Cuadro de mando integral en una empresa constructora de obras de ingeniería

Balanced scorecard in an engineering construction company

Dianelys Nogueira¹ *, Dayron López *, Alberto Medina *, Arialys Hernández *

* Universidad de Matanzas “Camilo Cienfuegos”. CUBA

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Resumen

El presente trabajo se desarrolla en una Empresa Constructora de Obras de Ingeniería, con el propósito de aplicar el Cuadro de Mando Integral para el despliegue, seguimiento y control de su rumbo estratégico. Como resultados se presentan el diseño del Cuadro de Mando Integral con la integración de otras herramientas que enriquecen el tratamiento de sus perspectivas (Modelo SERVQUAL, Despliegue de la Función de la Calidad y el Índice de Eficiencia Económica-Financiera); las relaciones causa-efecto para el análisis de los inductores de actuación, a través del mapa estratégico; y la propuesta de indicadores concatenados a los objetivos estratégicos, asociados a metas y con un tratamiento dinámico. La propuesta que se presenta quedó conformada por 21 indicadores, se comunicó a todos los niveles de la empresa, y se empleó el software “Catalejos”, con el desarrollo de tablas comparativas y otros reportes gráficos. La aplicación del índice de eficiencia financiera mostró un comportamiento económico – financiero estable en la empresa; los modelos de calidad permitieron fortalecer las perspectivas de cliente y de procesos, en aras de elevar las expectativas del cliente externo y contribuir a la mejora de los procesos de la empresa.

Palabras claves: Cuadro de mando integral, empresas de construcción, relaciones causa – efecto, indicadores

Abstract

The aim of the current paper is to illustrate the development of a Balanced Scorecard for strategy implementation and control in an engineering constructions enterprise. The main results are: the design of the Balanced Scorecard, integrated with other techniques that came to fertilize the conception of its perspectives (SERVQUAL model, Quality Function Deployment method and an integrated index for measuring financial and economic efficiency); the building of the cause-effect relations that help analyzing the performance drivers, based on the strategy map; and a set of indicators with a dynamic approach, that are aligned to strategic objectives and goals. The final BSC proposal, compounded of 21 indicators, was communicated down to all levels of the enterprise, with the aid of software “Catalejos”, which shows comprehensive information through comparative charts and reports. From the application of the integrated index for financial efficiency evaluation, it is concluded that the company exhibited a steady performance; meanwhile, the use of quality models in both customer and internal processes perspectives, represented a contribution to customers’ expectations management as well as processes improvement.

Keywords: Balanced scorecard, construction enterprises, cause - effect relations

1. Introduction

The process of designing the strategy becomes a key factor for the organization performance and success. Studies report that only 10% of designed strategies are eventually implemented, because of lack of communication, because all workers are not involved in such task or the organization does not have the adequate management tools to transform the strategy into daily actions and expected results.

Consequently, one of the most powerful tools and, most used nowadays, has emerged: the Balanced Scorecard (BS), which is a management tool that provides the required mechanisms to focus the organization towards its strategy.

The lack of a strategic approach, focused on the client and best performance, is a luxury none economy can afford. Cuba is not at the edge of such situation. Over a decade ago, this tool has been spread, together with strategy planning, in different economic fields.

¹ Autor de correspondencia / Corresponding author:

Ingeniera Industrial, Doctora en Ciencias Técnicas, Profesora Titular del Departamento de Industrial, Facultad de Ciencias Económicas e Informáticas, Universidad de Matanzas “Camilo Cienfuegos”
E-mail: nelydaylinyuly@yahoo.com, dayron.lopez@umcc.cu

The current study is focused on the development of a BS to deploy, follow-up and control the strategic direction of an Engineering Construction Company, where the strategy design and its implementation are essential for long-lasting projects' life spans, which are in turn used as basis for other company projects.

The procedure proposed by Nogueira Rivera (2002) was employed, integrating tools that fortify the BS perspective approach, such as SERVQUAL Model, Quality Function Deployment (QFD²) and the Economic-Financial Index (EFE Index). Results presented: The design of a SB to deploy a strategic direction of the construction company, the cause-effect relations for the analysis of performance drivers by using a strategy map and; the proposal of indicators with a dynamic approach, which are aligned to strategic objectives and goals.

2. Discussion and development

The creators of BS, Kaplan and Norton, started studying this subject in the 80's, and they published the paper "BS" on the Harvard Business Review (1992), where they define BS as a "set of indicators providing a comprehensive business view to chief executive officers". Over the years, and as the BS has been implemented by several companies, it has become an integral management system working together with the strategic planning.

Kaplan and Norton (1996, 1997, 2000 and 2001) state that the BS provides chief executive officers with the required tools to navigate towards competitive success into modern and complex environments. BS translates the organization strategy and mission into a wide set of action measurements providing the necessary structure for managing and measuring strategic system. It is the essential element of the information system, which supports the management control system to improve the competitiveness level in the long term. BS allows us to follow up financial results in parallel to skills development and the purchase of intangible assets which will be required in the forthcoming future. The performance of the organization is measured in four balanced perspectives: financing, clients, internal processes and development/growth.

In this way, the BS translates the mission and strategy into a set of indicators, of any kind, that report the completion of goals and performance drivers contributing to review the strategy on permanent basis. Once the organization mission and vision are identified, strategic issues shall be selected to elaborate the Strategy map (Kaplan and Norton, 2004; Quesada, 2007) as well as their cause-effect relations. It is essential to reconcile the goals to be achieved, which shall agree with the strategy. The strategy map shows how the strategy links the intangible assets with adding-value processes (Kaplan and Norton, 2004). Innovative companies are implementing BS as a Strategic Management system to develop their strategy in the long term.

² Por sus siglas en inglés: Quality Function Development/ Quality Function Deployment

Several methodologies for the design and implementation of BS are well known, among them: Kaplan and Norton (1992), Amat and Dowds (1998), López (1998), Olve et al. (1999), Biasca (2002), López (2002), Nogueira Rivera (2002), Papalexandris et al. (2005), Vega et al. (2005)³, Kaizen (2006), González (2006), CETUM (Cums Orihuela, 2007), González et al. (2007), Matilla and Chalmeta (2007), Armada Trabas et al. (2008), Soler (2009).

The procedure by Nogueira Rivera (2002) was selected. It is shown by Figure 1. It was developed based on the proposal by Amat and Dowds (1998), Kaplan and Norton (1999), Fernández (2000), Biasca (2002) and López (2002). The procedure's main feature is the presence of 11 variables out of 12 variables involved in the studied procedures⁴. The strategic formulation is excluded as it is a premise corresponding to the procedure. Additionally, we count with adequate procedure applications in other companies of this region (Regueira, 2008; Torres, 2008; González, 2009; Frías, 2010; García, 2010; Pardo, 2010).

Figura 1. Metodología propuesta para el despliegue del CMI. Fuente: Nogueira Rivera (2002)

Figure 1. Methodology proposed for BS deployment. Source: Nogueira Rivera (2002)

³ Metodología creada en el año 2005 por el Grupo de Investigación en Estrategia, Competitividad, Innovación y Territorio (RECIT), radicado en la Universidad de Girona, Cataluña, España/ Methodology created in 2005 by the Strategy Competitiveness and Territory Research Team (RECIT) at the University of Girona, Catalonia, Spain

⁴ Estudio de clúster realizado por Padrón, 2009; Victori, 2009.

Implementing the procedure selected for the design of the Balanced Scorecard.

Characterization of the organization

The Engineering Construction Company founded on April 1st, 2002, under administrative resolution 234/02, belongs to the Business Group of Matanzas Construction (GECMA), together with another two Engineering Construction Companies. It has 449 headcounts: 28 managers, 86 technicians, 4 administrators, 306 operators and 25 service workers. The company provides the following services: civil works and new building assembly, buildings and facilities; demolition and reconstruction; restoration and constructive maintenance; project development and cantilever structures; topography services, dredging services, cutting and suction services on ponds, channels, sea, among others. Its leading product is **Earth Movement**, which is certified by NC-ISO 9000/04.

The company developed a Strategic Plan for three years (from 2011 until 2013)⁵. A group formed by the company chief executive officers employed a formation – action process using the perspectives defined by Kaplan and Norton.

Reaching an agreement on the strategic goals

A list including 10 goals defined by the strategy was elaborated by a working group that decided two goals should be modified:

- ✓ Reaching high profitability: By achieving high financial efficiency to globally evaluate the financial perspective with the EFE Index.
- ✓ Appointing the worker as the leading role within the organization: Counting with skillful and motivated human capital, so as to evaluate the formation and development perspective by using Gap 6 from SERVQUAL model.

The strategic goals and their cause-effect relations are shown by Figure 2 in the Strategy map.

⁵ Realizado por la empresa Consultora CONAS y liderado por el Máster Carlos Olivera Rodríguez.

Figura 2. Mapa estratégico de la organización. Fuente: López (2009)

Figure 2. Strategy map of the Organization. Source: López (2009)

Indicators selection for each perspective

Financial perspective:

It is evaluated by means of EFE Index by calculating the last quarter of 2011 and the first quarter of 2012. The calculation stages for this global indicator are the following:

1. Indicators selection

According to the procedure by Medina et al. (2011), proposed indicators by Nogueira (2002), Nogueira et al. (2004), and the company goals, six indicators were selected: economical profitability, utilization of working capital, stock vulnerability, capital solvency, liquid assets and debt limit.

2. Estimation of indicators' relative weight

The Fuller's Triangle (Figure 3) is applied, method totally approved by experts.

TRINAGULO DE FÜLLER, 100% DE CONCORDANCIA ENTRE EXPERTOS									
					INDICADORES	PESO RELATIVO			
1*	1*	1*	1	1*	Rentabilidad Económica	0,2857			
2	3	4	5*	6					
	2*	2	2	2	Utilización del Capital Circulante	0,0714			
	3	4*	5*	6*					
		3	3	3*	Vulnerabilidad de las Existencias	0,0714			
			4*	5*					
			4	4*	Solvencia	0,2143			
				5*					
				5*	Liquidez	0,3571			
				6	Endeudamiento	0,0714			

TRINAGULO DE FÜLLER, 100% DE CONCORDANCIA ENTRE EXPERTOS									
					INDICATORS	RELATIVE WEIGHT			
1*	1*	1*	1	1*	Economical profitability	0,2857			
2	3	4	5*	6					
	2*	2	2	2	utilization of working capital	0,0714			
		3	4*	5*					
			3	3	stock vulnerability	0,0714			
				4*					
				4	capital solvency	0,2143			
				5*					
				5*	liquid assets	0,3571			
				6	debt limit	0,0714			

Figura 3. Peso relativo de cada indicador. Fuente: López (2009)

Figure 3. Relative weight for each indicator. Source: López (2009)

3. Determination of Economic-financial efficiency index

Figure 4 shows the behavior of indicators during above mentioned periods as well as their evaluation on the procedure of Ief index calculation, which result is shown by Figure 5.

Figura 4. Comportamiento de los indicadores con respecto al plan. Fuente: López (2009)

Figure 4. Indicators behavior in relation to the plan. Source: López (2009)

CÁLCULO DEL ÍNDICE DE EFICIENCIA ECONÓMICA-FINANCIERA (Ief)					
Indicadores Manejados	P R (Vj)	Eval (Pj)	Vj * Pj	Eval (Pj)	Vj * Pj
Rentabilidad Económica	0,2857	5	1,4286	4	1,1429
Utilización del Capital Circulante	0,0714	5	0,3571	4	0,2857
Vulnerabilidad de las Existencias	0,0714	1	0,0714	2	0,1429
Solvencia	0,2143	5	1,0714	5	1,0714
Liquidez	0,3571	2	0,7143	3	1,0714
Endeudamiento	0,0714	5	0,3571	3	0,2143
		Σ (Vj * Pj)	4,0000	Σ (Vj * Pj)	3,9286
		Ief	0,7467	Ief	0,7333

Figura 5. Cálculo del Ief para finales del 2011 y principios del 2012. Fuente: López (2009)

Figure 5. Ief Index calculation by the end of 2011 and beginning of 2012. Source: López (2009)

We observe a steady economic-financial behavior for this company. Although it is necessary to improve stock vulnerability, asset liquidity and debt limit indicators.

Clients' perspective:

The Gap 5 from SERVQUAL (See Table 1) was employed, expectation surveys and perceptions were processed by Caliserv (version 2.0), as well as improvement sources shown as follows:

Tabla 1. Resultados de la aplicación del Gap 5 del SERVQUAL**Table 1.** Results from Gap 5 by SERVQUAL application

Diferencia 5/ Difference 5		
Segmentación/ Segmented		
No segmentado/ Non-segmented		
Encuestas analizadas: 10/ Surveys: 10		
Atributo/ Attribute	Diferencia/ Difference	Nivel de satisfacción/ Satisfaction level
Tangibilidad/ Tangibility	-1.006	0.000
Fiabilidad/ Reliability	-0.436	0.000
Capacidad de respuesta/ Response capacity	-0.210	0.025
Seguridad/ Safety	-0.033	0.033
Empatía/ Empathy	-0.071	0.020
Diferencia total/ Total Difference	-0.351	0.016

Results indicate that client's expectations supersede their perceptions (-0.351 expect more than received), as far as Tangibility⁶ (-1.006) and Reliability⁷ (-0.436) are concerned. The main causes of client's dissatisfaction are caused by:

- Problems with tool kits employed; machinery conservation and maintenance; arrival of supplies at the job site in due time and; materials delivered do not meet the clients' expectations.
- Non-compliance of promises.

Internal processes perspectives

Based on the improvement sources indicated by external clients, the Quality Function Deployment (QFD) is applied, shown by Figure 6.

Figura 6. Figura 6: QFD o Casa de la Calidad. Fuente: López (2009)**Figure 6.** QFD or Quality House. Source: López (2009)

⁶ Se refiere a los equipos usados para realizar los procesos, a la terminación o acabado, u otro elemento que pueda apreciar o valorar el cliente, en su contacto con la obra.

⁷ Se refiere a cumplir con lo prometido de forma exacta y confiable; es decir, cumplir con las promesas realizadas por la empresa.

What is the most important?

- 1) Improving materials employed.
- 2) Improving machinery conservation and maintenance.
- 3) Improving tool kits available to workers.

How much important?

- 1) Improving suppliers group.
- 2) Proactive maintenance plan and spare parts stocking plan.
- 3) Improving supply chain for Business Management (stock plan).

These results were grouped, according to their relationship into the following processes: Business Management, Human Resources management and Workshops and machinery management. A process improvement study was developed based on the selection of Diana processes – the processes most influencing client's satisfaction, the compliance of strategic goals, which can be easily recovered (López, 2009).

Formation and development perspective

So as to evaluate the strategic goal "Counting with skillful and motivated human capital" the organization applies and analyzes Gap(s) 6 and 7 by SERVQUAL.

Formation and/training plans are designed, focused on the results obtained from abovementioned perspectives (mainly "how(s)" delivered by the QFD) to achieve a skillful and motivated staff, well capable of: improving organization's processes, increasing external clients' satisfaction and contributing to achieve the company's financial well-being.

Identification of cause-effect relations. Selection of indicators.

Cause-effect relations are obtained from Figure 2 of the strategy map. They serve as basis for key indicators selection to be included in the balanced scorecard. They will enable us to learn the extent each goal has achieved. By means of an iterative process, the following indicators were defined for each perspective.

Financial Perspective (Figure 7)

Figura 7. Indicadores de la perspectiva Financiera
Figure 7. Indicators of Financial perspective

Código/ Code	Indicadores/ Indicators	Interpretación/ Interpretation
F ₁	Índice de Eficiencia Económico-Financiera (Ief)/ Economic-financial efficiency index (EFE Index)	Indica de forma global la salud financiera de la empresa./ Globally indicates the company's financial well-being.

Client's perspective (Figure 8)

Figura 8. Indicadores de la perspectiva de Clientes
Figure 8. Indicators of clients' perspective

Código/ Code	Indicadores/ Indicators	Interpretación/ Interpretation
C ₁	Gap 5 (expectativas – percepciones) Modelo SERVQUAL/ Gap 5 (expectations – perceptions) SERVQUAL Model	Nivel de satisfacción de los clientes, atendiendo a la separación entre percepciones y expectativas/ Clients' satisfaction level, considering the gap between perceptions and expectations.
C ₂	Evaluación en auditorías ambientales externas/ Evaluations by means of external environmental audit works. Evaluación en auditorías ambientales internas/ Evaluations by means of internal environmental audit works.	Indica cumplimiento de los requisitos para la protección al medio ambiente/ Indicating the fulfillment of environmental protection requisites.
C ₃	Tiempo de respuesta/ Response time	Indica la capacidad de respuesta ante variaciones del cliente o el entorno/ Indicating the response capacity faced to the client or environment variations.
	Cumplimiento de compromisos/ Compliance of commitments	Índice de rapidez con que la organización entrega las obras/ Readiness index indicates whether the organization delivers the works in due time.

Internal Processes Perspectives (Figure 9)

Figura 9. Indicadores de la perspectiva de Clientes
Figure 9. Indicators of clients' perspective

Código/ Code	Indicadores/ Indicators	Interpretación/ Interpretation
P ₁	% de cumplimiento de las RC./ % fulfillment of QR. % de cumplimiento de las NC./ % fulfillment of QS.	Indica cumplimiento de normas y regulaciones de calidad./ Indicating the fulfillment of quality regulations and standards
P ₂	Disponibilidad tecnológica/ Technological Availability Productividad/eq/ Productivity/eq	Indica la disponibilidad de tecnología efectiva, o sea, la tecnología capaz y racional./ Indicating the availability of efficient technology, i.e., capable and rational technology
P ₃	% cumplimiento del flujo de información/ % fulfillment of information flow Cantidad de información fuera de flujo/ Information outside the flow % equipamiento de comunicación disponible/ % available communication devices	Refleja el alcance de la máxima conectividad/ Reflecting the maximum connectivity scope
P ₄	% cumplimiento del cronograma de entrega de suministros/ % fulfillment of supply delivery schedule % suministros fuera del cronograma de reclamación/ % supplies outside the complaint schedule % suministros fuera de requisitos solicitados/ % supplies out of requested requisites % cumplimiento del plan de suministros en obra/ % fulfillment of job-site supplies plan	Indica el desarrollo de la gestión Logística/ Indicating the development of supply chain management
P ₅	% de recursos invertidos en la mejorar la conservación y mantenimiento de los equipos/ % invested resources for improving machinery conservation and maintenance plan % de incremento de la calidad de materiales usados/ % employed materials quality increase % de cumplimiento del arribo de suministros en tiempo/ % fulfillment of material arrival in due time	Refleja el desarrollo de la gestión de negocios/ Reflecting the development of business management

Perspective of Formation and Development (Figure 10)

Figura 10. Indicadores de la perspectiva Financiera
Figure 10. Indicators of Financial perspective

Código/ Code	Indicadores/ Indicators	Interpretación/ Interpretation
FC	Gap 6 (expectativas – percepciones) (Modelo SERVQUAL)/ Gap 6 (expectations – perceptions) (SERVQUAL Model)	Indica la medida en que los trabajadores se sienten motivados y presentes en la toma de decisiones/ Indicating the extent workers are motivated and involved in decision making

Indicators Design (See Table 2)

Tabla 3.1. Objetivos estratégicos, indicadores, metas y responsables de la perspectiva Financiera

Table 3.1. Strategic Goals, Indicators, target, and heads responsible of financial perspective

Perspectiva/ Perspective	Objetivos estratégicos/ Strategic goals	Códi go/ Code	Indicadores/ Indicators	Período de medición/ Measuring Period	Metas/ Target	Responsables/ Head	Responsible
Financie ra/ Finance	Alcanzar una alta Eficiencia Financiera/ Reaching high Financial Efficiency	F ₁	leí/ EFE Index	Mensual/ Monthly	0,85	Director de Contabilidad y Finanzas/ Chief Financial & Accountability Officer	
	Aumentar la satisfacción de los clientes externos/ Increasing external clients satisfaction	C ₁	Gap 5	Mensual/ Monthly	0	Director de Desarrollo/ Development Chief Officer	
Cliente/ Client	Ser reconocidos por nuestro compromiso con el medio ambiente/ Being renowned by our environmental commitment	C ₂	Evaluación en auditorías ambientales externas/ Evaluations by means of external environmental audit works Evaluación en auditorías ambientales internas/ Evaluations by means of internal environmental audit works	Mensual/ Monthly Mensual/ Monthly	Excelente/ Excellent Excelente/ Excellent	Director de Desarrollo/ Development Chief Officer Director de Desarrollo/ Development Chief Officer	
	Ser reconocidos por nuestra seriedad/ Being renowned by our seriousness	C ₃	Tiempo de respuesta/ Response time	Mensual/ Monthly	≤ 3 días/days	Director de Negocios/ Business Chief Officer	
Procesos internos/ Internal Processes	Prestar servicios de excelente calidad/ Delivering high quality services	P ₁	Cumplimiento de compromisos/ Compliance of commitments % de cumplimiento de las RC./ % fulfillment of QR. % de cumplimiento de las NC./ % fulfillment of QS.	Mensual/ Monthly Mensual/ Monthly	100 % 100 %	Especialista en calidad/ Quality Expert Especialista en calidad/ Quality Expert	
	Contar con tecnología efectiva/ Counting with effective technology	P ₂	Disponibilidad tecnológica/ Technological availability Productividad/eq/ Productivity	Mensual/ Monthly Mensual/ Monthly	≥ 0,75 Máx fusión	Dirección de mecanización/ Mechanization Administration Dirección de mecanización/ Mechanization Administration	
	Alcanzar la máxima conectividad/ Reaching maximum connectivity	P ₃	% cumplimiento del flujo de información/ % fulfillment information flow % de información fuera de flujo/ % information outside the flow	Mensual/ Monthly Mensual/ Monthly	≥ 75% ≤25 %	Especialista en Informática/ IT Expert Especialista en Informática/ IT Expert	
			% equipamiento de comunicación disponible/ % availability of communication devices	Mensual/ Monthly	80 %	Especialista en Informática/ IT Expert	
			% cumplimiento del cronograma de entrega de suministros/ % fulfillment of supply delivery schedule	Mensual/ Monthly	100 %	Especialista de la sección Logística/ Supply chain department expert	
	Desarrollar la gestión logística/ Developing supply chain management	P ₄	% suministros fuera del cronograma de reclamación/ % supplies outside the complaint schedule % suministros fuera de requisitos solicitados/ % supplies out of requested requisites	Mensual/ Monthly Mensual/ Monthly	≥ 80% ≤15 %	Especialista de la sección Logística/ Supply chain department expert Especialista de la sección Logística/ Supply chain department expert	
			% cumplimiento del plan de suministros en obra/ % fulfillment of job-site supplies plan % de recursos invertidos en la mejorar la conservación y mantenimiento de los equipos/ % of invested resources for improving machinery conservation and maintenance	Mensual/ Monthly Mensual/ Monthly	≥ 85% ≥ 75%	Especialista de la sección Logística/ Supply chain department expert Director de negocios/ Business Chief Officer	
	Desarrollar la Gestión de Negocios/ Developing Business Management	P ₅	% de incremento de la calidad de materiales usados/ % employed materials quality increase % de cumplimiento del arribo de suministros en tiempo/ % fulfillment of material arrival in due time	Mensual/ Monthly Mensual/ Monthly	≥ 20% ≥ 75%	Director de negocios/ Business Chief Officer Director de negocios/ Business Chief Officer	
	Contar con un capital humano competente y motivado/ Counting with skillful and motivated human capital	FC ₁	Gap 6	Mensual/ Monthly	0	Director de RRHH/ Human Resources Chief Officer	
Formación y crecimiento/ Formation and development							

Management information system

Once each goal indicator per perspective was determined, we proceeded to implement the Balanced Scorecard into the organization under study.

This Balanced Scorecard employs a technique that operates similarly to a traffic light (alert system), which warns when the company exceeds some dangerousness limits, by showing it in red color. Yellow color indicates sensitive alert issues, reaching precaution levels. Green color indicates the absence of dangerousness or precaution levels, i.e., the company reached a satisfactorily behavior.

So as to computerize the Balanced Scorecard, the "Catalejos" software was employed. This software was developed by the systems expert, Msc. Ana Elena Hernandez Esnard, from the company Conas, using Java Studio Creator 2.1 which includes a SQL Server 2000 database. This application operates from a server connected to web a site. The application can be simultaneously accessed from different devices, with different users' levels to look up or to modify data, as follows:

- Chief Officers: are able to see the strategy, strategy map and the progress of each indicator.
- Managers: have the same right as Chief Officers and they are able to modify indicators.
- Users are able to see the strategy and the strategy map. They are able to see indicators progress, which are allowed by Chief Officers.

Figure 11 shows the alert system for an Engineering Construction Company

Figura 11. Foto del software "Catalejos" para el diseño e implementación del CMI en una empresa constructora de obras de ingeniería. Fuente: Victori (2009)

Figure 11. "Catalejos" screen photo for the design and implementation of BS into an Engineering construction company. Source: Victori (2009)

3. Conclusions

- 1) *By using this methodology the consensus was achieved on strategic goals represented by the strategy map. BS contributed to deploy, follow up and control the strategic direction of the company, which was broadcasted to all levels as integral part of the organization culture. The "Catalejos" software was employed, developing comparative tables and other graphic reports.*
- 2) *The application of Ief Index showed a steady economic-financial behavior in the company. Although, it is necessary to continue improving stock vulnerability, asset liquidity and debt limit indicators.*
- 3) *By using SERVQUAL and QFD model, the perspectives of the client and processes were fortified, which lead to increase external client expectations and contribute to improve the company processes.*

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