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Customer Relationship Management Web for construction companies

Customer Relationship Management Web para empresas de la construcción

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Abstract

This article describes the process of analysis, design, production and technological implementation carried out within the framework of the academic collaboration agreement between the Universidad Tecnológica de Jalisco (UTJ) through the Research Group (RG) UTJAL-CA-2 Social Responsibility , Sustainability and Integral Development for SMEs and the Camara Mexicana de la Industria de la Construccion (CMIC). This process consisted in the implementation of the agile software development methodology SCRUM for the creation of a web application for the automation of the management of the commercial relations of the clients. This application will allow to establish the mechanisms that ensure the correct communication and collaboration in the administration of projects to be developed, allowing the customer service processes to be stored and managed by the application, as well as being accessible to all the members of the organization that have a direct or indirect relationship with the client or the projects that are being developed. This will allow to control and direct the work efforts of the collaborators towards a better management of the resources of the company and offer a better follow up to all the sales processes.

CRM, Web development, Web application

Resumen

El presente artículo describe el proceso de análisis, diseño, producción e implementación tecnológica llevado a cabo en el marco del convenio de colaboración académico entre la Universidad Tecnológica de Jalisco (UTJ) a través del Cuerpo Académico (CA) UTJAL-CA-2 Responsabilidad Social, Sustentabilidad y Desarrollo Integral para SMEs y la Cámara Mexicana de la Industria de la Construcción Jalisco (CMIC). Este proceso consistió en la implementación de la metodología de desarrollo de software ágil SCRUM para la creación de una aplicación web para la automatización de la gestión de las relaciones comerciales de los clientes. Esta aplicación permitirá establecer los mecanismos que aseguren la correcta comunicación y colaboración en la administración de proyectos a desarrollar permitiendo que los procesos de atención al cliente sean almacenados y gestionados por la aplicación, además de ser accesibles para todos los miembros de la organización que tengan una relación directa o indirecta con el cliente o los proyectos que se están desarrollando. Esto permitirá controlar y dirigir los esfuerzos del trabajo de los colaboradores hacia una mejor administración de los recursos de la empresa y así ofrecer un mejor seguimiento a todos los procesos de venta.

CRM, Desarrollo web, Aplicación web

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Introduction

The agreement of academic collaboration established between the Technological University of Jalisco (UTJ) and the Mexican Chamber of the Construction Industry Jalisco (CMIC) has allowed since 2016 the Academic Body (CA) UTJAL-CA-02 Social Responsibility, Sustainability and Integral Development for SMEs implement strategies and actions with affiliated companies interested in their adhesion to the Global Compact of the United Nations Organization (UN) or in obtaining the Distinctive Socially Responsible Company (ESR) through The Mexican Center for Philanthropy (CEMEFI) and the Alliance for Corporate Social Responsibility (AliaRSE), through projects that have emerged from the strategic planning of SMEs that participate, and developed from the Innovative Lines of Applied Research or Technological Development (LIIADT) of CA in the areas:

a) Social Responsibility and Sustainability.
b) Industrial Projects, Strategic Management and Marketing.
c) Management, Total Quality and Business Finances.
d) Information and Communication Technologies for SMEs.

These projects oriented to Social Responsibility and aligned to the needs of the companies, allowed the company Asesores Constructores Técnicos Administrativos, S.A. of C.V. (ACTA) located in the city of Zapopan, Jalisco and with business activity in the field of construction, set up with the UTJAL-CA-02 a work plan, where the process of analysis, design, production and implementation was necessary technology of a web platform that would allow the management and administration of the process in the commercial relations with the clients, thus paying to have mechanisms that favor the control of the resources of the company and thus offer a better service to the sales processes.

The responsibility of establishing and maintaining a satisfactory relationship with customers allows the products and services offered to be maintained in a healthy commercialization process, one of the characteristic features being customer loyalty and recognition, in a way that identifies to the Economic Unit as the best alternative for the consumption of said products or services.

The projection of the ACTA company, as well as its objectives, establish the need for a timely and correct management in the handling of information and its processes, enhancing the importance of management, service and customer service, as a fundamental principle for its offer, which Cajiga (2010) defines as fundamental within the economic performance indicators of an ESR that includes clients, suppliers, employees, capital providers and the public sector.

Likewise; the management of commercial relations with customers through Information and Communication Technologies (ICTs) will allow for the appropriate mechanism so that the communication processes of all areas of the company that are involved in the commercial process be informed in real time and allow control and follow up each and every one of the actions scheduled or established in customer service.

The implementation of a Customer Relationship Management web platform will require that the company internally cause changes in its processes and organization. These changes will directly impact the preparation, safekeeping and management of their contracts, the administration of projects, collaboration and control of tasks, establishment of goals, monitoring of objectives, evaluation of proposals and communication with the client.

Methodology

The project was developed in a quarterly period between the month of May and August of 2017, which affected the selection of SCRUM as a development methodology, which according to Canós (2003) is characterized by its high adaptability to change and the required iterations, which were scheduled every two weeks. In the implementation of this methodology we worked in phases, such as: analysis, design, programming and testing.

Analysis

This phase required the elaboration of the plan to obtain requirements, in which the result of a group of interviews prepared for each of the profiles in the organization was designed, implemented and analyzed, with the objective of extracting the necessary information for its classification and categorization.

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Below is a diagram that represents the priority functional aspects obtained in the interviews:

Graphic 1 Functions
Source: Self Made

After having the information classified and categorized by functionalities, it began with the elaboration of the Software Requirements Specification (ERS) document for which the template offered by the IEEE Std 830-1998 of the Institute of Electrical and Electronics Engineers was used. (IEEE, 1998), this document specified the roles of the participants, the characteristics of the users, the scope of the software, as well as the functional and non-functional requirements. Below is a description of some specific requirements of the ERS:

Requisition number	R1.11
Requirement name	Create a new task within a project
Type	☒ Requirement ☐ Restriction
Supply of the requirement	Interview 28/05/2017, registry 12
Priority of the requirement	☒ High/Essential ☐ Medium/Desired ☐ Low

Requisition number	R1.13
Requirement name	Modify general data of a task assigned to a project
Type	☒ Requirement ☐ Restriction
Supply of the requirement	Interview 28/05/2017, registry 12
Priority of the requirement	☒ High/Essential ☐ Medium/Desired ☐ Low

Requisition number	R1.14
Requirement name	Delete a task assigned to a project
Type	☒ Requirement ☐ Restriction
Supply of the requirement	Interview 28/05/2017, registry 12
Priority of the requirement	☒ High/Essential ☐ Medium/Desired ☐ Low

Table 1 Specification of requirements
Source: Self Made

Likewise; for the planning, monitoring and control of the assigned tasks, as well as the deliverables of each meeting, the Gantt chart was made with the mentioned phases and the critical route of the project was determined through the Pert graphic.

Design

This phase was divided into two areas, the architectural design and the semantic data design, which allowed to define the operation of the dynamic and static aspects of the project, as well as the definition of the metadata and its relationship.

In the architectural design, the Unified Modeling Language (UML) was implemented, which according to Macías (2017) allows the definition of operations, interactions, sequences, states, activities and communication processes. In this definition was also included the interaction of the actors, functionalities and instances of the system.

Likewise; Documents defined by Canós (2013) were developed as good practices, such as the Class-Accountability-Collaboration (CRC) cards, the class dictionary and the block diagram.

This phase of architectural design also required the definition of the use cases, the identification of the actors with their inputs and outputs and the entities associated with the operations described in the definition of use cases.

To determine the complexity of the system, according to Larman (2003), the complexity matrix was elaborated based on the defined use cases. In terms of interface design, the navigation map of the web application was developed. Below is the graphic of features of the project:

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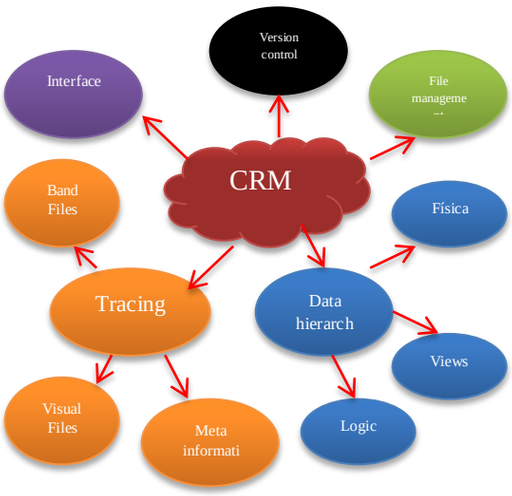

Graphic 2 Functionalities of the project
Source: Self Made

Programming

In this phase, we started with the production process, selecting Bootstrap as a development framework for the application and through HyperText Markup Language (HTML) its programming, in addition to the implementation of JavaScript for the development of the sessions, the control of security and accesses, and according to Macias (2017) thus avoiding intrusions to the database through the application using injections of Structured Query Language (SQL). Below is the interface for adding events:

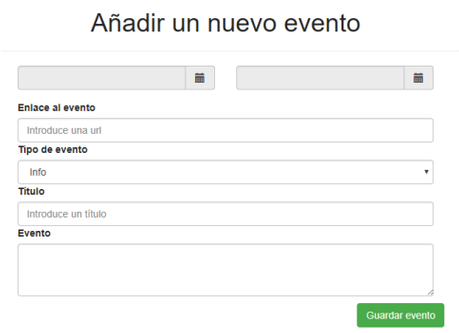

Figure 1 Interface to add events
Source: Self Made

In this interface, the user can add events associated with a client account and a contract. Below is the interface for managing tasks:

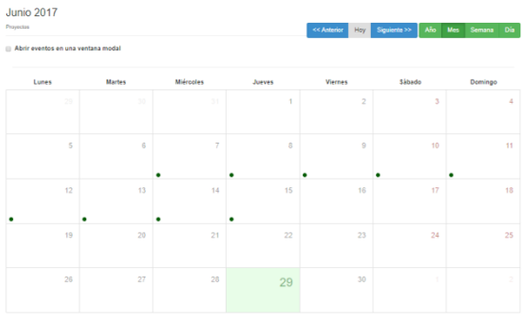

Figure 2 Interface to manage tasks
Source: Self Made

In this interface the user will be able to report the progress in the tasks associated with a project or event, in which a date and time must be established, both at the beginning and at the end, as well as a description of the same.

Likewise; the administrator through this interface can follow up on the tasks of each of the collaborators. Below is the event control interface:

Figure 3 Interface to manage events
Source: Self Made

From this interface the administrator can view the events, tasks, actions and monitoring of each of the projects that are running in the company, this will allow to have a global vision of the production.

Likewise; Interfaces were developed to determine progress, as well as a customer service log where the tracking and management of each of the requests or attentions provided was stored and managed, as well as alerting functionality when any of the elements developed was not met the time established.

Tests

In this phase a test plan was designed and implemented for the web application and the configuration and installation of the server that stores the database and the application.

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This test plan includes general information about the project, as well as a version history and the definition of the evidence, which included:

- Evidence elements
- Features to try
- Regression tests
- Functions not to try
- Test strategy

Further; with the objective of determining an approximate performance of the execution of the Use Cases, the criteria of acceptance and rejection of the tests through binary behavior were defined through the functional and non-functional requirements. As well as the determination of deliverables, resources, planning and organization for the execution of the test plan.

Results

It was determined to establish a centralized data model for its administration due to the fact that the estimate made according to the operational capacity of the company does not contemplate a simultaneous connectivity of more than 30 users, for which the requests of the clients, the storage management of data and processing operations, do not justify the cost of a distributed scheme.

Regarding the determination of the development environment, installation and configuration of the server, no restriction was contemplated except for the acquisition of licenses, so the choice was made to implement free technologies, which favors the adaptation of the technologies to their processes by not representing licensing costs.

Through the test plan, cases that contemplated aspects of connectivity, performance, interface and functionality were made; for which the simultaneous connection of 120 users and their respective requests as clients was verified, as well as the outputs of the processes, which through descriptive statistics allowed to determine the 98.35% coincidence with the expected results in the cases of test. The rest of the exits that did not meet the acceptance criteria were documented and reprocessed.

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Conclusions

The implementation of the Customer Relationship Management Web allowed during its development process to analyze and implement strategies that allowed the ACTA company to strengthen and consolidate its technological infrastructure, thus achieving the investment that would allow not only the operation of the CRM but the implementation of other IT tools for the daily operation of the organization.

Likewise; the implementation of the CRM allowed the unification of different areas involved in the costs, planning, monitoring and release of projects, in which there must be an efficient channel of communication with the client and a constant feedback of the progress of each of the tasks, even which allows the General Management of the ACTA company to provide timely follow-up to each of the projects it carries out simultaneously.

The operation of the CRM also allowed paying a new organizational culture, as well as being a strategy that will provide a better experience to the client and that will allow the efforts of each of the areas to be effective, thus contributing to the compliance of the indicators of the Distinctive (ESR) of CEMEFI, allowing the company to be more competitive, optimizing its relations with all the people involved, expanding access to technology, the price-quality ratio of a product or that a service will be easily comparable.

Besides representing a good practice and example for the rest of the MyPyMES members of the CMIC that are in the process of improving and evidencing their practices, which will generate a positive impact on CSR, according to the CEMEFI Distinctive (ESR) or of the evidences for the adhesion of the Global Compact of the United Nations Organization.

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