The Values of Public Library in Promoting an Open Government Environment

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ABSTRACT

Public participation has been less than ideal in many government-implemented ICT initiatives. Extant studies highlight the importance of public libraries as an intermediary between citizens and government. This study evaluates the role of public libraries as mediating the relationship between citizens and government in support of an open government environment. Using data from a national survey of "Library and Technology Use" conducted by PEW Internet in 2015, we test whether a citizen's perception of public values provided by public libraries influence the likelihood of the citizen's engagement within open-government environment contexts. The results signify a significant relationship between certain public values provided by public libraries with the propensity of citizens engaging government in an online environment. Our findings further indicate that varying public values generate different results in regard to the way citizens are stimulated to use public libraries to engage with government online. These findings imply that programs designed and developed to take into account a variety of values are more likely to effectively induce citizen engagement in an open government environment through the mediation of public libraries.

CCS Concepts

• **social and professional topics – technology policy – government technology policy – governmental regulations**

Keywords

"public libraries", "open government", "public values", "citizens engagement", "e-government".

1. INTRODUCTION

"If you build it, they will come." This famous line from the movie, Field of Dreams, reflects the underlying premise of many government ICT investments. Alas, public participation in many government ICT investments, such as open government and open data, has been underwhelming. Many initiatives assume that

citizens will be willing and interested to participate once the ICT project is developed [11].

Open government and open data has been criticized for focusing more on the supply side and less on the demand side [20]. Traditionally, the common strategy to encourage participation in open government and open data often involved events such as innovation competitions [11,13]. Yet, program such as innovation competitions are often overstated [11, 21] and user participation for open data is often low [18]. For instance, the total number of visits to data.gov.uk from July 2012 to December 2015 was only 6,547,307, averaging around 150,000 visits per month (https://data.gov.uk/data/site-usage#totals). In October and November 2015, data.gov had 357,905 visitors (https://data.gov/). The visitors of usaspending.gov in February 2011 was just under 10,000, and the site costs $4 million per year to maintain [29]. This situation could plausibly, as argued by Gurstein [8], depict a "data divide" in which efforts to extend access to data did not reach "everyone" since not "everyone" has access to infrastructure or skills that permit them to use open government and open data.

Public libraries are argued to have important roles in supporting an open government environment by, among other things, providing access and bridging the "data divide" [4,5,17,27]. A 2014 report by the Center for Technology in Government (CTG) strongly asserts that "The traditional and important role of public libraries as trusted information intermediaries provides a powerful platform for public libraries to be key facilitators in opening government," (Burke et al, [5], p. 6). The Center for Technology in Government recommends that public libraries focus on the demand side of open government and further argue that the public value of these libraries plays a significant role in the community open government ecosystem [5]. Public libraries promote increased digital inclusion to marginalized populations and those who face challenges using and benefiting from computers and the internet [23].

In this study, we concentrate on evaluating the role of public libraries to facilitate an open government environment by mediating the relationship between citizens and government ICT initiatives such as e-public services, open government and open data. We examine how citizens' perceptions of the value of public libraries determine their use of government ICT initiatives. Thus, we focus on two research questions: a) Do public libraries provide the value of facilitating users to engage open government? and b) How do public values and citizens' perceptions of those values in regard to public libraries determine citizen interaction with online government? We adopt the definition of Harrison et al [9] to identify open government environment as an ecosystem of interdependent relationships of government, innovators and citizens to promote transparency, accountability and participation. To maintain interdependency, such ecosystems rely on

intermediaries, such as public libraries to bridge connections and enable open government [5].

In addition, we adopt OECD's conceptualization of open government as transparency and accessibility of government services and information as indicators of open government. Thus, we consider citizens visiting government websites, acquiring information about government services, or using online databases as activities within an open government environment. Hence, we construct and justify our dependent variables as such.

We adopt the value-generating mechanisms from the public value framework of the Center for Technology in Government to define our variables. We specifically focus on two of their value-generating mechanisms, namely: a) enablement: providing means to enable the achievement of activities, and b) intrinsic enhancement: changing the environment in ways that are valuable to citizens [6]. To test for our hypothesis, we use data from a Pew Internet survey conducted on April 2015 called "Libraries and Technology Use" (http://www.pewinternet.org/datasets/).

Our paper is organized in five sections including the foregoing introduction. Section two presents our literature review, hypothesis and proposed model. In section three we describe our methodology. We present our analysis results and findings in section four and conclude our paper with discussion and concluding remarks in section five.

2. LITERATURE REVIEW & HYPOTHESIS DEVELOPMENT

2.1 Public Values, Public Libraries and Government ICTs Investments

Government investment in ICT systems to transform public services is argued to create values more than just financial benefit [6] and is not just about delivering economic efficiency or effectiveness [19]. In terms of government ICT investment, Cresswell et al [6] argue that these values—coined "public values," a concept first put forward by Moore (1995)—relate to "the delivery of benefits directly to citizens and enhancing the value of government itself as a public asset" (Cresswell et al, [6], p. 2). They further argue for four value-generating mechanisms from which ICT investments can deliver public value, namely: increases in efficiency, increases in effectiveness, enablement and intrinsic enhancement [6].

One area of focus for government ICT investment is the modernization and transformation of public library services, including access to internet, software and digital content; such transformation is key in promoting digital inclusion [12,26,30]. Public libraries play a critical role as intermediaries in extending benefits of ICTs offered by the library or by other agencies [3,4,15–17,23,27]. One impact of ICT investments in public libraries is the provision of online government services to citizens [2–4,10,15–17,22,27].

Public libraries are seen as trusted information intermediaries that connect citizens to their government [4,5,17]. The modernization of public libraries through ICTs potentially enhances the perception of public values regarding use of the library as an environment to engage in open government [5]. Citizens presume certain public values when using public library services, including engaging with government in an online environment [2]. The perceived public values of public libraries determines if and how citizens use e-government [1].

Public values of government services (including public libraries) can be generated from two mechanisms: enablement and intrinsic enhancement [6]. Enablement refers to values generated from the capability of public libraries to provide means to access the open government environment through the use of computer, internet or mobile application provided by the public library [6]. In addition, citizens obtain public values from intrinsic enhancement, which is the way in which public libraries change so that citizens can connect with government in an environment of open government. For instance, because public libraries provide assistance to citizens seeking information, citizens are more competent in deciding what information they can trust or how to protect their security and privacy.

On the other hand, extant studies show that access and acceptance of information technology innovation was significantly affected by the behavioral aspect of users [25]. A large body of research evaluated the determinants of users' direct experience in using the innovation by focusing on the user's expectation about outcomes and belief in one's own ability to perform particular actions [14,25]. The concept of user expectation about outcomes is known as perceived-usefulness [7]. One's beliefs regarding the ability to perform a particular action is known as self-efficacy [14] and it affects the perceived ease-of-use in using and adopting technology innovation [7,14,25,28].

Drawing from the above-mentioned argument, we posit that citizen engagement in open government through the mediation of public libraries is influenced by the citizen's perception of the public values of public libraries and the citizen's self-efficacy in using ICTs. We thus proposed our theoretical model in figure 1 below and explain our individual hypothesis in subsequent sections.
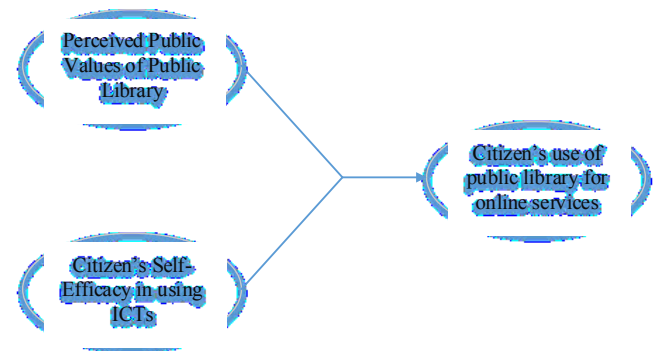

Figure 1. The Preliminary Model

2.2 Hypothesis Development

a. Public Library Enabling Citizens to Use Open Government

As asserted by Burke et al [5], public libraries is the forefront of providing access to enable citizen's engagement with government and others. Public libraries have and can provide free public access to the technology needed for the citizens to engage with government [4,17,22]. On the other hand, providing free access does not necessary means that the citizens will use it to engage with government [10]. From broader perspective, providing access also means enabling the citizens to use of the technologies through literacy programs as well as helping citizens navigate the process of obtaining online government services and information [17].

Public libraries have always been regarded as the frontrunners in providing literacy training, including learning new technologies [4, 5, 10, 17]. The technology literacy training provided by public libraries is argued to influence the citizen's engagement with

government [17]. This is especially due to a funneling effect when citizens rely on libraries to engage with government since agencies closed local offices and moved their services and resources online [24].

Public libraries also possess knowledge that can inform and assist citizens navigating the processes of identifying information when engaging with government online [22, 27]. Public library enable citizens to engage with government in online environment by helping their patron to navigate the process of reducing the barriers of getting the information [22], such as reducing the effort to identify which information to trust. Hence, we propose the following hypothesis:

H₁: Public values provided by public libraries through the enablement significantly influence the likelihood of citizens using public libraries to engage in open government environment.

b. Public Library Support Intrinsic Enhancement for Citizens to Use Open Government

Public libraries also create public values through intrinsic enhancement, by changing the environment or circumstances that enhance the capability of citizens to engage with government [6]. We argue that public libraries create public values through intrinsic enhancement by assisting, offering guidance and helping their patrons. By offering help, public libraries changing the circumstances for citizens in engaging in open government in ways that are valued by the citizens. Other than providing access, the other significant role of public libraries is in providing assistance to their patron [2, 4, 17].

The skilled librarians who are presumably familiar with multiple government systems offer assistance to their patron in interacting with government when requested [10], including personalized help to the patrons [27]. Public libraries assist patrons seeking information [22] and could help patron identifying how to protect their privacy and security. The skilled librarians also provide assistance in using the digital tools to whom who are not familiar to use it [22]. The librarians also offer assistance to help citizens carry out tasks involving government, such as seeking and requesting public records [22]. The assistance provided by public libraries influence the propensity of citizens in engaging with government, foremost in online environment [10, 17, 22, 27]. We thus propose the following hypothesis:

H₂: Public values provided by public libraries through intrinsic enhancement significantly influence the likelihood of citizens using public libraries to engage in open government environment.

c. Self-Efficacy Influence the Citizen's Uses of Open Government

Finally, a lot of research in information systems posit that access and acceptance of information technology innovation was significantly affected by the behavioral aspect of users [25]. The beliefs that one has the ability to perform particular action, also known as self-efficacy is argued to significantly influence the users' usage of technology innovations [14, 25]. Consequently, we posit that:

H₃: Citizen's self-efficacy in using web and mobile applications significantly influence the citizens using public libraries to engage in open government environment.

3. METHODOLOGY
3.1 Sample and Distribution

This study analyze the publicly available data (2015 Library and Technology Use) from the national survey conducted by the Pew Internet via phone interviews on 2015. The national survey track 2,000 individuals in the US age 16 and above. This study used portion of the original dataset keeping only responses pertinent to this analysis. We extracted dataset (N = 130) from respondents who used library website or mobile application to visit government website, obtain government services online or using online databases to get data.

Table 1 shows the distribution of the samples. Majority 42% of the respondents are between the ages of 16 to 45, followed by those (36%) whose age is from 46 to 65. The majority of the respondents are white Americans (77%) with majority (60%) obtain minimum college degree or above. Only minority (17%) of the respondents are not employed for pay while the greater part (51%) are employed full time (40%) or part time (11%) with 45% of the respondents earn annual salary between $10,000 to under $50,000 and 44% of the respondents earn annual salary of $50,000 or above.

Table 1. Distribution of Sample

	Categories	%
Employment	Employed Full Time	40%
	Employed Part Time	11%
	Retired	26%
	Not employed for pay	17%
	Self-Employed	2%
	Other (Disabled, Student, etc.)	5%
Education	Less than or high school incomplete	12%
	High school graduate	28%
	College or two year associate degree	25%
	Four years college or university degree	20%
	Postgraduate	16%
Race	White	77%
	Black or African American	14%
	Asian or Pacific Islander	3%
	Mixed Race	3%
	Native American	1%
	Other	2%
Income	Less than 10,000	11%
	10 to under 30,000	27%
	30 to under 50,000	18%
	50 to under 100,000	25%
	More than 100,000	19%
Age	16 – 25 years old	16%
	26 – 45 years old	26%
	46 – 65 years old	36%
	> 65 years old	22%

3.2 Variable Measurement
a. Dependent variables: Citizens Engagement in Open Government Environment

We use two dependent variables to which both measuring the likelihood to engage in open government through the mediation of public library. Both of the dependent variables are a dichotomous variable gives value of 1 if the respondent respond YES and 0 if the respondent respond NO.

- The first dependent variable named as government use, measure the likelihood that a respondent use a public library computer, internet or Wi-Fi connection to visit government website or get information about government services.

- The second dependent variable named as database use, measure the likelihood that a respondent use a public library website or mobile app to use online database.

b. Independent Variables

1) Enablement: The Role of Public Libraries to Provide Means for Involvement in Open Government environment.

There are two variables representing the role of public library to enabling involvement in open government. These variable measures the role of public library to enable citizens involving in open government by helping them deciding what information they can trust and helping them learn how to use new technologies.

- The first variable named as enable trust measures the role of public library to provide the means to help people decide what information they can trust.

- The second variable named as enable technology measures the role of public library to provide the means to help people learn how to use new technologies.

Both of these variables are measured in 4-point ordinal scale, from: a lot (1) to not at all (4).

2) Intrinsic enhancement: The Role of Public Libraries to Change the Environment to enable involvement in open government environment

There are three variables representing the role of public library to create public value by providing intrinsic enhancement to the citizen to be involved in open government. These variables measures the respondents' perceptions on the role of public library that enhance the capability of citizens to engage in open government by offering program to teach about privacy and security, teach citizens how to use digital tools, and to do tasks involving governments, or other institutions.

- The first variable named as intrinsic enhancement privacy and security measure whether public library should offer programs to teach patrons about protecting their privacy and security online. This variable is measured in 4-point ordinal scale ranging from: (1) should definitely do to (4) doesn't really matter.

- The second variable named as intrinsic enhancement digital tools measure public library should offer programs to teach patrons how to use digital tools such as smartphones, mobile apps and computers. This variable is measured in 4-point ordinal scale ranging from: (1) should definitely do to (4) doesn't really matter.

- The third variable named as intrinsic enhancement tasking measure respondents perception on whether public library provide values by offering help to patrons on how to use the internet or mobile apps to carry out tasks involving governments or other institutions. This variable is a dummy variable with value of 1 given if respondent feels that public library help them carrying out tasks involving governments or other institutions and value of 0 is given if they feel otherwise.

3) User's Self-efficacy for Involvement in Open government environment

There are two variables measuring respondents' self-efficacy in getting involved with open government. These variables measure respondents' perception on the ease to carry out tasks with government and schools using internet and the ease for them to carry out the tasks using mobile apps. The construct to measure this variable is as follows "These days, institutions such as government and schools often expect that people will contact them or learn about them using the internet. How easy

is it for you to carry out tasks with these institutions using the internet or email [mobile apps] (PEW Internet)" These variables are measured in 4-point ordinal scale ranging from: very easy (1) to not at all easy (4).

3.3 Analysis Technique

Given that the dependent variables are dummy variables, we use multivariate logistic regression to test our hypotheses on the causal relationship between the public value of public library and self-efficacy to the propensity of citizens to use public library to engage in open government. In addition, we also run series of cross-tabular analysis and pairwise correlation to better understand the bivariate relationship; an analysis of relationship between two variables. Finally, we run some simulations to test our model from the logistic regressions.

4. RESULTS AND FINDINGS

The premise of this study is to understand the role of public libraries in enabling citizens to engage in open government environment. For that, we posit that citizens' perception upon the public values provided by public libraries will influence them to engage in certain activities within open government environment, such as: getting certain information about government services, visiting government website, or using online databases. Our analysis thus is conducted in two steps. First, we evaluate the cross tabulation between the independent and dependent variable to better understand the bivariate relationships among the variables. Second, we evaluate the causal relationship between all of the independent variables to the dependent variables.

4.1 Correlating Public Values of Public Libraries with the Likelihood to Engage in Open Government Environment

Our bivariate analysis was conducted in two forms: correlation and cross tabulation. Table 2 shows the results of pairwise correlation among the variables. The results show low to moderate correlation coefficient and the directions of the relationship varies. Some variables also shown to have significant relationship among them. For instance, intrinsic enhancement by offering programs to teach people how to use digital tools (teach) has a significant, positive but moderate relationship (coeff. 0.401, $p< 0.05$) with enablement by providing help to people how to use new technologies (teach). This suggestively means that an increase in the way public libraries providing means to enable citizens to learn about new technologies will also increase the citizens' perception on how public libraries change the environment by offering programs to use digital tools that are valued for the citizens.

In another instance, enablement by providing help to people on how to use new technologies (tech) is shown to have weak, negative but significant relationship (coeff. -0.231, $p< 0.05$) with the likelihood that respondents use a public library computer, internet or Wi-Fi connection to visit government website or get information about government services (govt).

This suggestively indicates that an increase in the way public libraries providing means to enable citizens to learn about new technologies does not necessarily increase the likelihood of citizens using a public library computer, internet or Wi-Fi connection to visit government website or get information about government services. To further understand this result, we need to analyze the results from our cross tabulation linking the independent to the dependent variables.

Table 2. Pairwise Correlation Matrix

	govt	dbase	task	teach	trust	tech	prive	web	apps
govt	1.000								
dbase	**0.213**	1.000							
task	**0.290**	0.038	1.000						
teach	-0.144	-0.102	-0.068	1.000					
trust	-0.116	0.138	0.081	0.166	1.000				
tech	**-0.231**	-0.054	-0.071	**0.401**	**0.292**	1.000			
prive	-0.002	0.032	**-0.169**	0.002	0.024	0.081	1.000		
web	0.037	-0.060	0.032	-0.036	**0.212**	-0.020	-0.057	1.000	
apps	0.017	-0.140	0.036	0.157	**0.252**	0.042	0.015	**0.546**	1.000

*) *bold indicate significant at 0.05 level*

Table 3. Crosstab & Chi-Square

		Government Website			Using Online Database		
		Yes	No	Total	Yes	No	Total
Intrinsic enhancement by teaching digital tools	Definitely	93.10%	84.72%	88.46%	90.48%	86.57%	88.46%
	Maybe	6.90%	12.50%	10.00%	9.52%	10.45%	10.00%
	No	0.00%	2.78%	1.54%	0.00%	2.99%	1.54%
Intrinsic enhancement by teaching privacy protection	Definitely	81.03%	80.56%	80.77%	79.37%	82.09%	80.77%
	Maybe	17.24%	18.06%	17.69%	19.05%	16.42%	17.69%
	No	1.72%	1.39%	1.54%	1.59%	1.49%	1.54%
Intrinsic enhancement by helping carry out tasks	Yes	46.55%	53.45%	31.54%	33.33%	29.85%	31.54%
	No	19.44%	80.56%	68.46%	66.67%	70.15%	68.46%
Enable citizens to decide information to trust	A lot	32.76%	19.44%	25.38%	20.63%	29.85%	25.38%
	Somewhat	43.10%	50.00%	46.92%	44.44%	49.25%	46.92%
	A little	15.52%	19.44%	17.69%	23.81%	11.94%	17.69%
	Not at all	8.62%	11.11%	10.00%	11.11%	8.96%	10.00%
Enable citizens to use new technology	A lot	51.72%	27.78%	38.46%	38.10%	38.81%	38.46%
	Somewhat	37.93%	50.00%	44.62%	46.03%	43.28%	44.62%
	A little	5.17%	12.50%	9.23%	11.11%	7.46%	9.23%
	Not at all	5.17%	9.72%	7.69%	4.76%	10.45%	7.69%
self-efficacy in using internet	Very Easy	43.10%	50.00%	46.92%	52.38%	41.79%	46.92%
	Somewhat	43.10%	36.11%	39.23%	31.75%	46.27%	39.23%
	Not too easy	10.34%	9.72%	10.00%	12.70%	7.46%	10.00%
	Difficult	3.45%	4.17%	385.00%	3.17%	4.48%	385.00%
self-efficacy in using mobile apps	Very Easy	25.86%	29.17%	27.69%	28.57%	26.87%	27.69%
	Somewhat	34.48%	37.50%	36.15%	38.10%	34.33%	36.15%
	Not too easy	18.97%	15.28%	16.92%	17.46%	16.42%	16.92%
	Difficult	20.69%	18.06%	19.23%	15.87%	22.39%	19.23%

4.2 Cross-tabulation the Determinants

The results from the cross tabulation displaying a distribution of cases by their values on two variables are shown in table 3 above. The results indicate that citizens who place a high public values on services and facilities offered by public libraries are shown to have more inclination to use a public library computer, internet or Wi-Fi connection to visit government website or get information about government services. Respondents who perceive that public libraries providing public values through intrinsic enhancement by teaching to use digital tools (93.10% yes; 84.72% no), intrinsic enhancement by teaching about privacy and security protection (81.03% yes; 80.56% no), enabling citizens to decide which information to trust (32.76% yes; 19.44% no) and enabling citizens to use new technology (51.72% yes; 27.78% no) are suggestively associated with the likelihood to use a public library computer, internet or Wi-Fi connection to visit government website or get information about government services (govt). The results indicate that percentage of respondents who perceive that public libraries provide public values by helping them carry out tasks involving government and they use a public library computer, internet or Wi-Fi connection to visit government website are lower (46.55%) than percentage of respondents who perceive the same public value and do not use a public library computer, internet or Wi-Fi connection to visit government website (53.45%). The results also show that respondents who considered themselves more efficacious in using webs and mobile apps are less incline to use a public library computer, internet or Wi-Fi connection to visit government website. 50% of respondents who consider themselves have high efficacy in using internet and webs are those who do not use public libraries to visit government website, while 43.10% of these high efficacious respondents are those who use public libraries to visit government website.

On the other hand, the cross tabulation results shown in table 3 indicate that in average the percentage of respondents who are less likely to use a public library website or mobile app for using online database are higher than those who are more likely to use a public library website or mobile app for using online database. Even if the citizens perceived that public libraries provide public values through intrinsic enhancement by teaching about privacy and security protection (79.37% yes; 82.09% no) or enable citizens to decide which information to trust (20.63% yes; 29.85% no), these respondents do not necessarily use a public library website or mobile app for online database. On the other hand, providing public values through intrinsic enhancement by teaching citizens to use digital tools (90.48% yes and 86.57% no) or intrinsic enhancement by helping citizens carry out tasks involving government (33.33% yes and 29.85% no) are associated with more likelihood to use a public library website or mobile app for online database. Likewise, respondents with higher self-efficacy in using internet or mobile apps are more likely to use a public library website or mobile app for using online database.

4.3 The Determinants of Involvement in an Open Government Environment

While results from correlation and cross tabulation could provide measurement of association between two variables, these techniques do not analyze the causal relationship among the variables. This section describes the results from multivariate logistic regression to better understand which variables predict the likelihood of citizens using public libraries to engage in open government environment (table 4).

The results indicate that there are two (significant or close to significant) predictors that affect the likelihood of citizens to use a public library computer, internet or Wi-Fi connection to visit a government website or get information about government services, and the propensity of citizens to use a public library website or mobile app to access online databases.

Table 4. Multivariate Logistic Regression

Variables	code	Use of Government Website	Use of Online Database
Intrinsic enhancement in Conducting Tasks	task	1.41687 * (.40873)	.146916 (.37172)
Intrinsic enhancement by teaching the use of digital tools	teach	-.332000 (.50187)	-.442815 (.47160)
Intrinsic enhancement by teaching about privacy and security	prive	.473600 (.34193)	.307458 (.38366)
Enablement in helping people decide information to trust	trust	-.180021 (.20532)	.483311 * (.19920)
Enablement in helping people learn to use new technologies	tech	-.430311 ** (.22404)	-.196623 (.22458)
Self-Efficacy in using internet for tasks involving government	web	.128079 (.24593)	.004517 (.23073)
Self-Efficacy in using mobile apps for tasks involving government	apps	.027544 (.18621)	-.283328 ** (.15092)
N		130	130
Wald χ^2		19.59	10.63

*) significant at 0.05   **) close to conventional threshold levels of statistical significance of 0.05 (p ≤ 0.1)

Citizens' perceptions that public libraries provide public values through intrinsic enhancement, in the form of assistance in using the internet or mobile apps to access online governments or other institutions, significantly and positively influences the propensity of citizens to use a public library computer, internet or Wi-Fi connection to visit government websites or get information about government services (coeff. 1.417, p<0.05). 'who perceived that perception that public libraries provide public values through intrinsic enhancement by providing help to patrons on how to use the internet or mobile apps to carry out tasks involving governments or other institutions is more likely to use a public library computer, internet or Wi-Fi connection to visit government website or get information about government services. For a one-unit increase in citizen perceptionthat public libraries provide public values through intrinsic enhancement by providing help patrons on how to use the internet or mobile apps to carry out tasks involving governments or other institutions, the log odds of citizens using (versus not using) a public library computer, internet or Wi-Fi connection to visit government websites or to get information about government services increases by 1.417.

The results also show that citizens' perception that public libraries provide public values by enabling people to learn to use technology is close to conventional threshold levels of statistical significance (p=0.055), but negatively influences the likelihood that the citizen will use a public library computer, internet or Wi-Fi connection to visit government websites or to get information about government services (coeff. -.4303). This means that for a one-unit increase in citizen perception of public libraries as providing public values by enabling people to learn to use technology, the log odds decrease for citizens using a public library computer, internet or Wi-Fi connection to visit government websites or to get information about government services.

On the other hand, when the dependent variable measures the likelihood that citizens will use a public library website or mobile app to access online databases, the results indicate that only the citizen's perception that public libraries provide public values by enabling people to decide which information to trust is statistically significant at 0.05 levels. The results indicate that for every one-unit change in citizen perception about the public values in the form of public libraries enabling citizens to decide which information to trust, the log odds of citizens using (versus not using) a public library website or mobile app to access online databases increase by .4833. Likewise, the results also indicate that citizens who have high efficacy in using mobile apps for tasks involving government are less likely to use a public library website or mobile app to access online databases with the p-value falling just short of the conventional threshold levels of statistical significance (p=0.06).

4.4 Simulating Citizens' Propensity to Use Public Libraries to Engage in Open Government Environment

We run several simulations to better understand the determinants of citizens' propensity to use public library internet, Wi-Fi, web and mobile apps to engage in an open government environment. If we set the value of the independent variables to the highest value (such as: should definitely teach digital tools, help citizens a lot to use new technology, etc), the probability of the respondents using public libraries to access the internet, Wi-Fi and mobile apps to use government websites is 75.10%. If we alter the value of the independent variables, we will have different probability values.

Table 5. Simulation of the Logistic Regression Results

	Value is changed to*)	Probability of Using Public Library for Government Website		Probability of Using Public Library for Online Database	
		Yes [Pr(y=1|x)]	No [Pr(y=0|x)]	Yes [Pr(y=1|x)]	No [Pr(y=0|x)]
Intrinsic enhancement by helping carry out tasks [yes = 1; no = 0]	0	42.24%	57.76%	46.82%	53.18%
Intrinsic enhancement by teaching digital tools [should definitely do = 1 : does not matter = 4]	4	52.69%	47.31%	21.27%	78.73%
Intrinsic enhancement by teaching privacy protection [should definitely do = 1 : does not matter = 4]	4	92.58%	7.42%	71.95%	28.05%
Enable citizens to decide information to trust [a lot = 1 : not at all = 4]	4	63.73%	36.27%	81.30%	18.70%
Enable citizens to use new technology [a lot = 1 : not at all = 4]	4	45.33%	54.67%	36.11%	63.89%
self-efficacy in using internet [very easy = 1 : not at all easy = 4]	4	81.58%	18.42%	50.82%	49.18%
self-efficacy in using mobile apps [very easy = 1 : not at all easy = 4]	4	76.61%	23.39%	30.35%	69.65%
Threshold maximum: all values = 1	all maximum	75.10%	24.90%	50.49%	49.51%
Threshold minimum: all values = 4 or 0	all minimum	22.23%	77.77%	37.52%	62.48%

*) *if the value of the variable of interest is changed while holding other variables at the maximum value*

For instance, the probability of the respondents using a public library computer, internet or Wi-Fi connection to visit a government website or to get information about government services is at the lowest (45.33%) if the respondents do not perceive that public libraries provide public values by providing new technologies. The results also show that the respondents do not place high value on intrinsic enhancement in the form of teaching library patrons about privacy and security protection. When all respondents perceive that public library programs which teach security and privacy protection are not necessary, the simulation result shows that the probability that respondents will use a public library computer, internet or Wi-Fi connection to visit government websites or to get information about government services is the highest (92.85%).

For the majority of respondents using a public library website or mobile app to use online databases, the results indicate the importance of providing public values through intrinsic enhancement by teaching citizens to use digital tools. Respondents who perceived that public libraries do not provide public values through intrinsic enhancement by teaching citizens to use digital tools have higher probability (78.73%) of not using a public library website or mobile app to access online databases. Similarly, respondents who perceived that public libraries do not provide public values through enablement by teaching them to use new technologies have the second highest probability (63.89%) of not using a public library website or mobile app to access online databases. On the other hand, the simulation results about self-efficacy in using web or mobile apps show mixed results. For instance, when respondents express difficulty in using internet and web apps, the probability of these respondents using an online database is 50.82% (probability no: 49.18%), while respondents who expressed difficulty in using mobile apps showed a 69.65% probability of not using online databases (probability yes: 30.35%). These results plausibly indicate possible interactions among the predictors; thus, future research may test the influence of interactive variables to encourage the use of public libraries to engage in an open government environment.

5. DISCUSSION & CONCLUDING REMARKS

5.1 The Impact of Public Values of Public Libraries to Open Government Environment

The results reveal that citizens' perceptions of public values provided by public libraries influence engagement in an open government environment. These values include researching certain information about government services, visiting government websites, or using online databases. Our results further accentuate the findings from a number of studies that postulate the significant role of public libraries in mediating the relationships between citizens and government in an online environment [to name few: 2,4,5,17,27]. These studies, for instance, Jaeger et al [17], emphasize three significant roles of public libraries to extend the flow of information from government, namely: providing means to access, providing a way to understand the information, and providing a tool to navigate the e-government processes. On the other hand, these studies did not quantitatively test the causative relationships among these roles to the propensity of citizens to actually use public libraries to engage with government in an online environment. Our results demonstrate that enablement (allowing otherwise infeasible activity) and intrinsic enhancement (changing the environment to enhance the capability) are statistically significant in affecting the likelihood that citizens will use public libraries to engage with government online.

On the other hand, our findings indicate that citizens place different values upon the public library services that influence their engagement with government through the public library. For instance, our findings show that intrinsic enhancement, by helping the citizens carrying out tasks involving government, is a significant predictor, while intrinsic enhancement through offering classes on security and privacy protection is not a significant predictor in influencing citizen engagement in an open government environment. In another instance, enablement by helping citizens navigate which information to trust emerged as a significant predictor for the likelihood of citizens using online databases; on the other hand, helping them learn about new technologies does not emerge as a significant predictor.

Clearly, these findings demonstrate that not every public value provided by public libraries has a similar impact on stimulating the citizen's uses of public libraries for engaging with government online. Our simulation results further emphasize how the varying citizen values of the role of public libraries are influential in mediating the relationship between citizens and government. Thus, it is plausible to argue that this finding complements the argument on varying information behavior, different cultural expectations and attitudes about engagement with government in an online environment [17]. It is possible that these differences in behavior, cultural expectations and attitudes influence how patrons place values on the efforts provided by public libraries to mediate the relationships between the patrons and government. Consequently, enforcing a generic approach to encourage citizen interaction with government online through the mediation of public libraries could possibly produce less-than-ideal results. As such, government agencies should start to work collaboratively with public libraries in designing more effective ways of disseminating information [4, 17, 27, 24]; particularly considering the "capacity of public libraries to meet the government information needs of their communities [24, p.478].

5.2 Research and Practical Implications

As a final point, we would like to draw our attention to the call from Burke et al [5] on how best public libraries take advantage of the opportunities to advance their roles in opening government. This because understanding how public library could best advance their roles depend on understanding the intricate and continuum of relationships between patrons, public libraries and government agencies [27]. In this regard, our findings could offer preliminary suggestions by pointing out that the citizens place different interests and values in their engagement with government online through the mediation of public libraries.

Consequently, as research implications, future study should always consider these differing values in understanding the continuum of relationships between patrons, public libraries and government agencies. Our findings point out that there are set of determinants that influence the action of patrons, public libraries and government agencies. Thus, give rise to the need for better understanding the determinants that influence each of the actor in the continuum of relationship between patrons, public libraries and government agencies. Additionally, given that each actor is driven by set of determinants, it suggest that researcher should employ more unconventional analytical methods that take into account both recursive and non-recursive relationships to test the continuum of relationships between patrons, public libraries and government; for instance, structural equation modelling or simulations.

As practical implications, given that patrons place different values on the services offered by public libraries that affect their likelihood to engage with government online. Considering the varying information behavior of patrons [17], different cultural expectations and attitudes affecting the relationship between patrons, public libraries and government; Government agencies and public libraries should work collaboratively and always consider the different values and needs of the patrons in designing programs and services to help patrons engaging with government in online environment. Based on our findings, it is plausible to argue that programs or services designed and developed by considering the different values and needs placed by patrons will be more effective in inducing the engagement of patrons with government in online environment.

Finally, we call attention to some limitations to our study. While we found that citizens' perception of public values of public libraries influence their engagement with government online, this does not necessary mean that the citizens would be willing to access data that is not within their interests. The major contribution of this exploratory study is to highlight that citizens attach importance to public values offered by public libraries. As such that future research is needed to further ascertain the role of public libraries in stimulating citizens' motivation in engaging in open government. Furthermore, it is presumptuous to assume that the results from this study are sufficient for understanding citizens' motivation in using open government. On the contrary, the results from this study called for further study to understand citizen's motivation for engaging in open government. Likewise, we did not consider the influence of demographic factors in affecting the likelihood of public library patrons to engage with government in online environment. Since, different cultural expectations matter [17], future research could test the predictive power of demographic variables in affecting the model.

6. ACKNOWLEDGMENTS

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