

Computer system for process optimization. Practical case of a religious organization**Sistema informático para la optimización de procesos. Caso práctico de una organización religiosa**

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DOI: 10.35429/JCA.2021.17.5.32.36

Received July 25, 2021; Accepted December 30, 2021

Abstract

Thanks to technological advances, companies currently have computer systems and database systems for better administration of their organizations. However, in some of them there is a phenomenon in which they are not managed by computer systems, but by manual processes keeping their records on sheets of paper, which represents a large amount of time and money consumption, this system has deficiencies, both for the organization and for the personnel who have access to said process. Due to this problem, the design and implementation of a computer system is proposed using the agile Kanban methodology, which was used for its flexibility to avoid problems and bottlenecks between the activities of each iteration, also for the development of the system used the VB.Net programming language and the Microsoft SQL Server manager for the construction of the data model. Resulting in an efficient computer system in the control of records of the different services that a religious organization provides to its parishioners.

Resumen

Gracias al avance tecnológico, actualmente las empresas ya cuentan con sistemas informáticos y sistemas de bases de datos para una mejor administración de sus organizaciones. Sin embargo, en algunas de ellas se presenta un fenómeno en el cual no están administradas por sistemas computacionales, sino por procesos manuales llevando sus registros en hojas de papel lo que representa una gran cantidad de consumo de tiempo y dinero, este sistema presenta deficiencias, tanto para la organización como para el personal que tiene acceso a dicho proceso. A causa de esta problemática es que se propone el diseño e implementación de un sistema informático mediante la metodología ágil Kanban, la cual fue empleada por su flexibilidad para evitar problemas y cuellos de botella entre las actividades de cada iteración, asimismo, para el desarrollo del sistema se usó el lenguaje de programación VB.Net y el manejador Microsoft SQL Server para la construcción del modelo de datos. Dando como resultado un sistema informático eficiente en el control de registros de los diferentes servicios que proporciona a sus feligreses una organización religiosa.

Computer system, Kanban methodology, processes

Sistema Informático, Metodología Kanban, Procesos

Citation: CASTORENA-PEÑA, Jesús Abraham, DOMINGUEZ-LUGO, Alma Jovita, CAMPOS-POSADA, Gloria Elisa and CASTILLO-SIFUENTES, Néstor Daniel. Computer system for process optimization. Practical case of a religious organization. Journal Applied Computing. 2021. 5-17:32-36.

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Introduction

The great technological developments are indisputably transforming the way of doing things, as well as the way of providing support and new services to the management of current organizations, in this way information and communication technologies (ICT) have become in a relevant factor so that companies can be productive and efficient in their various processes (Bocanegra and Vázquez, 2010).

For Gálvez, Riascos and Contreras (2014), information and communication technologies (ICT) have become a catalyst for organizational processes that allow the improvement and optimization of each of the business processes in an appropriate and timely manner. In this way, according to Pérez and Dressler (2007), organizations are committed by two interrelated aspects: the first resides in the intensive and rational use of ICT that allows creating value for the organization and favors the second aspect, knowledge, resource fundamental of organizations.

Among the most prominent emerging technologies are those related to integrated wireless devices, service-oriented architecture and application infrastructures (Samad, McLaughlin and Lu, 2007). This type of technological development being one of the ways to satisfy the needs of the most sophisticated and demanding clients in the market, in addition to allowing the automation of various processes within organizations, as long as the acquisition and implementation of the technologies is appropriate. for your organizational structure.

The incorporation of technology in organizations plays a very relevant role (Hirscha, Almaraz and Ríos, 2015) to improve the performance of companies in their processes and to carry out work efficiently and thus be able to respond to the increase in demand. and changes in the environment in which they operate (García, 2013).

Arregocés and Cano (2007) argue that one of the technologies most used by organizations is those incorporated into the CIM, which has allowed manufacturing processes to be more flexible and have better productivity.

According to Nagalingam and Lin (2008), CIM technology together with ICT tools are the right combination for organizations to overcome the current economic climate and the dynamic changes that markets present. The incorporation of technologies and the change that this entails, has brought about a series of positive benefits for all organizations that wish to remain current and efficient.

It is because of the above that the following work is presented, which aims to propose a computer system to improve the processes of a religious organization in an optimal and efficient way through the agile Kanban methodology.

Methodology

There are various methodologies aimed at supporting and improving processes, however, it is agile methodologies that have captured the interest of software developers, as is the case with the Kanban methodology.

The Kanban methodology was used for the development of the computer system of the present study, due to its adaptability and flexibility during the development of the software. With Kanban, developers have the opportunity to organize and manage in a general way, the way in which each of the assigned tasks are carried out, in addition to clearly showing the priority of each task (Colla, 2016).

Kanban is based on incremental development, in which work is divided into segments using a board. The board shows all the tasks to be carried out and their status, in order to avoid bottlenecks in each iteration and ensure the correct fulfillment of each of the defined tasks (Janampa, Gómez, Juárez, Lozano, Solórzano & Meneses, 2021).

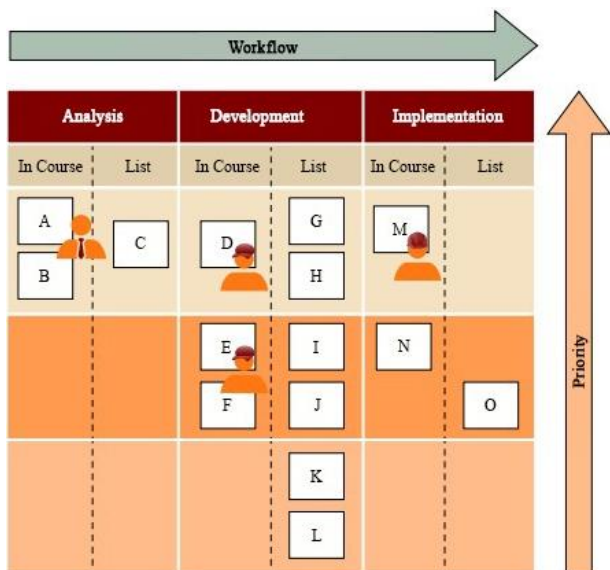


Figure 1 Kanban model
Source: Bermejo (2011)

For the development and implementation of the proposed System, the process of the Kanban methodology (Figure 1) was followed, which consisted first, with the definition and analysis of system requirements, then proceeded to collect the information that fed the system, the which was provided by the personnel in charge of the registration of the sacraments in the church. Once the information had been classified and organized, the data model was developed and built with the Microsoft SQL Server 2012 tool. While for the development of the application, Visual Studio 2017 was used as a programming language specifically VB .NET.

Construction and implementation of the system data model

Once the information obtained from the unit of analysis process was analyzed and modeled, the database was physically built through an ascending construction strategy, which begins with a detailed list of all the attributes that could be part of the data model. data. Once the list of attributes was defined, the requirements were decomposed and conceptualized independently to finally generate the data model. Figure 2 shows the database obtained from the parish process, which consisted of 12 tables for the storage, analysis and manipulation of data from the computer system.

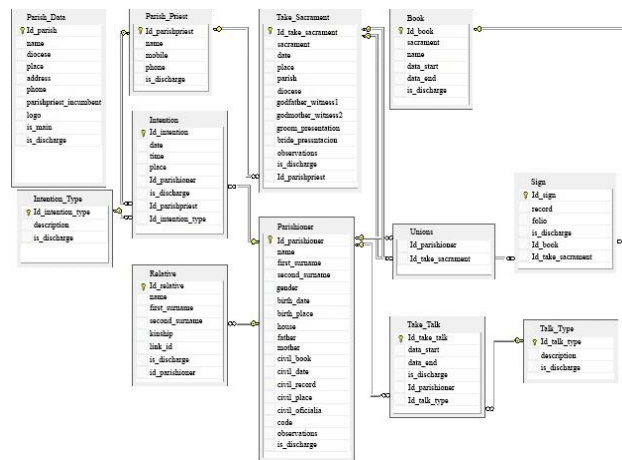


Figure 2 Parish process data model
Source: Own elaboration

Figure 3 shows the home screen of the system with all the automated actions for the registration and administration of services provided by the religious organization.

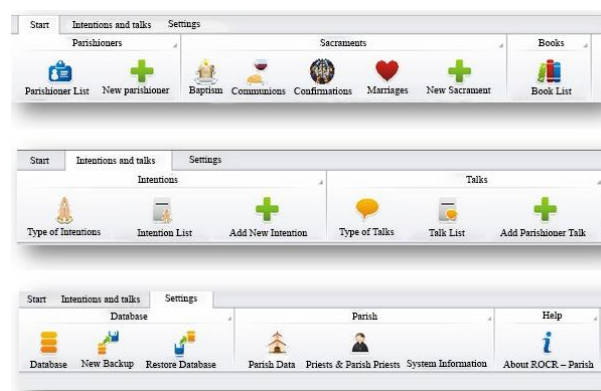


Figure 3 System main menu

To carry out the registration of the sacraments taken by the parishioners, the interface shown in Figure 4 was designed, where advanced searches can be carried out according to the unique identifier of the parishioner or full name among other functions of the registry.

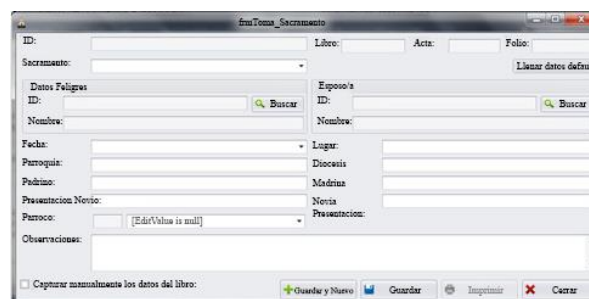


Figure 4 Sacrament Record Screen

Figure 5 shows the interface in which the user can consult, manipulate and organize the information collected from the different sacraments offered by the parish, for example, marriages.

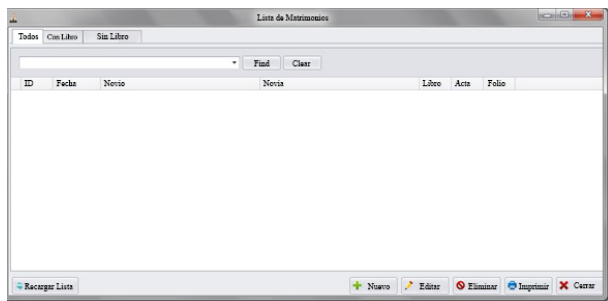


Figure 5 Information query screen (marriages)

Figure 6 shows the interface that allows recording the general information of each parish with which there is contact and collaborative work within the organization.

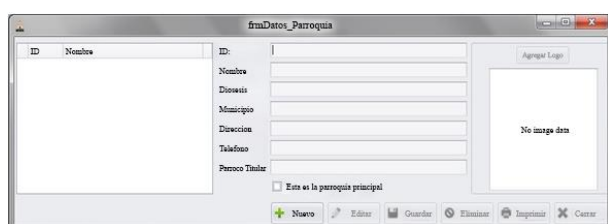


Figure 6 General parish data record

To secure the information of the computer system, two main interfaces were designed and developed to make backup copies in external and internal storage media in the organization. In these copies the information remains intact until the moment in which new files are saved (Figures 7 and 8).

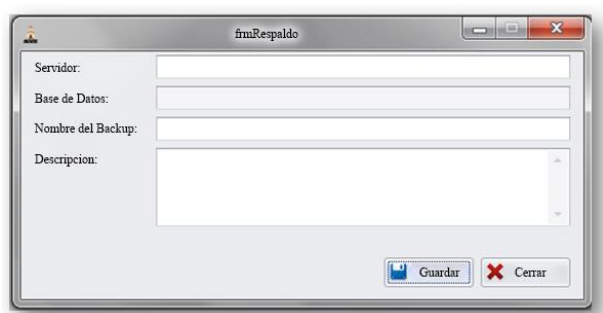


Figure 7 Database backup screen

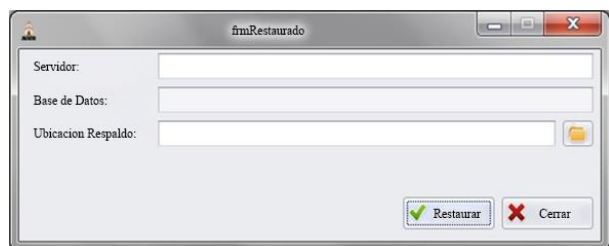


Figure 8 Database restore screen

Results

With the application of the Kanban methodology for the development of the computer system, it was possible to largely avoid bottlenecks in each iteration during its implementation, thus allowing satisfactory results to be obtained both in development, operation and test cases.

On the other hand, with the developed system, each of the services provided by the religious organization was expedited quickly and efficiently. Likewise, it was possible to have a better integrity of the information stored and managed by the processes of sacraments and intentions and talks.

Finally, through the database restore interface, the organization was able to reliably secure data backups.

Conclusions

The proposal developed and implemented in the selected analysis unit, it was possible to observe an increase in productivity in its processes, through validation tests with the end user. To mention an example in the registration of the sacrament of the first communion, a time of 20 to 30 minutes per person was taken and by means of the computer system it was reduced between 10 and 15 minutes.

Computer systems represent great quantitative and qualitative advantages in any process of interest, so the use of these is increasingly demanded by society, companies or organizations that wish to optimize their processes. Among the advantages identified after the implementation of the information system in the parish processes are:

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Acknowledgments

The facilities provided for the completion of this article to the Autonomous University of Coahuila are appreciated.

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