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The Relationship between Online Service Platforms and Customer Satisfaction: A Case Study of a State-Owned Enterprise

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Abstract

Online self-service platforms have increased significantly in the private sector as a business model to improve customer service and enhance competitive advantage. Moreover, Public institutions have also embraced online services to provide various public services. This study investigated how online self-service platforms influence customer satisfaction in a state-owned enterprise. A structured questionnaire was used to collect data. A total number of 400 valid responses were received and analysed. The key findings show that all four

variables; System availability, Efficiency, Fulfilment, and Privacy, positively and significantly influence the overall service satisfaction of customers. Thus, all four hypotheses were supported. For example, Fulfilment had the most significant effect (Beta = 0.327, $p < 0.000$), followed by Privacy (Beta = 0.292, $p < 0.001$), System availability (Beta = 0.197, $p < 0.000$) and Efficiency (Beta = 0.153, $p < 0.000$). In the digital age, it is anticipated that public organisations providing services through online self-service platforms will be able to use comparable factors to improve customer satisfaction and reach a larger demographic of citizens.

Keywords: *Online platforms, customer satisfaction, public sector, Zambia.*

Introduction

Governments are investing in e-government, which integrates information communication technology into administrative procedures to improve efficiency. The goal is to enable public institutions and businesses to easily access government services through various information and communication technology channels (Afieroho et al., 2023). An online platform can be defined as a digital service that permits communication between two or more dissimilar yet connected user groups (individuals or organisations) who collaborate through the service over the Internet (OECD, 2019).

Panayiotou and Stavrou (2021) argue that electronic services (e-Services) refer to services provided using information and communication technology. On the other hand, Online or E-services provide improved accessibility and transparency, allowing quicker and less expensive service delivery (Asogwa, 2013). Despite these advancements in electronic commerce, customers using public services must wait in line for services and spend several hours obtaining approval from authorities, sometimes in remote locations. (Abdulkareem & Mohd, 2022).

A burgeoning number of studies shows that State e-service platforms at a global level have been advancing mainly in Europe and Asia (Abdelhamid et al., 2019; Panayiotou & Stavrou, 2021). Nonetheless, most sub-Saharan African public institutions are lagging in e-service platform implementation. The precarious, underdeveloped technology infrastructure to support online services, limited internet accessibility, power outages and limited skills challenge the regional adoption of e-service (Anna et al., 2020). Furthermore, Abdulrauf (2021) laments that

data security is a prominent factor in adapting global e-services in the sub-Saharan African.

In Zambia, however, several institutions have adopted and implemented online services after the enactment of the Electronic Government Act No. 41 of 2021. Through this law, the Office of the President creates the SMART Zambia Institute, a division tasked with coordinating and implementing electronic governance (E-governance) for the benefit of enterprises, citizens, and the government itself to improve service delivery (SMART Zambia Institute, 2022).

However, despite the notable development, the extent of customer accessibility and overall satisfaction of such service delivery remains under-researched. Therefore, this study was motivated to determine the critical aspects of e-self-service platforms and customer satisfaction. More extant knowledge is needed regarding how these service platforms are transforming revenue collection, for example, and making it easy for citizens to apply for government services.

Furthermore, the Patents and Companies Registration Agency (PACRA) is one of the institutions that now has online registration of companies and business names. This implies that the general public will have to make payments and annual returns online. Established under the Patents and Companies Registration Agency Act No. 4 of 2020, PACRA is the state-owned enterprises under the Ministry of Trade, Commerce, and Industry. PACRA offers services for business registration and intellectual property protection. Furthermore, PACRA, one of the state-owned enterprises providing e-self services (PACRA 2023), registered around 33,083 companies in 2021. Because of the large number of customers utilising their online self-service platform, PACRA was selected as a case study.

Research gap

Numerous publications and reports have detailed grievances and challenges encountered by the public institutions in providing services and guaranteeing customer satisfaction. PACRA is not exempted as several customers have complained about poor service (Bwalya, 2009; Chipeta, 2018; Mauka et al., 2020; Masumo-Gwebente & Phiri, 2022). Phiri (2020), for instance, contends that among the difficulties encountered include unresponsive customer service when attempting to contact the PACRA call centre and comprehending the registration procedures.

Furthermore, Chishala (2018) laments that the PACRA needs to address the challenges of e-self-service platforms regarding system availability. Against this background, the study extends the discussion by examining the relationship between the E-Self Service Platform and Customer Satisfaction at PACRA. *The study examines the effect of the independent variables (platform Efficiency, Availability, Privacy and Fulfilment) on customer satisfaction.*

Literature and Empirical Review

E-self-Service System Availability

The OECD (2015) argues that many developing nations, including Zambia, have experienced difficulties implementing information and communications technology despite its widespread acceptance and potential benefits in government. Developing countries have continued to underperform and lag behind their European counterparts (UNDESA, 2016). Public value can be directly or indirectly evaluated by customers who embrace e-services, according to a study by Lopes et al. (2019). Creating public value occurs when customers effectively utilise e-services which should be consistently available.

According to Li, Liu and Suomi (2009), System reliability looks at the probability that a system will not experience any downtime when workers need to use it to be satisfied with the service. This supports the research findings that a significant correlation exists between system reliability and customer satisfaction regarding the e-self-service platform (Masumo-Gwebente & Phiri, 2022). Furthermore, in their investigation of customer satisfaction with online meeting platforms, Top and Ali (2021) found a significant relationship system availability and user satisfaction.

E-Service Efficiency

Ali (2020) argues that not only does customer self-service provide customers with more options to manage, update or order services, but it also offers organisations an efficient method of customer operations management.

Yldrm and Bostanc (2021) encourage policymakers to develop flexible and adaptive digital platforms and portals that provide the public with easy-to-use self-service alternatives in order to address these problems. According to Kurfalı et al. (2017), developing an e-government portal with modern public services, including web-based and mobile platforms, will support adopting and using e-government portals.

However, the system's efficiency plays a critical role in its adoption and implementation in the long term (Afieroho et al., 2023).

E-self-Service Privacy

Dehghanpouri et al. (2020) also found that trust and Privacy significantly influence customer satisfaction concerning the electronic customer relationship. Prinsloo and Kaliisa (2022) add that when economic and social activities are digitalised, the importance of data protection and Privacy is increasingly recognised and needs to be managed effectively. Zakrzewska and Miciuła (2021) argue that there is a need to balance the acceleration of economic activities through e-government and emerging dangers of information access by different people, its security and illegal use.

Samonas et al. (2019) indicated that barriers to using e-services include security worries about the confidentiality of personal information and the perception of a risk of cyberattacks, with the former having a more significant impact. Secondly, the results demonstrated that perceived government preparedness for Cybersecurity significantly lowers security worries and the perceived risk of cyberattacks. Thirdly, the post hoc group comparison between individuals with a bachelor's degree or higher and those without one revealed that those without one were more inclined to shy away from using e-services because of security worries and the perceived risk of cyberattacks. The precise relationship between the perceived danger of cyberattacks and avoiding e-services was not supported for individuals holding a bachelor's degree or above. Nulhusna et al. (2017) stress that the adoption and successful execution of e-government services depend on public trust.

E-self Service Fulfilment

Natural disasters and limited Internet and electricity access significantly impact e-service fulfilment. For example, Anna et al. (2020) reinforces this view that access to electricity, the Internet, and computers is hardly available in many regions in West Africa, negating access to e-services. The study also raised valid observations that in Africa, there is still a need to adequately support various local languages used by indigenous people by the websites to make communication easy for non-English speaking countries. They then pose a challenge regarding Fulfilment when using online platforms (Ibid). However, Afieroho et al. (2023) argue that despite being developing countries, some countries, such as Nigeria, have

a high prevalence of ICT technologies (such as the Internet, websites, and mobile phones), which the government can leverage to roll out e-self services. Interestingly, Rwanda is another country that has made strides in e-government (Bakunzibake et al., 2019).

Customer Satisfaction

Customer satisfaction influences organisations and products (Copley, 2017). E-self-service customer satisfaction measures how well a company's digital tools and platforms meet the needs and expectations of its customers (Carlson & O'Cass, 2010). Bayad et al. (2021) added that customer satisfaction is another important issue for increasing the profitability of the company's products; in addition, customer trust and customer satisfaction are close. Similarly Top and Ali (2021) argue that customer satisfaction influences retention and the likelihood of these referring others to the same service, thereby increasing profits towards the service. Stemming from the foregoing, customer satisfaction is a key indicator of business performance (Urumsah, 2015; Khan & Fasih, 2014; Ali & Anwar, 2021). Additionally, Nawafleh (2018) highlight that digital literacy and e-service quality are significant factors among Jordanian citizens regarding their intention to use e-government websites consistently.

Theoretical Framework

The research applied several theories to identify the gaps in the literature and provide a basis for our argument. The theories are the Technology Acceptance Model, the Unified Theory of Acceptance and Use of Technology, and Electronic (E-service) Quality. In this regard, the PACRA E-service platform was also assessed based on the proposed models.

Technology Acceptance Model

TAM explores the processes underpinning the acceptance of technology to predict the behaviour of and provide a theoretical explanation for the successful adoption of technology (Davis, 1993). Furthermore, the technology acceptance model has had three different models as improved versions of the theory (Davis, 1993). According to the TAM (Davis, 1993; Nair & Das, 2011), an online service platform's value increases with acceptance. However, the TAM model explores people's

general attitudes toward online platforms. For example, we ask why people use or do not use PACRA's platforms.

Unified Theory of Acceptance and Use of Technology

Technology use is determined by behavioural intention, according to the Unified Theory of Acceptance and Use of Technology (UTAUT). The perceived likelihood of technology adoption is determined by the direct effects of social impact, effort expectancy, performance expectancy, and enabling conditions (Marikyan et al., 2022). However, Afieroho et al. (2023) argue that numerous alternative models exist within the frameworks. Therefore, this study adapted the conceptual framework from the two models, summarised below.

Conceptual Framework

Given the above considerations of the TAM and UTAUT, below is the adapted conceptual framework describing independent variables and dependent variables for this research.

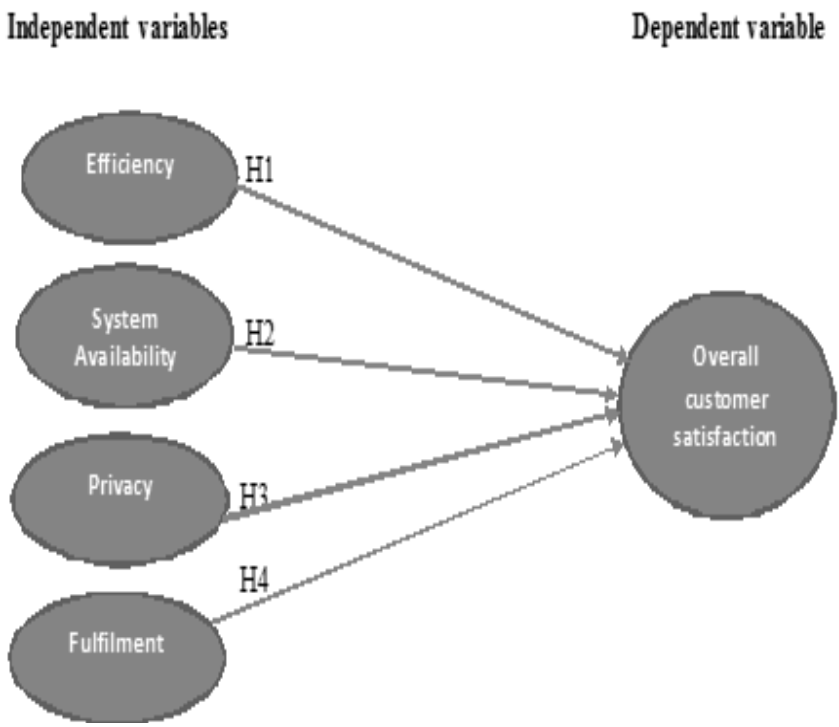

Figure 1: The Research Model

Hypotheses development

This study's hypothesis was developed by asking the research questions, considering the literature on the components of the E-service quality model and finally stating the hypothesis statements.

What is the relationship between the e-self-service platform's efficiency and customer satisfaction?

Yıldırım and Bostancı (2021) suggested that policymakers should design flexible and adaptable digital portals and systems to provide easy-to-use and self-use options for the citizens, making the system more efficient for use. Furthermore, Afieroho et al. (2023) stated that implementing e-self-service in the public sector aims to achieve more efficient and effective government services.

> ***H1:*** *Efficiency has a significant positive effect on overall service satisfaction.*

What is the relationship between the availability of e-self-service platform systems and customer satisfaction?

Bayad et al. (2018) argue that system availability/reliability influences e-service quality satisfaction levels. Moreover, Kurfali et al. (2017) share the same sentiments and demonstrate that subjective norms positively influence perceived usefulness and usability, experience positively influences perceived usability, and enjoyment influences perceived usability.

> ***H2:*** *System Availability has a significant positive effect on overall service satisfaction.*

What is the relationship between E-self-service platform privacy and customer satisfaction?

Blut (2016) defined system privacy as the security of credit card payments and the Privacy of shared information that customers give when accessing website services. Zakrzewska and Miciuła (2021) reiterate that while the benefits of e-government are evident, it is also important to protect client personal data. This indicates that customers are mostly satisfied when there is assurance of the safety of the information shared via the website.

***H3**: Privacy has a significant positive effect on overall service satisfaction.*

What is the relationship between the E-self-service platform fulfilment and Customer satisfaction?

Fulfilment refers to activities that ensure customers receive what they ordered, including delivery time, order accuracy, and delivery condition (Blut, 2016). This means that when it comes to online registrations, clients are satisfied if the service they apply for online is what they get (Afieroho et al., 2023).

> ***H4:** Fulfilment has a significant positive effect on overall customer satisfaction.*

Methods

The study adopted a quantitative approach to examine online self-service platforms and their effect on customer satisfaction at PACRA. The research used correlation and multiple regression analyses, and the quantitative approach examined the relationship among variables using the statistical package for social sciences software (Field, 2009).

Reliability and validity

Table 1 shows the questions used to measure Efficiency, Privacy, Fulfillment, and system availability to determine overall customer satisfaction. The Cronbach's Alpha values for the variables were as follows: Efficiency (0.796), Fulfilment (0.867), Privacy (0.835), System Availability (0.872) and overall service satisfaction (0.806). Given that the acceptable lower boundary for Cronbach's Alpha is 0.70, this indicates a satisfactory consistency of the measurement scales. Table 1 shows that all the variables have a Cronbach Alpha greater than 0.7. Furthermore, the study by Ighomereho et al. (2022) guided the refining of the measurement.

Table 1: Variable measures

Variable	Item	factor loadings	Cronbach's Alpha
Efficiency	With just a few clicks, I can easily find what I need on the PACRA Online E-Self-service Platform.	0.778	0.796
	Information provided on the PACRA Online E-Self-service Platform is well organised.	0.746	
	The PACRA Online E-Self-service Platform is user-friendly.	0.741	
	Accessing the PACRA Online E-Self-service Platform offerings on the platform is effortless.	0.717	
Fulfillment	The PACRA Online E-Self-service Platform delivers the order/payment when I confirm the transaction.	0.841	0.867
	The service requested is delivered on time.	0.841	
	The PACRA Online E-Self-service Platform shows what is ordered.	0.837	
	The PACRA Online E-Self-service Platform has a list of programs similar to those provided by the university.	0.841	
	The online service delivery of PACRA Online E-Self-service Platform is reliable.	0.835	
Privacy	The PACRA Online E-Self-service Platform does not share my personal information with anyone.	0.799	0.835
	The PACRA Online E-Self-service Platform protects my bank account information and online payments.	0.760	
	The PACRA Online E-Self-service Platform keeps all my personal information secret.	0.756	
System Availability	The PACRA Online E-Self-service Platform is always available for business use without a close time.	0.871	0.872
	The PACRA Online E-Self-service Platform launches and runs right away.	0.843	

	The PACRA Online E-Self-service Platform is never too busy to respond to my command.	0.844	
	The PACRA website does not go out of service after I enter my command.	0.827	
	The PACRA website is invulnerable to attacks.	0.836	
Overall Service Satisfaction	Generally speaking, using the PACRA online E-Self Service is an accurate decision.	0.804	0.806
	I feel satisfied when I use The PACRA Online E-self-service.	0.683	
	Based on my experience with the online services provided, I would recommend the PACRA E-self-service to Other want to get a service from PACRA	0.713	

Control Variables

The control variables included Gender, Age range, Occupation, Services acquired from PACRA and level of education. A control variable is a variable that is held constant or limited in a research study. The control variable is not of interest to the study's objectives but is controlled because it could influence the outcome (Pritha Bhandari, 2021).

Population and Sample Size

According to the PACRA 2021 Annual report, the total number of Companies and Business Names registrations was 33,083. Using the Raosoft Calculator at a 95% confidence level, with a known population of 33,083. The study targeted a sample size of 380 units, and fortunately, 400 responses were recorded, with 43 invalid returned questionnaires.

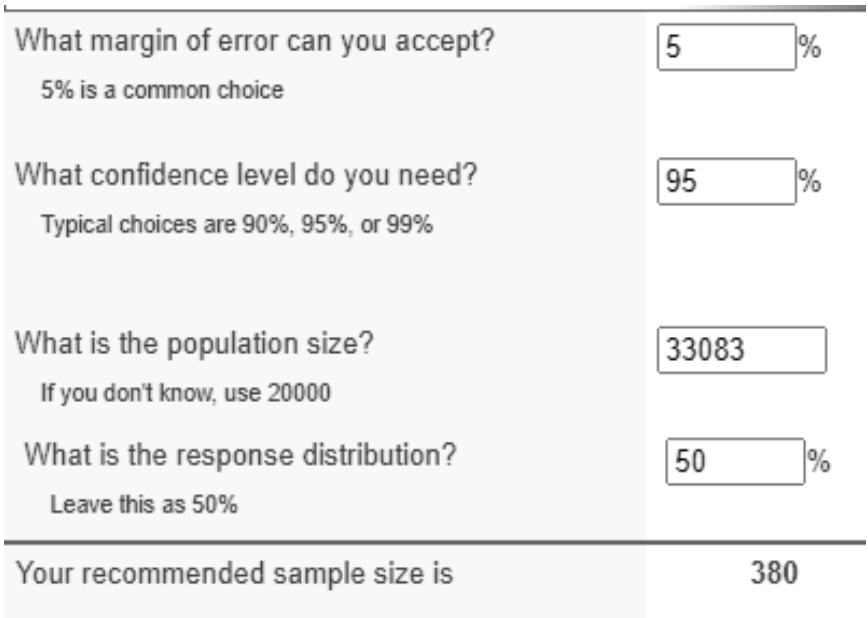

Figure 2: Sample calculations

A total number of 443 respondents was the target for this research study, and 400 respondents' valid responses were received, representing a response rate of 90.29%

Findings

Sample Profile

Table 2 shows the research sample profile. 61.3% were male, while 38.8% were female. Most respondents were between 18 to 29 years (45.8%). Furthermore, the majority are degree holders (36.8%). In addition, the majority of respondents, 58%, registered business names.

Table 2: Sample profile

Gender		
	Frequency	Per cent
Male	245	61.3
Female	155	38.8
Total	400	100.0

Age Group		
	Frequency	Per cent
18 – 29	183	45.8
30 – 40	125	31.3
41 – 50	46	11.5
Above 50	46	11.5
Total	400	100.0
Level of Education		
	Frequency	Per cent
GCE Certificate	84	21.0
Craft Certificate	24	6.0
Diploma	110	27.5
Degree	147	36.8
Master's Degree	35	8.8
Total	400	100.0
Occupation?		
	Frequency	Per cent
Business/Company Registration Agent	67	16.8
Company Secretary	82	20.5
Business Person	234	58.5
Other	17	4.3
Total	400	100.0
What service are you getting/got from PACRA?		
	Frequency	Per cent
Annual Return	69	17.3
Business Name Registration	232	58.0
Limited Company Registration	80	20.0
Other	19	4.8
Total	400	100.0

Correlations among Variables

All four variables showed that they were correlated significantly with the dependent variable. The four variables, efficiency, system availability, Privacy and Fulfilment, were positively significant ($\rho < 0.01$). The

correlations were as follows: Fulfillment (r=0.844), Privacy (r=0.837), system availability (r=.828), and efficiency (r=0.820).

Table 3: Correlation analysis

Variable	Mean	Std. Dev	N	1	2	3	4	5
Overall Service Satisfaction	4.429	0.662	400	-				
Gender	0.388	0.488	400	-0.069	-			
Efficiency	4.383	0.578	400	.820**	-.110*	-		
System Availability	4.361	0.678	400	.828**	-.110*	.824**	-	
Privacy	4.398	0.701	400	.837**	-0.081	.831**	.813**	-
Fulfillment	4.360	0.659	400	.844**	-.112*	.813**	.830**	.798**

**. Correlation is significant at the 0.01 level (2-tailed *. Correlation is significant at the 0.05 level (2-tailed).

Hierarchical regression

Firstly, model 1 shows the base model, with the only control variable being gender. Gender as a control variable makes no significant contribution with an adjusted R^2 of 0.2% and R of 0.069 and had a P-value of 0.170. This means that regardless of gender, PACRA customers use the PACRA E-self-service platform. Furthermore, the variables Efficiency, Fulfilment, system availability, and Privacy will be applied to satisfy them with the PACRA E-self-service platform.

Secondly, Efficiency is added to model 2 in addition to the control variable gender, and this results in a substantial combined effect (R-squared change of 66.9% from 0.5% to 67.3%) with R of 0.821, indicating a combined big effect size. The effectiveness of the service platform and general customer satisfaction had a substantial positive relationship (Beta=0.153, $p<0.000$). H_1 is therefore supported.

When System Availability is included in model 3, there is a significant combined effect (R-squared change of 7.3% from 67.3% to 74.6%) and a combined large effect size (R of 0.864). The system availability of the service platform has a strong positive relationship with total customer satisfaction (Beta=0.197, $p<0.000$). H_2 is therefore supported.

Model 4 introduces Privacy and shows a combination big effect size (R of 0.883) with a combined substantial effect (R-squared change of

3.4% from 74.6% to 78.1%). The privacy of the service platform had a considerable beneficial impact on overall customer satisfaction (Beta=292, p<0.000). H_3 is therefore also supported.

Model 5 introduces Fulfillment, resulting in a combination effect (R-squared change of 2.6% from 78.1% to 80.7%) and a combined large effect (R of 0.898). Overall customer satisfaction was positively impacted by the E-self Service platform's fulfilment (Beta=0.327, p<0.000). H_4 is therefore supported.

Table 4: Hierarchical regression

Variable	Model 1		Model 2		Model 3		Model 4		Model 5		
	Beta	SE (1)	Beta	SE (2)	Beta	SE (3)	Beta	SE (4)	Beta	SE (5)	VIF
Control Variables											
Gender	-0.069	0.068	0.022	0.039	0.031	0.035	0.024	0.032	0.030	0.030	1.016
Independet Variables											
Efficiency			0.823**	0.033	0.431**	0.051	0.247**	0.055	0.153**	0.053	4.435
System Availability					0.476**	0.044	0.329**	0.045	0.197**	0.045	4.406
Privacy							0.366**	0.044	0.292**	0.042	4.096
Fulfillment									0.327**	0.045	4.075
F	1.888		408.946**		387.750**		351.189**		328.840**		
F Change	1.888		812.155		113.529		62.081		53.332		
R	0.069		0.821		0.864		0.883		0.898		
R Square	0.005		0.673		0.746		0.781		0.807		
R Square Adjusted	0.002		0.672		0.744		0.778		0.804		
R Square Change	0.005		0.669		0.073		0.034		0.026		
** significant at p<0.01			* significant at p<0.05								

In summary, all independent variables influence the PACRA e-self-service platform customer satisfaction. Fulfilment has the most significant effect (Beta = 0.327, p < 0.000), followed by Privacy (Beta = 0.292, p < 0.001), System availability (Beta = 0.197, p < 0.000) and Efficiency (Beta = 0.153, p < 0.000).

Table 5: Summary of hypotheses

#	Hypothesis	Statistic	Test	Results
H_1	Efficiency has a significant positive effect on overall service satisfaction	Beta = 0.153**	Regression	supported
H_2	System availability has a significant positive effect on overall service satisfaction	Beta = 0.197**	Regression	supported
H_3	Privacy has a significant positive effect on overall service satisfaction	Beta = 0.292**	Regression	supported
H_4	Fulfilment has a significant positive effect on overall service satisfaction	Beta = 0.327**	Regression	supported

sig < 0.01 (1 percent); *sig < 0.05 (5 percent)

Discussion of Findings and Conclusions

Discussion of Findings

The statistical analyses shows that all the e-self-service platforms (Fulfillment, Privacy, System availability and Efficiency) positively influence customer satisfaction. According to Li, Liu, and Suomi (2009), system availability looks at the probability that a system will not experience any downtime when workers need to use it to be satisfied with the service. This complements the research findings that a significant correlation exists between the system availability and customer satisfaction regarding the PACRA e-self-service platform.

Furthermore, taking Efficiency into account, Yıldırım and Bostancı (2021) recommended that policymakers create flexible and adaptive digital portals and systems that offer citizens self-service and easy-to-use options, hence increasing system efficiency. Some respondents indicated that the PACRA e-self-service platform has excellent customer service from the contacts on the website and saved time and movement (transport) when physically visiting the PACRA offices. This collaborates with the findings that there is a link between efficiency on the PACRA e-self-service platform and customer service.

According to Dehghanpouri et al. (2020), privacy and trust have a significant influence on how satisfied customers are with their electronic

customer relationships. When a customer provides private information to PACRA to create their online accounts to access the services, they expect that the personal information provided to PACRA, such as National Registration Number, Full name, Residential addresses, date of birth and other personal information, is protected. This is consistent with the research findings that a significant relationship exists between Privacy and customer satisfaction as they use the PACRA e-self-service platform.

Finally, Bayad et al. (2021) undertook similar research on Fulfilment, stating that Fulfilment positively impacted customer service when attending online meetings through online platforms. This is consistent with the findings of this research indicating that customers are satisfied when all they know they can do on the PACRA e-self-service platforms, such as online payments, successful lodging on request concerning name clearance, annual returns and company and business name registration. Some respondents further indicated that the PACRA e-self-service platform was user-friendly and easy to navigate. This then agrees with the findings that there is a positive relationship between Fulfilment and customer service when customers access the PACRA e-self-service platform.

Conclusion

The primary goal was to investigate the relationship between e-self-service platforms (Fulfillment, Privacy, System availability and Efficiency) and customer satisfaction at a state-owned enterprise. According to the hypothesis testing, the study's findings indicate that System availability has a significant and positive effect on customer satisfaction. Furthermore, based on the study results, Fulfilment significantly and positively affects overall customer satisfaction based on the hypothesis testing results. Additionally, the results also showed that Efficiency has a significant and positive effect on customer satisfaction. Lastly, the hypothesis test also reveals that Privacy has a significant and positive effect on customer satisfaction. The case study for the research was a state-owned enterprise that had just implemented e-services successfully.

Recommendations

Service providers that provide E-self Service platforms should ensure that their platforms are available and do not have much downtime when it comes to the platform being able to provide the services needed by customers. This can be implemented by ensuring periodic website

maintenance and a good data centre infrastructure hosting provider to prevent the platform from going offline due to too much traffic during peak hours when most customers use the platform. There is also a need to ensure mechanisms are put in place that assure customers that the information provided when opening online accounts to use E-services on platforms will be secure and will not be shared with any other third party. Customers will then be more satisfied using the e-self-service platforms, knowing their Privacy is assured. Regarding Fulfillment, service providers should ensure that online applications and requests can be completed online as expected from the customers. This study shows that customers are more likely to be satisfied if their perceptions are met with expectations without any e-service quality gaps. Finally, E-self-service platforms should efficiently ensure that service providers make requests and applications on time with little paperwork from the customer. The e-self-service platform should be user-friendly, not have too many stages that confuse the customer, and should not be too technical, especially for public institutions that provide E-self-services to the public.

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