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E-GOVERNMENT IN MAURITIUS: A PRINCIPAL COMPONENT ANALYSIS

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Abstract

E-government has made the public sector more accessible, efficient, transparent and responsive to grievance. This paper investigated into these aspects through the principal component analysis to make interpretations of several variables easier for policy makers. A random survey among 244 e-government users was conducted across all districts of Mauritius. The Kaiser-Meyer-Olkin measure of sampling adequacy is 0.85. The determinant of R-matrix exceeds 0.00001 and the Barlett's test is highly significant (p<0.001). An oblique rotation has been done. This study reveals four subscales of e-government: 'democratic channel', 'e-interaction', 'website quality' and 'cyber trust. Around 56% of total variance is explained. The Cronbach alpha of each subscale exceeds the conventional 0.7 level. Through the democratic channel citizens express their views and participate in policy making. E-interaction is about the effectiveness of online dialogue between citizens and various government agencies. Website quality measures the overall experience of citizens towards aspects of navigation, comprehensiveness, information and content. Cyber trust emphasises the importance of having secure government websites. If the government pays inadequate attention to these subscales, citizens would eventually be dissatisfied and become slow at accepting e-government initiatives. They would feel frustrated with unclear content, abandon government e-portal and feel excluded from policy making.

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Keywords: E-government, Principal Component Analysis, Oblique Rotation, trust, TAM", "UTAUT.

1. Introduction

E-government is the use of ICTs in public service delivery. It has altered the way in which governments and citizens relate to one another by enabling access to government information; doing away with the forty-hour workweek restriction; improving provision of public services; leading to higher customer satisfaction through client orientation; inspiring greater trust in the government; making the public sector accountable, transparent, cost-effective and more responsive to grievances; reducing discretionary powers of ministers and government officials; improving citizen participation in the policy making process while at the same time opening itself up to scrutiny by citizens.

Principal component analysis is a technique that yields an 'efficient set of regressors' with reduced numbers of variables to increase degrees of freedom (Moser, 1984, p. 247). A high degree of inter-correlation among some variables may suggest that they relate to the same underlying component in which case an explanation of citizens' perception on e-government may be based on fewer but more fundamental independent factors than on the original larger number of variables. A model with the large number of original independent variables that explains a higher percentage of variation has little theoretical meaning as it causes confusion instead of explaining the phenomenon in question (Li, 1970). Each principal component is ranked according to the amount of variation it explains in the original set of variables. Although the use of principal component analysis is only exploratory it may be used to guide future studies and inform policy making.

Citizens basically value e-government in Mauritius in terms of the government 'website quality', its ability to act as 'democratic channel', its promise of upholding 'cyber trust' and acting as a platform for 'e-interaction' between the citizens and the government. The rest of this paper is structured as follows: first a theoretical and empirical review of the existing literature on e-government is provided, followed by some research questions after which the purpose of this study is clearly stated. The methodology is then explained and justified at length. The subsequent section discusses all results. To conclude this paper all theoretical and policy implications will be fully discussed and some suggestions that may guide future studies in the field of e-government will be made.

2. Problem Statement

2.1. Theoretical frameworks

The literature consists of several models that explains e-government use and these include the theory of reasoned action, motivational model, theory of planned behavior, combined TAM and TPB, model of PC utilization, innovation diffusion theory, social cognitive theory, the technology acceptance model (TAM), the unified theory of acceptance and use of technology (UTAUT). The TAM and UTAUT model are however most commonly used as they were designed to account for shortcomings in other models. Both have overlapping constructs, for example relative advantage of the diffusion of innovation theory and perceived usefulness of the TAM renamed as performance expectancy in the UTAUT model (Carter & Belanger, 2005). They may however be conceptually distinct.

The UTAUT was created after accommodating the conceptual and empirical similarities of eight models of technology acceptance in the IS literature (Venkatesh, Morris, Davis, & Davis, 2003). It revealed that four components: Performance expectancy, effort expectancy, social influence and facilitating

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conditions were determinants of behavioural intention. Performance Expectancy is the extent to which e-government use would enable the individual to improve his/her job performance. Effort expectancy is the extent to which e-government services are easy to use. Social influence is the extent to which the individual believes that people important to him/her feel that he/ she should use government websites. Facilitating conditions are the extent to which infrastructures exists to support e-government use. The two widely acknowledged components of the TAM model are the perceived ease of use (PEOU) and perceived useful (PU) whereas the UTAUT contains elements of social pressure and monetary aspects in terms of facilitating conditions which are non-existent in TAM.

Perceived usefulness is about the belief that the innovative technology will allow citizens to accomplish their tasks, that is the extent to which time may be saved and extraction of information may reduce costs (Shih, 2004) and the degree to which the website provides all information. Perceived usefulness is enhanced as the citizen need not be aware of the various government departments and the services they each provide but he/she can still access all services from one access point, the government web portal. Perceived ease of use is the extent to which an individual believes that use of ICT in the delivery of public services would be free of effort, that is, the ease associated with learning and becoming skilful at using government websites which depends on how clear, understandable and flexible these websites are (Davis, 1989). When it is easy to use a technology, it is perceived as being useful and one develops a positive attitude towards it. These increase a person's intention to use the technology and eventually actual use increases (Taylor & Todd, 1995).

However these theories explain mainly the adoption of innovation or the use of technology. E-government is beyond the mere adoption of technology and several other aspects such as trust in the government, trust in government departments, the extent to which government officials respond to citizens' demand and meet their expectations are important factors that ultimately encourages the use of digital government. These are further discussed in the next subsection.

2.2. E-government constructs

A good government website encourages e-government adoption. The fundamental role of government websites should therefore be about enabling citizens to access all government departments at one access point and at their own conveniences (Schuppan, 2009). Thus, citizens do not need to travel long distances to go to several government offices in search of government services. Also a good user interface should be simple, pleasant, easily navigable, usable, understandable and regularly updated. Designing an appropriate user interface can be a challenging task. Lim, Song and Lee (2012) report that the usability of an user interface contributes to its user-friendliness as users may work in an efficient, manageable and effective way. User-friendly interfaces may help e-government users to interact better with the government information available online. Galbraith (1973) stresses upon the availability of adequate online information to enable the users to complete their tasks. Sub-tasks with ill-defined and fuzzy structures would increase the complexity of tasks (McKeen, Guimaraes, & Wetherbe, 1994). In line with these principles, the government website should therefore show an obvious start with clear exit (Blair-early & Zender, 2008), be well-designed, speak the citizen's language, minimize the citizen's memory load, provide shortcuts and strive for consistency. Also clear and simple labels would improve clarity. If citizens cannot understand

or follow instructions easily on the government websites, they would feel frustrated and abandon its use. Basically the idea behind government websites is to enable citizens to interact with the government but if they cannot figure out how the websites work, then all investment in e-government projects would be void. The way in which information is presented is also critical to stimulate the user's citizen's involvement (Griffith, Krampf, & Palmer, 2001). Alsheri, Drew, & AlGhamdi (2012) advocates website quality as a determinant in explaining user acceptance of e-government services.

The use of the computer interface provides new possibilities of transaction between the provider and the consumer (Griffith, Krampf, & Palmer, 2001). The level of citizen satisfaction is linked to the availability of reliable and relevant information on the government web portal. According to Kumar, Mukerji, Butt, & Persaud (2007), online service quality may be analysed in terms of the quality of content available on the government web portal and how quickly the citizen receives an answer with a problem-solving approach. The quality of content such as the availability of searchable databases, audio and video clips help the citizen to process government information actively, eventually leading to a positive response from the citizen and continued use of the digital channel to interact with the government. Citizens' needs should take precedence over departmental structures and thus, government websites should be organized on the user perspective approach. Also the need to provide 'a readily accessible overall mechanism for assistance' to users has been highlighted (Blair-early & Zender, 2008, p. 102). Support should be available as the need arises and it should be easy to find with simple instructions that users can follow. E-government should enable the provision of real time and good service quality (Alsheri, Drew, & AlGhamdi, 2012). Online communication between citizens and the government should be both effective in terms of timely delivery what is required by the former and efficient in terms of time saved and cost reduction.

The importance of trust has been widely acknowledged in many studies (Alasem, 2015; Alomari, 2014; Nabafu & Maiga, 2012; Warkentin, Gefen, Pavlou & Rose, 2002). Trustworthiness is defined as the confidence placed in the online marketer's integrity and reliability (Carter & Belanger, 2005). McKnight, Choudhury, & Kacmar (2002) advocate the need for structural assurance, for example regulations, legal procedures and promises to promote success. As reported by Sanmukhiya (2018), in the absence of trust, a citizen would not reveal his/her personal information and engage in a virtual environment to transact with the government. Amongst other factors, it has been reported that trust in the government itself, information security, transaction security and perceived risks (Rehman, Kamal, & Esichaikul, 2012) reliability and integrity for the provisions of e-government services (Carter & Belanger, 2005), accountability (Belwal & Al-Zoubi, 2008) and confidence in the technology used by an institution (Jahangir & Begum, 2008) are of paramount importance to ensure the use of e-government services. E-government use is highly influenced by the extent to which people feel that the government online portal is safe and can protect their information against intrusion (Papadomichelaki & Mentzas, 2011) or against misuse by third party. Without trust, citizens would only engage with the basic e-government activities such as searching for information online, downloading documents and making enquiries. They would be unwilling to insert their credit cards details on government websites and would not conduct online transactions with the government (Sanmukhiya, 2018).

Schuppan (2009) argues that e-government is not restricted to the mere provision of public services but it extends to democracy given that it enables new forms of participation into the policy making process.

Citizens, for example, may access new information and be consulted on current issues or propose legislation amendments. Here e-government acts as a 'democratic channel'. In short e-government provides adequate venues such as discussion forums and chat rooms to encourage citizens' participation (Tolbert & Mossberger, 2006). Nevertheless some studies reported that government websites do not act as a vehicle for democratic dialogue and citizens do not participate in the decision making process (Al Athmay 2013; Sanmukhiya 2018). The lack of citizen involvement and consultation have been highlighted at the initial stages of policy making such as during conceptualization and planning which eventually renders e-government initiatives difficult during the implementation stage (Das, Patra, & Panda, 2011). Governments may learn from the effectiveness of the electronic bulletin board initiated in Fijisawa to gather feedback and other cost-effective policies from the citizens (Shim & Eom, 2008). This process is expected to increase citizens' trust in both the government itself and its agencies, and encourage the much needed collaboration between the citizens and policy experts. Through the democratic channel, e-government empowers citizens.

3. Research Questions

This research investigates **the various constructs of e-government** and **the perceptions of Mauritian citizens toward each construct**. It may be argued that the concept of e-government has evolved over the decades to such a large extent that theoretical concepts such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) may no longer explain the reasons behind the adoption of e-government unless these are modified.

4. Purpose of the Study

E-government is neither a single nor one-dimensional matter. It assumes multiple components which have a range of measurable attributes. The purpose of this paper is to investigate into these aspects of e-government through the exploratory factory analysis. This study based in Mauritius uses the principal component analysis in the field of e-government to make interpretations of several variables easier for policy makers by reducing them into some related sub-components of e-government.

5. Research Methods

Initially the researcher did an intensive reading on e-government so as to identify the relevant aspects that should be covered in a survey. Then a questionnaire which contained 21 likert-type items with a five point response scale (strongly disagree, disagree, neither agree nor disagree, agree and strongly agree) was designed to measure perceptions of citizens towards government websites in Mauritius. Participants were asked to tick one option that best explained their perceptions for each question. A pilot study was initially conducted among 21 users of government websites to test for ambiguous items in the questionnaire and to ensure that all aspects of e-government use which are valued by citizens were incorporated. The final questionnaire was modified accordingly. Data were then randomly collected among 244 citizens who claimed to use government websites. These data were collected across all districts of Mauritius irrespective of age, gender, occupation, rural/urban dwellings, qualification and income to ensure a nationally representative data set.

All questionnaires were administered on a face to face basis, allowing the researcher to go beyond the traditional mere ticking of options on the likert scale. The participants had the opportunity to explain their answer and express their views on e-government in Mauritius. The native language 'Creole' was used to avoid all misunderstandings. Data were collected only from those citizens who were willing to participate in the survey. Any participant could terminate this survey at any time without providing any justifications. Such data were not coded as these questionnaires were immediately destroyed.. Also no attempt was made to trace any of the respondents after they had filled in the questionnaires. All data were kept anonymous and confidential. The Statistical Package for Social Sciences was used to analyse all data for the current study.

As argued by Albaum (1997), likert-type items may not be analysed separately as these are intended to be used as summated scale. A statement on its own cannot capture the essence of what the questionnaire as a whole is designed to measure. Thus, in an attempt to identify reliable and valid constructs of e-government use from the questionnaire, the exploratory factory analysis was used. This approach did not only reduce several variables into related sub-components, it also made interpretations of citizens' perceptions towards the Mauritian government web portal easier. Although the principal component analysis is not an exploratory factory analysis method, it was deemed most appropriate as it is the most popular method used in the literature for variable reduction (Howard, 2016) and both procedures often generate similar results (Field, 2009).

Sample size is of paramount importance when assessing the reliability of factor analysis. Unlike the research conducted by Farell, Sapp, Johnson, & Pollard (1994), the current study does not have 250 participants and the mean communality is less than 0.60. But it exceeds a minimum of 200 subjects and the 5 participants to 1 variable ratio as recommended by Howard (2016). It also exceeds the 10 participants to 1 variable ratio advocated by Nunnally (1978). Thus the sample size in the current study is adequate to yield reliable factors. Alternatively the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy has been computed.

It was hypothesized that latent constructs were correlated with one another to some extent given that all items on the questionnaire were initially meant to capture citizens' perceptions about some related dimensions of e-government in Mauritius. This assumption is theoretically justified especially in the case of naturalistic data where psychological constructs are correlated (Field, 2009). The oblique rotation 'direct oblimin' was selected based on the fact that underlying factors might correlate and unlike the 'promax option' it is appropriate for the sample size in the current study. Finally the Cronbach alpha was calculated to examine the reliability of each factor.

6. Findings

6.1. Demographic features of respondents

As displayed in Table 1, male participants outnumbered female participants by around 12%. This is in line with other studies conducted on ICT and e-government adoption. Men are believed to be more likely than women to adopt ICT and as a result use government websites relatively more than women

(Rodrigues, Sarabdeen & Gil-Garcia, 2016; Avgerou, 2003; Owolabi, 2013; Venkatesh, Morris & Ackerman, 2000).

Table 01. Some socio-economic features of respondents

| Demographic Factors		Number of Participants	Percentage
Gender	Male	137	56.1
	Female	107	43.9
Area of residence	Urban areas	97	39.8
	Rural areas	147	60.2
Age group	Eighteen to twenty-five years	88	36.1
	Twenty-six to thirty-five years	94	38.5
	Thirty-six to forty-five years	33	13.5
	Forty-six to fifty-five years	22	9.0
	Fifty-six years and above	7	2.9
Sector of occupation	Private sector	121	49.5
	Public sector	82	33.6
	Others	41	16.8
Highest qualification	Up to School Level	31	12.7
	Up to Higher School level	43	17.6
	Certificate or Diploma	41	16.8
	First degree	85	34.8
	Postgraduate degree	44	18
Monthly income level	Up to ten thousand rupees	56	23
	Up to twenty thousand rupees	71	29.1
	Up to thirty-five thousand rupees	77	31.6
	Up to fifty-five thousand rupees	25	10.2
	Above fifty-five thousand rupees	15	6.1
Sample size	**N**	244	100

Around 60% of the government website users were rural dwellers and this may be explained in terms of the more even distribution of ICT infrastructures across all districts in Mauritius (Sanmukhiya, 2017; Ramessur, 2009). The majority of e-government users were aged between 26 to 35 years followed by those aged between 18 to 25 years. Thus around 75% of the sample were young people. The relatively low percentage of old people who participated in the survey may be attributed to the fact that as people grow older they are unlikely to use technology (Choudrie & Lee, 2004; Choudrie & Dwivedi, 2005; Mwangakalla, 2012; Olaitan, 2015). They may lack the necessary basic or IT skills (Mutula, 2008; van Djik, Peters & Ebbers, 2008; Jun & Wang, 2012).

The majority of e-government users, around 50% were private sector employees. During the face to face administration some of these respondents stated that they used the government websites for work purposes, for example, updating themselves on amendments in labour law and downloading documents to apply for business permits. The majority of participants, around 53% had done at least a bachelor's degree. This is in line with existing studies which report that education is positively related to the use of ICT and e-government services (Al-Shafi & Weerakkody, 2010; Niehaves, Gorbacheva & Plattfaut 2013; Taipale, 2013; Venkatesh, Sykes & Venkatraman, 2014). Less educated citizens tend to use face to face interactions.

The characteristics of respondents within the sample used for the current study is in line with the characteristics reported by existing literature. This sample reflects important demographic information of e-government users and thus findings of this paper may be generalized.

6.2. Analysis

The KMO value of 0.85 which falls within the range of 'good' (Howard 2016) and 'great' (Hutcheson & Sofroniou, 1999) implies that latent constructs are present and the sample size is appropriate for factory analysis. Kaiser (1960) recommends retaining all factors with eigenvalues exceeding 1 but Jolliffe recommends retaining all factors with eigenvalues above 0.7 (Joliffe, 1986). Stevens (2002) suggests an alternative method which is to use a scree plot to determine the number of factors to be extracted when the sample size exceeds 200 individuals. Since the current study contains a sample of 244 citizens and fits Stevens' (2002) requirement for reliable factor extraction, a visual scree plot was used. Also Field (2009) suggested running the PCA with the eigenvalues greater than 1 and generating the scree plot simultaneously. In case of no difference on the number of factors to be retained, the Kaiser's criterion of eigenvalues greater than 1 may be used. In this study both the scree plot and the Kaiser's criterion justified retaining four factors. Figure 1 shows the results of the scree plot as it starts to tail off after five components.
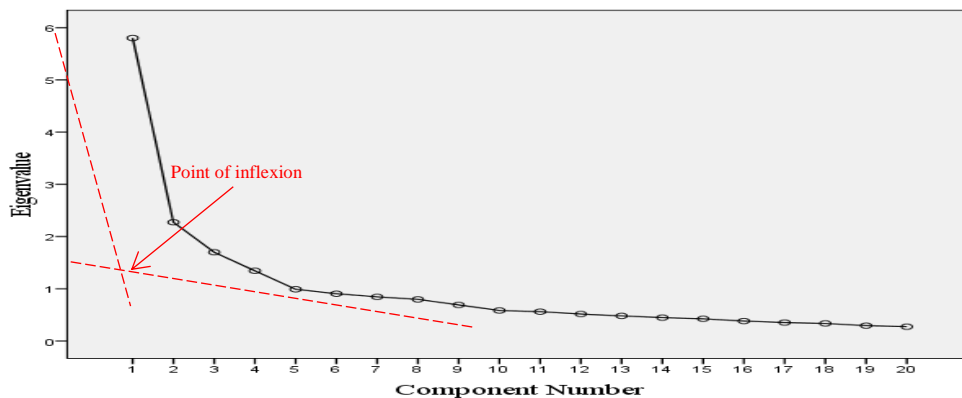
Figure 01. Scree plot of eigenvalues

Four components were extracted and these were labelled as 'democratic channel', 'e-interaction', 'website quality' and 'cyber trust'. These explained 55.6% of the total variance in e-government use with mean communality of 0.56. Each component has a Cronbach alpha above the conventional level of 0.7 with inter-item correlations exceeding 0.3, highlighting the internal consistency of each item and good reliability within each component. Thus, factor analysis evaluated construct validity.

Following Field (2009) and Howard (2016), loadings below 0.4 were suppressed. Good factor loadings on a primary factor should be at least equal to 0.4 to represent substantive values. A look at the correlation matrix confirmed that all items correlate rather well with one another. None of the items have excessively large correlation values (for example, above 0.9). The determinant of the correlation matrix exceeded the value of 0.00001 implying that the items in the questionnaire on e-government did not suffer from multicollinearity. The highly significant Barlett's test of sphericity χ^2 (190) = 1708, p<0.001, meant that items on the questionnaire were sufficiently correlated to find clusters and thus the data was suitable

for factory analysis. Table 2 reports loadings from the pattern matrix that have been rounded to 2 decimal places along with the eigenvalues, percentage of variance and Cronbach alpha of each of the four factors.

Table 02. Summary of PCA Results for the E-government Questionnaire: Pattern Matrix

Items on Questionnaire	Rotated Factor Loadings			
	Website Quality	Democratic Channel	Cyber Trust	E-Interaction
Information displayed on the government portal is easy to understand	0.78			
It is easy to find information on government websites	0.75			
Information on the government portal is useful to me	0.70			
The government portal is user-friendly	0.66			
There is adequate information on government websites	0.57			
Government websites are well-designed	0.41			
I have my say in the decision making process through e-government		-0.86		
With the use of government portal I help make decisions		-0.83		
With e-government I feel that my opinions matter		-0.77		
I feel I am being consulted through the government e-portal		-0.73		
The government takes feedback from citizens through its websites		-0.61		
My information will be kept confidential on the government websites			0.84	
I trust government websites			0.76	
Laws against cybercrimes encourage me to use e-government			0.71	
It is safe to disclose my personal details on government websites			0.64	
Government employees answer my online queries				0.78
I can communicate effectively with the government				0.72
Government websites provide support whenever I am stuck				0.62
Online communication with the government is efficient				0.50
High quality e-services are offered on the government e-portal				0.47
Eigenvalues	5.81	2.27	1.70	1.34
Percentage of variance	29.0	11.4	8.50	6.72
Cronbach alpha	0.80	0.84	0.75	0.73

Factor 1 measured the overall experience of the citizen who interacted with government websites and included aspects such as the ease of navigation, adequacy of information and clarity of content. It was labelled as 'website quality' and explained 29% of the overall variance in citizens' perceptions towards government websites. This factor has a Cronbach alpha of 0.8 which indicates good reliability and deletion of any item within this sub-scale would not increase reliability. All items correlate well with the subscale 'website quality' and they contribute positively to its overall reliability. All item-total correlations are

above 0.3 as required by Field (2009). On average citizens have moderate perceptions (3.4±0.7) towards the quality of the Mauritian government e-portal.   The website quality construct prioritized comprehensiveness of information followed by the ease of finding information, usefulness of government websites to the user, ease of dealing with the e-portal, adequacy of information provision and finally its capability to serve its purpose. AlSheri, Drew, & AlGhamdi (2012) also found website quality to be an important determinant in the adoption of e-government.

Factor 2 offers an avenue for citizens to express their views and participate in the policy making process from scratch to implementation. It was labelled as 'democratic channel' which is in line with the notion of governing with people (Oktem, Demirhan and Demirhan, 2014). It explained around 11% of total variance in the citizens' perceptions towards the use of government websites in Mauritius. The Cronbach alpha of 0.84 revealed good reliability of this sub-scale. During the extraction of factors one item was dropped due to low loadings (below 0.4). The statement read as 'E-government increases accountability of politicians and government officers'. This item had a maximum loading of 0.33 on 'democratic channel' and the Cronbach alpha of this factor improved from 0.82 to 0.84 once this item was removed from the analysis. All remaining items correlated well with the overall score of the construct 'democratic channel' with a mean inter-item correlation above 0.3. The factor structures in the PCA remained unchanged and total explained variance improved from 54.3% to 55.6%. On average citizens had low mean score (2.5±0.8) towards the 'democratic channel' factor. This factor prioritized citizens' say in decision making followed by their ability to guide policy making. Subsequent items were about the attitudes of the government itself, for example valuing the opinions of citizens, consulting them and finally incorporating their input into decision making.

Factor 3 emphasises anti-cybercrime legislations and the importance of having secure and reliable government websites where citizens' personal details are kept confidential. This factor was labelled 'cyber trust' as it relates to trust issues that may arise when interacting with the government online. It contributed 8.5% to the total variance which explained citizens' perceptions toward the use of government websites in Mauritius. The Cronbach alpha is 0.75 which is above the conventional level of 0.7 (Field, 2009) or 0.6 for exploratory research (Cronbach, 1951). The factor has item-total correlations above 0.3. Together these indicate good internal consistency and reliability of the scale. On average citizens have low perceived value (2.8±0.8) towards the 'cyber trust' construct. It prioritized keeping information of citizens confidential followed by trust placed in the website by the citizens, law enactment against cybercrimes and security of revealing personal details on the government web portal. As argued by Kumar, Mukerji, Butt, & Persaud (2007) a secure government web portal is of paramount importance in encouraging its use.

Factor 4 is about the efficient and effective online dialogue among government agencies and between government officials and citizens. It was labelled 'e-interaction' and added around 7% to the overall explained variance in citizens' perceptions towards e-government in Mauritius. The Cronbach alpha of this construct is above the conventional level and implies that all the five items add to the overall reliability of the 'e-interaction' construct. Deletion of none of the items on this subscale would improve reliability. All items correlate well with the overall score of 'e-interaction'. On average Mauritians displayed low mean score (2.8±0.7) revealing the failure of government websites to act as an effective online interactive platform between citizens and government agencies. Thus, contrary to Griffith, Krampf, & Palmer (2001),

the Mauritian web portal did not open up new opportunities of transaction between the user and the government. The factor prioritized government officers' responsiveness to enquiries made by citizens followed by effectiveness of online communication, availability of online support, efficiency aspect of online communication and finally the quality of government services dispensed online.

Figure 2 summarised the twenty items on the questionnaire which clustered together through the PCA in four factors. Theoretically we would expect all factors to be related to some extent.
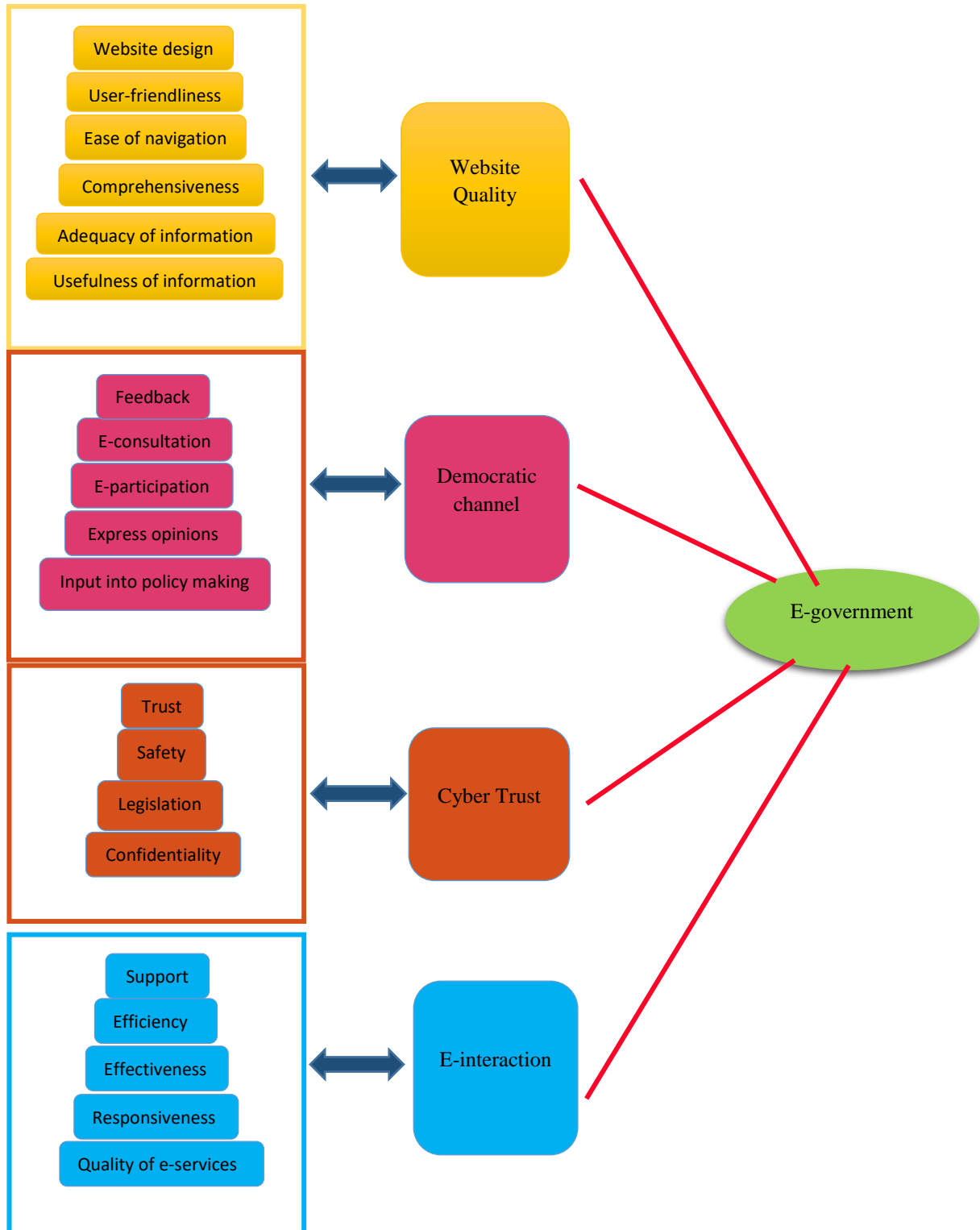
Figure 02: Proposed E-government Constructs

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Table 03. Correlation Matrix for the Four Factors in PCA with Direct Oblimin Rotation

Component	Website Quality	Democratic Channel	Cyber Trust	E-interaction
Website quality	1.00	-0.23	0.31	0.31
Democratic channel	-0.23	1.00	-0.22	-0.34
Cyber trust	0.31	-0.22	1.00	0.20
E-interaction	0.31	-0.34	0.20	1.00

The assumption of correlated factors was investigated. For independent factors oblique rotation must provide identical results to the orthogonal rotation and the correlation coefficients of all constructs must be equal to zero (Field, 2009). Neither of these conditions was satisfied and as shown in Table 3, the component correlation matrix revealed that the four factors were interrelated. Also if the correlation values among the factors are around ±0.32, then there is adequate variance to advocate an oblique rotation (Tabachnick & Fidell, 2007; Brown , 2009) in particular for the correlation between 'e-interaction' and 'democratic channel' followed by the correlation between 'website quality' and 'cyber trust' along with the correlation between 'website quality' and 'e-interaction'. Also the component correlation matrix is not an identity matrix. None of the correlation coefficients is close to zero. For this data set it was unreasonable to assume independence between factors of e-government use given the overlap in variance among these factors, thus the use of oblique rotation was justified.

The 'website quality' (ease of navigation, absence of ambiguity, availability of necessary, clear and comprehensive information) sets the platform for effective 'e-interaction' between citizens and government officials (where productive and collaborative interactions take place). Moreover the government web portal would not be useful to citizens unless it inspires trust, provides adequate laws against cybercrimes and removes concerns about privacy and confidentiality (Sanmukhiya, 2018). 'Cyber trust' between the user and the technology, for instance, would facilitate productive and constructive online communication and at the same time encourage citizens' participation in the policy making process through the 'democratic channel' where people may express themselves and provide their input into decision making.

Thus theoretical frameworks such as UTAUT and TAM which predict the use of technology may not be appropriate frameworks to explain the adoption of digital government. Several other equally valuable factors such as the level of trust in the technology of the Institution, the effectiveness of online dialogues between citizens and government agencies, and the possibility of engaging in a democratic dialog where people may speak up their minds have now become important aspects that may either encourage or discourage people from using e-government services. Citizens' relationship with electronic government has become rather complex.

7. Conclusion

All items on the questionnaire that eventually clustered into 'website quality', 'e-interaction', 'democracy channel' and 'cyber trust' were adapted from the extensive literature review carried out for this study on e-government in Mauritius. A principal component analysis was carried out on 21 items with oblique rotation (direct oblimin). The measure of sampling adequacy was deemed good as depicted by a Kaiser–Meyer–Olkin value of 0.85. The determinant of the R-matrix and the Bartlett's test of sphericity implied that correlations between the items on the questionnaire were neither too low nor too high. They

were sufficiently correlated for PCA. After applying the Kaiser's criterion and examining the scree plot, four factors with eigenvalues greater than 1 were extracted with a combined explained variance of around 56%.

Those items that clustered on the same factors suggested that factor 1 represented the quality of the government website; factor 2 represented an avenue conducive to democracy, that is, the need to cater for citizens' opinions, seek their input and change government policies accordingly; factor 3 was labelled as cyber trust as it related to online privacy, legislative aspects and trust issues; and factor 4 represented e-interaction, that is, online interaction and responsiveness of government officers. The component correlation matrix revealed that all factors were inter-dependent in particular for items on the 'e-interaction' and 'democratic channel' constructs. The Cronbach alphas of all four factors suggest good degrees of reliability. Citizens consistently had low mean scores for the e-government dimensions with the exception of the website quality where they displayed moderate and positive perceptions toward electronic government.

If e-government use is to be encouraged in Mauritius, online task complexity should be reduced. Tasks should be well-structured with straightforward instructions (McKeen, Guimaraes, & Wetherbe, 1994). The Mauritian government web portal should be easy to navigate and search engines need to be refined so that lists of inappropriate materials do not show on the results of the search button. Government websites should allow the users to find the e-services they seek in a quick and effortless manner, thus avoiding unsuccessful location of information which would decrease the behavioural intention of the citizens to use e-government (Carter & Belanger, 2005).

The government may develop educational resources online and provide technical assistance through community centres to help citizens to assess government e-services. Government agencies should develop online services that look like offline services so that citizens do not face difficulty in using the government web portal, for example, downloadable and editable online forms should resemble the familiar paper format available through the traditional face to face method.

Without cyber trust and trust in the government itself, citizens would be slow at adopting e-government initiatives and would resist to changes proposed by the government. The government should therefore show greater transparence about the flow of users' information once they are inputted online and implement more severe controls on access of these information by government officers.

In the absence of high website quality, citizens would feel frustrated. Unclear content and fuzzy instructions would reduce the usefulness of government websites. Thus, problems such as overly complex, misguiding instructions, static websites, no live chats and inaccessible government web pages should be addressed promptly. If the visitors are unable to find what they are looking for, they will become dissatisfied and spread the word about the non-functionality of the Mauritian government web portal. Along with other people, they may not visit the portal again (Glazer, 1991).

The democratic channel is an important aspect of democracy which all e-government initiatives must encourage. High degree of e-interaction would reassure citizens that government officials are responsive and attentive to their complaints causing their satisfaction with government websites to rise. Also mere citizen participation with inadequate influence to bring changes or affect policies may make both the potential and existing users see their participation as a waste of time or political manipulation. Nevertheless

the most challenging aspect of e-government would be to tackle diverse needs into a shared, reliable and complete online government portal.

Future research in the field of e-government may include social influence. Social influence has significant impacts on the adoption of e-government services (Malhotra & Galleta, 1999; Venkatesh, Morris, Davis, & Davis, 2003). Also the current study is based only on citizens' perceptions and hence future studies may include the perceptions of government officials and the administrators of the Mauritian government e-portal.

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