

TIC applied to collection management. SOFIPA CORPORATION. Case study**Las TIC aplicadas a la gestión de cobros. CORPORACIÓN SOFIPA. Caso práctico**

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Abstract

The developed project aims to automate and streamline the collection management processes of the SOFIPA CORPORATION Company through a web system and a mobile application that provides support to managers and the collection coordinator. The system has modules for portfolio recovery, managers, agreements, settlements, visit scheduling and the option to print reports of the activities carried out by managers. The mobile application is installed on 2 types of devices: mobile point of sale (mPOS) or smart phones, both must be permanently connected to the Internet. With them, the managers who visit the clients assigned by route and register their payments; once updated in the system, they will be able to print receipts on portable USB printers. This project contributes to streamline and automate processes and increase response capacity, mainly in the recovery of portfolio of delinquent clients. The Web system was based on the SCRUM agile development methodology, the SPRING framework was used for the development, the mobile development ide was Eclipse and as a MySQL database manager. The purpose is to guarantee efficient work.

Web system, Debt recovery, Payment reconciliation

Resumen

El proyecto desarrollado tiene como objetivo automatizar y agilizar los procesos de gestión de cobranza de la empresa SOFIPA CORPORATION a través de un sistema web y una aplicación móvil que da soporte a los gestores y al coordinador de cobranza. El sistema cuenta con módulos de recuperación de cartera, gestores, convenios, liquidaciones, programación de visitas y la opción de imprimir reportes de las actividades realizadas por los gestores. La aplicación móvil se instala en 2 tipos de dispositivos: punto de venta móvil (mPOS) o teléfonos inteligentes, ambos deben estar permanentemente conectados a Internet. Con ellos, los gestores que visitan a los clientes asignados por ruta y registran sus pagos; una vez actualizados en el sistema, podrán imprimir recibos en impresoras USB portátiles. Este proyecto contribuye a agilizar y automatizar los procesos y a aumentar la capacidad de respuesta, principalmente en la recuperación de la cartera de clientes morosos. El sistema web se basó en la metodología de desarrollo ágil SCRUM, se utilizó el framework SPRING para el desarrollo, el ide de desarrollo móvil fue Eclipse y como gestor de base de datos MySQL. El objetivo es garantizar un trabajo eficiente.

Sistema web, Recuperación de deudas, Conciliación de pagos

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Introduction

One of the main benefits that is obtained in the school-company link of the students of Computer Systems Engineering, enrolled in the Technological Institute of Oaxaca and who carry out the professional residency, by signing a framework agreement: it is the experience acquired that validates the skills strengthened throughout their training process. The role of organizations in the formation of the resident's social responsibility is very important, because the responsibility for complying with the requirements of the study plan is shared.

In this sense, during the period August 2020- January 2021, it was developed at the facilities of the company SOFIPA CORPORATION S.A.P.I DE C.V SOFOM E.N.R, a financial company that offers loans preferably to groups of women whether or not they are engaged in formal and established commerce at the national level. The document presented is organized integrating: the theoretical foundation and the activities carried out during the phases defined by the software development methodology used (SCRUM), in figure 1 the life cycle by interactions is shown, validating the stages of: Start, Execution, Testing and Launch. (Turley, 2019) Always looking to satisfy the demands and needs raised by project leaders in the sprints; in the delivery times of the project in general.

In the initial stage, the project requirements were collected and defined, interviews and questionnaires were conducted to finally analyze the needs. The execution was organized through four sprints, which include the following phases: Sprint planning, Daily Scrum, Design, Build, Testing, Sprint Review y Retrospective.



Figure 1 Process SCRUM

Source: Turley, Nader K. RadFrank, (2019)

The reason for doing it by sprint is because, as it is an agile methodology, priorities must be aligned between the company and project development and the contributions indicated in the User stories, modeling, interface design, databases. and performance tests were run and validated by the collection management area and overdue portfolio of the company SOFIPA.

The tools used in the different stages of figure 1 are those suggested by the company, because there are other applications developed under the framework of infrastructure support at the application level with the Spring and Angular development framework for the design of the interfaces, such as Eclipse mobile development IDE and Visual Studio Code for creating and debugging web and cloud applications, and a GNU GP license of MySQL as a database manager.

Finally, the results obtained are shown, through the interfaces, system tests, the conclusions obtained with the implementation of the system and the impact on the automated processes that contribute to the achievement of the general objective by developing a web system and mobile application to manage the system. collection of the company SOFIPA CORPORATION SAPI DE CV SOFOM ENR, the thanks given to the National Technological Institute of Mexico, the Technological Institute of Oaxaca and Sofipa Corporation SAPI de CV Sofom ENR for trusting our students and the references consulted in the preparation the article.

Problem statement

The SOFIPA company is a financial company that offers loans to groups of women who have a business (not necessarily established). When these loans are granted, they take into account the credit capacity, the economic situation of the applicants and the period chosen to pay the resource borrowed plus the corresponding interest. For the management of these loans, the company hires the credit managers to act as recuperators of the resource granted in the event that the client, regardless of the situation they go through; no longer go to the branches to continue paying and resort to a legal agreement.

Due to the fact that a manager is assigned several delinquent portfolio clients on a daily basis and by not having this automated process and with the daily report, sometimes it is not possible to make correct decisions regarding the client, in addition to the fact that the entire process described above is manual and are captured in spreadsheets. The execution of the procedure is asynchronous, which in most cases hurts the clients since if the record is not kept on time, the total interest continues to increase and affects the managers in the collection of their commission, as well as inconsistency in data, duplication or loss thereof.

Developing

The Collection Management System aims to automate and streamline processes in accordance with the problem statement and the scope is included in the following modules:

- Clients: list of portfolio clients to recover.
- Managers: customer assignment, visit scheduling.
- Payments: scheduled, settlements and release.
- Payment Agreements: Various periods.
- •Commissions: calculation of commissions per manager.
- Reports: activities of managers, client account statements, managerial decision making.
- Trading parameters.

The mobile application described above also records the customer's visit, notifies payment dates, shows the total commission achieved during the week, and shows the information on the agreements made.

Methodology

On the software development methodology, the use of the agile Scrum methodology was established because technical and management processes are used emphasizing the fast and functional delivery of the product.

(Peñalvo, 2019) using its main tools: User History, stacks of products, list of tasks and estimates of time and activities, the above organized in four sprints with the following phases: Planning, Design, Coding and Testing and that are nothing more than the execution of the tasks of the user stories to achieve a requirement.

Below is table 1 corresponding to the master list of user history planned for the project.

Master list of user histories			
Requirement	Estimated points	Priority	Risk
ITERACIÓN I			
LOGIN	1	HIGT	HIGT
CLIENTES	1	LOW	LOW
GESTORES	2	LOW	LOW
ITERACION II			
PAGOS	2	HIGT	HIGT
CONVENIO	4	HIGT	HIGT
ITERACION III			
COMISIONES	4	HIGT	HIGT
ITERACION IV			
REPORTES	3	LOW	LOW
PARAMETROS	2	LOW	HALF

Table 1 Master List of User stories and
Source: Own creation

User stories encompass a series of specific properties that must be met for their execution, once all have been defined.

A- Planning

In this first stage of the methodology, all the roles of the team (Team Scrum) that intervene in the project are defined, focusing on the Scrum Master who in this project was assigned to the ISC Mariela Pérez Lagunas Responsible for User Service at SOFIPA CORPORATION SAPI DE CV SOFOM ENR, Julissa Concepción Luis Lorenzo as developer, and Marisol Altamirano Cabrera, Claribel Benítez Quecha, Fernando Toral Enríquez and Carlos Alberto Díaz Lara as advisers.

B- User histories

Once the roles are defined, the processes that need to be automated are analyzed and they are reflected in stories known as users, these stories will help with the resolution of the functionalities of the system and the mobile application. Below is an example of two user stories (one per sprint).

Table 2 reflects the authentication of the managing user to enter the application and thus shows the list of clients that have been assigned for recovery and their details, and the different options to pay or settle the loan granted.

While table 3, validates the access of the administrator user to enter the application, and allows once the customer has been contacted, to reconcile the debit balance through a legal agreement, with fixed deadlines for its settlement.

User history	
Number: 2	Users: administrator and users
Story name: clients.	
Business priory: low	Development risk: low
Estimated points: 1.5	Assigned iteración: 1 weeks.
Responsible programer: luis lorenzo julissa concepción.	
Description: Need a web module where the clients and their details are shown, can be settled and assigned to the managers and a mobile module for the managers that only lists the clients assigned to them	
Observations:	

Table 2 User History Customers
Source: Own creation

User history	
Number: 4	User: Administrator and Users
Story Name: CONVENIOS	
Business priory: High	Development risk: medium
Estimated points: 2.5	Assigned Iteración: 2 semanas
Responsible Programer: Luis Lorenzo Julissa Concepción.	
Description: Clients agree to settle their account, the agreements that are in a single payment or in several are managed, the dates that the payment will be given must be saved, the frequency that will be applied may vary.	
Observations:	

Table 3 User history agreements
Source: Own creation

The work team developed the rest of the user stories identified for the web system and the mobile application, taking into account priority and development risk.

C- Design

In this phase, alternatives we generated for the design of the product based on the requirements to developed, including user orientation criteria, ensuring that it continues with the line drawn in the later phases.

The use of creativity is a strength at this point, since by modeling some processes and the database, the other members of the team and clients will be able to understand the analysis made, and that it may undergo changes due to the opinions expressed in this phase.

In figure 2, an example of a sequence diagram of the managing actor is shown, at moment in which a client is assigned for its follow-up and its interrelation with the system and figure 3, is the interface generated for such process, that is to say the screen that interacts with the end user when the project is completed.

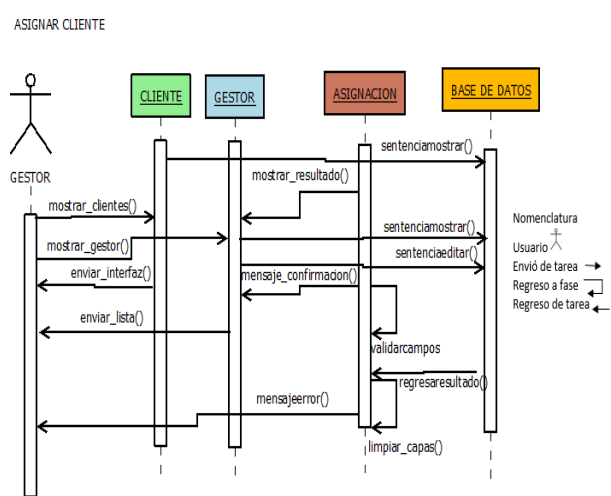


Figure 2 Assign customer diagram
Source: Own creation

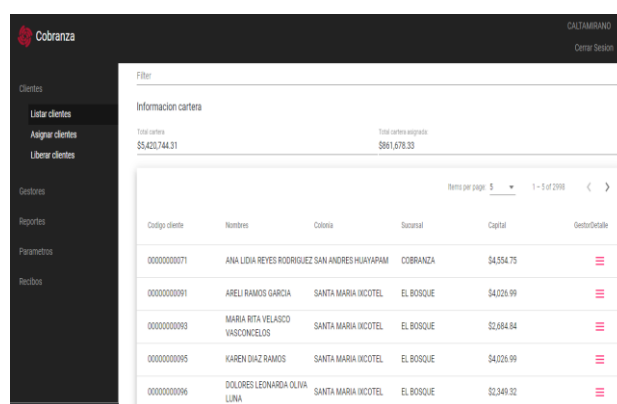


Figure 3 Customer list interface
Source: Own creation

In the design, the allocation of time and resources is prioritized, in addition to defining the technology with which the final product will be developed, it is usually suggested to make a comparative table of which are the programming languages, database managers, and other resources technological that serve to translate ideas to solve the needs of customers.

C- Development and production

In this phase, the activities defined above are carried out and the way in which it will be deployed is evaluated, starting from the initial requirements; The SCRUM team holds meetings with customers seeking, on the one hand, to deliver a simple product that, when built, meets the requirements of the requested by evaluating the functionalities shown and on the other, so that it can be corrected and iterated immediately. until a clearly defined product is obtained. In this phase where the effectiveness of the strategies and definitions proposed, we verified.

Based on the requirements discussed in the meetings, figure 4 shows the UML (Unified Modeling Language) diagram of the commission process, which describes the process of calculating the commissions generated by the total portfolio recovered by each manager on a weekly basis.

This process complies with some restrictions based on the commission table according to the days of delay, the assigned percentage, the days and the customer's credit type.

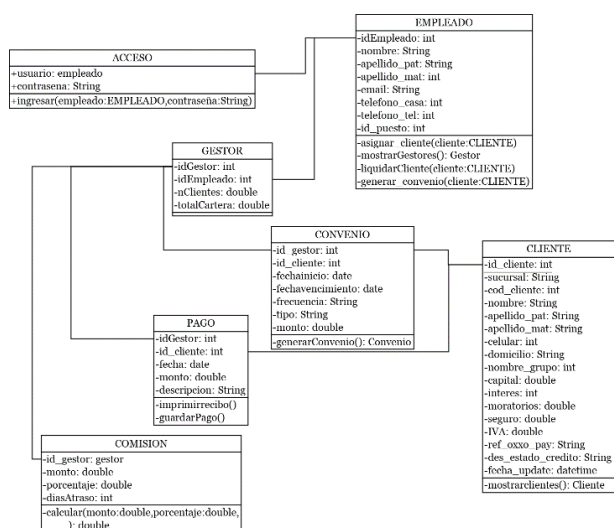


Figure 4 UML Iteration 3

Source: Own creation

Regarding the Web Collection Management System of the SOFIPA CORPORATION company and its mobile application, this process is reflected in the following interfaces (see figure 5), in which the administrator user will be able to carry out the collection assignments and general the corresponding payments.

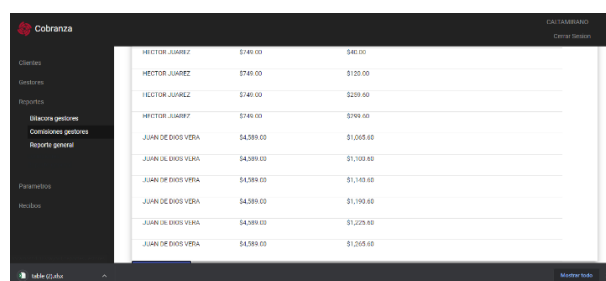


Figure 5 Commissions generated Interface

Source: Own creation

Results

According to the Scrum methodology, at the end of each sprint, the product obtained evaluated, endorsing its functionality; from that moment on, it recommended that the client use it once it has been configured and validated.

The results obtained here are nothing more than the conclusion of the planned activities are integrated in each sprint or iteration. In this work, two applications we obtained as result of the requirements posed by the client: The Web System and Collection Management mobile application of the SOFIPA CORPORATION Co. They have the requested modules, as well as the incorporation of the established business rules, in friendly and intuitive interfaces (figure 6).

By bringing together very efficient characteristics that ensure the fulfillment of its goals and objectives, the possibility of the project being profitable is very high, because it is efficient, safe, and practical and portable. The system and its structure respond to a strategy that seeks to facilitate activities of employees in the SOFIPA Co., streamlining internal processes during judicial collection.

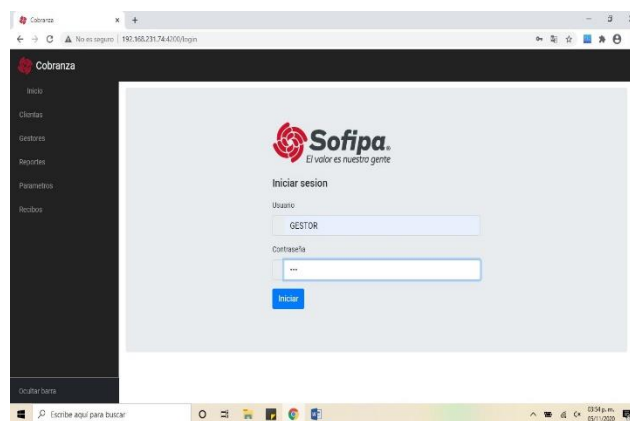


Figure 6 Web system access

Source: Own creation

The system intends to increase the organization to collect payments from delinquent clients, as well as the productivity of collaborators by having the mobile application installed (Figure 7) for printing payment receipts on portable thermal printers.



Figure 7 Movil application system SOFIPA
Source: Intellectual property SOFIPA

Conclusions

With this project, it we concluded that it is very beneficial for any educational institution to allow its final semester students to link with companies to develop their capacities and abilities to solve real problems in companies that require it, as well as skills for verbal and written communication.

This project not only provides a solution to a persistent problem in the SOFIPA company, but it is also confirmed that the use of an agile design methodology in web projects such as Scrum, allows systematic planning that includes the coordinated work of a multidisciplinary team. Led by experts in the area and that enrich the student's experience as the project progresses.

The great challenge presented is the current situation generated by the confinement due to the pandemic and the provisions in Mexico, coming from the World Health Organization, for which it we decided to work remotely and go to the physical facilities if necessary and specifically for managerial presentations.

The Web and Mobile applications are already in production, fully incorporated into the company's integral platform, in the first phase for the state of Oaxaca, considering that with the results obtained it can be replicated in other entities in which SOFIPA has a presence.

Gratitude

We thank the Technologic National de México campus Institute Technologic of Oaxaca and the company SOFIPA, for the facilities granted to carry out the project, mainly to Luis Lorenzo Julissa Concepción, student of Computer Systems Engineering, with his experience and time when carrying out the project in the course of your professional residence.

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