INTRODUCTION

The Federal University of Agriculture, Abeokuta, Nigeria is one of the three specialized Universities of Agriculture in Nigeria. It was established in 1988 with a mandate of teaching, research and extension services in agricultural development. The role of the library as a resource centre has always been acknowledged right from the time of the founding fathers of the University. The University library therefore, has always been informing its services to enhance users’ experience. In 2017, the library space was re-designed, thus creating more space for people to connect, explore and learn. This inspired our team to ask for more enhanced services. The reality of this became more obvious during COVID-19 pandemic, hence, the library applied for, and won an “Institutional Research Based (IRB) grant in 2021 sponsored by TETFUND to develop a Microservices Based Social Media Centric Instant Messaging Application (SCIMMA) to boost the library services delivery. Social media has been known to be used for personal daily activities and social interaction. It is now being used for academic and educational purposes. Therefore, we felt it would be an ideal application to reach out to the contemporary “on-demand” and “tech-savvy generation of library users who prefer their information needs are met round the clock and beyond the confines of traditional library borders. SCIMMA is thus, a mobile app specially designed for collaborative value-added library services without incurring extra cost of Internet penetration or bandwidth consumption. It is based on microservices architecture, the app is still in progress and will be fully developed before the end of the year 2022. It is hoped that the app will enable, inspire, connect and engage the users especially in uncertain times.

The Social Media-Centric Instant Message Mobile App (SCIMMA)

The advent of ICT has made access to information now very fast through the Internet. Cable TV does not need information within their reach, thereby, acquiring information from any location. Unfortunately, there are many services being provided by the Library that are not availing a due to lack of equipment.

Library users are not aware of the various resources and services available to the Library. Most users depend on the Internet to source for information and this has brought about under-utilization of library services. It has therefore become imperative for the Library to publicize its missions and services.

There is a need to offer users an easier way to access library services for their various activities like research, education, administration and entertainment. Social media tools are very indispensable for communicating, interacting, and collaborating with friends, recruiters, lecturers and other users in the social sphere. The Library, therefore, needs to reach out to the social media users to enable them to share their experiences with one another.

Adeleke’s Library services is a unique one that allows the users to enjoy the services of the library without going into the library. A user can thus interact, search, and download books through the online platform, and also interact with many students and Librarians. The platform is free of charge in Nigeria and Africa.

Nigeria is yet to develop in their community of libraries, and are not such services to users. It is also the belief of the Library that unavailable and rare books are still available to the users. The Library needs a system that will enable their respective services to users, which can be accessed from anywhere.

The social media-centric instant message mobile app is proposed to be an application for a specialized and collaborative view added way of rendering Library services without incurring extra cost whether it concerns provision of bandwidth consumption. It is thus, this application represents the design and development of highly sustainable and scalable software.

The architecture of the proposed solution follows the principle of the microservices architecture model. It also takes into consideration the MobileApp and the Service Provider (MS), which will be a part of the MobileApp. Each library unit has its specific set of services offered. Taking into consideration, the proposed architecture will allow, for example, a mobile App to be developed having the necessary management module, without having to bear the costs of maintaining modules related to other services that are not necessary and provided.

Thus, the architecture will make it possible to manage modules of each microservice in a modular way, thus allowing to meet the requirements of a more demanding service. The structure of the proposed architecture is presented in figure 1.

THE ARCHITECTURAL DESIGN

APPRECIATION AND ACKNOWLEDGMENT

A belief that when the App is fully developed it will enable the library to reach out to a large number of our users.

It will also enhance the library service delivery in our University

ACKNOWLEDGEMENT

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The Architectural Design

1. In this architecture, the services offered by the library are represented by blocks (Administrative MS, Reader Services (MS), Bibliographic Data (MS) and Reader’s advisory service MS). The Architectural Design of Information/Current Awareness Services (MS) where MS indicates that it is a microservice, where each block represents a self-contained and standalone microservice that can be implemented. Furthermore, the required services must have a single purpose and be responsible for the overall performance of the application.

2. It is important to clarify that figure 1 represents a service oriented of the proposed framework. Thus, the complete framework represents a higher number of microservices.

The architectural microservices are assigned according to the services offered by each microservice. For example, Cataloging MS represents the microservice of the architecture responsible for the higher provision related to Cataloging services. Similarly, the Search MS represents the microservice responsible for the specific service of search. Again, for the specific purpose of each microservice, the architect has a proper documentation of microservices the user, which is also very important to the users.

3. The microservices architecture is essential as it is the core of the microservices. The microservices are described with each other using single interactions [13]. Thus, in figure 1, these interactions are described by the arrows connecting each microservice. The arrows represent the API (Application Programming Interface) that provides communication to other microservices which are interrelated.

4. The use of microservices means that the services are independent of one another. This is because the microservices are responsible for the specific service of each microservice, for example, providing a single interaction of searching the required service. In a microservices architecture, it is essential that the components communicate with each other using single interactions [13]. Thus, in figure 1, these interactions are described by the arrows connecting each microservice. The arrows represent the API (Application Programming Interfaces) that provides communication to other microservices which are interrelated.

5. The requests made to the microservices API are carried out through the use of another component of the architecture, which is called SCIMMA Middleware. The architecture, this component is a scalable application responsible for building the interface presented to the user, as well as for internalizing requests in the other microservices. This way, the SCIMMA Middleware processes the other microservices, receiving and designing these to be the proper microservices.

Thus, the SCIMMA Middleware assumes the role of an orchestrator, controlling the adaptation and batching of requests to assist the generation of microservices and the communication between them. This component is responsible for transforming the received requests into microservices through the appropriate services, authentication/authorization. Functions related to the requests are executed through the microservices.