

Studying the Knowledge Management - Effect of Promoting the Four Balanced Scorecard Perspectives: a Case Study at SAIPA Automobile Manufacturing

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Abstract

In recent years, two new categories have been presented and introduced in the management world. Balanced Scorecard as a model of strategic planning that combines financial measures with organizational intangible factors and knowledge management aims to identify, evaluate and organize, store and apply knowledge in order to meet the needs and established objectives. This study clarifies the effect of knowledge management indices on the advancement of the four balanced scorecard perspectives. Intellectual Capital as a model of knowledge Management was the basis model in this survey. The samples were selected among managers, directors, officials and experts in Saipa Automotive Company. Data were collected via Questionnaire. The Pearson correlation, Friedman and linear regression tests have been used to analyze the data. According to the Pearson correlation test, the study showed a positive significant relationship between the knowledge management model and the four perspectives of Balanced Scorecard. It is of considerable importance the fact that Friedman test specifies all variables ranking then according to their importance and priority as follows: human capital in the first position, social capital in the second and structural capital in the third. Moreover, regression analysis represents accurate prediction and shows stronger correlation between KM and BSC. Overall, the present study suggests Product quality, Customer satisfaction and Staff satisfaction respectively as three important aspects of knowledge management in the strategic plan of SAIPA Company.

Key words: Knowledge Management, Balanced scorecard, Intellectual capital, SAIPA Automotive Corporation, Iran

Jel Classification: D8, J24, M00

Introduction

On entering the new millennium, the importance of cash, raw materials and land which were considered as critical factors for formation and growth of organizations has decreased; countries and organizations should survive and continue their life in a situation that is associated with rapid and major changes. All these changes are based on knowledge. In today's business

environment, having knowledge, particularly a network of knowledge, is considered as the most important strategic resource in an organization.

Thus, along with other assets and any source, knowledge management is one of the vital processes of organizations. Progressive and knowledge-based organizations have found that knowledge is the most important and most striking stability criteria in today's competitive world.

Therefore, knowledge management has some ability to deliver and maintain organizations in strategy based processes and to achieve the advantages of the formulation and implementation of strategy. Also, the role of knowledge management in explaining and describing the BSC model performance in strategic based reorganizations is determined as very important. So, it is emphasized that a balanced scorecard model is an important tool for measuring and managing KM, especially the transformation and evolution of information into knowledge and the communication and transfer of that into the organization. Knowledge management is a set of processes for understanding and applying strategic resources of knowledge in the organization. Knowledge management is a structured approach that establishes procedures to identify, evaluate and organize, store and apply knowledge in order to meet the needs and goals (Jafari and Kalantar, 2003, pp 24-29).

The question is whether knowledge management effects upon promoting the four perspectives of BSC model in organizations that have used it.

Literature Review and Hypotheses

Balanced Scorecard

History and Concept of Balanced Scorecard

In early 1990 Robert Kaplan, with David Norton began the research plan for investigating the fundamental causes of the top 12 U.S. companies and studying methods of performance evaluation in these companies. The outcome of this research was published in an article in January 1992 in the Harvard Business Journal. This article mentioned that successful companies did not just rely on financial measures for the evaluation of their performance, but they also evaluate their performance from three other perspectives, i.e. customer, internal processes, and learning and growth (Kaplan and Norton, 2004, p.14). In the decade 1990, they emerged a set of indicators that they called a balanced scorecard. This collection which includes process indicators and the final results show a comprehensive image of organization's performance for managers to measure how the advancement of the organization to achieve strategic goals (Ali Ahmadi, 2003, p. 336). Nowadays, Balanced Scorecard is recognized as one of the 15 Special, effective and low error management tools among managers of different companies in 22 countries. Research shows that about 70 percent of American companies have used or intend to use it (Ebn alrasoul, 2005, p. 43).

During the four years after publishing the first article in this regard, a number of organizations and companies implemented the balanced scorecard method by Kaplan and Norton assistance and they have achieved successful results rapidly. Organizations used this method not only for performance evaluation but also as a tool to control their implementation of strategies (Kaplan and Norton, 2004, p.16). Kaplan and Norton, in the second article in 1993, discussed this model not only as a measurement system but also as a management system and they emphasize the role of organizational strategy on it. Scorecard measures are based on strategic objectives and competitive needs (Ebn alrasoul, 2005, p. 45)

Many management and operational control systems in organizations and institutions are formed based on financial criteria and goals, whereas they have little relationship with the

organization's development to achieve strategic long term goals. By relying on financial measures in the most organizations and companies, there is a gap between strategy development and implementation of strategy. In the balanced scorecard, internal processes indicators are linked to the financial and non financial results within a network of cause and effect. Kaplan and Norton presented in 1996 a more developed form of the Balanced Scorecard as a strategic management system.

They discuss that the traditional system of management is unable to establish a relationship between the long-term strategy in the organization and the short-term performance, but all managers who use balanced scorecard, have not relied on the short-term financial measures as a unique criterion of organization performance. Balanced Scorecard allows them to start four new management processes that can help to establish a relationship between long-term strategic goals and the short-term ones, exercised separately and combined together (Ebn Alrasoul, 2005, p. 45). Kaplan and Norton have been working over the past years with more than 300 companies and have confidence that the balanced scorecard is a powerful tool of management. Of course in about 70 percent, the real problem is not a bad strategy, but it is related to poor implementation (Kaplan and Norton 2004, pp 52-63).

The topic of strategy, goals and indices that measure the strategy are guides for programs and strategic actions, and also, Budget of strategy is results from Actions and initiatives (wu, Anne, pp 267-284). The balanced scorecard (BSC) is a management tool that helps to align all employees' behaviour to the organization's strategy.

Financial Aspect

In many organizations, financial indicators are very important. These organizations are trying to increase revenue, reduce costs and risks and increase productivity via more efficient use of assets. In fact, obtaining good financial results in companies and economic institutions is necessary for their survival and growth. At the same time, the measurement and analysis of the financial results as a major function of the organization is a necessity in the study of organizational strengths and weaknesses (Ali Ahmadi et al, 2004, p. 344).

Customer Aspect

Customer satisfaction as one of the most important business issues in today's world plays a role in many fields of knowledge management, as most other indicators of product quality, price, waiting time and after sales service are in this regard. Professional organizations are looking for Customer satisfaction, because customer loyalty provides long-term interests for organizations (Ebn Alrasoul, 2005, p. 48).

Internal Process Aspect

The internal process perspective identifies those internal business processes that enable the firm to meet the expectations of the customers in the target markets and those of the shareholders. (Figge et al, 2002, p271)

Learning and Growth Aspect

The fourth aspect of balanced scorecard, describes learning and growth, intangible assets of organizations and their role in the strategy. Organization can grow and innovate when it is able to develop its skills and leadership and also learn from its mistakes and other organizations' behavior and be able to create new techniques for itself. Intangible assets are divided into *three categories*:

- human capital: skills, knowledge and talented staff;
- information capital: databases, information systems, networks and information infrastructures;

- organizational capital: culture, leadership, staff coordination, and teamwork and knowledge management.

Strategy Map

The strategy map as a visual tool of causal relations within the strategy components of an organization gives managers awareness just as the balanced scorecard. The Strategy Map provides the missing link between strategy formulation and implementation of the strategy. In the research that has been done in a manufacturing company in Greece, objectives and measures can be clearly communicated to all units and employees. For this purpose two basic strategic tools are implemented, the Balanced Scorecard (BSC) and the strategy map. Based on the statements about mission, vision, and values of the company, and the strategic analysis, we formulate the strategy on four axes. The company's strategy map is constructed using the four axes as strategic themes, and the four traditional perspectives of the BSC (Konstantinos Anagnostopoulos, 2010, p2).

The balanced scorecard of Kaplan and Norton is a management tool that supports the successful implementation of corporate strategies. It has been discussed and considered widely in both practice and research. By linking operational and non financial corporate activities with causal chains to the firm's long term strategy, the balanced scorecard supports the alignment and management of all corporate activities according to their strategic relevance (Figge et al, 2002, pp:269-284).

Knowledge Management

The Concept of Knowledge

One of the major advances in defining knowledge is mentioned as the understanding of the difference between knowledge, information and data. Data is a collection of facts and obviously matters about the phenomenon. Information includes organizing, grouping and categorization of data in the significant models (Jafari and Kalantar, 2003, p. 24). To achieve an overall approach in the field of knowledge management, first of all, we have defined and described the knowledge. Knowledge has been presented in different definitions and categories. Knowledge is the expertise and the skills acquired by a person through experience or education, the theoretical or practical understanding of a subject. The term Knowledge is also used to mean the confident understanding of a subject with the ability to use it for a specific purpose if appropriate (Patel etc, 2010, pp: 24). The increasing interest in research and application of knowledge management through the creation and preservation of competitive advantage in business is testimony for the increase in importance of knowledge management for organizations.

History and Concept of Knowledge Management

In the mid of the 80s, the importance of knowledge was apparent as a competitive asset of organizations, but most organizations had no methods and strategies for managing it. In 1989 the first articles and books related to knowledge management are published. Until 1990 a number of consulting firms began knowledge management programs. More than a decade ago, Handy (1996) suggested that managing the knowledge and skills of its employees was the current organizational challenge. Since then each of the management disciplines has sought to contribute to the concept of knowledge management in a rather independent way (Turner, et al, 2010, p 161).

Knowledge management is the collection of processes that govern the creation, dissemination and utilization of knowledge. Knowledge management is not a technology thing or a computer thing. If we accept the premise that Knowledge management is concerned with the entire process of discovery and creation of knowledge then we are strongly driven to accept that

knowledge management is much more than a technology thing and its elements exist in each of our jobs (Patel, et al 2010, p: 24).

With the passing from resource-based economy to knowledge-based economy, knowledge has become one of the essential assets of organizations and the management of these assets seems necessary. Nowadays, the success and prosperity of organizations in the economic arena can be produced from their ability to acquire, encode and transfer knowledge in a more efficient manner against competitors. Knowledge management (KM) is a process that deals with the development, storage, retrieval, and dissemination of information and expertise within an organization to support and improve its business performance (Gupta and et al, 2000, p: 17).

Component of Knowledge Management Systems

Different texts related to knowledge management have nominated various components, for example, Bhatt argues that the knowledge management process can be categorized into knowledge creation, knowledge validation, knowledge presentation, knowledge distribution, and knowledge application activities (Bhatt,2001,p:68). There are basically three broad objectives of KM: leveraging the organisation's knowledge; creating new knowledge or promoting innovation; and increasing collaboration and hence enhancing the skill level of employees (Arora, 2002, p: 240). The success of many KM initiatives over the last 15 years was predicated on the successful use of a KM-style technology. However, for most of that time the technology was not a good fit for the way that people involved in KM actually work (Sinclair,2007,p:256). In most organizations, knowledge management is being done with an obvious defect or in a subtle manner. For example, data, information and knowledge transfer from one person to another, from person to computer system, or one generation to the next generation of workers represents incomplete and slow processes (Bergroun, 2003, p. 23).

Intellectual Capital and Knowledge Management

Measuring intellectual capital is a growing area of interest in the knowledge management field. Metrics are being developed and applied by some organizations, but there needs to be more research throughout the international community to better define these measures.(Liebowitz and Suen, 2000, p: 54-67) The importance of tangible assets is waning and has been gradually shifting to knowledge and IC, and thus, KM has become an important strategy in corporate competition (Shih and Chang and Lin, 2010, pp: 74-89). Firms, which are small and medium in size and particularly private-owned, create human capital through a hierarchical KM structure (Birasnav and Rangnekar, 2010, pp: 57-75).

The performance of knowledge creation has significant influence on the accumulation of subsequent human capital (Shih and Chang and Lin, 2010, pp:74-89). In today's fast changing and non-linear business environment the only way to gain competitive advantage is by managing intellectual capital, which is more commonly known as knowledge management (KM) (Arora, 2002, pp: 240-249). Some models of knowledge management are classified in this category; the most famous model is the model of the Skandia co. This model has been considered as a default model with a scientific approach in relation to knowledge that can be establishing the link between organizational capitals. Skandia is the first company which noted activities and philosophy of intellectual capital of the company in its annual report. In this model, the social aspects of knowledge management have been ignored (Abbasi, 2008). A total of 2,175 articles published in 11 major KM/IC peer-reviewed journals were carefully reviewed and subjected to scientometric data analysis techniques. A number of research questions pertaining to country, institutional and individual productivity, co-operation patterns, publication frequency, and favorite inquiry methods were proposed and answered. Based on the findings, many implications emerged that improve one's understanding of the identity of KM/IC as a distinct scientific field (Serenko et al, 2010, pp: 3-23).

Relationship between Balanced Scorecard and Knowledge Management

Some specific Balanced Scorecards have been designed within the Knowledge Management theory framework. To work the Balanced Scorecard needs a sophisticated information system support (Wegmann, 2007). One of the responses to criticisms of traditional forms of accounting reports for knowledge-based firms has been the development of the balanced scorecard (BSC), a strategic performance measurement framework and methodology based on a family of performance measures (Bose and Keith,2007,pp:653-665). In their book entitled *The Balanced Scorecard*, Kaplan and Norton set forth a hypothesis about the chain of cause and effect that leads to strategic success. This cause and effect hypothesis could be fundamental to understanding KM metrics in a way that the balanced scorecard prescribes. By looking at the Kaplan and Norton implementation framework, it would be seen that Knowledge management fits within the learning and growth aspect of BSC. If this is true, Knowledge management outputs will impact on other processes (Fairchild, 2002, p17).

Fairchild introduces in an article *two unique approaches* which are being used to improve knowledge management in organizations:

First Approach: the first approach would be to use the different types of capital available in an organization to be the four different scorecard perspectives of how KM is leveraged in the organization. The *four capitals* which make up a knowledge centric organization are:

- human capital is all individual capabilities, the knowledge, skill and experience of the employees and managers;
- intellectual capital includes the intangibles such as information, knowledge and skills that can be leveraged by an organization to produce an asset of equal or greater importance than land, labor and capital;
- structural capital includes the processes, structures and systems that a firm owns less its people;
- social capital is the goodwill resulting from physical and virtual interchanges between people with like interests and who are willing to share ideas within groups who share their interests.

A dynamic mixing of intellectual capital, human, social and structural capital provides the fuel for creating and using knowledge. The four capitals shown in the diagram can be directly related to the traditional balanced scorecard method in the following manner, shown in table1.

Table 1. First approach to KM

BSC Perspective	Metrics	Intellectual Capital Perspective	Metrics
Financial	ROI-	Intellectual	The output of below measures
	EVA-		
Customer	Customer Satisfaction	Social	Customer Satisfaction
	Market share		Number of customer complaints
	Retention		Profits per employee
			Ratio of sales to total customers
			Ratio of customers to employees

Internal	Quality	Structural	Number of patents or copyrights per employee
	Response time		R&D invested in product design
	Cost and new product introductions		Average length of time for product
Design			
Investment in IT			
Learning and Growth	Employee Satisfaction	Human	Employee Motivation
			Years of experience in profession
			Percent of employee with degree
			Training expense per employee
			Ratio of manager to employees

Source: Fairchild and Skandia, 2002

Second approach: The other approach possible in viewing the role of KM in organizational strategy via a balanced scorecard would be to use a resource management based approach, focusing on intellectual capital resources combined with business processes of the organization. this is based on the work of Mouristen et al at the Copenhagen Business school, using the work on intellectual capital balance statements of Sveiby. Table 2 correlates this approach to the balanced scorecard perspectives of Kaplan and Norton.

Table 2. Second approach to KM

Financial	ROI EVA	Employees	The output of below measure
Customer	Customer Satisfaction Market share Retention	Customers	Customer Satisfaction Number of customer complaints Profits per employee Ratio of customers to employees Average time from customer contact to sales response
Internal	Quality Response time Cost and new product introductions	Processes	Number of patents or copyrights per employee R&D invested in product design Average length of time for product Design Product life cycle trend Investment in IT
Learning and Growth	Employee Satisfaction	Technology	Employee Motivation Years of experience in profession Percent of employee with degree Training expense per employee Ratio of manager to employees

Source: Fairchild and Skandia, 2002

Hypotheses

The general hypothesis in our research is, as follows:

There is a meaningful relationship between knowledge management and promoting of balanced scorecard.

According to the literature and conceptual model of research, it will also be considered secondary hypotheses. These hypotheses reveal different aspects of relationship between knowledge management and balanced scorecard:

First hypothesis: There is a meaningful relationship between social capital and the customer perspective of balanced scorecard.

Second hypothesis: There is a meaningful relationship between the structural capital and internal processes perspective of balanced scorecard.

Third hypothesis: There is a meaningful relationship between human capital and learning and growth perspective of balanced scorecard.

Fourth hypothesis: There is a meaningful relationship between social capital and financial perspective of Balanced Scorecard.

Fifth hypothesis: There is a meaningful relationship between structural capital and financial perspective of balanced scorecard.

Sixth hypothesis: There is a meaningful relationship between human capital and financial perspective of balanced scorecard.

Research Methodology

The Sample

Our method in this study is descriptive and applied research. We have investigated via books and articles in Persian and Latin. Then field research methods have been done by questionnaire. Population consists of managers, directors, officials and experts in Saipa Automotive Company. To determine the size of sample we used various methods, which have led to one result. All population was 1694, but we have considered 1700 person. Cockran formulas and Morgan table are used to calculate the sample. Finally, it has obtained 313.

$$n = \frac{N \cdot T^2 \cdot p \cdot q}{T^2 \cdot p \cdot q + N \cdot d^2} \quad (1)$$

$$n = \frac{1700 \cdot (1/96)^2 \cdot 0.5 \cdot 0.5}{(1/96)^2 \cdot 0.5 \cdot 0.5 + 1700 \cdot (0.05)^2} = 313$$

Regularly random sampling is used. The important note in this regard is that, According to the technical and electronics infrastructure in Saipa Co, it has been done sample selection and automative distribution and electronic questionnaires. After confirming the validity of variables and questionnaire by teachers and experts, initial questionnaire distributed among 20, and reliability of it was determined by the Cronbach's alpha test. The result was 0.897; therefore it seems desirable and possible to distribute a questionnaire among a larger number of responders

Analysis and Presentation of Findings

The data obtained from questionnaires and demographic studies shows that 88 percent of respondents were men and 12 percent of them were women. 73 percent have BA, 25 percent have MA and 2 percent of them were Ph.D. level. Moreover, the average experience was more than 13 years.

The normal distribution of statistic was confirmed with Kolmogorof - Smirnov test by Spss software.

Testing the Main Hypotheses

Main hypothesis: there is a meaningful relationship between knowledge management and balanced scorecard.

H0: there is not a meaningful relationship between knowledge management and balanced scorecard.

H1: there is a meaningful relationship between knowledge management and balanced scorecard.

Table 3. Pearson correlation test - the main hypothesis

Variables		Knowledge management-IC
BSC	Pearson Correlation	848
	Sig.(2-tailed)	0
	N	313

The level of correlation between knowledge management and balanced scorecard equals to 0.848 with significant level of 0.000. Because of the significant level of Type I, the error rate is less than 0.01, so H0 is rejected i.e. there is a meaningful relationship between Knowledge Management and Balanced Scorecard. The correlation coefficient indicates a strong relationship between the two varies. Moreover, because of the positive sign of correlation, with each increase, the other increases as well.

Testing the Correlation Between Dimensions of Knowledge Management-IC and Balanced Scorecard

Hypothesis 1: There is a meaningful relationship between social capital and the customer perspective of balanced scorecard.

H0: There is not a meaningful relationship between social capital and the customer perspective of balanced scorecard

H1: There is a meaningful relationship between social capital and the customer perspective of balanced scorecard

The correlation between social capital of IC and customer perspective of BSC equals to 0.559 with significant level of 0.000. Because of significant level of Type I error rate is less than 0.01, so H0 is rejected. ie between social capital and customer perspective of balanced scorecard is a meaningful relationship. The correlation coefficient shows a strong relationship between these two variables. Moreover, because of positive sign of correlation, with each increase, other increases.

Hypothesis 2: There is a meaningful relationship between the structural capital and internal processes perspective of balanced scorecard.

H0: There is not a meaningful relationship between the structural capital and internal processes perspective of balanced scorecard.

H1: There is a meaningful relationship between the structural capital and internal processes perspective of balanced scorecard.

The correlation between structural capital and internal processes perspective BSC is 0.786 with significant level of 0.000 .Because of significant level of Type I error rate is less than 0.01, so H0 is rejected.ie between structural capital and internal processes perspective of balanced scorecard is a meaningful relationship. The correlation coefficient shows a strong relationship between these two variables. Moreover, because of positive sign of correlation, with each increase, other increases.

Hypothesis 3: There is a meaningful relationship between human capital and learning and growth perspective of balanced scorecard.

H0: There is not a meaningful relationship between human capital and learning and growth perspective of balanced scorecard.

H1: There is a meaningful relationship between human capital and learning and growth perspective of balanced scorecard.

The correlation between human capital and learning and growth perspective of BSC equals to 0.478 with significant level of 0.000 .Because of significant level of Type I error rate is less than 0.01, so H0 is rejected.ie between human capital and learning and growth perspective of balanced scorecard is a meaningful relationship. The correlation coefficient shows a strong relationship between these two variables. Moreover, because of positive sign of correlation, with each increase, other increases.

Hypothesis 4: There is a meaningful relationship between social capital and financial perspective of Balanced Scorecard.

H0: There is not a meaningful relationship between social capital and financial perspective of Balanced Scorecard.

H1: There is a meaningful relationship between social capital and financial perspective of Balanced Scorecard

The correlation between social capital and Financial perspective of BSC is 0.534 with significant level of 0.000 .Because of significant level of Type I error rate is less than 0.01, so H0 is rejected.ie between social capital and Financial perspective of balanced scorecard is a meaningful relationship. The correlation coefficient shows a strong relationship between these two variables. Moreover, because of positive sign of correlation, with each increase, other increases.

Hypothesis 5: There is a meaningful relationship between structural capital and financial perspective of balanced scorecard.

H0: There is not a meaningful relationship between structural capital and financial perspective of balanced scorecard.

H1: There is a meaningful relationship between structural capital and financial perspective of balanced scorecard.

The correlation between structural capital and Financial perspective of BSC equals to 0.604 with significant level of 0.000 .Because of significant level of Type I error rate is less than 0.01, so H0 is rejected.ie between structural capital and Financial perspective of balanced scorecard is

a meaningful relationship. The correlation coefficient shows a strong relationship between these two variables. Moreover, because of positive sign of correlation, with each increase, other increases.

Hypothesis 6: There is a meaningful relationship between human capital and financial perspective of balanced scorecard.

H0: There is not a meaningful relationship between human capital and financial perspective of balanced scorecard

H1: There is a meaningful relationship between human capital and financial perspective of balanced scorecard.

The correlation between Human capital and Financial perspective of BSC is 0.543 with significant level of 0.000. Because of significant level of Type I error rate is less than 0.01, so H0 is rejected. ie between Human capital and Financial perspective of balanced scorecard is a meaningful relationship. The correlation coefficient shows a strong relationship between these two variables. Moreover, because of positive sign of correlation, with each increase, other increases.

Regression Test

In regression, we have multiple correlation coefficients, which show the intensity of relationship between the independent and the dependent variables. In this research, it has been investigated the intensity relationship between variables of knowledge management based on intellectual capital model and balanced scorecard variables. In this study, the coefficient is 0.85. Thus, between intellectual capital variables as a model of knowledge management and Balanced Scorecard exists strong multiple correlation.

Coefficient of determination represents variability or deviation in the dependent variable which is explained by the regression. Coefficient is approximately 0.729. Thus the obtained value indicates the highlighted role of intellectual capital variables in defining of the BSC variables.

Standard error shows the data scatter around the estimated regression. The amount for this study is 0.233. Lower amount, indicates more accurate prediction and stronger correlation; which represent in this study. Significance level in the ANOVA table was close to zero and confirms that the regression model is appropriate.

Table 4. Coefficients table- Regression test

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.901	0.106		8.517	0
Social Capital	0.236	0.027	0.313	8.682	0
Structural capital	0.368	0.032	0.44	11.503	0
Human capital	0.21	0.026	0.287	8.173	0

Standardized impact coefficient (Beta) shows that the role and relative importance of structural capital is ranked in the first place, social capital in the second and human capital in the last .with referring to the last column of table 4 and related statistics of t, we could know, all variables of intellectual capital as a model of knowledge management have statistical significant effect on the balanced scorecard.

Friedman Test

We have used Friedman test to evaluate the effect and ranking of the variables.

KM Variables Ranking

H0: there is no significant difference between Mean ranks of variables of knowledge management.

H1: there is significant difference between Mean ranks of variables of knowledge management.

The amount of Chi-square is 79.347 with 2 degrees of freedom and significance level is 0.000. Because of significant level of Type I error rate is less than 0.01 levels, so there is significant difference between Mean ranks of variables of knowledge management.

Table 5. Ranks of KM

Variables	Mean Rank
Social capital	2.07
Structural capital	1.62
Human capital	2.31

Accordingly, priority of variables of knowledge management based on the intellectual capital model is the following: The highest is human capital, second is social capital and the lowest is structural capital. It means that, Human capital is the most importance and structural capital is the lowest importance in this company-SAIPA.

BSC Variables Ranking

H0: there is no significant difference between Mean ranks of variables of balanced scorecard

H1: there is significant difference between Mean ranks of variables of balanced scorecard

The amount of Chi-square is 321.235 with 3 degrees of freedom and significance level is 0.000. Because of significant level of Type I error rate is less than 0.01level, so there is significant difference between Mean ranks of variables of balanced scorecard.

Table 6. Ranks of BSC

Variables	Mean Rank
Financial	2.25
Customer	3.58
Internal process	1.91
Learning and growth	2.25

Accordingly, priority of variables of balanced scorecard is the following: customer variable is in the first rank, financial and learning & growth both shared in the next rank and internal processes is in the final ranking. It means that customer has the highest importance versus the lowest importance is given to internal processes.

Discussions and Conclusions

This study has observed the relation between Knowledge management and balanced scorecard. In the present survey, we clarify the effect of knowledge management indices on the

advancement of the four balanced scorecard perspectives as a strategic organizational tool. The results of different tests first emphasize the relationship between knowledge management and balanced scorecard perspectives and then, it shows the priority and ranking of knowledge variables.

The Hypothesis was confirmed that there is a relationship between knowledge management and balanced scorecard with 99 percent confidence. This issue can be realized theoretically via studying literature. In the literature, it is mentioned that knowledge management is considered at least as a basis of balanced scorecard or sometimes instead of learning and growth perspectives. Another theoretical factor to confirm the above hypothesis is the balanced scorecard emphasis on the intangible resources, intellectual capital and knowledge resources. In order to investigate the relationship between the three dimensions of intellectual capital as a model of knowledge management and four perspectives of balanced scorecard there are also mentioned some sub-hypotheses which have been confirmed. And the results indicate the relative importance and role of structural capital ranking first, social capital ranking second and human capital ranking last. This ranking of intellectual capital in the company has revealed that further activities are required. In other words, knowledge strategic plans of organization occur based on regression test and according to the ranking. As Friedman test was observed, priority of knowledge management variables based on intellectual capital model is the following: Human capital in the first, social capital in the second, then Structural capital in the third rank.

Therefore, considering the test results, this study suggests the overall knowledge management program as follows:

- Knowledge related to human capital, which includes all the capabilities, knowledge, skills and experience of employees and managers in Saipa. Employee satisfaction index in this topic is important.
- Knowledge related to social capital which associated with the outcome and usefulness of physical interactions between people in Saipa and outside the company. Customer satisfaction and also increasing or maintaining of market share is major topics in this regard.
- Knowledge related to structural capital, includes processes, structures and systems in Saipa. Quality of product is the most important category in this class.

Overall, the major indices of knowledge assets in order of priority importance is as follows Rating:

- Product quality
- Customer satisfaction
- Staff satisfaction

These three factors related to knowledge and according to mentioned rank are the most important aspects of knowledge management in the strategic plan in Saipa Company.

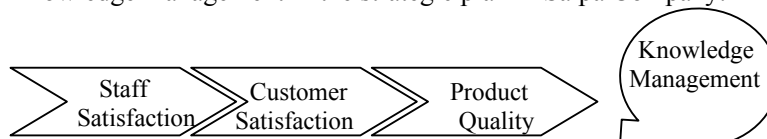


Fig.1. Plan of results

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Studiul managementului cunoașterii – efect al promovării celor patru perspective ale conceptului Balanced Scorecard: studiu de caz la Fabrica de automobile SAIPA

Rezumat

În ultimii ani, două noi categorii au fost prezentate și introduse în lumea managementului. Conceptul „Balanced Scorecard” ca model de planificare strategică ce îmbină măsurătorile financiare cu factorii organizaționali intangibili și managementul cunoașterii urmărește să identifice, să evalueze și să organizeze, să stocheze și să aplice cunoașterea pentru a satisface nevoile și a atinge obiectivele stabilite. Studiul de față clarifică efectul indicilor de managementul cunoașterii asupra evoluției celor patru perspective ale conceptului „Balanced Scorecard”. Capitalul intelectual, ca model de management al cunoașterii, a constituit modelul de bază al acestei anchete. Eșantioanele de studiu au fost selectate dinte manageri, directori, oficiali și experți al Companiei Saipa Automotive. Datele au fost colectate cu ajutorul chestionarului. Corelațiile Pearson, testele Friedman și cele de regresie liniară au fost utilizate în analiza datelor. Conform testului de corelare Pearson, studiul a arătat o relație semnificativ pozitivă între modelul managementului de cunoaștere și cele patru perspective ale conceptului “Balanced Scorecard”. Este important totodată faptul că testul Friedman specifică toate variabilele, clasificându-le în ordinea importanței și a priorității astfel: capitalul uman pe primul loc, capitalul social pe a doua poziție și capitalul structural pe locul trei. De asemenea, analiza regresiei reprezintă o predicție corectă și indică o corelație puternică între KM și BSC. În ansamblu, studiul de față sugerează calitatea produselor, satisfacerea clienților și satisfacția personalului drept trei aspecte importante ale managementului cunoașterii din planul strategic al companiei SAIPA.