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DEVELOPMENT OF MOBILE APPLICATION SOFTWARE FOR COMPULSORY ACQUISITION AND COMPENSATION IN NIGER STATE, NIGERIA

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Abstract

The recent mass road development by Niger State government poses some challenges to professionals involved in the construction process including Estate Surveyors and Valuers as they involved compulsory acquisition of lands with unexhausted improvement on them. One of the major challenges of Estate Surveyors and Valuers on the project is the short time duration for submission of assessment report for compulsory acquisition and compensation. It is therefore, imperative to deploy technology to improve the compulsory acquisition and compensation process in Niger State, Nigeria. It was based on this background that the research intends to develop mobile application software for compulsory acquisition and compensation for Niger State. The mobile application software serve as a template for compulsory acquisition and compensation process by the professionals in the state. Data were collected on the current land acquisition and compensation process in Niger State, through reconnaissance survey, interview of the Estate Surveyors and Valuers on the software currently being used for compulsory acquisition and compensation and the appropriate state authorities to know the applicable rate as it relates to the unexhausted improvement. The result provided user friendly mobile software on Android platform for compulsory acquisition and compensation, accurate data collected from the properties to be compensated, accuracy of valuation method and adopted rate for the valuation practical use of the software. The finding of this study was expected to add value to the existing procedure for compulsory acquisition and compensation in Nigeria and contribute to the existing literature by designing and implementing mobile application software, particularly, for field inspection, data collection, computation and reporting in order to achieve efficient and adequate compensation.

Keywords: Mobile Application, Software Development, Compulsory Acquisition, and Compensation

1. Introduction

Compulsory acquisition of land and compensation for unexhausted improvements on lands is a practice in many nations (Gemeda et al., 2023; Lekgori et al., 2020; Merrill, 2020; Mohd Salleh & Peng, 2024). Governments acquired land compulsorily for provision of basic infrastructure for public use (Abdullahi & Idiedo, 2024). As such, lands are acquired for overriding public interests which include construction of public roads and parks, provision of services and utilities such as drainage and sewerage, and installation of social facilities like schools and hospitals, among others (Bake, 2022; Idris et al., 2023). In most countries, it is the power of the government to acquire private rights with or without the willing consent of their owners in order to benefit the society (Onah, 2022; Phan & Spitzer, 2022; Rao et al., 2020). The process is compulsory but not confiscatory; thus the owner's interests in the property are converted into right to claim compensation for their loss (Pine & Agan, 2022; Udoekanem & Adoga, 2023).

Compulsory acquisition and compensation exercises involve several procedures and stages, depending on national laws (Dankani et al., 2021; Dilrukshi & Wickramaarachchi, 2022; Elong, 2020). In Nigeria, the leading law and policy document guiding the compulsory acquisition and compensation procedure of private properties for the overriding public interest is the Land Use Act (LUA) of 1978 (Adebisi et al., 2024; Adekunle et al., 2020). The procedure involves a series of legal and administrative steps that ensure fair compensation for affected property owners (Federal Republic of Nigeria, 1978). The procedure includes the legal framework, initiation of compulsory acquisition, valuation of the property, compensation process, transfer of property and finalisation and documentation (Otegbulu, 2023). Each of these processes involves technical activities which require enough resources and time (Adekunle et al., 2020; Shukla, 2021). The technical activities and time require for the

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completion of compulsory acquisition and compensation process is one of the major challenges of professionals and agencies involved (De Maria et al., 2023; Shukla, 2020).

The professionals involved, particularly the Estate Surveyors and valuers, can deploy software applications in the compulsory acquisition and compensation process. Software is used by Estate valuers in various aspects of the profession, particularly mobile application software (Akinola et al., 2021; Ifediora, 2022). Both generic and customised software can ease property inspection, enumeration, analysis, and reporting of compulsory acquisition and compensation, although, a customise application software can be more useful and precise. Therefore, customised application software will enhance the compulsory acquisition and compensation process in Niger State, Nigeria.

2. Methodology

The research focuses on the development of mobile application software for valuation for compensation in Niger State. The research was carried out in three linked stages which were data collection on current practice, software development, and testing. This was conducted at various stages vis-à-vis data collection on the current land acquisition, analysis, and report on the compensation process in Niger State.

Data collection

Structured questionnaires were distributed to estate surveyors and valuers engaged in compensation work in Niger State. The questions explored the types of software (if any) currently in use and, more importantly, the practical difficulties encountered with manual methods. The respondents consistently highlighted the pressure of tight deadlines, the risk of transcription errors during fieldwork, and the time taken to cross-check calculations against

gazetted rates and interviews with state authorities confirmed the official rates for structures, crops and economic trees that would form the database of the new application.

Software development

The application was built on the Android platform to ensure wide accessibility among field practitioners and all gazetted rates supplied by the Niger State government were embedded directly into the software. The interface provides separate login pathways for administrators and enumerators, a data-computation screen that applies the correct rates automatically, an editing function, and a final report-generation module. The Enumerators can choose between an automatic mode that uses GPS and mapping tools or a manual mode for entering detailed structure measurements and dimensions where the image capture from properties and improvements were integrated throughout.

Testing

The application was tested on selected properties that had already been gazetted by the Niger State government after development to validate it efficiency and trials took place at different locations across the state so that its performance could be evaluated under real field conditions.

Results

The completed application, named **NGValues**, met all the objectives set out at the beginning of the project. It supplies a straightforward, Android-based tool for compulsory acquisition and compensation work. The data collected from the field were captured accurately and in real time where valuation methods and the approved gazetted rates were applied consistently, removing the scope for manual error. Most importantly, the software has proved genuinely

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practical where enumerators can move quickly from site inspection to final report without the delays and inaccuracies that characterise traditional paper-based processes.

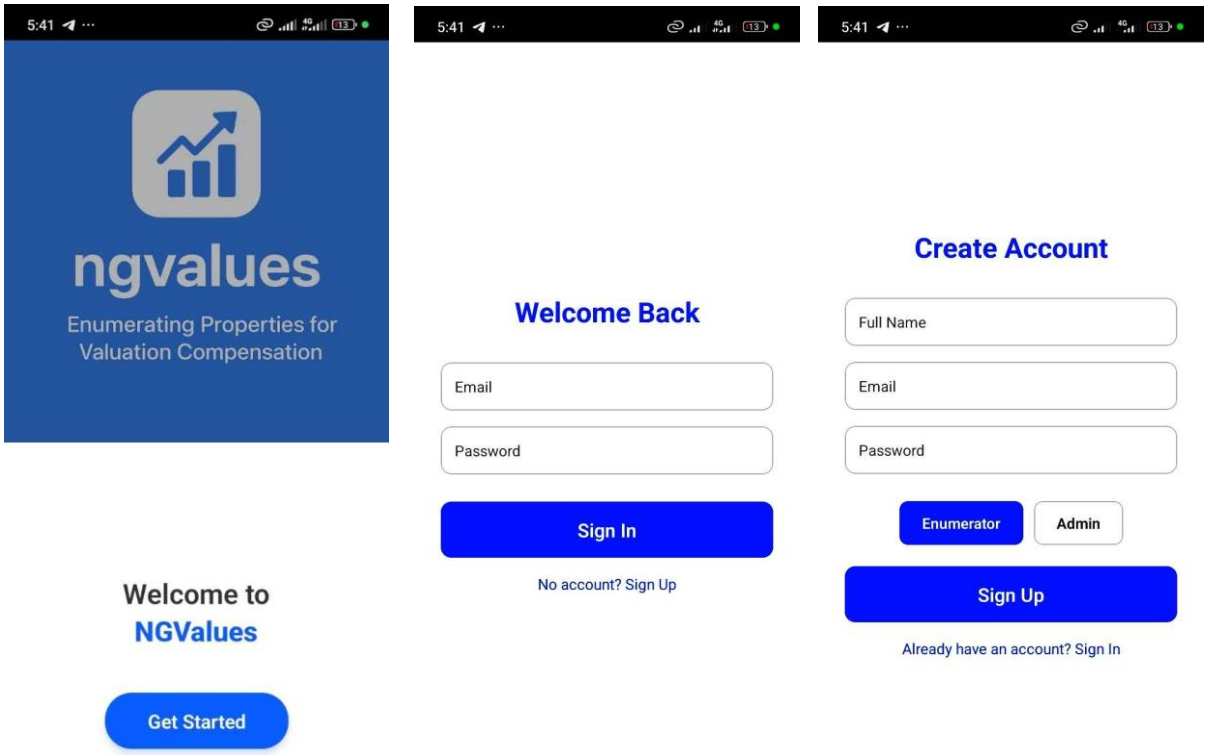
The new application when compared directly with conventional manual methods, it can be concluded that the differences are striking. The traditional fieldwork depends on handwritten notes, separate calculators and printed rate schedules where any change in the field requires returning to the office for recalculation and retyping. The mobile application, by contrast, performs all these tasks on the spot, thereby making enumeration time to reduced dramatically, computation accuracy is assured by the embedded rates, and the risk of transcription mistakes disappears. The automatic mode further speeds up measurement of larger areas, while the manual mode retains flexibility for complex structures. In short, the software transforms a slow, error-prone sequence of tasks into a streamlined, reliable workflow.

3. Data Representation And Analysis

The mobile application NGValues was designed to support every stage of field enumeration, data capture, computation and reporting. Its interfaces guide users logically from login through to final submission.

Demonstration of the Usage of the Software for Compensation Valuation with different interface

The opening screens show the splash page with the NGValues logo and the welcome message “Enumerating Properties for Valuation Compensation” and users then move to the sign-in or account-creation page, where they select either Enumerator or Admin access.



Once logged in, the claimant information screen appears. Enumerators enter the claimant's full name, phone number, BVN, NIN and address, and can attach a passport photograph by choosing camera or gallery. The next step is property-type selection – Structure, Farmland or Economic Tree.

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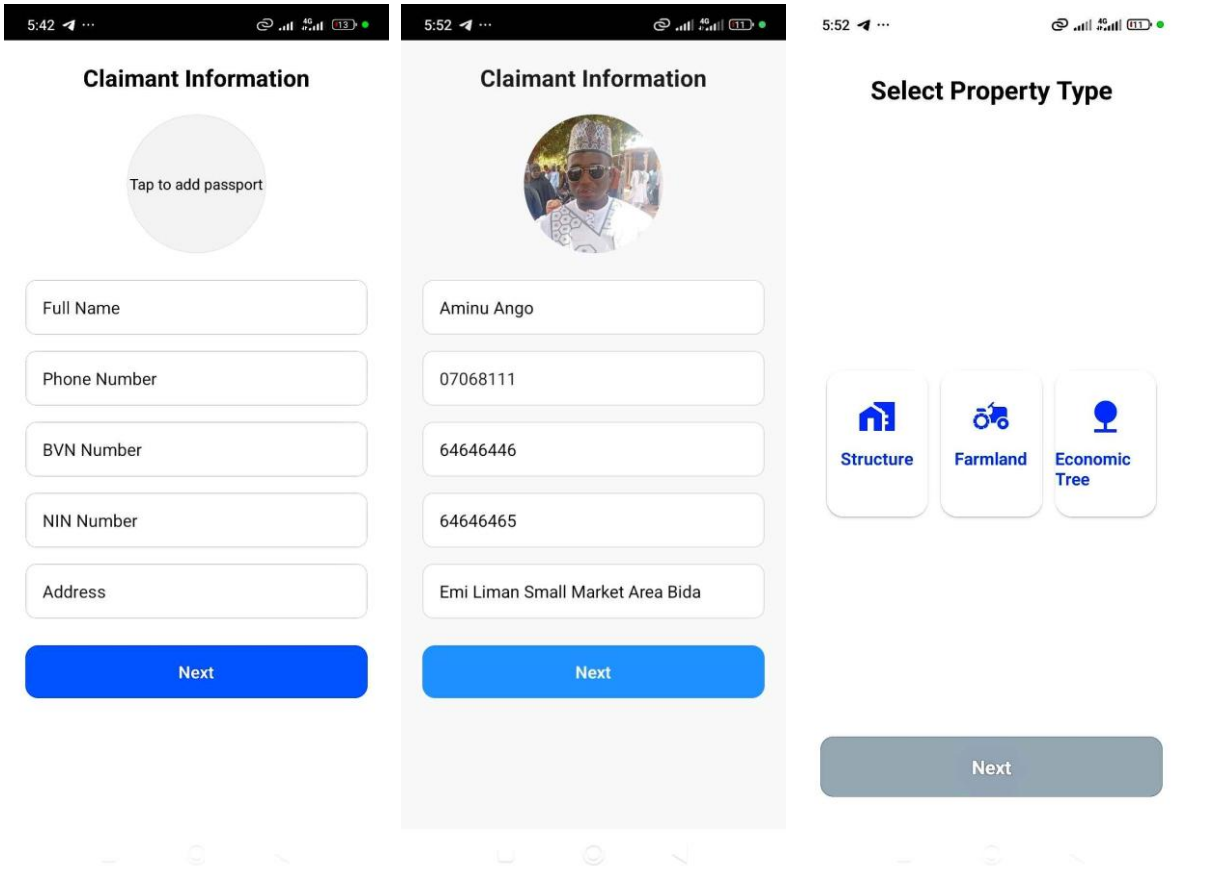
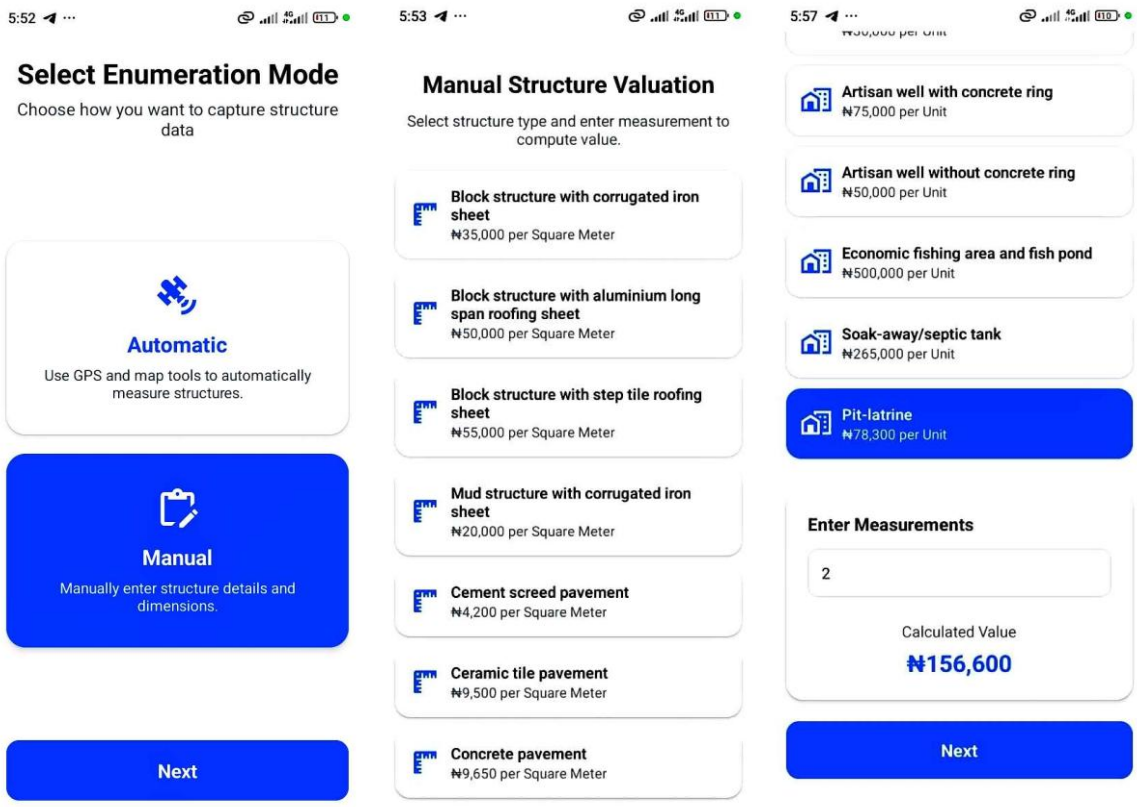


The users then choose the enumeration mode. The automatic option employs GPS and mapping tools to measure structures quickly, while the manual option opens a detailed valuation screen listing pre-loaded structures with their exact gazetted rates per unit (for example, block structures with corrugated iron sheets, mud structures, pit latrines, soak-away tanks). Measurements are entered directly and the application instantly calculates the compensation value.



A summary overview then displays the claimant details alongside all recorded properties and their calculated values. The final screen confirms successful submission and saves the data locally. Throughout the process the interface remains clean and intuitive, allowing even first-time users to complete a full assessment without returning to the office.

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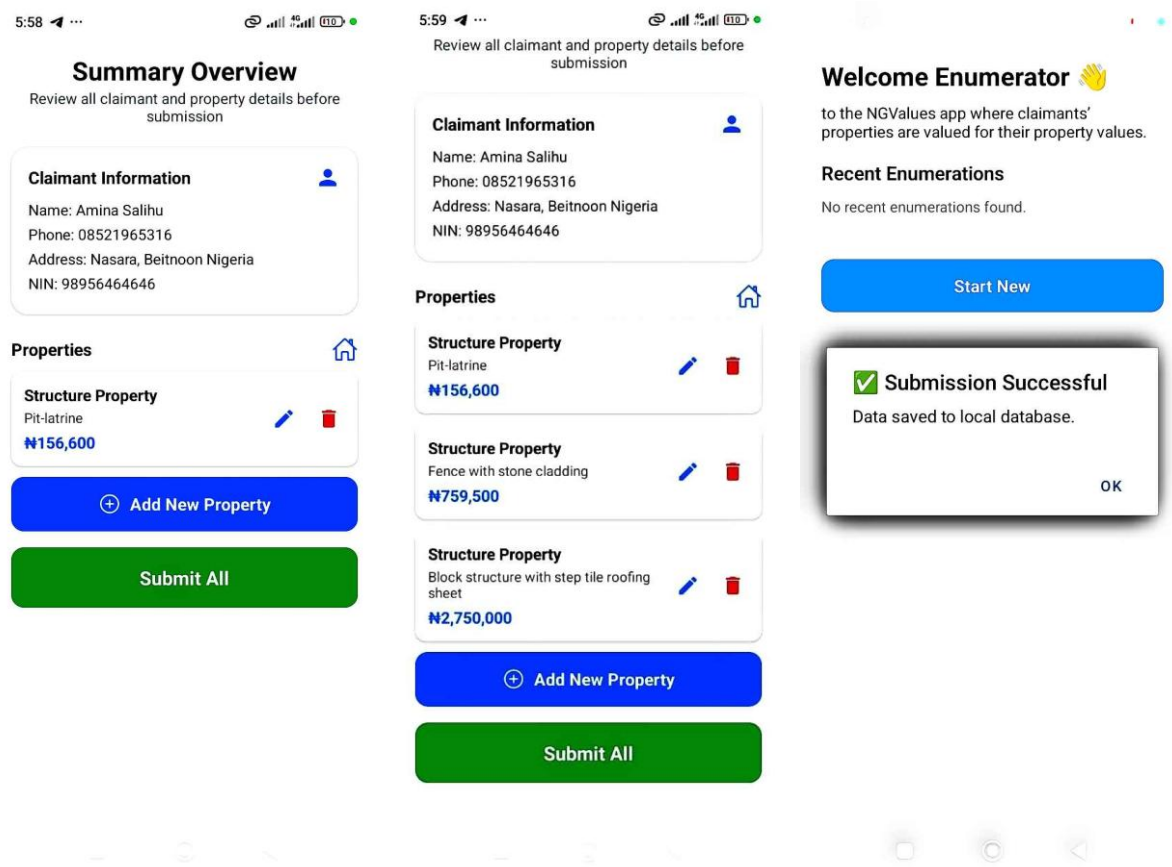

4. Conclusion

This study has shown that the traditional manual approach to compulsory acquisition and compensation in Niger State, while long established, is increasingly ill-suited to the pace and scale of current infrastructure projects. The combination of tight deadlines, labour-intensive fieldwork and reliance on handwritten records and manual calculations frequently leads to delays, inaccuracies and frustration for both professionals and affected landowners.

The development of the NGValues mobile application, through the research has provided a practical digital alternative where the software embeds the official gazetted rates, automates calculations, supports both automatic and manual data capture, and generates professional reports on the spot. The field test confirmed that it delivers accurate data, applies the correct valuation methods and rates, and greatly reduces the time required from inspection to submission.

The application therefore serves as a ready-made template for estate surveyors and valuers across Niger State and, more broadly, in Nigeria thereby strengthens the procedures laid down in the Land Use Act and offers a clear example of how customised mobile technology can overcome the limitations of older manual practices, ultimately helping to achieve fairer, faster and more reliable compensation for citizens whose land is acquired for public use.

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