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An Educational Management Information System to Support Institutional Planning at the University of Colima

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Abstract

This research work present an Education Management Information System designed for the Department of Institutional Planning and Development at the University of Colima, this system allows the gathering of relevant information related to the institutional management indicators with a suitable interface to its users in order to simplify and reduce the time needed for management the University information. Usability testing of our system showed high user satisfaction.

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1. Introduction

Educational planning, which is responsible for establishing the goals and objectives of education, had growth rapidly in Latin America. This is because in the early 90's started the interest in the systematization of indicators that encourage decision making, this information is gathered from an Education Management Information System (EMIS).

There are evidences that the education planning allows a solid structure to expedite the establishment of goals and priorities, facilitates the creation of guidelines for the expansion of the educational system and prevents the neglect or misuse of resources (International Institute for Educational Planning, 2010).

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The work presented in this paper aims to develop an EMIS called e-Planea, which will perform the gathering of relevant information related to the institutional management indicators at the University of Colima.

2. Background

Efforts to optimize the quality of data and available information to improve the educational system and support decision-making have occurred for a long time. The EMIS began with the rise of systems programming in the 80's with projects in many countries to compute the annual school census and other administrative routines (Cassidy, 2005).

An EMIS has as a function to collect and analyze management indicators related to the education sector, and aims to support the processes of strategic planning, resource assignment, monitoring, policy formulation and decision making in Institutions of Higher Education (IHE). (International Institute for Educational Planning, 2010).

Currently, the University of Colima also makes the collection of information relevant to the indicators of educational management.

To accomplish this, the University of Colima uses the annual reports as one of its instruments for data collecting and monitoring, this for high schools, colleges, research centers and departments that constitutes it.

This process is performed by the Department of Institutional Planning and Development (DGPDI for its acronym in Spanish) through the distribution between dependencies of files in word processor format to be filled with the required information and then the collection of such files is done through e-mail, which are analyzed manually to formalize the information.

Organize all these files and keep them updated is a big problem. Is a must to take proper coordination between the planning advisors (who are employees of the DGPDI) and the various dependencies and schools (both higher and middle level) with which the University has.

After gathering all this information a review must be conducted in order to make decisions to guide the educational planning. This step is very complex and time consuming due to the enormous amount of data collected in multiple files, which usually have several versions.

Carry out the processes of data collection, management and analysis is becoming a complex task to perform, because is a not systematized process, so it becomes an open problem within our institution. This situation is optimal for the development of an EMIS.

The development of an EMIS will benefit the DGPDI, allowing information visualization quickly and organized, because this department is responsible for the educational planning process of our University.

3. Related work

The EMIS have been widely used in Latin America (eg Colombia, Chile and Mexico) of which have been experiences of successes and failures. Here are some of these cases (Cassidy, 2005).

Colombia (1999 - 2003) The use of information technology enabled them to bring significant financial savings and open 240,000 places in schools, of which 120,000 were the result of efficiency, and did not require hiring more teachers.

Also the website of Mexico City provides geographic information, but it is not easy to use, besides that the help and information are very limited.

Chile in the 80s developed a system that facilitates the presentation and analysis of results allowed the comparison between schools in the municipalities. Provides detailed reports to compare the performance between schools within the community, region or nation. It is also possible to compare schools based on

the socio-economic state of the community receiving the service.

Additionally, some states in Mexico have developed and maintained their own systems for educational planning. A particular case is the state of Aguascalientes (Aguascalientes State Government, 2012). This site provides very easy access to a complete set of information for education by status and educational level. Also includes statistics, analysis, and the availability of 6 years of historical data.

4. System development

e-Planea is a cloud web application developed and implemented in a LAMP platform (Dougherty, 2001). As the application resides in the cloud, the users (planning advisors, head of departments and administrators) can access the system from any computer with a web browser and Internet connection.

4.1. Analysis

Use cases represent a typical interaction between a user and a computer system (Fowler & Kendall, 1999). Such diagrams are a primary element of software development, and part of the Unified Modeling Language (UML). For the e-Planea platform the actors are the user previously defined: planning advisors, head of departments and administrators. The Fig. 1 shows the use case diagram for the proposed EMIS.

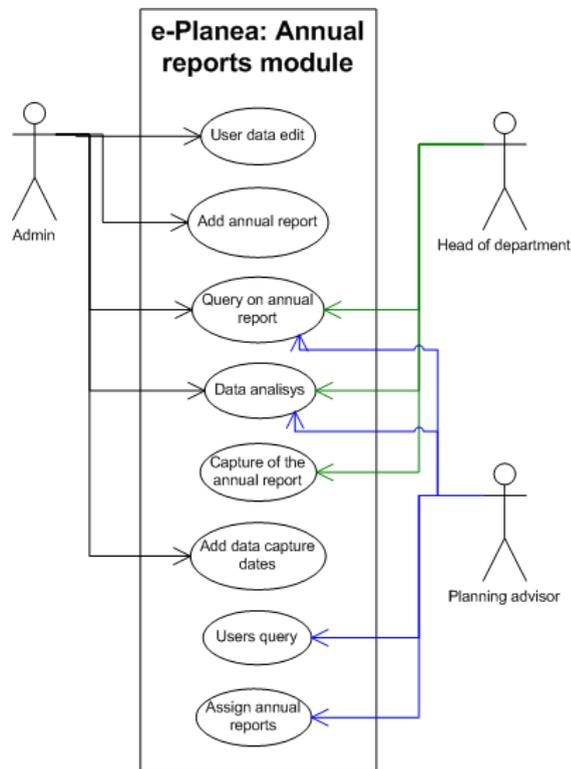


Fig. 1. Use-case Diagram

4.2. Software design

As illustrated in Fig. 2 for the development of the e-Planea platform a cloud web configuration is used, in order to allow Access to the users from a web browser (eg Firefox, Chrome or Safari).

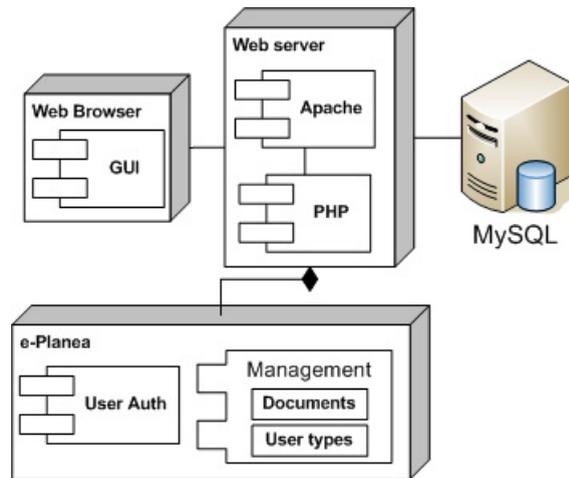


Fig. 2. System architecture

4.3. Implementation

The next step is the software implementation; which should provide a user friendly interface. We develop a fully-functional system, where each user of the application should fill identification requirements in order to login in its personalized interface and use the system (see Fig. 3).

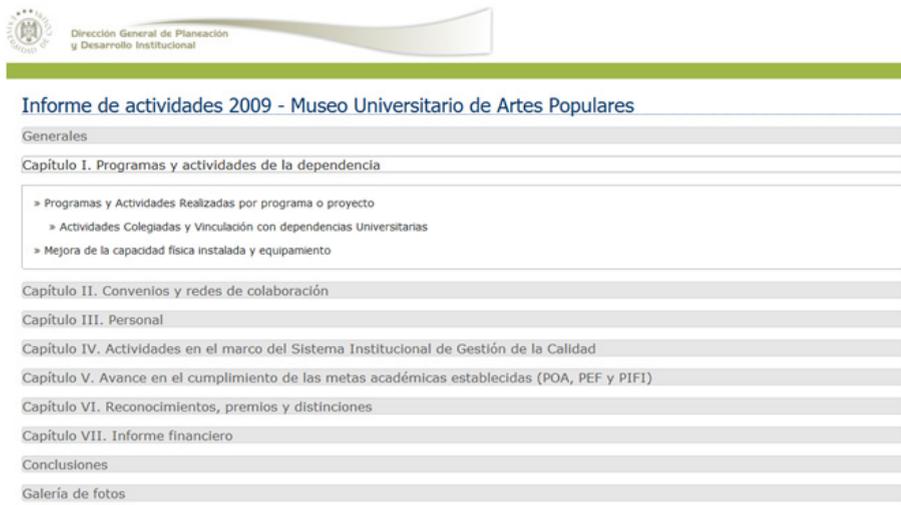


Fig. 3. Home interface.

5. Evaluation

To measure the acceptance of the platform the Technology Acceptance Model (TAM) was used. Developed by (Davis, 1989), because it is a highly effective model tested on predicting the use of the technology. The purpose of TAM is to explain the causes of the acceptance of the technology by the users. Proposes that perceptions of usefulness and ease of use by an individual in an information system are conclusive in determining their intention to use the system. The TAM evaluation was performed with a group of 13 users of type “Planning advisors”, which means 100% of the DGPDI’s staff of advising. We used this group since they are the direct links between DGPDI and all the departments and schools of the University, besides being who reviews the annual reports and trains the directors in order to use the EMIS. Taking into account the “Strongly agree” and “Totally agree” answers, the TAM generated the following results.

For the perception of ease of use, 100% believe that the system is easy to use, 100% think it is easy to learn, while 85% think that is clear and understandable, and finally by 85% believe that is easy to find information on it (see Fig. 4).

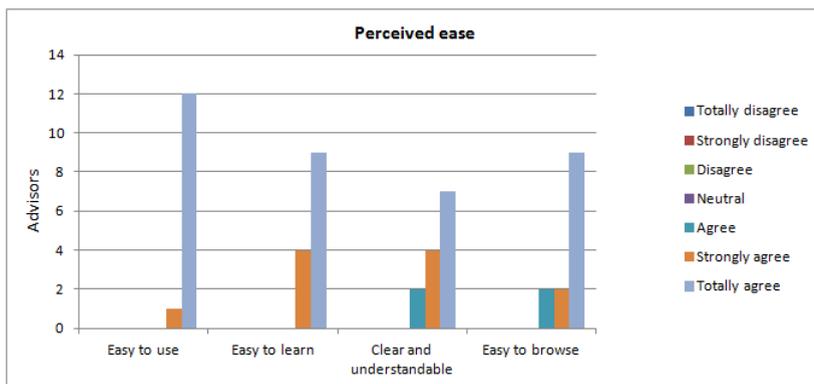


Fig. 4. Results about the perception of the easy to use of the platform.

In the area of the utility perception, of the responders, 85% believe that the system is efficient, 85% said it improved their performance, while 77% said it improved their productivity, and 92% believe that was useful (see Fig. 5).

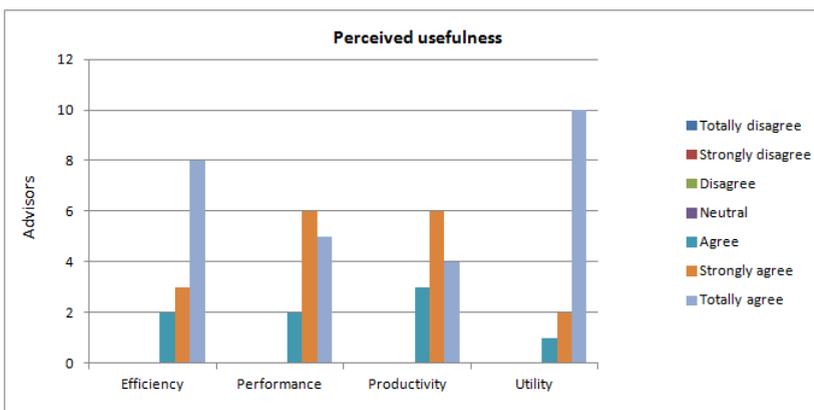


Fig. 5. Results about the perception of the utility of the platform.

Regarding the attitude towards the use, a positive response was obtained for the system: 92% agree that it seems a good idea it software (see Figure 6).

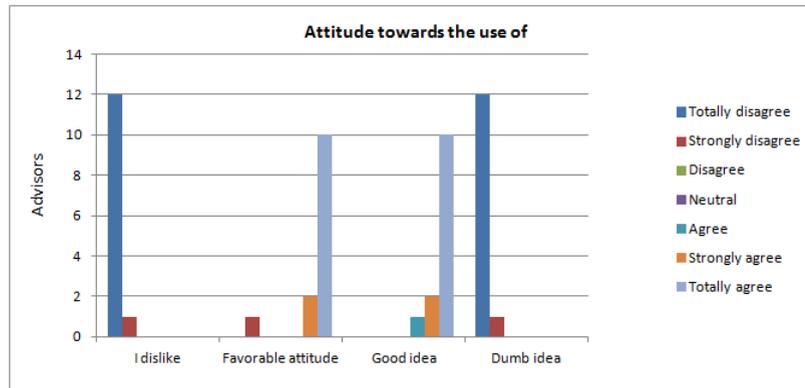


Fig. 6. Results about the attitude toward the use of the platform.

Finally the answer on the intended use, 100% of the users said they would use the system in their work, use it again and have the intention of use it (see Figure 7).

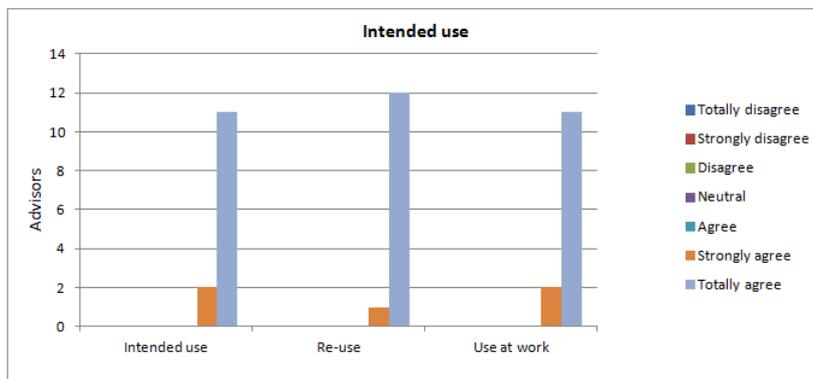


Fig. 7. Results about the intention of use of the platform.

6. Conclusions

This work presents the creation of an EMIS called e-Planea at the University of Colima, that supports the elaboration of annual reports of the University schools and departments. The features developed are: a) Systematization of annual reports, b) Capture of reports by the heads of the various schools and departments, c) Reviewing of reports by the planning advisors and d) Automatic generation of reports in the required formats.

The evaluation of this platform gave as a result that the platform is useful and allows a greater performance and efficiency, and it is also considered a good idea. Thus, this created good intentions in the users of using it again.

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