Design of an administration software system for academic events

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Abstract: This work presents the design of a software system for the management and administration of academic events in a higher education institution, which allows handling the information of the events in an efficient way, strengthening existing resources and fostering an organizational culture within the university community.

Keywords: Academic Events, Mobile Application, Web Service, Model View Controller.

I.   INTRODUCTION

The accelerated growth of Information and Communications Technologies (ICTs) has contributed to the proliferation of software applications created to meet the needs of different types of consumers. Application users are in different fields such as industry, commerce, finance, tourism, education, among others.

IBM in its report on communication in companies emphasizes that "New Internet-based technologies have significantly - and in a few years - changed the way companies and institutions communicate and interact with their audiences". Currently, academic or business events must be conceived with a high technological component to improve their chances of success, as well as improve the quality and performance of these events [1].

In the case of the Tizimin Multidisciplinary Unit of the Autonomous University of Yucatan (UMT), academics use software applications to support their teaching-learning processes as well as the UMT incorporates software systems in the management of its administrative processes, however, it is still a challenge to incorporate a technological system in the organization and execution of academic events held at the UMT.

In this work, the design of a technological proposal is presented as a support tool for the management and administration of the academic event called UMT Anniversary Days, the proposed system has been called AppUMTate.

II. ACADEMIC EVENTS

Events have been with us since man lives in society. They emerged as a way through which human beings can exchange experiences and knowledge acquired during their work or social life.

For Higher Education Institutions (HEI), academic events are meetings where education is pursued as a primary purpose, and the transmission of scientific and other knowledge; the dissemination of information, knowledge sharing, debates on specific topics and all kinds of acts, ceremonies and parties related to educational institutions [2].

The emergence and use of ICTs has led to a profound transformation in the way of acting of human beings, at the same time they have become indispensable in all areas of our society, but since new technological tools are increasingly appearing that improve and automate the processes we carry, technological demands are increasing, and it has generated that many activities that we carry out cannot be conceived without the use of ICTs. The organization of events does not escape this, since it increasingly incorporates various technological resources into its development, which have become indispensable to ensure their success. But being at the forefront in the use of technological tools in the organization of events is an economic challenge, since the inclusion of these resources demands considerable expenses in equipment and personnel, especially if it is an academic event, which does not have the financially backing of private company [1].

III. MOBILE APP

A mobile application, also known as app, is a software program designed to be run on cell phones, electronic tablets, and other mobile devices.

Currently there are more mobile devices in the world than computers and many people use them not only as a means of communication, but also to carry out professional activities, stay informed, access commercial, financial, entertainment and transport services, among other possibilities. The development of mobile applications has expanded in recent years due, on the one hand, to the widespread use of mobile phones and access to data services, and on the other, to the emergence of software tools that facilitate their development [3].

In October 2020, it was reported the download of around 8.2 billion iOS apps and 28.3 billion Android apps [4]. The world of mobile applications has evolved as consumer habits demand it. And it is that the current lifestyle defined by mobility and lack of time makes mobile important when going from one place to another. The society in which we live is constantly connected to the internet and mobile is, to a large extent, the protagonist of this [5].

IV. WEB SERVICES

A web service is a collection of protocols and standards used to exchange data between applications on computer networks such as the Internet.

The development of web services has become a standard in programming when sharing information between different software applications, since to distribute their functionalities these are independent of the hardware, the operating system, the programming language and just as they are independent to provide the functionalities, they are independent at the time of being executed and developed for use [6].

V. MODEL-VIEW-CONTROLLER (MVC)

MVC, is the recommended architecture model for interactive applications. It organizes an interactive application into three separate modules: one for the application model with its data representation and business logic, the second for views that provide data representation and user data entry, and the third for a controller that processes requests and handles flow.

New data sources are easily added to an MVC-based application by creating code that adapts the new data source to a new view [7].

VI. DESIGN OF THE SOFTWARE

Faced with the need to develop a technological system as a support tool for organization of the academic event of the UMT called Anniversary Days, which will allow to have the processes integrated into a single system to save time, money, and effort. Software development group proposes the software system called AppUMTate. Design of the proposed system will be described below.

The system architecture is based on a model distributed in three layers, which are: client, web server and database manager. This model aims to separate the business logic from the design logic.

The technological proposal includes the use of a mobile application, an administrative web system adapted to a client-server architecture. Both systems interact with the web server with the intention of executing programmed statements to be managed with the database.

VII. DESCRIPTION OF THE APPUMTATE SYSTEM

The AppUMTate system would allow the UMT student and administrator to interact through a user role with a mobile app for the Android platform that presents all the activities available during the Anniversary Days of the institution. In addition to this, it would allow answering satisfaction surveys and downloading the certificates of participation for the activities they attended.

The above would be administered from a web system to which only previously identified administrators would access, whose task would be to configure and manage activities, surveys and attendances.

The complete system would be composed of the following three separate modules: The mobile application, the web administrative system and the web service.

The web service would be responsible for performing the entire logical process of the system, without a graphical environment and would rather be a service that can be consumed by other modules which do have graphical environments, its main objective is to define access routes through http that perform the operations corresponding to all the events of the Anniversary Days. For this, an authentication process would be included in each request that is made.

Figure 1 shows the component diagram of the AppUMTate system and the dependencies between these components.
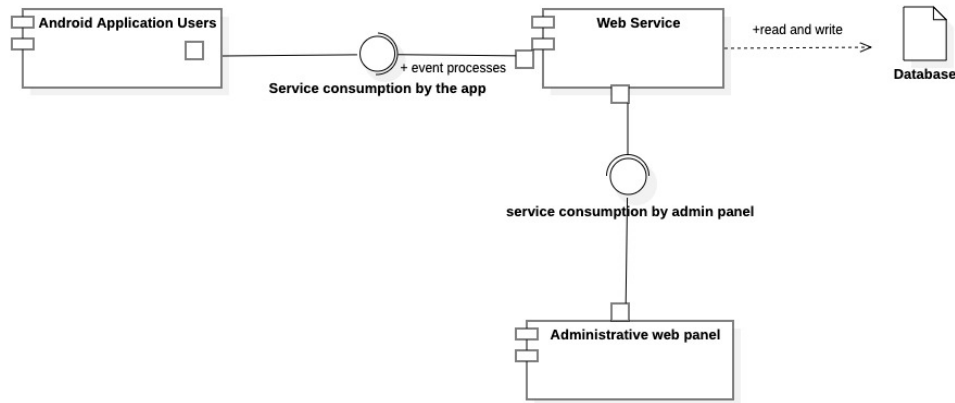
Fig. 1 Component diagram of the AppUMTate system

Figure 2 presents the use case diagram of the AppUMTate system, which specifies the functionality and behavior of the system through its interaction with users.
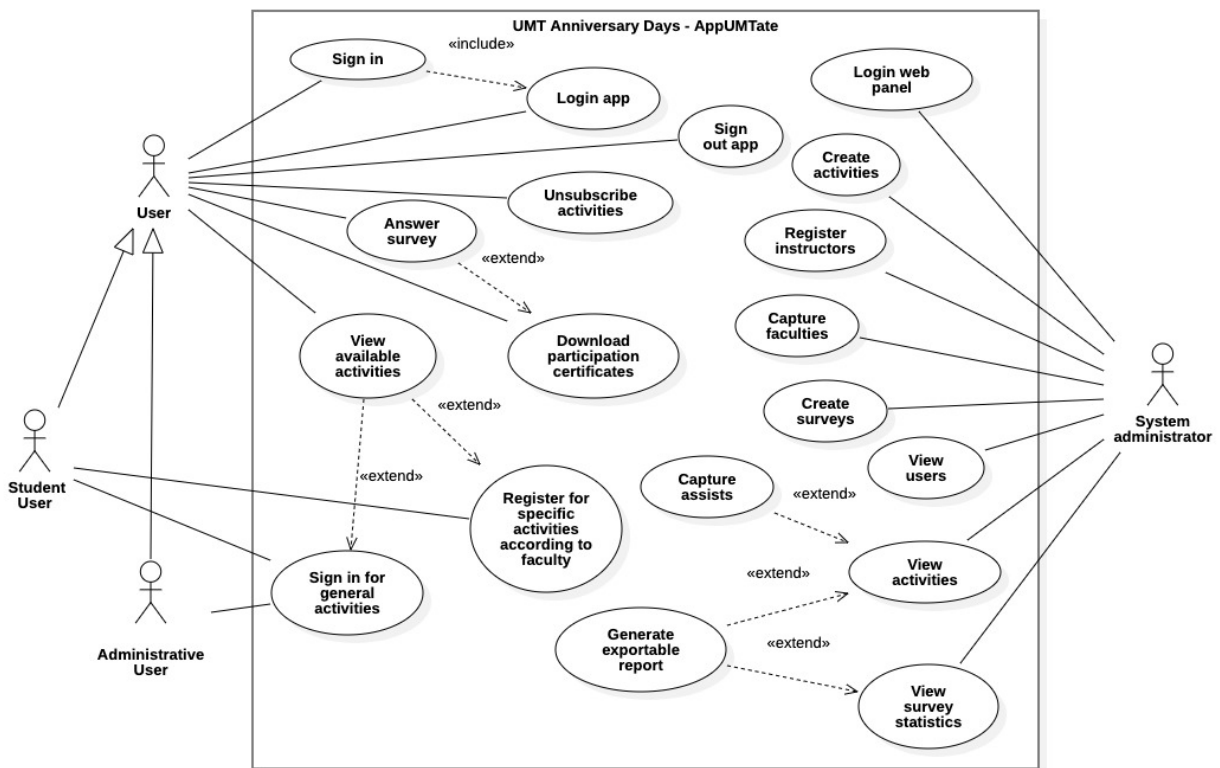

Fig. 2 Use Case diagram of the AppUMTate system

Figure 3 shows the class diagram of the AppUMTate system, in which it can be seen the classes of the system, their attributes, operations and the relationships between objects.
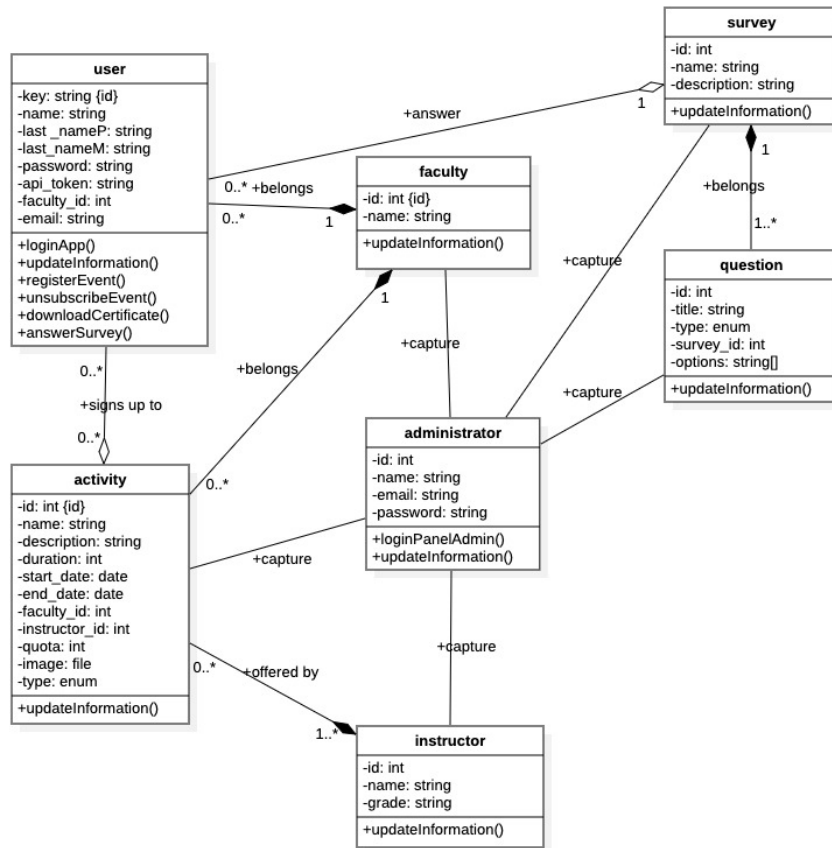

Fig. 3 Class diagram of the AppUMTate system

Figures 4 and 5 show the sequence diagrams of the login and event registration processes, respectively. Sequence diagrams are two-dimensional graphs that show the interaction between objects over time.
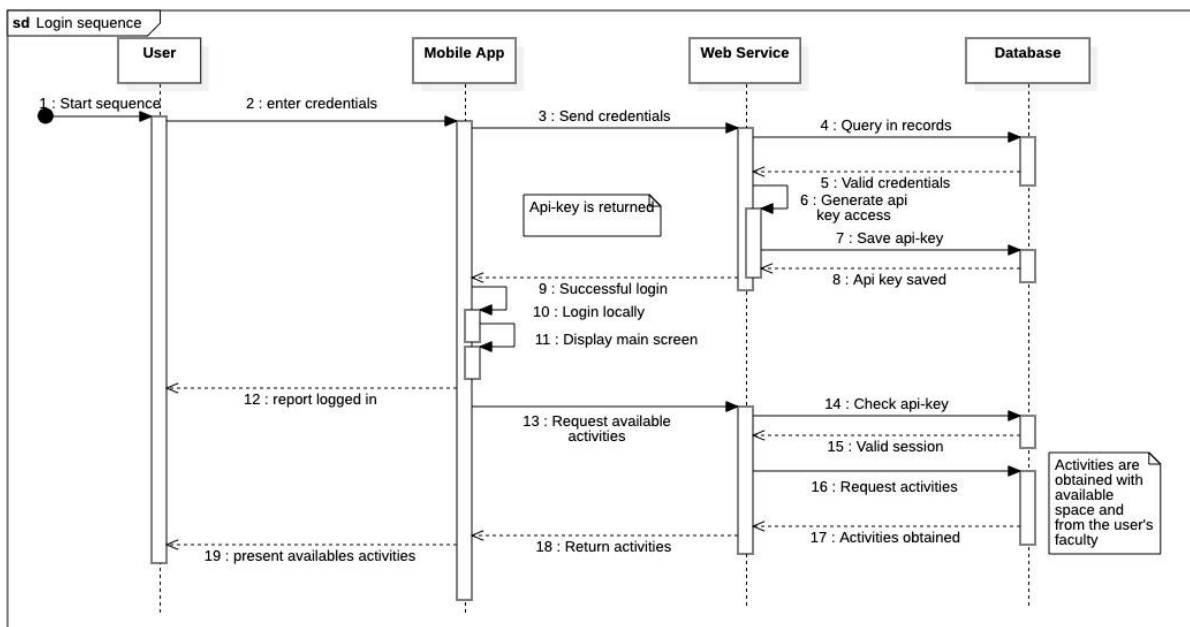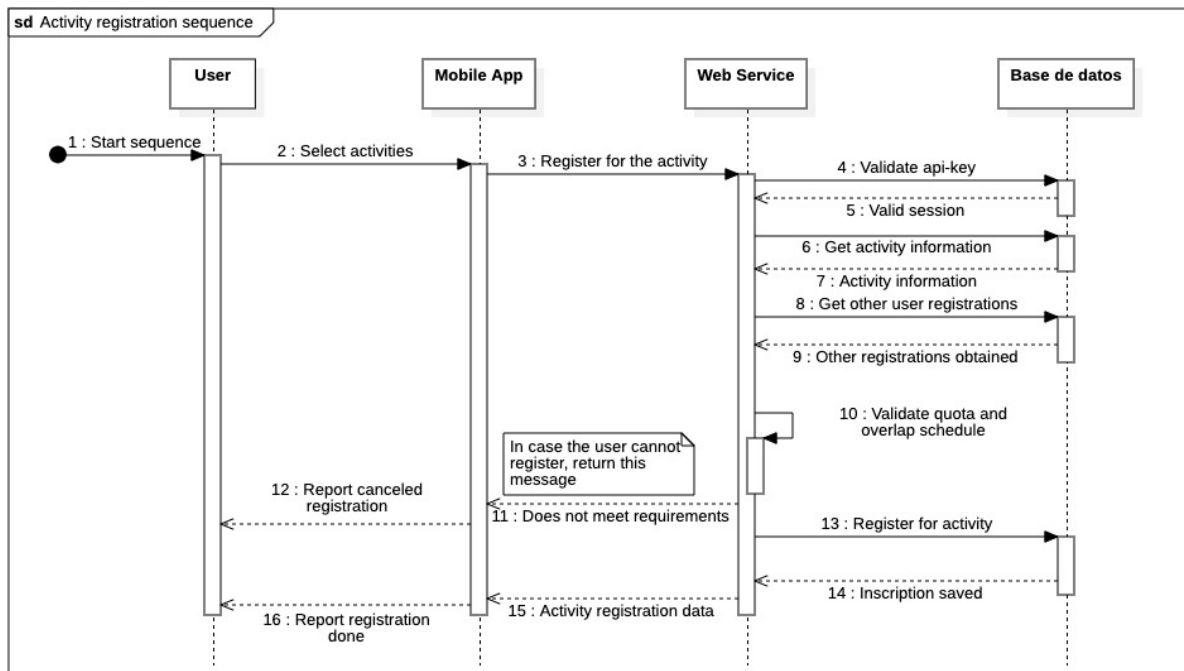

Fig. 4 Sequence diagrams of the login

Fig 5. Sequence diagrams of the event registration processes

VIII. CONCLUSION

The goal of the design phase has been completed. All the requirements obtained from the analysis phase have been implemented, and we have the final model that provides a complete idea of what should be built in the next phase of the development of the AppUMTate system.

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