Business Intelligence: Benefits of Information Analysis in a Small Business Enterprise in Mexico

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Abstract: In a previous investigation to Design and Machining Reyper (DMR) Industrial Inc. was determined that small business has the opportunity to improve process of information analysis in areas where information is necessary to make decisions. Using Business Intelligence tools as dashboards through Excel, a model was created to support the decision-making process. This article describes creation and use of this model and makes recommendations for small enterprises interested in the use of business intelligence.

1. Introduction:

Small Business Enterprises represent worldwide the segment of the economy that provides the greatest number of economic units and employed personnel; hence is relevant to improve their performance (INEGI, 2009). In Mexico, 75% of new companies close operations after two years and among the main causes of failure is lack of key process indicators, as well lack of analysis processes (Dávila et al., 2014). The main objective of this investigation has developed a proposal of use of business intelligence for a company from the metal-mechanical sector, with the purpose of making the organization capable of making operational decisions based on the analysis of its information.

2. Methodology:

This research has a quantitative approach to the purpose is to measure the impact of business intelligence on the maturity level of the organization. The scope is descriptive, data will be collected in a specific period of time which makes this investigation transversal. The maturity level of the organization will be measured with the self-assessment extracted from the international standard ISO 9004: 2009 and the proposal of use of business intelligence will be created using Cano´s methodology, exposed in his book " Business Intelligence: compete with information", published in 2007.

According to the real Spanish academy, self-evaluation refers to the evaluation that someone makes of themselves or of their own aspect or activity, this can be interpreted as a method that consists of assessing oneself the own capacity that is available for such or which task or activity, as well as the quality of the work that is carried out.

The application of the self-assessment extracted from the standard was carried out according to the methodology suggested by the same standard, the development of the methodology, as well as the result, are shown in table 1.

Table 1: *Maturity level self-assessment.*

Methodology	Application & development
The scope of the self-evaluation	The self-evaluation will be carried out in the purchasing, sales and warehouse departments, it will be applied only with those responsible for the area, as they are the ones with the power to make decisions.
Responsible	A researcher who directs this work
Timeframe	September-October 2017
How will the self-assessment be carried out?	Through individuals, specifically with those responsible for each area.
Maturity level identification	First, of all, criteria according to the ISO 9004: 2009 standard was presented to the heads of sales, purchasing and warehouse departments.
Evaluation of the current performance	The current situation in the organization was compared with criteria from the standard. The

of the organization process	elements that the organization is already applying were marked; starting at level 1 and progressing to higher levels of maturity.

Analytical summary: Self-evaluation of the monitoring, measurement, analysis and review processes.

Criteria	Maturity Level
8.1 (Monitoring, measurement, analysis, and revision) 8.2 Monitoring	1
8.3.1 (Measurement) General 8.3.2 Key performance indicators	1
8.3.3 Internal audit 8.3.4 Self-evaluation	2
8.3.5 Comparative studies with best practices (benchmarking)	2
8.4 Analysis	1
8.5 Review of information obtained from monitoring, measurement, and analysis	1
TOTAL	1

in the products or in management, information review activities are initiated (Own elaboration, 2017).

The business intelligence tool proposed for the company are Dashboards. This tool allows knowing the operation of the organization at a glance while making it easier to analyze the information that the company generates. Dashboards presented below, contain information about each department summarized in graphs and tables.
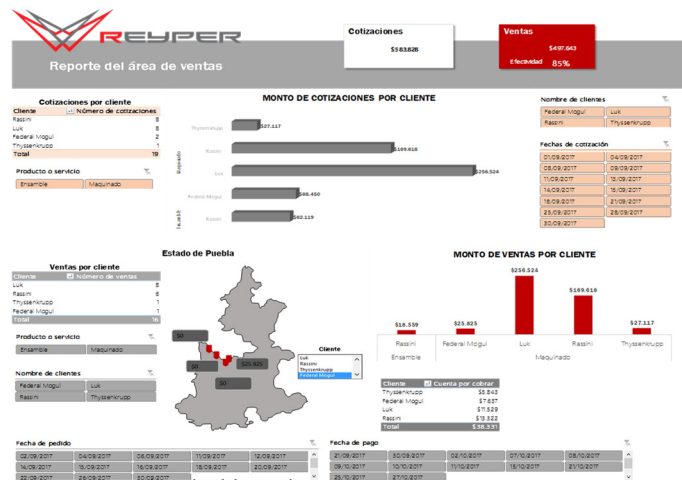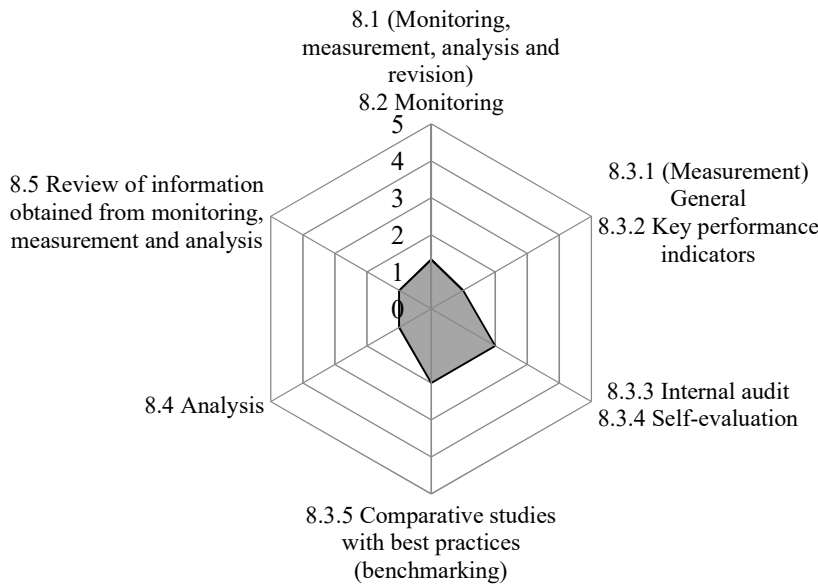

Figure 1. Sales dashboard.

Results Report

The results of the self-evaluation carried out in the areas of purchasing, sales and storage with respect to the processes of monitoring, measurement, key performance indicators, analysis and review of the information, point out that these are basic processes. These are characterized by being reactive processes, which is when problems arise

The objective of creating dashboards for the sales, purchasing and warehouse departments is to provide them with a tool that allows them to make decisions based on the analysis of their information. To explain how dashboards contribute to this process, the following table exemplifies the analysis of information.
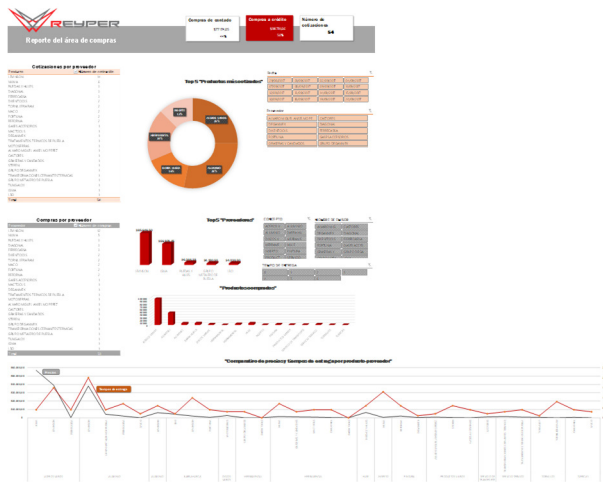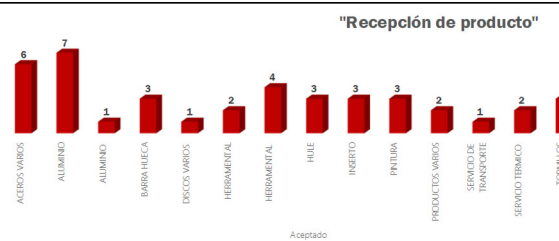
Figure 1. Purchases dashboard.

Figure 2. Warehouse dashboard.

Table 1: *Information Analysis Demonstration*

Analysis questions	Dashboard response		Information analysis
How many quotes does each client request? Which client requests more quotes?	**Quotes per client**		Rassini and Luk are the clients that request the highest number of quotes. While Thyssenkrupp is the client with the least number of requests.
	Client	Number of Quotes	
	Rassini	8	
	Luk	8	
	Federal Mogul	2	
	Thyssenkrupp	1	
	Total	19	
How much is the total amount of sales?			Of the quotations that were made, the amount of the actual sales amounts to $ 497,643.00 which represents an 85% effectiveness.
How much is the amount of sales by origin of the customer?			Rassini is the closest customer located geographically, the amount of purchases made reaches $ 188, 177.00
Which supplier is the best option according to prices and delivery times, to acquire the most requested product by the company?			According to the comparison of prices and delivery time, Ferrecabsa supplier is the best option to acquire steels, according to the information recorded from previous purchases, their prices are the lowest and their delivery time is the shortest.

| What are the most received products? | "Recepción de producto" | The most received products were steels, aluminum and tooling. |

Source: Own elaboration, 2018.

As can be seen in table 2, now is possible to analyze information before making a decision. With information from dashboards the departments can monitoring their processes, they can also measure and analyze their operation, which generates a continuous review of the process.

3. Results

The use of business intelligence tools in addition to allowing the analysis of information, impact the maturity level of the organization. To measure the maturity level, the self-assessment was applied for the second time to the monitoring, measurement, analysis and revision processes of the sales, purchasing and warehouse departments. The methodology was exactly the same used at the beginning for that reason in this section only appears the results of the self-assessment.

Table 2: *Analytical summary from self-assessment*

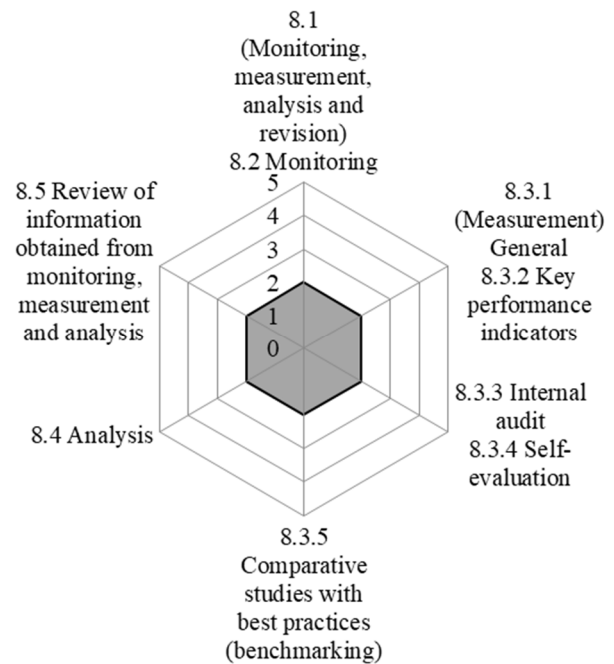| CRITERIA	MATURITY LEVEL
8.1 (Monitoring, measurement, analysis, and revision) 8.2 Monitoring	2
8.3.1 (Measurement) General 8.3.2 Key performance indicators	2
8.3.3 Internal audit 8.3.4 Self-evaluation	2
8.3.5 Comparative studies with best practices (benchmarking)	2
8.4 Analysis	2
8.5 Review of information obtained from monitoring, measurement, and analysis	2
TOTAL	2

Source: Own elaboration, 2018.

Figure 3. Graph of analytical summary

4. Discussions

According to the results of the final self-assessment, the level of maturity of the organization is generally in a level 2. A level two process must meet certain criteria. First, a follow-up process is carried out periodically; second, internal data are used for performance indicators; third, decisions are based on performance indicators; fourth, data is collected on a regular basis; finally, the analysis of the information is done periodically.

Although the proposal generated improvements to the decision-making process, there are still many areas of opportunity that the company needs to improve.

It is necessary to ensure the quality of the data that is generated to ensure that correct decisions are being made. To implement a true business intelligence system requires investing in software, as well as forming a team in charge of the project of implementation and maintenance of business intelligence.

5. Acknowledgments

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