CONCEPTUAL MODEL FOR ASSESSMENT TOOL TO MEASURE CITIZEN-CENTRICITY IN E-GOVERNMENT WEBSITES

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ABSTRACT

Citizen-centric e-government website is a crucial element for the present governments because it serves as a key tool to increase access to and from citizens. To ensure websites comply with citizen-centricity concept, assessment on the websites need to be done to measure its conformance. However studies have shown that there are no standardized approaches and evaluation criteria to assess citizen-centric e-government websites. This research sets out to develop a conceptual model for an assessment tool to measure citizen-centricity in e-government websites and propose an assessment tool for measuring citizen-centricity in e-government websites. To achieve the objectives, a qualitative approach using literature analysis and website observation methods was employed. Analysis of the results showed that the proposed conceptual model encompassed four components and thirty-nine characteristics under seven different themes. Based on the model, an assessment tool to measure citizen-centricity in e-government websites has been developed as an artifact of the research.

Keywords: *Citizen-Centric, E-Government, E-Government Website, Website Assessment, Assessment Tool*

1. INTRODUCTION

Building the trust in e-government is fundamental for citizen engagement and maintaining user satisfaction [1][2]. Hole [3] suggested that in order to build and maintain trust in e-government, employment of user-focused is important in e-government development. Many technological solutions and tools available for implementing e-government has resulted in increased trust in the government [4], where major utilization of ICT is by making use of website to enable citizens to obtain online information. According to Osman et al. [4], a web site is the window for the most utilized Internet Services; the World Wide Web. In line with this technological change, e-government is expected to shift its focus toward the citizen as the main part of the e-government strategies, called customer-focus or citizen-centric. Thus, providing the citizen-centric website in e-government can be considered as a crucial element for any modern government.

Citizen-centric is a central concept being coined together with transformational government implementation [5][6]. It means viewing the government from outside-in where understanding the needs and expectations of citizen became the main principle for government policies and services [7]. Luna-Reyes et al. [8] stated that by having citizen-centric approach, increased efficiency and reduced bureaucracy is apparent in public offices. In the meantime, Kamaruddin et al. [9] stated that citizen participation and allowing citizens to contribute ideas through requirements-gathering and e-government services design and evaluation is important in upholding democratic principles of a government.

To ensure e-government websites comply with the citizen-centric characteristics, assessment on the website is important to be done to measure its conformance. At the global level, United Nations Public Administration Network (UNPAN) is accountable to evaluate all e-government developments through E-Government Development Index (EGDI). Kamaruddin and Noor [10] suggested future works need to be done on the development of an assessment tool for measuring citizen-centricity in e-government websites. From the researchers' observation on available literatures, there was a paucity of studies related to assessment

on citizen-centricity in e-government websites being done, as well as no standardized approaches and evaluation criteria to assess citizen-centricity e-government websites. Due to that, this research was aimed to identify the characteristics of citizen-centric e-government websites through the method of literature analysis and observation on selected e-government portals. It also attempts to develop a conceptual model for assessment tool for measuring citizen-centricity in e-government websites. Finally, this research intended to propose an assessment tool to measure citizen-centricity in e-government websites as an end product of the research.

2. LITERATURE REVIEW

2.1 Citizen-Centric E-Government

E-government is said to provide benefits to the citizens, businesses and the government itself [11]. Among the benefits to the citizens are the services are always available, economical, fast and efficient via electronic, equitable and convenient as the service can be accessed while on the move or at home. While defining e-government is comparatively simple and direct, what really constitutes it changes considerably when defined by multiple scholars and organizations. Generally, e-government can be defined as "government's use of ICT, particularly, web-based applications, to enhance the access to and delivery of government information and services to citizens, businesses, employees and other agencies and entities" [2]. In addition to that, Wang et al. [12] have defined e-government as the information and services provided to the public on government websites where recent trends include creating citizen-centric websites in which content and services are organized around the anticipated needs of website visitors. Citizen-centric also means viewing the government from outside-in where understanding the needs and expectations of citizen became the main principle for government policies and services [13]. On the other hand, Misra [11] suggested that in order for any electronic intervention qualified to be called citizen-centric e-government, it must meet twenty criteria that had been proposed, which range from e-democracy to quality-marked e-government, as illustrated in Figure 1.

S.N.	Criteria
1	E-democracy
2	E-citizen
3	E-inclusion
4	E-literacy
5	E-empowerment
6	Citizen-centric government
7	Single portal
8	Single sign on (SSO)
9	All public services online
10	Efficient onsite search
11	Easy site navigation
12	E-payment
13	Participative e-government
14	Grievance redress
15	Anywhere e-government
16	Anytime (24x7) e-government
17	Privacy and security
18	Legal support
19	Customer relationship
20	Quality-marked e-government

Figure 1: Citizen-Centric Criteria-Based Definition of E-Government [11]

Thus, it is common for the present government particularly in the developed countries to work using ICT in order to reach and serve their citizens. By putting the citizens at the centre of any government's initiatives, terms such as 'citizen-centric', 'citizen-focused' or 'citizen-oriented' have been widely used to refer to the state. Zibret et al. [14] have summarized seven characteristic of a citizen-centric government, as shown in Figure 2. It consists of behavioral elements such as support sustainability, foster organizational change, cultivate leadership, establish culture and values, build customer relationships, improve operations, and manage performance [14].

Figure 2: Seven characteristics of citizen-centric government [13]

2.2 E-Government Website Assessment

Wang et al. [12] affirmed that evaluation of web-based e-government services is a necessary activity for ensuring returns from financial and organizational investments over time. Various past literatures concerned on the e-government website quality evaluation have resulted in the emergence of many models regarding the evaluation. For

instance, Osman et al. [4] suggested the implementation of Information, e-Service and Organization (IEO) Tasks Model to evaluate public sector's websites functionality. The IEO Tasks Model presents three distinct tasks for a website which includes Information Task, e-Service Task and Organization Task. On the other hand, Misra [11] has proposed similar criteria used in the US e-government websites assessment for the assessment of official Indian websites. The assessment consisted of 25 features and grouped into 7 indexes of services which are site usability, citizen responsiveness, disability, information and information tools, procurement, payment services and human resources.

In supporting the study of Luna et al. (2013), Zahran et al. [15] suggested a more comprehensive evaluation that considered the front-office and other factors, such as technology, organization/institution and context. They stated that e-government is not only delivered through websites and is not restricted to a specific technology, but extended to different delivery channels, such as mobile devices and social media platform [14]. Social media could become disorganized and provide poor results if a plan and set of rules related to it are not being implemented in the e-government [14]. Both the study of Lehemets [16] and Zahran et al. [15] agreed that the evaluation of e-government websites is influenced by the political system. On the other hand, Sørum et al. [17] have suggested that website evaluation may vary depending on its type, for instance whether it is the inviting website, the intuitive website, the easy to use website, or the simple website. The famous UN EGDI is based on expert assessment survey of online presence of all United Nations member states, which assesses national websites and how e-government policies and strategies were applied in general and in specific sectors for delivery of essential services [18].

2.3 Citizen-Centric E-Government Website Assessment

The reason citizens access a web-based e-government service is to seek for information which involves problem-solving processes. Wang and Lu [1] have created a formula to evaluate whether and how citizen's information seeking activities are facilitated, using performance model involving citizens' characteristics, information task attributes and web features.

Meanwhile Lehemets [16] defined user-centric e-government as a new paradigm with external coherence, which is against the old government-centric paradigm that emphasis on organizational coherence. Lehemets [16] recommended the use of e-GovQual, COBRAS and Finnish Ministry of Finance's e-government quality assessment model since they emphasize on the user-centric e-government quality needs. Nevertheless, Lehemets [16] asserted that the development of quality model should be based on legislation and guidelines of a country in order to confirm with the special needs of the countries.

On the other hand, a study by Waseda University has broader measurement indicators that cover network infrastructure and organizational structure of the country [19]. Waseda e-Government ranking is based on ten indicators which included thirty-five sub-indicators and one-hundred and fifty-four questions. Thereby this study provides a more comprehensive outlook of a country's perspective in terms of its e-government initiatives [20]. Finally, Kamaruddin and Noor [10] has proposed a citizen-centric demand model for transformational government which represents four components namely 'openness', 'transparency', 'participation' and 'responsiveness', as the essence of the model. Our research adopted this model in theorizing and classifying the components and characteristics of citizen-centric e-government websites as it is the most relevant to the context of research.

From the above literatures, it can be seen that evaluation of web-based e-government services is considered to be a necessary activity for ensuring returns from financial and organizational investments throughout web-based e-government services implementation. Furthermore, there is a significant value to have commonly standardized approaches and evaluation criteria to evaluate the website performance. That leads to the significance of developing a complete set of evaluation criteria for e-government websites using elements of citizen-centricity.

3. RESEARCH METHODOLOGY

This research was qualitative in nature and has utilized a triangulation of data collection methods by conducting literature analysis and performing observation on selected government's national portals in order to provide a more holistic and better understanding of the phenomenon under study. The result was used to develop a conceptual model for assessment tool for measuring citizen-centricity in e-government website.

3.1 Literature Analysis

Literature analysis consists of data collection and data analysis phases and it was conducted to identify the characteristics of citizen-centric e-government websites. In data collection phase, literatures from numerous academic databases in the research area were explored and collected using keywords such as 'citizen-centric government', 'user-centric government', 'citizen-oriented government', 'user-oriented government', 'open government', 'transparent government', 'responsive government' and 'participatory government'. Characteristic is defined as, "a feature or quality belonging typically to a person, place, or thing which serves to identify them" [21]. Based on the definition, citizen-centric characteristics in the literatures were scrutinized and coded based on model proposed by Kamaruddin and Noor [10]. Table 1 listed the model's four components and its description. After this phase was done, a list of citizen-centric characteristics was produced and categorized according to the four components.

Table 1: Component Of Citizen-Centric Characteristics Adapted from [10].

Citizen-centric Component	Description
Openness	Government provide free access to its structured and unstructured data
Transparency	Government provide information about their operations and decisions to the public
Participation	Citizens contribute in government's planning and decision-making and use government's data to create better service for the community
Responsiveness	Government listens to citizens' feedback and acknowledges it

The data analysis phase began when all characteristics found in previous phase were synthesized and interpreted to get a solid understanding of its concept. Cross-referencing was done to the terms used in literatures to understand its context better. Similar terms were grouped together using thematic analysis method and a theme that best described all the characteristics in each group was adopted as the main theme. The themes selections were generated using the inductive approach where the identified themes are strongly linked to the data without trying to fit them into a pre-existing model or frame [22]. The emerging themes were then clustered and adapted into becoming constructs of the conceptual model. At the end of this phase, each characteristic of citizen-centric e-government website in each component were categorized in their preferred theme accordingly.

3.2 Website Observation

The purpose of this activity is to validate the citizen-centric characteristics in e-government website developed in the previous phase. Model validation is the practice of determining whether a model is an accurate representation of the real world from the perspective of the intended use [23]. The observation unit being used was e-government national portal. Selected national portals were chosen based on top ten portals from 2016 UN EGDI and Waseda-IAC International e-Government ranking, as shown in Table 2.

Table 2: Top Ten Countries In 2016 UN EGDI And Waseda Ranking.

Rank	UN EGDI	WASEDA
1	United Kingdom	Singapore
2	Australia	USA
3	Korea	Denmark
4	Singapore	Korea
5	Finland	Japan
6	Sweden	Estonia
7	Netherlands	Canada
8	New Zealand	Australia
9	Denmark	New Zealand
10	France	United Kingdom

Selection of the national portals was based on their existence in both rankings. The five national portals that fulfill this criterion are United Kingdom, Australia, Korea, Singapore and New Zealand, as tabulated in Table 3.

Table 3: Five National Portals' URL Selected.

No.	Country	Assessment Rank		National Portal URL
		UN	*Waseda*	
1	United Kingdom	1	10	www.gov.uk
2	Australia	2	8	www.australia.gov.au
3	Korea	3	4	www.korea.net
4	Singapore	4	1	www.gov.sg
5	New Zealand	8	9	www.govt.nz

The characteristics of citizen-centricity in e-government websites gathered in literature analysis phase were used as variables in the observation process. Each variable was coded with a 'Yes' or 'No' value to represent the state of conformance towards the observation unit. The total for each component was counted and given a Boolean number based on majority counts. The Boolean number one (1) represents conformance on the characteristics while zero (0) is a non-conformance. In the end, total votes were counted and validity of the characteristic were determined. The method is in line with the popularly understood democratic principle known as "majority rule" [24]. A citizen-centric characteristic in an e-government website is said to be validated when all the variables are agreed based on majority consensus. Matrix of citizen-centric e-government website characteristics was delivered after the stage is completed.

3.3 Conceptual Model and Assessment Tool Development

The findings in literature analysis and website observation were analyzed to develop a conceptual model for an assessment tool to measure citizen-centricity in e-government websites. Then, an approach was taken to build the tool using the matrix generated from website observation stage. Few modifications were made onto it where name of national portal column were eliminated and value column were converted into confirmatory value, while characteristic list and its descriptions were remained as it is. In the header section, fields of agency's name, website URL, assessor's name and assessment date were added to identify each assessment activity. Hence, the deliverable of this phase is an assessment tool to measure citizen-centricity in e-government websites.

4. RESULTS AND FINDINGS

4.1 Literature Analysis

A total of fifty-seven characteristics were gathered from the literatures before they were synthesized and interpreted to get a solid understanding of its concept. Then, the characteristics of citizen-centric e-government were divided into four components of citizen-centric demand model, which are Openness, Transparency, Participation and Responsiveness [10]. Each component has between six to thirty-one characteristics depending on its related literatures. For instance, Transparency component contains six characteristics synthesized from five main literatures [10][25][26][27][28]. As shown in Table 4, the characteristics for Transparency component are social media; operation and activities information; share decision made; simple and understandable information; traceable process flow; and searching.

Table 4: Citizen-Centric E-Government Characteristic for Transparency Component.

No.	Author	Characteristic
1	Al-Aufi et al. 2017; Bertot et al. 2012; Porumbescu 2016	Social media
2	Kamaruddin and Noor 2017	Operation and activities information
3		Share decision made
4		Simple and understandable information
5		Traceable process flow
6	Thornton and Thornton 2013	Searching

As mentioned in the methodology section, themes were introduced to classify the characteristics using thematic analysis method. Eight themes were generated during this process and used as parent themes for all the characteristics found. Table 5 listed each the identified themes and its related description.

Table 5: Themes and its Description.

No.	Theme	Description
1	Channel/ Platform	Channel: A method or system for communication or distribution. Platform: A standard for the hardware of a computer system, which determines what kinds of software it can run.
2	Facility	A special feature of a service or machine, which offers the opportunity to do or benefit from something.

No.	Theme	Description
		Absence of difficulty or effort. Synonym: Simplicity.
3	Information	What is conveyed or represented by a particular arrangement or sequence of things.
4	Quality	The standard of something as measured against other things of a similar kind; the degree of excellence of something. Condition.
5	Usability	The degree to which something is able or fit to be used. Fitness for purpose and ease-of-use.
6	Application	A program or piece of software designed to fulfil a particular purpose. In this research context particular purpose might refer to particular government service or business unit.
7	Engagement Program	Engagement: The action of engaging or being engaged. Synonym: Participation, participating, taking part, sharing, partaking, involvement, association

Program: A set of related measures or activities with a particular long-term aim. Synonym: plan of action, initiative, strategy, solution |
| 8 | Communication | The imparting or exchanging of information by speaking, writing, or using some other medium. Synonym: imparting, conveying, reporting, presenting, passing on, and handing on.

Social contact. Synonym: contact, dealings, relations, connection, association, socializing, talk, conversation, discussion, speaking, talking, chatting, meeting, getting in touch |

Note. Second description for Usability theme was adopted from UN-APCICT/ESCAP (2011), and other theme descriptions were gathered from English Oxford Living Dictionaries (n.d.).

Thematic analysis method was also used to categorize the characteristics of citizen-centric e-government website in each component according to the appropriate themes, namely channel/platform, facility, information, quality, usability, application, engagement program, and communication. To illustrate this, the characteristics of transparency component mentioned previously were now categorized under suitable themes, as shown in Table 6. One characteristic was categorized under channel/platform theme, four under information theme and one characteristic under application theme.

Table 6: Characteristic Categorization for Transparency Component

No.	Author	Characteristic	Theme
1	Al-Aufi et al. 2017; Bertot et al. 2012; Porumbescu 2016	Social media	Channel/Platform
2	Kamaruddin and Noor, 2017	Operation and activities information	Information
3		Share decision made	Information
4		Simple and understandable information	Information
5		Traceable process flow	Application
6	Thornton and Thornton, 2013	Searching	Information

To complete the structure, description for each characteristic was also given and it was derived from the literature analysis that has been carried out before. It is depicted in Table 7.

Table 7: Description of Characteristic in Transparency Component.

No	Theme	Characteristic	Author	Description
1	Channel /Platform	Social media	Al-Aufi et. al, 2017 Bertot et. al, 2012 Porumbescu, 2016	Promoting transparency, satisfaction and perceptions of public sector trustworthiness through social media.
2	Information	Operation and activities information	Kamaruddin & Noor, 2017	Provide information about government operations and activities.
		Share decision made	Kamaruddin & Noor, 2017	Provide information about government decisions.
		Simple and understandable information	Kamaruddin & Noor, 2017	Provide simple to understand, relevant and honest information for the public to know.
		Searching	Thornton & Thornton, 2013	Access points available for searching.
3	Application	Traceable process flow	Kamaruddin & Noor, 2017	Clear and traceable process flow.

4.2 Website Observation

Websites observations of selected e-government national portals were performed according to the characteristics to be observed, starting from openness and followed by transparency, participation and responsiveness characteristics. Openness in this research refers to free access to structured and unstructured data that government provides to its citizens. Meanwhile, transparency refers to information about government's operations and decisions that are provided to the citizens. Participation means involvement of citizen in the government process and decision making, while responsiveness is related to the response of government towards citizens' feedback. Using these descriptions, five e-government national portals were observed page by page to look for the features that conform to the characteristics that have been derived. For example, Figure 3 depicted screenshots in Singapore and Australia e-government portals that contain the characteristic of 'operation and activities information' in transparency component.

Figure 3: Screenshots of Singapore and Australia E-Government Portal showing Operations and Activities Information

Each of the characteristics that conform to the portals' features was given a 'y' (yes) value and those that do not conform were given either an 'n' (no) or 'na' (not available) values. Table 8 showed the observation findings that are linked with transparency characteristics.

Table 8: Observation Result for Characteristics in Transparency Component

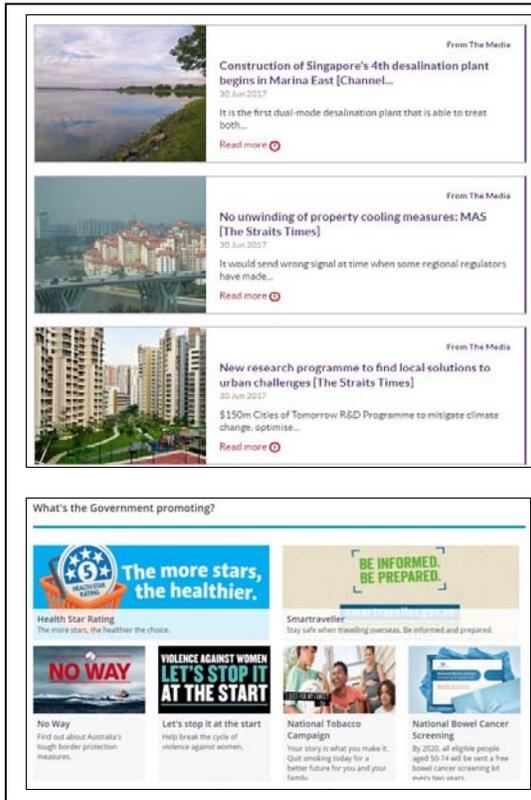| No.	Characteristic	Country					Value
		UK	AU	KR	SG	NZ	
1	Social media	y	y	y	y	y	1
2	Operation and activities information	y	y	y	y	y	1
	Share decision made	y	y	y	y	y	1
	Simple and understandable information	y	y	y	y	y	1
	Searching	y	y	y	y	y	1
3	Traceable process flow	na	na	na	na	na	na

Results from Table 8 show that a majority of transparency characteristics have returned a conformity value (1). However, traceable process flow characteristic has returned a 'na' (not available) value to denote that this characteristics cannot be validated using the observation technique. Nevertheless, all transparency characteristics observed during this process have been valued with conformance. Table 9 represents the return value count for '1', '0' and 'na', categorized by all citizen-centric components.

Table 9: Citizen-Centric Components' Return Value Count

No.	Component	No. of Characteristics	Value Count		
			1	0	na
1	Openness	31	21	4	6
2	Transparency	6	5	0	1
3	Participation	13	9	3	1
4	Responsiveness	7	4	2	1
	Total	57	39	9	9

It can be concluded that out of fifty-seven characteristics of citizen-centric e-government websites identified from the literature analysis, nine characteristics were rejected because of its non-conformance during the website observation activity. The rejected characteristics comprised of four characteristics from openness component, three characteristics under participation component and two characteristics from responsiveness

component. As for 'na' value count, there were nine characteristics with returned 'na' value due to the research limitation. These characteristics cannot be included in the final list of citizen-centric characteristics because its conformity is unknown and will be studied further in future research. As a result, thirty-nine characteristics were identified as valid due to its conformance value returned. These characteristics were made up of twenty-one openness characteristics, five transparency characteristics, nine participation characteristics and four responsiveness characteristics. All characteristics were then arranged into its respective components and themed accordingly.

4.3 Conceptual Model for Assessment Tool Development

Figure 4 portrayed a conceptual model for assessment tool to measure citizen-centricity in e-government websites that has been developed based on findings from the previous phases. The conceptual model consisted of four components, seven themes and thirty-nine characteristics.
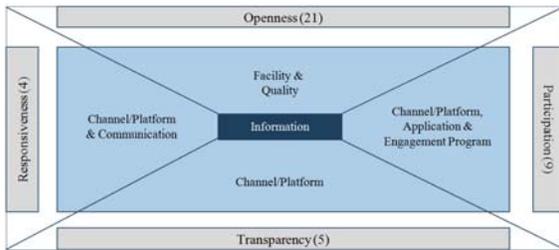

Figure 4: Conceptual Model for Assessment Tool To Measure Citizen-Centricity In E-Government Websites

The components are illustrated inside the grey boxes, which are Openness, Transparency, Participation and Responsiveness, while the themes that are illustrated within the blue boxes are Information, Channel/Platform, Communication, Facility, Quality, Application and Engagement Program. The Information theme is located in the centre so as to show that it is a shared entity. Each component owned more than one theme, and each theme was associated with several citizen-centric e-government website characteristics. The number in the brackets next to each component showed the sum of the characteristics that the component has. Concisely, the conceptual model can be read using these statements:

Openness component consist of twenty-one (21) characteristics which are established from Information, Facility and Quality themes.

Transparency component consist of five (5) characteristics which are established from Information and Channel/Platform themes.

Participation component consist of nine (9) characteristics which are established from Information, Channel/Platform, Application and Engagement Program themes.

Responsiveness component consist of four (4) characteristics which are established from Information, Channel/Platform and Communication themes.

Finally, Figure 5 showed the first page of the assessment tool which tabulated all the information that have been collected into characteristics confirmation form. The form includes thirty-nine citizen-centric e-government website characteristics that will be used as conformance variables during website assessment. Conformance of the characteristics can be marked using Y or N value where Y refers to characteristic compliance and N refers to non-compliance. To facilitate the website evaluation process, assessors were also provided with a description of each component and characteristic in the second page of the assessment tool, as depicted in Figure 6. Additional information concerning the theme description underlying each characteristic was also provided in the third page of the tool.

ASSESSMENT TOOL TO MEASURE CITIZEN-CENTRICITY IN E-GOVERNMENT WEBSITE						
						Page 1: Characteristic Conformation Form
Agency Name:				**Website URL:**		
Assessor Name:				**Assessment Date:**		
No	**Component**	**No**	**Theme**	**No**	**Characteristic**	**Confirmation (Y/N)**
A	Openness	1	Facility	i	Free	
				ii	Timely available	
				iii	Multi and open format	
				iv	Categorization	
				v	Manipulation	
				vi	Searchable	
				vii	FAQ	
				viii	One-stop access points	
				ix	Downloadable	
				x	Data request	
				xi	Learning aid	
		2	Information	i	Data structure	
				ii	Non-discriminate	
				iii	Updated	
				iv	Contact information	
				v	Transfer fund records	
				vi	Expenditure records	
				vii	Acknowledgement	
		3	Quality	i	Primary	
				ii	Trusted	
				iii	Save to open	
B	Transparency	1	Channel/Platform	i	Social media	
		2	Information	i	Operation and activities information	
				ii	Share decision made	
				iii	Simple and understandable	

ASSESSMENT TOOL TO MEASURE CITIZEN-CENTRICITY IN E-GOVERNMENT WEBSITE

Page 1: Characteristic Conformation Form

| Agency Name: | | Website URL: | |
| Assessor Name: | | Assessment Date: | |

No	Component	No	Theme	No	Characteristic	Confirmation (Y/N)
					information	
				iv	Searching	
C	Participation	1	Channel/ Platform	i	Social media	
		2	Application	i	E-Consulting	
				ii	E-Informing	
		3	Engagement Program	i	Innovation competition	
				ii	Citizen involvement	
				iii	Successful story	
		4	Information	i	Usable data	
				ii	Guideline	
				iii	Database search	
D	Responsiveness	1	Channel/ Platform	i	Social media responsiveness	
				ii	Ubiquitous engagement	
		2	Communication	i	Citizen feedback	
		3	Information	i	Easy and simple message	

Figure 5: Page One of Assessment Tool to Measure Citizen-Centricity in E-Government Websites: The Characteristic Confirmation Form

ASSESSMENT TOOL TO MEASURE CITIZEN-CENTRICITY IN E-GOVERNMENT WEBSITE

Page 2: Characteristic Description

No.	Component	No.	Theme	No.	Characteristic	Characteristic Description
A	Openness — *Public data provided by the government to the citizens.*	1	Facility	i	Free	Data is freely available, accessible and findable on the internet at no charge. It is not subject to any copyright, patent, trademark or trade secret regulation.
				ii	Timely available	Data is available as quickly as necessary and been published in a timely manner.
				iii	Multi and open format	Data can be saved in multiple formats, including open and non-proprietary formats, such as spreadsheets and text to facilitate the analysis of information.
				iv	Categorization	Data is provided with categorization and indexing.
				v	Manipulation	Data can be manipulated by simple and complex tools.
				vi	Searchable	Data can be searched which allows access to information in an objective transparent, clear and easy to understand language.
				vii	FAQ	Citizen can ask questions and FAQ is provided.
				viii	One-stop access points	Data is available through one-stop access points.
				ix	Downloadable	Data can be downloaded into well-known formats that is easily being processed such as PDF, Excel, CSV, KML, XML etc.
				x	Data request	Citizen can request for data directly on the portal via online form and status of request is regularly updated and viewed in portal dashboard.
				xi	Learning aid	Learning aids such as online video tutorials, FAQs, help, glossaries, and downloadable manuals to assist average citizens to translate the data provided.
		2	Information	i	Data structure	Data is provided with format description and clear meaning of it.
				ii	Non-discriminate	Data is available to anyone, with no requirement of registration and anonymous users are allowed to access the data.
				iii	Updated	Data provided is the latest.
				iv	Contact information	Organizational structure details with units, responsibilities and contact information is provided.
				v	Transfer fund records	Data related to funds transfer is provided.

ASSESSMENT TOOL TO MEASURE CITIZEN-CENTRICITY IN E-GOVERNMENT WEBSITE

Page 2: Characteristic Description

No.	Component	No.	Theme	No.	Characteristic	Characteristic Description
				vi	Expenditure records	Data related to expenditure is provided.
				vii	Acknowledgement	Be clear what information can't be released.
		3	Quality	i	Primary	Data is as collected at the source, with the highest possible level of granularity, not in aggregate or modified forms.
				ii	Trusted	Data is digitally signed or include attestation of publication/creation date.
				iii	Save to open	Data should not include executable content to avoid harm to the user.
B	Transparency — *Transparent service provided by the government to the citizens.*	1	Channel/ Platform	i	Social media	Promoting transparency, satisfaction and perceptions of public sector trustworthiness through social media.
		2	Information	i	Operation and activities information	Provide information about government operations and activities.
				ii	Share decision made	Provide information about government decisions.
				iii	Simple and understandable information	Provide simple to understand, relevant and honest information for the public to know.
				iv	Searching	Access points available for searching.
C	Participation — *Involvement of citizen in the government process and decision making.*	1	Channel/Platform	i	Social media	Using social media as a platform for public/open participation that is not limited to below functionalities: - bulletin board, calendar, email form functionality, mobile friendly - disaster alert: automatic fire alert service, hazard overview for the map feature and pictures posting and remarks on damages - receive public feedback and location-based citizen report - list examples of how the government data is used
		2	Application	i	E-Consulting	To collect public feedback via e-consulting; a two-way communication channel that allow citizen and government contribute opinions on some issues.
				ii	E-Informing	To provide information to citizen via e-informing; one-way communication channel which provides citizens with policies and citizenship information.
		3	Engagement Program	i	Innovation competition	Conduct innovation competition where public open data are used for the development of new information services.
				ii	Citizen involvement	Citizen involvement in the early stage of e-government initiatives to encourage open collaboration.
				iii	Successful story	Promoting successful cases of open data use to encourage open data usage.
		4	Information	i	Usable data	Use government's data to create better service for the community.
				ii	Guideline	Guidelines in designing the initiative, preparation of ICT used and information material, realization and evaluation of the initiative objectives are laid out.
				iii	Database search	Allowing search to the database of the site.
D	Responsiveness — *Responsiveness of government towards the service provided to the citizens.*	1	Channel/ Platform	i	Social media responsiveness	Communication between government and citizen via social media to improve government responsiveness.
				ii	Ubiquitous engagement	Citizen engages and accesses various governments' applications using single sign on.
		2	Communication	i	Citizen feedback	Encourage for citizens' feedbacks, requests or suggestions.
		3	Information	i	Easy and simple message	Short sentences and using words and language that citizen could recognize.

Figure 6: Page Two of Assessment Tool to Measure Citizen-Centricity in E-Government Websites: The Characteristics Confirmation Form

5. DISCUSSIONS

In the early stage of the study, the researchers have adopted four components of the citizen-centric demand model for transformational government proposed by Kamaruddin and Noor [10] to guide this research towards developing a conceptual model for assessment tool to measure citizen-centricity in e-government websites. A total of fifty-seven characteristics were collected from twenty-three literatures. Thirty-one of these characteristics were segregated into 'openness' component, six in 'transparency' component, thirteen in 'participation' component and another seven in 'responsiveness' component. Then thematically, all characteristics were synthesized to get a solid understanding of its concept which in return yielded eight distinct themes to represent them. Each characteristic was defined using the description from literature analysis that has been carried out.

Then, the collection of characteristics gathered was used in subsequent validation activity called website observation. The characteristics were used as variables to validate its existence in established citizen-centric e-government portals. As a result, only thirty-nine characteristics were identified as valid due to the returned of its conformance value.

The findings from literature analysis and website observation were used as a basis to develop the conceptual model for an assessment tool for measuring citizen-centricity in e-government websites. Subsequently, the conceptual model has become a fundamental element in the development of the assessment tool. The proposed assessment tool was intended to be a guideline for assessors of e-government websites from government or external agencies mandated to perform e-government websites assessment. Prior to performing the assessment, assessors need to understand each of the characteristics by reading through the characteristics and theme description provided with the assessment tool. After that, the assessments may take place by starting with the identification of website to be assessed and making sure that it can be accessed during the assessment period. Some information regarding the assessments such as the agency who owned the website, website URL, assessor's name and assessment date need to be filled out prior to the assessment for the purpose of reference and record-keeping.

During the assessment, the conformance on any characteristics can be marked using Y or N value. Y value refers to the characteristic's compliance while N value refers to its non-compliance. At the end of the assessment, the tool will produce a list of characteristics' confirmation. Attention should be given to the characteristics with N value. Websites' owner should be made aware of this while taking necessary actions to comply with the non-conformance characteristics. Assessors may put a deadline for the development team to make improvements on the websites under scrutiny. This should be done to show significance of the assessment, indicate agency's readiness for the next assessment cycle and most importantly to meet the needs of the citizens.

6. LIMITATIONS

This research was not without its constraint and limitation. Thus, it is important to acknowledge several limitations arisen from this research as stated below. Firstly, there were some situations in which part of the characteristics cannot be observed using direct observation technique. This usually happened to the characteristics that fall under usability theme. These kind of characteristics required registered citizenship ID or login ID in order to test its functionality. Thus, the researcher has decided to put a 'not applicable' (na) value for the tested characteristics.

Secondly, there were several searching characteristics that could not be found within the national portals neither in the form of link nor information, but they were found through internet browser search engine in respective public service or agency websites. For these cases, the researcher has put a '0' value for the characteristics. Therefore, the discussion and interpretation of the results should be read with care, and with these limitations in mind.

7. CONCLUSIONS

At present, models used to evaluate e-government websites suggested a more comprehensive evaluation that considered wide range of aspects such as network infrastructure, organizational/institutional structure, front-office, technology, context and political systems [15] [16] [19]. However, these models did not focus on the demand side requirements which emphasized on citizen-centricity and did not offer tools for evaluating the e-government websites. This

research project was carried out with the aim to develop a conceptual model for assessment tool to measure citizen-centricity in e-government websites and subsequently propose an assessment tool to measure citizen-centricity in e-government websites as its artifacts. This assessment tool consists of citizen-centric e-government website components and characteristics.

Refining e-government websites to meet citizen-centric e-government requirement will have a major impact on how services will be delivered. Nevertheless, it could also improve public service delivery because successful services are built on an understanding of what the citizens need. Thus, it is believed that the findings in this study will be helpful to the government in order to prioritize and focus on their websites quality aspects that put citizens' satisfaction as the top priority. Furthermore, the citizen-centric e-government website characteristics can also be used as insights to develop and improve the quality of public sector websites.

Thus, we suggest that it is important for e-government developer to have knowledge about different user groups in order to design and develop effective online services that will be accepted and used by the users. According to Sarikas and Weerakkody [29], research on e-government has identified many open issues which are hindering the adoption of e-government in many countries, which includes usability of e-government web sites and lack of trust. They suggested on the development of one stop e-government web portal where citizens can have online access to ubiquitous government services with multiple levels of government [29].

Citizen-centric design is regarded as "understanding of the specific needs of different segments of society and their capacity to benefit from online and mobile services" while citizen-centric approach revolves around targeting of e-services to provide tailor-made services to benefit segmented citizen groups [30]. By adhering to the characteristics of citizen-centricity in e-government websites identified in this research, it could help government to design better e-services for the citizens which will eventually encourage higher level of take-ups of government online services.

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