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WHIBO APP: A SECURE WEB-BASED APPLICATION FOR NIGERIAN ANTI-CORRUPTION AGENCIES

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ABSTRACT

This study attempts to propose an improved data persistence functionality approach using the application called “WhiBo App” for tackling Nigerian whistle-blowing reporting challenges for Nigerian Anti-corruption agencies which would allow them digitally and technologically to join hand with citizens in the fight against corruption. The application as proposed would provide necessary features and functionalities of gathering corruption tips information from whistleblowers regardless of geographic barriers. The application was developed using Rapid Application Model (RAD), this method is well known for its flexibility and speed, which allows for frequent iterations and adjustments based on user feedback. The actual implementation may vary depending on the specific tools and technologies used in the web development process. WhiBo app was tested using PHPUnit for unit and acceptance test, and the result indicated that 95% pass successfully and 5 failed, indicating the overall positive performance of the application. The application would provide a centralized means of gathering corruption suspicious information for easy access and analysis of crime data for necessary actions by anti-corruption authorities and finally, The WhiBo App would guaranteed the protection and confidentiality of whistle blowers credentials inline and within the jurisdiction of the law.

Keywords: Anti-Corruption, Agencies, Secure, WhiBo App

INTRODUCTION

People can disclose unethical or unlawful activities within an organization using a secure platform called a whistleblowing application. Its primary duties include permitting anonymous reporting, guaranteeing secure communication, recording misconduct, encouraging prompt reporting, tracking and managing cases, facilitating reporting to authorities, protecting whistleblowers, analyzing data for trends, guaranteeing legal



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compliance, assisting crisis management, fostering an ethical culture, and managing an organization's reputation. Overall, these programs encourage morality, accountability, and openness among businesses (Teichmann and Marie, 2021).

Whistleblowing is a process in which individuals or groups become concerned about and decide to report any observed unethical misconduct by employees or stakeholders of an institution to senior management or specialized legal counsel (Teichmann and Marie, 2021). In today's digital age, Nigerian anti-corruption agencies have access to an ever-increasing volume of economic and financial crime data, coupled with the constantly evolving and intricate nature of criminal activities. This underscores the necessity for a supportive anti-corruption application Eisenstadt *et al.* (2018). Whistle-blowers are individuals who take it upon themselves to expose unethical or illegal activities occurring both within and outside their workplace. They report internal misconduct to their superiors and external wrongdoing to the media, authorities, or specialized legal experts (Ejovi *et al.*, 2013).

Anti-corruption Agencies are challenged with fighting corruption and financial crimes in this modern and dynamic era as corruption has eaten deep into the fabrics of every system in Nigeria. However, the establishment of some specialized corruption institutions such as Nigerian Economic and Financial Crime Commission (EFCC) and Independent Corrupt Practices and other Related Offences Commission (ICPC) was part of the effort made by Nigerian Government to avert corruption. Despite all the commitments, the problem of corruption is still at large (Shehu, 2014). The Economic and Financial Crime Commission was directed by the Nigerian government to prevent and combat economic and financial crimes. The whistleblowing policy is one of the vital policies adapted by this current government.



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RELATED WORK

Nigeria, several attempts have been made by both government and individual organisation using different approach that would help government to mitigate corruption incidents especially the one committing by individuals in public offices. Nigerian government launched the first known application for whistleblowers called “FMF-Whistle”. The website claimed to be secured, which allows individuals to submit any economic and financial wrong doing directly to them by filling report some reports, whistleblowers are invited by the government if their report have reached some advance stages Gholami et al. (2019). Perhaps, the identity of the reporters must be known before the government invitation.

However, various private sectors made some attempt to bring an end to this menace but the existing whistleblowing policy is not yet approved by the government. The African Centre for Media & Information Literacy (AFRICMIL) has launched a civil society whistle-blower project named Corruption Anonymous (CORA). Corruption Anonymous was developed to promote and support public acceptance to the established laws regarding the whistle-blower. The application was developed independently without governmental inputs and finally the application was not yet implemented (Onumah, 2015; AFRICMIL, 2021).

Government reward incentive to those who willingly expose illegal acts remains that any whistle-blower who is responsible for providing government with information that directly leads to the voluntary return of stolen or concealed public funds or assets may be entitled to anywhere between 2.5 percent and 5.0 percent of amount recovered. This website served as second party because its only collects the suspicious tips and forward them to the right authorities i.e. EFCC who happens to be the only one constitutionally in charge of pursuing and prosecuting such crimes. Also, the website can only collect suspicious tips but have no means of analysing the generated data, and if the whistle-blower chooses to communicate in real-time, the application would not guarantee that (Premium Times, 2017).



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This research proposes an improved approach for handling the whistle-blowing reporting tools, via an application tool called WhiBo, for Nigerian Anti-Corruption Agencies. The application will give room to Nigerians to report any suspicious economical and financial malpractices that affect the public services. The application intends to provide a secure and effective website where whistle-blowers could submit information anonymously without feared of risking their identities. The application generates the identification number for every tips submitted where whistle-blowers can use the generated Id for any further enquiries. Whistleblowers can login anytime and check the progress of their tips without any harassment from authorities.

METHODOLOGY

WhiBo software was developed using multiple layers of security to guarantee confidentiality, security, and integrity. HTTPS was used to implement data encryption in transit using SSL/TLS encryption certificates, safeguarding user privacy and the integrity of the data. To filter and monitor incoming traffic and guard against widespread web vulnerabilities like SQL injection and cross-site scripting (XSS), Web Application Firewall (WAF) was implemented. Identifier verification and authorization utilize robust user authentication techniques, such as multi-factor authentication (MFA), when required by ensuring users only have access to the information and tools they are permitted to use.

To counteract SQL injection, XSS attacks, and other injection vulnerabilities, the application modified its approach to input validation, sanitizing and validating user inputs. Additionally, mechanisms for handling user-secure sessions, such as session tokens and. The following steps have been observed in the design and development of this application.



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Table 1: Psedocode of Whibo Application

Pseudocode of Whibo Application

BEGIN RAD WhiBo Application Development

DEFINE Requirements

- Gather initial requirements from stakeholders
- Define the scope and objectives of the website

DEFINE Data Model

- Identify data sources and database structure
- Design the data schema

DESIGN User Interface

- Create a user-friendly and visually appealing design
- Develop wireframes and mockups
- Gather feedback and make design revisions

DEVELOP Website Components

- Code the website's frontend and backend components
- Implement database functionality
- Continuously integrate feedback and make iterative improvements

TEST Functionality

- Perform rigorous testing to ensure all features work as expected
- Identify and fix any bugs or issues

DEPLOY Website

- Prepare the website for deployment on a production server
- Perform final testing in a live environment
- Train and Maintenance

END WhiBo App Development

Table 1 Shows pseudocode for RAD methodology used in the realization of this application

System Architecture

System architecture is the model that demonstrates the steps, features and behaviours that depicts more views of the system (Hannu & Bernhard, 2011). Therefore, system architecture of the WhiBo App is shown in Table 1.

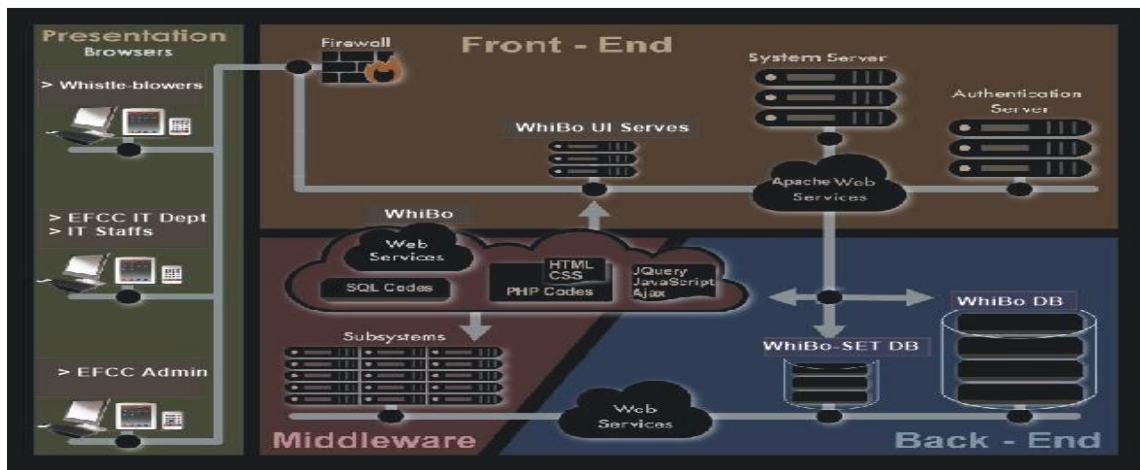


Figure 1: WhiBo App System Architecture

Figure 1 Shows the formal description and representation of this propose system which was organized in a way that supports reasoning about the structures and behaviours of the system using EFCC as case study. The architecture consists of system components, Presentation layer, Front-end, Back-end and Middleware that will work together to implement the overall system. The architecture has shown all the system components and the way they interacted together to achieve the workable aim of the system.

The presentation layer is where users interact with the system using different media like a personal computer, tablet, or even mobile phones.

WhiBo App Designed Interface

Below are the samples output of the WhiBo App.

WhiBo-Index Page:



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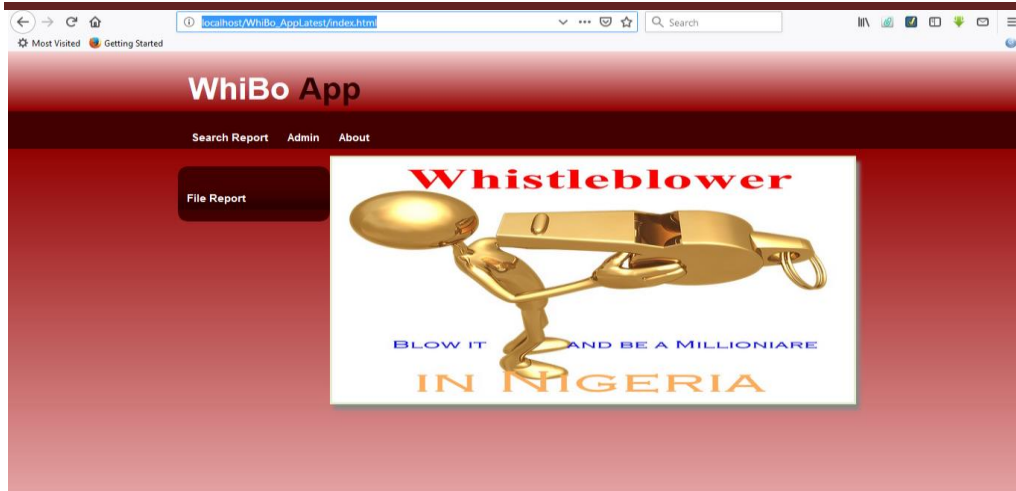


Figure 2: WhiBo Website Index-Page

Figure 2 demonstrates the index page, the page appears when the user enters the webpage address `http://localhost/WhiBo_AppLatest/index.html` in the browser address bar on the Homepage, Menus are arranged vertically and horizontally. The user can directly move around the page to find the appropriate menu for the reporting.



Figure 3: File Report-Page



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Figure 3 shows the link that takes whistle-blowers to a page where they can fill and report the perceived and suspicious wrongdoing without disclosing their identities. The interface allows whistle-blowers to fill in the details concerning the wrongdoing and then submit

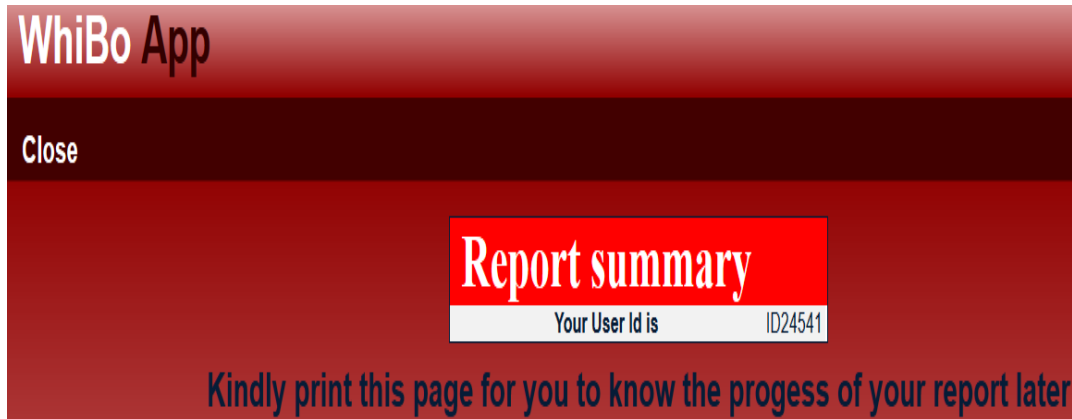


Figure 4: Acknowledgement-Slip

Figure 4 shows the acknowledgement page which displayed immediately after the report have been submitted. The page summarized the report and generates a random report Id as the only means that the whistle-blowers can use to checks for the progress status of the report submitted.

RESULTS AND DISCUSSION

A Whistle blowing Application, a web-based information system named WhiBo App, has been proposed by the researchers as an enhancement over the current available tools for Nigerian anti-corruption agencies' whistleblowing policies. The data integrity, security, and effectiveness for whistleblowers that were absent in the previous tools are now included in the WhiBo App. In order to ensure an iterative and collaborative design process between users and stakeholder groups, the application was created using the Rapid Application Development model. The PHPUnit framework offers a smooth medium for both unit and integrated tests, including those that involved interactions with databases like MySQL. The



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outcome showed that 95% of the tests passed successfully, while only 5 failed, demonstrating the application's successful overall performance

CONCLUSION

WhiBo App is a secure, robust, user-friendly and easier to use information system that is purposely designed to motivate citizens to engage into whistleblowing act without being feared of any victimization or risk. Our major suggestion is that the current methods of whistleblowing can be improve technologically using this centralized data persistence functionality (i.e. WhiBo App), the application was designed to promote whistleblowing report anonymously without risking your identity, also this paper aimed to encourage citizens and anti-corruption agencies to work together toward building a corruption-free society in Nigeria. In the future, some features of the application need to be improve, features like the chatroom where the whistle-blower can chat and disclose tips in real-time, alarming system for timely notification from the reporter's point of view and some added incentive features.

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