

Impact of process automation in companies' subcontractors to the oil service

Luis Javier Martínez León, Teresa de Jesús Javier Baeza, Sergio Díaz Contreras,
María de la Luz Valdez Ramos, Diana del Carmen Carrillo Reyes

Tecnológico Nacional de México Campus Villahermosa, Cd. Industrial; Department: Postgraduate and Research Department; Address: Carretera Villahermosa Frontera, K. 3,5, Cd. Industrial, Villahermosa Tabasco, CP: 86010

Resumen

La automatización para el control de procesos integrada a una empresa, hoy en día es fundamental para mejorar los tiempos de respuesta en los servicios que ofrecen. El avance de la tecnología ha contribuido a que las compañías alcancen ventajas competitivas tal como, la implementación de un sistema web, el cual aporta y soluciona errores de procesos de información. Por lo anteriormente expuesto, este artículo tiene como objetivo analizar el impacto de un sistema web enfocándose en la automatización de actividades en una empresa al servicio de la industria petrolera.

Abstract

Automation for the control of processes integrated into a company, today is essential to improve the response times in the services they offer. The advance of technology has contributed to companies achieving competitive advantages such as the implementation of a web system, which contributes and solves errors in information processes. Due to the above, this article aims to analyze the impact of a web system focusing on the automation of activities in a company serving the oil industry.

Palabras Clave: Sistema web, Progress Bars, Curdate.

Keywords: Web system, Progress Bars, Curdate.

1. INTRODUCTION

Nowadays we live in a world where the use of a web system has taken importance for the control and management of administrative activities within the company, changing dramatically the way of carrying out a workday in the office, that is, it is now very common to find platforms of each company, which works according to its activities. Due to the fact that now large companies already require subcontractors to make use of technological means in order to comply in time and form the contracted service.

It should be made clear that, previously when a company carried out a process of bidding for subcontracting (OUTSOURCING) companies, the technological means didn't have enough impact to add up points in favor, since they were satisfied with the fulfillment of the required service; But nowadays it is totally different for a company that has its own web system and is capable of having control in administrative activities, in addition to being in an acceptable level where it creates trust and security to the client to choose it as your service provider.

2. WEB SYSTEM AND COMPANY

In the beginning the first programming language for the development of web applications is the "Perl". Its inventor Larry Wall in 1987 before the internet became available to the open public. The PHP language was

made available in 1995 by the programmer Rasmus Lerdorf with which all web application development really took off [1].

Talking about web systems in companies, only the most powerful had the opportunity to implement them, in light of the jumping to digital was an enormous step and expensive, because of this there were important questions about the impact that this type of technology could have and what it would be its impact within the company. Regarding this, it's important to mention that the organizations need to assign support to the production process, which must be characterized by repeating specific tasks. It means, with a very precise definition of the methodology to follow to achieve the objective.

All of this seems to confirm that big industries consider the inclusion of innovative systems, to take control of tasks highly repetitive and minimal level of "intellect" use.

Web systems are a major technological advance that has proven to be an element that helps the human being to carry out activities that involve a greater effort, reduce time as much as possible and automate processes today highly repetitive it is of very high importance for the fulfillment of the objectives.

Outsourcing is a business process by which a company transfers responsibility for its tasks to another firm specialized in that exercise. The outsourced company, called a subcontractor or supplier, is one that develops certain tasks for another firm (contractor or customer). This commercial relationship is usually defined in a contract [2].

3. AUTOMATED COMPANY

The next point deals with the service that subcontractors offer to your clients in the oil industry. Here are some activities:

- Ordering and cleaning
- Reception and delivery of chemical products
- Assembly and disassembly of parts
- Manual loading and unloading
- General packing
- Sandblasting and scratching

On the other hand, so that they comply with customer service, companies have with the appropriate processes and established in the ISO 9001 System regulations of Quality Management, taking into account that customer satisfaction plays a very important role to preserve the commercial relationship (Figure 1).

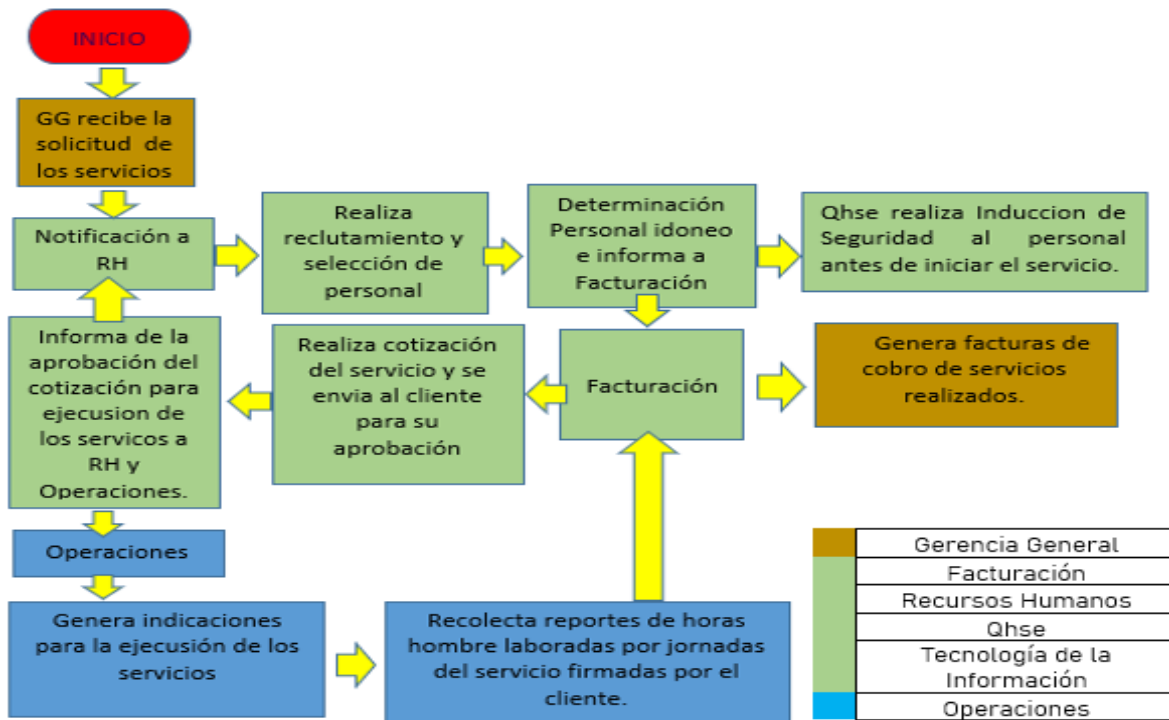


Figure 1. Process flow diagram for customer service fulfillment.

In this sense, through the Tecnológico Nacional of Mexico that enables teachers to carry out scientific and technological innovation projects where apply different types of technologies which make a contribution to the public sector or private. In my case I have been working on a project called " web system of inventory and control of administrative processes for the company SAOG". In the end, the project consists of a system that will allow users to manage some of the company's own processes in an automated way. This project will benefit the SAOG company, as they will be able to save a lot of time to fulfill the activities. It will also optimize the security of the employee information.

a. HR automation

As has been said about automate the human resources process, it is a tool that helps manage and track employees and collaborators, in addition of having a complete management of profiles and skills, as well as centralized benefits administration.

As regards, an outsource company where the client performs requests at any time, having an Rh system allows the person in charge of the area comply in time and form to provide personnel that complies with the specified requirements.

Moreover, my project in this module specifies the information that is required by SAOG which generates the profiles of the staff with their information and the different reports for the customer service delivery processes (Figure 2).

```

1 select `persona`.`IdPersona` AS `IdPersona`
2 ,concat('SAOG-',`persona`.`IdPersona`) AS `Control`,
3 `persona`.`Posicion` AS `Posicion`,
4 `persona`.`Nombre` AS `Nombre`,
5 `persona`.`Apellidos` AS `Apellidos`,
6 `persona`.`FechaNacimiento` AS `FechaNacimiento`,
7 `persona`.`LugarNacimiento` AS `LugarNacimiento`,
8 timestampdiff(YEAR,`persona`.`FechaNacimiento`,curdate()) AS `Edad`,
9 `persona`.`Direccion` AS `Direccion`,
10 `persona`.`EstadoCivil` AS `EstadoCivil`,
11 `persona`.`Nss` AS `Nss`,
12 `persona`.`Rfc` AS `Rfc`,
13 `persona`.`Curp` AS `Curp`,
14 `persona`.`Sexo` AS `Sexo`,
15 `persona`.`Ine` AS `Ine`,
16 `persona`.`TipoSangre` AS `TipoSangre`,
17 `persona`.`Escolaridad` AS `Escolaridad`,
18 `persona`.`FechaAlta` AS `FechaAlta`,
19 `persona`.`NumeroTarjeta` AS `NumeroTarjeta`,
20 `persona`.`LugarTrabajo` AS `LugarTrabajo`,
21 `persona`.`Estatus` AS `Estatus`,
22 `persona`.`Telefono` AS `Telefono`,
23 `persona`.`ContactoEmergencia` AS `ContactoEmergencia`,
24 `persona`.`ExperienciaLaboral` AS `ExperienciaLaboral`,
25 `persona`.`Foto` AS `Foto`,
26 `persona`.`ObjetivoLaboral` AS `ObjetivoLaboral`,
27 `persona`.`Documento` AS `Documento` from `persona`
    
```

Figure 2. Viewing Personnel Information in Navicat

b. Automation of training

All companies must develop and maintain plans and programs of training, operational training and productivity according to what is indicated in the Articles 153-F Bis, 153-H, 153-B second paragraph and 153-S of the Federal Law on Job [3].

It is to be clarified that most subcontractors have a business relationship with an external training provider which is in charge of training the personnel in security matters to give follow-up to the service order.

Taking care of the administration of training and course requirements is a great work for the administrative staff, making the system to control these activities provides assurance of keeping updated the training and the personnel for the moment it is required.

It is true that automating the planning and maintaining control over training is a valuable tool for companies that want to improve their internal procedures. At the same time, my project includes a module where the staff's courses are integrated with the date they were taught and their period of validity, as well as the state in which it is. (E.G., in figure 3). As a result, before a course ends its period of validity, the staff will be trained on time.

CURSOS ASIGNADOS
LUIS JAVIER MARTINEZ LEON

CURSO	F. DE INICIO	F. DE VENCIMIENTO	DIAS RESTANTES	PROGRESO	ESTADO	ACCIONES
TRABAJOS EN ALTURA.	2016-02-02	2018-02-01	-1331		VENCIDO	
AUTORIDAD PARA DETENER EL TRABAJO.	2020-05-05	2022-05-05	223		VIGENTE	
BASICO DE PRIMEROS AUXILIOS.	2020-05-05	2022-05-05	223		VIGENTE	
COMBATE CONTRA INCENDIOS.	2021-04-07	2023-04-07	560		VIGENTE	
TRABAJOS EN ESPACIOS CONFINADOS.	2021-01-07	2023-01-07	470		VIGENTE	
SEGURIDAD CON LA ESPALDA.	2020-01-01	2021-12-31	98		VIGENTE	

Figure 3. Control of validity of staff courses

c. Automation of personal protective equipment

Establishing the minimum requirements for the employer to select, acquire and provide your workers with personal protective equipment corresponding to protect them from the agents of the work environment that may damage their physical integrity and health [4].

As previously stated, the subcontractor's client establishes in the contract that employees must wear appropriate personal protective equipment within of the facilities and that the specific Epp requirements will be based on the type of work or activity to be performed.

Having said that, my project has a specialized module for handling inventory and control in the delivery of equipment to personnel where its effectiveness is reflected in keeping the entire staff protected with equipment in good condition (Figure 4).

```

1 select `personaapp`.`IdPersonaEpp` AS `IdPersonaEpp`,
2 `personaapp`.`IdPersona` AS `IdPersona`,
3 `personaapp`.`IdEpp` AS `IdEpp`,
4 (`personaapp`.`Fecha` + interval `epp`.`Duracion` day) AS `FechaVencimiento`,
5 (to_days(curdate()) - to_days(`personaapp`.`Fecha`)) AS `Dias`,
6 (`epp`.`Duracion` - (to_days(curdate()) - to_days(`personaapp`.`Fecha`))) AS `DiasRestantes`,
7 if(((`epp`.`Duracion` - (to_days(curdate()) - to_days(`personaapp`.`Fecha`))) <= 0), 'VENCIDO', 'VI
8 `personaapp`.`Fecha` AS `Fecha`,
9 `persona`.`Nombre` AS `Nombre`,
10 `persona`.`Apellidos` AS `Apellidos`,
11 `persona`.`Posicion` AS `Posicion`,
12 `epp`.`NombreEpp` AS `NombreEpp`,
13 `epp`.`Duracion` AS `Duracion`
14 from ((`personaapp` left join `persona` on((`personaapp`.`IdPersona` = `persona`.`IdPersona`)))

```

Figure 4. Control of validity and delivery of personal protective equipment.

d. Service request automation.

Taking into account that the client requires personnel to carry out activities in different oil wells and areas, you need to make a request for service to the subcontractor, who in turn selects the available personnel (Trained, complete personal protective equipment, suitable medical certificate and documentation required by the client) to send it on the date and area correspondent.

On the other hand, due to the extensive staff and multiple areas of work, internal processes must be effective to have control of the employees in terms of their activities, likewise time in the delivery of service to avoid any discrepancy or dispute for a timely compliance.

Because of keeping this process up to the required levels, my project has a service request module according to the necessary requirements to make the request for personnel so that everything related is known in this procedure (figure 5).

```

}
else {
    $solicitud->getAll();
}

while ($row = $solicitud->next()) {
    echo "<tr>";
    echo "<td>$row->Folio</td>";
    echo "<td>$row->FechaInicio</td>";
    echo "<td>$row->FechaFinal</td>";
    echo "<td>$row->DiaServicio</td>";
    echo "<td>$row->Jornada</td>";
    echo "<td>$row->TotalDias</td>";
    echo "<td>$row->Psl</td>";
    echo "<td>$row->Area</td>";
    echo "<td>";

```

Figure 5. Requirements code for application process

4. CONCLUSIONS

In the end, this type of project shows that more and more companies are dependent on systems to control activities. The current use of web systems in companies have made changes in the service compliance of many

ways. It has served to improve recruitment and hiring of personnel, as well as the monitoring data that is created automatically, saves time obtaining information, and even to monitor in real time each of the requirements met by a worker, say protective equipment personnel, medical analysis, training and service areas.

In relation to this project and the implementation in the SAOG company, in the future it can be made known in companies that are in the business of oil and this is a spearhead to motivate more companies' subcontractors to invest in technology, improve processes that in some way impact in economic terms on the hiring of new services or contracts with large companies.

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Correo autora: m20301151@villahermosa.tecnm.mx