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## Design and Development of an E-Petition Mobile Application

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### Abstract

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Petition, which is the most common means for parliaments to act on behalf of citizens, is characterized by the high cost of manually collecting and verifying the signatures of petitioners and supporters, as well as covering physical distances to deliver the petition. This project improves on the previous e-petition applications developed for traditional web-based platforms by using a mobile platform in an android environment. The application was implemented by using Java programming language, and android studio (3.4 version), and Google Firebase as the database. XML was employed to give a better user interface design with ease, and Photoshop to fine-tune the background picture. The significance of this project is for the petition to be done from anywhere within a stipulated geographical space, to encourage real time response to petitions and to enhance the petitioning process. In conclusion, this work is designed to increase citizens' level of participation in governance and to reduce the dearth of mediums which the public can use to participate in government activities. This study improves on previous e-petition applications developed for traditional web-based platforms by using a mobile platform in an android environment.

**Keywords:** e-Petition, Governance, Parliament

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## 1.0. Introduction

A formal request to an authority has been described as a petition. It is usually made to an institution run by government (Lindner and Riehm, 2009). Citizens have the legal right to tender this request to a parliament or congress in a democratic set up. These public institutions are presented with these legally codified documents, and in many cases also by law or constitutional practices (for example, in the United Kingdom, USA). As regards electronic requests (e-petitions) involving different sets of technologies, it has become very pertinent to differentiate between two forms of this legal request, that is formal and informal types of petitions (Moscow and Santucci, 2009). Petitions that are directed at institutional bodies and, at least, to a certain level, legally presented, are called formal petitions. Informal electronic legal requests are systems set up and managed by private non-governmental organizations. As clearly stated in many studies, these last few years have experienced a monumental decline in political support of traditional democratic institutions (Mair, 2013; Sloam & Henn, 2018; Grasso, Farrall, Gray, & Hayand, 2019). The defense of democracy refers to initiatives through which "citizens participate directly in the process of the formulation of policies" (Dalton 2003, 11), and, as with other democratic innovations, there has been a rapid rise in the popularity of electronic requests since the early 2000s due to the power of the Internet in terms of ease of dissemination and collection of signatures (Smith, 2009, Hale, 2014). Surveys have long shown the efficacy of petitions in the affairs of governance and as an important tool in political activism (Hansard Society, 2016).

With the incredible explosion in the development of electronic governance attention is moving towards mobile governance especially government-to-citizens (G2C) and citizens-to-government communication (C2G). This is all because mobile communication has totally changed the reach of global communication in this century. In the early 2000s, mobile devices were primarily used as a form of communication, but today's government agencies consider them appropriate instruments not only for disclosing crucial information, but also for providing services to citizens. The last few years have seen a huge expansion of democratic innovations (Smith, 2009; Theocharis and van Deth, 2018) to help address public dissatisfaction with political institutions. Electronic petitions are among these innovations, with increasing popularity, to the extent that several parliaments have developed their own electronic petition systems.

Cell phones are now used to provide services such as health, education, banking, judicial services and transport, among others. The use of mobile devices does not have a demarcation line for all citizens, be they literate, illiterate and being inhabitants of rural and urban areas. This was recognised by governments around the world as a great means of simplifying the lives of all citizens, regardless of their position, and to get a smooth interaction with citizens and vice-versa. Government that is not static electronically give people, enterprises and civil servants access to information made available by the government and services through mobile digital devices. This study, through a rigorous review of existing e-petition systems, proposes a mobile e-petition application for Nigeria. This will enable Nigerians to make use of the ubiquitous nature of mobile digital technology to engage in public decision making.

There is a decline in political support in traditional representative democracies, as evidenced by lower voter registration and participation (Oni *et al.*, 2015). Citizens are particularly disenchanted with failed promises of corrupt elected representatives and the limited opportunities to challenge them. This is due to the limited opportunities offered by the dominant formal models and by the institutions of political participation that mainly vote during the elections. While it is important that citizens, in democratic milieus, contribute to the decisions on how the country is governed (Lindner et al., 2011; Miller, 2009; Wright, 2012), there is almost too little credible platform for the input of citizens in the important political decisions that affect their lives in Nigeria. Other ways of political involvement such as the municipal assembly, and referendums have not been effective in Nigeria and citizens rarely have access to interact with their representatives.

Petition, which is the most common means by which parliaments act on behalf of citizens, is characterized by high cost of manually collecting and verifying the signatures of petitioners and supporters, as well as the physical distance to be covered to deliver the petition. More advanced democracies, such as those of

the United Kingdom and the United States have implemented petitioning systems on distributed web platforms so that the process of petitioning is more convenient for citizens. However, this may not be suitable for a developing country like Nigeria, where there are more mobile Internet users than traditional Internet users. This study thus aims to develop an e-petition mobile application for the citizens, review existing e-petition systems and gather requirements for mobile-application e-petition system as an improvement on the previous e-petition applications developed for traditional web-based platforms, model the functionalities of the mobile-application e-petition system and evaluate the usability of the e-petition system.

## **2.0. Literature Review**

This section examines previous research work on E-Petition mobile applications, as well as the problems related to this phenomenon as presented by Naranjo-Zolotov, Oliveira and Casteleyn (2019). It has been suggested that mobile applications should be used as a platform for advertising due to their increased penetration and acceptance (Okazaki, 2005). The observation made is that the outcome of mobile applications relies on the relevance of the information they offer to users or how much value they provide to end users (Schmitt, 2008).

### **2.1. E-Government**

To direct, control and influence from a position of authority is regarded as governance. However, governance is the use of power to direct social systems, and also a procedure and structure by which organizations are managed, directed, controlled and held accountable (World Bank, 2012). It is also seen as a set of systems and processes related to ensuring the general orientation, effectiveness, supervision and responsibility of an organization (Cornforth, 2003). The present time has experienced rapid change and continuous revolution in the World and whatever that is not changing is considered dead. Changes worldwide towards a greater spread of IT by governments have risen since the 1990s, with the presence of the Internet. Technology, as well as e-government ideas, have increased tremendously since then. The use of information and communications technology platforms by government agencies is capable of making tremendous positive effects on its relationship with citizens, businesses, and other arms of government (World Bank, 2012). Aldosari, (2006) has opined that, e-government is a process where latest innovative technologies, especially web-based Internet applications are put into use to meet citizens and businesses demands by providing more convenient access to information and services. This is done to engage the best quality of service and to make available better opportunities involving democratic institutions and processes.

The technology and procedures used in online governance projects provide a structure for the efficient provision of services. At present, the advancement of any country is a factor of how such country's government engages the power of electronic governance and also on its penetration. Any government development can be judged by the level of electronic government in that country. However, today's governments also have full confidence in online process and its capillary structure throughout the world demonstrates this. Moon and Norris (2005) defined electronic governance as a medium of electronic information delivery of government services. Andersen and Henriksen, (2006) described e-governance as the synonymous to: e-government, online government, single government and digital government. Riley (2003) refers to "government" as decisions premised on superstructure, standards, implementation and results of its policies, whereas "governance" refers to the performance based on processes, objectives, performance, coordination and results. E-government refers to the structure that is responsible for electronic service provision, electronic workflow, electronic voting and electronic productivity.

#### **2.1.1 Models of E-Government**

This sub-theme has to do with various platforms through which citizens interact with the government on e-government platforms. E-governance include activities and actors and it is possible to identify three different sectors to briefly describe their mutual interaction. They are: government-to-government (G2G), government-to-business (G2B); and finally, the relationship between the government and her citizens

(G2C) (Becker, Niehaves, Bergener, and Räckers; 2008). Scholars like Ai, Maslin and Sabariyah, (2013) have opined that e-government and e-governance have come into prominence, and both terms have been used interchangeably and they serve different purposes but towards a common goal.

### **2.1.2 Government-to-Government (G2G)**

This serves as a spinal cord of e- governance. Governments at all levels need to work to boost their internal work and operational policies before they can do so. Gregory (2007) opined that G2G involves online communications among government organizations, departments and agencies based on a super-government database (Getrude and Japhet, 2013). However, this can be the interaction among governments. The benefit of process is supported by the use of information & communications technology and cooperation which gives room for sharing of databases and resources and the combination of skills and competencies. It gives a hint concerning compensation and benefit policies, training and learning opportunities, and civil rights laws in a readily accessible manner (Ndou, 2004). The major focus of G2G focus is to improve inter-government organizational participation by narrowing cooperation and coordination. The electronic management of G2G involves the sharing of data and the creation of information electronically, both vertical and horizontal, amidst government actors. Considering this, it implies a well-structured and robust intra-institutional and inter-institutional coordination and updates.

### **2.1.3 Government-to-Commercial Sector (G2C)**

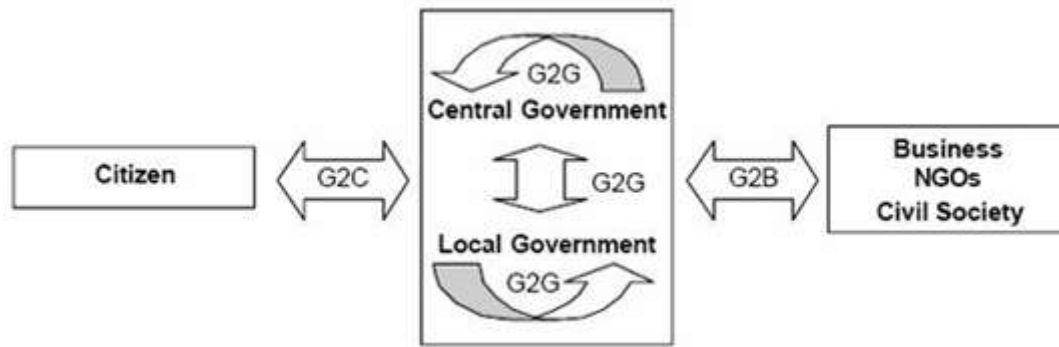
The relationship between government and business is another major category of e-government. G2B brings very impactful and important leverage of the government to business relationship. G2B involves services mutually engaged in by the government and business sectors. This covers a wide range of activities of all manners of government to business sector relationships. There are different services occurring between the government and business sectors, which include: obtaining information pertaining to business, current government/business regulations and accessing application forms (online) among others. The relationship of government/business via online transactions helps businesses mainly in the improvement of small and medium scale enterprises (Pascual, 2003). Conducting transactions with government via online platforms reduces red-tape and simplifies regulatory processes. This helps businesses become more viable and competitive.

### **2.1.4 Government-to-Citizen (G2C)**

This form of electronic government embraces the relationship between government and the governed. This has been referred to as "citizen-centered form" according to some scholars. The main objective of electronic government is centered around this premise. G2C brings about the use of mechanisms to make the participation of the citizens possible by making available various services, such as websites and /or kiosks to improve accessibility to certain information by the general public. This alleged attribute of electronic administration is simply an effort to provide a trouble-free service appropriate to many of government functions. Experts of e-governance state that the aim of every government, from the electronic platform to the citizens, should be to provide an avenue that will evolve and encourage full participation of the people. This will cancel the temporal impediments and barriers to citizens to actively participate in governance.

### **2.1.5 E-Governance Stages (E-Governance Models)**

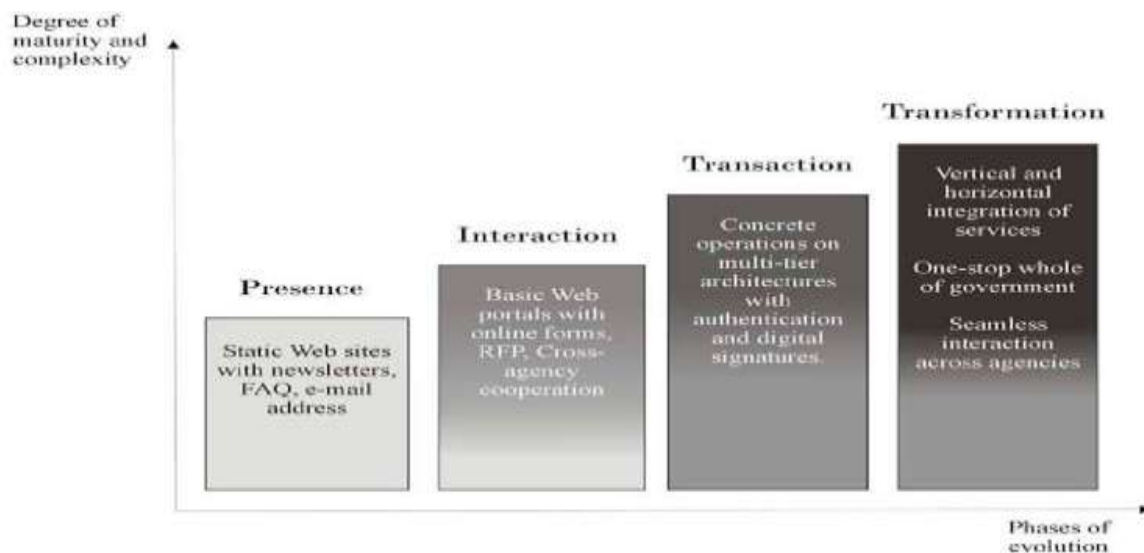
Linked to previous analysis, it has been noted that the three groups that stand out in the concept of electronic governance are: the government (involving a wide range of agencies in government), general citizenry and businesses/elements of commercial interest. The relationship among these groups is presented in Figure 1 below. As discussed earlier, e-government is not just an Internet government website. The major concern arises with regard to services provided and the opportunities and possibilities e-government holds for the future. Based on various levels of relationships between the various components of electronic governance, scholars have devised some models (Muhammad, 2016).



**Figure 1:** Interactions in e-government

### 2.1.6 E-Governance Maturity Model

Gartner (2000) came up with an e-government model of four phases. The model is concerned about the study of sectors in government and the classification of projects based on their degree or stage of development. Both governmental and non-governmental organizations at different levels have made use of this tool (government model) whenever an evaluation of e-government strategy is needed. Employing this model, review of methodologies and the availability of the resources coupled with the time framing, can provide opportunities to trace the steps if necessary. Governments usually start their e-government process in conjunction with the provision of information via electronic means and momentarily yield complex services. Gartner believes that the electronic administration will mature according to a four-step model of electronic management maturity (Muhammad, 2016). The pictorial representation of the four phases in the maturity model for e-governance is shown in Figure 2 below.



**Figure 2:** Maturity Model for e-Governance

The major four stages in this model as analysed by Mohammad, (2006) are based on the level of technology engaged in the provision of electronic resources. However, these evolution stages have emerged. It is worth knowing that a task flow must not necessarily follow the linearity arrangement of the phases (Muhammad, 2016).

#### a) Presence

The presence phase makes the impact of government to be felt regarding government publicity. Websites are used to publicize the aims and objectives of the government for all stakeholders. Websites belonging to different government agencies and ministries are evolved at this crucial *presence* phase. The major

objective is about making the information needed by the general public available as at when due and through appropriate channels on different ideas employed to solve general problems. Passive presentation of general information meant for the citizens through these basic websites list superficial information about an agency and do not have interactive capabilities. During the *presence* phase, a very basic need to build the telecommunications requirement is met (Muhammad, 2016).

#### **b) Interaction**

Capacity is very limited at this *interaction* phase to rationalize and automate government functions. However, this potential has been expanded by interactive Web-based initiatives. Employing this phase enables making information and forms requested more frequently available on these websites. Instructions for obtaining services, downloadable forms for printing and sending to an agency, or perhaps an e-mail contact to answer simple questions are the possible available resources. The management of the tasks is made available through the construction of the underlying processes; allows quick usage of high-level applications as required by the subsequent stages (Muhammad, 2016).

#### **c) Transaction**

Transaction initiatives in the e-government evolution has made it possible to have a direct interaction/connection with government. As the complete infrastructure has already been established, service in a very large chunk online can be started to meet the needs. Utility payments and fines, renewal of licenses, online tax returns, etc. that are public services for individuals and business sectors, can be carried out at this stage. (Muhammad, 2016).

#### **d) Transformation**

This is the peak of e-government initiatives in an evolution stage to complete the four stages mentioned earlier. At the transformation stage, the way government functions are designed and organized are subject of technological initiatives for transformation. Solid relationships and management skills are built with the citizen, with the ability to address a full range of needs, problems and questions by the help of the technological initiatives. (Muhammad, 2016).

### **3.1 History of Petition**

According to the Parliament of Victoria (2016), petition is seen as a request that prompts a swift action or a reaction to a matter under deliberation in parliament or another representative body, by a citizen or by an organisation. In addition to voting, a petition is considered as the most widely used tool for political engagement. These requests (Petitions) frequently embrace changes in laws, the reassessment of the way decisions are taken or the reengagement of a local claim. Petitions allow affected individuals make a public expression of their views on the impact and the operation of policy, decision, or law. In this manner, a petition is a cord that joins the governed and the government. Petitions are differentiated from other forms of political engagements, as they are vertically coordinated, coming from bottom-to-top and in general, do not have complex formal infrastructures.

Different mechanisms are available to address personal complaints and hold elected representatives accountable, including ombudsmen, commissions, courts and tribunals (Parliament of Victoria, 2016). The media also facilitates the government's responsibility to defend public opinion. However, petition has remained as the only means from time immemorial by which parliament are moved to act. Influence of petition in policy and other criteria of governance include; Increased awareness of an issue; Publicity; Galvanizing support; Creating a sense of solidarity within a community; Empowering citizens; Fulfilling a sense of civic duty; Increasing government understanding of how policies affect people; and providing a direct link between elected representatives and those they represent. According to Riehm (2009), a petition is a formal request to a public authority, usually a governmental institution with the purpose of changing public policy, calling for an official statement, or evoking certain acts by a public institution. It may also be a mechanism for public direct interaction with the parliament to inform it of a particular issue and to seek parliamentary action to remedy it (Corbett, 2011).

### 3.2 History of E-Petition

The electronic petition tool was developed in the United Kingdom and in the Commonwealth countries. These countries have a long tradition of petitions where citizens collect signatures for a proposal, which is then sent to decision makers. In the late 1990s, a modernization program for public services was launched in the United Kingdom. The aim was to promote people's trust in public services and improve the efficacy of public service endeavours. Several public authorities have developed new methods to engage people and some of them were based on ICT. In 2006, a special initiative was launched to develop online participation methods. A number of pilot areas, including Kingston and Bristol in the UK, have developed several methods; one of which was e-petitions. The idea was to make the management of requests more transparent and allow new groups to send initiatives to local authorities (Swedish Association of Local Authorities and the Region, 2010).

### 3.2 Review of Existing Petition System

According to the Parliament of Victoria (2016), E-petition that are web-based has been in used in various countries as enumerate in Table 1 below. There is no way to reviewing the existing petition systems without analyzing few of the countries mentioned above (Ellingford, 2008; Bohle and Riehm, 2013).

**Table 1:** E-petitions models worldwide

Country	e-petition website	Online-web submission	Petitions/decision	Parliamentary petitions committee
Austria	Yes	No	yes	Yes
Canada	Yes	Yes	yes	No
European Parliament	Yes	Yes	yes	Yes
Germany	Yes	Yes	yes	Yes
Italy	Yes	Yes	no	No
Ireland	Yes	Yes	no	no
Lithuania	Yes	No	yes	yes
Luxembourg	Yes	yes	yes	yes
Netherlands	Yes	yes		yes
Portugal	Yes	yes	yes	yes
Australia-Queensland	No	No	yes	no
Romania	No	yes	yes	yes
Scotland	Yes	yes	yes	yes
South Korea	Yes	yes	yes	no
Australia-Tasmania	No	No	yes	no
Ukraine	No	yes	yes	no
United States of America	Yes	yes	yes	no
Wales	Yes	yes	no	yes

**Source:** <https://www.parliament.vic.gov.au>

All these countries have procedural arrangements, security, and outcomes of the e-petition process (Parliament of Victoria, 2016). It is important to underline the major differences in existing e-petition platforms and this research work focus on mobile platforms in contrast to the traditional/website platforms.

## 4. System Analysis Design

### 4.1 System Requirements

#### 4.1.1 Functional requirements

The functional requirements of this system include:

The user shall download the mobile application through play store

The system shall display a sign-up form which takes E-mail address id and password as input

The system shall verify that user's provided account exists.

The system shall display a confirmation message to give feedback that "user is successfully registered".

The application would feature user registration

The application must be able to count the number of signatures

- The application would have an instructions/guide's page
- The application would have approval/rejection page before displaying petition(s) to view
- The application must have an administration page
- The application would have a splash screen
- The application would have a title screen
- The application would have a User Interface for reading previously posted petitions
- The application would have a User Interface for submitting new petitions
- Users must sign up before submitting petitions
- User must sign in before signing petitions

#### 4.1.2 Non-functional requirements

Non-functional requirements for this project include:

- Speed:** The application should respond very fast to user options
- Size:** The application should not take up a lot of the users' phone storage
- Ease of use:** The application should be simple to use with a friendly and responsive User Interface.
- Reliability:** The application should have minimal down time and produce little percentage of errors.
- Integrity:** The application should provide Real-time database information
- Portability:** The application must be able to run effectively on all android devices.
- Scalability:** The application must perform effectively even as it grows in size and number of users.

#### 5.0 System Architecture

System architecture describes the behaviour of the application, focused on how they interact with each other and with users. It is focused on the data consumed and produced by applications rather than their internal structure (Figure 2).

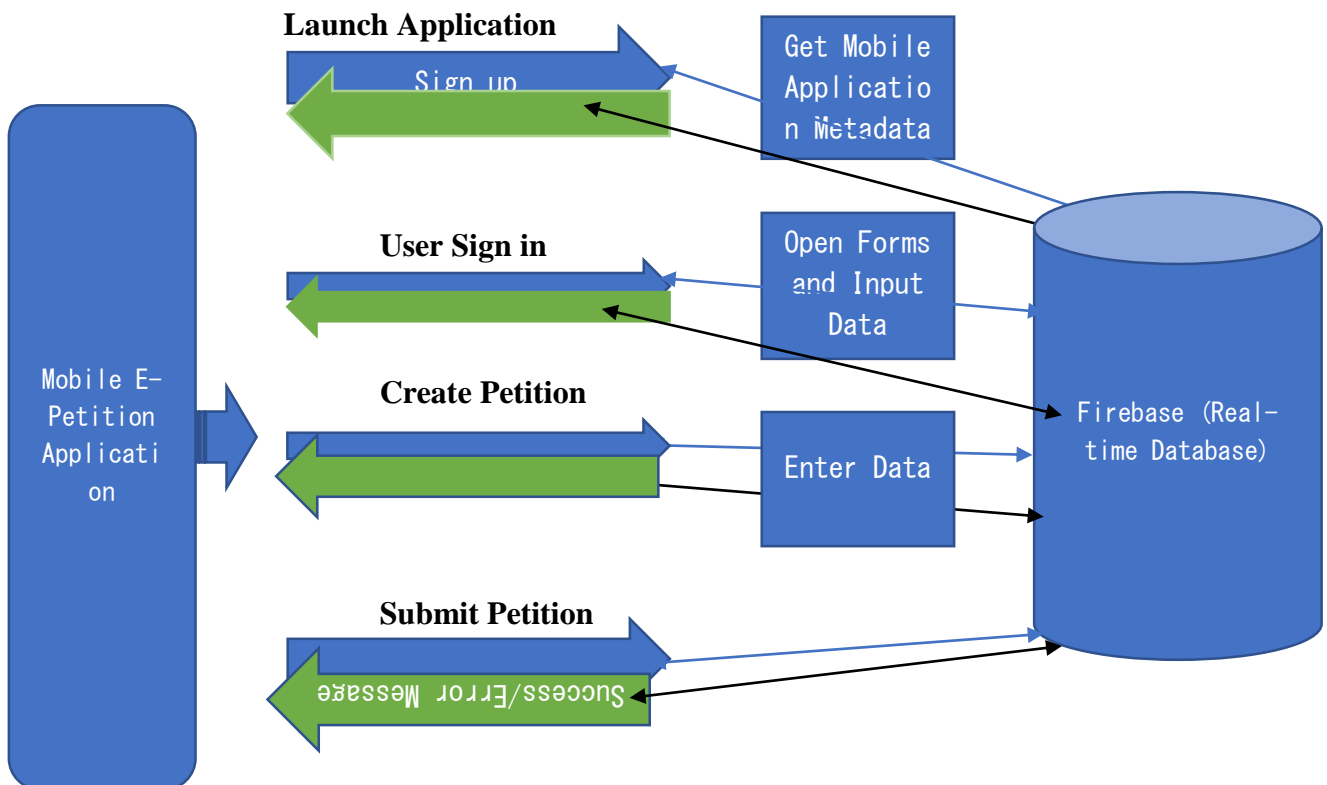


Figure 2 System Architecture of e-petition mobile application



## 6.0 System Structure

The application starts with a splash screen when it is first loaded, then a progress bar appears. Once the application is fully loaded, the home screen appears. The home screen displays a short introduction to the application as well as previously submitted petitions. The home screen also contains the read more and create petition button. The read more button loads a user interface where users can read more information about the application. Once the user is done reading, there are two buttons. The first links back to the home screen which is where the user can sign a petition while the other links to the create petition interface. If the user decides to sign any of the petitions in the Home screen, the user is prompted to supply

- National Identity Number
- Email address

The Create petition button loads a new user interface for users. In this user interface, the user is required to fill the following fields;

- Email
- Petition

Once the user supplies the above information, the petition is submitted into the database and the application switches back to the home screen.

## 7.0 Use Case Diagrams

The user is the actor in this case. First, the user launches the application and recent petitions are displayed. The user has the option to sign a petition or create a petition. If the user decides to sign a petition, the user has to supply national Identity Number and Email Address. If the user decides to create a petition, the user must supply National Identity Number, Email Address, petition title and description. Once this is done, the system receives and saves the petition. This is shown below in Figure 3.

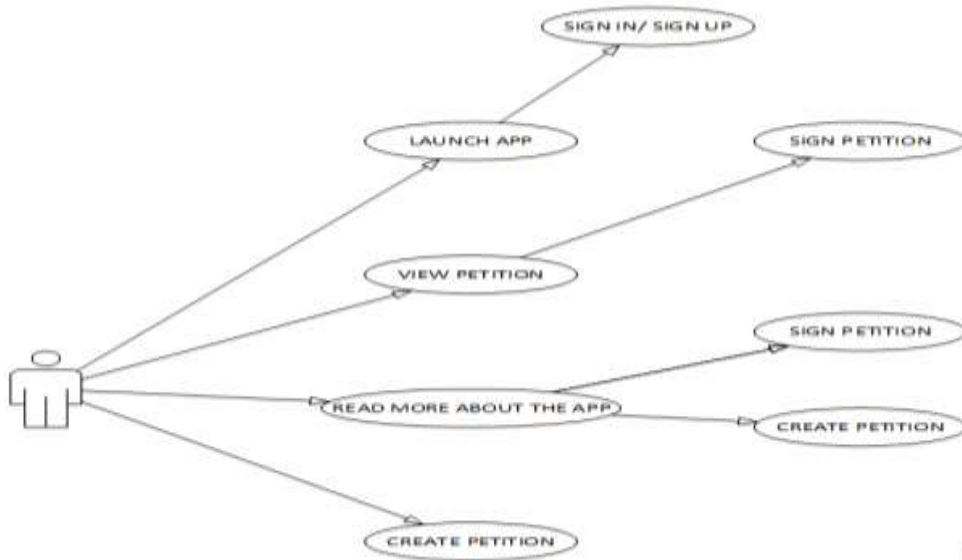


Figure 3: Use Case Diagram for E-petition application

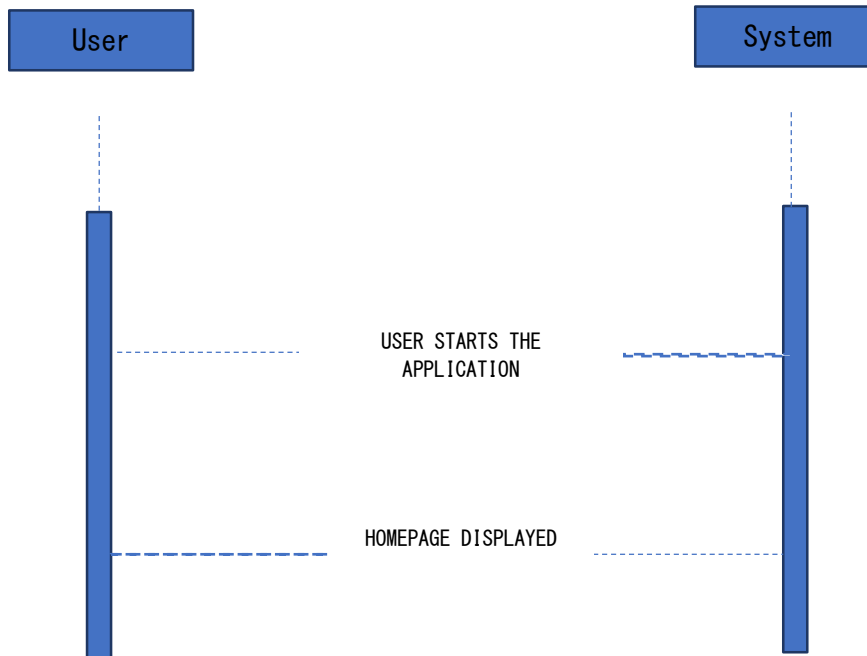
### 7.1 User Use Case Narrative

**Table 2:** User Authentication (Sign in & Petition Creation) use case Narrative

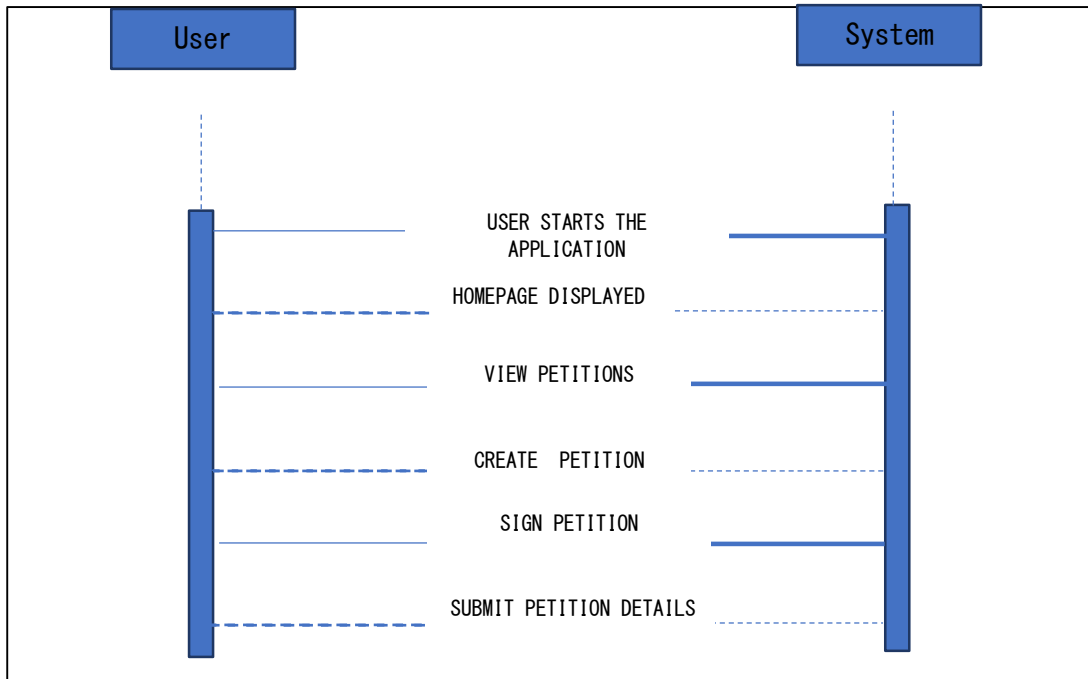
USE CASE NAME	DESCRIPTION
<b>Brief Description</b>	This describes the total process of how the application is run.
<b>Actor</b>	Users
<b>Flow of Events</b>	Basic Flow: The case begins when the user launches the application. <ul style="list-style-type: none"> <li>• The user launches the application</li> <li>• The system displays the home screen</li> </ul>
<b>Parameters</b>	Input: Launching the application Output: The application’s home screen.
<b>Pre-Conditions</b>	The user starts the application by pressing the application icon
<b>Post-Conditions (Sign petition)</b>	User supplies necessary details to sign petition
<b>Post-Conditions (Create petition)</b>	User supplies required information to create a new petition
<b>Trigger</b>	Launching the application
<b>Extension points</b>	None.

### 8.0 Sequence Diagrams

The sequence diagram describes the user access into the system as shown in Figure 3, while Figure 4 shows the conduct inside the system.



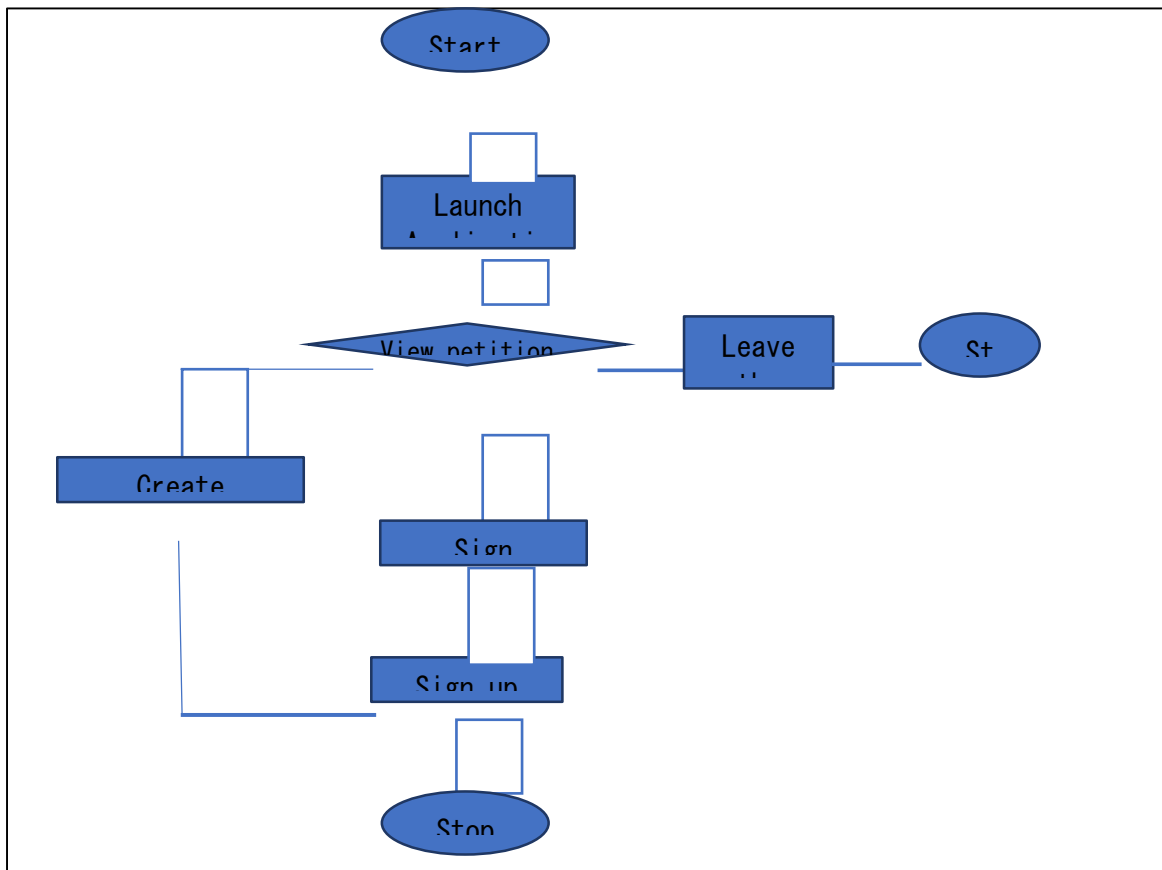
**Figure 4:** Sequence Diagram Showing User Login into System



**Figure 5:** Sequence Diagram for E-petition Application

### 9.0 Flowchart

Flowchart shows the flow of activities until the system goal is achieved. In figure 6, the flowchart shows the flow of activity when a user decides to create or sign a petition.



**Figure 6:** Flowchart for E-petition application

## 10.0 Interface and Modules

This section describes the various modules, installation and interfaces of the application.

### 10.1 Application installation

This stage precedes every other activity. It is very simple to install and the process could be by downloading the application through google play store (Not yet there) or by collecting it from other users that have the application on their mobile devices through different media of doing such. The installation is a click process.

### 10.2 Home screen

This is the first page that shows anytime the application is opened. It gives the user the option to create petition. If the petition is already created, the user can choose the option 'read more' to explore the already uploaded petition by other petitioners/users.



**Figure 7:** E-petition application Home Screen.

In Figure 8, there a clear display of how the application works with create petition and view petitions buttons.

Here, the petitioner can sign up if an account is already created or register as a first-time user of the application with the prescribed requirement information; (Email Address, and a password to secure the account to be created. After an account has been created, such account can be used to submit petition by following the prescribed instructions. The screenshot is shown in Figure 9.

Here, the petitioner input the petition for the people to append their signature in favour of the petition as shown in Figure 10.

## 11.0 Conclusion

The e-petition on mobile platform as shown in this project is very promising in citizens' participation and ease of participation in governance. In conclusion, this work is designed to increase citizens' level of participation in governance and engaging medium. It also reduces the deficit of means to increase engage in government activities. This research work advances the common man's participation in the affairs of government. The application will run only on the android platform.



Figure 8: E-petition mobile application with how it works preview.

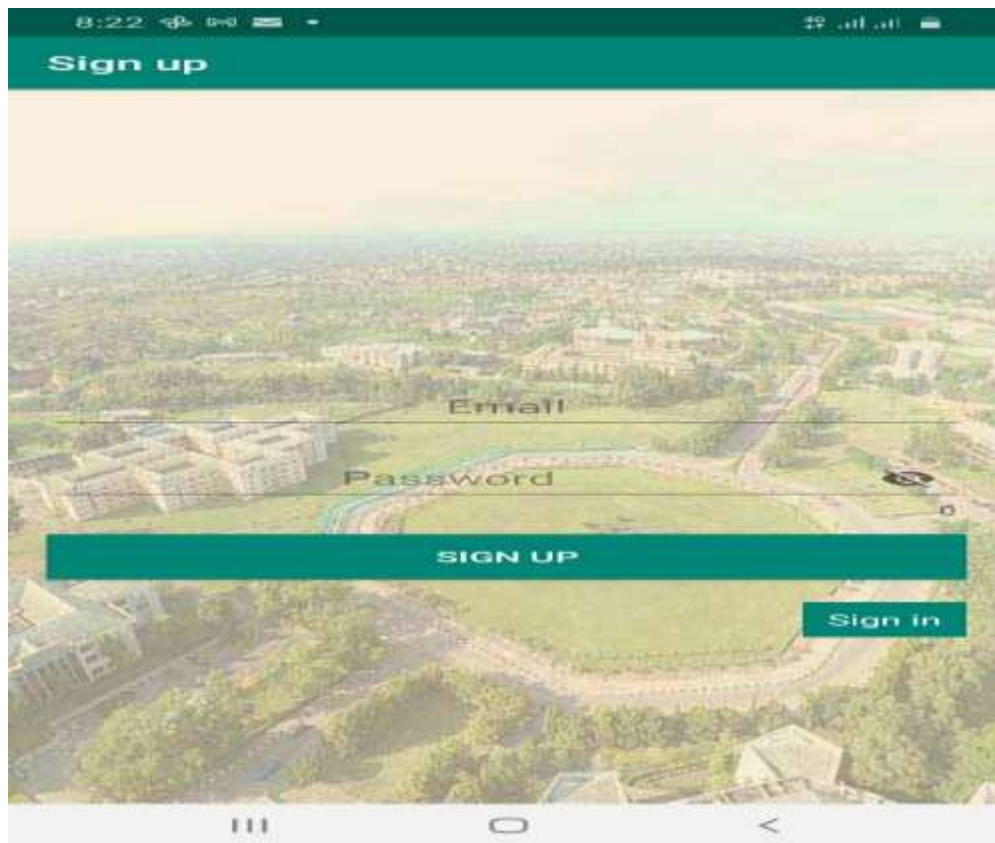


Figure 9: E-petition mobile application Sign-Up page



Figure 10: E-petition mobile application petition creation page

## 12.0 Recommendation

The field of mobile e-petitions application still has a lot of room for improvement in governance, e-petition graphics, e-petition design, etc.

Recommendations for further improvement of this project work include:

- i. The e-petition application should have better graphics.
- ii. The e-petition should have better rating system.
- iii. Better and more uniform means of authentication should be used.

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