizen centric adoption of e-government services (Fig. 2).

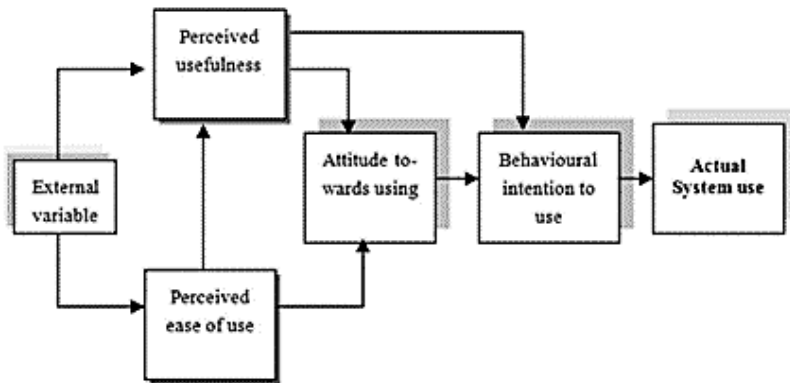


Fig. (2) – The Technology Acceptance Model (TAM)

Crucially, TAM and its subsequent versions have been used to evaluate e-Government programs around the world. For example, Rabaa'I [17] used an extended version of TAM to identify how e-Government services in Kuwait are explainable in terms of ... perceived usefulness, perceived ease of use, computer self-efficacy, subjective norm, perceived credibility, attitude and behavioral intention. Also, Sebetti [18] used a TAM approach to conclude that perceived usefulness and perceived ease of use, along with the variables of mandatory use, management support, training support, and attitude” could evaluate the performance of e-government programs as deployed by public institutions in Turkey. Similar methods have been used by scholars assessing e-Government programs in Greece (Karavasilis, Zafirooulos, and Vrana, [19], Saudi Arabia [20], and Jordan [21].

In one of the later iterations of TAM, TAM 3, Venkatesh and Bala [15] suggested that both perceived usefulness and perceived ease of use are determined by four factors. These are for many, critical success factors: “individual differences” (the degree to which a portal accommodates personal and demographic attributes such as age and gender; “system characteristics” (the features leading to favorable or unfavorable perceptions; social influence (the social processes shaping perception), and “facilitating conditions” (speaking to infrastructure, training, and organizational support. After much testing in the research field, those are the factors whose realization or fulfillment increases the likelihood of success. Some scholars have chosen to amend the list of critical success factors by adding, replacing, or merging the factors with those of other models. Lai and Pires [22] for example, in their evaluation of e-Government in Macao, integrated TAM with the “End-User Satisfaction” model (EUS), which yielded the success factors of “information quality, system quality, perceived effectiveness, and social influence”.

Another useful set of factors or indicators have been provided by the United Nations, which has been actively encouraging e-Government and their portal projects around the world to improve public services, build more resilient societies, and address the digital divide. In its drive to assess e-Government systems and rank countries, UN has expressed its view that e-Government also has the capacity to influence societal change. “As evidenced by the survey assessment and case studies, exploiting digital government has far-reaching potential for countries, not just in improving institutional processes and workflows for greater efficacy and effectiveness of public service delivery, but also in ensuring inclusion, participation and accountability to leave no one behind” it says. Here, it is useful to note, the potential contribution of e-Government to the private sector, as noted by Panda, Sahu, and Gupta [23]: “Research indicates that India

can save up to 25% in its public procurements (valued 3.4% to 5.7% of GDP) by migrating to e-Government procurement (E-GP)".

In its measurement of e-Government portals worldwide, the United Nations uses the E-Government Development Index (EGDI), a weighted average of the normalized score of three basic indexes. The composite indexes are: the Online Service Index (OSI), which speaks to the scope and quality of online services; the Telecommunication Infrastructure Index (TII), based on the status of infrastructural development; and the Human Capital Index (HCI), or the amount of human capital that a child born today can expect to attain by 18 years of age.

In this paper, the observations above are to be merged with those below so that we may better understand how e-Government stimulates economic growth. The next section describes a conceptual framework to that end, one provided by neoclassical economic theory and its time-tested insight into technology, competitiveness, and economic growth.

1.2. Economic Growth

The relationship between the technology of e-Government and economic growth requires an underlying theory that lays bare its assumptions, specifies its research questions, and explains the logic—the how, why, what, and where—behind the potential cause-and-effect relationship.

Neoclassical theory, widely accepted and time-tested, descends from classical theory, which was the approach of Adam Smith, David Ricardo, and John Stuart Mill, among others. However, unable to answer some of the pressing questions of the day, economists shifted their focus to subjectivity, perception, and supply and demand. Weintraub [24] effectively described how in this "marginal revolution" the classical was eclipsed by the neoclassical: "The classical 'substance' theories of value, which took value to be a property inherent in an object, gradually gave way to a perspective in which value was associated with the relationship between the object and the person obtaining the object". The transition between the two schools of thought represented a significant paradigm shift. For economics as a discipline, its interest in systems of forces gave way to interests in systems of relations, Giocoli [25].

In light of the above, "How does e-Government relate to economic growth?" becomes the question, and it is arguably best addressed by returning to the theory that initially identified technology as a key generator of economic growth. As Sredojević, Cvetanovic and Bošković [26] concluded: "Neoclassicists were the first to explicitly analyze the category of technological changes in growth theory". Therefore, Neoclassical theory, or more specifically that vast and diverse array of studies published under its umbrella, support the conclusion that e-Government can indeed promote "Economic Growth". This may be defined in terms of Gross Domestic Product (GDP), estimated by "... the total monetary or market value of all the finished goods and services produced within a country's borders in a specific time period" Chappelow, [27]. Research attention on economic growth is understandable because its measurement—the GDP—is strongly correlated with human progress over (time) or over the long term. A recent study confirms reinforces the importance of GDP. After analyzing performance of Southeast Asian nations across the span from 2008 to 2017, Nababan [28] concluded as follows: "The GDP of ASEAN-7 countries has a positive and significant impact on the improvement of global competitiveness index, except for Thailand". Also, as Kowal and Paliwoda-Pękosz [29] observed: "Economic growth is the most important factor of Human Development (HD), HD is defined as a measurement of achievements by humans through advancement of knowledge, biological changes, habit formation, or other criteria that display changes over time. It can be measured by the Human Development Index (HDI)".

Before continuing, it is necessary to clarify that neoclassical theory is defined by three basic assumptions: 1) people have rational preferences; 2) individuals maximize utility and firms maximize profits; and 3) people act independently with full and relevant information, Weintraub, [24]. In addition, it is possible to clarify further this paper's position on these three assumptions. Hard-line neoclassical economists would insist that the assumptions are universally true and need no qualifiers, which is a position that matters most for the assumption of "rational preferences" because "rationality" has become the basis of rational choice theory. Defenders of rational choice theory claim it to be a scientific or mathematical method, while critics describe it as dogmatic, tautological, or simply wrong, with constructivist and postmodern scholars viewing

human behavior (practices) as irrational Thomassen, Derrida, and Habermas, [30]. This paper does not hold an orthodox view and defines rationality as the reasoned pursuit of self-interest, thus returning to the maximization approach that prevailed among neoclassical economists before the 1980s, Giocoli, 25]. Neoclassical theory is useful for conducting analysis and building models, and there is no need to elevate it as a grand theory of everything.

The neoclassical school of thought has witnessed a differentiation of approaches, but at its core, the theory holds that economic growth is the product of labor, capital, and technology—which are factors moving at different speeds, resulting in short-term equilibrium. At this point, of these three factors, the role technology becomes extraordinarily vital. As Banton [31] observed, “While an economy has limited resources in terms of capital and labor, the contribution from technology to growth is boundless”. In other words, technology enables capital, output, consumption, and population to grow at a constant rate so it addition to the Solow model is what leads to constant growth in productivity. New technology is what permits labor augmentation, whereby each unit of labor becomes more productive.

Such an observation suggests that the effects of e-Government on economic growth may have fewer constraints than many people might imagine. The formulation called neoclassical growth theory was furnished by Swan [32], and it made a significant impact on the research field for the next several decades.

In the (Fig. 3), potential output grows at the rate of technological progress. Technology is seen manifesting the relationship between capital and labor, reflecting how capital can be used to increase labor productivity. This paper does not address the strengths and weaknesses of the model, which is included here only to highlight how technology, sometimes called technical or technological progress, has earned a place at the center of the most established theory in the discipline of economics. Not to overreach, but technology as a factor of production is also found at the core of endogenous theory, evolutionary-institutional theory, and other theories Sredojević, Cvetanović, and Bošković [[26].

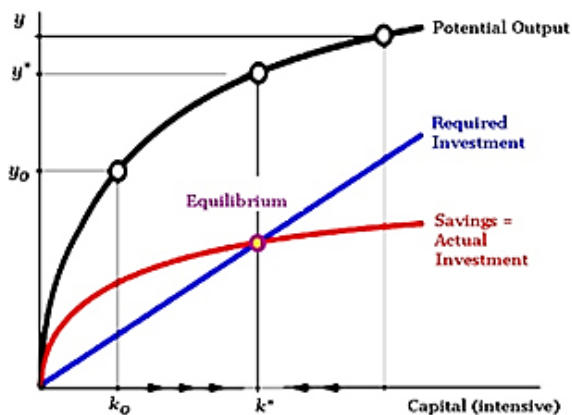


Fig. (3) – The Solow-Swan Growth Model

Moving from general to specific—from technology to information and computing technology (ICT) to e-Government—numerous studies have found that ICT—both its penetration and diffusion—contributes to economic growth. Jorgenson and Vu [33], for example, studied 110 countries and found that ICT investments contribute to growth in GDP. Cross-national regression techniques have also established that ICT promotes economic growth. One early study analyzed data from 60 nations to show how telephones contributed to economic development. Of course, the digital revolution changed that research focus such that studies now investigate a wide variety broadband internet technology and their applications, which brings the analysis of this paper down to a more specific level.

Arguably, today’s most intensely studied technology—in terms of a proposed stimulus effect on economic growth—is that of e-Government and its portals, and this focus is likely due to e-Government’s capacity to influence both public and private spheres simultaneously, thus creating synergy among mutually reinforcing domains. Research efforts have not been disappointing in this regard. Empirical studies have found that e-Government yields a long list of beneficial results, such as a more receptive government, transparency, effectiveness, increased efficiency, cost reduction, time reduction, and accessibility of services, increase participation, and trust in government and informed decision making (Gil

The Role of E-Government as a Stimulus for Economic Growth

Garcia et. al., [34]. Another way, in which e-Government encourages economic growth, and specifically the per capita income of a country, is via e-financing. As Majeed and Malik [9] conclude: "Thus, the practice of e-Government in financial development can strengthen its positive influence on economic growth". As is well known, these efforts have extended into the domain of international humanitarian aid and the provision of "microloans."

The most widely studied aspect of the relationship between e-Government and economic growth has been through the mediator of competitiveness, which in a business sense refers to the ability to be profitable in an open market with competitors. Hoa et. al. [35], in "The Impact of E-Government on Competitiveness-based Economic Growth in Vietnam," note how e-Government has a significant relationship with economic growth because of "... the ability of digital technology to thrive at the grass-roots level". A confluence of events then creates favorable conditions, lowering costs of government and creating more opportunities for employment. The positive effects of e-Government as follows: "1) cost effectiveness, 2) the utilization of resources, 3) the empowerment of youth, 4) the improved delivery of public services, 5) transparency and accountability, 6) effective collaboration between the respective actors, 7) the creation of new job opportunities, and 8) the crafting of innovation". All together as a set, these factors may also be considered critical success factors that indicate e-Government performance. Recent research has reached a similar general conclusion. For example, Peng [36] noted the following: "Therefore, if local government wants to improve the urban economic competitiveness, in addition to vigorously developing the information economy industry and the network society, government can also strengthen e-Government".

All of the above positive effects speak to the promotion of competitiveness, which is variable can be separated out and identified as paramount in the link between e-Government and economic growth. Here, the concept of competitiveness unfolds in two directions. While this paper is primarily concerned with the economic dimension, with competitiveness-based economic growth, competitiveness also entails "economic governance," which Khan [37] describes as follows: "achieving market and non-market transfers of assets and resources to more productive sectors, managing incentives for achieving the rapid acquisition of technology and enhancement of productivity, and maintaining political stability amidst rapid social transformation". This social dimension of competitiveness can be seen as providing a foundation for the more rapidly changing economic dimension.

In light of the above, emphasizing the role of e-Government in increasing competitiveness, the (Fig. 4) below was developed by Kim et. al. [38] to visualize the advances the causal framework that places e-Government at the center of this wider process.

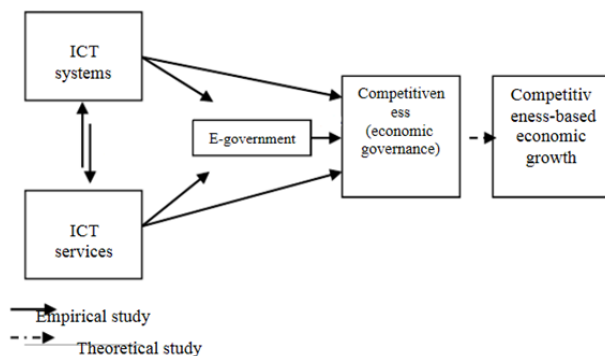


Fig. (4) - Theoretical model of the impact of e-government on economic growth

The above framework is entirely compatible with the overall approach taken by the World Economic Forum (WEF), which is that e-Government has transformative potential stemming from its capacity to intensify and deepen the engagement between people and their governments. Furthermore, the WEF-like the analysis provided across this section-emphasizes the economic potential competitiveness, as described in a report by Schwab [39]: "The results demonstrate a strong correlation between competitiveness and income level" (ix). The WEF concluded that e-Government systems create economic growth and benefit society'

The Role of E-Government as a Stimulus for Economic Growth

The mechanisms for encouraging growth are outlined in the WEF's 2019 Global Competitiveness Forum. The WEF takes a similarly comprehensive approach, the CGI 4.0 introduced in 2018, as in the figure above using 98 indicators to quantify 12 pillars of competitiveness in its Global Competitiveness Index (GCI): Institutions; Infrastructure; ICT adoption; Macroeconomic stability; Health; Skills; Product market; Labour market; Financial system; Market size; Business dynamism; and Innovation capability. Interestingly, unlike a decade ago, the WEF is promoting the integration of these items into a more holistic economy and the idea that more economic inclusion of previously marginalized groups can enhance competitiveness.

What is to be done? Perhaps the next frontier for e-Government, in terms of its role in promoting economic growth, is to focus on the extension and refinement of government services to smart cities and megacities, which is a strategic move that recognizes cities as engines of economic growth. Such cities are designed as interfaces between the most advanced technology available and human populations, with their needs and goals. Given the centrality of technology in human progress, e-Government may be one of the most critical factors for helping realize a better future. The United Nations has acknowledged this potential for e-Government to support transformation towards sustainable and resilient societies. Arguably, such efforts begin with enhancing the link between e-Government and economic growth.

E-government, after all, represents what neoclassical economists held to be an ideal technology, one allowing for a synergy between capital and labor, and even between the public and the private.

III. Conclusion

The overall conclusion of this literature review is that the strategic use of e-Government can reinforce economic growth. The specific mechanisms of this causal relationship—a reinforcing relationship, and not entirely deterministic, given that economies are open systems—are as follows. As suggested by socio-technical theory, such technology creates a closer relationship between the citizens and the government, granting citizens greater access to information and enhancing efficiency.

Perhaps more important is that the role of technology also conforms to neoclassical theory, which in fact places technology at the very center of the productive process, enabling labor (and management) to become more productive—more competitive. Furthermore, e-Government can build competitiveness in the private sphere (economic competitiveness) and in the public sphere (leading to social development and “economic governance”). Similar and parallel conclusions have been emphasized by the United Nations, World Bank, World Economic Forum, and other institutions, with the hope that e-Government may be deployed in urban contexts such as smart cities and megacities.

E-Government represents a unique technology because it may well be the best direct link between private and public domains and, as such, represents a unique opportunity for stimulating economic growth, which is the foundation for the progress of civilization itself.

References

- [1] United Nations, E-Government for the People. *United Nations E-Government Survey*, 2012, New York, Available at: <http://unpan1.un.org/intradoc/groups/public/documents/un/unpan048065.pdf>
- [2] D Gershon, O Prince, AM Opoku, Promoting Inclusiveness, and Participation in Governance: The Directions of Electronic Government in Ghana. *International Journal of Social Science*, 7, 2018, 397-406.
- [3] R Kumar, A Sachan, R.A Mukherjee Kumar, A. Sachan, & Mukherjee, Direct vs indirect e-government adoption: an exploratory study. *Digital policy, regulation and governance*. 2018, Mar 12.
- [4] A Sabani, H Deng, V Thai, Evaluating the Performance of E-Government. *Proc. 12th International Conf. on Theory and Practice of Electronic Governance, ICEGOV*, Indonesia, 2019, 254-258.
- [5] M Davis, M Ali, E Benard, M Kassim, OG Gilibrays, ICT Integration Challenges into Service Delivery in the Ugandan Ministry of Local Government: A Literature Review. *American Journal of Online and Distance Learning*, (1), 2019, 1-10.
- [6] CO Madsen, JB Berger, M Phythian, The development in leading e-Government articles 2001-2010: definitions, perspectives, scope, research philosophies, methods and recommendations: an update of Heeks and Bailur. *In International Conf. on Electronic Government*, 8653:17-34, 2014, https://doi.org/10.1007/978-3-662-44426-9_2
- [7] GIQ Research Report, *An International Journal of Information Technology Management, Policies, and Practices*, 2015.

- [8] Z Engin, P Treleven, The Computer Journal, Algorithmic Government: Automating Public Services and Supporting Civil Servants in using Data Science Technologies. *The Computer Journal*62, 2018, 448-460. <https://doi.org/10.1093/comjnl/bxy082>
- [9] M T Majeed, A Malik, E-government, Financial Development, and Economic Growth. *Pakistan Journal of Applied Economics* 26, 2016, 107-128
- [10] Cornell C Chikere, Jude Nwoka, The Systems Theory of Management in Modern Day Organizations - A Study of Aldgate Congress Resort Limited Port Harcourt. *International Journal of Scientific and Research Publications*, 5(9), 2015, Sep.
- [11] S Alter, Sociotechnical systems through a work system lens: A possible path for reconciling system conceptualizations, business realities, and humanist values in IS development. *Socio-Technical Perspective in IS Development*, University of San Francisco, 2015, 32-39. <http://www.stevenalter.com>
- [12] I Nanos, V Manthou, E Androutsou, Cloud computing adoption decision in E-government. In *Operational Research in the Digital Era-ICT Challenges*, Springer, Cham., 2019, 125-145.
- [13] FD Davis, RP Bagozzi, PR Warshaw, User acceptance of computer technology: A comparison of two theoretical models. *Manage Sci* (35), 1989, 982-1003. <https://doi.org/10.1287/mnsc.35.8.982>
- [14] I Ajzen, M Fishbein, Understanding attitudes and predicting social behavior, *Englewood Cliffs, NJ: Prentice-Hall. Addict Behav* (31), 1980, 1271-1276.
- [15] V Venkatesh, H Bala, Technology acceptance model 3 and a research agenda on interventions. *Journal Compilation, Decision Sciences Institute*, 39,(2), 2008, 273-315. <https://doi.org/10.1111/j.1540-5915.2008.00192.x>
- [16] N. P. Rana, Y. K., Dwivedi, & M. D. Williams. Evaluating alternative theoretical models for examining citizen centric adoption of e-government. *Transforming Government: People, Process and Policy*. 2013
- [17] ARabaa'I, Identifying Critical Success Factors of ERP Systems at the Higher Education Sector. *Proc. of the ISIICT*. 2016, 133-147. <https://www.scienceopen.com/hosted-document?doi=10.14236/ewic/ISIICT2009.12>
- [18] Ö Sebetci, A TAM-based model for e-government: a case for Turkey. *Int J Electron Gov* (7): 2015, 113-135. <https://doi.org/10.1504/IJEG.2015.069503>
- [19] I Karavasilis, K Zafiroopoulos, V Vrana, Extending TAM to Understand E-Governance Adoption by Teachers in Greece. *Organizational, Business, and Technological Aspects of the Knowledge Society* 112, 2010, 57-68. https://doi.org/10.1007/978-3-642-16324-1_7
- [20] M Hokroh, G Green, System adoption: socio-technical integration. *International Journal Business* (2), 2018, 95-107
- [21] S Obeid, M Akram, A Theoretical Discussion of Electronic Banking in Jordan by Integrating Technology Acceptance Model and Theory of Planned Behavior. *International Journal of Academic research account and Finance Management Sciences* (6), 2016, 272-284. <http://dx.doi.org/10.6007/IJARAFMS/v6-i3/2275>
- [22] CSK Lai, G Pires, Testing of a model evaluating e-government portal acceptance and satisfaction. *Electron J Inf Syst Eval*, (13), 2010, 35-46
- [23] P. Panda, G. P. Sahu, & B Gupta, E-government procurement implementation in India: evolving decision parameters for project success. *International Journal of Business Information Systems*, 31(3), 2019, 414-454.
- [24] ER Weintraub, The concise encyclopedia of economics: Neoclassical economics. *Library of Economics and Liberty*, 2002. Accessed on 4, 2013
- [25] N Giocoli, Modeling rational agents the consistency view of rationality and the changing image of neoclassical economics. *Cahiers d'économie politique, Papers in Political Economy*, (2), 2005, 177-208
- [26] D Sredojević, S Cvetanović, G Bošković, Technological changes in economic growth theory: Neoclassical, endogenous, and evolutionary-institutional approach. *Economic Themes* (54), 2016, 177-194. <https://doi.org/10.1515/ethemes-2016-0009>
- [27] J Chappelow, Economics: Overview, Types, and Economic Indicators, Economics, 2019, *Investopedia*
- [28] TS Nababan, Development Analysis of Global Competitiveness Index of ASEAN-7 Countries and Its Relationship on Gross Domestic Product. *Integrated Journal of Business and Economics* 3(14), 2019.
- [29] J Kowal, G Paliwoda-Pękosz, ICT for global competitiveness and economic growth in emerging economies: Economic, cultural, and social innovations for human capital in transition economies. *Information System Management* (34), 2017, 304-307. https://doi.org/10.1080/TANDF_CROSSMARK_01
- [30] Thomassen, L., Derrida, J., & Habermas, J. (2006). The Derrida-Habermas Reader.
- [31] C Banton, Economics, Macroeconomics: Neoclassical Growth Theory. April, 2019. Also available on: <https://www.investopedia.com/terms/n/neoclassical-growth-theory.asp>
- [32] TW Swan, Economic growth and capital accumulation. *Economic record* (32), 1956, 334-361. <https://doi.org/10.1111/j.1475-4932.1956.tb00434.x>

The Role of E-Government as a Stimulus for Economic Growth

- [33] DW Jorgenson, K Vu, Information technology and the world growth resurgence. *German Economic Review* (8), 2007, 125-145. <https://doi.org/10.1111/j.1468-0475.2007.00401.x>
- [34] R Gil-Garcia, J Zhang, G Puron-Cid, Conceptualizing smartness in government: An integrative and multi-dimensional view. *Government Information Quarterly* (33), 2016, 524-534. <https://doi.org/10.1016/j.girana.2016.03.002>
- [35] TT Hoa, SK Pan, The Impact of E-Government on Competitiveness-based Economic Growth in Vietnam, 2016. Available on: DOI: 10.21485/hufsea.2016.26.2.003
- [36] RX Peng, Urban Competitiveness, and the Smart City: An Empirical Analysis in a Developing Country Context. 2019. <http://dx.doi.org/10.2139/ssrn.3445732>
- [37] M Khan, JA Ocampo, KS Jomo, V Rob, Governance, economic growth and development since the 1960s. *Growth Divergences: Explaining Differences in Economic Performance, Hyderabad, London and Penang: Orient Longman, Zed Books and Third World Network*. (54), 2007,24. <https://doi.org/10.18356/9156b122-en>
- [38] P S Kim, H T Thanh, The Impact of E-Government on Competitiveness-based Economic Growth in Vietnam. *Korea Open Access Journals*. 2016. <https://DOI.org/10.21485/hufsea.2016.26.2.003>
- [39] K Schwab, The Global Competitiveness Report. *World Economic Forum*. 2017-2019.