

**Building Balanced Scorecard in a complex form of enterprise with various effective managerial tools and performance strategies.  
The case of Gas Corporation S.A., in Greece.**

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**Abstract**

*The present paper makes a significant effort to introduce and eventually build the appropriate Balanced Scorecard (BSC) for the specific Gas Company of Greece. As the latter is a complex organisation several management tools are considered important for the most accurate development of BSC as a strategic planning tool. An overview of the performance measures and specifically the gap between traditional and innovative performance measures is provided, so as the necessity for using progressive tools to be highlighted. Moreover, the gap between the obsolete Greek means of measuring performance and suggested ones by literature is underlined, so as to provide insight to Greek companies in improving their performance measurement system as well as keep it consistent with their strategic objectives. Finally, it was considered vital that two BSCs for both public and private sectors to be build in order to obtain the most appropriate total BSC for the specific complex organisation. It was also considered important to use particular management tools for the most accurate results and proper suggestions for improving strategic objectives of the company. As a result, the aim of this paper by developing BSC was to provide more comprehensive and efficient procedures through which managers can develop strategies and goals for progressive and competitive future businesses. As far as the specific company.*

**Keywords:** BSC, management tools, complex organizations, public sector, private sector, performance measures

## Introduction

For an extended period of time in the past and even today, in a business environment, particular confidence in financial measures has always been central so as to evaluate the company's level of performance. Specifically, the success of a company and its development in industry is marked by financial elements, which consist in the absence or presence of enhancement in the profits. Despite this, at the present time an organisation's environment has been enormously complicated due to the fact that it can be under the influence of constant alterations as globalisation, technical development, corporate policies, and elevated antagonism to mention a few examples. The above issues can have a considerable influence on the performance of companies, no matter if these companies are non-profit or not. A novel dimension, has characterized achievement capacity which incorporates even additional features of the process and delivery of services of endeavours. As a result, is it not possible for the traditional performance management tools to adjust to the novel conditions for the reason that they are quite old-fashioned and for a transformation of strategic character to be materialized and the conditions of success of a new strategy to be created?

Balanced Scorecard (BSC) is one of the most important performance measurement systems, which developed the last years by R. Kaplan και D. Norton (1992). This model allows the company to acquire strategic focus. In addition, allows and enhances the strategic learning and the feedback of the company's strategy, while at the same time depicts the extent to which a company materializes its strategic targets through the follow up of appropriately selected (of strategic character) measurements.

As far as Greece is concerned, there are a number of factors, which considerably delay the development of its company's progress and its economy as a whole. It would be advisable by mentioning that Greece is a developing country and many obstacles have arisen at this intermediary stage. Furthermore, the majority of Greek companies are of medium if not small size and this is something that limits additionally their awareness and financial position towards innovative performance measurement systems like Balanced Scorecard (BSC). Despite this, the most noteworthy point is that most Greek companies are typically ignorant of the presence of such frameworks.

The present paper aims to the development of the Balanced Scorecard (BSC) model of the Gas Corporation as system of strategic management. The imminent emancipation of the market of Gas in Greece obliges the Gas Company X (the activities of which until very recently were monopolized by the government) to start the preparation for its adaptation to the conditions that will be created as well as for its transformation to a competitive company. In order for the implementation of the model however, to be decided in the company of Gas Corporation, some management tools were used such as the SWOT, AHP and QFD methods, and some strategies so that things could become clear and additionally unravel whether BSC can indeed be implemented in such a peculiar company.

First aim of the present work is to identify with the aid of research (interviews and questionnaires) all the crucial parameters which are associated with the vision, mission and strategy of Gas Corporation. In the new period, in which the company is entering, the suitable ones (KPIs) should be defined, so as to be entered in the under

development scheme of BSC of the company. Additionally, the research seeks to define, which procedures and strategies the company should followed so as to select the model of BSC. As far as the suitability of the model is concerned, as system of strategic management in a public company, the research will attempt to demonstrate that, despite the presence of some obstacles and limitations, from the exterior mainly environment, the model is suitable to serve its purposes.

## **Literature Review**

As current years are characterized by rapidly occurring changes, the commercial environment has also been seriously affected. As Atkinson (2006) comments, several factors such as "escalating globalisation, sophisticated customers, subtle product differentiation", just to name some, have forced the "industrial age" to give way to the "information age" and suggests the development of multidimensional performance measures. In addition, Sotirakou and Zeppou's (2006) reference to radical changes was oriented towards a transformation from a conventional system into a strategically philosophised, wide and clear as well as flexible system that satisfies all stakeholders' demands. Another important feature of this new environment is the collaboration between companies and non-profit organisations. Vernis et al. (2006) claim that the key factors that enhance the linkage between companies and non-profit organisations, hinge on specific benefits obtained through "cross-sector agreements". According to Lane (1993, cited in Eskildsen et al. 2004) one probable reason may be the unequal strategic freedom of public and private sector that may pose restrictions on the organisation's operational ability.

The need for change that was initially pervasive in profit organizations had highlighted the desire for implementing a new performance measurement system.

## **BSC an Overview**

Balanced Scorecard, introduced in 1992 by Kaplan and Norton, was regarded as the most appropriate framework for performance measurement because it "retains financial measurement as critical summary of managerial and business performance, but it highlights a more general and integrated set of measurements that link current customer, internal process, employee and system performance to long-term financial success" (Kaplan & Norton, 1996). BSC uses both 'lag' (financial) and 'lead' (non-financial) indicators, as well as it set the objectives in four main perspectives: financial, customer, internal business process and learning and growth (McLaney & Atrill, 2005). Besides, some additional perspectives exist referring to human resources, the environmental and supplier perspectives, which could be integrated in the original ones, as their context fluctuates. Since the implementation of BSC in the private sector was met with success and the environmental changes started affecting the public sector as well, the need to be applied also in the latter was apparent. Even though, its suitability for public sector was a matter for debate for a period of time, it has been eventually proved that BSC can successfully be applied in public organisations as well (Wisniewski and Dickson, 2001).

### **BSC in Public and Private Sectors**

Complex organisations are dominant in Greece, where the situation is even more complicated. As Sotirakou and Zeppou (2006) noted "Greek public administration is bureaucratic, highly centralized, inflexible and inefficient system" and continue by underlining the need for "a holistic framework that understands the responsibilities of contemporary public administration, such as, responsiveness to market conditions along with assurance of citizens' rights and well being". Even though some attempt was made to decentralize many of its responsibilities to local authorities through the formulation of 'Kapodistrias' Act in 1998, still the need for radical changes in order to survive in the current competitive European environment remained prominent. Particularly, services such as energy, water supply were part of government control and operated regionally in a monopolistic way. For this reason and in accordance with the business environmental changes, many European countries started opening their markets, which increased challenges for the energy industry (Haapasalo et al. 2006). Greek companies whose services concern the production and supply of energy, water, telecommunication and many other services, were also confronted with such challenges. Thus, the need to survive from the competition led companies to change their management. So, in comparison to other management tools that were being used by Gas Corporation S.A., the present model has an extra advantage because precisely as a system of strategic administration allows the follow up of the strategic goals, the control of the conditions, the strategic learning and development but also the feedback/transformation of the strategy without encircling the company in a specific and undisputable prototype.

### **Management Tools**

Some data need to proceed to acquire and examine the necessary financial and non-financial indicators, since the effectiveness of BSC is a result of those metrics' accurateness for the purpose of the KPIs. Furthermore, this management tools help the company to take a lot of important decisions and use it to the business strategy. For this reason, the methods that will be used for the implementation of BSC in GAS COMPANY X are analysed below, whereas the combination among these tools is more explicit in the analysis chapter.

### **Research Methodology**

The current paper necessitates an exhaustive knowledge of the difficulties and insufficiency of the present performance measurement tool in the context of Gas Corporation usual background. Yet, the complexity of Gas Company X causes the demand to divide the 'relevant from the irrelevant' and subsequently arrange and construct the first (relevant) in order to attain significant investigation (Baker, 2003). As a result, important propositions and ideas have been delineated, providing either motivation or careful consideration on other companies. The present research, take into account numerous sources of data. This selection is generated because of the necessity to investigate the 'real-life context' of the company from a secure viewpoint. In addition, it is the only advance, via which additional data are attainable, which although it is so significant, we do not encounter it in any printed papers (Feagin et al., 1991; Saunders et al., 2003).

For the aims of the present paper, specifically, qualitative information is utilized for gathering information, whilst this is examined by quantitative techniques. So, the combination of qualitative and quantitative data can be considered vital in the development, clarification and analysis of both financial and non-financial indicators that are required.

#### **Data collection**

The data have been collected by a combination of 30 questionnaires and 11 interviews, two types of questionnaires were selected as an alternative way of primary gathering of information due to their many advantages. Also, queries have been applied to large samples which strengthen the precision of the outcomes to a greater extent.

Also, as suggested by White (2000), interviews are considered to be the most valuable and extensively applied qualitative method of gathering primary information and offering a significant basis of subject-matter, which the informant has the opportunity to 'talk them through in their own time'. Regarding the public sector, interviews were administered to recently employed executives of Gas Corporation who have not been controlled by the bureaucracy and hold more unbiased views for the situation in the company (Sotirakou and Zeppou, 2006). For the present paper interviews were the most important way of gathering primary information as they are most suitable for complicated cases as that of Gas Corporation (Kumar, 1999).

Nevertheless, apart from questionnaires and interviews through which primary data have been collected, there is another category concerning secondary data. The latter, involves any available information, such as archives, reports and any other documentation related to the management of the company which are very useful for our research.

#### **Methodology and Empirical Results**

The analysis of the data is divided into two parts, from which the first focuses on the analysis of questionnaires, interviews and secondary data. The responses of the participants have been coded with the assistance of the AHP method, so as to provide comprehensible results referring to two different Balanced Scorecards developed, one for the private sector and one for the public one. In addition, the combination of those two Balanced Scorecards, so as to obtain the total one for the company, have been even clearer through this method.

In the second part, two other methods have been involved, the AHP in combination with SMART and the QFD method. The former aims at prioritizing the firm's KPIs according to the principles of SMART referring to setting the goals (Shahin and Mahbod, 2007). On the other hand, QFD focuses on prioritizing those organisational aspects that are interrelated and will improve customers' satisfaction.

#### **First part**

It is worthwhile to be reported that the customers' questionnaire was divided also in two parts. The first one aimed at examining customers' opinion for the current situation of the company as well

as at what extent they are satisfied from its services. On the other hand, the second part included questions related to customers' future cooperation with the company and what further services they would like to be offered. This information's as the interviews and secondary data keep it confidential.

**Implementation of the BSC**

After having completed the first step of gathering of data, the next step is the SWOT analysis in order to identify the Strength, Weaknesses, Opportunities and Threats of the company (Lee and Ko, 2000b).

**Table 1: presents in detail the SWOT analysis:**

<b>SWOT</b>	
<p style="text-align: center;"><b>STRENGTHS</b></p> <ul style="list-style-type: none"> <li><b>S1.</b> Profitable growth of the main activity</li> <li><b>S2.</b> Continuous customer Satisfaction</li> <li><b>S3.</b> Mutual advantageous relations with customers</li> <li><b>S4.</b> Support for EPE activities</li> <li><b>S5.</b> Reliable operation</li> <li><b>S6.</b> Reliability of Gas supply</li> </ul>	<p style="text-align: center;"><b>WEAKNESSES</b></p> <ul style="list-style-type: none"> <li><b>W1.</b> No development supply of new innovative services</li> <li><b>W2.</b> Lack of knowledge in new technology</li> <li><b>W3.</b> Rising age profile implementation of plans sector</li> <li><b>W4.</b> Enhancement of Employees Participation</li> <li><b>W5.</b> Unsuccessful implementation of plans</li> </ul>
<p style="text-align: center;"><b>OPPORTUNITIES</b></p> <ul style="list-style-type: none"> <li><b>O1.</b> Introduction of new activities</li> <li><b>O2.</b> Profitability assurance</li> <li><b>O3.</b> Increase of Customers</li> <li><b>O4.</b> Reformation / focus on the market and the customers.</li> <li><b>O5.</b> Rearrangement and reformation of activities</li> <li><b>O6.</b> Creativity enhancement and Educational diffusion.</li> <li><b>O7.</b> Enhancement of teamworking</li> <li><b>O8.</b> Risk Reduction</li> <li><b>O9.</b> Quality of service</li> </ul>	<p style="text-align: center;"><b>THREATS</b></p> <ul style="list-style-type: none"> <li><b>T1.</b> Use of strategic information systems</li> <li><b>T2.</b> Sufficiency of Gas Quality</li> <li><b>T3.</b> Control of cost</li> </ul>

Having clarified the strategy, vision and mission, as well as having conducted the SWOT analysis, then the development of BSC is the next

stage, where the qualitative data were used, which in turn were quantified with the assistance of AHP method, that follows. The AHP method facilitates the understanding of the importance of an appropriately structured BSC, in numerical terms, as well as how managers relate it to the firm's strategic objectives. Qualitative data were obtained through the secondary data and interviews and both data sources assisted on a better understanding of the respective KPIs of the BSC perspectives. Admittedly, the customers' demands as well as the future changes that the company may be subject to, should also be taken into serious consideration.

In addition, the qualitative data obtained from managers' questionnaires and which refer to the proper number of the perspectives so that BSC can be developed as well as the priority that each manager attributes to every perspective in comparison to the rest. The respective responses of managers they are quantitatively presented in tables 2 and 3.

AHP method requires three steps:


**Step 1: Pair-wise Comparisons**

It is fundamental that when embedding data into the upper half of the matrix, the preference of the 4 participants should be also included

(i.e.  $P_{ij}$ ,  $i$ =column,  $j$ =row) otherwise its reciprocal should (i.e.  $P_{ji}=1/P_{ij}$ ). The example below indicates the extent to which any perspective is more important than others, according to the answers of the participants, and it is explained by the relation between the pairs of numbers with the same color (Shahin and Mahbod, 2007).

Upper half of the matrix

1	4	6	7
1/4	1	3	2
1/6	1/3	1	5
1/7	1/2	1/5	1



Reciprocity is crucial for the 'pair-wise' comparison. For instance, in table 2, referring to public sector, if the Employee (B5) is estimated as two times more significant than the Internal (D5), the reciprocity axiom indicates that the Internal is 1/2 times more significant than the Employee. (Saaty, 1991)

**Step 2: Normalize Comparisons**

The second step applies the geometrical mean to the participants. For instance, the formula for the cell C15 is  $(C5 / C9) = 0.40$  and does just the same process with the rest of the participants' answers, so as to produce the results for the Normalize Comparison set included in Table 2 (Saaty, 1986).

**Step 3:**

The third step involves calculations of the performance score, consistency measures and of the consistency ratio. The performance score for Employees can be calculated through the following formula:  $C26 = AVERAGE (C15:F15)$  and then in turn, the consistency measures for Employees is determined through the following formula:

$$D26 = \text{SUM} ((C5 * C26) + (D5 * C27) + (E5 * C28) + (F5 * C29)) / (C26).$$

In order to achieve absolute consistency, the consistency measure will be equal to the number of alternatives (perspectives), which means that currently it should be 4 (Wayne, 2004).

Table 2 shows that there is no complete consistency, still the emerged inconsistency is not too much and absolute consistency is very difficult to achieve. Besides, the obtained performance scores can be regarded as rationally truthful. Finally, the consistency ratio =  $CI/RI$  and is calculated by dividing the consistency index ( $CI$ ) =  $\lambda - n / n - 1$  with the proper random index ( $RI$ ) which is 0.9, when  $n = 4$ . According to the above formula the consequent consistency ratio for cell G34 =  $(AVERAGE (D26:D29) - 4) / (3 * 0,9)$ . As a consistency ratio of 0.10 or less is considered acceptable, in our case it is also acceptable since it is 0,080. The same procedures are applied for the calculation of Private Sector of the company, with the only difference that the  $RI$  is equal to 1.24, when  $n=6$  (Wayne, 2004).

The following table 2 is developed only for the public sector and aims at examining whether the four or the five perspectives are perfectly balanced with the company's strategy or not. For the four perspectives the perfect balanced would be 25% (100/4) and for the five 20% (100/5) respectively.

According to the results, the first BSC (4 perspectives) seems to be more balanced with scores from 0.12 to 0.38 than the second BSC (5 perspectives), which has a largest deviation between 0.06 and 0.42. However, by examining the ranking of performance categories some interesting points are identified. Particularly, in the first BSC

employees are considered as the most important perspective (0.38), the financial perspective follows (0.29), then the internal perspective (0,21) and last is the customer perspective (0.12). The abovementioned ranking reveals a series of wrong choices, because whereas customers are ranked last, they still constitute a key issue for the company. Moreover, the financial perspective is ranked as 2,5 times more important than customers, which according to Kaplan and Norton (1996) is completely wrong when a public organisation is considered. Finally, the consistency result is equal to 80%, which indicate that the company satisfies its strategies only to that percentage.

Table 2: presents in detail the Public sector

	B	C	D	E	F	G	H	I	J	K	L	M	N	O		
2	<b>PUBLIC SECTOR:</b>					<i>Pair-Wise Comparisons</i>					<i>Pair-Wise Comparisons</i>					
3	<b>FIRST</b>										<b>SECOND</b>					
4	(STEP 1)	Employee	Internal	Financial	Customer						Suppliers	Customer	Financial	Internal	Employee	
5	Employee	1	2	2	2						Suppliers	1	0,50	2	5	0,20
6	Internal	0,50	1	0,80	3	← Upper half of the matrix					Customer	2	1	2	3	0,33
7	Financial	0,50	2	1	3						Financial	0,50	0,50	1	3	0,50
8	Customer	0,50	0,33	0,33	1						Internal	0,20	0,33	0,33	1	0,25
9	SUM	2,50	5,33	3,83	9,00						Employee	5	3	2	4	1
10											SUM	8,70	5,33	7,33	16,00	2,28
11																
12	<i>Normalized Comparisons</i>										<i>Normalized Comparisons</i>					
13																
14	(STEP 2)	Employee	Internal	Financial	Customer						Suppliers	Customer	Financial	Internal	Employee	
15	Employee	0,40	0,38	0,52	0,22						Suppliers	0,11	0,09	0,27	0,31	0,09
16	Internal	0,20	0,19	0,13	0,33						Customer	0,23	0,19	0,27	0,19	0,15
17	Financial	0,20	0,38	0,26	0,33						Financial	0,06	0,09	0,14	0,19	0,22
18	Customer	0,20	0,06	0,09	0,11						Internal	0,02	0,06	0,05	0,06	0,11
19											Employee	0,57	0,56	0,27	0,25	0,44
20																
21																
22																
23																
24		<b>Performance Consistency</b>				7	0,34			<b>Performance</b>	<b>Consistency</b>			8,7	0,22	
25	(STEP 3)	<b>Scores</b>	<b>Measure</b>			5,00	0,24			<b>Scores</b>	<b>Measure</b>			8,33	0,21	
26	Employee	0,38	4,267			6,50	0,31			Suppliers	0,18	5,350		5,5	0,14	
27	Internal	0,21	4,202			2,17	0,10			Customer	0,20	5,650		2,12	0,05	
28	Financial	0,29	4,287							Financial	0,14	5,193		15	0,38	
29	Customer	0,12	4,111							Internal	0,06	5,203				
30										Employee	0,42	5,804				
31																
32	SUM	1,00				20,67	1,00			SUM	1,00			39,65	1,00	
33			<b>Balanced</b>			25,00	or 25%	(perfectly balanced)		<b>Balanced</b>				20	or 20%	(perfectly balanced)
34			<b>Consistency Ratio=CI/RI</b>					0,080		<b>Consistency Ratio=CI/RI</b>						0,098
35																

Consequently, it appears to be an irrelevance between BSC and the company's strategy. For this reason, it is important that the firm's administration apprehends the significance of a connection between a structured BSC and the strategic goals of the organisation. On the other hand, according to the BSC of five perspectives, where Gas Suppliers perspective is also included, the consistency of BSC is stronger as it has risen up to 98%. Moreover, in that case, employees come first (0.42) and customers come in a second place (0.20), which is equal to the total perfect balance that the company aims to achieve. Third in place is the Suppliers' perspective with 0.18, still this perspective played a major role in the improvement of the BSC and is considered crucial for the public sector. The financial perspective with only 0.14, which is quite logical and coherent to the relative literature as far as public BSC is regarded.

Also the next table 3 illustrates the BSC for the private sector, where the strategy of the company is different from the respective strategy of public sector. This is attributed to the fact that the managers regard new investment as an important factor for the company in order to keep its leading position, within its sector, in the market. This new perspective (new investments) is third in place



(0.15), whereas the financial perspective with 0,39 is regarded as the most critical one for the private sector and then the customer perspective follows with 0,17. Moreover, the consistency for BSC with the company's strategies are essentially satisfactory (98%).

**Table 3: presents in detail the Private sector**

	B	C	D	E	F	G	H
2	<b>PRIVATE SECTOR:</b>						
3	<i>Pair-Wise Comparisons</i>						
4	(STEP 1)	Financial	New Invest.	Employee	Customer	Suppliers	Internal
5	Financial	1	5	4	2	4	5
6	New Invest.	0,20	1	2	0,50	3	2
7	Employee	0,25	0,50	1	0,50	0,50	0,50
8	Customer	0,50	2,00	2	1	0,50	3
9	Suppliers	0,25	0,33	2	2	1	2
10	Internal	0,20	0,50	2	0,33	0,50	1
11	SUM	2,40	9,33	13,00	6,33	9,5	13,5
12	<i>Normalized Comparisons</i>						
13	(STEP 2)	Financial	New Invest.	Employee	Customer	Suppliers	Internal
14	Financial	0,417	0,536	0,308	0,316	0,421	0,370
15	New Invest.	0,083	0,107	0,154	0,079	0,316	0,148
16	Employee	0,104	0,054	0,077	0,079	0,053	0,037
17	Customer	0,208	0,214	0,154	0,158	0,053	0,222
18	Suppliers	0,104	0,036	0,154	0,316	0,105	0,148
19	Internal	0,083	0,054	0,154	0,053	0,053	0,074
20							
21							
22							
23							
24		Performance	Consistency				
25	(STEP 3)	Scores	Measure				
26	Financial	0,39	6,859				
27	New Invest.	0,15	6,989				
28	Employee	0,07	6,472				
29	Customer	0,17	6,555				
30	Suppliers	0,14	6,392				
31	Internal	0,08	6,300				
32	SUM	1,00					
33			Balanced	16,67	or	16,7%	
34			Consistency	Ratio=CI/RI		0,096	

Comparing the two BSC of private and public sector it can be concluded that they are used in different ways according to the different objectives of both sectors, where 6 (private) and 5 (public) perspectives are needed respectively. Having developed two BSCs, one for public sector and another for private, the combination of both was considered as crucial, so as to be able to build the total BSC for the examined company. The company's total BSC is provided below with the KPIs in the right column. Also it should be reported that this BSC can be used by the company for only a period of three years (see Appendix A).

**Second part**

As it has been mentioned previously, this part involves two other methods the AHP-SMART and the QFD method, which are very useful for the company in order to make effective strategic decisions.

**AHP-SMART method**

The data used in this method were obtained from the responses of managers in the interviews and questionnaires. The purpose of the AHP-SMART method in this research is to facilitate managers in planning and sustaining a consistent and competitive strategy for future advancements. Apart from that, it also provides a clear concept of the KPIs analysis. Particularly, it offers the chance to managers to identify and prioritize the most important KPIs so as not only the organisational objectives to be accomplished, but also complexity in assessment process to be evaded. The need for the identification and prioritization of the KPIs is great, as the size and complexity of companies have an impact on the number of the emerged KPIs. However, investment and examination of all KPIs is not rational, as a result the most critical ones should be defined. The manager's responses led in the adoption of the SMART method in consistence with AHP. However, this method suggests the existence of a group of decision-makers, so as to 'aggregate' single answers into

a group response. A possible way to achieve this is by organising meetings, where the participants discuss about the important KPIs (Oakland, 1993). Unfortunately, in the current research, this was not feasible as managers were in fact hectic and only individual answers were obtained and five KPIs were chosen as most important for the company.

In order to build the AHP-SMART approach, Shahin and Mahbod, (2007) suggest five steps:

**Step 1: Define and list all of the KPIs**

This step has already been completed through the development of the Total BSC previously.

**Step 2: Selection of crucial KPIs via SMART criteria**

The AHP hierarchy is built on SMART criteria and includes five KPIs which are presented in figure 1<sup>1</sup>

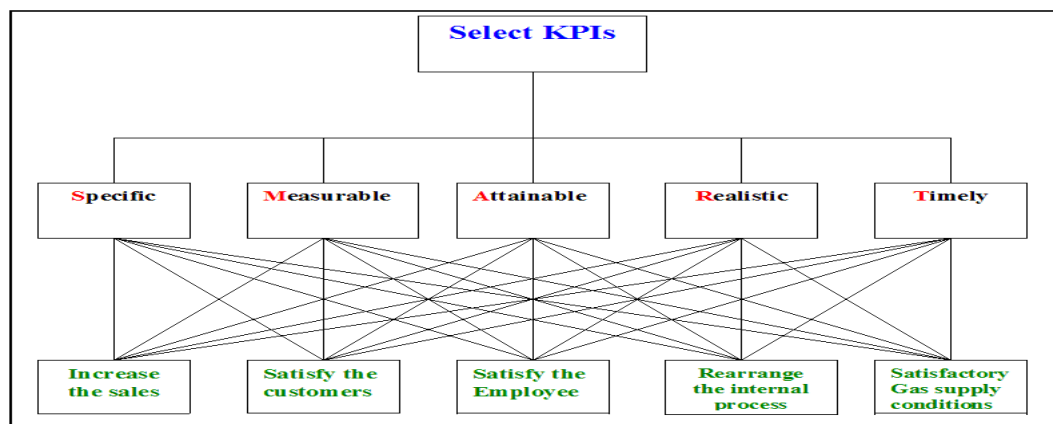


Figure 1

According to managers' responses, the five most important KPIs are the increase the sales, customers satisfaction, the rearrangement and reformation of the internal activities, employees satisfaction and the assurance of satisfactory gas supply conditions, which embraces gas quality and quantity, reliability of gas supply and no deviation between gas offer and gas demand.

**Step 3: Calculations of AHP-SMART approach**

In this step the use of a nine-point scale is required as it is presented below.

Table 4:

A nine-point scale for AHP analysis		
Ratings	Definition	Intensity of importance
1	Equal importance	Two criteria/alternatives contribute equally to the objective
2	Weak	Experience and judgement slightly favour one criterion/alternative over another
3	Moderate importance	Experience and judgement strongly favour one criterion/alternative over another
4	Moderate plus	Experience and judgement strongly favour one criterion/alternative over another
5	Strong importance	A criterion/ alternative is favoured very strong over another
6	Strong plus	A criterion/ alternative is favoured very strong over another
7	Very strong importance	The evidence favouring one criterion/ alternative over another is of the highest possible order of affirmation
8	Very very importance	The evidence favouring one criterion/ alternative over another is of the highest possible order of affirmation
9	Extreme importance	The evidence favouring one criterion/ alternative over another is of the highest possible order of affirmation

Source: Saaty (1994)

<sup>1</sup> The KPIs included in figure 1 represent the KPIs of the total BSC, though their name has been changed slightly, so as to be more inclusive and make managers provide more accurate responses as well as these KPIs are presented in red in the next total BSC.

Having used the above nine-scale the appropriate calculations were conducted according to steps of the AHP method mentioned in the first part. For the following results we use an excel software and the final results are presented in table 5.

**Table 5:**

	B	C	D	E	F	G
3	Alternative		Global weight			Ranking
4	Internal Activities		7,52			2
5	Increase Sales		3,52			3
6	Satisf. Employees		2,25			5
7	S.G.S.C		2,56			4
8	Satisf. Customers		8,55			1

Still, as it was concluded from Part 1 of analysis, customers have still many demands referring to their priorities, whereas they are satisfied by other issues, which are not so important though to them. Consequently, it is reasonable that the company would persist in trying to find ways to satisfy to a greater extent its customers and the next method is the appropriate one for achieving this goal.

#### **QFD Method**

In this method three out of the eleven managers were selected, who are executive for the strategies that the company develops in respect to its customers. Those three managers were requested to rank the correlation of each pair of WHATs-HOWs as 9=strong correlation, 3=medium correlation, 1=weak correlation and 0=no correlation. As the five most important KPIs were chosen and among them customers satisfaction was considered as the critical one, the QFD method is the most appropriate method for identifying and prioritizing those activities necessary for the accomplishment of customers' satisfaction (Omachonu and Ross, 2004).

The QFD method involves the following (2) phases. First, the SWOT analysis is used, so as to obtain the more complicated SWOT matrix (see Appendix B) and combine it with the BSC in order to provide a systematic strategic management regime. Having combined the SWOT matrix with the BSC, the KPIs along with the six perspectives are established (Dale and Oakland, 1994). Then, according to QFD methodology, the BSC's KPIs are regarded as the 'Whats', whereas the strategies developed from Sun Tzu's Philosophies (D) are considered as the 'Hows' (Lee and Ko, 2000). Since the philosophies of Sun Tzu are understood, then it is critical to determine how these philosophies can eventually be adapted to the organisation's strategies. After having completed the above procedures the final QFD table is as follows.

From this method the company attempts to comprehend what has successfully been called 'The Voice of the Customer' (Oakland, 1993). A significant aspect of the QFD method is that it encourages the participants to raise their creativity and find the solution to plenty design problem as well as to effectively determine the measures to be used for assessing their advancement precisely.

Currently, as it has been noticed, the first priority for achieving customers' satisfaction is Positioning and Targeting, Strengths and Weaknesses estimation with 94%. On the other hand, the destroying & design and the competitive situations & causes of failure come last with 0.78% and 1.17% respectively, which considerably differ from the

rest. These issues should be carefully considered by the firm, in order to achieve advancements.

Table 6:

Whats	How	Planning of strategies, Estimation & Leadership	Resources & Competitive Actions	Competitive Strategy & Wisdom	Positioning & Targeting, Strengths and weaknesses estimation	Opportunity, Timing & Management Structure	Control of Market Situations & Climate	Management of Conflict & Avoid Confrontation	Flexibility & Adaptability	Observing & Manoeuvring	Competitive Situations & Causes of Failure	Competitive Conditions and Offering Strategy Alliance & Vision	Destroying & Design	Intelligence and Information	Score	Percentage %	Sub-total
<b>F=Financial Perspective</b>																	
(F) O8O3S6	Introduction of new activities	9	9	9	9	9	9	9	9	3	1	0	0	9	85	11,1	
(F) O1S1O3S2	Profitability	9	9	9	9	9	3	3	0	0	0	1	0	1	53	6,91	
(F) S2S3W1	Financial Development	9	3	3	9	3	1	1	0	0	0	1	0	0	30	3,91	21,9
<b>C= Customer Perspective</b>																	
(C) S3S4S2O2	Relation with customer and EPA	3	3	3	9	3	1	3	0	9	1	3	0	3	41	5,35	
(C) O9C2	Increase of customer and gas sales	9	9	9	9	9	9	9	3	3	1	0	0	3	73	9,52	
(C) O3C2S6	Market Growth	3	9	9	9	9	9	9	9	3	0	9	0	3	81	10,6	25,4
<b>I= Internal Process Perspective</b>																	
(I) O4W1O6W2W3	Strategy Change	3	9	9	9	9	9	0	9	1	0	9	1	3	71	9,26	
(I) O5W1W4O7	Re-planning of functional Education	3	0	3	0	1	9	0	1	3	0	0	0	3	23	3	12,3
<b>L= Learning and Growth Persp.</b>																	
(L) W4O7O6	Organizational Education	0	1	9	1	1	3	0	9	9	0	1	0	3	37	4,82	
(L) T1W2W1	Technology	1	3	9	9	3	9	9	9	1	0	9	1	3	66	8,6	13,4
<b>S= Suppliers Perspective</b>																	
(S) T2T1S1	Coverage of market peak needs	3	9	3	3	9	0	1	1	9	0	9	1	3	51	6,85	
(S) S8O5	Relation with suppliers	3	3	3	9	3	3	3	9	9	3	0	3	9	60	7,82	14,5
<b>P= New and large Investments Persp.</b>																	
(P) T3W5	The confrontal of the neighbouring countries towards the new challenges.	9	9	9	9	9	9	9	9	3	3	9	0	9	96	12,5	12,5
	<b>Note: Predictive quality of performance measures</b>	64	76	87	94	77	74	56	68	53	9	51	6	52	767	100	
	<b>Strong - 9, Medium - 3, Weak -1, None - 0</b>	8,34	9,91	11,34	12,26	10,04	9,65	7,30	8,87	6,91	1,17	6,65	0,78	6,78			
	<b>Priority</b>	<b>7</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>5</b>	<b>8</b>	<b>6</b>	<b>9</b>	<b>12</b>	<b>10</b>	<b>13</b>	<b>11</b>			

Discussion

This part completes the research with a discussion of the critical findings and recommendations for the examined company and presents possible ways the company can use the aforementioned results and hence benefit from them. As Kaplan and Norton (1996) have stated, the four perspectives of BSC have been successfully used by a great range of organisations and industries. Still, they have underlined that these perspectives should not be regarded as a 'strait-jacket', but as a 'template'. This suggestion implies that organisations should not strictly use only those four perspectives, but even fewer or more than those already proposed according to the circumstances, objectives and strategies of an organisation (Chen et al., 2006). This implication proved to be considerably useful for the current research, as the four suggested perspectives turned out to be insufficient for satisfying the strategic needs of the firm. The examined company is characterised by significant complexity due to its public and private characteristics, which complicates even more those strategic needs.

Also, the obtained results are in agreement with relevant paper of Kaplan and Norton (2001) who claims that for public organisations customers' perspective should come first, whereas for private the

financial perspective plays the most major role. However, the two previously mentioned BSC cannot be used separately, as some of their objectives conflict. At this point the current research becomes even more complicated as the objectives and KPIs of both private and public BSCs should be combined in order to produce a representative BSC, which aggregates all the important issues, such as vision, mission and strategy of the entire firm.

#### **Further Recommendation**

According to Toft and Reynolds (1994) companies should use 'isomorphic learning' in their attempt to improve their performance and secure their continuity. 'Isomorphic learning' requires the examination of experience of other organisations in similar issues. Particularly, as the specific company is a multinational it should investigate the impacts not only of companies in Greece, but also internationally, so as to identify hazardous issues that it had not considered before. Besides, the company could also examine the means through which the other companies faced various discontinuities, the reasons why plans did not work, just to mention few of them.

#### **Conclusion**

It has been widely acknowledged that success in organisations is based on the effective control and management of the various activities interrelated with the strategy, vision and mission of each company. The better able the company is in order to achieve the aforementioned targets, the more capable it is to also respond effectively to changes. At this point procedures that identify the KPIs and enhance the establishment of efficient sets of objectives are imperative and even more for organisations, such as the organisation under examination of the present piece of research. This organisation belongs to the energy sector with all of its features, such as different functional standards, globalisation and rigorous environmental requirements that may admittedly have an impact on the implementation of such procedures. For this purpose, the use of BSC and other not so familiar tools as SWOT analysis, AHP, AHP combined with SWOT and QFD method were estimated as vital in order to achieve an effective as well as unaffected from the peculiar and complex features, implementation of BSC in the examined firm.

As a result, the aim of this study by developing BSC was to provide more comprehensive and efficient procedures through which managers can develop strategies and goals for progressive and competitive future business. As far as the specific company is concerned, the linchpin issues to focus on are customers, financial and especially the rearrangement of internal processes. In reality, the benefits of accomplishing these goals can be noteworthy. Taking into account all organisational assets such as people, tangible and intangible valuable knowledge is gained and the basis for generating further knowledge is established.

Finally, as future adoption of BSC was essentially expressed, the examined company will be able to achieve all of its goals and even to provide insight to other Greek organisations into being progressive and adopting innovative processes for the improvement of their performance as BSC.

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**Appendix A: The total BSC of Gas Corporation**

The Total Balanced Scorecard of Gas Corporation X			
Perspective	Strategy issues	Strategic objectives	Measurement Strategies/ Indicators (KPIs)
<b>Financial</b>	Financial Development	(Commutative stage of development)	(Commutative stage of development)
	Profitability	F1. Profitable growth of the main activity F2. Introduction of new activities	• Rate of sales increase • Rate of income increase
	Risk Reduction	F3. Profitability assurance	• Rate of income from non-gas activities
		(Maturing stage)	• Cash Flow
		F4. Further increase in profitability F5. Amplification of profit resources F6. Increase of performance to the employees	• Scope of exploitation per cubic metre of gas (Maturing stage) • Rate of Clear Profit per activity
			• Scope of exploitation per activity vs competitors • Rate of cot reduction from allowed synergies • Rate of income from activities apart from gas activities and towards the total income
<b>Customers</b>	Market Growth	C1. Increase of customers and gas sales	• ROCE per activity • Number of customers per category and region in total
	Quality and breath of services	C2. Continuous customer satisfaction	• Rates of completely satisfied customers (survey)
	Relations with customers and EPA	C3. Mutual advantageous relations with customers	• Number of customers of partnership relations
		C4. Support for EPE activities	• Average economical benefit of customers from Natural Gas in comparison with alternative fuels • Improvement rate of the EPA scope from providing special sales discounts
<b>Internal Process</b>	Strategic Change	I1. Reformation / focus on the market and the customers	• Customer rate that the conventional obligations were wholly conducted
	Ability Upgrade	I2. Development/ supply of new innovative services	• Rate of customers that receive additional services
	Re-planning of functional processes	I3. Reliable operation with no mishits and incidents I4. Rearrangement and reformation of activities	• ROI of additional services • Periods of intervantions in comparison with the prearranged periods • Number of operational mishits and incidents
			• Rate the Re-planning of processes • Number of customers that are being served through the internet
<b>Innovation and Learnir</b>	Organisational Education	L1. Strategical ability enhancement of DEPA and ability enhancement of employees	• Customer perception for DEPA's reliability (survey) • Rate of satisfied employees (survey)
	Creativity-Action-Initiatives	L2. Creativity enhancement and Educational diffusion (seminars)	• Ascription to payment of wages cost
	Basic Abilities	L3. Use of strategic information systems	• Rate of operational procedures with the assistance of computing systems (SAP, SCADA)
	Technology	L4. Cultural change, innovation support and actuation of employees L5. Enhancement of employees' participation L6. Enhancement of teamworking	• Number of employees recommendations that were accepted according to the total number of recommendations • Rate of employees with Balanced Scorecard • Number of accidents because of human error
			• deviations from team targets
			• Deviation between Gas offer and Gas orders
<b>Gas Suppliers</b>	Coverage of market peak needs	S1. Sufficiency of Gas quantity	• Deviation between Gas offer and Gas orders
	Relations with suppliers	S2. Reliability of Gas supply	• Number of hours/days with quantitative and qualitative problems during the Gas delivery
	Diversification of supply gas sources	S3. Assurance of satisfactory Gas supply conditions	• Weighted Gas delivery cost in comparison with the competitors
<b>New and Large Investments</b>	Strategical Alignments	P1. System enhancement and peak demand coverage	• IRR, NPV
	Equipment Insurance	P2. Control of cost/ financing	• Deviations from approved budgets
	Exploitation of the market provisioning	P3. Successful implementation of plans	• Deviations from approved milestones

## Appendix B:

<b>SWOT MATRIX:</b>	<b><u>STRENGTHS</u></b>	<b><u>WEAKNESSES</u></b>
	<p><b>S1.</b> Profitable growth of the main activity</p> <p><b>S2.</b> Continuous customer Satisfaction</p> <p><b>S3.</b> Mutual advantageous relations with customers</p> <p><b>S4.</b> Support for EPE activities</p> <p><b>S5.</b> Reliable operation</p> <p><b>S6.</b> Reliability of Gas supply</p>	<p><b>W1.</b> No development/ supply of new innovative services.</p> <p><b>W2.</b> Lack of knowledge in new technology.</p> <p><b>W3.</b> Rising age profile of the employees in the sector</p> <p><b>W4.</b> Enhancement of Employees participation.</p> <p><b>W5.</b> Unsuccessful implementation of plans.</p>
	<b>MAXI-MAXI (S/O)</b>	<b>MINI-MAXI (W/O)</b>
<b><u>OPPORTUNITIES</u></b>	<p>(F) 0803S6 -Introduction of new activities .</p> <p>(C) S3S4S202 –Relations with customer and EPA.</p> <p>(C) 09C2- Increase of customer and gas sales.</p> <p>(C) 03C2S6- Market Growth</p>	<p>(I) O5W1W407 – Re-planning of functional processes</p> <p>(I) 04W106W2W3 – Strategy change.</p> <p>(L) W4O706 - Organizational Education</p>
<p><b>O1.</b> Introduction of new activities</p> <p><b>O2.</b> Profitability assurance.</p> <p><b>O3.</b> Increase of Customers</p> <p><b>O4.</b> Reformation / focus on the market and the customers.</p> <p><b>O5.</b> Rearrangement and reformation of activities</p> <p><b>O6.</b> Creativity enhancement and Educational diffusion.</p> <p><b>O7.</b> Enhancement of teamworking</p> <p><b>O8.</b> Risk Reduction</p> <p><b>O9.</b> Quality of service</p>		
	<b>MAXI-MINI (S/T)</b>	<b>MINI-MINI (W/T)</b>
<b><u>THREATS</u></b>	<p>(F) O1S1O3S2 - Profitability</p> <p>(F) S2S3W1 – Financial Development</p> <p>(S) T2T1S1 – Coverage of market peak needs</p> <p>(S) S6O5 – Relation with suppliers.</p>	<p>(L) T1W2W1 - Technology</p> <p>(P) T3W5 – The confrontal of the neighbouring countries towards the new challenges</p>
<p><b>T1.</b> Use of strategic information systems</p> <p><b>T2.</b> Sufficiency of Gas Quality.</p> <p><b>T3.</b> Control of cost</p>		