

Online Services Index Performance: Countries' Analysis in OSI Ranking to Improve Malaysia UN Ranking

Zulkhairi Md Dahalin, Mohd Rushdi Idrus, Mohd Khairudin Kasiran, Maslinda Mohd Nadzir, Rohaya Dahari, Rafidah Abd Razak, Nadraturun Nafisah Abdul Wahab

Abstract: This paper presents countries' analysis in online Services Index performance (OSI) ranking to improve Malaysia UN ranking. The study found that the top 5 countries (Spain, Saudi Arabia, Slovenia, Malta, Serbia and UAE) by-passed Malaysia the most out of 35 countries in the last 10 years. This study proposed future research to find gaps and areas for improvement while gaining insights from international best practices that have enabled other governments to surge ahead. In particular, the study found how Malaysia can improve UN ranking through investigating what those countries that by-passed Malaysia the most in the last 10 years are doing that have enabled them to offer much superior e-Government services.

Keywords: E-Government, United Nation, Digital Index, assessment, OSI

I. INTRODUCTION

In the era of the digital economy, Malaysia's public sector is migrating towards a digital government to ensure a holistic national digital transformation. In 2015, Malaysia's Digital Government has started to move towards what can be referred to as e-Gov 3.0 where the utilization of online service in general society segment has taken an upward trend geared towards generating economic and other opportunities by driving the public towards greater participation in the digital realm. During the initial phase e-Government implementation in Malaysia, businesses and citizens accessed government websites for the purpose of obtaining information (Verkijika & De Wet, 2018). Today, the government has progressed to digital transformation where public sector online services came with the ability to conduct transactions in a Government-to-Citizen (G2C) manner (Alshehri, Alhussain, Drew, & Alghamdi, 2012). However, Malaysia's standing from the international best practices in the online services in the last decade has not been encouraging. In terms of the online services Index (OSI), Malaysia was ranked 42 out of 193 federal governments surveyed in the UN e-Government Development Index, 2016.

Revised Manuscript Received on May 22, 2019.

Zulkhairi Md Dahalin, School of Computing, Universiti Utara Malaysia

Mohd Rushdi Idrus, School of Computing, Universiti Utara Malaysia

Mohd Khairudin Kasiran, School of Computing, Universiti Utara Malaysia

Maslinda Mohd Nadzir, School of Computing, Universiti Utara Malaysia

Rohaya Dahari, School of Computing, Universiti Utara Malaysia

Rafidah Abd Razak, School of Computing, Universiti Utara Malaysia

Nadraturun Nafisah Abdul Wahab, Universiti Utara Malaysia

Of particular concern was the consecutive decline in the performance of the OSI since 2010 from 16th position in 2010, to 20th in 2012, 33rd in 2014, and the latest down to 42nd in 2016 (Jungtinių Tautų Organizacija, 2014; UN E-Government Survey, 2016). Table 1.1 shows Malaysia's ranking positions since its inception in 2005. This study therefore attempts to identify gaps and areas for improvement while gaining insights from international best practices that have enabled other governments to surge ahead. In particular it will be interesting to see what those countries that by-passed Malaysia in the last 10 years are doing that have enabled them to offer much superior e-Government services. The improvement of digital government is dependent on the online administrations given by general society segment since they speak to the touch point between the legislature and the general population. The top ranked digital governments on the UN's list such as the UK, Australia, Singapore, Canada and Finland (world's top-5) provide online services that meet the demands and expectations of their respective citizens and business users (UN E-Government Survey, 2016).

Table. 1.1 Malaysia's EGDI and OSI Ranking

Year	EGDI_Rank	EGDI	OSI_Rank	OSI
2005	43	0.57057	40	0.57692
2008	34	0.6063	18	0.67558
2010	32	0.61014	16	0.63174
2012	40	0.67031	20	0.79084
2014	52	0.61152	33	0.67716
2016	60	0.61749	42	0.71739

This paper suggests recommendations for future Digital Services implementation that could address the problems related to the decline in the country's online services ranking by making comparisons among selected countries that by-passed Malaysia in the last 10 years. Unique features were identified in the countries' official websites and portals that contribute significantly to the UN OSI evaluation criteria (Akram & Sulaiman, 2017; Alshomrani, 2012; Nguyen, 2014; Rorissa, Demissie, & Pardo, 2011; UN E-Government Survey, 2016; Villaseñor-García & Puroñ-Cid, 2017). It is hope that these features can be included in the agencies' websites to improve their overall digital services and in turn addressed the shortcomings associated with Malaysia's decline in the OSI ranking (MAMPU, 2017).



Resolution 44 of the United Nation Conference on Sustainable Development in 2012 held in Brazil states that:

44. We acknowledge the role of civil society and the importance of enabling all members of civil society to be actively engaged in sustainable development. We recognize that improved participation of civil society depends upon, inter alia, strengthening access to information and building civil society capacity and an enabling environment. We recognize that information and communications technology is facilitating the flow of information between governments and the public. In this regard, it is essential to work towards improved access to information and communications technology, especially broadband networks and services, and bridge the digital divide, recognizing the contribution of international cooperation in this regard (emphasis added).

The UN General Assembly Resolution 66/288, (A/RES/66/288, 2012) in recalling the above resolution entitled "The Future We Want" emphasised the significance of ICT in encouraging the stream of data amongst governments and people in general. To push its dedication in guaranteeing a maintainable advancement in this area, the United Nation E-Government Development Index (UN-EGDI) was made. The UN-EGDI presents the state of E-Government Development everything being equal, which is estimated in light of three vital measurements speaking to how a nation is utilizing data advances to advance computerized access and incorporation of its kin. The measurements are arrangement of online services (Online Service Index or OSI), which is the focal point of this paper, telecommunication availability (Telecommunication Infrastructure Index or TII), and human capacity (Human Capital Index or HCI). The index measures a country's performance in terms of the three dimensions and ranks the country relative to one another (UN E-Government Survey, 2016).

Benchmarking of the UN-EGDI was based on the UN E-Government Survey carried out once every two years since 2008. The survey started in 2003 for three consecutive years until 2005 and no surveys were done in 2006 and 2007. Along with the UN-EGDI, there is also the OSI that is specifically measuring e-Government services. This paper will examine Malaysia's OSI performance closely and make a comparative analysis among countries that have significantly overtaken Malaysia in the last decade to identify features and initiatives that can improve her online services performance. The focus of this paper therefore is on improving Malaysia's performance in the Online Service Index (OSI).

The 2016 OSI saw the UK, Australia, Singapore, Canada and Rep. of Korea occupying the top 5 in delivering online services. As mentioned previously, Malaysia is ranked 42 out of 193 countries, same ranked as Luxembourg and Tunisia but behind Ireland, Russia and Brazil, and ahead of Argentina, Belgium and Mauritius. Since 2008, Malaysia's OSI ranking has been on the decline. According to the UN E-Government Survey 2016 (2016), the OSI is calculated based on a normalized value that falls in the range 0 to 1. A 0 means the lowest (absence of online services) and 1 is the highest score (Alhabshi, 2009; Deka, Zain, & Mahanti, 2012; UN E-Government Survey, 2016).

As far as e-Government activities, MAMPU has led infrastructural and shared administrations undertakings to government organizations and keep on expediting the e-Government activity as a team with services and government offices and additionally the private segment. Malaysia, as indicated by MAMPU, was among the first on the planet to leave on an e-Government activity. Malaysia is among 193 nations that have actualized programs for e-Government change on a national scale (MAMPU, 2017). Advancement of the national execution in the e-Government change has been benchmarked against current worldwide estimations, for example, those set by the United Nations, Waseda University (where Malaysia positions 23 in its 2012 rankings) and the World Economic Forum's World Competitiveness Index (Alhabshi, 2009; Keretho, Lent, Suchaiya, and Naklada, 2015; Nguyen, 2014).

These rankings are helpful and have impacted in speeding up the advancement of the e-Government change programmes (Cooley, 2017; Deka et al., 2012; UN E-Government Survey, 2016; Villaseñor-García and Puron-Cid, 2017). Ventures that have been actualized incorporate the union of Government Data Center, the Government Cloud Computing execution and furthermore the Government Unified Communication and Telepresence administrations. Others incorporate myGov Mobile passage, myHealth, myJAKIM, myTour, and mySMS. Some flow administrations are reestablishment of driver's permit and auto street charge, e-lodgement for enrollment of business, myIdentity administrations for resident to refresh their own information to four offices (National Registration Department, Immigration Department, Inland Revenue Board and Road Transport Department), e Filing for assess affirmation and myBayar for making on the web installments with government organizations. As indicated by MAMPU, 56 % of taxpayer supported organizations are accessible online through different channels, including the above activities, the MyGovernment gateway, cell phones and stands. The essential points of these activities are to implement e-government strategy in its offices and divisions with a specific end goal to upgrade the nature of administrations, to give better straightforwardness and more noteworthy responsibility (MAMPU, 2017).

II. LITERATURE REVIEW

Existing E-government Evaluation Methods

Various assessment investigates, particularly e-government overviews, have been utilized to audit national and specialist organization needs and to inspect the nature of e-government sites. Review strategies incorporate up close and personal and phone interviews with subjects or government authorities (Agimo, 2003; Crook et. al., 2003; Sharrard et. al., 2000; Shutter and Graffenreid, 2000), center gatherings (Agimo, 2003), visits to government sites (UNPAN, 2010; Wauters and Durme, 2004) and poll overviews to nationals.



Investigation technique was utilized to decide the angle that compares to upward or descending example from the information gathered for the elements being viewed as (Alshomrani, 2012; Jonathan, Ayo, and Misra, 2014). This strategy is a remarkable kind of relapse investigation in which the needy element is determined and the free substance is time. The examination considered the EGDI and every single other factor of the three principle components that constitute the EGDI for review reports. In light of the investigation they separated every marker bunches for nation into two segments i.e. pattern and hole (Jonathan et al., 2014).

Alshomrani (2012) revealed e-government improvement situation in Saudi Arabia contrasted it and the USA. The investigation depends on the e-government overview reports directed by the United Nations somewhere in the range of 2003 and 2010. This report give some basic comments identified with Saudi Arabia e-government. This examination likewise gave proposals and countermeasures to enhance e-government in Saudi Arabia. This investigation has displayed a diagram of the predominant circumstance of Nigeria e-government by the utilization of UN E-government review reports for the period 2008 to 2014 and other scholarly materials and reports. The investigation additionally contrasted the Nigeria e-government execution and that of Korea, a present world pioneer in e-government.

As per Jonathan, Ayo, and Misra (2014), utilizing the e-Government overview reports did by the UN for the period covering 2008 to 2014, the outcomes display exercises learnt from South Korea and Nigeria by estimating the positioning in the intermittent audit. The information accumulation gathered from different sources. The specialist checked on USA and Saudi Arabia e-government official reports, entryways, explore papers and other authority reports. In this exploring procedure the scientist recognized distinctive pointers which influence the execution of e-government. In the explored records, the most imperative were Saudi Arabia and USA ICT insights and UN e-government review reports. This investigation depends on optional information accumulated basically from e-government studies (2003, 2004, 2005, 2008 and 2010) directed by United Nations. The analyst gathered information from these five reviews and investigated it to answer the exploration questions.

Most of the current work on e-government centers around the supply side (government suppliers) (Reddick, 2005). The greater part of the exploration studied governments to investigate the diverse kinds of administrations offered on the web and to discover boundaries that hinder the execution of e-government (Goings, et. al., 2005; Norris and Moon, 2005; Wong, et. al., 2010), and United Nation Public Administration Network (UNPAN), then again, benchmarked e-government and positioned e-government at the universal level (UN E-Government Survey 2016, 2016).

Assessing Online Services

Assessment of the quality, degree and utility of online administrations is one of the more direct parts of e-government execution estimation. At first glance, pointers of electronic and portable administration conveyance are adroitly simple. A portion of the inquiries that can be acted

like piece of the assessment are: Does the administration give data on basic administrations? Are there a pursuit highlight and a webpage outline on each site? Will open administrations be gotten to on the web? Are there e-administrations incorporated with each other? (Alshehri et al., 2012; Bhattacharya, Gulla, and Gupta, 2012; Fesenko and Fesenko, 2016; Papadomichelaki and Mentzas, 2012; Villaseñor-García and Puron-Cid, 2017).

Practically speaking, assessment of online administrations is never that straightforward. Similarly as there is enormous many-sided quality out in the open execution estimation as a rule, so too are there significant definitional and methodological difficulties in checking and assessing the productivity and viability of open administration conveyance through online media. Indeed, even a pure sounding inquiry regarding the nearness of a site outline a thought about reaction. After every one of the limits of a site are not in every case clear, nor is there is any standard of what a site outline, where it should show up and how it ought to be named (Alshomrani, 2012; Choi, Park, Rho, and Zo, 2014; Fesenko and Fesenko, 2016; Jonathan et al., 2014; Keretho et al., 2015; Papadomichelaki and Mentzas, 2012; Rorissa et al., 2011; UN E-Government Survey, 2016).

Any genuine exertion at understanding the condition of administrative online administrations calls for (1) cautious thought of the sorts of communication expected among natives, organizations and legislative on-screen characters and (2) a few suspicions about negligibly satisfactory interface outline over a scope of advancements. Assessment techniques require structure, disentanglement and adaptability in assessment strategies, given the assorted variety of settings and alternatives for benefit arrangement (Cooley, 2017; Janowski, 2015; Norris and Reddick, 2013; Otniel and Claudiu, 2015; UN E-Government Survey, 2016).

As said already, the online administrations list is one of three parts of the United Nations e-government advancement file. It endeavours to catch a nation's execution in a solitary universally practically identical esteem utilizing a four-arrange model of online administration development as appeared in Figure 2.1. The model expect, in view of broad perception and reflection among specialists, that nations ordinarily start with a developing on the web nearness with basic sites, advancement to an upgraded state with arrangement of sight and sound substance and two-way collaboration, progress to a value-based level with numerous administrations gave on the web and governments' requesting resident contribution on issues of open strategy, lastly to an associated web of coordinated capacities, far reaching information sharing, and routine conference with natives utilizing long range interpersonal communication and related devices (Jeff Gulati, Williams, and Yates, 2014; Keretho et al., 2015; Papadomichelaki and Mentzas, 2012; UN E-Government Survey, 2016).



III. METHOD

For this study we have adopted simple transformation from excel to csv files in the UN e-government by ranking the performance of countries for each year of evaluation from 2005 till 2016 (Otniel & Claudiu, 2015). Steps for website evaluation for this research was conducted as below:

- i) The 5 countries were identified based on the assessment made by the UN in evaluating the UN- EGDI.
- ii) The R codes used is just a simple transformation from excel to csv files for each year of evaluation from 2005 till 2016.
- iii) Identified the 5 most significant positive change in their ranking.

By positioning the execution of nations on a relative scale, the examination gives applicable data to help strategy creators in moulding their e-government programs for advancement. As a composite pointer, the e-government advancement list (EGDI) particularly OSI is utilized to gauge the eagerness and limit of national organizations to utilize data and correspondence advances to convey open administrations (UN E-Government Survey, 2016). This proportion of the list is valuable for government authorities, strategy producers, analysts and agents of common society and the private segment to pick up a more profound comprehension of the similar benchmarking of the relative position of a nation in using e-government for the conveyance of comprehensive, responsible and native driven

administrations (MAMPU, 2017; UN E-Government Survey, 2016).

The OSI evaluates national sites and how e-government arrangements and methodologies are connected when all is said in done and in particular divisions for conveyance of fundamental administrations. The appraisal rates the e-government execution of nations with respect to each other rather than being an outright estimation (UN E-Government Survey, 2016). The outcomes are classified and joined with an arrangement of markers checking a nation's ability to take an interest in the data society, without which e-government improvement endeavors are of restricted prompt utilize.

IV. RESULTS

Beginning with the 2005 dataset which Malaysia was ranked 40th, the 2008 dataset was examined focussing on Malaysia's position and the countries that overtook Malaysia since the last evaluation. In 2008, Malaysia's position improved to 18th (ie. from 40th to 18th) with 22 change in OSI. Despite the improvement, one country managed to overtook Malaysia, which is Spain from 71st to 15th rank with an OSI change of 56. In 2010 Malaysia improved further to 16th position. However, it was overtaken by four countries – New Zealand (15th), Singapore (10th), Columbia (9th), and Bahrain (8th). Bahrain made the most change in OSI with 36 position improvement. This is followed by Columbia at 29, Singapore 15 and New Zealand 7.

Table 4.3 Top 10 Countries in the OSI E-Government Survey 2016

No.	Year	Country	EG_Rank	EG_Index	E-Participation Index	OSI_Rank	OSI	Human Capital Index	Telecommunication Infrastructure Index
1	2016	United Kingdom of Great Britain and Northern Ireland	1	0.91928	1	1	1	0.94018	0.81766
2	2016	Australia	2	0.91428	0.98305	2	0.97826	1	0.76459
3	2016	Singapore	4	0.8828	0.91525	3	0.97101	0.87947	0.85296
4	2016	Canada	14	0.82847	0.91525	4	0.95652	0.83598	0.84141
5	2016	Republic of Korea	3	0.89149	0.9661	5	0.94203	0.94399	0.75903
6	2016	Finland	5	0.88168	0.91525	6	0.94203	0.92096	0.81339
7	2016	New Zealand	8	0.8653	0.94915	7	0.94203	0.9183	0.75173
8	2016	France	10	0.84559	0.89831	8	0.94203	0.94024	0.71364
9	2016	Netherlands	7	0.86586	0.94915	9	0.92754	0.95303	0.82466
10	2016	United States of America	12	0.84201	0.89831	10	0.92754	0.84452	0.75021

For 2012, six countries overtook Malaysia whilst Malaysia's OSI rank begin to decline to 20th position. The six countries that overtook Malaysia along with their new OSI position (in bracket) were: Saudi Arabia (19th), Estonia (18th), Sweden (16th), Israel (15th), UAE (11th), and Finland (7th). Their OSI change were 56, 10, 8, 4, 88, and 25, respectively. It is worth noting at this point that UAE has made the most significant change in their OSI rank from 99th in 2010 to 11th in 2012. Saudi Arabia has also made drastic improvement from 75th to 19th position with an OSI change of 56.

The year 2014 saw the most number of countries overtaken Malaysia in their OSI ranking. Fourteen countries overtook Malaysia whilst Malaysia slip further in her rank to 33rd position. Details of the rankings and the countries that overtook Malaysia in 2014 along with their OSI change can be seen in section 4 of this paper.



Note that with the exception of one country (Kazakhstan), all other countries have made positive change (improvement) to their ranking. In the case of Kazakhstan, it was only a small decline (-3), compared to Malaysia with -13 decline in ranking.

The last dataset to examine was 2016 which saw Malaysia's position worsen to 42nd. Twelve countries overtook Malaysia with Serbia having the most significant change in the OSI at 61 position. Next is Slovenia with 60 position change in OSI, and Malta with 57 change in OSI. The rest of the country ranking can be seen in section 4. The top 5 countries with the most significant change in their OSI were then selected. Further analysis of their websites and evaluations based on the four stages of the UN OSI model were carried out but not reported here since it is beyond the scope of this paper.

The OSI is computed in light of the aggregate number of focuses scored by the nation (crude) less the most minimal aggregate conceivable focuses scored by a nation separated by the scope of aggregate score esteems for all nations (ie the most astounding less the least conceivable score). Looking at the three fundamental EGDI segments as said in

the first, the OSI positioning is the best accomplished by Malaysia, trailed by TII and HCI. This pattern has been reliable throughout the previous 10 years (Jungtinių Tautų Organizacija, 2014; UN E-Government Survey, 2016; UN General Assembly, 2012; United Nations E-Government Survey, 2012). Be that as it may, Malaysia's online administrations positioning had returned to where the nation was 10 years back (Table 4.1), not as a result of the diminishing utilization of e-Government benefits however because of enhancements in the utilization of e-Government benefits by different nations. Malaysia's OSI has really enhanced from 0.577 out of 2005 to 0.717 out of 2016, a change in right around 20 percent in the most recent decade. Be that as it may, the nation's waning execution contrasted with whatever remains of the world was on account of different nations have been gaining noteworthy ground in the arrangement and utilization of e-Government online administrations. This is the reason that rouses this investigation in which the results of the nations' examination is exhibited in this paper (United Nations E-Government Survey, 2012).

Table 4.1. Malaysia's EGDI and OSI Ranking

Year	EGDI_Rank	EGDI	OSI_Rank	OSI	OSI_Change	EGDI_Change
2005	43	0.57057	40	0.57692		-1
2008	34	0.6063	18	0.67558	22	9
2010	32	0.61014	16	0.63174	2	2
2012	40	0.67031	20	0.79084	-4	-8
2014	52	0.61152	33	0.67716	-13	-12
2016	60	0.61749	42	0.71739	-9	-8

Table 4.2 shows out of the 35 countries that overtook Malaysia in the past 10 years. Researchers identified the most significant positive change in their ranking. The top 5 of these countries we selected, focusing the countries that

have the most drastic changes to their online services that overtook Malaysia in the last 10 yrs. The reason we believe that these countries have made significant improvement to their online services which Malaysia can emulate.

Table 4.2 Countries that overtook Malaysia in OSI Ranking

Year	Malaysia Rank	OSICountry Overtook Malaysia	Country OSI Rank	Previous Year Rank	Change
2008	18	Spain	15	71	56
2010	16	New Zealand	15	22	7
		Singapore	10	25	15
		Columbia	9	38	29
		Bahrain	8	44	36
2012	20	Saudi Arabia	19	75	56
		Estonia	18	28	10
		Sweden	16	24	8
		Israel	15	19	4
		UAE	11	99	88
		Finland	7	32	25
2014	33	Belgium	32	39	7
		Ireland	31	57	26
		Morocco	30	56	26
		Latvia	29	46	17
		Russia	27	37	10



		Oman	26	36	10
		Kazakhstan	25	22	-3
		Italy	24	49	25
		Austria	23	26	3
		Lithuania	22	30	8
		Chile	16	25	9
		New Zealand	15	21	6
		Uruguay	14	53	39
		Spain	6	23	17
2016	42	Luxembourg	40	42	2
		Brazil	38	50	12
		India	35	58	23
		Portugal	34	39	5
		Croatia	33	71	38
		China	32	48	16
		Denmark	28	35	7
		Malta	26	83	57
		Serbia	24	85	61
		Germany	21	34	13
		Mexico	20	36	16
		Slovenia	19	79	60

Note that since there are two countries in the top 5 having the same change in the OSI score, six countries were actually selected for further analysis.

The approach used in this study is to identify the top 6 most significant countries that overtook Malaysia in the last 10 years based on the UN-OSI ranking performance. This was done by examining the change in the OSI position that the country made in overtaking Malaysia and identify those countries that made the most significant OSI change. Data from the UN E-Government Survey was used. The data is available at the UN website at the link <https://publicadministration.un.org/egovkb/en-us/Reports/UN-E-Government-Survey-2016>. Datasets are available from the above site according to the year of evaluation, from 2003 when the first e-Government Survey started until its last publication in 2016. The 2018 dataset, however, is still not available at the time of writing. For the purpose of this study, six datasets were downloaded, ie from the year 2005, 2008, 2010, 2012, 2014 and 2016. Each datasets which is in Excel format contains 193 rows corresponding to all the countries in the world and ranked according to the EGDI. Each dataset consists of 10 columns, which are No., Year, Country, EG_Rank, EG_Index, EG_Participation_Index, OSI_Rank, OSI, Human_Capital_Index, Telecommunication_Infrastructure_Index. These datasets were then sorted and ranked according to the OSI index since the focus of this study is on the OSI evaluation. Table 3.1 shows an example of part of the 2016 dataset based on the OSI ranking.

V. DISCUSSION

The online administrations file is one of three parts of the United Nations e-government advancement list. It endeavors to catch a nation's execution in a solitary universally similar esteem utilizing a four-organize model of online administration development. As shown in Table 5.1 six countries had overtaken Malaysia in the past 10 years saw significant changes to their online services. These countries (UAE, Serbia, Slovenia, Malta, Spain and Saudi Arabia) have the most drastic changes to their online services that overtook Malaysia in the last 10 years.

This paper suggest for future e-government assessment for these six countries (UAE, Serbia, Slovenia, Malta, Spain and Saudi Arabia) coordinated differently using four stages of online service development with five ministries; Ministry of Education, Ministry of Human Resource, Ministry of Health, Ministry of Finance and Ministry of Agriculture. The study is hoped to have impact on online services index performance and improve Malaysia UN Ranking.

Table. 5.1 Summary selected countries for research

Number	Country	Change in OSI Rank
	Overtook	
1	UAE	88
2	Serbia	61
3	Slovenia	60
4	Malta	57
5	Spain	56
6	Saudi Arabia	56

REFERENCES

1. Agimo. (2003) March. E-Government Benefits Study. Australian Government Information Management Office (AGIMO) Online].
2. Akram, M., & Sulaiman, R. (2017). A Systematic Literature Review to Determine the Web Accessibility Issues in Saudi Arabian University and Government Websites for Disable People. *International Journal of Advanced Computer Science and Applications*, 8(6), 321–329. Retrieved from
3. Alhabshi, S. M. (2009). What we have & have-not : E-government in Malaysia. *International Conference on Malaysia: Malaysia in Global Perspective*, 241–283. Retrieved from
4. Alshehri, M., Alhussain, T., Drew, S., & Alghamdi, R. (2012). The Effects of Website Quality on Adoption of E-Government Service: An Empirical Study Applying UTAUT Model Using SEM. *Website Quality and E-Government Service*, (2011), 1–13.



5. Alshomrani, S. (2012). A Comparative Study on United Nations E-Government Indicators between Saudi Arabia and USA. *Journal of Emerging Trends in Computing and ...*, 3(3), 411–420. Retrieved from
6. Bhattacharya, D., Gulla, U., & Gupta, M. P. (2012). E-service quality model for Indian government portals: citizens' perspective. *Journal of Enterprise Information Management*, 25(3), 246–271.
7. Choi, H., Park, M. J., Rho, J. J., & Zo, H. (2014). Rethinking the assessment of e-government implementation in developing countries from the perspective of the design–reality gap: Applications in the Indonesian e-procurement system. *Telecommunications Policy*, 40(7), 644–660.
8. Cooley, A. (2017). Examining Development of E-Government in Russia and China: A Comparative Approach. *International Journal of Public Administration*, 0(0), 1–10.
9. Deka, G. C., Zain, J. M., & Mahanti, P. (2012). ICT's Role in e-Governance in India and Malaysia: A Review. *Journal of Next Generation Information Technology*, 3(1), 7–16.
10. Fesenko, T., & Fesenko, G. (2016). E-readiness evaluation modelling for monitoring the national e-government programme (by the example of Ukraine). *Eastern-European Journal of Enterprise Technologies*, 3(3(81)), 28.
11. Janowski, T. (2015). Digital government evolution: From transformation to contextualization. *Government Information Quarterly*, 32(3), 221–236.
12. Jeff Gulati, G. J., Williams, C. B., & Yates, D. J. (2014). Predictors of on-line services and e-participation: A cross-national comparison. *Government Information Quarterly*, 31(4), 526–533.
13. Jonathan, O., Ayo, C. K., & Misra, S. (2014). A comparative study of e-Government successful implementation between Nigeria and Republic of Korea. *Asia-Pacific World Congress on Computer Science and Engineering, APWC on CSE 2014*, (March).
14. Jungtinių Tautų Organizacija. (2014). Annexes. UNITED NATIONS E-GOVERNMENT SURVEY 2014: E-Government for the Future We Want, 179–263.
15. Keretho, S., Lent, B., Suchaiya, S., & Naklada, S. (2015). Evaluation of National e-Government Development Levels in Thailand.
16. MAMPU, U. P. T. dan P. P. M. (2017). *Pelan tindakan transformasi kerajaan digital :Lonjakan antarabangsa*.
17. Nguyen, M. H. (2014). A Study on Evaluation of E-Government Service Quality. *International Journal of Social, Management, Economics and Business, Engineering*, 8(1), 16–19.
18. Norris, D. F., & Reddick, C. G. (2013). Local E-Government in the United States: Transformation or Incremental Change? *Public Administration Review*, 73(1), 165–175.
19. Otniel, D., & Claudiu, B. (2015). Usage of Facebook by University Students in Romania and Lithuania: A Comparative Study. *Informatica Economică*, 19(1), 46–55.
20. Papadomichelaki, X., & Mentzas, G. (2012). E-GovQual: A multiple-item scale for assessing e-government service quality. *Government Information Quarterly*, 29(1), 98–109.
21. Rorissa, A., Demissie, D., & Pardo, T. (2011). Benchmarking e-Government: A comparison of frameworks for computing e-Government index and ranking. *Government Information Quarterly*, 28(3), 354–362.
22. UN E-Government Survey. (2016). Performance of PLC in 2015. Amman Stock Exchange. Retrieved from
23. UN General Assembly. (2012). The Future we want (Resolution adopted by the General Assembly on 27 July 2012). United Nations, (January), 53. <http://doi.org/A/RES/66/288>* United Nations E-Government Survey, 2012. (2012). Annexes.
24. Verkijika, S. F., & De Wet, L. (2018). A usability assessment of e-government websites in Sub-Saharan Africa. *International Journal of Information Management*, 39(September 2017), 20–29.
25. Villaseñor-García, E. A., & Puron-Cid, G. (2017). An artificial intelligence method for digital government assessment: An application of neural networks analysis of a ranking of digital government of Mexican states. *Proceedings of the 18th Annual International Conference on Digital Government Research*, 270–278.