

Research Progress: Intangible assets monitor during economic crisis, a case study

Daniel Guevara

daniel.guevara@ge.com

Université Paris-SUD 11

April 2010

Abstract

Now a day, the world has been experiencing the worst economic crisis since 1929, and this is considered as the “perfect storm” (Krugman et al, 2009). And the business and organizations are trying to be safe at this context. This report focus on a organization that have been experiencing a recession on its economy since 2009, and also monitor how its intangible assets are becoming relevant and having more precedence during this situation, especially right after the business experienced some years of expansion and growth. This report also identifies the expenditures and decisions made around Human Capital, Structural Capital and Relational Capital, and which intangible and knowledge assets are making precedence as well.

1. Organization Background Of The Case Study

This case study is about a company located in Mexico. The business focus is the manufacturing of electrical machines; it is also a Joint Venture or JV, between a Mexican group that holds the 50% of shares and the rest belongs to a global business. The company started operations in 1969 and during the 1990's completed the JV. Moreover, during the year of 2008 the organization reported on its financial annual report that had more than 5,700 workers and annual sales around \$1,150 million of dollars. Also the business started its global operations after acquiring an enterprise in India in 2008.

This case study is narrowed to a business unit of the organization and it is organized as follows: one business director, some managers and more than 20 employees distributed among the management areas.

2. Research Case Study

Since 2008, the current global environment has been polarized due to economic crisis and recession. This case study is of an organization that is not exempt of this situation and it is experiencing a slope-down of its economy. Previous to this current situation, the business was experiencing an impressive growth that allowed expanding its operation to India and also to expand its portfolio, including the design, manufacturing, and sales of new line of products and services.

For this case study, the current global economic turbulence started in 2008 but affected the business in 2009 as shown in figure 1. Here, there are two cycles identified; the first ended in 2004 and the second started in 2005. From 2005 to 2008 the business experienced a positive slope of operation profits, but in 2009 its economy started to diminish and it is estimated to continue with this trend in 2010.

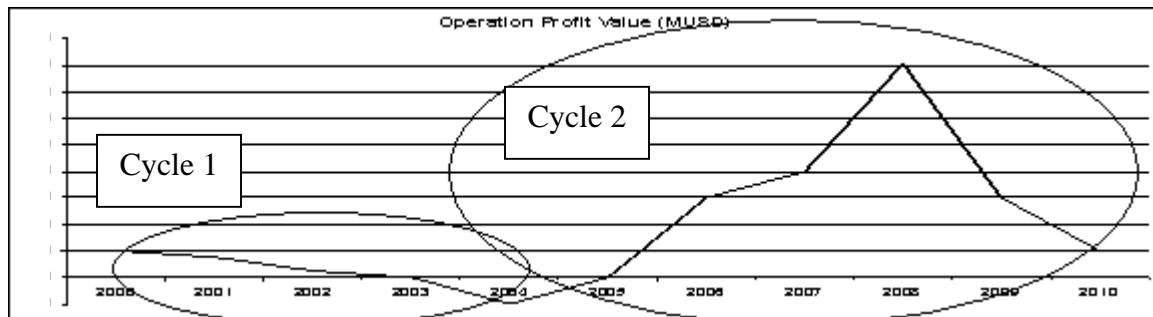


Figure 1: 10 Years Operation Profit

The shape of the graph in figure 1 is similar to the theoretical concept of an economic cycle by Akerman (1960) shown in figure 2. If both figures are compared, they have similar trend. Thus there is a growth period, a crisis phase and then its recession or a slope down.

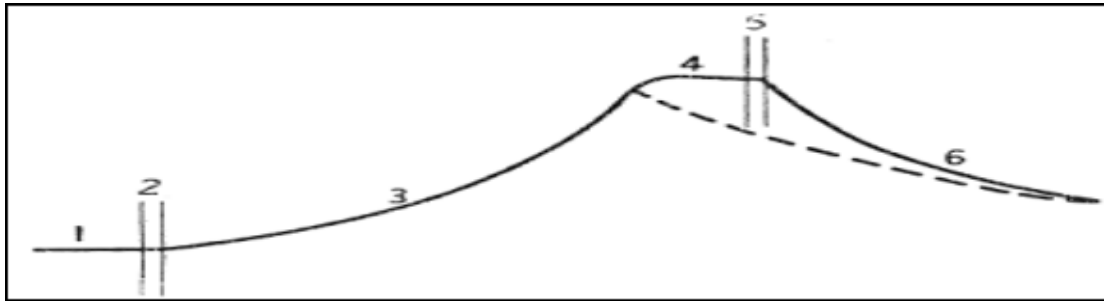


Figure 2: 6 phases of Akerman's economic cycle

The figure 2 indicates the 6 phases of the economic cycle as a reference for this case study:

Phase 1: Lowest level of the depression, or cycle starts.

Phase 2: Change from a steady state to a growth period.

Phase 3: Time to growth and invest.

Phase 4: The economic crisis starts.

Phase 5: The economic crisis itself.

Phase 6: The recession.

The present research focus only on phases 4 to 6, and for the organization of this case study such period of time is from 2008 to 2010. Moreover, the research goal is to identify the intangible asset that are contributing to the organization in order to make it survive and also be ready to start a new cycle as soon as it arrives.

So, to monitor the intangible assets during the crisis, the research question is stated as follows:

How are behaving and having precedence the intangible assets of the organization during the current economic crisis?

To clarify the intangibles trends and organization priority on them, the complementary questions are:

Q1. Which intangible assets are relevant during economic crisis?

Q2. How is the organization spending on intangibles during a downturn?

Q3. How are manager making decisions during the economic crisis and recession to influence on intangible assets?

3. Primary assumptions

As mentioned previously for this organization, from 2008 to 2010 it has been experiencing an economic crisis and recession phases. So considering relevant elements found in literature review and some assumptions regarding intangible assets, the complementary question could be completed as follows:

Q1. Which intangible assets are relevant during economic crisis?

Assumption: All intangibles related to Human Capital should remain secure inside the organization. This means that the individuals of the organization provide knowledge assets that turn into intangible assets to resolve problem during tough times (Harvey and Lusch, 1997; Schenker-Wicki at al., 2009; Eliasson, 2005; Heylen et al., 2007).

Moreover, intangibles associated to Relational Capital have precedence due to the need of the organization to access public funds and promote laws and economic rules to facilitate the commerce and reactive local economy (Chin et al., 1999; Ernst, 1998).

Finally, intangible from Structural Capital should focus on activities that create differentiators and innovations to the current portfolio of products and services, while coming from R&D activities and cost-out projects (Tan and Mathews, 2009; Pate & Narain, 2008; Moore, 2009).

In table 1, there are identified intangible assets that have more relevance under economic crisis. This taxonomy comes from a literature review done and it has moved toward a general IC taxonomy of any organization.

Q2. How is the organization spending on intangibles during a downturn?

Assumption: Based on relevant case studies, organizations tend to cut all costs that are not related to the value generation such as organization imaging or non-productive activities. Additionally, organizations spend only on activities that reinforce competitive advantages. The business focuses on high profit product and services while eliminating those that the revenue is low (Lafrenz, 2006).

Moreover, organization would use more resources on R&D activities to create new products and services that satisfy current demand and market condition. For example, devices based on high technology but low price. Thus implies from the investment to make the business be ready while the phase 1 stars (Blausten, 2009).

Q3. How are managers making decisions during the economic crisis and recession to influence on intangible assets?

Assumption: The relevant literature around decision-making during economic crisis mentions that organizations decision-makers put together conclusion faster than ordinary times and the decisions are based majority on their instinct and experience. This means that during expansion or growth time, decision-makers

have more time to analyze the situation and choose considering the majority of information and data available (Bonn et al., 2006; Sayegh et al., 2004; Lee et al., 2008; Santella et al., 2009)

IC for Economic Crisis	Intangible Assets
1. Human Capital	1.1 Knowledge 1.2 Skills 1.3 Innovation 1.4 Values 1.5 Experience
2. Structural Capital	2.1 Investment in R&D 2.2 Investment in technology 2.3 Process and procedures 2.4 Innovation process 2.5 Intellectual property 2.6 Cut cost
3. Relational Capital	3.1 International and local providers 3.2 Customer 3.3 Government participation

Table 1: IC for Economic Crisis context

4. Research Schema

To answer the primary question and its complementariness, the research is conducted base on the following diagram in figure 3.

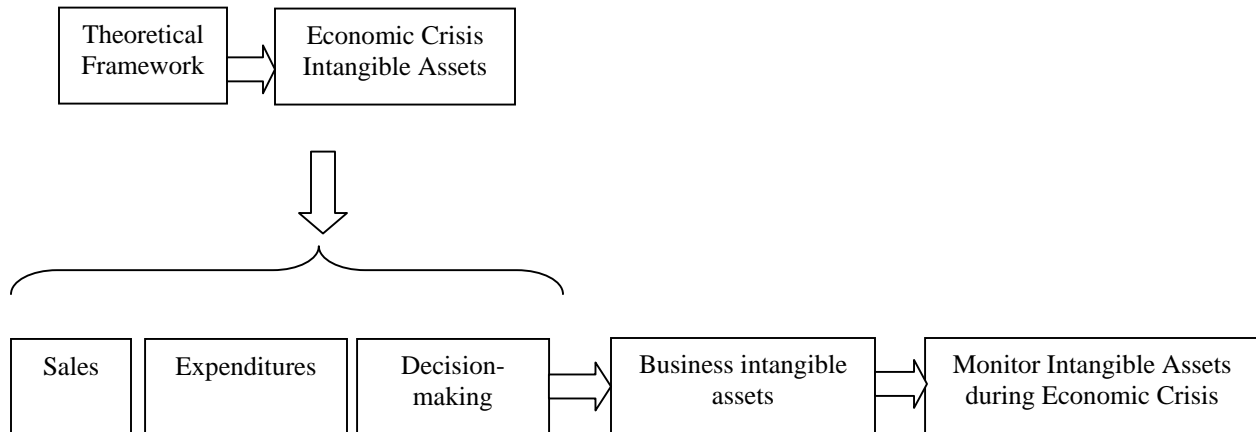


Figure 3: Research diagram

5. Research Method

Identifying intangible assets that are relevant during economic crisis has different aspects to consider. The first is to clarify where and when the economic crisis is in the economic cycle. As mentioned in previous paragraphs and referring to Akerman's (1960) economic cycle; it starts in phase 4 and continues in phase 5 to change into recession in phase 6. Also, this case study considers the last ten years, where a complete economic cycle has been identified, but for the economic crisis and clarity/quality of the information and data available, the research focuses on the last 5 years (2005-2010).

Although the economic cycle has been associated to the business operational profit, this research considers the sales (billing) trend because it has a similar trend and shape like the economic cycle.

After identifying the phases of the cycle using the sales (billing) trend as base line, the next step is to compare that trend to the expenditures of the business. To perform this activity, the information regarding expenditures is classified in two mayor categories: the first is related to tangible and material assets and the second is for intangible activities. The first category is no considered in this research and the second is grouped in 3 types: those account terms related to Human Capital, related to Structural Capital and related to Relational Capital.

The last activity of this method consists on identifying more intangible assets but while reviewing the decision-made during the related period of time. To gather this information, periodical interviews with decision makers are conducted. The answer will be compared to the IC taxonomy of table 1 and relevance of intangible assets would be identified. This information is compared to the result of sales trend and intangible expenditures during the same period of time.

In order to contextualize the economic downturn of the case study, next are some relevant elements that influenced during 2009:

- Global economy downturn: for the business implied a 50% reduction on sales to overseas and market participation reduced to 30%.
- Indian Enterprise acquisition: represented more than \$ 4 million of dollars.
- Quality crisis in complex exported product.

Moreover and to keep monitoring the intangible assets during the current crisis and recession, the next considerations are in place:

- Monthly interviews with decision-makers to clarify more intangibles trend.

- Monthly sales report to identify the recession trend and compare to intangible trends.
- Monthly expenditures per Human Capital, Structural Capital and Relational Capital to validate intangible relevance.

6. Research Findings

Additional to the graphs presented on figure 1 that shows the profit of the business, the next figure 4 indicates the annual sales from 2006 to 2010 estimated. Also and to compare the information in the same dimension, the next figure 5 shows the monthly sales (billing) trend of the business but until March 2010.

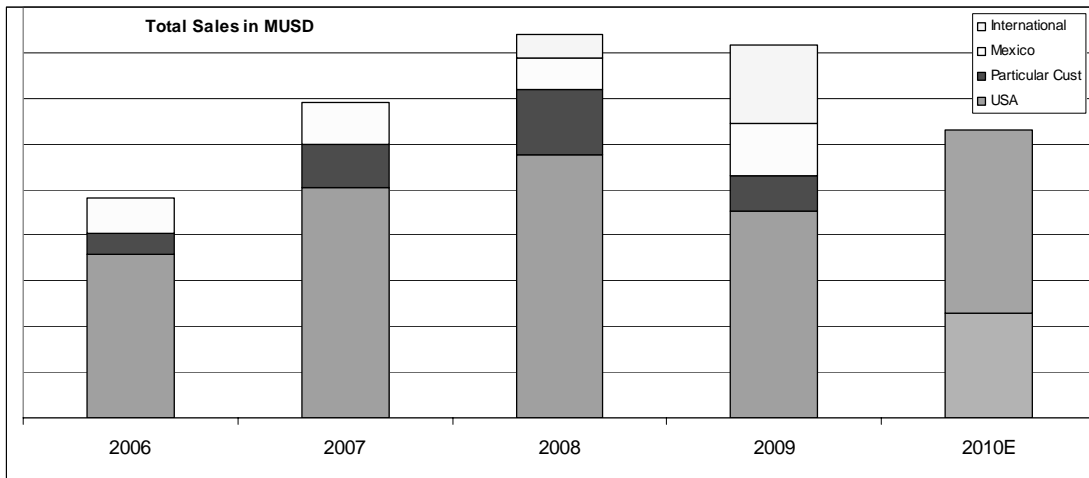


Figure 4: Annual sales (note: 2010 is estimated)

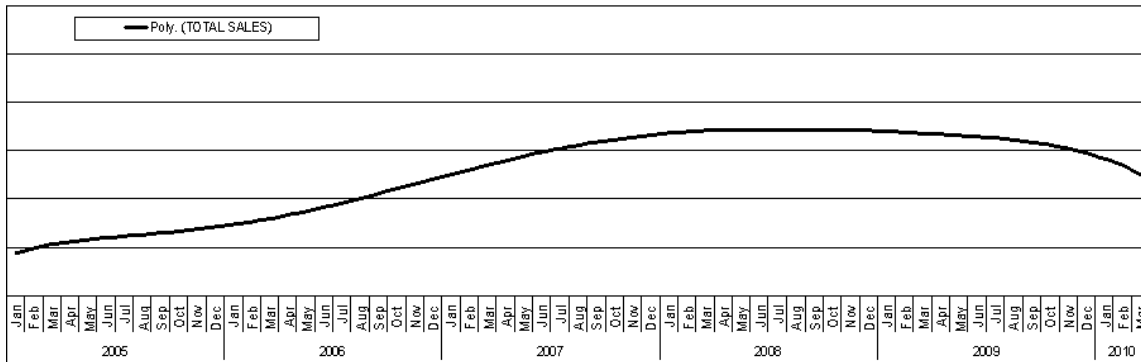


Figure 5. Monthly sales from 2005 to 2010

Furthermore, if figure 5 is compared to the Akerman’s economic cycle of figure 2, the phases 3 to 6 are identified as follows in figure 6 (phase 1 and 2 are previous to 2006 as described in previous paragraphs): Phase 3 for growth starts in 2005 through 2008, phase 4 for economic crisis beginning is from May 2008 to October 2008. The economic crisis *per-se* for phase 5 is from November 2008 to December 2008, and the last phase 6 or recession starts on January 2009 and would be present during 2010 (estimated).

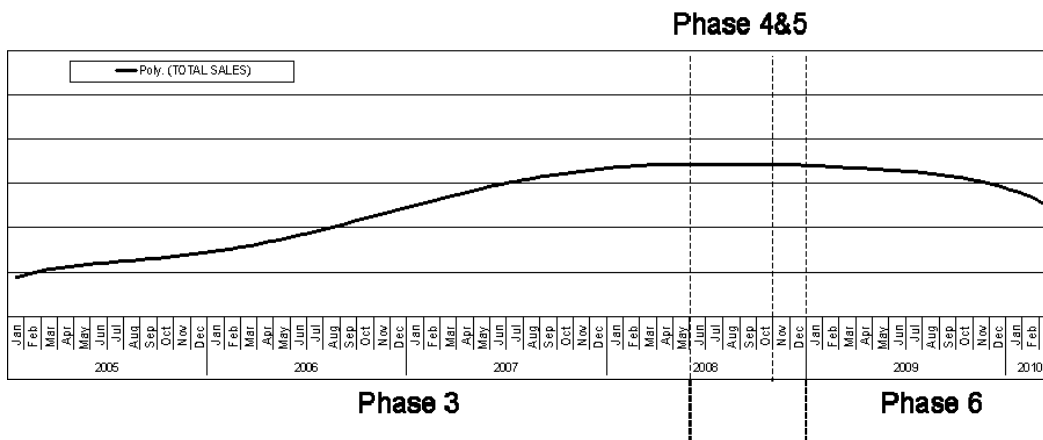


Figure 6: Case study economic cycle phases

So far, the economic crisis has been recognized for this case study but the question regarding the relevance of intangible assets is still open. To address this answer, it is important to identify in which intangibles is the organization spending and then clarify to which is giving some precedence. After this, more research is needed to identify other intangibles not accounted but with high priority for the organization; this would come after some decision made are identified. The findings are reported next.

Next in table 2 there are enlisted the organization expenses in intangibles and also they are classified in Human, Structural and Relational Capital categories. This information comes from the accounting systems of the organization and its expenses during the same time span (2005-2010).

Thus and with the expenditures on a monthly bases, they are compared to the economic cycle of the figure 6 in order to contrast the relevance based on trends and confirm where the organization is cutting cost during the economic crisis and also to identify in which areas is investing more. The theory found says that cut cost are related to those activities that do not generate immediate value, and the investments are primarily in R&D and Human Capital development (Blausten, 2009; Lafrenz, 2006; Tan and Mathews, 2009; Pate & Narain, 2008).

Intellectual Capital	Concepts
Human Capital or HC	<ol style="list-style-type: none"> 1. Headcount and people with certification on Core Competences ⁽¹⁾ or HC asset 2. Personnel Extraordinary Expenditures
Structural Capital or SC	<ol style="list-style-type: none"> 1. Non-Deductive Expenditures 2. Variable Expenditures 3. Office Related Expenditures 4. Services and Taxes Related to the Product 5. Telephone and Computer 6. Rent Of Special Equipment
Relational Capital or RC	<ol style="list-style-type: none"> 1. Meetings 2. Expos And Conferences 3. Travel Expenditures 4. Marketing And Promotion 5. Assessors And Consultants 6. Inscription To Public Bids 7. Clubs And Associations Fees 8. Technical Assistance For Imports

Table 2: Intangible catalog of concepts from accounting system

(1) A person with a core competence certification is consider as 1.25, because the certification process reinforce the knowledge part of the competence (knowledge, skills, attitude and experience)

7. Research Finding: Intangible Expenditures and Decision Made to Identify Intangible Assets

Warning: For confidentiality of the information, the following figures and tables are represented only as tendencies and not real amounts.

Because this research focus on the identification and monitoring of intangibles based on their tendencies and relevance during an economic crisis and recession of the organization, in the next figure 7 is shown the expenditures on all intangibles relevant to the organization. Herein the tendency is to reduce the expenditures in a time previous to the phase 4, but here that tendency stops. However, in phase 5 there is increase of expenditures until the 2nd half of 2009, where a new contraction in expenditures start. Thus the expenditures had major amplitude than previous years. At the next figures, there is detailed information per capital such as Human, Structural, and Relational, in order to understand better the tendency and moreover to identify to which intangibles the organization is expending more during the economic crisis of 2009 and made the general tendency to expand and later to contract during the recession phase.

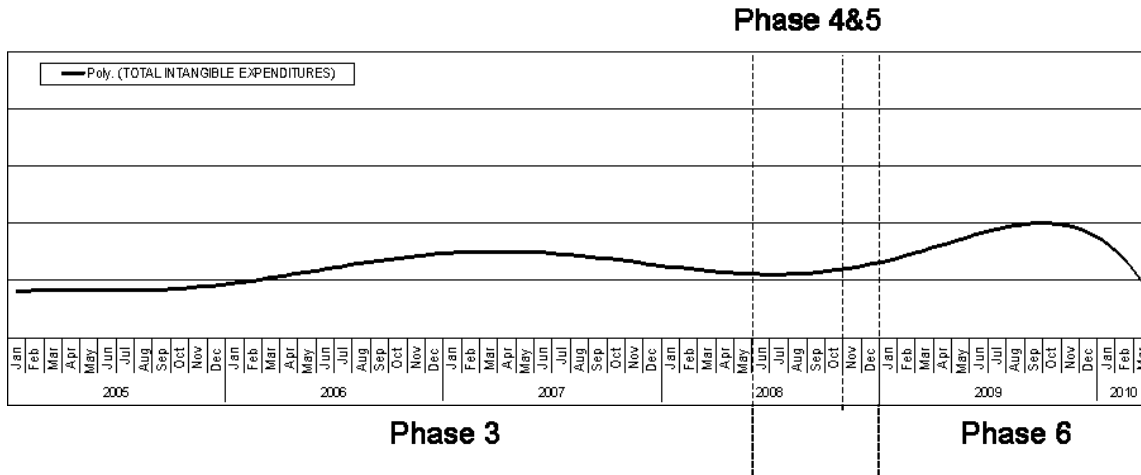


Figure 7: All expenditures related to intangible assets.

However to understand better and have more clarity on which intangibles the organization is making their decision and making them more relevant during the economic crisis, in figure 8 there is the more relevant decisions made that influenced in the intangible assets. In this figure 8, there are identified the months when the organization made the majority of the decisions, that happened at the very beginning of the phase 6 of recession; this situation implied that the organization made many things to counter-cycle the recession and made the business safe while increasing the sales amounts. Also, and after the decisions were made, in the figure 8 there is a tendency to diminish the decisions made that meant that the organization was waiting until those actions had some effect on the slope-down. Moreover and due to the fact that the sales still are going down, the organization made more decision by the end of the year 2009 and it is expecting to see more result by the beginning of 2010. Despite the decisions made, the business is living an outside-in effect that is pulling down the sales and internal activities are not being very effective, but they have diminished the impact to the business.

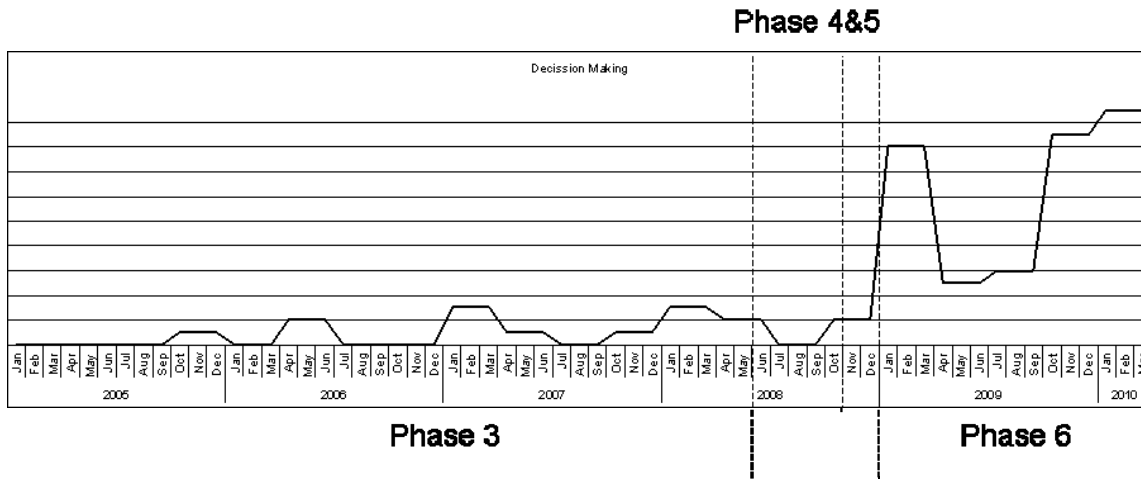


Figure 8: All decision made related to intangible assets.

As mentioned in previous paragraphs, next are detailed figures with the decisions made per intellectual capital. Also, the intangibles aligned to the table 2 of this report are identified and monitored for this analysis.

8. Human Capital Aspects

For those expenditures and decisions made related to Human Capital or HC, in the figure 9 is shown the headcount of this organization. Also in figure 10 are shown all the decisions made related to HC. Herein it is displayed that during the month of December 2009 there is a relevant diminish or laid-off of the headcount. This is because in November 2009, the organization decided to eliminate the Service Business that was implemented in 2007, but under the current context, the organization is focusing only on products sales.

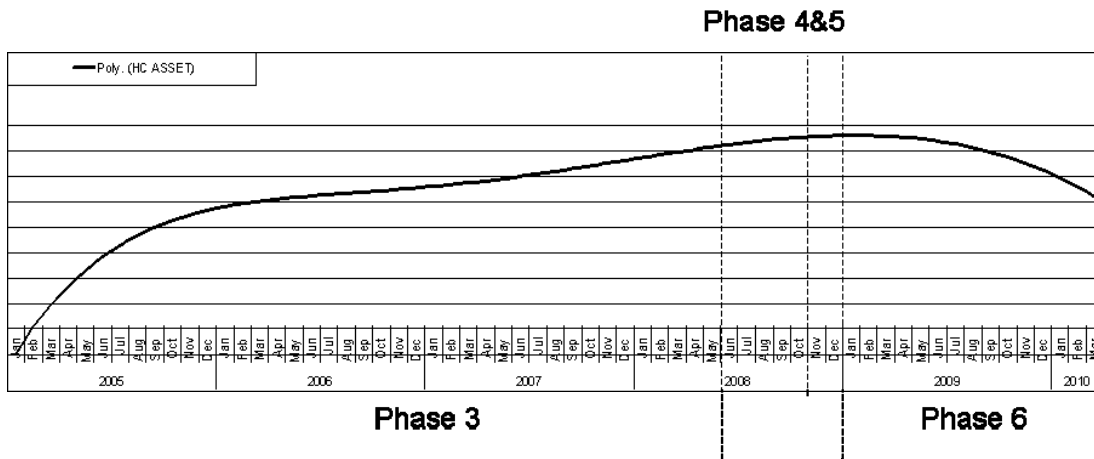


Figure 9: Headcount of the organization

In figure 9 is included the core competency certification program and is reflected as adding a 0.25 per person that achieved that. This fraction comes based on the organization definition of a core competency that is made of: 1) knowledge, 2) skills, 3) attitudes and 4) performance. So, if a person achieves a certification, it means that his performance had been improved and consequently contributes with more value to the organization.

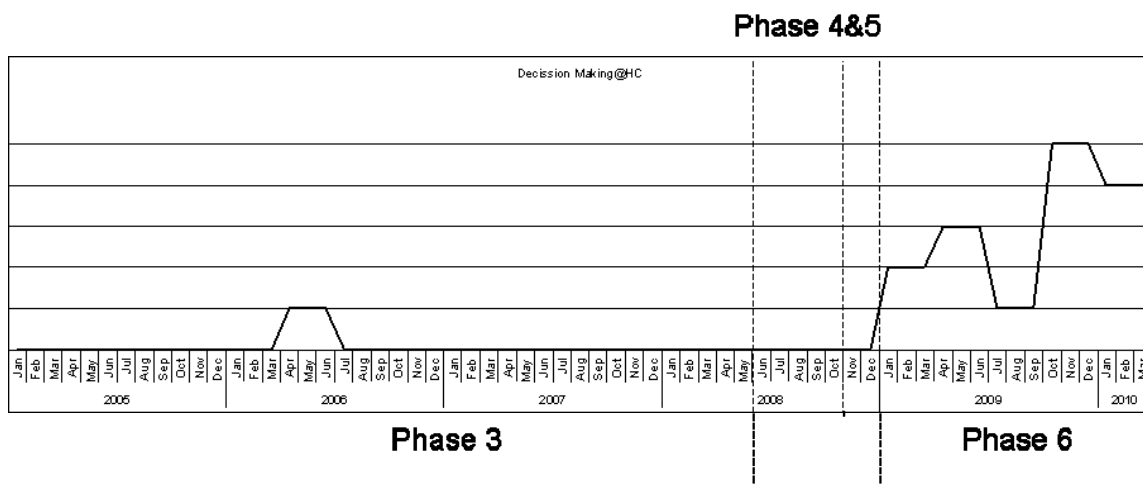


Figure 10: Decisions made related to HC

In figure 11, there is a comparison of more intangible assets of the Human Capital in 2 scenarios. The intangibles are regarding the distribution of the people regarding the years of experience and their scholar degree. The first scenario is previous to the decision made to laid-off personnel by removing the Service Business and the second scenario is after the change and also shows the part that was removed.

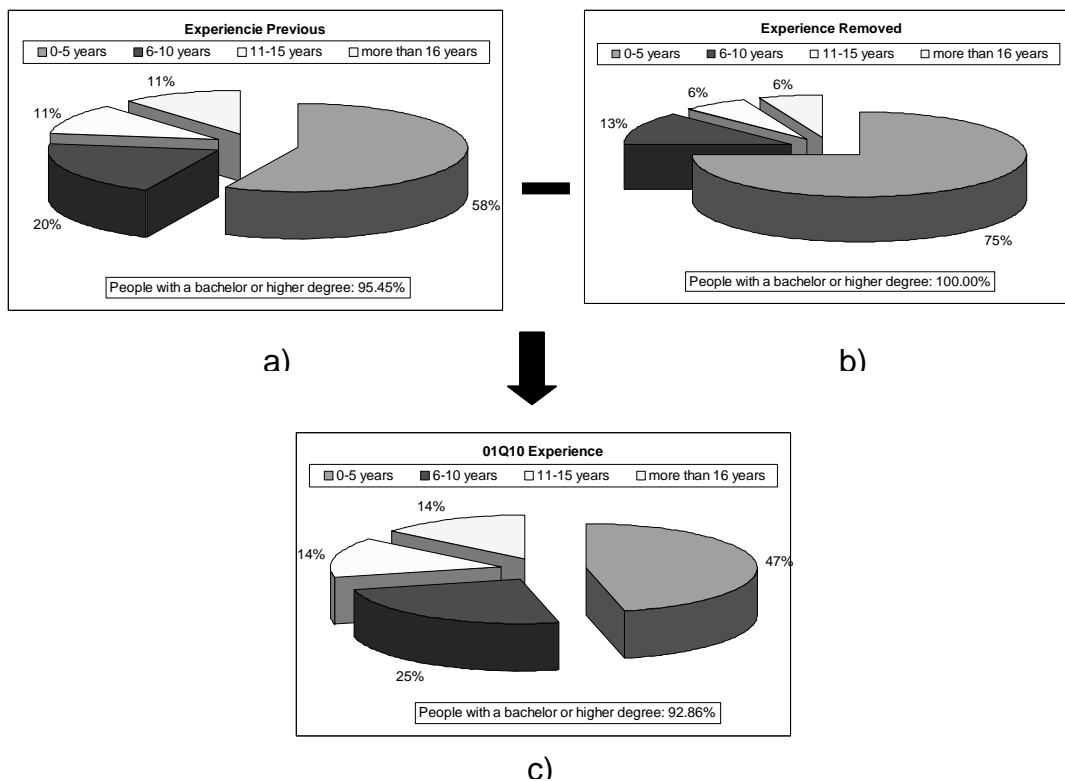


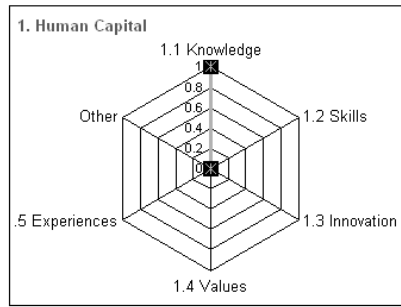
Figure 11: a) Human Capital experience distribution previous to the organization change. b) Human Capital experience removed, and c) Human Capital experience after the organization change.

It is relevant to identify that in figure 11 and after comparing part a) and c), there is not a relevant change on the distribution of people experience and scholar degree, but decreased from 95.45% to 92.86% of people with a bachelor or higher degree. Also and after comparing the amount of people more experienced, it changed from 11% to 14%. So far, it could be considered that

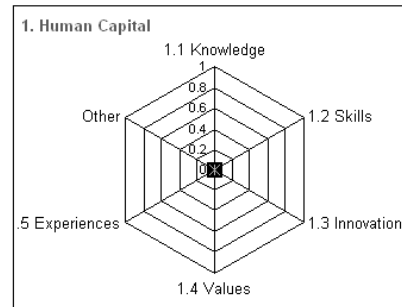
there is not change on the level of the personnel as well as the experience, however there is a down-size of the organization.

Considering the elements of table 1 and the decisions made on figure 10, in the next figure 12 are the radar identification and relevance of the intangible assets related to Human Capital. The criterion used for this case and forward is as follows: after the decision makers made a relevant decision in a specific month or quarter, it is mapped to the elements of table 1. If it hits a particular asset, then it is accounted as 1, but if it does not match then it is considered a 0 in the other group. Also and for clarity of the data, the information has been grouped per quarters previous to the crisis, during the crisis and then during the recession.

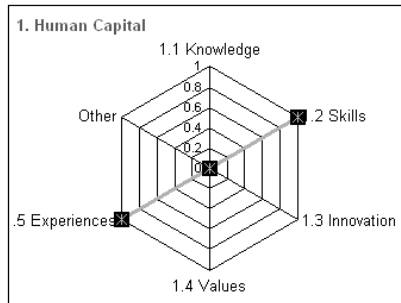
Also, in the next figure 13 are identified in a 3-D graph the tendencies of the intangibles, also are identified those relevant to table 1, and those that belong to the other category. The elements accounted are enlisted on the next Table 3.



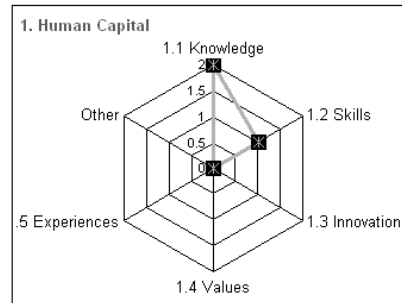
a) Phase 3



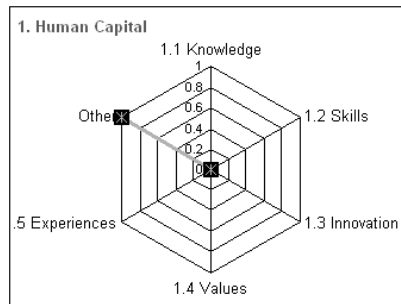
b) Phase 4&5



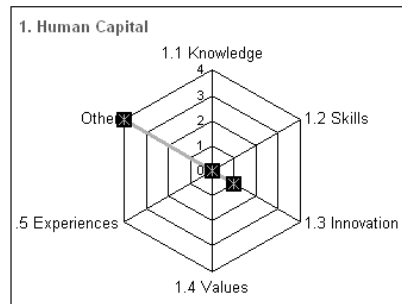
c) Phase 6: 1Q09



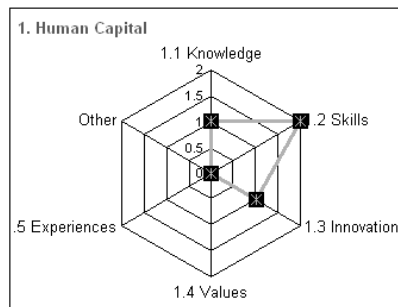
c) Phase 6: 2Q09



c) Phase 6: 3Q09



c) Phase 6: 4Q09



c) Phase 6: 1Q10

Figure 12: Relevant Intangible Assets related to Human Capital: a) During phase 3, b) during phases 4 & 5, c) during phase 6 but in quarters since 2009 to 2010.

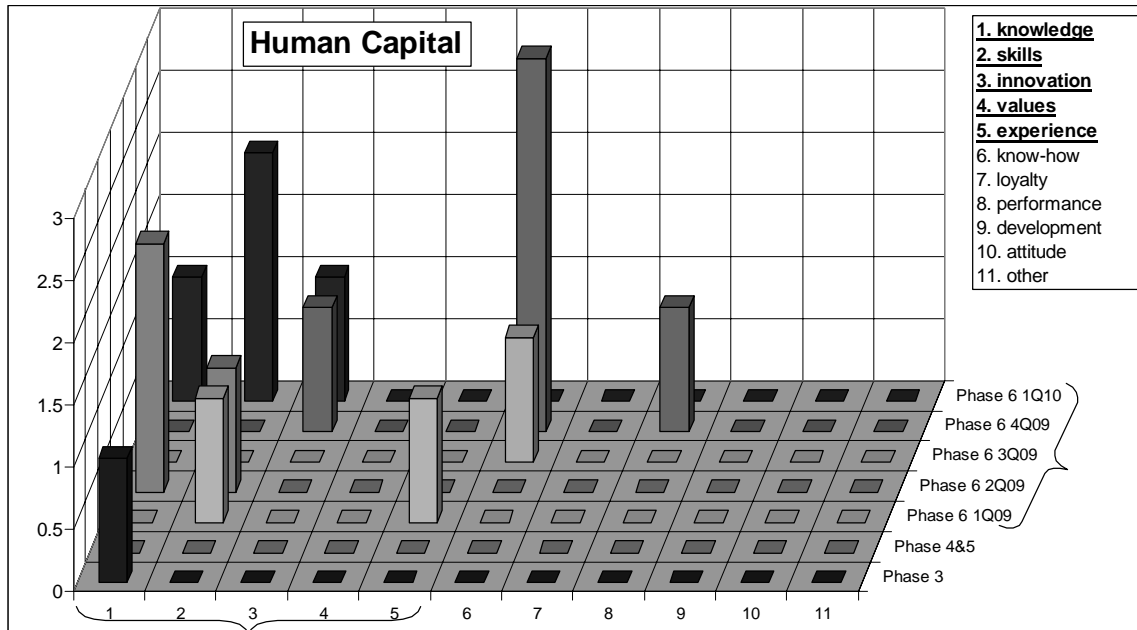


Figure 13: All intangibles related to Human Capital

So far, the information gathered in previous figures 12 and 13 from the organization, there are more intangible assets that are becoming relevant during the current downturn. This means that assets more relevant are those related not only to the employees' knowledge, skills, innovation and experience (this group belong to the table 1 taxonomy), but also know-how and people performance. Moreover, those intangibles related to employee values are not becoming relevant during the recession phase. This new taxonomy is consistent to the headcount and especially to the more experienced people remaining inside the organization, right after the downsizing of the organization.

IC	Other Intangible Assets
1. Huma Capital	1.6 Know-how 1.7 Loyalty 1.8 Performance 1.9 Development 1.10 Attitude 1.11 Other
2. Structural Capital	2. 6 Culture 2.7 Administration and management 2.8 Information technology 2.9 Routines and practices 2.10 Publications 2.11 Business strategy 2.12 Other
3. Relational Capital	3.5 Partners 3.6 Stakeholders 3.7 Stockholders 3.8 International policies 3.9 International operations 3.10 Consultants and assessors 3.11 Other

Table 3: All other intangible assets taxonomy

9. Structural Capital Aspects

Next in this report is the chance to analyze the Structural Capital intangibles behave during economic crisis of the organization. Considering the figure 14, it shows the expenditures related to this capital. After comparing it to figure 7 of all intangible expenditures, this type of expenditures is responsible of “pulling-up” the graph.

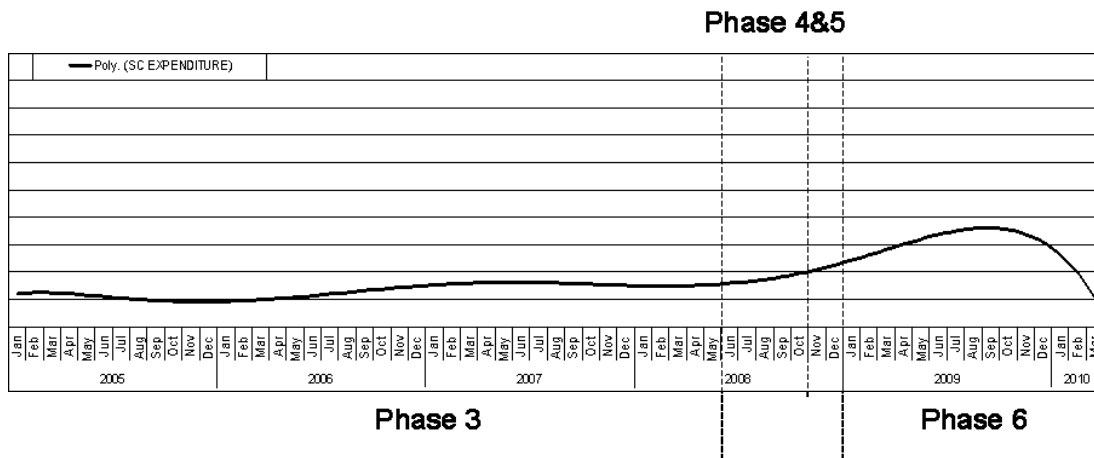


Figure 14: Expenditures related to Structural Intangibles

Before analyzing the organization decision making regarding this Intellectual Capital, it is relevant to review the organization expenditures, and find which intangible expenditure is the most relevant during this downturn (Abdul-Shukor et al, 2009). To perform this activity, the monthly amounts are compared using different statistical tools as follows.

9.1 Quantitative Analysis

As mentioned in previous paragraphs, expenditures related to intangible assets such as Structural Capital have a particular trend during the economic downturn, as shown in figure 14, especially at phases 3, 4&5 of the expansion and economic crisis and also at the phase 6 of recession too. Moreover, it is relevant

to find which intangible asset related to appropriate account of table 2 is having more relevance during the economic crisis while comparing their trends to the sales trend in figure 6.

To find out which expenditures are having a precedence during the downturn, some statistical tools were used to compare the different data series of expenditures and also to the sales from 2005 to 2010. The first step was to identify per data series the median, average, minimum, maximum and standard deviation (MathIsFun, 2005) but grouping them in the 3 groups regarding phase 3, phases 4&5 and phase 6, as shown in the next table 4.

		Phase 3 (Jan05-May08)					Phase 4&5 (Jun08-Dec08)					Phase 6 (Jan09-May10)				
		Mean	Median	Std.Dev	Min	Max	Mean	Median	Std.Dev	Min	Max	Mean	Median	Std.Dev	Min	Max
Structural Capital (SC)	1. Non-Deductive Expenditures	0.1579	0.1322	0.1807	0.0021	1.0000	0.7553	0.7362	0.1371	0.6012	1.0000	0.4547	0.3930	0.2404	0.1296	1.0000
	2. Variable Expenditures	0.2954	0.1954	0.2532	0.0000	1.0000	0.3897	0.3623	0.3550	0.0516	1.0000	0.0925	0.0268	0.2517	0.0000	1.0000
	3. Office Related Expenditures	0.5830	0.5703	0.1965	0.1558	1.0000	0.5562	0.6237	0.3273	0.1022	1.0000	0.6013	0.5929	0.2506	0.2134	1.0000
	4. Services and Taxes Related to the Product	0.1766	0.0875	0.2307	0.0000	1.0000	0.2636	0.0402	0.4198	0.0057	1.0000	0.2373	0.1395	0.3058	0.0059	1.0000
	5. Telephone and Computer	0.4862	0.4532	0.1684	0.2300	1.0000	0.7730	0.7561	0.2044	0.4227	1.0000	0.2687	0.2282	0.2191	0.0807	1.0000
	6. Rent Of Special Equipment	0.3200	0.2797	0.1902	0.0030	1.0000	0.4738	0.4381	0.2933	0.0039	1.0000	0.3169	0.1595	0.3519	0.0010	1.0000
	TOTAL SC EXPENDITURE	0.2653	0.1721	0.2142	0.0605	1.0000	0.3103	0.0983	0.3952	0.0484	1.0000	0.2800	0.1525	0.3020	0.0398	1.0000
TOTAL SALES	0.5121	0.5121	0.2427	0.1200	1.0000	0.6891	0.7808	0.2247	0.4065	1.0000	0.6043	0.6064	0.2345	0.2750	1.0000	

Table 4: Structural Capital and Sales standard deviation

Warning: all data has been normalized to the unit

The tools used to identify which data series became relevant was the t-Test or Student's test (GraphPad, 1999; Trochim, 2006; Diaz et al, 2001), the F-Test and the ANOVA (La Brake, 1992). These tools are used to compare two standard deviations. However, and after reviewing the results using a $p=0.05$ for the 3 tools, the preliminary conclusion is that they were useful to identify how spread are the data (expenditures) among them but the relevance in the period or phase. So, they are not appropriate to the purpose of this research. Also, a comparison of the standard deviations respect to its average and then identify which data series has more spread expenditures. Again, this approach did not reveal good information to identify which expenditure is more relevant during phases 4&5 and phase 6.

Despite the reported results, the previous analysis of the standard deviation is useful to clarify the monitor phases of the economic crisis and downturn, but reviewing only with the sales data series. This means that the mentioned phases 4&5 and 6 are identified while comparing the average data and standard deviation. For example, the average and the data spread of phase 3 implies a higher value than the amount indicated in phase 4&5 and phase 6. But during phase 4&5 the average is high but the spread is also high; this could be interpreted as the sales varies considerably, implicating a period of time with inaccurate growth. However, during phase 6, the average data is lower than previous phase, but the standard deviation shows that the data has a trend and is stable. If this information is compared to figure 6, the phase identification is accurate and has been confirmed the average of time estimated per phase.

Moreover to the previous analysis, another test was performed to identify which expenditure is having more relevance during the economic crisis, but this time was using Pearson correlation tool. This was elected due to the fact that compares not only two standard deviations of data series, but also its trend. So, the analysis was performed comparing all the expenditures in intangibles to the sales, but in the three phases of this research (3, 4&5 and 6).

The Pearson correlation analysis was elected because its simplicity to find if two data series have a similar trend gives a number close to +1, but if the analysis gives a correlation number of -1 implies that both data series are running in opposite ways. Additionally, if the result is close to 0, means that both data series are completely different. Considering this criteria, next are some other considerations for the analysis:

1. An expenditure account is considered relevant when its Pearson correlation analysis respect to sales is close to +1 during phases 3 and phases 4&5.

2. An expenditure account is considered relevant when its Pearson correlation analysis respect to sales is close to -1 during phase 6. Due to the fact that during this phase the sales are going down while the expenditure is expected to increase. This means that both are running in opposite trends.
3. But if the Pearson correlation analysis has a result close to 0, it is considered as a-non-relevant date because the expenditure and the sales trend are both running different.

After running the analysis among all the expenditures and also to the sales trend, in next table 5 is shown the result, and also it is marked the account that complies with the criterion mentioned in the previous paragraph.

Structural Capital: Phase 3 (Jan05-May08)						
Pearson correlation	1. Non-Deductive Expenditures	2. Variable Expenditures	3. Office Related Expenditures	4. Services and Taxes Related to the Product	5. Telephone and Computer	6. Rent Of Special Equipment
0. Sales	0.42383	-0.07369	0.09608	0.39127	-0.37114	0.21714
1. Non-Deductive Expenditures	1.00000	0.06211	0.13847	0.26263	-0.24157	-0.07376
2. Variable Expenditures		1.00000	0.37027	0.01360	-0.20825	-0.31049
3. Office Related Expenditures			1.00000	-0.11178	0.02706	-0.18766
4. Services and Taxes Related to the Product				1.00000	-0.17122	0.05964
5. Telephone and Computer					1.00000	-0.08974
Structural Capital: Phase 4&5 (Jun08-Dec08)						
Pearson correlation	1. Non-Deductive Expenditures	2. Variable Expenditures	3. Office Related Expenditures	4. Services and Taxes Related to the Product	5. Telephone and Computer	6. Rent Of Special Equipment
0. Sales	0.39815	0.36943	-0.56543	-0.04015	-0.24819	-0.47633
1. Non-Deductive Expenditures	1.00000	0.00638	0.16097	0.64954	-0.74668	-0.03452
2. Variable Expenditures		1.00000	-0.39014	-0.09637	-0.01665	-0.13469
3. Office Related Expenditures			1.00000	0.19873	-0.37640	-0.19336
4. Services and Taxes Related to the Product				1.00000	-0.38546	0.12162
5. Telephone and Computer					1.00000	0.41185
Structural Capital: Phase 6 (Jan09-May10)						
Pearson correlation	1. Non-Deductive Expenditures	2. Variable Expenditures	3. Office Related Expenditures	4. Services and Taxes Related to the Product	5. Telephone and Computer	6. Rent Of Special Equipment
0. Sales	0.16720	0.20839	0.38193	0.04676	-0.21505	0.07333
1. Non-Deductive Expenditures	1.00000	0.63010	0.56653	0.51165	-0.00494	0.47261
2. Variable Expenditures		1.00000	0.27528	0.45221	0.00999	0.51947
3. Office Related Expenditures			1.00000	0.36853	-0.28131	-0.01082
4. Services and Taxes Related to the Product				1.00000	-0.00625	0.10122
5. Telephone and Computer					1.00000	-0.03837

Table 5: Pearson correlation analysis

From table 5, it is shown that during phase 3 the expenditure related to Non-Deductive Expenditures, Services and Taxes Related to the Product, have a close relationship to sales trend. However, this research focuses on intangible assets during economic downturn. So next is the comparison to phases 4&5 related to the crisis and phase 6 related to recession, as follows.

For phases 4&5, the relevant expenditures are Non-Deductive Expenditure, Variable Expenditures, because these accounts are closer to 1 respect to the others.

For phase 6, the relevant expenditures is Telephone and Computer, because it Pearson correlation analysis result is closer to -1 respect to the others. Also, and after interviewing relevant actor about this finding, it made sense due to the fact that during the recession they are spending more time at the telephone looking for more deals and also to counter-cycle the decision to minimize travels.

The previous analysis represent that for this case study, during the economic crisis the expenditures around Telecommunications and Information Technology is more relevant than the other, but when the crisis started, the expenditures related to activities that are non deductive such as any activity that is not directly associated to the business or the operation; also the variable expenditures such as activities that are not in the expenditure catalog and are not fixed to the business operation became relevant.

9.2 Qualitative Analysis

After the crisis phase is ending and the recession is taking place, the expenditures are increasing, but in certain time of the year 2009 they increased to get contracted later. But, if this trend is compared to figure15, this situations is due to the fact that he organization is making the majority of its decisions considering intangibles related to structural capital, such as process, procedures or cost reductions.

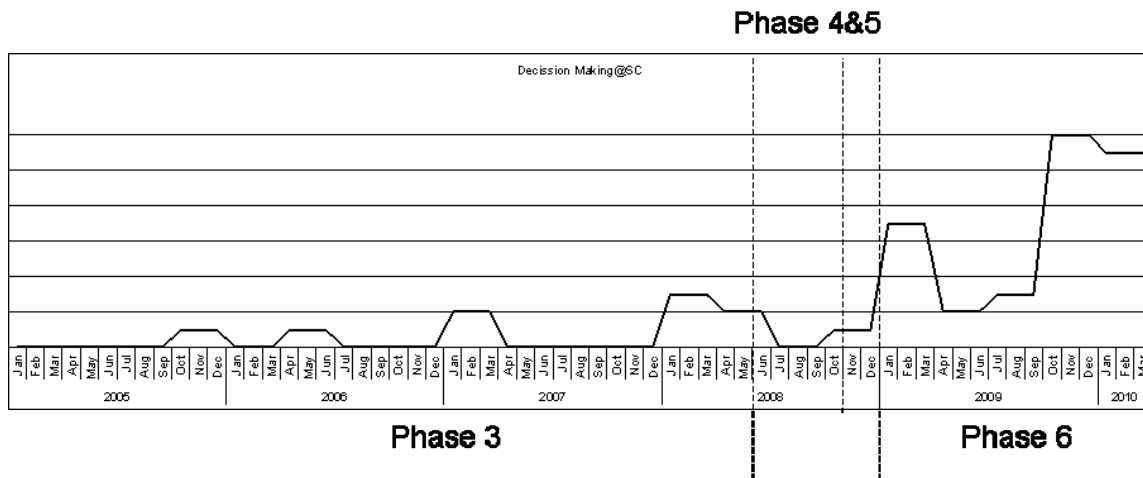


Figure 15: Decisions made related to SC

In this figure 15, it is relevant to mention that previous to the crisis, the organization made some decisions related to this group of intangibles, but the majority were made right after the recession started in 2009. During this period, the organization made some decisions, and expected to see the consequences on the economical situation then, and after the critical part is no getting better, the business made more decisions that are under evaluation and progress during this first quarter of 2010.

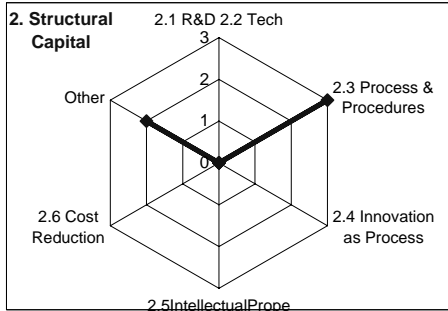
As the previous group of intangibles, in figures 16 are shown the intangible assets that are taking a relevant role during the crisis and recession phases. Herein, the assets related to R&D, Process and Procedures, cost reduction and other to be defined have been very active. But at the economic crisis, the organization only considered those related to Process and Procedures.

Moreover and during the beginning of the recession, the intangibles related to innovation as a process, cost reduction, Process and Procedures and other to be defined are having more precedence. In spite of this situation, the Process and Procedures intangible assets are relevant the most. The interpretation of this situation is that the organization is changing their own process to confront the

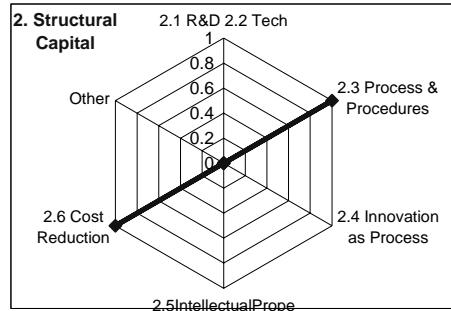
situation, meaning that is focusing more on quotation and pricing process to participate in a market that now a day is making decisions on price than quality. Even though, the organization is not considering relevant those assets such as R&D, Patents and Intellectual Property matters.

Similar to the previous group, there are relevant activities around other intangibles not listed in table 1 but in table 3. Those assets are clearly identified in next figure 17. Herein there are identified assets that are having more relevance during the context, such as those related to administration and management of the business, routine & procedures, and business strategy. But those related to Information Technology activities only became relevant just at phases 4&5 and not during phase 6.

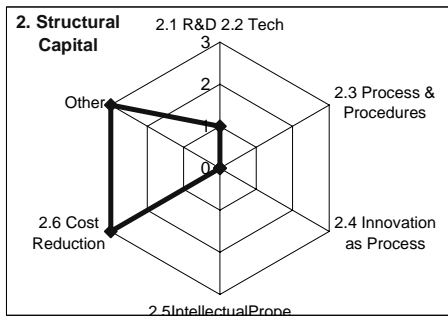
Additional, if these group of assets are compared to those related to Human and Relational Capital, then the amount of decisions made here are up to 8, while to the other two the maximum are 3.



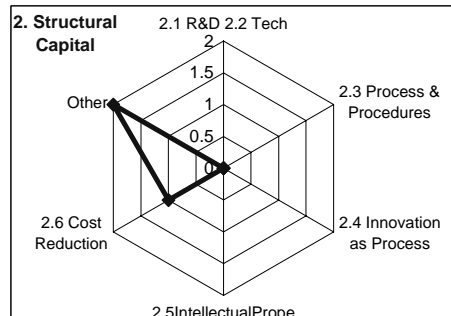
a) Phase 3



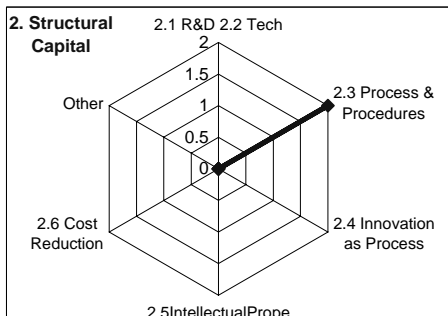
b) Phase 4&5



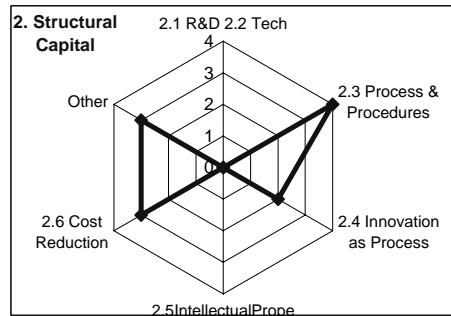
c) Phase 6: 1Q09



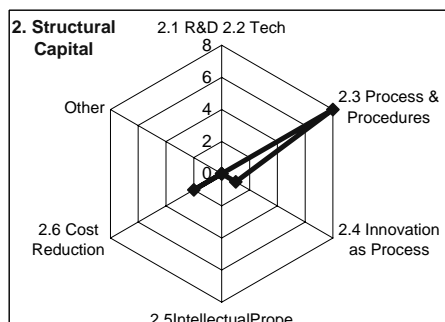
c) Phase 6: 2Q09



c) Phase 6: 3Q09



c) Phase 6: 4Q09



c) Phase 6: 1Q10

Figure 16: Relevant Intangible Assets related to Structural Capital: a) During phase 3, b) during phases 4 & 5, c) during phase 6 but in quarters since 2009 to 2010.

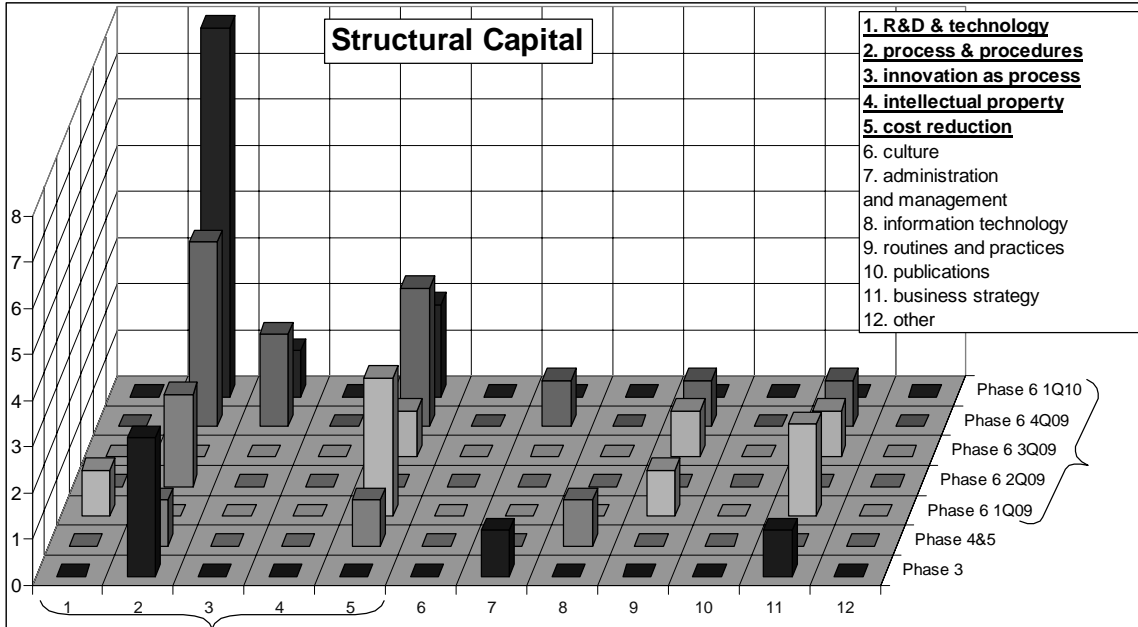


Figure 17: All intangibles related to Structural Capital

10. Relational Capital Aspects

Finally and regarding the Relation Capital group of intangibles, in the next figure 18 are identified the expenditures related to this group. Thus, the graph trend is to diminish this type of expenditures right after the phase 3 or the expansion was coming to an end.

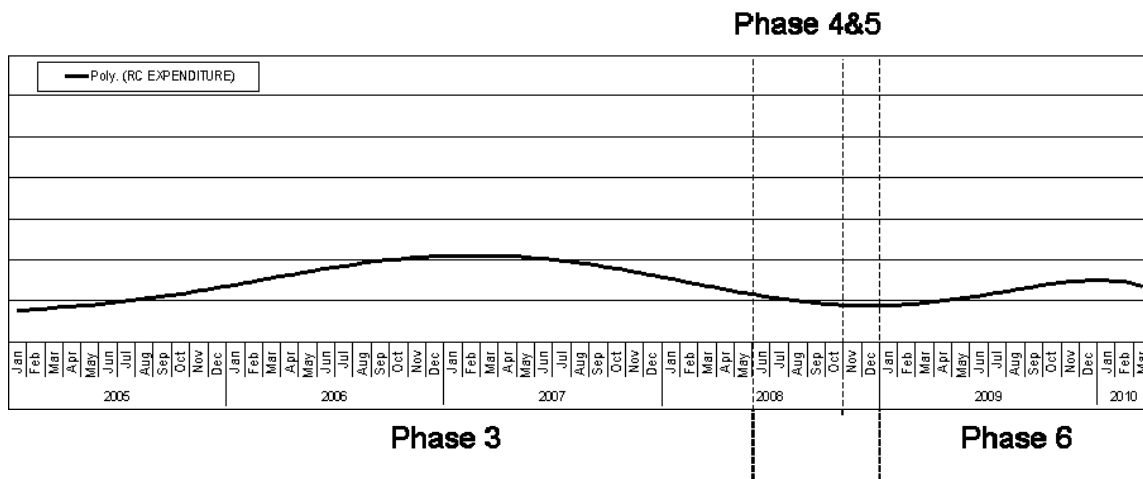


Figure 18: Expenditures related to Relational Intangibles

10.1 Quantitative Analysis

Considering the same analysis and criteria done in the previous part 9.1, the t-test, F-test and ANOVA tools (GraphPad, 1999; Trochim, 2006; Diaz et al, 2001; La Brake, 1992) were implemented to find out which expenditure account has more relevance during the economic crisis of this case study and like in the Structural Capital none of them were useful for this research.

In the next table 6 are shown the statistic analysis of the expenditures related to this group of Relational Capital. Here it is also shown the economic downturn considering the sales standard deviation at the 3 phases.

	Phase 3 (Jan05-May08)					Phase 4&5 (Jun08-Dec08)					Phase 6 (Jan09-May10)				
	Mean	Median	Std.Dev	Min	Max	Mean	Median	Std.Dev	Min	Max	Mean	Median	Std.Dev	Min	Max
1. Meetings	0.3562	0.3342	0.1883	0.0000	1.0000	0.4186	0.2160	0.4054	0.0000	1.0000	0.2875	0.1786	0.2971	0.0000	1.0000
2. Expos And Conferences	0.2388	0.1718	0.2538	0.0000	1.0000	0.3803	0.3709	0.3255	0.0605	1.0000	0.3839	0.3440	0.2891	0.0305	1.0000
3. Travel Expenditures	0.2773	0.2401	0.2270	0.0000	1.0000	0.1901	0.0000	0.3778	0.0000	1.0000	0.0874	0.0000	0.2579	0.0000	1.0000
4. Marketing and Promotion	0.2415	0.1279	0.2657	0.0000	1.0000	0.2160	0.0518	0.3523	0.0016	1.0000	0.2315	0.2119	0.3504	-0.4943	1.0000
5. Assessors And Consultants	0.0625	0.0000	0.1850	0.0000	1.0000	0.3479	0.1013	0.4534	0.0000	1.0000	0.0941	0.0000	0.2545	0.0000	1.0000
6. Inscription To Public Bids	0.1804	0.0607	0.2359	0.0000	1.0000	0.3742	0.3049	0.3078	0.0585	1.0000	0.2750	0.2621	0.3042	0.0000	1.0000
7. Clubs And Associations Fees	0.1611	0.0193	0.2581	-0.4514	1.0000	0.1605	0.0000	0.3730	0.0000	1.0000	0.1063	0.0000	0.2737	0.0000	1.0000
8. Technical Assistance For Imports	0.0300	0.0000	0.1594	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0835	0.0000	0.2574	0.0000	1.0000
TOTAL RC EXPENDITURE	0.2558	0.1797	0.2028	0.0259	1.0000	0.4276	0.3781	0.2843	0.1506	1.0000	0.4605	0.4256	0.2444	0.1231	1.0000
TOTAL SALES	0.5121	0.5121	0.2427	0.1200	1.0000	0.6891	0.7808	0.2247	0.4065	1.0000	0.6043	0.6064	0.2345	0.2750	1.0000

Table 6: Relational Capital and Sales standard deviation

Warning: all data has been normalized to the unit

Moreover and after doing the same considerations of the Pearson correlation analysis described in the previous section, next are the same criteria used in order to identify which intangible expenditures are relevant during the economic crisis and downturn.

1. An expenditure account is considered relevant when its Pearson correlation analysis respect to sales is close to +1 during phases 3 and phases 4&5.
2. An expenditure account is considered relevant when its Pearson correlation analysis respect to sales is close to -1 during phase 6. Due to the fact that during this phase the sales are going down while the expenditure is expected to increase. This means that both are running in opposite trends.
3. But if the Pearson correlation analysis has a result close to 0, it is considered as a-non-relevant date because the expenditure and the sales trend are both running different.

In the next table 7 is the Pearson correlation analysis of all the expenditures compared to the sales.

Relational Capital: Phase 3 (Jan05-May08)								
Pearson correlation	1. Meetings	2. Expos and Conferences	3. Travel Expenditures	4. Marketing and Promotion	5. Assessors and Consultants	6. Inscription to Public Bids	7. Clubs and Associations Fees	8. Technical Assistance for Imports
0. Sales	-0.09616	0.16880	0.19705	0.29646	0.17055	0.12799	-0.29694	0.14083
1. Meetings	1.00000	0.02612	0.38339	-0.00620	-0.12823	-0.01962	0.18036	-0.30802
2. Expos And Conferences		1.00000	0.20494	-0.04376	-0.00039	0.22280	-0.06346	-0.06003
3. Travel Expenditures			1.00000	0.21080	-0.03028	0.13397	0.06495	-0.22571
4. Marketing and Promotion				1.00000	0.51603	-0.08263	-0.18411	-0.05570
5. Assessors And Consultants					1.00000	-0.00772	0.04437	0.13046
6. Inscription To Public Bids						1.00000	0.17798	-0.11673
7. Clubs And Associations Fees							1.00000	-0.06692
Relational Capital: Phase 4&5 (Jun08-Dec08)								
Pearson correlation	1. Meetings	2. Expos and Conferences	3. Travel Expenditures	4. Marketing and Promotion	5. Assessors and Consultants	6. Inscription to Public Bids	7. Clubs and Associations Fees	8. Technical Assistance for Imports
0. Sales	0.29663	0.31114	0.05912	-0.34913	0.31941	0.25830	0.13880	ND
1. Meetings	1.00000	-0.38621	-0.45630	-0.29784	-0.19569	-0.17681	-0.39645	ND
2. Expos And Conferences		1.00000	0.69640	-0.28962	0.67934	0.95131	0.81417	ND
3. Travel Expenditures			1.00000	0.28529	0.52255	0.74721	0.93004	ND
4. Marketing and Promotion				1.00000	-0.17804	-0.31492	-0.07342	ND
5. Assessors And Consultants					1.00000	0.68103	0.64486	ND
6. Inscription To Public Bids						1.00000	0.87855	ND
7. Clubs And Associations Fees							1.00000	ND
Relational Capital: Phase 6 (Jan09-May10)								
Pearson correlation	1. Meetings	2. Expos and Conferences	3. Travel Expenditures	4. Marketing and Promotion	5. Assessors and Consultants	6. Inscription to Public Bids	7. Clubs and Associations Fees	8. Technical Assistance for Imports
0. Sales	0.13636	0.62062	0.51514	-0.32402	-0.20393	-0.11182	0.24155	0.13806
1. Meetings	1.00000	0.28558	0.65362	-0.25834	-0.19703	0.63788	-0.12842	0.23708
2. Expos And Conferences		1.00000	0.30460	-0.52844	-0.05937	-0.09048	0.11996	0.61462
3. Travel Expenditures			1.00000	-0.57856	-0.09922	0.38313	-0.13969	0.05880
4. Marketing and Promotion				1.00000	-0.19064	-0.16492	-0.02923	-0.26687
5. Assessors And Consultants					1.00000	-0.23350	-0.07596	-0.11482
6. Inscription To Public Bids						1.00000	-0.20591	0.32503
7. Clubs And Associations Fees							1.00000	-0.07915

Table 6: Pearson correlation analysis

From this table 6, the next expenditures are relevant during the different phases:

For phases 4&5, the Meetings, Expos and Conferences, and Assessors and Consultants are the relevant expenditures on intangibles.

For phase 6, the Marketing and Promotion, as well as Assessors and Consultants expenditure is the relevant. Also and after interviewing relevant decision makers, the confirmed that these variables made sense because during

the difficult part, they are trying to promote the brand in international markets and also are asking professional advisor to overcome the current situation.

The previous analysis represent that for this case study, during the economic crisis the expenditures around business exposure while promoting the business product and services is more relevant than the other, but when the crisis started the expenditures related to assessor, consultants and participating in expos activities became relevant.

10.2 Qualitative Analysis

As seen in the next figure 19 and compared to figure 18, the explanation of the critical diminish of this expenditures is due to the fact that the organization is making decisions related to cutting travel expenditures while reducing them. This situation implies that the travels used to include many employees visiting customers, conventions, forums; but now, they only send one employee to the minimum travels. Also, this contraction implied to cut-off expenditures related to consults and assessors.

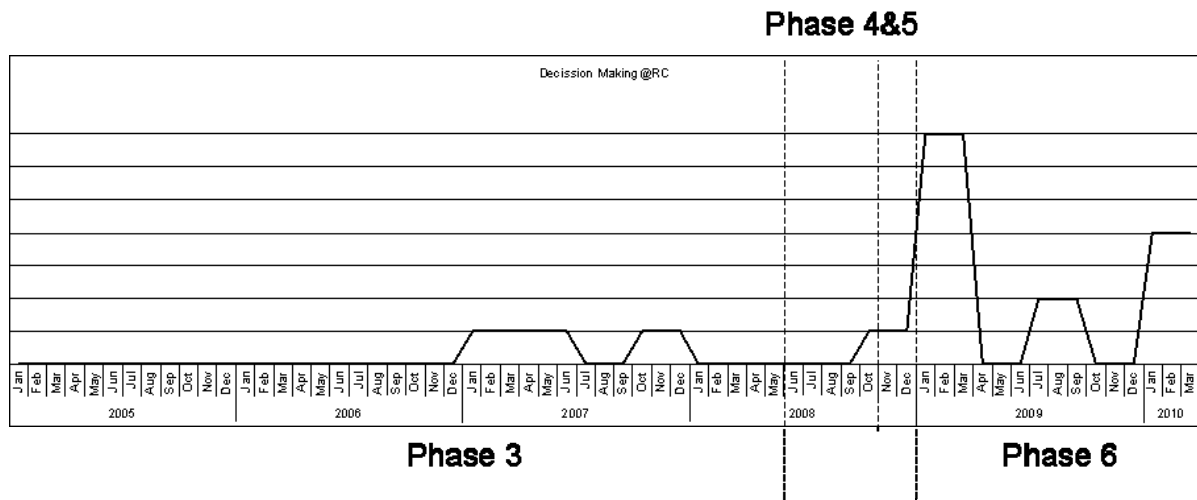
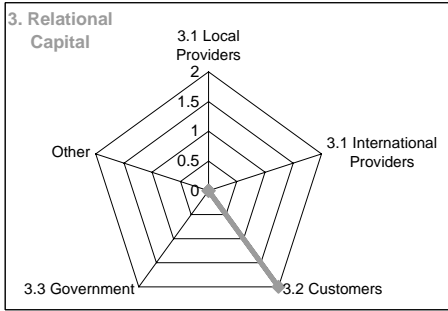


Figure 19: Decision made related to SC

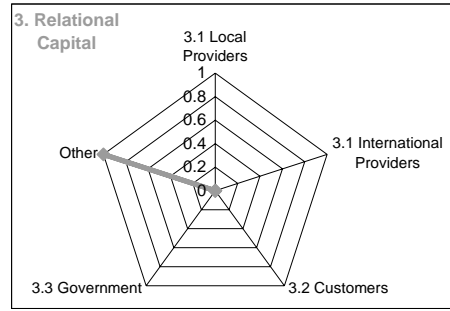
Like the previous intangibles, it is relevant to review figure 20 to identify to which intangibles the organization is making relevant. Thus all the intangibles are not considered but the relation to customers is the primary one. This is because the organization wants to keep fresh and in a high level the relationship to customers and getting more orders and sales during the current recession.

Moreover, in figure 21 are identified the following assets that are becoming relevant during the downturn context: Relationship with local and international providers, government related activities, and the relationship to customers is the asset more relevant during the 2009 and 1Q10. However, assets related to consultants, assessors and international policies became relevant just at the beginning of the crisis context but no more decisions have been done during the recession part.

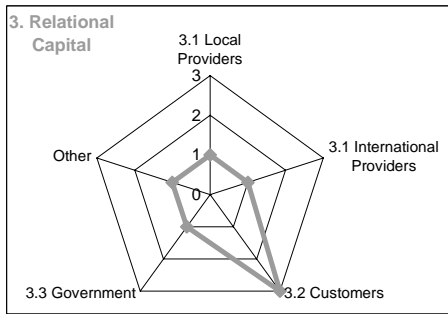
Moreover, all the intangibles identified in table 1 are really the asset more relevant during the recession phase, but the other assets that are identified in table 3 have not been identified as relevant, at least as of 1Q10.



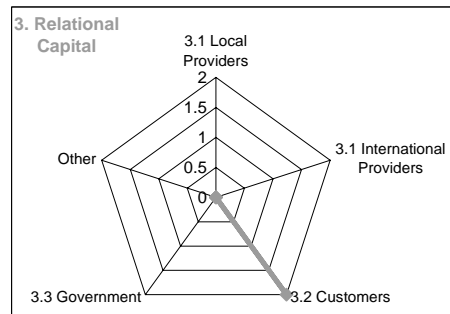
a) Phase 3



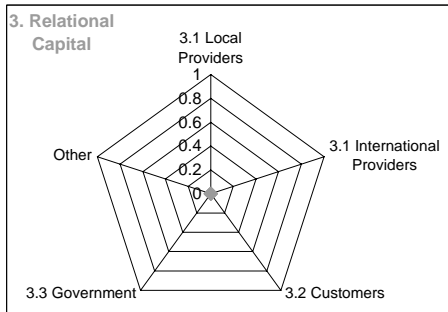
b) Phase 4&5



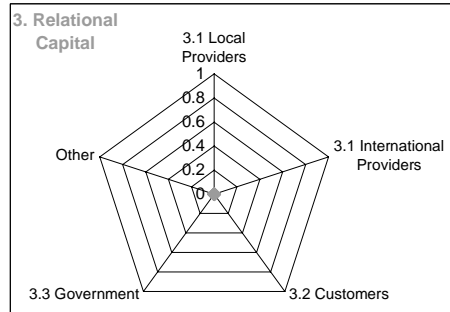
c) Phase 6: 1Q09



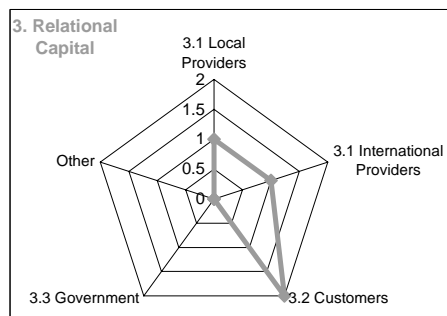
c) Phase 6: 2Q09



c) Phase 6: 3Q09



c) Phase 6: 4Q09



c) Phase 6: 1Q10

Figure 20: Relevant Intangible Assets related to Relational Capital: a) During phase 3, b) during phases 4 & 5, c) during phase 6 but in quarters since 2009 to 2010.

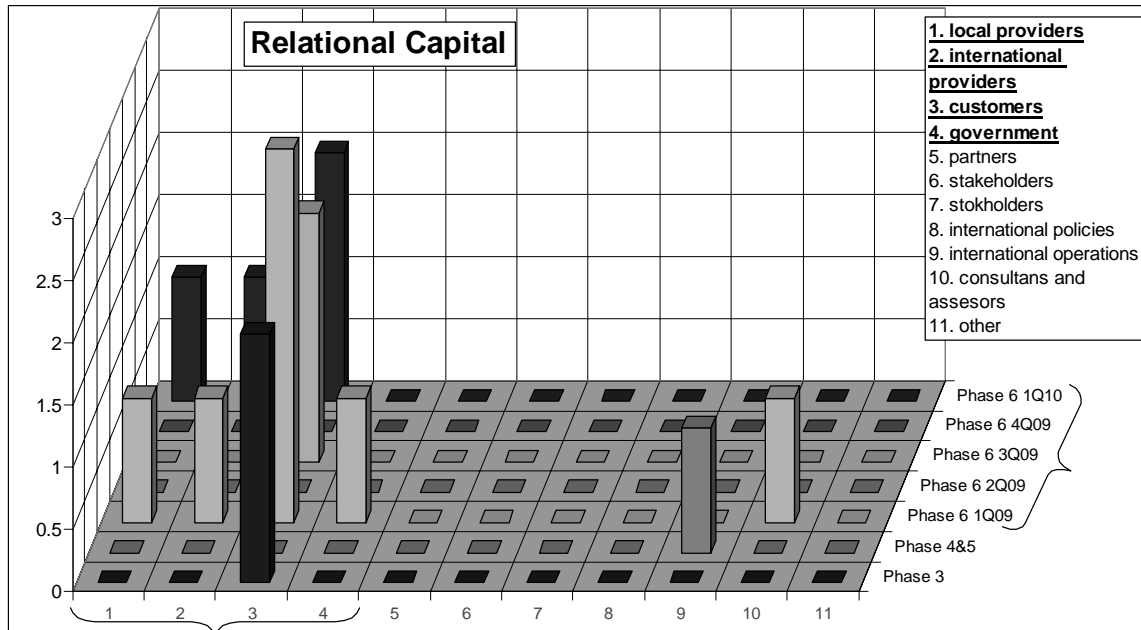


Figure 21: All intangibles related to Relational Capital

11. Relevant Comments Regarding Intangible Asset Monitor

With the information found on this report, it is relevant to mention the following comments:

1.- At the beginning of the recession, the organization made more decision related to Structural Capital and Relational Capital, but while the recession and slope down increased, the organization prioritizes decision on Structural Capital and Human Capital. Because of this trend, the decision makers confirmed that the organization decided to diminish all expenditures to consultants and also to activities out of the business such as customer visits (reduce the amount of delegates per trip), expos on summits and others.

2.- The organization intangible assets that are being more relevant are those related to internal process, procedures, systems, cut-cost and other that are part of the business or Structural Capital. This is also confirmed with the expenditures related to this type whereas the organization is spending more on internal process and procedures than other. But their expenditures are more inverse correlated to the sales in the matters of telecommunications and telephone services.

3.- At the beginning of the recession, the organization made many decisions related to the Relational Capital, but after the time passed, the organization decided to stop more expenditures on this chapter (as described en previous paragraph). However, the decision makers are considering relevant action around local and international providers, as well as customers. Moreover, and regarding their expenditures, the organization is considering more relevant during the recession all expenditures related to the re-position of the brand and also to hire assessors and consultants to help the organization restructure inside the business.

4.- A new taxonomy of intangible assets during economic crisis is found for this case study. It is similar to the table 1, but has at least less assets for Human Capital, more assets found for the Structural Capital and reminds equal to those related to Relational Capital. But considering the expenditures mentioned in previous paragraphs.

12. Highlight related to Decision Making

The questions made to the decision makers are as follows and also some comments are reported:

1.- During the last year, which were the most relevant decisions made?

Comment: The answer to this question provided relevant activities to the organization, and this information is compared in a matrix that includes the intangible assets identified on table 1. After several interviews during the recession of year 2010, the intangibles are monitored.

2.- What did influence on the decision made: experience, intuition or any other?

Comment: During the interviews conducted, the decision makers concluded that the decisions made were mostly based on data and information coming from different sources inside and outside the organization. Due to the culture of the organization, the decisions were less based on intuition and more on hard data.

3.- During the same period of time from 2008 and 2009, were the meetings and team backs more intense and change focus?

Comment: The decision-makers commented that the amount of interviews and meetings have not changed on frequency, duration and participants. They only adjust the focus of the meetings making them with more intensity and focus on sales level, new opportunities to sell and new orders entry. This happened on all daily meetings.

13. References

Abdul-Shukor, Z, Jagjit-Kaur, M., Md Nor, H. (2009) "The Value Relevance of Intangible Non-Current Assets During Different Economic Conditions and Accounting Environments". *Malaysian Accounting Review*, Vol. 8, No. 2, Pp. 43-66

Akerman, J. (1960) "Estructuras y Ciclos Económicos". E. Aguilar. 1st Edition. Madrid.

Blausten, P. (2009) "Can Authentic Leadership Survive the Downturn?", *Business Strategy Review*, London Business School, Pp 84-87

Bonn, I., Rundle-Thiele, S. (2007) "Do or Die- Strategic Decision-Making Following a Shock Event". *Tourism Management*. Vol. 28, Pp. 615-620

Chin, A., Hooper, P. and Oum, T. H. (1999) "The impacts of the Asian economic crisis on asian airlines: short-run responses and long-run effects". *Journal of Air Transport Management* Vol 5. Pp 87-96

Diaz, P., Fernandez, P. (2001) "Métodos paramétricos para la comparación de dos medias. T Student". *Unidad de Epidemiología Clínica y Bioestadística. Complejo Hospitalario Juan Canalejo*. No. 8. Pp. 37-41

Eliasson, G. (2005) "The nature of economic change and management in a new knowledge based information economy" *Information Economics and Policy*. No. 17. Pp. 428-456

Ernst, D. (1998) "Catching-up, crisis and industrial upgrading: Evolutionary aspects of Technological Learning in Korea's Electronics Industry", *Asia Pacific Journal of Management*, Vol. 15, Pp. 247-283

GraphPad (1999) "Interpreting the Unpaired T Test". On line: www.graphpad.com

Harvey, M. & Lusch, R. (1997) "Protecting the core competencies of a company: Intangible asset security". *European Management Journal*. Vol. 15, No. 5. Pp. 370-380

Heylen, F., Pozzi, L. (2007) "Crisis and Human Capital Accumulation". *Canadian Journal of Economics*. Vol. 40, Issue 4, Pp. 1261-1285

Krugman, P., Stiglitz, J., Gorbachov, M., Soros, G., Toffler, A., Brown, G., Oppenheimer, A. (2009) "La Crisis Económica Mundial". Ed. Debate. México.

La Brake, M. (1992) "Test for Differences". Six Sigma Research Institute. Motorola University Press.

Lafrenz, K. (2006) "From Crisis to Value Increase: How Companies can Attain High Profits During a Restructuring Phase". From book Corporate Restructuring Finance in Times of Crisis. Ed. Springe. Berlin Heidelberg.

Lee, S., Beamish, P., Lee, H., Park, J. (2008) "Strategic Choice During Economic Crisis: Domestic Market Position, Organizational Capabilities and Export Flexibility". Journal of World Business. Doi: 10.1016/j.jwb.2008.03.015

MathsFun (2005) "Standard Deviation and Variance" Online: www.mathsFun.com

Moore, L. (2009) "Surviving Financial Crisis With Structural Capital". Functional Ingredients

Pate, N. & Narain, U. (2008) "Can intangible assets act as a cushion in a down turn?". Online report by www.watsonwyatt.com

Santella, N., Steinberg, L., Parks, K (2009) "Decision Making for Extreme Events: Modeling Critical Infrastructure Interdependencies to Aid mitigation and Response Planning". Review of Policy Research. Vol. 26, Issue 4, Pp. 409-422

Sayegh, L., Anthony, W., Perrewé, P. (2004) "Managerial Decision-Making Under Crisis: The Role of Emotion in an Intuitive Decision Process". Huma Resource Managemnr Review. Vol. 14, Pp. 179-199

Schenker-Wicki, A., Inauen, M. & Olivares, M. (2009) "Unmastered risks: From crisis to catastrophe. An economic and management insight". Journal of Business Research. Doi:10.1016/j.jbusters.2009.02.021

Tan, H., Mathews, J. (2009) "Cyclical Dynamics in Three Industries" Danish Research Unit for Industrial Dynamics.

Trochim, W. (2006) "The T-Test". Research Methods Knowledge Base. On line