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Greg H. Ezeah

University of Nigeria, Nsukka, Gregezeah100@gmail.com

Ogechi Eucharia Okwumba

ogechieucharia100@gmail.com

Gever Verlumun Celestine

University of Nigeria, Nsukka, encyclopediadia100@gmail.com

Wogu Joseph

worgujoseph100@gmail.com

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**Human-Machine Communication and the Burden of Reaching Internal Publics:
Does Technology Acceptance Model Play a Role?**

Greg Ezeah

Okwumba, Ogechi Eucharia

**Gever, Verlumun Celestine
Wogu Joseph¹**

Abstract

The objective of this study was to examine how variables from Technology Acceptance Model (TAM) play a role in determining the use of digital interfaces for internal communication in public service institutions. The researchers also examined the most preferred digital interface for internal communication among employees of public service institutions as well as the relationship between internal communication and public service delivery. A total of 385 respondents working in a public service institution took part in the study. The questionnaire was the instrument for data collection. To analyse the results, the researcher used both descriptive and inferential statistics. The result showed that perceived ease of use, perceived usefulness and attitudes to digital interfaces significantly correlate actual use. It was also found that social media was the most preferred digital interface for internal communication among employees of public service institutions. Our result also suggested a significant association between effective internal communication and public service delivery. The theoretical, scholarly and practical implications of the results have been explored.

Keywords: acceptance, communication, interfaces, internal publics, technology and usage

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¹ Corresponding Author: Wogu Joseph, department of Mass Communication, University of Nigeria, Nsukka joseph.wogu@unn.edu.ng

Introduction

The place of communication in building consensus and stimulating development has not been in doubt. This partly explains why communication plays a critical role in all organizations that range from health to engineering and construction, to education, among others. It is nearly impossible for any meaningful interaction to take place without communication being at the centre. For as long as people exist, they must communicate, they must relate. Maslow (1943) in his classical theory of human needs says that interaction and relationship are among the essential needs of man. Although Maslow did not specifically mention communication, there cannot be interaction or relation or love without communication. Even infants communicate with their mothers. The difference could be the approaches to their communication but the central point is that meaning exchange through the instrumentality of communication is essential for effective interaction among people. In fact, there cannot be society without communication.

Although the importance of communication in human interactions remains the same, the emergence of communication hard and soft wares have completely altered the scope and nature of communication. Scholars (Olojede, et al 2014; Ladokun, et al 2013; Ibikunle & Binpe, 2014) are in consensus that advancements in technologies have expanded the scope of communication and changed its nature completely. In contemporary world of communication, digital media are significantly mediated communication among people. Communication in the 21st century relies substantially on digital interfaces. This cuts across security, commerce, governance, marketing, politicking, among others. Even family ties are now maintained through interfaces. The society has come to a point where as human-machine and machine to machine communication have become commonplace. Decker, (1996) says that computer-mediated communication describes the process in which case people create, share, and hold views about information through networked telecommunications systems that enhance encoding, transmitting, and decoding messages. In the views of Digital interfaces have emerged as critical in getting job done. They are very cardinal in harnessing the potentials of ICTs. The popularity of the interfaces in communication experience has also spilled over to formal organizations and institutions who now regard mediated communication as the simplest and cost-effective ways of reaching their internal publics. While substantial evidence exist suggesting that communication has changed and that institutions and organizations have also changed their approaches to reaching their internal publics, the same cannot be said of how elements from technology acceptance model play a role in this process. Communicating with the internal publics is of particular interest because when organizations and institutions strengthen their internal communication, its members could better work in harmony and offer effective services to the general public, thus leading to effective implementation of public policy. Therefore, when there is poor internal communication among corporate bodies that render services to the public, the negative outcome will be felt by the general public. For this reason, a study of the application of interfaces in communication engagements of organizations and institutions is of critical significance. Also essential is the need to evolve theories that explain the changes in communication. Consequently, the Technology Acceptance

Model, TAM has been regarded as a reliable framework for examining the use of innovations in technology. Therefore, in this study, the researcher will apply the tenets of TAM to (i) examine how perceived usefulness influence the use of interfaces, (ii) ascertain how perceived ease of use predict perceived usefulness, (iii) determine how perceived usefulness predict actual use of interfaces.

Internal Communications in the Era of Digital Interface

Communication among members of an organization is very important for policy formulation, implementation, and evaluation. Internal communication (IC) is a subset of strategic communication, corporate communication as well as strategic public relations. In every organization where human beings operate, there is the need for them to communicate. It is through the instrument of communication that meanings are created and shared among members of the organization. Therefore, internal communication is that type of information exchange that take place among members of an organization in their official duties. This is sometimes called internal memo. Vercic et al (2012) say that internal communication describes a communication system managed by an organization in which case the employees are considered as stakeholder group or internal publics. Welch and Jackson (2007) say that Internal communication spans from informal communication that takes place in office including gossip to more formal corporate communication that occurs between senior staff members and all employees as part of the public relations or corporate communication functions. Omilion-Hodges and Baker (2014) conceptualize internal communication as “thoughtful and proactive framing of messages tailored to meet employees’ temporal, informational, and affective needs” (p. 436). Effective internal communication has been regarded as beneficial to the attainment of organizational objectives. This assertion is supported by evidence in literature (Yeomans and Carthew 2014; FitzPatrick and Valskov 2014; (Zerfass et al 2015). In time past, internal communication was accorded less attention from public relations theorists because their central focus was on external publics. Members of the internal publics were assumed to be loyal, predictable, as such, deserving of less scholarly attention. But, internal communication is nowadays considered as fundamental for many organisations, and theorists are paying closer attention to internal communication with specific consideration to issues like employee engagement (Welch 2011; Karanges et al 2015; Zerfass et al 2015). Employee engagement is an approach that ensures that workers stay and work together. In recent times, scholars (e.g. Fawkes 2007; MacLeod and Clarke 2009; Welch 2011; Schaufeli 2014; Johansson 2015) focused attention to examining internal communication within the prism of employee engagement. Hitherto, internal communication was done through written memos that were pasted on notice boards for members to read. Also, meetings and briefings were held at organisations’ conference centres to communicate important information to members. However, the emergence of digital interfaces have provided new opportunities for interfaces in organizations. Digital interfaces in form of hardware and soft ware have changed the nature of internal communication considerably. Digital devices like smartphones, personal computers, desktop with corresponding software are now useful digital interfaces that define internal communication. The emergence of social media have also added to the interface options. Organizations are also harnessing the potentials

of these digital interfaces to maintain a two-way communication with employees. Scholars (e.g., Friedl and Vercic, 2011; Gallicano et al., 2012; Ruck and Welch, 2012) are of the view that in contemporary highly digitized society with many digital interfaces, it is essential for organizations to consider the channel preference of their employees when determining way of reaching them. Social media platforms have been particularly regarded as digital interfaces that could be useful for effective internal communication. Miles and Mangold, (2014) Omilion-Hodges and Baker, (2014) corroborate that social media platforms allow employees the leeway for instantaneously, meaning sharing not minding if they are in the good or bad light. Cameron and McCollum, (1993) add that Internal social media could satisfy the desire for more interpersonal communication platforms that actively engage with employees. Overall, the emergence of digital interfaces have changed the scope of internal communication. Consequently studies are required to examine acceptance and use of such interfaces for internal communication among employees in public service organisations. Evidence in literature (Asogwa, & Oluwakemi, 2017; Asogwa, Ojih, Onoja, 2015; Asogwa, & Ojih, 2013 Ezeah, Asogwa, & Edogor, 2013; Ojih Onoja & Asogwa 2018) social media are among the most used digital media platforms.

Universities as institutions of Public Service

Universities are institutions of public services. They are cardinal to the overall development of any nation. Universities provide the manpower needed in different areas like engineering, legal services, the economy, agriculture, security, fashion, arts, entertainment, journalism, public administration, politics, teaching among others. Sharma (2015) avers that universities are essential in training leaders, in teaching and learning, in education, research as well as technology. He adds that concerning teaching engagements, , universities offer the professional training for high-level jobs, as well as the education needed for the development of the personality. Sharma further reveals ‘Universities are considered to have been regarded as key institutions in processes of social change and development. The most important role they have been assigned is the production of highly skilled manpower and research output to meet perceived targets.’ Castells (2001) identified four functions of universities that further present them as institutions of public service. He identification was found useful in this study. The first, of such functions according to Castells is that universities play a pivotal roles as ideological mechanism which voice out the ideological struggles common in all societies. The second function, in the postulations of Castells is that universities are instruments of selection and socialisation of dominant upper class. That is the elites. In the third place, Castells says that universities generate knowledge, often regarded as their most useful function, is actually – in the views of Castells – a relatively minor one. The Fourth and last is the most traditional function of universities is the training of a skilled labour force. Castells calls this function the “professional university.”

Which ever way one looks at it, universities offer public services. They are very important to the overall development of the society. In this study, we considered universities as rendering public services because the impact of university education is felt by all. For example, when universities produce medical doctors, the impact of the activities of such medical personnel is felt by the entire society, when universities

produce journalists, the impact of the activities of such journalists is felt by the entire society. Nigerian laws, for example, recognize universities as public service institutions. For example, in section 169 of the 1999 Constitution of the Federal Republic of Nigeria (as amended) says public service include the civil service (Ministerial departments), judiciary, legislature, statutory corporations or parastatals, educational institutions, financially completely or mainly owned by government at the State, Local and Federal levels, Nigeria Police or Armed Forces and as well as organizations where the Federal or state governments has control. Marshall, and Murtala (2015) aver that public service institutions serve the general public by offering services and implementing government development goals. Suffice it to say that universities are institutions of public service, then effective internal communication among its staff is very important. The acceptance and use of interface among university staff is also of importance because it could offer insights on how to ensure effective internal communication with a corresponding impact on public service delivery and policy implementation at the university level.

Theoretical Framework and Hypotheses

This study found expression on the Technology Acceptance Model (TAM). Davies suggested TAM in 1986 to explain the adoption and eventual use of innovation in technologies. According to Lee, et al (2003) among all the theories, TAM is considered the most impactful and frequently used theory for describing an individual's acceptance of information systems. Davies adapted TAM from the Theory of Reasoned Action of Ajzen and Fishbein, (1980). TAM postulates that an individual's information systems acceptance is determined by two major variables: viz Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). The conceptual model of TAM is shown below:



Figure 1 Conceptual illustration of TAM

The conceptual illustration of TAM as above suggests that the stimulus that trigger technology use are the features that such a technology has. If the features are considered as beneficial and not difficult to use, they could serve as propelling force and ultimately results to actual use. Davies, thus, redefined the conceptual model to propose TAM as shown below:

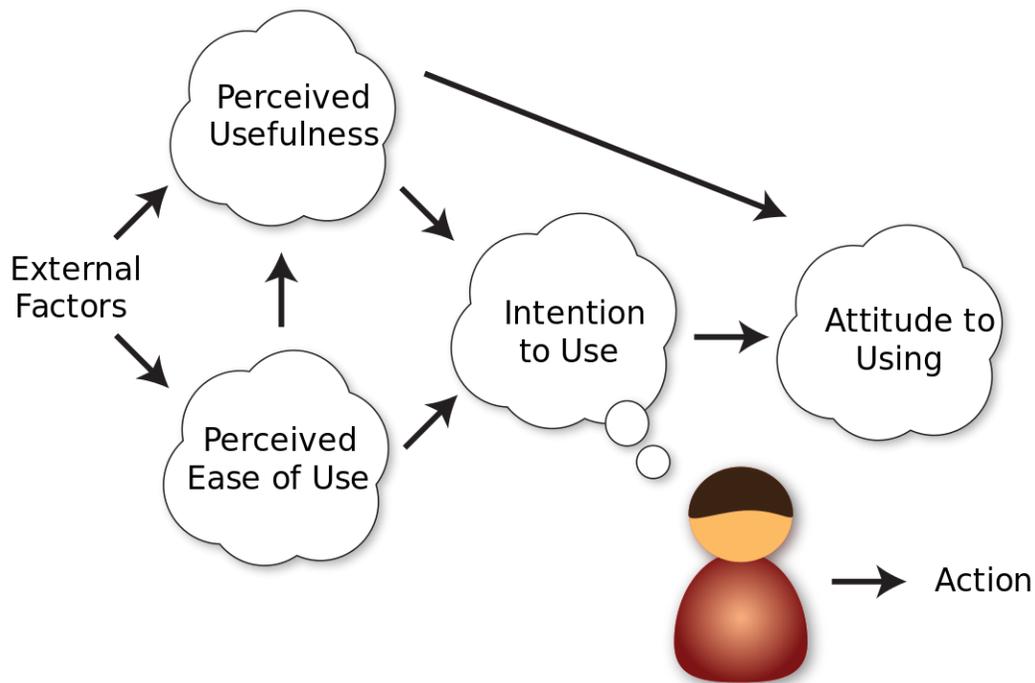


Figure 2 Technological Acceptance Model

Based on the the illustration above, Davies argues that perceived ease of ease and perceived usefulness predict attitudes to new technologies and attitudes influence eventual decision to use or not to use new technologies. In the opinion of Lee et al (2003) TAM has been applied to different technologies (e.g. WWW, e-mail, Hospital Information Systems word processors, GSS,) using different situations like time and culture. TAM has also be examined using different control factors like gender, organizational type and size. It has also be examined using various subjects like undergraduate students, MBAs, and knowledge workers. Lee at al add that currently, researchers in the IS field regard TAM as one of the information systems fields' own theories, and still require much effort into the study of research using the theory. TAM has also been applied in many communication studies (see Mackay & Ivory 2014; Zhou, 2008; Ernst, et al, 2013). The use of interfaces is essential for organization to harness its potentials for policy promotion and implementation. If digital interfaces are not utilised by the users, then their potentials for solving organizational problems will not be harnessed. This is more so that more and more interface technologies continue to emerge almost on a daily basis. Institutions are also deploying interfaces for public services as well as internal communication. Effective interfaces among members of an

organization that offer services is worth investigating because poor meaning sharing among them could eventually affect the quality of services that they give. Knowledge of determinants of use of interfaces among members of a formal organization is essential for redesigning interfaces strategies. Therefore, the researchers hypothesized as follows:

H1: Perceived ease of use of interfaces will significantly influence user attitudes for internal communication among members of an organization.

H2: Perceived usefulness will significantly influence attitudes to digital interfaces for internal communication among members of an organization.

H3: Attitudes to digital interfaces will significantly influence its use for internal communication among members of an organization.

H4: perceived ease of use will significantly correlate actual use of digital interfaces for internal communication.

H5: Perceived usefulness will significantly correlate actual use of digital interfaces for internal communication among members of an organization.

H6: There is a significant relationship between the preferred digital interface and actual use for internal communication.

H7: Effective internal communication is significantly associated with public service delivery.

Materials and Methods

In this study, we adopted correlational survey. We considered this useful because it is often preferred when a researcher seeks to ascertain relationship among variables. In this study, we sought to utilise variables from TAM to ascertain how they relate to use of digital interfaces for internal communication among members of a public service institution. The study was conducted among staff of the university of Nigeria, Nsukka. We regarded staff of the University of Nigeria as providing a good example to study the use of digital interfaces for internal communication because the university has made provision of digital interfaces among its staff. All members of staff have institutional email addresses that is also added to the central data base. Information about the university reaches all staff. Members of staff also have the option of interacting with the administration through such interface arrangements. There is also an ICTs centre through which members of staff without digital devices could use for such interfaces. The University equally has a functional portal that is updated on a regular basis for staff to interface with the administration and get relevant information. Therefore, with these interface arrangement, the university was used as an example for the study.

To determine the sample size for the study, the researchers used the Cochran formula (1963). With 95 percent level of confidence (confidence interval - $\pm 5\%$), population estimate of 50% (.5) and a permitted margin of error at .05 (5 percentage points), the Cochran Equation '1' which yielded a representative sample for population that are large and it is as follows:

$$n_0 = \frac{[Z/2]^2 (p q)}{e^2}$$

$$n_0 = \frac{[Z/2]^2 (P) (1-P)}{e^2}$$

Where: n_0 = sample size, Z^2 = confidence level (the abscissa of the normal curve that cuts off an area α at the tails), p = rate of occurrence or prevalence (the estimated proportion of

an attribute that is present in a population), q = complement of p and e = margin of error. Therefore;

$$n = \frac{[1.96]^2 0.5 (1 - 0.5)}{0.05^2} \quad n = \frac{3.8416 (0.25)}{0.0025}$$

$n = 385$

Therefore, the sample size for this study was 385. We used the purposive sampling technique to select the sample. The instrument for data collection was the questionnaire. Three communication scholars at the Department of Mass Communication, University of Nigeria, Nsukka validated the questionnaire. The experts were requested to examine the logicity of the items, ascertain the clarity of meaning as well as assess the appropriateness of the items. Their comments were used to produce a final version of the instrument. To determine the reliability of the instrument, a pre-test questionnaire of 20 copies were designed and administered to respondents in the study area. After two weeks interval, the same pre-test copies of questionnaire were administered again to the same respondents with the aid of SPSS version 16.0, the correlation coefficient was determined and this yielded 0.77 reliability which was considered high. It should be noted that respondents who took part in the pilot study were not part of the actual study. In the analysis of data for the study, the researchers used a combination of descriptive and inferential statistics. All inferential statistics were tested at 0.05 level of significance. Results were presented in tables. All analyses were done with the use of SPSS version 22.

Results

There was 100% return rate for the study as all the copies of the questionnaire administered were returned. The sample was 67% male and 33% female. The sample was 50% academic staff and 50% non-teaching staff. The average number of years the sample had been working for the university was 10 years (range 5 years and 15 years). The mean age of the respondents was 40 (range 35 and 45). The result of the hypotheses testing is presented in the table below:

Table 1: Correlation analysis of Perceived ease of use of interfaces and user attitudes

	Item	$\rho_{X,Y}$	p. value	Decision
1	Perceived ease of use	.713**	0.001	Sig
2	Negative attitudes	.983**	0.001	Sig
	Positive attitudes	.811**	0.001	Sig
3				
4	Digital interface	.814**	0.001	Sig

The result in table one sought to ascertain the correlation between perceived ease of use of digital interfaces and attitudes of users. The result showed that perceived ease of use of digital interfaces significantly correlate with attitudes of users. When users perceive digital interfaces as easy to use, they have positive attitudes towards it. Conversely, when they perceive it as not ease to use, they have negative attitudes towards it. Based on this result, our first assumption was supported and we concluded with 95%

confidence that perceived ease of use of digital interfaces significantly correlate the attitudes of employees in a public service institution.

Table 2: Perceived usefulness and attitudes to digital interfaces

Item	$\rho_{X,Y}$	p. value	Decision
1 Perceived usefulness	.803**	0.001	Sig
2 Negative attitudes	.781**	0.001	Sig
Positive attitudes	.804**	0.001	Sig
3			
4 Digital interface	.913**	0.001	Sig

The essence of table two was to ascertain the correlation between perceived usefulness of digital interfaces and attitudes of users in a public service institution. It was found that that perceived usefulness of digital interfaces significantly correlate with attitudes of users. When users perceive digital interfaces as useful, they have positive attitudes towards it. On the other hand, when they perceive it as not ease to use, they have negative attitudes towards it. Based on this result, our second assumption was supported and we concluded with 95% confidence that perceived usefulness of digital interfaces significantly correlate the attitudes of employees in a public service institution.

Table 3: A correlation analysis of attitudes to digital interfaces and actual use for internal communication

Item	$\rho_{X,Y}$	p. value	Decision
1 Attitudes to digital interface	.883**	0.001	Sig
2 Use of digital interfaces	.719**	0.001	Sig

In table three as shown above, the researcher sought to ascertain the correlation between attitudes to digital interfaces and actual use among the sample. It was found that significant correlation exists between both variables. Therefore, the third assumption was supported and the researchers conclude with 95% confidence that attitudes to digital interfaces significantly correlate with actual use.

Table 4: Perceived ease of use and actual use of digital interfaces for internal communication

Item	$\rho_{X,Y}$	p. value	Decision
1 Perceived ease of use	.981**	0.001	Sig
2 Use of digital interfaces	.816**	0.001	Sig

In table four above, the researchers sought to ascertain the correlation between perceived ease of use and actual use of digital interfaces for internal communication. It was found that both perceived ease of use and actual use significantly correlate. Therefore, the fourth assumption was supported and the researchers conclude with 95% confidence that perceived ease of use significantly correlate actual use of digital interfaces.

Table 5: : Perceived usefulness and actual use of digital interfaces for internal communication among members of an organization

Item	$\rho_{X,Y}$	p. value	Decision
1 Perceived usefulness	.922**	0.001	Sig
2 Use of digital interfaces	.887**	0.001	Sig

The table above examined the correlation between perceived usefulness and actual use of digital interfaces for internal communication among employees. The result showed that both perceived usefulness and actual use significantly correlate. Therefore, the fifth assumption was also supported and the researchers conclude with 95% confidence that perceived usefulness significantly correlate actual use of digital interfaces. To ascertain the digital interfaces which users perceived as easy to use and most useful, the following table was computed:

Table 6: Perceived usefulness and attitudes to digital interfaces for internal communication among members of an organization.

Item	$\rho_{X,Y}$	p. value	Decision
1 School portal	.703	0.07	Not Sig
2 University email	.681	0.08	Not Sig
Social media	.804**	0.001	Sig
3			

The table above sought to ascertain the relationship between the most preferred digital interface and actual use for internal communication. It was found that significant relationship between the preferred digital interface and actual use. Most of the respondents reported preferring social media and using it for internal communication. Therefore, the sixth assumption was also supported.

Table 7: Correlation analysis of internal communication and public services delivery

Item	$\rho_{X,Y}$	p. value	Decision
1 Effective Internal Communication	.884**	0.001	Sig
2 Public service delivery	.917**	0.001	Sig

The table above was computed to ascertain the association between effective internal communication and public service delivery. The outcome of the study showed that when internal communication among employees is effective, it could positively impact on the quality of public service delivery and vice versa.

Discussion of Findings

This study used variables from technology acceptance model to examine the use of digital interfaces for internal communication in public service institutions. A total of seven hypotheses were tested in the study. The result supported all the seven assumptions in the study. In particular, it was found that perceived ease of use of interfaces is associated with user attitudes, perceived usefulness is associated with attitudes to digital interfaces. Our results have shown that attitudes to digital interfaces is associated with actual use, perceived ease of use was also associated actual. Also, we found that perceived usefulness is also associated with actual use. Our result equally indicated that there exists a significant relationship between the preferred digital interface and actual use for internal communication. Finally, our result showed a significant associated between effective internal communication and quality of public service offered to the general public. Our result supports postulations of technological acceptance model of Davies (1986). Davies had argued that people's perception about a technology regarding its usefulness and easy to use influence their attitudes to such technologies and their attitudes play a role in their eventual use. It was also emerged from our study that most of the employees studied reported their preference for social media as means of internal communication. This aspect of the result is consistent with scholars (e.g. Miles and Mangold, 2014; Omilion-Hodges and Baker, 2014) who regard social media as essential tools for employees communication. The result is also consistent with previous studies (e.g., Asogwa, & Oluwakemi, 2017; Asogwa, Ojih, Onoja, 2015; Asogwa, & Ojih, 2013 Ezeah, Asogwa, & Edogor, 2013; Ojih Onoja & Asogwa 2018) social media are among the most used digital media platforms. It is, therefore, essential for public institutions rendering public service to regard channel preference of their employees as scholars (e.g., Friedl and Vercic, 2011; Gallicano et al., 2012; Ruck and Welch, 2012) say that this is important in the current very digitized society. Another critical aspect of the findings is that the quality of internal communication plays a role in determining public service delivery by institutions. This aspect of the result is consistent with previous scholars.' This assertion is supported by evidence in literature ((Yeomans and Carthew 2014; FitzPatrick and Valskov 2014; (Zerfass et al 2015) postulations who reveal that internal communication is essential for the performance of organizations. Our results, therefore, point to the fact internal communication is essential for public service delivery.

Conclusion/Recommendations

Based on the results of this study, we conclude that variables from TAM play essential roles in determining the use of digital interfaces for internal communication. Our results have extended beyond by TAM showing that in contemporary new media world, most employees of public service institutions express strong preference for social media as communication tools within their organization. Another addition that extends beyond TAM is the quality of internal communication goes a long way in determining the quality of public service delivery. Our results have scholarly, theoretical and practical implications. In the area of scholarship, our results have provided information for understanding the relationship between perception and actual use of interfaces for internal communication. This is an aspect that has been rarely investigated within the prism of TAM. Our result have also shown the most preferred interface for internal

communication as well as the relationship between internal communication and public service delivery. Theoretically, this study has tested TAM. In practical terms, the results of this study have offered a practical guide regarding how to promote effective internal communication by revealing the most preferred channel among employees of public service institutions. Summarily, therefore, result generated from the study could be useful for theory testing as well as provide fresh perspectives on how best to promote interface in institutions and organizations, hence the result could be useful for policy formulation and implementation. It is recommended that further studies should be conducted to ascertain media preference and use among employees of public service institutions. In the second place, further studies are required to examine the challenges against the use of digital interfaces among employees of institutions of public service. Finally, further studies are required to examine other institutions apart from the university to broaden literature in this direction.

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