

Short title:

PERFORMANCE INDICATORS:Quantity, Shape and Content

Author:

Wagner Bronze Damiani, PhD

Address:

Av. Nove de Julho, 2029, 11^o andar – Bela Vista

São Paulo – SP / Brasil

CEP: 01313-902

Phone: (55 11) 68657587

Fax: (55 11) 284 1789

e-mail: damiani@fgvsp.br

Second World Conference on POM and 15th Annual POM

Conference, Cancun, Mexico, April 30 - May 3, 2004.

ENTERPRISE PERFORMANCE INDICATORS: QUANTITY, SHAPE AND CONTENT

Wagner Bronze Damiani

Professor at Escola de Administração de Empresas de São Paulo da Fundação

Getúlio Vargas – Brasil

*Departamento de Informática e Métodos Quantitativos (Informatics and
Quantitative Methods Department)*

Av. Nove de Julho, 2029, 11º andar – Bela Vista

São Paulo – SP / Brasil

CEP: 01313-902

Phone: (55 11) 68657587

Fax: (55 11) 284 1789

e-mail: damiani@fgvsp.br

Abstract: nowadays, performance indicators are essential for enterprises in which decision-making has to be based on performance analysis to obtain risk minimization related to equivocated decisions, judgment mistakes and re-work. The new models of quality, inspired on performance indicators, in order to allow qualifications and certifications, strengthen this opinion. So, this research which has covered 63,7% of all Brazilian banks (174 listed by the Central Bank of Brazil) has evaluated performance indicators applied by these financial

institutions, through three key aspects: quantity received, contents and presentation shapes. The main conclusion drawn was that the lack of interaction between the technological and human dimensions as a set back to an efficient application of these indicators.

Keywords: Performance Indicators, Balanced Scorecard, Attention Psychology, Interaction Men-Technology, Intellectual Capital, Decision-Making

Introduction

Nowadays Performance Indicators are fundamental to companies thanks to their capability to control, permitting corrective actions, new initiatives and costs minimization. Moreover, all decisions taken by huge companies must be based on performance analysis in order to minimize risk of decision-making, judgment errors and rework, boosting new quality models as well as certifications and qualifications awards that we are acquainted (i.e. ISO'S). According to FNPQ, Criteria of Excellence 2002, indicators can be defined as being data or information that quantify the inputs, outputs and the process, products and the entire organization performance (FNPQ, 2002, p. 55).

To reinforce this tendency and the importance of the performance indicators we present a huge bibliography material. Recent theories as the *Balanced Scorecard* one, from R. KAPLAN and D. NORTON (1992, 1997), have been applied and gathering adepts for all over the business world. It's

commonplace that performance indicators are basic information tools but the question is: At what level are these indicators being used? How much can they be absorbed by executives and companies? What are the best strategies to constitute these indicators? The main question that involves this research is: Nowadays, information is being identified and presented in a simple way in order to straightforwardness decision-making to executives?

In this project is essential to figure out the importance of studying the use of information inside organizations constituting critical systems that helps decision-making. However, technology depends on the human factor that will apply it. Thanks to efforts to transform information in efficient information this research entails two basic points that brings about efficiency to information: content and shape. What are the contents and shapes that information systems offer to executives and organizations, and what are the most efficient ones to maximize decision-making accuracy in a short time period.

If Administration theories give special attention to performance indicators and their efficient appliance, on the other hand, Psychological theories have been studying for donkey's years the human attention, searching for one knowledge base consistent with this topic. The come across of these two theories will be certainly enjoyable and useful for the evolution of theories as for the evolution of tools for executives and their support systems of decision-making.

Objectives and Hypothesis

The aim of this research is to test performance indicators applied by executives in its shape and content. It's been examined the degree of appliance of these indicators on the decision-making, the shape presentation most applied, their content and the reliance of the gathered data.

Methodoly

This research has five stages: 1) bibliography revision; 2) closed questionnaire; 3) semi-structured interview; 4) eletronic test and 5) data analisis and report.

Bibliographic Review

The bibliographic research structured the project. This stage has three phases: a) bibliographic research (libraries-specially from EAESP/FGV, USP, Harvard Business School and eletronic libraries); b) reading and filing; c) conclusion.

Closed Questionnaire

Aiming data generalization, one quantity questionnaire has been applied according with criteria of *American Statistical Association*. The filling

strategy applied was developed on HTML and was divided into two subphases:

- Monting: it's been applied an eletronic formulaire version to fasten the speed of answers and to minimize costs (SHEEHAN, 2001). It's been composed of questions elaboration and answers options, and programation of the eletronic formulaire on HTML.
- Data Gathering: the population chosen was adepts of decision-making support systems. There're fulfilled 151 questionnaires on more than 100 different banks (see *Population and Sample*).
- Data Processing: all data gathered by research monitors have been stored electronically. After this, it's been made a team review in order to guarantee reliance of data and correct typing mistakes.

Semi-Structured Interview

Through a semi-structured itinerary to interview, elaborated according to the hypothesis cited before, there're interviewed executives from eight companies that have answered to questionnaire in order to improve the answers. The interviews were based on qualitative methodologies, especially speech analisys.

Electronic Test

In order to give consistence to the interviewer's opinion about the efficient appliance of performance indicators was made one eletronic test in PHPscript, available in the Internet. Eighteen interviewers have answered.

Data Analysis and Report

Each stage has a different criterion. The first stage entails primordial concepts (bibliography review). The second one was analised according to opinion and market researchs and inferences were based on simple statistics (aleatory sample). The third one had a methodology of speech analisys. The last one entails eletronic tests according to statistical analisys (non aleatory sample).

Population and Sample. Based on the results of the research of Prof. Fernando S. MEIRELLES (2002): Universe = financial institutions (the most investing sector of 2002 on TI); Population = bank institutions of Central Bank; Sample = 150 executives within banks; repetition of the bank origin is accepted.

Sample Analysis. Closed Questionnaire: 100 banks representing 63,7% of the total amount of banks listed on Central Bank; 151 people answered the questionnaire; Sample: Divided into two levels: tatical and strategical – and

in three areas: financial, administrative and others; Semi-Structured Interview: 8 executives interviewed; Eletronic test: 18 valid answers.

Bibliographic Review

At first place, there're defined what are the performance indicators, according to Kee Theories of Performance Indicators making an attempt to cover the organizational, technological and human levels. On the technological level it's been developed the concept of EIS - *Executive Information Systems* – as their adepts were chosen as sample of population. Theories of Attention were used to analise human levels. On the content analisys, it's been applyied the *Balanced Scorecard Theory* to confirm or not if the perspective of the interviewers keep on based on classic vision of financial indicators or if it's being applied one diversication byproduct of widespreading of new and more abragent theories in their content.

Strategies, Goals and Performance Indicators

According to BAKER (2002), the definition of kee performance indicators takes place on the holistic strategy of organization (idem, p. 168). HARBOUR (1997) affirms that to reach desired goals is necessary to have capability to measure performance (idem, p. 1). TAVARES (1991) assumes strategy in organizations as one evolution of long run planning concept on the 70th decade.

Through the strategy concept it's been created the strategy planning concept which steps can vary according to objectives and aims, although in any concept is included the goal idea – one specific objective with a pre established result and time. Goals make the difference between performance indicators and strategic planning because the comparison between indicator and goal make it possible to test planning and to take necessary decision-making to correct deviation. As strategy depends on information to monitor and develop goals, this can bring about competitive advantage to organizations.

Executive Information Systems (EIS)

These systems are based on TI with the aim to develop and improve efficiency and accuracy of decision-making inside organizations through data and information analysis.

Essential Points:

- Executives;
- Customization;
- Adaptation;
- Strategic areas;
- Long run vision;
- Structured information;
- Tendencies and perspectives;
- Knowledge;

- Decision-making.

Balanced Scorecard

Constant adaptation of organizations thanks to the Information Era demands systems of measurement and management, specialized and that are innovations. KAPLAN and NORTON proposed the BSC which measures the organizational performance through four balanced perspectives: Financial; Clients; Internal Process; Apprenticeship and Growth. BSC is a top-bottom vision of the organizational performance with focus on vision and strategy, being the organization more able to execute its strategies thanks to their power of communication of objectives, targets and goals.

Attention and Indicators Theory

We can verify conflict between the growth tendency of controlling process through ERP's and the executive capability to process a huge amount of data. Thanks to this conflict there're developed methodologies to point out the Performance Indicators that can be found on BI projects. They consider other aspects as information perception capability or attention.

Results

Closed Questionnaire

We verified the following aspects:

- 151 answers have been obtained between 100 different banks;
- The questionnaire had 14 questions: 4 about identification, 3 about performance indicators, 3 about reports and 1 about data reliance;
- 70% of sample was reached electronically;
- 60% of interviewers receive more than 16 mansal reports;
- Great difference between strategic and tatic levels concerning performance indicators appliance quantity (76% x 18%);
- 68% affirm to use at most 50% of the indicators that they receive and in the tatic level this number falls to 25%;
- Financial area apply 75% of them;
- Shape: 13% prefers to interpret graphics than tables – on the strategic level they prefer 3D graphics and on the tatic level the 2D ones;
- 51% rely on the data received and 47,7% only partially.13% simply don't rely.

Semi-Structured Interview

In this third stage had been interviewed 8 executives of 8 different banks. We obtained 8 different topics:

- Systems diversity;
- The difference between reports and indicators;
- The use of indicators as tools of decision-making;
- Indicators adequation;
- Indicators format;
- *Balanced Scorecard*;
- Outrage Information;
- Relyance on data.

Electronic Test

This stage counts on 18 interviewers in 17 different banks.

We verified the following aspects:

- Answered by 19 people and available via internet for al 151 interviewers;
- Composed by 4 questions through data presentation – one table, one graphic 2D, one graphic 3D and one line graphic – with the mensal hypothetic detailed report for four months of fours different selling

- teams. The interviewer should have answered which team that sells the most in the cited period;
- Facility when answering the test: mean time answer - 6 min 24 seg \pm 1 min 52 seg.;
 - All 18 interviewers got right when answering the question that was composed of tables as way of data presentation - mean time answer - 61,5 \pm 13,9 seg.;
 - Generally, the means interval of time to answer the questions was 90,3 \pm 17,6 seg.;
 - There're 2 outliers: 365 e 351 seg. Avoiding them by stepwising we got the following mean: 82,2 \pm 13,8 seg.;
 - There're 4 errors in the end and three out of the four have been occurred in the final part of the test, comproving tiredness and exhaustion during the test.

Conclusions

Indicator's Quantity

- The following conclusions have been drawn:
- 21,9% of interviewers have affirmed to receive more than 100 mensal reports what means three to four dayly reports;
 - 44,4% of interviewers receive more than 15 types of indicators;

- The previous information comprises a huge quantity of information widespread massively through executives, and even if these information proves to be intelligent, the mental effort to interpret it jeopardizes the decision-making, taking more time and becoming less efficient;
- 68,0% of interviewees has affirmed that they couldn't apply more than 50% of indicators and only 19,0% were successful in applying all them;
- 23,1% of interviewees receives no more than 15 indicators and apply more than 75% - 8,8% receives more than 15 and apply more than 75%;
- Reasons to the use of indicators: excess of indicators; difficult in accessing information caused by the systems diversity consulted by executives;
- 64,3% of interviewees on the strategic sector affirmed to use more than 50% of the indicators; 57,1% on the tactical sector – only 6,3% of the first sector uses less than 5%; On the second one we have 17,1%;
- Financial area seemed to apply more indicators but this can lead the research to a wrong conclusion thanks to the fact that bank institutions are our universe and this fact can bias the first conclusion;
- 17,5% of interviewees on the administrative area and 12,5% on others affirmed to use 100% of their indicators – this mean can reach 21,7% on the financial area.

But for these points, we can't affirm with certainty that are substantial discrepancies concerning the differences between levels or areas thanks to the fact that we assume that the mean of indicators could vary.

Indicator's Content

We've chosen BSC as study basis in order to know if the basic hypothesis – that companies recognize the limitations of applying only financial indicators - is true. Although the results were better than we've expected, financial indicators are still being the most applied indicators. It can be noticed the following aspects:

- 9,7% of interviewers uses only financial indicators; only 2,1% of interviewers applies others;
- 30% to 100% of the total of the indicators that the interviewers received are financial ones; at most 40% of the total are other indicators;
- 62,8% of interviewers affirmed that more than 50% of their indicators are financial ones.

It'd be convenient to notice that despite of the excess of indicators received they are fully concentrated in their content. There're 3 basic hypotheses for that:

- Information assymetry and redundant information;
- Concentration – lack of data intelligence.

Considering the four perspectives suggested by KAPLAN and NORTON, the least applied was client's satisfaction (12,2%). Growth indicators have a mean of 13%, Internal Processes of 18,5% and Financial Indicators of 55,6%. As we thought, it was nine to ten that the financial setor concentrate financial indicators. This was confirmed by the fact that 50% of interviewers of this area reported to use more than 70% of these indicators. Only 15% of the administrative area reported the same.

Indicator's Presentation Shape

The following conclusions have been drawn:

- 20,0% of interviewers received indicators in a misunderstanding way;
- 18,6% of interviewers receives tables but they express more acquaintance with graphic interpretation;
- Strategic level has a graphic preference; Tatic level has a table preference;
- Indifference level is high – meaning that standartizations could reach massively the population;
- However, a customized presentation could reach highest levels of data retaining by executives (30%);
- 57,1% of interviewers prefers 2D graphics;
- Line graphics ease the interpretation - 38,2% of the answers were indifferent with reference to the graphic type.

To our mind the electronic test would help us to find out the most efficient form of data presentation. At first, tables appeared to be the most efficient method as the answers were faster. But the Friedman test (Table below) doesn't make us refute the hypothesis that the mean time was different.

Test Statistics^a

N	16
Chi-Square	3,825
df	3
Asymp. Sig.	0,281

a. Friedman Test

This means that we can't affirm through our sample that the time means of answering are or not equals.

Finals Considerations

The interaction between human and technological dimensions has been distracting researchers for times. KAPLAN and NORTON (1997), SENGE (1998), and DRUCKER (*In Harvard Business Review*, 2000) are some authors that have

been alerting to the significance of the human factor on organization environment. But for this speech, we haven't seen yet a practical approach.

This research makes it crystal and clear that there is yet a huge path through an efficient interaction. Despite of all TI efforts to be always on top, the lack of approach between the executive and technology seemed to minimize the possible development.

We can explain this through some observations or hypothesis:

- Lack of preparation and know-how;
- Parametrization;
- Judgements;
- Others.

These hypotheses deserve to be more elucidated. However, they shed light on recent paradigmas related to indicators implantation and decision-making showing that there're some aspects that must be improved in order to boost the development of the interaction man-technology.

References

FNPQ. *Critérios de Excelência*. São Paulo: FNPQ, 2002.

HARBOUR, J. L. *The basics of Performance Measurement*. Portland (USA): Productivity, 1997.

HARVARD BUSINESS REVIEW. *Gestão do Conhecimento*. Rio de Janeiro: Campus, 2000.

KAPLAN, R. S. and NORTON, D. P. *The balanced scorecard: measures that drive performance*. Boston: Harvard Business Review, January de 1992.

KAPLAN, R. S. and NORTON, D. P. *A estratégia em ação: balanced scorecard*. Rio de Janeiro: Campus, 1997, 9ª ed.

MEIRELLES, F. S. *Tecnologia da Informação, 13ª pesquisa anual*. São Paulo: Fundação Getúlio Vargas, 2002, Available in: www.fgvsp.br/cia/pesquisa.

SENGE, P. M. *A quinta disciplina*. São Paulo: Best Seller, 1998.

SHEEHAN, Kim. "E-mail survey response rates: a review". Oregon, 2001, Available in: <http://www.ascusc.org/jcmc/vol6/issue2/sheehan.html>

TAVARES, M. C. *Planejamento Estratégico: a opção entre sucesso e fracasso empresarial*. São Paulo: HARBRA, 1991.