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Mapping Technology: Stakeholder Perspectives on Ghana Post GPS

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Abstract:

Ghana is experiencing rapid population expansion, inadequate infrastructure, and a lack of proper addresses for both residences and businesses as a result of its poor road network and inadequate city planning. This phenomenon complicates the delivery of effective and timely emergency responses as well as other essential services to both households and businesses across the country. To overcome this issue, the Ghanaian government used unique postcodes for properties issued using a digital address programme called the GhanaPost GPS. This qualitative research examined the perspectives of 200 respondents on the use of the Ghana Post GPS mobile application. The findings reveal that only 20% of the study's sample had the App installed on their smartphones and electronic devices since its release. This is due to a lack of general awareness/effective publicity, as well as the App's limited functionality. The study further indicates that Google currently generates unique postcodes for all buildings/properties in the countries where they operate, including Ghana, hence there was little need for the government of Ghana to create a separate App for the specific purpose of creating postcodes. The study's recommendations focused on how to integrate and enhance the usage of the Ghana Post GPS Application by adding several capabilities like the taxi-hailing option for commercial taxis, in-land parcel tracking, and interstate bus booking and purchasing.

Keywords: Ghana Post GPS, application, digital address, postcode, stakeholder

1. Background

The role of technology has been instrumental throughout history, in spearheading development and modernization in societies as well as aiding in social interactions. The invention of the computer and the internet heralded the information age which has seen society's rapid shift from the traditional means to an economy primarily hinged on information technology. Technology's contribution is related to perspectives of its integration and approaches into our daily lives as human beings. The increasing attention of technology is evident in how the internet and the use of mobile phones have redefined the personal and business activities of users in society. Ankrah (2015) aptly describes this turn of events by stating that 'technology is no longer an enabler, but a business driver' (p. 125). Hence, leveraging on the use of technology such as mobile devices and the internet ensures our connection to people and businesses and aids information sharing.

The acceptance of information technology was demonstrated by its continued use during restricted working hours. Technology has progressed from restricted usage to widespread use by the general population, affecting our lives in a variety of ways in areas such as entertainment, travel, leisure, education, business, transportation, and health (Monteiro, 2017). The use of technology in the information age has resulted in widespread technological advancements, particularly in the areas of computer software and mobile applications, such as social media applications, financial technology, and Global Positioning Systems (GPS) software, which provides a visual representation of geographical locations on the globe on one's mobile device. Based on these developments, Monteiro (2017) purports that we do not just employ technology in its usage alone but we live with it; it is an all-consuming innovation. The potential of technology innovation in service delivery, such as mobile applications, cannot be underestimated. Owing to the Government of Ghana's agenda to digitalize service delivery, the adoption and use of technology are on the rise; an example is the online passport application which outperforms the lengthy and stressful processes in acquiring a passport in Ghana as reported by *myjoyonline* (2019). Aside from the individual use of innovative technology, the extension towards developing countries in harnessing the power of technology to assist in their developmental effort in areas such as business, education, entertainment, health, finance and property addressing, direction and location is fast becoming a growing trend.

One growing area of interest is property addressing and location systems. Gah, Katsriku and Gyamfi (2018) explain that properties in developing countries like Ghana lack proper addresses due to poor planning of road and street networks. This phenomenon indeed poses challenges to the provision of emergency and other vital services to Ghanaians.

To address Ghana's street and house numbering challenges, and to facilitate the provision of services, the Government of Ghana (GoG) turned to digital technology, such as GPS. The GPS technology was established to assist with the country's general addressing system, resulting in the development and deployment of the GhanaPost GPS Software in October 2017.

2. Ghana Post GPS Application

The GhanaPost GPS Software is a digital addressing system developed by Vodacom Limited on behalf of the Government of Ghana with the sole purpose of providing each landmark or property with a unique digital address. The Software divides and marks every 5-meter by 5-meter (5 x 5) square with a unique address making it possible for every landmark or property in the country to be identified and allocated a unique digital address. This makes the identification of properties and landmarks easy. Geolocation services employ the services of networking routing addresses or the internal global positioning system (GPS) to locate the user's location according to (Svennerberg, 2010).

To use the Ghana Post GPS application, a user will need an android- or iOS-enabled smartphone to download the Ghana Post GPS application. Android- and iOS-enabled mobile devices will be required to download the application from Play Store and App Store respectively. Upon completing the download, the user is required to launch the Ghana Post GPS application on their smartphone by signing up with an active phone number. The user receives a verification code which is used in verifying the phone number provided for registration on the application. Furthermore, the user, as part of signing up, is mandated to register by inputting their name and proceed to the main page where they can register their property as well. The process of generating the unique address is initiated by the user by standing outside of their house to capture a more accurate address. Alternatively, users can skip the registration process and generate their unique address, in which case the user will not be able to access emergency numbers on the application.

Again, users can save their generated GPS address by entering their identity number and type, for instance, passport, voters or national ID, in the Ghana Post GPS application. This measure, according to Ghana Post GPS's (2020) communication on their website, is to prevent users from constantly generating new addresses of their present location, but have their address verified. Once this stage is successfully done, the user can proceed to use the generated digital address as a means of identifying the property. The user's unique digital address will be generated and appear as such: GA-543-0125.

In locating a given address, the user would be required to key in an address in the search column and click on the search button. Full details of the address will be generated (Figure 1, below). Users can also employ the route option to get directions to specific address locations. To find landmarks, the user must type the name of the landmark into the search tab, for example, 'Kwame Nkrumah Mausoleum.' There will be alternatives to choose from in the dropdown menu. The user will be required to select a landmark and the digital address will be automatically generated. Similarly, the route option is available to help navigate users to identified landmarks. The emergency services such as the Police, Fire services and the national Ambulance service have been incorporated into the application and appear in the emergency button on the application.

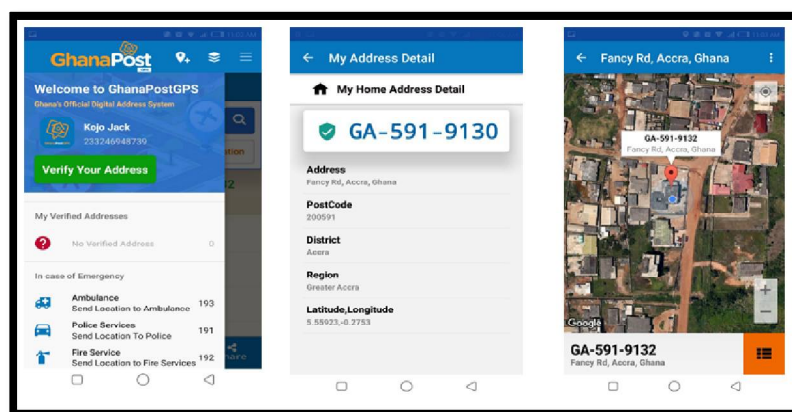


Figure 1: Ghana Post GPS Images from Google Play Store

Characteristics of Ghana Post GPS, as stated, are needed to develop evidence of effort from the government and other stakeholders in improving location issues in Ghana. In particular, this study acknowledges the research efforts in this area especially about the technical underlining concepts backing GPS and its use in Ghana. Several studies (e.g.: Gah, Katsriku & Gyamfi, 2018) have outlined the spatial development of towns and the diverse challenges that hinder efficient planning and management of these towns even before the inclusion of GPS.

Other studies including Fuseini and Kemp's (2015) highlight the struggle local governments encountered in effectively planning out their cities especially in the regulation of land use in Ghana. Such struggle, especially at the stride of Ghana's urban development, may have obstructed the ability of local government authorities to enforce the appropriate layout of properties in the cities (Abebrese, 2019). Again, street addressing projects instituted by consulting firms lacked local capacity, which is a requisite to sustaining any initiative and were subsequently terminated on a pilot basis (Abebrese, 2019). It is interesting to note the steps local government initiated in property numbering and street naming. This process culminated in guidelines established by the Government of Ghana and the Ministry of Local Government and Rural Development in 2012 with the core idea of improving issues of property numbering and street addressing. Abebrese

(2019) expounds that adherence to the implementation phases of this project was subpar. In 2017, property addressing and street naming took a different approach when the National Digital Property Addressing System commenced GhanaPost GPS's *Jack Where Are You* project in Ghana. The full potential of the Ghana Post GPS was derived from user encounters with the technology. Discussion in the media about GhanaPost digital address emphasised the socioeconomic benefit, particularly in the supply of critical services such as power, emergency services, and the police service's effective location of victims in robbery scenarios.

2.1. Rationale of the Study

The GhanaPost GPS discusses the interplay between the physical environment, digital representation, and people in the urban management system. The digital representation component intersects the digital addressing of properties and also the use of the technology by the people who own these properties. Hence, the ability of the people to comprehend and fully embrace the technology after the euphoria has died down becomes an interesting gap for research focus. Lind (2001) emphasizes that the simplicity and ease of use of an addressing system are what people associate with it. Inferring that people's attachment to a piece of technology stems from their adoption rate, which is found in their knowledge and understanding of the technology. The people, also known as stakeholders, who have a legitimate claim to the technology due to its proximity of use are the focus of this study. According to Pouloudi (1999), stakeholders are not passive environmental elements, but rather use their power to influence the organisation while acting in their best interests. The current study investigates stakeholder perspectives on the digital address system, that is GhanaPost GPS, four years after its launch. The paper presents its findings in light of the Stakeholder Theory and the Technology Acceptance Model (TAM) by investigating stakeholders' perspectives on the GhanaPost GPS and examining the technology's reception levels. Available studies have generally focused on the technological infrastructure of the digital address system (E.g., Gah, Katsriku & Gyamfi, 2018). The purpose of this paper is to fill gaps in the literature by providing a fairly comprehensive analysis of the GhanaPost GPS through the lens of the theories stated. This study could provide insight into future governmental digital initiatives and stakeholder acceptance.

3. Theoretical Framework: Stakeholder Theory and Technology Acceptance Model

Edward Freeman's (1984) 'stakeholder theory' is an approach to understanding groups or individuals who can affect or are affected by the achievement of an organisation's objectives. This theory perceives stakeholders in different groups who are related based on how they are treated. Again, Freeman (1984) explicates the concept of stakeholders as individuals, groups or organisations whose interests are in the developments and outcomes of a firm. The role stakeholders play in an organisation hinge on their contribution towards the value addition processes. This value chain includes employers, managers, shareholders, customers and so on. The direction of this study is on the consumer who is the end-user of the technology. Cording *et al.* (2014, as cited in Harrison, Freeman & Abreu, 2015) emphasize that how an organisation treats its customers has a direct influence on the behaviour and attitudes of the organisation's employees. This creates a synergy between stakeholders, as what happens to one has a bearing on the other.

Stakeholder theory, as asserted by Parmar *et al.* (2010), has been embraced by several disciplines such as finance, accounting, human resource management, information technology, corporate social responsibility, marketing, law and many more. Interestingly, in trying to understand technology use by audiences, we tend to rely on expert experiences of the technology use. However, employing stakeholder theory to examine the audience's perspective of GhanaPost GPS, the study recounts the challenges stakeholders encounter from the use of the technology. This revelation can help drive policy and build a more resilient technology adaptable to the Ghanaian context based on the analysis of the study. This theory is instrumental for understanding different aspects of an organisation because it establishes a framework for interrogating an organisation and its achievement of organisational objectives. If stakeholders are persons with an authentic interest in an organisation, what duty is laid on management when their product or service appears not to meet the satisfaction of the users? Boddy and Buchanan (1986) mention a critical aspect of stakeholder theory. The authors are of the view that stakeholders are identified by their interest in the organisation in promoting or resisting innovation. This is evidenced by stakeholders' differing perspectives on their disinterest or opposition to a service or an innovation. To situate the relevance of the stakeholder theory, Kamal, Weerakody and Irani (2011) describe its use in analysing electronic government applications. Their study focused on the role of stakeholders and the ensuing challenges in implementing an integration of technology solutions to deliver improved services in local government authorities and e-government applications (Kamal, Weerakody & Irani, 2011). The study discussed the various types of stakeholders and their perspectives on the factors that influence their adoption phases, as well as the significance of their expertise in the use of technology. Furthermore, Lapointe *et al.* (2011) argue that their paradigm considers the 'productivity paradox' citing discrepancies in research regarding enhancing healthcare productivity and quality. Their research advocated that stakeholders analyse technology in the context of implementation, considering the perspectives of many stakeholders (Lapointe *et al.*, 2011).

Again, how a piece of technology is used can be analysed based on cultural and organisational steps and technological processes. Hence, to understand stakeholder perspectives, this study employed Technology Acceptance Model (TAM). TAM is a model for appreciating users' adoption and application of emerging technologies especially mapping technologies like the GhanaPost GPS. The theory avers that a person's intent to use and usage behaviour of technology is premised on the person's perceptions of the specific technology's usefulness and ease of use (Portz *et al.*, 2019). Therefore, acceptance and actual use of technology by users depends on the benefit they will derive from using the same and the ease of use of the technology (which is accounted for in the high-quality design and interface of the

application). Consequently, the theory also describes external variables which underpin acceptance of technology which include individual differences, social and cultural influences, system characteristics, and facilitating conditions (Portz *et al.*, 2019).

Beldad and Hegner (2017) expanded TAM in their study by including trust, social inclusion and health valuation to determine 476 German users' willingness to continue using fitness app. Their study established that trust in the fitness app developer did not have a significant bearing on users' intention to continue using the app (Beldad & Hegner, 2017). Conversely, ease of use and descriptive social norms influence users' perception of a fitness app's usefulness and invariably contributed to the trust in the fitness app developer. Based on the above, the application of TAM, to this current study, is key in appreciating stakeholders trust and willingness to use the GhanaPost GPS application.

4. Methodology

The goal of this research was to examine stakeholder perspectives on GhanaPost GPS. It explored the concept of GhanaPost GPS among primary and secondary stakeholders and their acceptance and perspectives on the technology. This research employed a qualitative approach to examine stakeholder perspectives and experiences in the case of Ghana's digital address system of GhanaPost GPS. 2017 marked the beginning of *Jack Where Are You* marketing campaigns that ushered in the GhanaPost GPS application for use by the public. Hence, the study employed qualitative online surveys and interviews as means of collecting data from stakeholders. Because of this, the research identified people who have consistently used the digital addressing application on their mobile devices in the last three (3) months. This period, as the basis for sampling respondents for the study, aligns with the study's goal of analysing the perspectives of application stakeholders. Furthermore, the researchers were able to gain in-depth perspectives and analyse the adoption rate four years after the launch of the GPS address system in Ghana.

4.1. The Sample Size and Sampling Techniques

The research examined two hundred (200) respondents using a qualitative online survey combined with interviews that asked respondents critical questions on their use of the mapping technology. The sample for this study included Ghanaians in the sixteen (16) major cities in the country that have used the application/software to generate their digital address or have had the digital address generated on their behalf in the last three months. These groups were purposively targeted with the view that they could provide relevant information related to the research questions since they constitute major stakeholders in the usage of the software/application in the country. Collecting data from all sixteen (16) cities for the study presented practical challenges. In the light of this, the researchers sampled the four (4) largest cities based on population size, economic and commercial activities and access to social amenities like roads, proper town and city planning, electricity, water and internet (Population Review, 2021). The sampled cities were Accra, Ghana's capital (regarded as the largest city in Ghana with over three million urban dwellers), Kumasi in the Ashanti Region of Ghana, Sekondi-Takoradi in the Western Region and Tamale in the Northern Region of Ghana out of the sixteen (16) regional capitals in the country.

Purposive sampling was used in this selection to enable the researchers to select cities with the most urban dwellers. Based on this, a sample of fifty (50) users of the GhanaPost GPS application was selected from each of the four selected cities to make up a sample size of 200 users. The research further detailed the demographic of the sample comprising sixty (60) tertiary students, forty (40) active civil servants (formal sector), sixty (60) entrepreneurs and forty (40) taxi drivers and other commercial drivers. This selection was based on the urban demographic distribution of people who were most likely to use their smart devices in their day-to-day activities (Population Review, 2021). The respondents were chosen from a category based on the reason that they had the application downloaded on their smart devices (smartphones, laptops or desktops), had used the app, or had made someone generate their digital location/address on their behalf in the last three months.

The researchers assigned higher quotas to students and entrepreneurs because they believe that students and entrepreneurs are more likely to use smartphones for academic work and business activities, respectively. The taxi drivers and other commercial drivers were selected because their job requires them to drive people from one location to the other and GPS or location software is vital to their operations. All the respondents from the four groups for the study were purposively chosen with the only common denominator being that they have the application downloaded on their smart devices and have used the application in the last 3 months. A total of 200 people responded.

Respondents	Sample Size	Response Rate
Tertiary Students	60	60 (100%)
Taxi & Other Commercial drivers	40	40 (100%)
Civil Servants (Formal Sector)	40	40 (100%)
Entrepreneurs	60	60 (100%)

Table 1: Sample and Response Rate
Source: Researchers' Fieldwork (2021)

4.2. Data Collection and Analysis

Primary data used for the study was obtained from the researchers' field data where two hundred (200) respondents sampled under the study gave responses from sets of questionnaires. Both self-administered questionnaires and interviews were employed for the study. This allowed for responses from the respondents with varying characteristics, some of whom required further assistance in responding. The self-administered questionnaires were

deployed to respondents through google forms. The Google form hyperlink was sent to respondents online. The feedback on the form determined respondents' inclusion in the study especially their length of use of the app. The interview guide used was open-ended to allow respondents to fully express themselves. The specific responses to the survey questions were analysed thematically based on tenets of the stakeholder theory and the technology acceptance model (TAM).

5. Results and Discussion

5.1. Stakeholder Perspectives on the Use and Usage of GhanaPost GPS Application

5.1.1. Awareness of the Application/Software

The National Digital Property Addressing Systems also known as the *GhanaPost GPS* application was launched in 2017 with the expectation that the app will serve the purpose of addressing properties in Ghana to rectify the sad state of the local addressing system. An advertising campaign was adopted for the *GhanaPost GPS* App before the launch which featured a man looking everywhere for 'Jack' to whip up interest. This was replicated on Television, Online and out of home (billboards). A maze was created and placed in newspapers so people would help find Jack, all to create and drive interest. When the researchers reached out to the advertising firm, Vizeum Ghana, which spearheaded the campaign, to enquire the reason for the chosen theme, they explained that it was an inspiration by a children's hide and seek game – *Jack where are you*, where one person is blindfolded and has to find the others by their voices. They likened this phenomenon to the challenges of finding people and places in Ghana since most properties were not addressed properly or at all (Population Review, 2021). A respondent from the firm added

'Have you tried finding someone's house in Ghana? It's just like the hide and seeks game when following given directions.... turn right, turn left, keep going until you see a porridge seller. What happens when the vendor doesn't show up' (Respondent 1)?

The advertising campaign before the launch created a buzz online with people asking, 'Who is Jack'? A respondent was of the view that

'People have not come to terms with the idea of the good addressing system, not to talk of the idea of digital addressing system in Ghana. However, with smartphone adoption at 27% and mobile internet at 45%, the smartest way forward to solving the addressing challenge was adopting a digital approach' (Respondent 2).

With the response, the researchers sought to find out from the various stakeholders identified for this study as to whether the 'Jack Where are you' campaign for the *GhanaPost GPS* got the expected attention from them.

Out of the two hundred (200) respondents, an overwhelming majority, that is one hundred and ninety-seven (197) of the respondents indicated that they saw the advert on TV, heard of it on the radio or saw the creatives for the campaign on an outdoor source (billboards etc.) before the App was launched. However, at that time, they really could not connect 'Jack where are you' to the app. One of the respondents claims that

'I saw a lot of billboards and signposts with an image of a gentleman peaking from the side on several occasions with the caption, 'Jack where are you'. It culminated my interest in finding answers, however, it was not after the launch of the app that I was able to link the 'Jack where are you' I saw everywhere to the GhanaPost GPS app.' (Respondent 3)

According to Vizeum Ghana, it was important to drive awareness of the solution and educate people by using the most popular morning shows on the major electronic network with a national appeal by bringing up the pain points of poor addressing in Ghana, its effects, and the benefits of a robust and accurate addressing system. Adding up, Vizeum Ghana said they recorded over 170,000 downloads on the first week after the launch and it reached the most downloaded app 2 weeks after the launch in Ghana, surpassing the 80% target (300,000) that was set out. Indeed, most of the respondents targeted for this study indicated that they had either downloaded the app due to the awareness created from the campaign or have at least used it once to generate the digital address. *'We built the awareness of the app around the emotion people felt after using the application and I believe it's what led to the success of the campaign'*, the respondent from Vizeum Ghana added. This result shows that majority of the respondents are aware of the application so it is enough for the researchers to make an analytical conclusion that to a large extent awareness was created through the efforts of advertising.

5.2. Usability and Integration

The National Digital property addressing system, popularly known as the *GhanaPost GPS* app, was created purposely to solve one of Ghana's biggest challenges – providing a proper addressing system. It was also meant to serve as a tool to create awareness of the other services Ghana Post Limited provides (*myjoyonline*, 2020). Ghana Post Limited has, for a while, been regarded as an old and inefficient government institution for just posting letters. Due to this, the Government of Ghana mandated it to champion the National Digital property addressing system to enable it to become competitive with other companies that provide similar services in the country. Unfortunately, 4 years after the launch and introduction of the app, data shows that patronage and usage of the app have dropped significantly by a large percentage. Google play store has recorded only 8,360 downloads as of May 2021 (*Google*, 2021) and 454 downloads from the iPhone's App Store (*Appstore*, 2021). When asked how often they use the app, one hundred and fifty-one (151) out of the two hundred (200) respondents sampled for this study claimed that they had not used the application again since they generated their digital address.

The majority of the respondents said they were not even aware that the application had any other functions apart from generating the digital address. A respondent admits that

'To be honest I downloaded the application when it was first advertised, that it would be an integral part of our addressing system but once I was able to generate my digital address, I had no reason to open it (the app) again' (Respondent 8)

Most of the entrepreneurs sampled for this study also had similar submissions insisting that the app had no significant role it played in their business. An entrepreneur explained that *'When we give people the location of our business using the app (digital address), they simply tell us to send them a live google location because that is much easier for them to locate and also most of our clients say they don't have the app on their phone...everyone uses Google maps these days'* (Respondent 15)

The commercial drivers sampled for the study also reiterated that they hadn't picked up any customer who asked them to drive to a location using a digital address. A comparative analysis would show that the numbers recorded after the launch of the app in 2017 and the numbers recorded in 2021 shows a very sharp decline in patronage of the app and would go to confirm the responses from the respondents.

A quick run through the app will show that apart from the 'contact emergency services' option available on the app, there are no other options on the app that allows the app to undertake other functions apart from generating addresses. When asked if the app was easy to use, one hundred and eighty-seven (187) of the respondents sampled for the study responded in the affirmative. They explained that using the app was easy and they did not require any particular extensive education on its usage even though some respondents were of the view that generation of the digital addresses came with some level of inconsistencies. A respondent notes that

'While at one place, it could give different addresses on each search...the app is supposed to store my registered address on my handset, unfortunately, anytime I open the app on my handset, it automatically initiates the registration process again, this is unlike Google Map which keeps a single registration in memory, which can be forwarded as pin drop at any time' (Respondent 39)

Some of the respondents insisted that if the app had other functions that could be integrated into their day-to-day activities, it will encourage others to download the app and use it: *'I believe that the issue with the app is that, it was advertised as an address generating app so after you generate your address, what other purpose can it serve?'* When the researchers asked respondents if they are aware that the app is supposed to also aid in parcel delivery services, one hundred and ninety-seven (98.5%) of the respondents responded negatively and insisted that they were not aware of such.

5.3. Security and Data Protection

The issues of privacy, cyber security and data protection continues to be one of the challenges facing internet users because internet users are always at risk of their personal information getting compromised. The researchers sought to find out from the respondents if they felt safe using the app. Out of the 200 respondents sampled for this study, one hundred and one (50.5%) of them stated that they felt safe using the app and did not think that the information entered when signing up on the app might be enough for anyone to harm or manipulate them even if it got into the wrong hands:

'The app only asks for your phone number and name to set up. I do not believe that information is enough for anyone to harm me if it got hacked' (Respondent 7)

However, the remaining ninety-nine (49.5%) respondents were of the view that the information that the app requires for them to sign up was adequate to harm them, should it get into the wrong hands. A respondent asserts that *'In this day and age, all you need is someone's phone number and their name and you can almost pull all data about them.'* (Respondent 27)

Some respondents were of the view that if the application was mainly for generating a digital address, then there was no need for the app to require their personal information to sign up. A respondent argues that

'Why can't the app generate the information without necessarily asking for our phone numbers and name?' (Respondent 83)

The researchers contacted Vodacom, the app developers, to seek their opinion on the subject of data privacy for app users. They responded that they were prohibited by the law from sharing any personal information on the app with any third party, as specified by the Data Protection Commission.

6. Conclusion

In conclusion, this study recognised that stakeholders were aware of the GhanaPost GPS application since its launch in 2012 especially through the advertising campaign, *'Jack Where Are You'* by Vizeum Ghana. The study also sought the perspectives of stakeholders on their use of the application in their daily activities. The study established that usability and integration, and security and data protection were issues of interest to stakeholders. The study further revealed that most people were not aware that the app was designed to perform other functions apart from the generation of digital addresses.

The study, therefore, recommends that there should be more awareness creation and advertising to stakeholders on the other functions the GhanaPost GPS can be used for. For instance, tracking of parcels/letters since the app has a unique opportunity to allow users of Ghana Post services to track their parcels and letters when dispatched in real-time similar to what DHL and FedEx offer their customers. This can build consumer confidence over time and more people will trust their services. Furthermore, intercity bus booking and payment is another functionality that the app can offer Ghanaians. This will integrate intercity bus services on the app to allow people to book and pay for bus tickets from the comfort of their homes. Moreover, food delivery and Ride-hailing functions can be featured on the app by creating and

integrating ride-hailing options such as Uber, Bolt or Yango for both drivers and riders as an additional function. These extra functions will go a long way to encourage people to use the app on a day-to-day basis.

7. References

- i. Abebrese, K. (2019). *Implementing street addressing system in an evolving urban center. A case study of the Kumasi metropolitan area in Ghana* (Doctoral dissertation, Iowa State University). Retrieved from: <https://www.proquest.com/openview/3ba6c52fe6368c959e8058157f0eff97/1?pq-origsite=gscholar&cbl=18750&diss=y>.
- ii. Ankrah, E. (2015). *The Impact of Technology on Postal Services in Ghana*. Retrieved from <http://ugspace.ug.edu.gh/handle/123456789/27106>.
- iii. Beldad, A. D., & Hegner, S. M. (2018). Expanding the technology acceptance model with the inclusion of trust, social influence, and health valuation to determine the predictors of German users' willingness to continue using a fitness app: A structural equation modeling approach. *International Journal of Human-Computer Interaction*, 34(9), 882-893.
- iv. Boddy, D., & Buchanan, D. A. (1986). *Managing new technology*. Blackwell.
- v. Coetzee, S., Cooper, A. K., & Ditsela, J. (2011, July). Towards good principles for the design of a national addressing scheme. In *25th International Cartographic Conference (ICC 2011)*. Paris, France: French Committee of Cartography.
- vi. Fuseini, I., & Kemp, J. (2015). A review of spatial planning in Ghana's socio-economic development trajectory: A sustainable development perspective. *Land Use Policy*, 47, 309-320.
- vii. Gah, S. K., Katsriku, F., & Gyamfi, N. (2018). Using GPS and Google Maps for Mapping Digital Postal Address (GhanaPostGPS). *Communications on Applied Electronics (CAE)*, 3(13), 15-20. ISSN: 2394-4714.
- viii. Harrison, J. S., Freeman, R. E., & Abreu, M. C. S. D. (2015). Stakeholder theory as an ethical approach to effective management: Applying the theory to multiple contexts. *Revista brasileira de gestão de negócios*, 17(55), 858-869.
- ix. Kamal, M., Weerakkody, V., & Irani, Z. (2011). Analyzing the role of stakeholders in the adoption of technology integration solutions in UK local government: An exploratory study. *Government Information Quarterly*, 28(2), 200-210.
- x. Lind, M. (2001). Developing a system of public addresses as a language for location dependent information. In *Proceedings of the 2001 URISA Annual Conference*.
- xi. Monteiro, J. (2017). Non-Digital Native? No Problem: The Significance of Technology Integration to Non-digital Native Teachers Committed to Implementation. Retrieved from: TSpace Repository. <https://tspace.library.utoronto.ca/handle/1807/77134>.
- xii. Parmar, B. L., Freeman, R. E., Harrison, J. S., Wicks, A. C., Purnell, L., & De Colle, S. (2010). Stakeholder theory: The state of the art. *Academy of Management Annals*, 4(1), 403-445.
- xiii. Portz, J. D., Bayliss, E. A., Bull, S., Boxer, R. S., Bekelman, D. B., Gleason, K., & Czaja, S. (2019). Using the technology acceptance model to explore user experience, intent to use, and use behavior of a patient portal among older adults with multiple chronic conditions: descriptive qualitative study. *Journal of medical Internet research*, 21(4), e11604.
- xiv. Pouloudi, A. (1999, January). Aspects of the stakeholder concept and their implications for information systems development. In *Proceedings of the 32nd Annual Hawaii International Conference on Systems Sciences*. 1999. HICSS-32. Abstracts and CD-ROM of Full Papers. IEEE.
- xv. Svennerberg, G. (2010). *Beginning Google Maps API 3*. Apress.