

SGE: Information System for Strategic Planning Management Applied to an Electric Utility

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Abstract—In this paper we present a software system that allows tracking, reviewing and managing data regarding an electric power company's organizational strategic plan, defining metrics, as well as creating strategic dashboards using spotlight indicators in order to follow up on the plan. Given the definition of a strategic dashboard, the system displays the goals, strategies and measures for each subsequent area of the business in order for each of them to be able to manage its operational planning and therefore contribute to the organizational strategic plan. The computer system is installed at the Direccion de Operacion in the Comision Federal de Electricidad in Mexico, design and development of the system is based on the Balanced Scorecard methodology and it allows for the creation of strategic maps; it can also be adapted for the use of different methodologies for strategic management. The system was developed based on the collaborative platform Lotus Notes/Domino; it contains interconnected modules at different planning processes. Furthermore, given the graphical display of results, it supports the decision-making process for Senior Management.

Index Terms— Balanced Scorecard, Collaboration, Strategy, Strategic Dashboard, Strategic Planning.

I. INTRODUCTION

Nowadays, strategic planning is the most commonly used managerial process for businesses; it can be complemented with assessment mechanisms and performance tracking from the perspective of strategy management [1]. Currently, it is essential to have a tool that allows the organization to manage its planning properly.

The Federal Electricity Commission (in Spanish, Comisión Federal de Electricidad, CFE), through the Operations Management (in Spanish, Dirección de Operación, DDO) and with an aim to follow up on the fulfilling of its strategic plan, has stated the need for a computer system capable of adapting to its requirements as a company and that is a supporting tool for managing their strategy.

Currently, the CFE performs the follow-up independently through its multiple areas. This means that each area

submits the information in the form of documents that are later manually compiled in order to obtain consolidated data. Some of the issues this process presents are: a) dependency on the information provided by the different areas, b) response time of the areas to validate the information, c) potential errors in the information, d) lack of information integration, among others.

The information system for strategic planning management (referred to by its acronym in Spanish as SGE) covered in this document solves the aforementioned issues as it enables the operating areas of the CFE to manage and understand each of the measuring elements. The elements used are: goals, strategies and measures. In addition, this system maintains the reliability and consistency of the information, and it supports communication by way of collaboration processes among all the areas of the CFE.

Currently there are computer systems that help manage strategic planning of an organization.

Prior to the design and creation of this software system, the possibility of acquiring a commercial system that would be able to adapt to the needs of the CFE was analyzed for it. QPR (Business Driven Enterprise) [2], Cognos (IBM Software Cognos) [3] and Hyperion (Hyperion Software) [4] were some of the assessed systems. As a result, it was considered that these systems have extremely high licensing and maintenance costs, they require additional computer resources (databases, gateways, etc.) and they are not quite flexible enough to allow for customization.

The SGE is a software system capable of adapting to the processes and needs of the organization, it was developed based on the Lotus Notes/Domino which it is one of the most robust platforms of software in the market [5][6], a tool used for email and collaborative processes management of the CFE, therefore it does not incur in additional licensing costs because it has a complete development suite.

The table 1 shows some features software's used to manage the strategic planning, the system SGE is included.

Table 1. Features software's used to manage the strategic planning, the system SGE.

Features	SGE	QPR	Cognos	Hyperion
Integral software (not need DB's, managers DB's and additional licenses)	X			
Allows collaborative flows in the same tool (mail, minutes, and meetings).	X			

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Allows create and view strategy maps	X			X
Allows advanced math calculations on strategic indicators.	X		X	X
Cascade deployments indicators to their lower areas	X			
Allows extraction of information with other systems	X	*	*	*
Flexibility to add modules to the system.	X	X		
User roles	X		X	X
Easy-to-use Interfaz (web)	X	X	X	X
Single Sign On Supported	X			X

* It requires additional software which involves higher costs

II. SYSTEM PROCESSES AND ARCHITECTURE

This system is comprised of interconnected systems (hereinafter defined as modules) that enable the tracking and management of information about strategic planning, metrics generation (goals, strategies and measures) and the creation and deployment of strategic dashboards.

Figure 1 shows the user-system interaction diagram. The user gets access through the system's main page, which allows him to track and look up information. As all modules are interconnected, the system makes it possible to report the progress in all modules through processes by way of a strategic control panel.

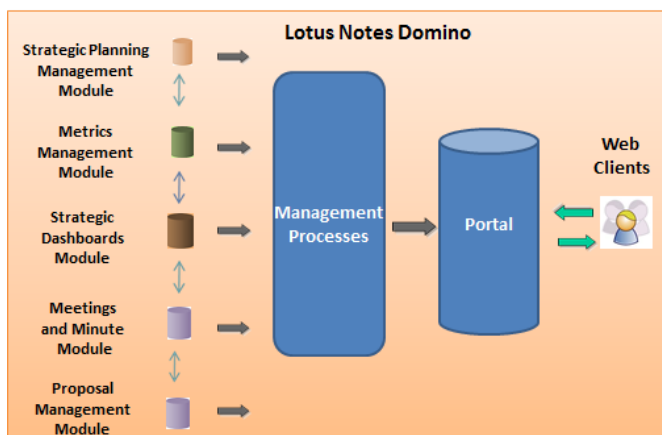


Fig. 1. System Overview.

The system was created based on the Lotus Notes/Domino platform with architecture distributed in client/server environment that uses collaborative flows for quick process development. The login is completed using a CFE's organizational email user account and password (Lotus Notes). The system is operated by users who have roles and profiles that allow them to perform specific processes based on user privileges.

Access may be public or restricted, and tests of operation, performance and stress were conducted on installation in order to validate and review the correct operation of the system.

This paper is organized as follows: Introduction, modules (System Processes and Architecture, Strategic Planning Management Module, Metrics Management Module, Strategic Dashboards Managing and Deployment Module,

Meetings and Minute Module, Proposal Management Module), conclusions and references.

III. STRATEGIC PLANNING MANAGEMENT MODULE

Strategic planning is the core of the company and its success depends on the proper management of strategy using targets for consolidation. It is important to establish a plan which leads the company in the right direction and allows it to meet all goals established.

This module allows for the documenting of the strategic plan through the use of information gathering wizards which have to be checked and accepted in order to be published within the system. This process is performed by way of collaborative workflows in the system, sending email messages and accessing the system directly in order to accept or reject the workflow.

Once the strategic planning has been integrated, it is published through the el SGE gateway and available to be checked by the employees within the organization. Depending on the methodology used, in this case BSC, it is possible to enter the organization's mission, vision, goals, strategies, measures and SWOTs (strengths, weaknesses, opportunities and threats), among other elements.

Figure 2 features an example of how the DDO's strategic plan is shown in the system.

COMISION FEDERAL DE ELECTRICIDAD

Dirección de Operación
Plan Operativo DDO 2013-2018

Versión: 1.0

Fecha: 19/11/2013



Visión

Ser una empresa de energía, de las mejores en el sector eléctrico a nivel mundial, con presencia internacional, fortaleza financiera e ingresos adicionales por servicios relacionados con su capital intelectual e infraestructura física y comercial. Una empresa reconocida por su atención al cliente, competitividad, transparencia, calidad en el servicio, capacidad de su personal, vanguardia tecnológica y aplicación de criterios de desarrollo sustentable.

Elementos
Valores
Líneas Estratégicas
Estrategias
FODA

Fig. 2. Organizational Strategic Plan.

The BSC methodology was used as a basis to manage the strategy information and translates an organization's mission and strategy into a comprehensive set of performance measures that provides the framework for a strategic measurement and management system [7]. The BSC allows for an overview of the organization from different perspectives (financial, client's, processes, learning and growth). Additionally, the system may use other methodologies as its design is based on general fundamentals of strategic management.

Once the critical objectives of planning have been defined, they can be communicated through strategic maps by grouping them in the different perspective areas. Arrows and relationships can be used to identify cause and effect. In this manner a strategic map can become a visual interactive route for implementation of the plan.

The strategy map provides the specificity needed to translate general statements about high-level direction and

strategy into specific objectives that are more meaningful for all employees and that they can act on [8].

The system allows for strategic maps to be generated. It features a map editor where perspectives can be configured, items can be edited (ellipses, rectangles, processes), and cause and effect interactions can be added as well as block connections. Also, text can be labelled, and the map can be edited, deleted or revised.

The elements on the strategic map may be related to its objectives using spotlight indicators that visually show the real state of the plan.

Figure 3 shows an example of a strategic map generated in the system and the elements used to create it

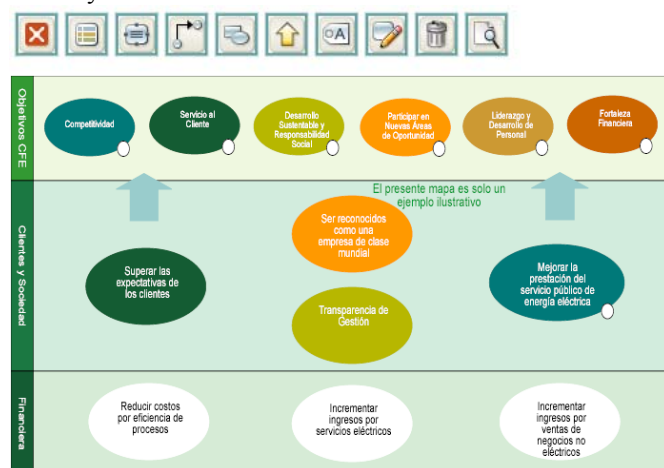


Fig. 3. Example of a strategic map created in the system.

IV. METRICS MANAGEMENT MODULE

In order to continue with the strategic planning management published in the previous module, and based on the strategic plan, the main elements used for its measuring must be indicated.

In this system module, the goals, strategies and measures of the strategic plan must be entered.

The system makes it possible to record the information of the abovementioned elements easily by way of dynamic gathering wizards, entering the general data (name, area, type of unit, method of calculation, frequency, etc.). Each datum must be carefully filled in so as to show the accurate information

Figure 4 shows the information of the measuring element called "interruption time By User" including the moment registered in the system, the algorithm applied, the person in charge of the indicator, their area, among other data, as well as a graph with the captured values in the period corresponding to the goal, result and margin.



Fig. 4. Data for "Interruption Time by User" measure name.

Similarly, the maintenance of each of the measures that were recorded is performed in this module.

There is a section that enables the user to enter values manually, through automated calculations (formulas), or by extracting data from other systems in order to feed each one of the sources of information (goal, result and margin) for each indicator in the strategic planning. In case of selecting the value calculation through formula, any type of mathematical operation can be performed; if data will be extracted from other systems, consolidated information may be extracted from external systems by way of Web Services or with the use of any business intelligence tool.

Information extractors can be programmed to perform during a period of time or by segments depending on the volume of information. In every case, the calculation can be made in cascade style in both directions; in this way, the lower levels are able to report data with operative metrics that are used in upper levels for the calculation of strategic measures.

Figure 5 shows how to record the values for the "Interruption Time by User" indicator for each one of the data sources (goal, results and margin) respectively.

Métrica: DDO.1.6.3 Tiempo de Interrupción por Usuario (Minutos) - DDO
Rango: De 0 a 100 Minutos

9.57	8.87	10.24
01/02/2013 - 28/02/2013	01/02/2013 - 28/02/2013	01/02/2013 - 28/02/2013
6.02	5.56	6.44
01/01/2013 - 31/01/2013	01/01/2013 - 31/01/2013	01/01/2013 - 31/01/2013
2.92	2.67	3.12
01/12/2012 - 31/12/2012	01/12/2012 - 31/12/2012	01/12/2012 - 31/12/2012
50.06	56.04	53.57
01/11/2012 - 30/11/2012	01/11/2012 - 30/11/2012	01/11/2012 - 30/11/2012
46.84	52.23	50.12
01/10/2012 - 31/10/2012	01/10/2012 - 31/10/2012	01/10/2012 - 31/10/2012
43.08	48.33	46.1
01/09/2012 - 30/09/2012	01/09/2012 - 30/09/2012	01/09/2012 - 30/09/2012
39.15	41.84	41.89
01/08/2012 - 31/08/2012	01/08/2012 - 31/08/2012	01/08/2012 - 31/08/2012
34.95	36.95	37.4
01/07/2012 - 31/07/2012	01/07/2012 - 31/07/2012	01/07/2012 - 31/07/2012
29.53	31.45	31.59
01/06/2012 - 30/06/2012	01/06/2012 - 30/06/2012	01/06/2012 - 30/06/2012

Fig. 5. Value record in data sources for "Interruption Time by User" indicator.

V. STRATEGIC DASHBOARDS MANAGING AND DEPLOYMENT MODULE

The strategic dashboards in the system show at a glance an overview of the current status of the organization based on the fulfilment of its goals. This helps senior management take actions that allow for the fulfilment of the strategic plan.

The system allows for the setting of the dashboard using acquisition forms where each of the elements that will be shown is added according to hierarchy in a tree structure.

In turn, each element in the tree may relate to the measures that have already been recorded in the metrics administration module.

It is in this part where the two modules interconnect (Metrics Managing Module and Dashboard Managing Module) in order to be able to visualize the entire structure of said dashboard.

Information updates automatically in the dashboard. When performing maintenance of the measures in their

module and recording their value, this information is reflected in the strategic dashboard. This can be viewed as graphic images through columns where stoplight indicators (red, yellow, or green symbols that provide an at-a-glance view of a measure's performance) and follow-up values are shown, making it possible to know the present status of the organization's strategic plan within a determined period of time.

Figure 6 shows the operating dashboard of the DDO where the status of the measure can be visualized with stoplight indicators for a specific period of time.

	Nombre	Estado	Valor Actual	Meta	Area líder
	I.- ASEGURAMIENTO DEL SUMINISTRO EFICIENTE Y DE CALIDAD DE LA ENERGÍA ELÉCTRICA, QUE EL PAÍS REQUIERE PARA SU CRECIMIENTO Y DESARROLLO, CON UNA VISIÓN DE INCLUSIÓN SOCIAL.				
	I.1 Mejorar el Margen de reserva operativo-DDO				
	Margen de reserva Operativo - DDO	●	10.4	6	SDC
	I.2 Planear y ampliar la infraestructura eléctrica del SED (de media tensión)-DDO				
	Cumplimiento de ampliación de infraestructura del SED (de media tensión)-DDO	○	pendiente		SDD
	Capacidad de atención a demanda-DDO	○	pendiente		SDD
	I.3 Incrementar la cobertura del servicio eléctrico-DDO				
	Grado de electrificación [%]-DDO	●	97.8	97.37	SDD

Fig. 6. DDO operative dashboard structure.

Once the strategic dashboard has been recorded and validated, deployment to the lower areas can be carried out.

The system deploys the dashboard by way of a wizard that allows delegating metrics to the immediately lower level; the person in charge of the main dashboard chooses the elements that contribute to the goals of the strategic plan and allocates them to the person in charge of the immediately lower level, who receives them and may add new measures, and repeat the deployment process with subsequent corresponding areas. After that, each area is in charge of performing maintenance of its measures. The updating of values is automatic because data is related to each dashboard.

In this system module, strategic dashboards are generated automatically from the main dashboard.

VI. MEETINGS AND MINUTE MODULE

The system makes it possible to control the planning management; meetings and minutes can be generated in this module.

The system allows users to create meetings including general details (date and time, meeting location, etc.), add activities, and call and inform participants through emails automatically generated by the system.

It is very important to mention that following meetings and minutes are on the same tool that is made possible by enabling collaboration flows in the lotus notes domino platform.

Figure 7 shows an example of the data acquisition form for a meeting where the user entering the general data (name, general description, date, place of the meeting.).

Fig. 7. Example of meetings form.

Minutes can be generated from the meeting or independently. The minute includes the list of attendees, items discussed, agreements, commitments, and it informs participants of overdue commitments through emails. Minutes can be printed or sent by email.

The system features flexible connection with its modules. Panels can be generated where the user may select the information he wants to show at a glance; information can also be sorted in order to show the most relevant data and the easier to access (notices, meetings, minutes, etc.)

Figure 8 shows an example of an information panel with the options for meetings and minutes that the user selected based on preference.

Mis avisos	Mis minutos como responsable
<p>Nuevo</p> <p>En este momento no tiene avisos pendientes...</p> <p>Mis reuniones como participante</p> <ul style="list-style-type: none"> 07/02/2012 02:21 p.m. Prueba 4 07/02/2012 09:40 a.m. Prueba 3 03/02/2012 01:30 p.m. Prueba_2 18/07/2011 12:54 p.m. VDMC-35 07/01/2010 08:00 a.m. Reunión de seguimiento a la Participación de la DDO en el 	<ul style="list-style-type: none"> 01/02/2012 001-Prueba... Responsable 04/05/2011 Reunión Telef Celular 4/05/2011 - Revisión de estadísticas de Uso de Telefonía Celul... Responsable 13/01/2011 Reunión Plan. Operativa 13-Ene-2011-Reunion con enlaces de CG y Planeación de las Subd... Responsable 12/11/2010 Reunion 12_11_2010 Comunicacioens Móviles- Presentación de Tecnologías Trunking por Responsable

Fig. 8. Information Panels.

VII. PROPOSAL MANAGEMENT MODULE

This module makes it possible to plan and follow up on the proposals required in order to fulfill the goals and objectives of the strategic plan.

Proposals are logged in the system through data acquisition wizards; some of the details included are: staff responsible for the development of the proposal, strategic goal it affects (related to metrics module), budget, assigned human resources and infrastructure, activities to be performed and timeframe set for development.

The system makes it possible to individually follow-up on each of the activities in two different levels, and the entire group of activities will determine the status of fulfillment of the proposal.

The person in charge will record the real progress of each activity through forms; the overall progress of the

activity in relation to its completion is calculated automatically using intelligent agents programmed to perform the calculations.

In this module, the system shows the degree of completion of the activities using Gantt charts and fulfillment status lights, and it sends notification emails with critical dates to the users in charge so that, in case of delay or default, remedial measures may be added to the proposal.

Figure 9 shows the Gantt chart of the activities of the DDO's macro project. The true progress and programmed progress of each activity can be seen as well as the corresponding percentage.

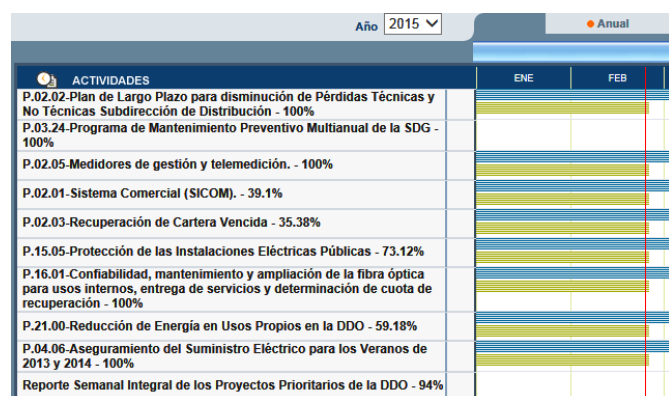


Fig. 9. Gantt chart of the DDO's macro project.

Supporting documents can be appended for each of the recorded activities for purposes of consultation.

To review the status of the proposals, information is displayed in views with dynamic columns where the user decides what data will be shown. In this process, mathematical calculations are performed by agents that estimate the real and programmed progress of all the activities recorded for the fulfillment of the proposal.

Figure 10 shows the state of all projects within a specific area. The information displayed consists of the project's title, the start and finish date, the true and programmed progresses which are calculated with their activity operations, and two icons. One of these icons shows each of the activities and the other which shows the Gantt chart for the project.

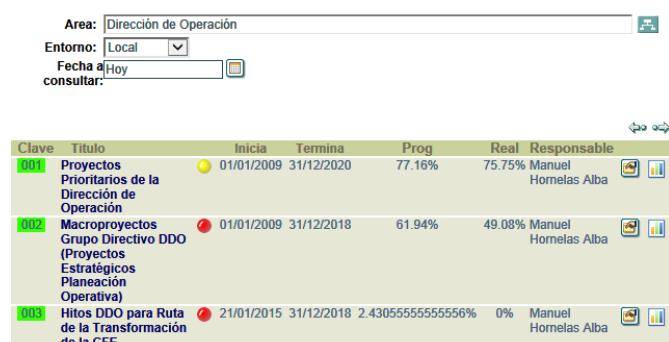


Fig. 10. State of the projects within a period determined for a particular area.

VIII. CONCLUSION

The system is currently installed and operative at DDO gateway. This system serves as support for the follow-up on the strategic plan of the organization, allowing

communication of strategic planning in all areas of the business.

Currently, with the use of this system, the operating costs are down as well as wait times, and the DDO has made expedient decisions which have served to improve the company's processes.

The system makes it possible to convey the strategic plan in a timely, reliable, safe and high quality manner, and it adapts to the specific needs of the organization.

It creates collaborative workflows in order to perform the processes faster and in a timelier manner.

It can connect to other systems to obtain information by way of data extractors which automatically gather values and update metrics records, thus making it possible to access real-time information.

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