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Digitization and Citizens' Satisfaction with Land Services in Rwanda

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Abstract

Purpose: The purpose of the study was to examine whether there is a relationship between digitization and service quality of land services and to establish if the relationship is significant.

Methodology: The study used a quantitative research approach to collect the data. A probability sampling technique was employed to choose a sample of 2,229 respondents from a population of 47,260 land service customers. A bivariate correlation analysis was conducted for all questions and the Pearson correlation coefficient was statistically significant with a value less than 0.05. Using Cronbach's Alpha calculation, reliability was tested and produced a value of 0.946 > 0.7 which demonstrates excellent reliability of the tool. An ordinal logistic regression method was applied to model the relationship between one outcome variable and seven predictor variables.

Findings: the research findings show that the seven elements of digitization have a significant influence on the satisfaction of customers with land services. The element with the highest influence is the digitization of land services preserves the security of land information effectively (6.555); digitization of land services reduces the cost of land transfer services (6.476); digitization of land services increases quality and consistency in land services provision (6.096); digitization of land transfer services offers easy access to files and information (6.049); digitization of land services minimizes corruption (5.937); digitization of land services reduces human error (5.863) and digitization of land services reduces the time to process land documents (5.745).

Contribution to Theory, Policy, and Practice: Establishing if digitization can measure service quality is a new aspect that the study adds to the body of knowledge. The researchers recommend that digitization be added to the dimensions that measure service quality in ways that take into consideration study contexts.

Keywords: *Digitization, Service Quality, Customer Satisfaction, Land Services, Service Quality Measurement*

INTRODUCTION

The application of technology in organizational processes has become an indispensable aspect of the present business environment across the globe. In the pursuit of creative and unique ways of gaining competitive advantage among businesses, digitization is thought to be among the best approaches to undertake (Ferreira et al., 2019). The highly competitive business environment necessitates the employment of technological capacities to enhance efficiency and effectiveness and boost their profitability level. The notion of digitization emanates from a development in which organizations create and implement digital technologies to provide solutions to practical problems facing society (Balsmeier & Woerter, 2019). This implies employing technological solutions to respond to the needs of society effectively and efficiently (Leonardi & Treem, 2020). Contemporary authors believe that the new digital technologies have influenced the way organizational processes are shaped and managed (Burton-Jones et al., 2020).

Problem statement

It is argued that the contribution of technology to the economic advancement of societies is significant (Minna & Mika, 2019). Technology has become a tool that enhances efficiency, increases the financial position of firms, and has the potential to improve the well-being of people (Lucia et al., 2019). The use of technology in organizations' business processes is considered indispensable in the current business environment. Organizations not ready to integrate technology to deliver services to their customers will likely lose in the marketplace. Ferreira, et al. (2019) assert that organizations should pursue innovative and distinctive ways of attaining competitive advantage using a digitization approach. Technology solutions have proved to enhance efficiency and effectiveness in service delivery and have consequently influenced how organizations design and manage their business processes (Burton-Jones et al., 2020; Leonardi & Treem, 2020).

The government of Rwanda has heavily invested in technology infrastructure and skills to leverage technology solutions in enhancing service delivery and its drive to achieve a knowledge-based economy (Republic of Rwanda, Vision, 20250). In this regard, the government set an ambitious target of delivering all its services online by 2024 (Ministry of Finance and Economic Planning, 2017). In addition to the government's desire and commitment to embracing technology solutions to promote service delivery and economic growth, service seekers and service providers generally believe that this could be one of the answers to service delivery. Despite this general belief, there is very little scientific evidence to show how digitization influences service quality. Service quality measurements have been carried out using several models in different settings (Adeinat, 2019; Lee & Cheng, 2018; Malik et al., 2020). Some of the models widely employed include SERVQUAL (Parasuraman et al., 1988); Six Sigma (Tennant, 2001), and the SERVPERF (Cronin & Taylor, 1992). This study aims to establish the influence of digitization on service quality by examining if digitization is a positive and significant predictor of citizens' satisfaction with land services in Rwanda

Research objectives

1. To examine if there is a relationship between digitization and service quality
2. To establish whether digitization is a positive and significant predictor of customer satisfaction with land services

LITERATURE REVIEW

Some writers on institutional development have in the past few years highlighted the impact of pervasive digital solutions, digital information, and platforms used in digital applications (Faik et al., 2020; Hinings et al., 2018). Digitization can be defined as the growing usage of digital technologies (Balsmeier & Woerter, 2019). Some authors consider digitization as an exotic threat to the more common and familiar organizational processes and structures operated by people who would be replaced by digital innovations and solutions (Berente & Seidel, 2022; Hinings et al., 2018; Nambisan et al., 2019). This understanding may however limit the efforts of organizations to leverage the technology innovations in advancing service quality and their organizational growth. There is a need to broaden the understanding of digitization to include aspects such as new elements of technology that need to be integrated, and systemic and structural re-organization to suit the delivery model of service. It should be looked at, as something that extends beyond the application of technology as an enabler of work processes to include their impact on human actions, particularly technology aspects such as artificial intelligence (Cepa & Schildt, 2022; Murray, Rhymer, & Sirmon, 2021; Raisch & Krakowski, 2021).

Presently, the business environment is extremely competitive and necessitates the application of technology tools to be more efficient and effective to guarantee profitability and business success. Technology solutions have continually been employed to offer practical responses to practical problems facing the business community that require efficiency (Balsmeier & Woerter, 2019; Leonardi & Treem, 2020). Digitization and digital technologies have influenced how organizations design and run their business systems and processes (Burton-Jones et al., 2020). The effectiveness and efficiency with which digital technologies influence business processes and society in general in the delivery of services are visible (Faik et al., 2020). In many businesses, human beings have been substituted by digital technologies to try and enhance some of their business processes and systems.

Digital technologies enable governments to enhance accountability, increase transparency, and public service delivery but they alone cannot achieve these benefits without a designed efficient system and skills to drive the implementation of digital technologies. Besides enhancing service delivery, proper record-keeping is urged to improve effectiveness and efficiency, increase transparency and accountability, and facilitate quick informed decision-making (Abuzawayda et al., 2017). Adequate record-keeping and easy access to the records also enhance the advancement and development of countries (Hoque & Sorwar, 2019). Research shows that digitization will drive the future industrial revolution by promoting smart production and the interconnection of industries (Kayikci, 2018). The research showed that the application of digital technologies has a big impact on managing knowledge within

manufacturing processes and the supply chain. It further highlights that digitization improves collaboration, enhances efficiency in cost and time management, expedites service delivery, and enhances adaptability, integration as well as control of manufacturing processes. Research also indicates that minimizing human interaction between people seeking the service and those who provide it reduces the susceptibility to corruption from public officials who deliver services to the people (Kalesnikaite et al., 2023; Santiso, 2022). The application of a digitally enabled service delivery system is believed to enhance the efficiency of governments, minimize corruption, reduce needed resources to process service, minimize paperwork involved, and enhance the participation of citizens in the service delivery chain (Cordella & Paletti, 2019; Matarneh et al., 2022). Presently, businesses are implementing creative and unique approaches to gain competitive advantage through digitization (Ladeira et al., 2019).

Digitization allows governments to make information and services available to their people promptly. The technology age has enabled almost nonstop delivery of services and the expectations of citizens have grown in terms of efficiency and effectiveness in communication using the internet and other technology tools (Zaagsma et al., 2023). Service quality is based on the desire to satisfy customer needs and digital platforms should be designed to enable the user to seamlessly employ them to participate in service delivery decisions that impact its quality (Jarke, 2021). The government of Rwanda has made digitization a top priority in its development agenda to promote people-centred governance. Information and Communication Technology has been prioritized over the past two decades and by 2019, 4G LTE services' geographical coverage was 97.6% and population coverage was 98.9% while the 3G and 3.5G services had a geographical coverage of 92.3%, and population coverage of 97.4% (Ministry of ICT and Innovation, 2019). The focus is now to take full advantage of the investment in ICT and translate it into actual service delivery where the government targets 100% of public services to be delivered online (Ministry of Finance and Economic Planning, 2017).

Service Quality

The definition of service quality comes from the desire to satisfy the needs of customers. It refers to the ability of institutions to meet the needs of their customers effectively and efficiently to remain in business (Ramya et al., 2019). There is no quality without customer satisfaction. Irrespective of the nature of the sector, organizations should have the ability to strike a balance between the satisfaction of their customers and remaining competitive in the marketplace.

Customer Satisfaction

Satisfaction of customers is understood as the extent to which goods and services provided to customers meet or exceed their expectations (Agnihotri et al., 2019). People who purchase services expect them to meet their desire for those services and to derive satisfaction from experiencing and consuming the services (Gunawan, 2022; Hamzah & Shamsudin, 2020; Lim et al., 2020). Satisfied customers are motivated to make repeat purchases and to tell others about the company and its products and or services (Ilias & Shamsudin, 2020; Zakari &

Ibrahim, 2021). Customer satisfaction is always the missing link between the organization and the market and once this link is completed, business success is guaranteed.

Service Quality Measurement

Service quality is measured from the perspective of customers; how customers believe that their service experience meets or exceeds their expectations. Understanding aspects that determine the satisfaction of customers helps to establish measurement mechanisms to enhance service quality to sustain the customers' relationship with the organization (Ngo & Hieu, 2020). The SERVQUAL model (Parasaruman et al., 1988) with the five dimensions (Responsiveness, Tangibles, Reliability, Assurance, and Empathy) has been widely used (Goumairi et al., 2020; Jonkisz et al., 2021; Salem & Kiss, 2023) to measure service quality. In a recent study on land services in Rwanda, digitization was widely mentioned as an element that would enhance service quality (Kalisa & Jain, 2024). This study measured whether digitization is a positive and significant predictor of land services' quality by examining how it affects the satisfaction of customers.

Digitization

The concept of digitization stems from the desire to produce and apply digital technologies to offer real-time solutions to practical problems facing society (Balsmeier & Woerter, 2019). It means the application of technology to offer appropriate, quick, and cost-effective solutions to the service delivery needs of society (Leonardi & Treem, 2020). The current advancement in technology has enabled and influenced business processes and organizations are devising means of leveraging technology to enhance what they offer to their customers (Burton-Jones et al., 2020). In the context of land services, digitization is anticipated to speed up the process of producing land documents, improve storage, and retrieval, and minimize corruption.

Conceptual Framework

The conceptual framework refers to the structure of actions the investigator expects to carry out in a research study. Since this study examines the impact of digitization on customer satisfaction, the conceptual framework shows the association between the study variables (Naslund & Norman, 2022). It relates digitization as a predictor variable with customer satisfaction.

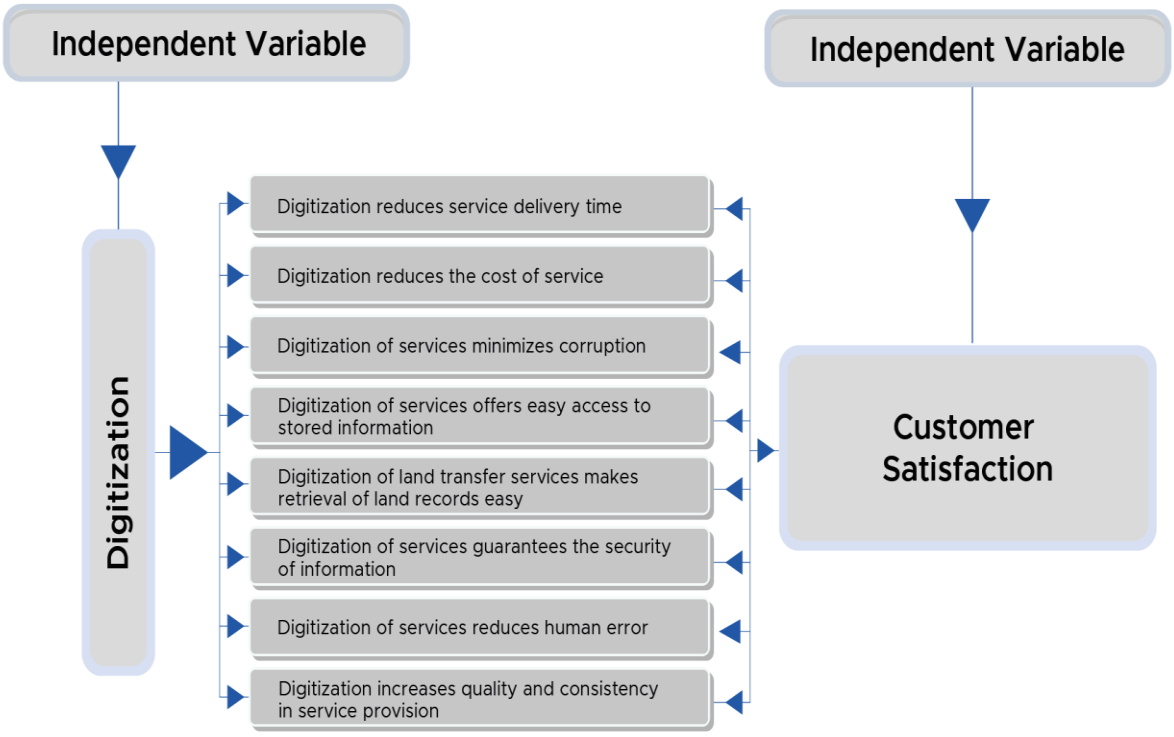

Figure 1: Conceptual Framework

Source: Primary Data (2024)

The model above demonstrates the relationship between digitization as a proposed service quality dimension and the satisfaction of service seekers with service quality. To enable the assessment of this relationship, eight variables/characteristics presented in the table below were developed and used to assess the satisfaction of customers.

Table 1: Digitization Dimension Variables

Dimension	**Variable/characteristic**	**Rating**				
		1	2	3	4	5
Digitization	1. Digitization reduces service delivery time					
	2. Digitization reduces cost of service					
	3. Digitization of services minimizes corruption					
	4. Digitization of services offers easy access to stored information					
	5. Digitization of land transfer services makes retrieval of land records easy					
	6. Digitization of services guarantees security of information					
	7. Digitization of services reduces human error					
	8. Digitization increases quality and consistency in service provision					
Overall Digitization is important		**1**	**2**	**3**	**4**	**5**

Source: Primary Data (2024)

Research Hypotheses

$H0_1$: There is a relationship between the predictor variable (digitization) and the outcome variable (customer satisfaction) with land services

$H1_1$: There is no relationship between the predictor variable (digitization) and the outcome variable (customer satisfaction) with land services

METHODOLOGY

Data collection

The study employed a quantitative approach to collect data from respondents who received land services in the fiscal year 2022/2023 in 13 out of 30 districts of Rwanda. The 13 districts were purposively chosen based on two criteria; all secondary city districts and districts that had low citizens' satisfaction with land services based on the Citizen Report Card survey conducted (Rwanda Governance Board, 2023). The study population was 47,260 people who received land services in the 13 selected districts. A five-item Likert scale was used to rate the responses of the customers on each of the eight variables/elements of digitization. The questionnaire was administered to a sample of 2,229 respondents who were randomly drawn from all customers who received land services (National Land Authority, 2023). The questionnaire was based on the SERVQUAL model (Parasuraman et al., 1988) but was customized to the digitization to establish if it is a predictor of satisfaction with land services and could therefore be proposed as another dimension to measure service quality.

Data analysis

After data collection, data were cleaned before the commencement of the analysis and then the actual analysis followed using Statistical Package for Social Science (SPSS). The cleaning of the data was done to enhance its quality and to ease the data analysis process. The study employed several statistical tests to assess the validity, and reliability and to test hypotheses. Pearson Correlation Coefficient was employed to test the validity of the research tool and Chronbach's alpha to test reliability. ANOVA was also employed to test whether the means between scale items differed significantly, whereas the Explanatory Factor Analysis was used to test the scale's dimensionality. Hypotheses testing was carried out using the Ordinal Logistics Regression model. Logistics regression analysis is the most relevant model to determine the correlation between multiple predictor variables and a categorical outcome variable (Boateng & Abaye, 2019; Harris, 2021). The test results showed that there is a significant relationship between digitization and customer satisfaction.

Validity and Reliability

The validity of the tool was tested to ensure that, the collection of research data and their analysis take into account the veracity being assessed (Mohajan, 2020). Pearson correlation coefficient was employed to compute a new total variable of all variables compared

to a critical value, every variable was tested for its validity. A bivariate correlation analysis was conducted for all questions and the Pearson correlation coefficient was statistically significant with a value less than 0.05. All the actual values were also found to be much higher than the critical value of 0.041519 which shows that the questionnaire was comprehensive and fully valid for the study and even for future research projects.

Table 2: Intraclass Correlation Coefficient

Intraclass Correlation Coefficient							
	Intraclass Correlation	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.715[a]	.701	.728	18.527	2227	13362	.000
Average Measures	.946	.943	.949	18.527	2227	13362	.000

Source: Primary Data (2024)

Table 3:Detailed test results of validity test of all variables

S/N	Parameter	Level	Description
1	n	Two thousand and two hundred twenty-nine (2,229) respondents participated in the survey	The combined sample size was selected and was representative of all characteristics of the targeted population who looked for land services at least once in time.
2	Degree of freedom	n-2=2,227	The degree of freedom that was used to determine the exact sample size on the table of critical values for Pearson correlation.
3	Alpha level	0.05	This is the limit at which the correlation coefficient is statistically significant
4	Critical value on the Pearson Table	0.041519	The actual value should be greater than a critical value which is the case for this measure. This confirms the validity of the variable.

Source: Primary data (2024)

In measuring internal consistency, Cronbach's Alpha coefficient was employed to assess the internal consistency of the Likert scale which reverberates with the views put forward by Taber (2017). Reliability means the consistency, dependability, authenticity, trustworthiness, and replicability of the results of any research (Mohajan, 2020). The coefficient of reliability ranges from 0 to 1; this implies that the higher the coefficient, the higher the reliability level (Park, 2021). It is generally agreed that the internal consistency coefficient be at least 0.70 (Arifin, 2018).

Table 4: Reliability statistics

Cronbach's Alpha	N of Items
.946	7

Source: Primary data (2024)

Table 5: Cronbach's Alpha Detailed Test results

Variable	Cronbach's Alpha if the item Deleted
1. Digitization reduces the time to process land transfer documents.	.936
2. Digitization reduces the cost of land transfer services.	.941
3. Digitization of land transfer services minimizes corruption.	.939
4. Digitization of land transfer services offers easy access to files and information.	.935
5. Digitization preserves land information effectively.	.939
6. Digitization of land transfer services reduces human error.	.937
7. Digitization increases quality and consistency in land services provision.	.937

Source: Primary data (2024)

RESEARCH FINDINGS

Demographic characteristics of respondents

This section presents different demographic characteristics of respondents that include: age, sex, education level, marital status, and occupation.

Table 6: Age of respondents

Age Range	Counts	%
18-30 Years	195	8.7
31-40Years	687	30.8
41-50 Years	656	29.4
51-60 Years	388	17.4
60+ Years	303	13.6
Total	2229	100

Source: Primary data, 2024

The table above indicates that the youth is the population category that makes up less than 10% while other adult categories make up over 90% of the participants. The youth population and people aged 50 and above seek less land services compared to the adults in the age category of 31-50.

Table 7: Distribution of sample per district and by sex

District	Male	%	Female	%	Total
Muhanga	60	74.1%	21	25.9%	81
Huye	50	80.6%	12	19.4%	62
Rusizi	135	69.6%	59	30.4%	194
Musanze	96	72.7%	36	27.3%	132
Rubavu	155	63.5%	89	36.5%	244
Ruhango	275	68.4%	127	31.6%	402
Kayonza	92	66.2%	47	33.8%	139
Nyagatare	29	74.4%	10	25.6%	39
Ngororero	35	74.5%	12	25.5%	47
Gicumbi	58	58.0%	42	42.0%	100
Nyarugenge	94	66.7%	47	33.3%	141
Kicukiro	212	74.1%	74	25.9%	286
Gasabo	252	69.6%	110	30.4%	362
Total	1543	69.2%	686	30.8%	2229

Source: Primary data (2024)

As indicated in the table above, the percentage of women sought less land services in all districts than their male counterparts. Overall, 69.2% of all land services customers (respondents) were male while 30.8% were female.

Table 8: Education level of respondents

Education level	Counts	%
Primary school	872	39.1
Vocational Technical School	175	7.9
Secondary school	457	20.5
IPRC	46	2.1
University	500	22.4
None education level	179	8
Total	2229	100

Source: Primary data (2024)

As shown in the table above, a large proportion of the respondents (39.1%) attended primary school and only 8% did not have any formal education. The respondents who had university and secondary school education were 22.4% and 20.5% respectively.

Table 9: Marital status of respondents

Marital status	Counts	%
Single	217	9.7
Married	1844	82.7
Widowed	143	6.4
Divorced	25	1.1
Total	2229	100

Source: Primary data (2024)

Table 9 above shows that, the majority of the land services customers (82.7%) from all the sampled districts were married suggesting that, they own more land than those not married.

Table 10: Occupation of respondents

Occupation	Counts	%
Student	11	0.5
Farmer	783	35.1
Entrepreneur	885	39.7
Employee	390	17.5
Retiree	41	1.8
None occupation	119	5.3
Total	2229	100

Source: Primary data (2024)

On the side of occupation, 35.1% and 39.7% are farmers and entrepreneurs respectively.

Presentation of Statistical test results

As earlier stated, the satisfaction of land service customers is the outcome variable while digitization (composed of seven elements) is the predictor variable. Digitization is an enabler an enabler of service delivery that is believed to enhance the quality of land services administration. Data were collected using a questionnaire based on a Likert scale with five items. The questionnaire was administered to a sample of 2,229 who received land services at least once in the financial year 2022/2023. Since the variables of this study are ordinal, the Ordinal Logistic Regression (Proportional Odds Model) suits this dataset better than others (Lelisho et al., 2022; Tolles & Meurer, 2016; Wang et al., 2022;) and was therefore used to model the data and to scrutinize if the seven elements of digitization are contributing and are the only contributors to the satisfaction of land service customers.

The logistic regression provides a measure of the suitability of a predictor variable as well as its direction of correlation (positive or negative). As stressed earlier, the variables for this study are ordered requiring the application of ordinal logistic regression. The logit is the natural logarithm of the odds from which the term logistic regression derives its name. So, the odds ratio is used in logistic regression to represent the ratio of the conditional odds of the outcome at one level of x relative to the conditional odds of the outcome at another level of x. In this way, the odds ratio –is explained as a ratio of the odds of an outcome that helps to record the effect of the independent variables (McHugh, 2009).

Regarding the land service customers, a new design of seven variables was necessary to employ OLR with the Likert-scale data. This implied the computation of the seven elements of digitization is as follows:

Table 11: Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	Df	Sig.
Intercept Only	4679.611			
Final	.000	4679.611	14	.000

Source: Primary data (2024)

The information on the model fitting demonstrates that the model is significant implying that, the improvement in the model fit is significant compared to the null model or when the outcome variable has no predictor variables to explain it. The difference between the intercept only and the final model is significant where the level of significance is less than 0.05. Hence the data describes significantly our model. This means that the seven variables of the digitization dimension predict customer satisfaction when other factors (dimensions) are kept constant.

Table 12: Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	304.227	1057	1.000
Deviance	226.620	1057	1.000

Source: Primary data (2024)

The goodness of fit information shows that the model adequately fits the data where the significance level is greater than 0.05. We can confidently deduce that the observed data highly correspond to the fitted model which consequently results in the acceptance of the null hypothesis.

Table 13: Pseudo R-Square

Cox and Snell	.877
Nagelkerke	1.000
McFadden	1.000

Source: Primary Data (2024)

In the case of Pseudo E-square, McFadden is used and equals 1.00 which implies that there is a 100% improvement in the prediction and variation of the outcome categories compared to when the model is out of the predictors.

Table 14: Parameter estimates and ODDs ratios analysis

Parameters	Estimate	Std. Error	Wald	Odds	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
[[1]Customers' Satisfaction = .00]	8.173	1.083	56.925	-	1	0	6.05	10.296
[[2]Customers' Satisfaction = 1.00]	9.559	1.005	90.451	-	1	0	7.589	11.528
[[3]Customers' Satisfaction = 2.00]	14.381	1.064	182.792	-	1	0	12.296	16.466
[[4]Customers' Satisfaction = 3.00]	20.356	1.103	340.762	-	1	0	18.195	22.517
[[5]Customers' Satisfaction = 4.00]	26.165	1.185	487.763	-	1	0	23.843	28.487
[[6]Customers' Satisfaction = 5.00]	32.672	1.341	593.647	-	1	0	30.044	35.301
[[7]Customers' Satisfaction = 6.00]	38.646	1.514	651.239	-	1	0	35.678	41.614
[[8]Reduce Time=.00]	-0.459	0.722	0.405	0.631915	1	0.525	-1.875	0.956
[[9]Reduce Time=1.00]	5.745	0.643	79.734	312.6236	1	0	4.484	7.006
[[10]Reduce Time=98.00]	0.000	.	.	1.000	0	.	.	.
[Reduce Cost=.00]	-0.319	0.574	0.309	0.726876	1	0.578	-1.444	0.806
[Reduce Cost=1.00]	6.476	0.554	136.655	649.3683	1	0	5.39	7.562
[Reduce Cost=98.00]	0.000	.	.	1.000	0	.	.	.
[Minimize Corruption=.00]	-0.73	0.614	1.414	0.481909	1	0.234	-1.933	0.473
[Minimize Corruption=1.00]	5.937	0.514	133.232	378.7968	1	0	4.929	6.945
[Minimize Corruption=98.00]	0.000	.	.	1.000	0	.	.	.
[Ease Access=.00]	0.33	0.679	0.236	1.390968	1	0.627	-1.002	1.661
[Ease Access=1.00]	6.049	0.577	109.705	423.6891	1	0	4.917	7.18
[Ease Access=98.00]	0.000	.	.	1.000	0	.	.	.
[Security=.00]	0.617	0.617	1.002	1.85336	1	0.317	-0.591	1.826
[Security=1.00]	6.555	0.497	173.892	702.7491	1	0	5.581	7.53
[Security=98.00]	0.000	.	.	1.000	0	.	.	.
[Human Error=.00]	-0.574	0.62	0.858	0.563268	1	0.354	-1.79	0.641
[Human Error=1.00]	5.863	0.556	111.228	351.7779	1	0	4.774	6.953
[Human Error=98.00]	0.000	.	.	1.000	0	.	.	.
[Quality=.00]	-0.597	0.627	0.907	0.550461	1	0.341	-1.827	0.632
[Quality=1.00]	6.096	0.601	102.889	444.0779	1	0	4.918	7.274

[1] Customers' Satisfaction=0.0: There is no satisfaction with all seven elements.
[2] Customers' Satisfaction=1: There is satisfaction with one out of seven elements.
[3] Customers' Satisfaction=2: There is satisfaction with two out of seven elements.
[4] Customers' Satisfaction=3: There is satisfaction with three out of seven elements.
[5] Customers' Satisfaction=4: There is satisfaction with four out of seven elements.
[6] Customers' Satisfaction=5: There is satisfaction with five out of seven elements.
[7] Customers' Satisfaction=6: There is satisfaction with all seven elements including the loss.
[8] Reduce Time=0.0: Customers are dissatisfied with this element
[9] Reduce Time=1: Customers are satisfied with this element
[10] Reduce Time=98: Customers do not know this element

[Quality=98.00]	0.000	.	.	1.000	0	.	.	.

Source: Primary data (2024)

Discussions

Largely, the predictor variable which is the overall customers' satisfaction with land services, has seven different independent variables. It is indicated that all seven elements have a positive probability of falling into a higher category (strongly satisfied) of the customer's satisfaction. On the other hand, the response of dissatisfaction has the probability of falling into the lower category (strongly dissatisfied) of the dependent variable/customer satisfaction.

Of the seven elements of the digitization dimension, the "digitization that preserves the security of land information effectively" (6.555) has the highest influence on the satisfaction of customers with land services. The second highest influencer of satisfaction of customers is "digitization reduces the cost of land transfer services" (6.476) while the lowest influencer of customer satisfaction is "digitization reduces the time to process land documents" (5.745). The above findings show that customers are more concerned with security of land documents and cost of land services than other benefits of digitization in the delivery of land services. customer satisfaction cannot be influenced by those customers who said they do not know the role or benefits of digitization on land services.

Detailed discussions on each of the seven elements of digitization dimension is presented below:

Digitization reduces time to process land documents: Customers who are satisfied with the fact that digitization reduces time of processing land documents, have a higher influence on the overall satisfaction of the customers compared with those who are not satisfied with this element. The difference is statistically significant with the probability of 0.00 less than 0.05. The odds of the overall customers' satisfaction are 312.6236 times greater with only one additional customer to those who are satisfied with the digitization that reduces the processing time of land documents. Nevertheless, the overall satisfaction is 0.631915 times lower with one additional customer to those who are dissatisfied with this element.

Digitization reduces the cost of land services: The satisfaction with this element shows a higher influence on the overall satisfaction of customers than the dissatisfaction and don't know response on this element. The difference is statistically significant with the probability of 0.00 less than 0.05. The odds of the overall customers' satisfaction are 649.3683 times greater with only one additional customer to those who are satisfied with this element. Conversely, the overall satisfaction is 0.726876 times lower with one additional customer to those who are dissatisfied with this element.

Digitization of land services minimizes corruption: The satisfaction with this element indicates a higher influence on the overall satisfaction of customers than the dissatisfaction and "don't know" response on this element. The difference is statistically significant with the probability of 0.00 less than 0.05. The odds of the overall satisfaction of customers are 378.7968 times greater with an addition of only one customer to those who are

satisfied with this element. Conversely, the overall satisfaction is 0.481909 times lower with one additional customer to those who are dissatisfied with this element.

Digitization of land services offers easy access to files and information: The satisfaction with this element demonstrates a higher influence on the overall satisfaction of customers than the dissatisfaction and "don't know" response on this element. The difference is statistically significant with the probability of 0.00 less than 0.05. The odds of overall customer satisfaction are 423.6891 times greater with an addition of only one customer to those who are satisfied with this element. On the other hand, the overall satisfaction is also 1.390968 times greater with one additional customer to those who are dissatisfied with this element. This means that dissatisfaction with easy access to files and information has no significant influence on the overall customers' satisfaction with land services. Consequently, more attention must be paid to customers' satisfaction rather than dissatisfaction.

Digitization preserves the security of land information effectively: The satisfaction with this element shows a higher influence on the overall satisfaction of customers than the dissatisfaction and don't know the response. The difference is statistically significant with the probability of 0.00 less than 0.05. The odds of overall customer satisfaction are 702.7491 times greater with an addition of only one customer to those who are satisfied with this element. On the other hand, the overall satisfaction is also 1.85336 times greater with one additional customer to those who are dissatisfied with this element. This means that dissatisfaction with the security of land information has no significant influence on the overall customers' satisfaction with land services. Therefore, attention must be placed on customers' satisfaction rather than dissatisfaction.

Digitization of land services reduces human error: The satisfaction with this element demonstrates a higher influence on the overall satisfaction of customers than the dissatisfaction and "don't know" response. The difference is statistically significant with the probability of 0.00 less than 0.05. The odds of the overall satisfaction of customers are 351.7779 times greater with an addition of only one customer to those who are satisfied with this element. Conversely, the overall satisfaction is 0.563268 times lower with one additional customer to those who are dissatisfied with this element.

Digitization increases quality and consistency in land services provision: The satisfaction with this element demonstrates a higher influence on the overall satisfaction of customers than the dissatisfaction and "don't know" response of this element. The difference is statistically significant with the probability of 0.00 less than 0.05. The odds of overall satisfaction of customers are 444.0779 times greater with an addition of only one customer to those who are satisfied with this element. On the other hand, the overall satisfaction is 0.550461 times lower with one additional customer to those who are dissatisfied with this element.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study examined the relationship between digitization and customer satisfaction to determine whether digitization impacts the quality of land services. The study employed a quantitative research approach to collect data from a sample of 2,229 respondents who were randomly chosen from the population of all customers who received land services in the 13 sampled districts. Since the data are ordinal, the ordinal logistics regression model was used to analyze the data and the results showed that all the assumptions and conditions to accept the null hypothesis were satisfied. The results indicated that the predictor variable (digitization) significantly influences the outcome variable (customer satisfaction).

The seven elements of digitization show different levels of influence on the satisfaction of customers. The element with the highest is "digitization of land services preserves the security of land information effectively" (6.555) followed by "digitization of land services reduces the cost of land transfer services" (6.476); digitization of land services increases quality and consistency in land services provision (6.096); digitization of land transfer services offers easy access to files and information (6.049); digitization of land services minimizes corruption (5.937); digitization of land services reduces human error (5.863) and lastly digitization of land services reduces the time to process land documents (5.745). The findings demonstrate that customers have high regard for the security of their land information and the cost of land services compared to the other elements of digitization. The results also show that, the customers who said they do not know the benefits or role of digitization have no significant influence on the satisfaction with land services. The overall conclusion is that; digitization significantly influences the quality of services since quality is defined by the extent to which customers are satisfied. As a result, the null hypothesis was accepted.

Recommendations

The results showed that all the elements of digitization influence the satisfaction of customers with land services even if their level of influence varies. This implies that digitization (predictor variable) has a positive and significant relationship with customer satisfaction. It is also understood that service quality is dependent on the satisfaction of customers. Hence the researchers recommend that digitization be added to the dimensions that are employed to measure service quality. The researchers also understand that; contexts differ and the elements of digitization may be adjusted to suit the context where service quality measurement is to take place. The researchers also recommend the application of the digitization dimension to measure service quality in other areas such as banking and hospitality in Rwanda.

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