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Original Article

Adoption of Digital Technologies as a Driver for Cost Leadership Strategy in Tour Firms within Nairobi City County, Kenya

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Mobile Applications, Social Media, Operational Efficiency, Cost Leadership, Digital Technologies.

ABSTRACT

Digital technologies play a major role in reducing the cost of operations in tour firms. The main focus of the study was to find out the adoption of digital technologies as a driver of cost leadership strategy in tour firms within Nairobi City County. The specific objective was to investigate the influence of mobile applications on cost leadership strategy in tour firms in Nairobi City County. Embedded research design was applied in the study. The study adopted the null hypothesis that mobile applications had no statistically significant influence on cost leadership strategy in tour firms within Nairobi City County. The study population was 278 tour firms obtained from the Kenya Association of Tour Operators (KATO) list where a sample of 164 tour firms were selected through the application of Yemane's (1967) sample size formula. 10 tour firm mangers were selected for interviews. Systematic random sampling was utilized for the determination of the sample size of 164 tour firms. Semi-structured questionnaires and interview schedules were utilized as data instruments. Questionnaires were filled by tour consultants while interviews were conducted with tour firm managers. 133 respondents filled out the questionnaires representing 81% response rate while 7 interviewees were conducted representing 70% response rate. Both descriptive and inferential statistics were used during data analysis. The study utilized both ANOVA and multiple regression tests to test the hypotheses, and influence between the adoption of digital technology and cost leadership strategy. The results of the R Square equals 0.919 therefore revealing that 91.9% of cost leadership is attributed to mobile applications. The study confirmed there was a statistical significance (p =.000) between mobile applications and cost leadership. Mobile applications as a digital technology tool accounted for a positive significant increase (B = 637) in cost leadership strategy. The study concluded that there is a positive strong influence between the adoption of mobile applications and cost leadership strategy. The study recommends that tour firms should fully adopt digital technologies to maximize cost control, minimize marketing costs, and promote operational efficiency.

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INTRODUCTION

The contribution of technology to business has necessitated industries to adopt it in their various operations. Digital technologies refer to the integration of artificial intelligence, the internet, multimedia, big data, information systems, and social media platforms (Kononova et al., 2020). There are numerous categories and examples of digital technologies however this study will confine itself to three types of digital technologies namely: Mobile applications, artificial intelligence, and web technologies. Digital technologies have been adopted in various sectors of the economy. In education, for instance, digital technologies have transformed education processes and systems thus giving learners access to education even when far away from classrooms (Kalolo, 2019). In healthcare, the application of digital technologies has led to the innovation of wearable computing devices that possess sensors responsible for monitoring fitness information and cardiovascular impulses (Dhanvijay & Patil, 2019). In the agricultural sector, farmers utilize digital technologies such as robotics to save labour costs (Du et al., 2023). In summary, digital technologies have led to transformation and growth in numerous sectors of the economy. Njagi & Ndavula (2020) contends that digital transformation is a massive challenge for a number of organizations. Tour firms are not immune to these challenges, and they too are grappling with several disruptions such as increased cost of doing business and cut–throat competition. The survival of tour firms is dependent on their ability to incorporate cost-cutting mechanisms and make improvements in how they interact with their customers (Islam et al., 2022). Tour operators should leverage the latest technological trends to remain competitive (Ministry of Tourism, 2020)

The tourism sector is constantly evolving with disruptive digital technologies being on the rise such as 3D technology, online booking platforms, and social media (Pencarelli, 2020). The United Nations World Tourism Organization (UNWTO) provides that the tourism sector was among the early adopters of new technologies and platforms (Sinno, 2019). The tourism organization asserts that embracing digitization will generate new business opportunities for the tourism industry. Moreover, a digitized tourism sector will also have increased competitiveness, sustainable development, and consistent growth. The new tourism strategy for Kenya 2021 – 2025 has 9 major initiatives and one of them is the digital initiative (Ministry of Tourism, 2022). The digital initiative intends to digitize and deliver an end-to-end digital customer experience.

The adoption of digital technologies ensures the accessibility of tour products and services is optimum through the elimination of mobility barriers (UNWTO, 2022). UNWTO posits that the future of travel will be based on technology. Students getting into the tourism career will be required to possess soft skills such as digital literacy so that they can be able to manage smart initiatives adopted in the tourism sector. The adoption of digital technologies in the tourism sector will lead to the creation of many new

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opportunities thus enabling the achievement of Sustainable Development Goal number 8, which is decent work and economic growth. SDG number 8 provides that there is a need for the promotion of economic growth that is sustainable and which promotes decent and productive jobs for all.

Cost leadership is a strategy in which companies work hard to achieve the lowest possible prices through the adoption of technology. Cost leadership entails firms providing their products or services at the lowest prices therefore making above-average profits and amassing a huge market share (Ochodo et al., 2020). Mobile applications such as social media applications are being used for digital marketing while navigation apps such as travel guides assist people with their travels around the globe (Saura, 2020). One of the latest business models being adopted in the tourism sector is the utilization of mobile applications (Palos-Sanchez et al., 2021).

Statement of the Problem

Innovation has led to the development of new digital technologies in various economic sectors including the hospitality and tourism sector (Pencarelli, 2020). Despite the benefits accrued from the adoption of digital technologies, some tour operators have yet to fully adopt these technologies in their tour firms (Ong'ele, 2018). Moreover, Alford & Jones (2020) posit that amongst smaller tour firms, there is a widespread ineffective utilization and lack of adoption of digital technologies. Further, in the tourism sector, there exists a digital divide that has prompted the digital exclusion of some tour firms which do not have the capacity to take part in opportunities that come up from fully adopting digital technologies (Inversini et al., 2020). The digital divide in Kenya makes tour firms unable to reliably utilize and access digital technologies in their firms (Ragnedda et al., 2018). Ragnedda et al. (2018) state that the cost of internet connectivity in Kenya is high thus impedes the adoption of digital technologies. Consequently, the aim of this study was to investigate mobile applications as a tool for utilization by tour firms and their contribution towards cost leadership.

General Objective

To assess the influence of the adoption of digital technologies on cost leadership strategy in tour firms within Nairobi City County.

Specific Objective

To investigate the influence of mobile applications on the cost leadership strategy in tour firms within Nairobi City County.

Research Hypothesis

H_{01}: Mobile applications have no statistically significant influence on cost leadership strategy in tour firms within Nairobi City County.

LITERATURE REVIEW

This section outlines the adoption of mobile applications and cost leadership in Nairobi City County. The section provides a theoretical framework, empirical review and conceptual framework.

Innovation Diffusion Theory

This study is anchored on the Innovation Diffusion theory. In 1962, E. M Rodgers developed the theory. The Innovation Diffusion Theory (IDT) provides the pattern followed and the rate at which new ideas, practices and products spread through a population (Rodgers et al., 2014). Rodgers defined diffusion as "the process whereby an innovation is communicated via particular channels over time among members of a social system" (Rodgers, 2003).

There are four major elements of IDT that are Innovations, communication systems, time and social systems (Wani & Ali, 2015). Innovations are new ideas, objects or practices while communication systems are channels utilized by users to disseminate information (Wani & Ali, 2015). Further, time refers to the period the innovation is created to when it ceases to be one while a social system refers to the people and society that accepts or rejects an innovation (Wani & Ali, 2015). For social system analysis, Rodgers

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(2003) categorized the members of the social system into five categories. The categories include innovators, early adopters, early majority, late majority and the laggards. Innovators are the first and quickest to adopt or act to a change in technology while early adopters are first in their group to adopt technology, but they have boundaries. The early majority are more cautious and rely on information provided to them by the early adopters while the late majority only adopts after the average population has adopted. The laggards are resisters of change and only incorporate an innovation during its dying stages.

Rodgers and Shoemaker (1971) found out that there are five major factors that determine whether an innovation will be adopted or not. The five attributes are relative advantage, compatibility, complexity, trial-ability and observability. Therefore, for tour firms to adopt a particular technology then they must perceive the benefits that are the relative advantage of the technology to be better than the one currently in use. Moreover, tour firms will also adopt mobile applications only to the extent in which they are compatible and consistent with consumer beliefs, values and needs. Rodgers (1983) formulated the 5 – stage model followed in the process of innovation adoption. The five steps in the process include the knowledge stage, the persuasion stage, the decision stage, the implementation stage and the confirmation stage (Wani & Ali, 2015). The knowledge stage is the first step, and it entails an individual or organization finding out the existence of an innovation via various communication channels. The knowledge stage is succeeded by the persuasion stage whereby an individual forms an attitude be it favourable or unfavourable towards an innovation. The third stage involves making a judgement on whether to adopt or reject an innovation. The implementation stage forms the fourth stage whereby an innovation is put into practice and the last stage is confirmation whereby a decision to implement a decision can be reversed or confirmed (Rodgers 1983). Despite the informative nature of the theory, it also possesses some limitations. Firstly, the concept of innovation diffusion began from studying agricultural fields rather than high-end technological products thus some researchers argued that the theory could not hold for innovations in other sectors (Wani & Ali, 2015). Secondly, Lyytinen and Damsgaard (2001) postulate that innovations do not necessarily require one to go through the various stages of adoption for an individual to adopt it and that in some instances the Laggards have proven to be more visionary than the innovators. Rodgers has always positively considered the criticisms to better improve the theory.

Empirical Literature Review

The study focused on empirical analysis of papers related to digital technologies and cost leadership. Tourism forms one of the most dynamic and profitable sectors in the global economy (Davydova, 2015). A study was conducted on the impact of Digital Technologies on the Transformation of the Tourism and Hospitality Industry by (Nikolskaya et al., 2021). The study found that Mobile applications promote operational efficiency through the provision of effective solutions to the core tasks in the tourism business (Nikolskaya et al., 2021). Further Nikolskaya et al. (2021) posit that mobile applications are responsible for the reduction of operational costs. Ong'ele 2018 researched Digital Technologies and how they improve Competitive Advantage in Travel and Tour Firms. The study revealed that the adoption of digital technologies improves the competitive advantage of tour and travel firms. Social media applications such as Facebook, X, TikTok, and Instagram provide a cost-effective way for tour firms to connect with potential customers (Tuten & Solomon, 2017). The use of financial applications to send money reduces the costs associated with the physical transportation of money in tour firms. The adoption of digital technologies has also had its fair share of challenges. One of the challenges is that some tour companies are apprehensive regarding data safety and secrecy if they incorporate digital technologies in their operations (Salleh et al., 2018).

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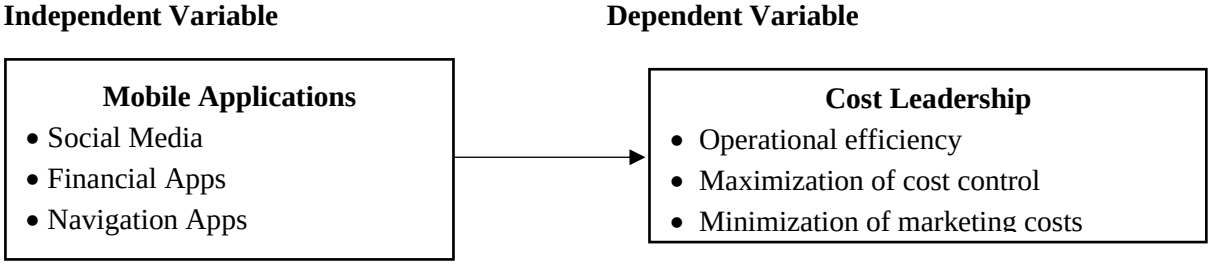
Study gaps

This study aims to fill various research gaps which include time-based gaps, literature-based gaps, contextual-based gaps and methodological-based gaps. For the time-based gap, (Rodger et al., 2014) investigated the innovation diffusion theory, outlining patterns followed and the rate of adoption of new technology. The study was carried out before the COVID-19 pandemic. However, this study will be carried out after the Covid 19 pandemic thus bridging the time–based gap. For the literature-based gap, (Sharma & Mishra, 2014) Technology adoption is determined by four main constructs: performance expectancy, facilitating conditions, effort expectancy and social influence. The study has a Literature-based gap since there is no direct link in the study linking the adoption of digital technologies in tour firms with the UTAUT theory. This study seeks to bridge that gap by linking the adoption of digital technologies in tour firms to the UTAUT theory. (Alford & Jones, 2020) Among tour firms there is widespread ineffective utilization and lack of adoption of digital technologies. This is a Contextual gap. The study was carried out in an advanced country, Britain. This study will be conducted in a less-developed country, Kenya. (Mosiara, 2021) Digital technologies lead to cost efficiency thus enabling tour firms to earn a higher cost margin. Methodological gap. The author used a review of the empirical literature.

Cost Leadership Strategy

This is a strategy that was developed by Michael Porter in 1985. The strategy is also referred to as the low–cost strategy which consists of a high–level plan by businesses to reduce costs thus earning higher profits (Islami et al., 2020). This strategy ensures an organization achieves a competitive advantage by reducing operational costs to a level lower than competing firms (Islami et al., 2020). Businesses attain low production costs through minimization of costs in areas such as overhead costs, sales and advertising (Eraslan, 2008). Eraslan (2008) posits that cost leadership possesses three main aspects that are maximization of operational efficiency, minimization of marketing costs and maximization of cost control. Mobile applications enable maximum operational efficiency which in turn reduces operational costs (Nuseira & Aljumahb, 2020).

Figure 1: Conceptual framework



METHODOLOGY

The study adopted a mixed method approach which consisted of both the quantitative and qualitative research approaches. The study adopted a mixed method approach in order to obtain richer data regarding the study topic. The research design that was utilized was the embedded research design. Embedded research design was preferred for this study so that the results from the questionnaires can be complemented by the responses from the interviews. The research took place in Nairobi City County. Nairobi City County was selected as the study area due to the high concentration of tour firms in the location which guaranteed access to a sufficient number of respondents. The study population was 278 tour firms in Nairobi obtained from the Kenya Association of Tour Operators (KATO) list The study adopted systematic random sampling to identify 164 tour firms that were identified using Yemane's (1967) formula for sample size determination.

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$$n = \frac{N}{(1+Ne^2)}$$

Equation 1 is Yemane's (1967) formula for sample size determination Where n= sample size, N= population size, e = Margin of error (MoE), e = 0.05

$$n = \frac{278}{1 + 278(0.05^2)} = 164$$

The main data collection tool was the semi-structured questionnaire however, interview schedules were utilized as well. Descriptive and inferential statistics were used in the analysis of the results. A simple linear regression analysis was adopted to determine the degree and tendency of the relationship between mobile applications and cost leadership. The regression analysis model used was as follows:

$Y= \beta_0 + \beta_1 X_1 + e$

Where: Y = Cost Leadership, β_0 = constant of the model, β_1 = coefficients for the determination; + X_1 = mobile applications and *e* = error term

FINDINGS AND DISCUSSIONS

Response Rate

The researcher disseminated 164 questionnaires through a drop-and-pick system, where 133 questionnaires were filled, and 7 interviews were conducted. The questionnaires were disseminated to tour consultants while the interviews were conducted with the tour firm managers. The questionnaire response rate was 81% which was above the 50% recommended by Mugenda and Mugenda (2003). The interview response rate was 70% which conforms to Kothari & Garg's (2014) finding that a response rate of 70% and above is excellent. The response rate was hence sufficient for data analysis.

Mobile Applications

Means indicate the level of agreement for each statement thus higher mean levels depict stronger agreement. The values of standard deviation showcase variability within the responses. *Table 1* shows that statement 1 ("electronic payment applications have reduced transaction costs") had an average response (*M* = 3.60, *SD* = 1.31). Statement 2 ("Navigation applications have promoted vehicle operation control in fleet management") had the least mean scores (*M* = 3.33, *SD* = 1.67). The standard deviation for statement 2 was relatively high indicating thus showcasing a high variability in the responses. Statement 3 ("Social Media applications have made marketing cheaper") had the highest high level of agreement and a relatively low standard deviation thus showcasing the responses were sparsely spread (*M* = 4.35, *SD* = 1.04). These findings are supported by findings from Nikolskaya et al., 2021 which show that mobile applications promote operational efficiency through the provision of effective solutions to the core tasks in the tourism business. Statement 3 indicates that social media has made marketing cheaper compared to traditional marketing methods. Statement 4 ("Social media applications have enabled the reach of a wider audience") recorded the second-highest mean score (*M* = 4.10) and the lowest standard deviation (*SD* = .87). The aggregate mean score of 3.85 indicates a moderate level of agreement towards the statement as a whole. These findings agree with responses from one of the interviewees who said

"*as a tour firm we have incorporated social media applications in marketing our tour packages which has significantly lead to the drop in our marketing expenses. It is cheaper to post tour packages on social media compared to marketing the packages on billboards and mainstream tv and radio stations*."

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Table 1: Mobile Applications

Statements	Mean	Std. Dev
Electronic payment applications have reduced transaction costs	3.60	1.31
Navigation applications have promoted fleet management	3.33	1.67
Social media applications have made marketing cheaper	4.35	1.04
Social media applications have enabled the reach of a wider audience	4.10	0.87
Average	3.85	1.18
Valid N (listwise)	133	

Mobile Applications and Cost Leadership Strategy

The study also sought to find out the respondents' views on cost leadership and the respondents were requested to indicate their level of agreement on a 5-point Likert scale of 1 – 5 where 1 = strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree. *Table 2* indicates the means and standard deviations for the responses given. Statement 1 ("Operations in tour firms have become easier due to mobile applications") is the highest ranked item on the scale with a mean of 4.31 and a standard deviation of .58. This statement also had the least standard deviation denoting the least variability thus showcasing that the responses were closely related. Statement 2 ("Time required to complete tasks has improved") also possessed an averagely high level of agreement (*M* = 4.10, *SD* = .58). However, statement 3 ("Mobile applications have reduced the cost of paper-based systems") had a relatively low level of agreement and the highest standard deviation (*M* = 3.73, *SD* = 1.27). Statement 4 ("Automation of marketing tasks via mobile apps minimizes marketing costs") also possessed a high level of agreement (*M* = 4.14, *SD* = .84). The means measuring cost leadership have an average mean of 4.07 which indicates a high level of agreement with the statements on the scale. These findings imply that tour firms have improved operational efficiency and achieved cost control through the adoption of mobile applications in their operations. The respondents indicated that automation of marketing tasks, and the timely completion of tasks improves operational efficiency. The ability of mobile applications to reach a wider audience and automation of marketing tasks reduces the marketing cost thus leading to cost leadership. Social media's ability to make marketing cheaper and the reduction of paper-based systems have led to cost control among tour firms. The respondents also mentioned some of the challenges that inhibited them from fully adopting digital technologies and they include lack of digital skills, unstable internet supply, and high cost of acquisition of digital technologies. During the interviews one of the interviewees postulated that *"time needed to complete tasks such as marketing has immensely reduced since once the posters for particular tour packages are out, its just a matter of minutes before they are posted on our platforms"*

Table 2: Mobile applications and cost leadership strategy

Statements	Mean	Std. Dev
Operations in tour firms have become easier due to mobile applications	4.31	0.58
The time required to complete tasks has improved	4.1	0.58
Mobile applications have reduced the cost of paper-based systems	3.73	1.27
Automation of marketing tasks via mobile apps minimizes marketing cost	4.14	0.84
Average	4.07	0.82
Valid N (listwise)	133	

Table 3 showcases the model summary of the simple linear regression analysis where cost leadership is predicted by mobile applications variable. According to *Table 3*, the R square value is .919 at a 0.05 significance level. Therefore, the coefficient of determination (R square) postulates that 91.9% of cost leadership among tour operators in Nairobi city county can be attributed

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to mobile applications. These finding are consistent with the findings of Nikolskaya et al., 2021 which showed that Mobile applications are responsible for the reduction of operational costs. These findings also indicate that there exists a strong positive influence of mobile applications on cost leadership. The results of this analysis postulate that the independent variable (Mobile applications) is strongly related to the dependent variable (cost leadership) and explains a large proportion of its variation.

Table 3: Model summary for mobile applications and cost leadership

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.959[a]	0.919	0.918	0.21869

a Predictors: (Constant), Mobile Applications

Table 4 presents the results of the analysis of variance analysis. The findings of *Table 4* indicate that the F – value between groups is 1481.98 and since the F calculated is greater than F critical (Value = 3.91), this indicates that the overall model is significant. The hypothesis postulated that H_{01}: There is no statistically significant influence between mobile applications and cost leadership in tour firms within Nairobi City County. The results of the simple linear regression analysis indicate that the p-value is 0.000, which is less than 0.05. Since the significance value was less than < 0.05 the null hypothesis was rejected. These findings imply that there is a statistically significant influence between mobile applications and cost leadership strategy in tour firms within Nairobi city county. The sum of the squares for the regression is 70.876 and the sum of the squares for the residual is 6.265. This suggests that most of the variability in the data can be attributed to differences between groups rather than within groups.

Table 4: ANOVA test for the hypothesis

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	70.876	1	70.876	1481.98	.000[b]
Residual	6.265	131	0.048		
Total	77.141	132			

a Dependent Variable: Cost-Leadership Strategy
b Predictors: (Constant), Mobile Applications

The regression model is presented as follows: Cost leadership = 1.616 + 0.637 (Mobile applications). The regression coefficient for mobile applications is 0.637 implying that for every unit increase in mobile applications, the dependent variable that is cost leadership increases by 0.637 units. At a 5% level of significance and 95% level of confidence mobile applications had a p-value of 0.000 which is less than 0.05 thus implying mobile applications are statistically significant. The equation is a multiple regression model that relates the cost leadership of the tour firm to mobile applications adopted in the tour firm. The equation states that the expected cost leadership (the dependent variable) is equal to the constant term of 1.1616 times mobile applications where mobile applications are the independent variable.

Table 5: Regression Coefficients table

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.616	0.066		24.329	0.000
	MA	0.637	0.017	0.959	38.496	0.000

a Dependent Variable: Cost-Leadership Strategy

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SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary

The objective of the study was to examine the influence of mobile applications on cost leadership strategy in tour firms within Nairobi city county. To accomplish this objective, a five-point Likert scale comprising five items was adopted. The highest-ranked statement on the scale was statement 3 "Social media applications have made marketing cheaper (M = 4.35)". The lowest ranked item on the scale was "E-payment applications have reduced transaction costs (M = 3.60)". The majority of the tour firm managers and tour consultants were in agreement that mobile applications had a significant influence on cost leadership strategy within tour firms. The results of the model summary show that the R-square value was 0.919 at a 0.05 significant level. The model summary postulates that 91.9% of cost leadership in tour firms within Nairobi City County can be attributed to Mobile applications.

Conclusion

The study concluded that there is sufficient evidence to allude that there is a significant influence of mobile applications on cost leadership in tour firms. This can be evidenced by the p-value of 0.000 for mobile applications. Since the p-value is < 0.05, the null hypothesis was rejected. The study determined that tour firms had adopted mobile applications which in turn improved operational efficiency, maximized cost control and minimized the costs incurred in marketing. This led to tour firms' increased profit, lower customer retention costs and the ability of tour firms to reach a wider audience cost-effectively.

Recommendation

This study advocates for the full implementation of all digital technologies by tour firms so that they can reap the full benefits of these technologies. The study recommends that tour firms should be at the forefront of finding out the latest digital technology innovations and being the first to adopt them in their operations. Moreover, the study also recommends that researchers should do more research on digital technologies in the tourism sector to build a body of knowledge regarding these inventions. The research will enable more tour operators to gain the much-needed knowledge required to easily adopt digital technologies. Lastly, policymakers should formulate adequate policies and procedures required to mitigate the challenges of adopting digital technologies such as data protection laws. The government should fast-track the establishment of public-private partnerships that will reduce the cost of the Internet thus facilitating full access to all digital technologies

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