

A STUDY OF EFFECT OF DEMOGRAPHIC FACTORS ON E-GOVERNMENT DIVIDE IN THE REPUBLIC OF MAURITIUS

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Abstract

Purpose: This study is the first attempt to address the effects of demographic factors on the e-government divide in the Republic of Mauritius. Findings would encourage wider e-participation and e-inclusion into policy-making from all segments of the population.

Methodology: A stratified random sample of 310 users and non-users of e-government was used. Logistic regression was estimated. The non-significant Hosmer-Lemeshow test and the Nagelkerke R^2 of 0.538 imply that the logit model is useful in predicting the e-government divide.

Main Findings: The classification table shows 81% correct classification. All Wald Chi-Square statistics are reported. This research reveals that marital status and gender do not predict the e-government divide. Age ($p < 0.01$), education ($p < 0.001$), middle income range ($p < 0.05$), dwellership ($p < 0.01$) and public sector employment ($p < 0.05$) affect a citizen's decision to adopt e-government. The massive investments in e-government initiatives cannot be justified as these have not catered for universal coverage. Young citizens are 20 times more likely than old citizens to adopt e-government.

Implications/Applications: The tendency to use e-government increases as more education is acquired. Rural dwellership almost triples the odds of e-government adoption although these citizens are less educated than their urban counterparts. Public sector employees are 3.6 times more likely to use government websites than the self-employed. Monthly income earners of Rs 20001 to Rs 35000 are 3.3 times more likely to use e-government services than those earning up to Rs 10000. This study is ground-breaking and challenges the belief that rural dwellers are marginalized and reinforces the importance of education within the theoretical framework of the e-government divide.

Keywords: Demand Side Factors, Digital Divide, ICT Adoption, Logistic Model, Demographic Factors, E-Government Divide, E-Government.

INTRODUCTION

Out of the 582 African websites, Mauritius had the highest number of online features and executable services on its government website ([Rorissa and Demissie, 2010](#)) and it was ranked first with an ICT development index of 5.99 in the African continent in 2015 ([Statistics Mauritius, 2016](#)). However, these did not translate into an online surge by Mauritians to make use of online government services. Similarly the 100% supply of government e-services in the U.K. did not translate into universal use by its citizens but instead amounted to only 35% of its population using these e-services ([Almuwil, Weerakkody, and El-Haddadeh, 2011](#); [Dianita, 2015](#)). Thus, administrators and politicians must not only focus on the supply of e-government services but they must also learn from the vast digital divide research to understand the demand side. Demand for e-government services may be restricted by digital divide which occurs because of traditions, barriers to access and lack of competencies to use technology which is shaped by demographic factors and converts into e-government divide. Thus knowing and acting upon the e-government divide problem may increase the success of e-government initiatives.

This study is the first attempt to estimate the extent to which demographic factors influence the likelihood of e-government use in the Republic of Mauritius. E-government divide translates into inequalities whereby some citizens receive special treatments by their mere use of technology to interact with the government. Oftentimes it is remarked that administrators miss out on important inputs from some segments of the population who are non-users. Here, the rationale behind e-government divide may be attributed to differences in age, income, qualifications, rural/urban residence, gender, marital status and sector of employment. Also following the advice of ([Almuwil, Weerakkody, and El-Haddadeh, 2011](#)), this paper includes both online and offline users of government services.

The research objectives may be written as follows:

1. To establish the importance of demographic factors as determinants in the e-government divide.
2. To assess the extent of the e-government divide among the various segments of the population.
3. To make recommendations to guide policymaking and ensure the success of future e-government initiatives among the various subgroups of the population.

Although this research is limited to the demographic aspects of the population in predicting the use of government websites, it acknowledges the importance of other factors such as a hassle-free, rich and secure government website ([Biju, 2016](#); [Kumar, Mukerji, Butt, and Persaud, 2007](#)); the need for people to know how their confidential and personal

information would be handled ([Bizon, 2016](#); [Sanmukhiya, 2017](#)); proper website design, computer skill confidence and perceived usefulness ([Alomari, 2014](#)); frequency of use, degree of ease and past e-government experience; social influence; system quality, perceived effectiveness and information quality ([AL Athmay et al, 2016](#)).

As a contribution to theory, this paper postulates that demographic factors per se explain the non-use and use of electronic government. It also proposes the use of logit models as an innovative methodology in the field. The rest of this article is structured as follows: a thorough literature review on the e-government divide is followed by an outline of the methodology where the research hypotheses are clearly stated. Then the characteristics of all participants in the e-government survey are displayed. Some important results from the logistic model are discussed at length. These are then summarised. Some recommendations that may widen and ensure the continued use of online government services in the Republic of Mauritius are made. Some limitations of the current research are highlighted and finally some suggestions for future studies are made.

LITERATURE REVIEW

E-government refers to the use of information communication technologies (ICT) by the government to create an interactive environment within which businesses and citizens may do business with the government ([Almarabeh and AbuAli, 2010](#)). The rationale behind e-government is that it makes government services more accessible, gives the public greater access to information, cuts costs, reduces delays, delivers high-quality e-services, engenders high customer satisfaction and makes government officials more responsive to grievances.

The perceptions of people towards e-government may be influenced by demographic aspects such as sex, occupation, and education ([Mwangakala, 2012](#)). In his study, [Al Athmay \(2015\)](#) propounds that all demographic factors (age, gender, type of employment and education) except for nationality explained differences among users within the 'e-openness' and 'e-participation' dimensions of e-governance in the United Arab Emirates. Also another research was conducted to determine whether age, education, gender, internet, and computer experience influenced e-government usage by Jordanian citizens ([Almahamid, Mcadams, Al Kalaldehy, and MO'TAZ, 2010](#)). Specifically it was noted that education level and gender played a significant role in the use of e-government but only in terms of gathering information and not for carrying out transactions. Internet and computer experience made no significant difference in the citizens' intention to use electronic government.

In their most conspicuous observation, [Hung, Chang, and Yu \(2006\)](#) highlighted the importance of marital status in their study on the adoption of online tax filing and payment system (OTFPS) in Taiwan. They revealed that married OTFPS users outnumbered unmarried OTFPS non-users to a large extent. They also concluded that those Taiwanese middle-aged men who were married and had university education were more likely to use OTFPS than others. Likewise, scholars like [Lenhart, Madden, and Hitlin \(2005\)](#) reported that single, separated, divorced and widowed parents were less likely to use the Internet than married parents, that is, 89% of the latter category went online compared to only 76% of the former category. However [Ibrahim and Pope \(2011\)](#) did not find any significant effect of marital status on the use of e-filing tax system. Instead they reported that education and gender had significant impacts on the e-filing tax system with a greater percentage of manual tax return submitters having lower education levels and with below-average knowledge on Information Technology. Another study conducted by [Van Dijk, Peters and Ebberts \(2008\)](#) however revealed that parents aged between 30 to 45 years had the highest intention to use government e-services. Parenthood may thus be a vital aspect in the use of online government services.

Scholars like [Rodrigues, Sarabdeen, and Balasubramanian \(2016\)](#) reported that women were less likely to use e-government services in the UAE and recommended special training programmes to be designed for them. However the low tendency to use online government services may not pertain to e-government adoption only but rather too low ICT adoption ([Avgerou, 2003](#)). It has been reported that gender is one of the causes of not adopting ICT ([Owolabi, 2013](#)), especially in Western Europe where the use of the Internet is more of an activity for men than for women ([Carveth and Kretchmer, 2002](#)). Gender affects the initial decision to adopt new technology ([Venkatesh, Morris, and Ackerman, 2000](#)). In this context, women are relatively slower than men at learning how to use technology ([Gefen & Straub, 1997](#)) which may eventually inhibit the continued use of ICT by women ([Venkatesh et al, 2000](#)). But by August 2011, 76% of the female population were internet users and no significant difference between gender and internet users could be found ([Zickuhr & Smith, 2012](#)). Other demographic factors such as age, income, employment, and education have been found to explain differences between non-adopters and adopters of e-government, but gender did not ([Colesca & Dobrica, 2008](#); [Bélanger & Carter 2009](#); [Komba & Ngulube 2014](#); [Taipale, 2013](#)) as more women started to use the internet and the gender gap decreased ([Mason & Hacker, 2003](#); [Dwivedi & Lal, 2007](#)).

As age increases, citizens tend to experience decreased tendency of internet and e-government use because older age groups are less receptive to new technology. [Van Dijk et al \(2008\)](#) reported that young citizens experienced fewer difficulties to use technologies than those citizens classified as senior. [Choudrie and Lee \(2004\)](#), for instance, reported that younger South Koreans use the Internet more than older South Koreans. Other studies found that older people were less likely to subscribe to broadband services or new forms of ICTs ([Dwivedi & Lal, 2007](#), [Choudrie & Dwivedi, 2005](#)). Here the use of internet is a pre-requisite for e-government use and e-government adoption declines as age increases, especially after the age of 54 years ([Choudrie and Dwivedi, 2005](#)). However age did not seem to affect the use of government e-

services in Finland (Taipale, 2013). In another study, the majority of the manual tax users were middle-age people who were afraid to use the Internet and e-government services as their confidence in these e-services (or self-service based technologies) was still at an early stage (Ali, Tazilah and Kamaruzaini, 2016). The age factor also influences the satisfaction level of e-government use. People aged 40 years and above are more satisfied with government websites than younger ones because the latter use the Internet relatively more and thus younger citizens are more exposed to government website problems (Olaitan, 2015) which reduces their satisfaction.

It is good to point out that the cost of deploying resources such as buying a computer and subscriptions to broadband plays an instrumental role in the use of ICT and e-government services. Technological adoption therefore imperatively depends on the costs associated with the use of technology and the user's income. Here the mobile broadband service, for instance, maybe expensive (Omigie, Zo & Rho, 2015). The use of technology may be hindered if the user has to bear all the costs alone given his/her low income. Besides a positive correlation between computer ownership and income in the USA with a considerable gap between higher and lower-income groups was reported (Venkatesh, Morris, Davis & Davis, 2003; Carveth & Kretchmer, 2002). Santhanamery and Ramayah (2015) examined the impact of socio-economic factors and the big five personality features of agreeableness, conscientiousness, neuroticism, extraversion, and openness to experience on the intention to continue to use e-filing tax system. It was concluded that low and middle incomes did not affect the intention of continuous use but high income positively and significantly influenced the continuous use of the online filing system. The higher the income level, the higher was the intention to continue using online filing. However the positive relationship between income and electronic government has not been observed, that is, income did not influence the citizens' willingness to use government websites in Tanzania (Mwangakala, 2012).

During a survey conducted on tax e-filing in Malaysia, it was reported that public and private sector employees were significantly different from those in self-employment (Islam, Yusuf, & Bhuiyan, 2015). Also, those citizens outside the labor force or the educational process such as house partners, the disabled and the unemployed had greater difficulties than those people who were within the labor force and educational system, for example, students and employees. In fact they reported that pensioners, house partners and disabled citizens in the Netherlands had both little actual use and lower intention to use government e-services. It is also good to point out those students although relatively young were reported to have low usage of e-government services as they did not need these e-services. The unemployed however exhibited high usage of these e-services as they needed to look for jobs and related e-services. Thus, the societal position of a citizen influences his/her use of government websites.

Positivists argue compellingly in favor that e-government services should be provided to the poor rural dwellers at their doorsteps. Van der Meer and Van Winden (2003) points out that although the Internet may be available in all the main cities, it is not available in several rural areas, for instance, only a small percentage of rural population in India, owns a PC with access to the Internet (Cecchini & Raina, 2004). Schuppan (2009) highlights that infrastructures and connectivity are major challenges to the successful implementation of digital government in the rural parts of many African countries where electricity is either available for some hours only or not available at all and the number of PCs is only 52 per 10000 inhabitants. Subscription fees for unlimited monthly internet access are also extremely costly along with illiteracy and poverty being prevalent in rural areas. Development occurs mostly near cities and is often slow in rural areas because of economic and political issues (Evans & Yen, 2006). However Mauritius does not suffer from such extreme urban/rural divides because ICT infrastructures, for instance, telephone and electricity is not a problem (Shalini, 2009). There is rather equal distribution of ICT infrastructures across all the districts of Mauritius and unlike many countries rural dwellers are not at disadvantage relative to urban dwellers.

In addition to ICT infrastructures not widely available to rural dwellers, government officials and citizens who want to use online government services may lack the online basic skills (Mutula, 2008). As a matter of fact, those who are old, poor, less educated and belong to minority groups are more likely to require computer assistance. Besides a positive relationship between education and usage of computer (Venkatesh, Sykes, & Venkatraman, 2014) and a positive correlation between e-government adoption and education (Al Athmay, 2015; Taipale, 2013) have been revealed. Education significantly affects the adoption of government e-services. Turkish people, for instance, interacted more with e-government as their level of education increased and many of the online requests came from those with increasing education levels whereas citizens with low education preferred face to face interactions (Akman, Yazici, Mishra, & Arifoglu, 2005). Niehaves, Gorbacheva, and Plattfaut (2013) found that although age, gender, income, and education had significant effects on internet usage, only education had a significant effect on e-government use. Higher education levels implied that internet users were also e-government users. Low usage of e-government services by women, low-income earners, and older people may, therefore, be attributed to their low usage of the Internet.

In the study conducted by Belanger and Carter (2006) features like ethnicity, computer experience and frequency of online buying did not predict e-government use. However, income, age, frequency of internet use and education were significant predictors of e-government usage. Along with the level of education, Islam, Yusuf, and Bhuiyan (2015) has highlighted the importance of previous experience with the e-filling tax system. However as a rebuttal to this point, it can be said that no significant difference in e-government adoption was identified across the various educational levels in the UAE (Rodrigues et al, 2016). Young citizens and those with higher qualifications prefer to use digital channels of government services but senior citizens and those with lower qualifications favor the traditional channels of telephony and service desks (Van Dijk

et al, 2008). Also occupation and income have been described as the main drivers of innovativeness as new technologies are embraced by people with more resources (Mason & Hacker, 2003) which eventually increases the ownership and usage of ICT (Choudrie & Dwivedi, 2005). Better educated citizens tend to earn more and have greater probability of having computers and internet subscriptions. They have increased access to digital resources and as a result, use them disproportionately more than the less educated citizens (Akman et al, 2005).

Thus as discussed above education, age, place of residence, gender, marital status, occupation, and income may be used as independent predictors of e-government. The theoretical framework thus proposed for estimating the influences of demographic factors on e-government divide in the Republic of Mauritius is illustrated in Figure 1. Socio-economic factors affect e-government adoption either directly (where the citizen mainly uses the internet to access the government e-portal) or indirectly (where the citizen initially just intended to use the Internet). ICT adoption is an important pre-requisite to e-government adoption. The poor lack the digital resources to engage in e-government, women and rural dwellers lack opportunities to use the digital resources whereas uneducated and old people lack digital skills which hinder their use of e-government services. In this study, however due to lack of data, only the direct link between demographic factors and e-government divide will represent the research model.

Eventually, all regions were classified into either rural or urban areas. The sample from both areas was close to the official percentages for urban (41.3%) and for rural (58.7%) populations that prevailed in the Republic of Mauritius (Statistics Mauritius, 2016) at the time of data collection. Data was collected at several strategic locations and these included, for instance, Bagatel Mall of Mauritius, bus stations, Super U Grand Baie complex, Le Vieux Moulin complex, government offices in Port Louis, some primary and secondary schools. Face to face questionnaires was administered to a total of 310 individuals in all regions of the Republic of Mauritius irrespective of their age, gender, marital status, income level, sector of employment and qualification in order to generate a nationally representative data set which may be used to inform policymaking. This study comprises of 153 male and 157 female citizens whereby 50% of the sample did not use government websites. All questionnaires were verbally administered in the native language 'Creole'. Only those people who expressed their willingness to participate in the survey were interviewed and they could terminate the survey at any time without giving any justification. All information was treated in strict confidentiality and all respondents remained anonymous.

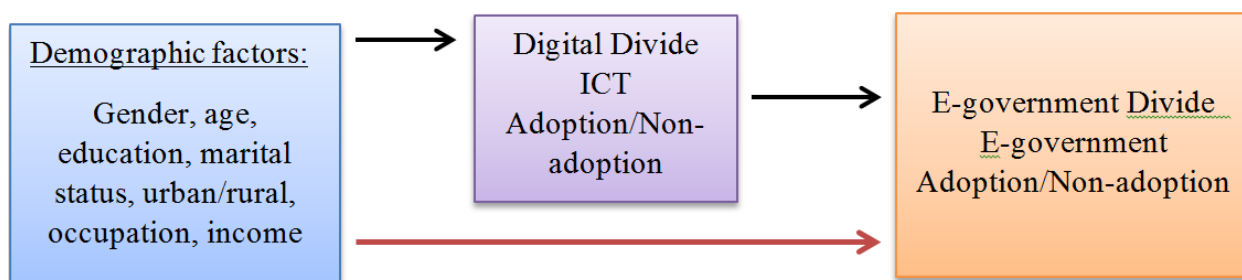


Figure 1: Proposed theoretical framework for e-government divide

METHODOLOGY

The research hypothesis that underlines this study is that the decision of a citizen to adopt e-government, or not is related to his/her area of residence, gender, marital status, age, education, sector of employment and income.

At first, stratified sampling was used whereby the number of respondents per region was randomly selected according to the percentage of the population prevailing in each particular region. This was done in an attempt to capture any difference that may exist across different regions. All analysis was carried out through the Statistical Package for Social Sciences (SPSS). Logistic regression was used to model the dummy variable e-government. This is a novel and effective way of assessing e-government divide. The log odds of adopting e-government services are modelled as a linear combination of gender, age, income, occupation, area of residence, qualification and marital status. Although the use of logistic regression is the first in the field, the forced entry method was used as there is prior research that tells us about the variables which may be reliable predictors. Wald Chi-Square statistics are also reported as they test the significance of coefficients in a logistic model. When the p-value of the odds ratio is less than 0.05, it may be stated that 'the predictor is making a significant contribution to the prediction of the outcome' (Field, 2009).

The following research hypotheses are tested in this study. These were derived from the relevant literature as discussed at length in the previous section.

H1: Gender does not predict the use of e-government services.

H2: Marital status does not predict the use of e-government services.

H3: Education is positively related to the likelihood of adopting e-government

H4: Income significantly affects a citizen's willingness to use e-government services.

H5: Sector of employment affects the likelihood of adopting e-government

H6: Age is inversely associated with the likelihood of e-government use

H7: The likelihood of e-government use differs across rural and urban areas.

While discussing the impact of each socio-economic factor on the likelihood of e-government adoption, the effects of all other predictors are held constant.

RESULTS AND DISCUSSION

The majority of the sample consists mostly of women, rural dwellers, private sector employees, those who are married/in a union, those aged between 26 to 35 years, earning up to Rs 10000 (or approximately €250) per month and have done at least a bachelor's degree. These are rather close approximations to the true population. Figure 2 and the Appendix illustrate some key characteristics.

Impact of Demographic Factors on E-government Divide

An investigation about how e-government use may be predicted by age, gender, area of residence, occupation, income, qualification, and marital status was carried out.

The Chi-Square goodness of fit rejects the null hypothesis of intercept and all coefficients being zero with a Chi-Square value of 160.1 ($p < 0.001$). Both the Cox & Snell R^2 of 0.403 and the Nagelkerke R^2 of 0.538 indicate that the model

is useful (around 40% and 54% respectively) in predicting the likelihood of e-government use in the Republic of Mauritius. The classification table shows 81% correct classification. The Hosmer-Lemeshow test ($\chi^2 = 5.183$, 8 degrees of freedom, $p = 0.738$) indicates that the goodness of fit is good. The number of citizens using e-government is not significantly different from what is predicted by the logit model. Table 1 displays the results from the logit model, that is, the coefficients with their respective standard errors, Wald test, odds ratios, and confidence intervals.

H1: There is insufficient evidence to claim that women are 0.6 times less likely to use government websites than men in the Republic of Mauritius ($p > 0.05$). This finding is in line with the study conducted by [Van Dijk et al \(2008\)](#) who did not find gender to be significant in e-government use. Unlike some countries where women face numerous restrictions, social and cultural factors in the Republic of Mauritius do not prevent most women from using the Internet or government websites at public places such as kiosks and cybercafés. Most probably there were no significant gender differences in ICT adoption in the first instance because of the equal access to free education (hence ICT education) granted to both sexes since 1976. Ultimately the likelihood of e-government use is not affected by gender.

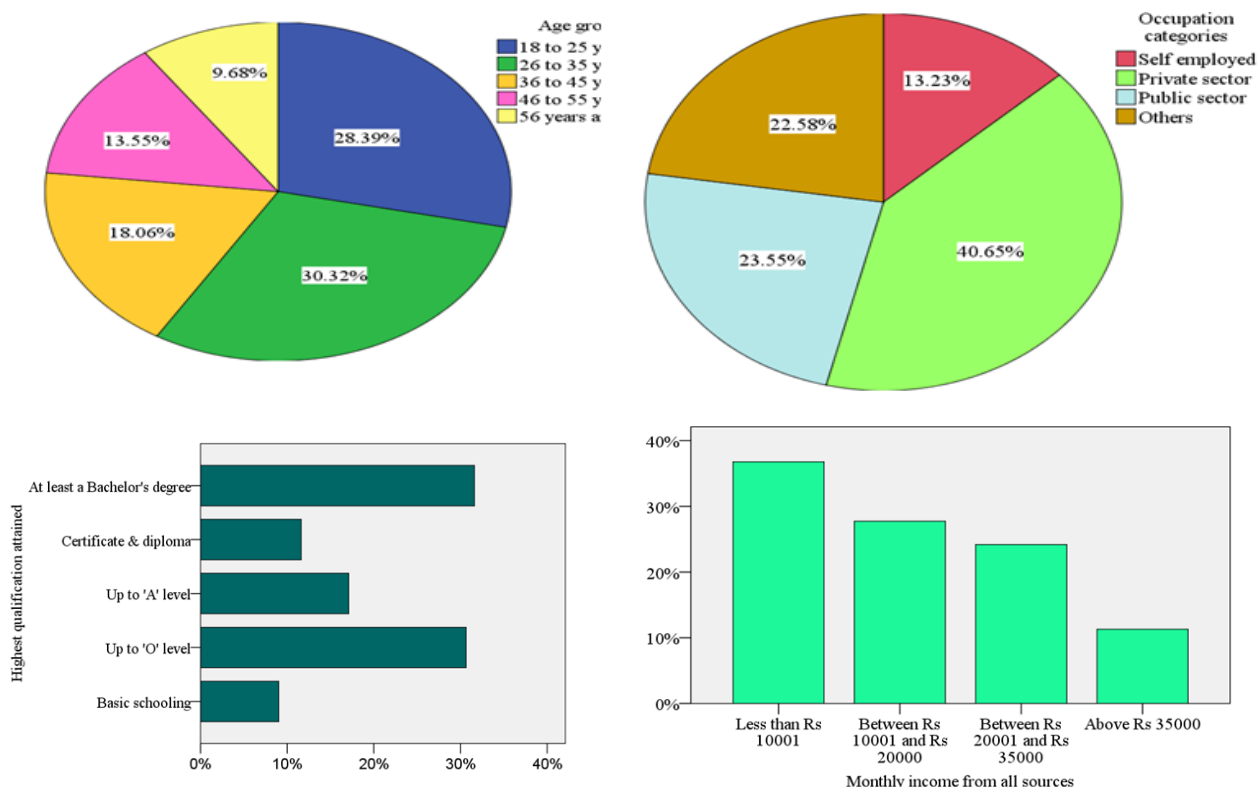


Figure 2: Characteristics of Participants

H2: The B coefficient on marital status is insignificant implying that marital status has no effect on e-government use in the Republic of Mauritius. This is line with Ibrahim & Pope [17] who also found that marital status did not influence e-government use. However, it may be argued that parenthood instead of marital status influences the adoption of e-government. Children who are exposed to ICT, live in an ICT ready environment and with e-government acceptance maybe eventually influenced to use ICT and government websites.

H3: The overall education coefficient is statistically significant at 0.1% level. Here ‘up to O level’ is used as the reference category. All education coefficients are statistically significant. All odds ratios exceed 1 implying that each education category (versus the reference category) increases the chances of e-government adoption. Those individuals who have done at least an undergraduate degree are around 14 times more likely to use e-government services than those who did up to ‘O’ level only. The odds of adopting e-government for those who did at least a certificate course or for those who did up to ‘A’ level only are around 10 times and 5 times, respectively more than those who studied up to ‘O’ level only.

The likelihood of adopting e-government rises with the level of education. Education thus makes a significant and positive contribution to e-government use in the Republic of Mauritius. This is in line with studies conducted elsewhere which have reported that the level of education affects the adoption of ICT and e-government on the user’s side ([AL Athmay et al, 2016](#); [Mwangakala, 2012](#); [Colesca & Dobrica, 2008](#); [Venkatesh et al, 2014](#); [Al-Shafi & Weerakkody, 2010](#); [Dwivedi, Choudrie & Brinkman, 2006](#); [Susanto, 2013](#)).

H4: When income is examined as a predictor for e-government adoption in the Republic of Mauritius, overall income has no impact on the likelihood of e-government use. The overall insignificant effect of income, that is, income does not predict the willingness of citizens to use e-government services is in line with other studies ([AL Athmay et al, 2016](#); [Mwangakala, 2012](#)). At any given income level, education tends to have a bigger impact on both ICT and e-government adoption. However, for those earning between Rs 20001 and Rs 35000, income seems to predict the use of government e-services in the Republic of Mauritius. People within this income category are 3.3 times more likely to use e-government services than those earning up to Rs 10000.

Table 1: Variables in the Logit Model

Demographic variables	B	Standard error	Wald	Odds ratio	Confidence Interval	
					Lower limit	Upper limit
Female	-0.487	0.335	2.061	0.619	0.321	1.192
Rural area	0.981**	0.340	8.342	2.667	1.371	5.189
Married or in a relationship	0.040	0.416	0.009	1.041	0.461	2.350
Age:	**		13.868			
18 to 25 years	3.010**	0.918	10.737	20.280	3.352	122.711
26 to 35 years	1.928*	0.873	4.880	6.879	1.243	38.068
36 to 45 years	1.244	0.880	2.000	3.470	0.619	19.462
46 to 55 years	1.696	0.873	3.777	5.454	0.986	30.179
Highest qualification attained:	***		33.677			
‘A’ level	1.677***	0.447	14.105	5.349	2.230	12.835
Certificate or diploma	2.274***	0.572	15.821	9.719	3.169	29.805
At least a Bachelor’s degree	2.604***	0.463	31.664	13.521	5.458	33.491
Sector of employment:			5.353			
Private sector	0.960	0.518	3.430	2.611	0.946	7.208
Public sector	1.274*	0.596	4.568	3.574	1.111	11.492
Others	0.518	0.647	0.641	1.679	0.472	5.964
Income:			4.550			
Between Rs 10001 to Rs 20000	0.918	0.508	3.269	2.504	0.926	6.771
Between Rs 20001 to Rs 35000	1.194*	0.585	4.168	3.300	1.049	10.382
Above Rs 35000	1.102	0.739	2.225	3.011	0.707	12.817
Constant	-5.272***	1.128	21.846	0.005		

*** Significant at 0.1%

**Significant at 1%

*Significant at

H5: The overall effect of the sector of employment is not statistically significant. But the coefficient on public sector employment is significant at 5% level. In the logit model the base category for the sector of employment is self-employment. The odds of adopting e-government for public sector employees are 3.6 times higher than those in self-employment. This is in line with the study conducted by [Islam, Yusuf, and Bhuiyan \(2015\)](#). This could be explained

through the social influence component of the Unified Theory of Acceptance and Use of Technology model (Venkatesh et al, 2000) or the peer effect prevailing in the public sector. Government departments are inter-connected and civil servants necessitate the use of government websites to perform their work.

H6: The overall effect of age is significant at 1% level. The '18 to 25 years' category is highly significant at 1% level and the '26 to 35 years' category is statistically significant at 5% level. Here the base age category is '56 years and above'. The odds of a citizen who is aged between 18 to 25 years, using e-government are 20 times higher than those of someone who is aged 56 years and above. Similarly, the likelihood of someone who is aged between 26 to 35 years to use government websites is around 7 times higher than that of someone who is above 55 years old. Although the coefficients of the other age groups (36 to 45 years and 46 to 54 years) are statistically insignificant (and given their relatively small sample sizes), it may be argued that the likelihood of using e-government services declines as age rises. This is in line with Mwangakala (2012) who argues that elderly citizens have very low interest in the Internet and Carveth and Kretchmer (2002) who report that older groups of people are less likely to use the Internet than younger groups. The use of the Internet precedes the adoption of e-government. Youngsters use e-government more actively when compared to the older generations (Jun & Wang, 2012) because the latter lack the necessary IT skills especially with more interactive websites that are more troubling. Thus evidence ostensibly appears to point to the conclusion that the younger the citizen is the higher is his/her likelihood to adopt e-government services in the Republic of Mauritius.

H7: The coefficient on dwellership is statistically significant at 1% level as shown in Figure 3. Rural dwellers are 2.7 times more likely to use electronic government than urban dwellers. As more education is acquired, people tend to use the Internet and e-government more (Akman et al, 2005) and less educated people prefer face to face interactions. However a higher percentage of urban dwellers were more educated than rural dwellers, for example, 64.1% of urban citizens had done at least 'A' level compared to around 57.4% of their rural counterparts. This would imply greater e-government use by urban dwellers and not by rural dwellers which is against what the logit model has reported in this study.

Nevertheless, a Mann-Whitney U test revealed that although the mean rank (of educational attainment) for urban dwellers is higher than the mean rank for rural dwellers, there is no significant difference in the educational attainment between the rural and urban citizens ($U=11180$, $p=0.409$). Differences in educational attainments may not, therefore, explain the lower tendency of urban dwellers to take up e-government. One explanation could be that most government offices are found in urban areas that are within the relatively easy reach of urban dwellers given that Mauritius is a very small country with all its towns situated near or on the Central Plateau. Thus the lower tendency of e-government use by urban citizens may be attributed to their possibilities of having higher number of visits to government offices than rural citizens. Rural dwellers have to travel long distances to have face to face interactions with government officials.

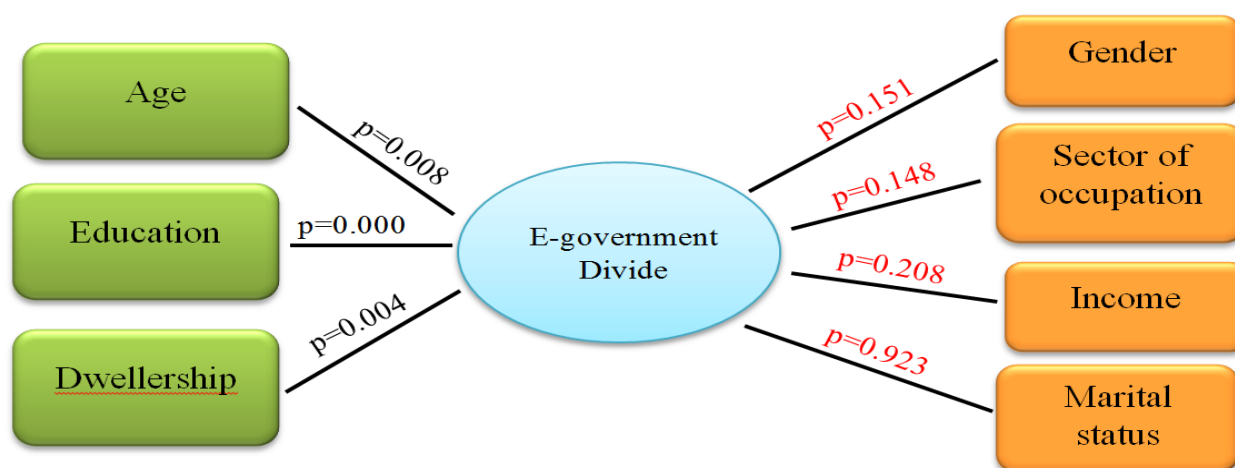


Figure 3: Overall effects of socio-economic factors on e-government divide

Moreover, if education is removed from the logit model, all coefficients on income groups, sectors of employment and older age groups become significant with the exception of gender and marital status which remain insignificant throughout the analysis. This suggests that e-government divide across the middle-aged and elder generations may not be attributed to age only. Similarly e-government divide may not be due to income levels and sectors of employment per se. Education plays a more vital role in explaining e-government divide in the Republic of Mauritius.

CONCLUSION

This paper assessed the e-government divide in terms of demographic factors. It may serve as pioneer research in the field for the Republic of Mauritius. A Nagelkerke R^2 of 0.538 was reported. The goodness of fit test which is the Hosmer-Lemeshow test revealed a χ^2 (8) of 5.183 and was statistically insignificant. The number of observations in each group exceeded 5 as ideally required to meet the conditions for reporting the Hosmer-Lemeshow test statistic. There were 81% correct classifications. The model fitted to the data well.

This study has highlighted the greater role that education per se plays in the theoretical framework on the e-government divide and that rural dwellers are not necessarily at a disadvantage. Gender and marital status do not predict the use of online government portals. Nevertheless, there is sufficient evidence to support the hypothesis of e-government divide in terms of age, occupation, education, urban/rural dwellers, and income in the Republic of Mauritius although education alone is said to have a bigger impact on e-government divide. Contrary to the existing literature, rural dwellers have greater odds of using government websites although these citizens are less educated than their urban counterparts. Also those citizens who are younger, more educated, live in rural areas, have a monthly income of Rs 20001 to Rs 35000 and in public sector employment are most likely to use e-government services compared to their respective counterparts. These inequalities combined with the poor delivery of most government e-services, the massive investments in e-government initiatives carried out so far in the Republic of Mauritius are not justified.

POLICY IMPLICATIONS

Some groups of citizens face higher obstacles than others, so the government must pay attention to the marginalized groups and devote more resources to them. Without access to ICT and lack of ICT competencies, these citizens would be unable to benefit from the expensive e-government initiatives. They would not be able to retrieve information online and conduct their transactions with the government and e-participate into policymaking.

The government must learn from successful e-government implementations across the world, for instance, the case of transfer of elementary school teachers in Karnataka which takes the needs of disabled and female teachers into consideration and removes all vested interests or the case of Gyandoot Community Network in Madhya Pradesh where its focus is on key information that villagers want such as online link to primary health care center and prices of agricultural products ([Saxena, 2005](#)).

Moreover, for low-income groups, the government must provide internet at subsidized prices. Also in the sample 68% of those within the 'Rs 20001 to Rs 35000' income category are e-government users which means that a considerable percentage of citizens within the same income group are non-users. The government may investigate further into what appeals to this segment of the population as it seems that this group already has all the required resources to embrace e-government.

Elderly citizens are more unlikely to use electronic government and this may become a serious issue as their inputs to decision-making are of paramount importance. The Republic of Mauritius has an increasing number of older citizens. Life expectancy at birth is estimated at around 71 years for men and 78 years for women. The percentage of senior citizens (60 years and above) is expected to reach around 29% of the total population by 2040 ([Rorissa & Demissie, 2010](#)). The government must, therefore, devise special programs, provide training along with free and easy access for senior citizens to increase their motivations and willingness to use online government services so that they would not be excluded from e-government initiatives.

The government should offer on-going IT courses and assistance to old people through kiosks, public libraries and community centres which must be properly equipped with adequate number of computers and technical assistance. With adequate training and access to ICT, old people may be able to fight their computer anxieties. The government must aim at creating knowledgeable citizens who are ready for e-government. Besides education per se plays a greater role in eliminating e-government divide.

The government must abide by the concept of citizen-centric governance, that is, prioritize customer satisfaction and deliver services according to its citizens' needs. These would translate into online government portals that, for example, are safe, well-designed, easy to use, written in languages accessible to all segments of the population, carry all the required information, answer all queries promptly, provide access to representatives and provide relevant features to assist citizens in completing their tasks online. Following [Luo \(2009\) and Saxena \(2005\)](#), the government must serve diverse groups of citizens, including those who are old, poor and disabled instead of merely serving an universal group such as online taxpayers. Policymakers should devote more energy to finding out how well e-government is doing and whether these e-services are actually fulfilling people's expectations.

[Rehman, Esichaikul, and Kamal \(2012\)](#) report that awareness is a significant determinant of a person's intention to use electronic government for searching information online and conducting transactions online with the government. Awareness campaigns should help create the perception that both online and offline services are important to complete e-government transactions. Emphasis must be laid upon the fact that this combination speeds up the delivery of public services, for instance the amount of time required for applying for a driving license in the Republic of Mauritius has been reduced considerably through the online application process. Also many citizens are unaware of the various government services available online. Thus, it is important for government officers to tell them about the online availability of public services when the latter go to their offices. This will also help to spread awareness among offline citizens. Here good offline public services may have strong and positive influences on the use of public e-services.

However, awareness is not to be restricted to the advertisements of government e-services and telling citizens about the benefits of electronic government. For the successful adoption of e-government, citizens must be made aware of whether or not their online applications or grievances were received and they must be informed of the actions taken by the

government officers within a specified length of time. Citizens must be able to check the status of their online queries, applications, and requests at their convenience.

Also, some citizens are using smartphones as their only means to connect to the Internet. As argued by [Van Dijk et al \(2008\)](#) the actual e-government service supply is a precondition for citizens to develop the interest to use these e-services. Thus government officials and all the other stakeholders should ensure that all of the e-government services available on PCs are equally available on mobile sites. Also all government services have not yet been digitized and most services are still being offered through the traditional face to face interactions. Government administrators must transform these into digital channels and offer them to the public at the earliest. These measures may help to boost the demand for online government services. However to ensure the success of e-government initiatives, the government requires skilled and professional local employees who can plan and implement e-government projects properly. Also the government must join hands with other stakeholders such as private organizations and NGOs to fight against both the digital divide and the e-government divide.

Government officers must investigate further into the requirements of each demographic group and amend their websites according. An example would be redesigning the government website to act as a free and regularly updated platform for online job advertisements from public and private sectors to cater to the needs of the unemployed. Similarly full-time students may be attracted by the online provision of educational resources. Also the self-employed should be made aware of all the applications that can be made and submitted online. E-government should be of tremendous help to disabled people. While designing government websites, and during implementations, adequate attention must be given to this group of people by allowing for sign language, offers read-aloud services, the possibility of altering font size, color and so on to meet the needs of the disabled.

Ideally, e-government should neither create social exclusion nor marginalized groups. Ignoring the e-government divide that already exists in the Republic of Mauritius will only increase the excluded segments of the population and lower their input in economic development.

LIMITATION OF STUDY

The logistic model is recommended for a large sample size with at least 500 observations otherwise the significance level of the Wald statistics gets inflated ([Verma, 2013](#)). However since the Chi-square value of the Hosmer and Lemeshow test is statistically insignificant, the logistic model in this paper is valid for predicting e-government use and provides a pioneer study.

SUGGESTIONS FOR FUTURE STUDIES

This research paper provides a seed for further research. Other aspects such as computer experience, IT competency, frequency of searching information online and frequency of internet use; the extent to which e-government meets the users' demand; and the degree of online task completeness must be investigated. Probing into these aspects may add to the knowledge on the demand side of e-government services.

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