

# A Proposal of Integration Between IT Governance and Business Balanced Score Card

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## ABSTRACT

*Useful management models have to work with the most important aspects in a modern organization: environment, market analysis, innovation, learning, operation, diffusion, reengineering and added value. These terms are related in a supply demand schema under a dynamic systems based frame, because the supply demand schema is the best way to understand and simulate the real daily operation of every organization. The New Economy behavior is not possible to replicate or simulate with classical theories based on internal organization characteristics or considering modern concepts (as innovation, for example) in a more or less isolated way. These concepts (environment, market analysis, innovation, learning, operation, diffusion, reengineering and added value) cannot glue any old how, they have to be absorbed in a modern system based context. A new conception of how to measure the value added is supported by this new business dashboard. Nowadays it is impossible to further delay the preponderance of Information Economics and Information Systems as an essential frame to understanding the enclosing of our organization in a marked leaded by concepts such as: effectiveness, integration and globalization. The name of this new conception that joins the best of IT Governance proposal with the best of Business Balanced Score Card idea is IG4 (Information Governance Four Generation Model).*

## 1. INTRODUCTION

There are many models to analyze the companies' management and strategies (Balanced Score Cards, EVA, etc) under a business perspective. Under the system and technological point of view there are other theories to plan and manage the systems in the companies such as IT Governance, Balanced Score Card for IT, System Strategy Planning and the Cobit initiative. These two perspectives, business and systems, are glued together in the current theories throughout alignment of IT with business (strategy alignment and operational alignment). However in the Modern Economy and under the powerful Internet, the private companies and

the public organizations are completely dependent on the Information Systems: With hundreds of thousands of transactions the functions that are not covered by systems are impossible to accomplish in the daily company business. In this scenario to align systems with business is not enough and it is necessary to integrate both approaches, business and technology, in only one approach: the IG4 model. The IG4 model substitutes alignment for integration.

As is depicted in figure II, the IG4 model tackles the system perspective and the business perspective under an applied orientation. The SBMII model covers the disciplines of IT Governance, Systems Strategy (and its sub-component of System Strategy Planning) and Balanced Score Card. The IG4 model has a high management and strategy orientation due to this; it does not support the level of detail of the operation level. However the IG4 model considers the best analysis characteristics of these models: the CMMI model (process oriented) [Ahern, 2004], the Software Project Dynamics (software develop oriented) [Abdel-Hamid, 1991] the reengineering theories (process oriented), activity based costing (costing oriented) and Lean thinking (quality oriented) [Womack, 2003]. There are other studies based in different variables to measure the IT effectiveness [Scott, 1995]. These variables are more focused in levels of IT expenses (training, number of PC, etc) obtained by surveys than an added-value method and a complete review of the organization throughout their systems. In conclusion, none of these studies gives a complete response to the IG4 objectives thought in giving integral answers to New Economy requirements.

In addition, in recent periods, there has been a tendency to consider innovation and change as hackneyed fashion and the solution of every organization income problem. It is impossible to attend any conference or company meeting in which innovation is not a central theme. During the last decades, there were different fashions that rocked the organization department's boat: reengineering, ERP

Figure 1. Conceptual model of the modern organizations

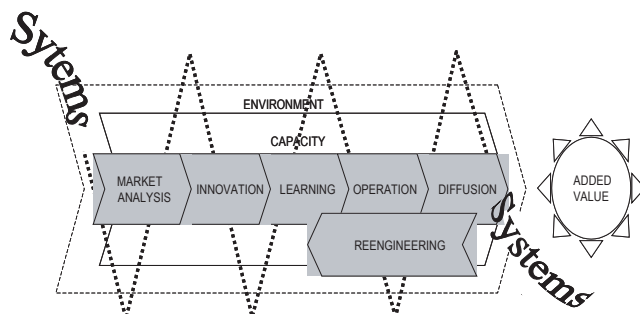
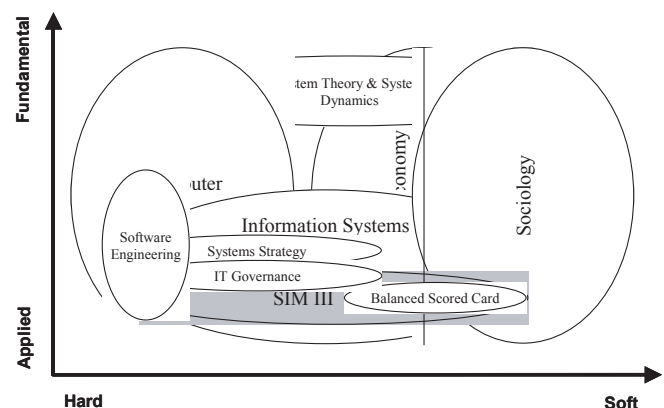


Figure 2. The fit of SIMIII between technology and business



(Enterprise Resource Planning), Internet, just in time, globalization, activity based costing, etc [Davenport, 1998]. After the dot com bubble burst, there has not been a new global movement that gives opportunities for quick growth and this makes innovation a recurrent conversation topic. However, to consider innovation in plain theories or in an isolated way is not giving good results [Sull, 2000]. There are several examples that confirm this fact:

- It is difficult to find clear and convincing relations between the research capacities (innovation) and the chances to create added value [Bryjolfsson 1993, 1996] [Hitt, 1996].
- In the last years, some sectors such as telecom and banking in order to improve results have preferred mergers or purchase strategies better than innovation strategies as different studies showed [Olazabal, 2002]. When telecom applied the 3G only considering a new innovative and powerful technological opportunity, the results were not as desired.
- Some areas have reached maturity (technological maturity, functional maturity and contents maturity) and sometimes only innovation is synonymous with new niches but with very low customer margins (in Internet history several examples can be found) [Johnston, 2003].

The present outlook follows a logical evolution; the industrial based management gave way to marked centered management, after that social centered management took its place, which presents a virtual and collaborative focus [Kaplan 1996, 2006]. But social models mainly give responses to important aspects such as leisure activities (chatting, peer to peer, etc) or transmission of ideas and information (wikis, blogs, etc). However, they do not cover the complete market and do not entirely explain the supply / demand based economic market. A framework is needed which conjugates more elaborated strategic ideas under the dynamic system glue [Forrester 1961, 2003] (as depicted in figure I these concepts are not isolated).

The general formula of this proposal is based on the general business formula "Demand = f(Supply)" and with more detail:

$$\text{Value Added} = \text{Value Added Systems Depended} + \text{Value Added No System Depended}$$

This research concentrates on the Value Added System Depended, where:

$$\text{Value Added System Depended} = f(\text{Value Added in the Business by Systems}) + f(\text{Value Added in the Operations by Systems}).$$

This formula marks the three views of the model: Value View = Business by Systems View + Operations by Systems View as is depicted in the figure III. If it expands all of this terms in a formula:

$$\text{Value added} + \text{Operation effectiveness} + \text{Welfare} = f(\text{Environment, Market Analysis, Innovation, Learning, Operation, Diffusion, Reengineering}) + f(\text{Systems Quality, Operation, Maintenance, IS People \& Organization, Development \& Acquisitions})$$

The IG4 model is at the same time a model, a philosophy, a tool and a method. The measure unit is always the systems or its subdivisions (subsystem, functionality, characteristic, etc).

1. The IG4 model is supported in a methodology that allows in a clear and systematic way to analyze our systems: this is because IG4 incorporates human, technological and business considerations.
2. The IG4 model is at the same time a tool. It is supported in a simulating tool that allows implementing a continuous and dynamic process (it supports added-value and time delays) following the supply demand cycle of our organization and through continuous feedbacks about our systems. Because of this dynamic simulation tool the IG4 model is supporting the functionality of Strategy System Planning.

This paper is a summary of a study supported by three complementary validations (the complete model is showed in the figure V):

Figure 3. Three interrelated views support the whole model

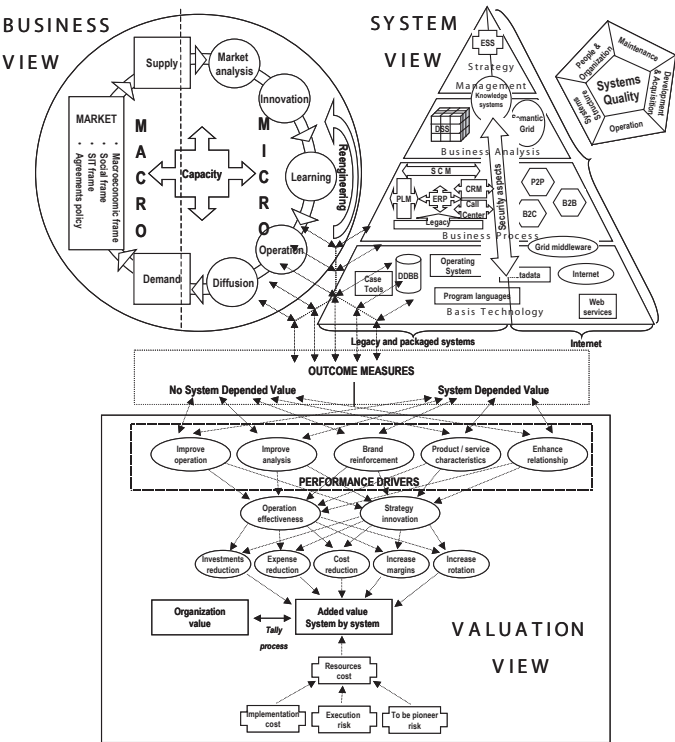
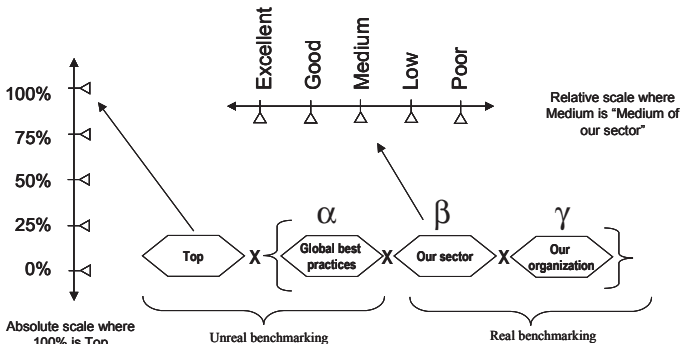


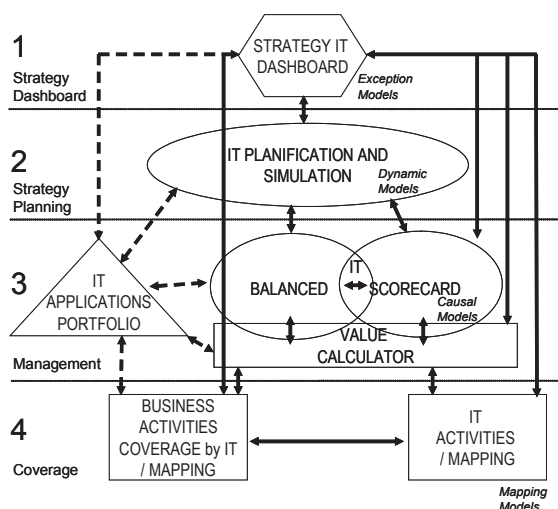
Figure 4. A comparative (benchmarking) scenario supported in four stages



1. A review of the variables that have affected the IT industry history.
2. An empiric validation through a survey to project directors of thirty large system projects.
3. A review of the general admitted theories that mainly involve the IT frame.

## 2. THE MAIN CONCEPTS OF THE MODEL

In this paragraph the main conceptual points of the IG4 model are analyzed in more detail: Added value, environment, capacity, diffusion, reengineering, innovation and all of them glued with the concept of systems: Beginning analyzing added value. It is good to analyze the goal of every activity before building our balanced scorecard: Improving the **productivity**? Improving the **added value**?

Figure 5. Complete view of the information governance model (IG<sup>4</sup>)

Improving the organization's **profit**? It is necessary to combine the three concepts: productivity, value added and organizational profit, to analyze something as amazing as all around New Economy [Bakos, 1992] [Hiitt, 1996] [Boehm, 2000]. Furthermore these concepts split the New Economy and allow us to separate and analyze concepts as different as a blog (value added disguised as journalism), a portal (productivity generated by the direct connection among different agents) and a complete solution such as MySAP.com (economic profit by manual tasks reduction and better management tools).

The productivity concept, as a relation between entry and exit economic flows, is supported in the elimination of intermediate steps (operation effectiveness). In today's Information and Knowledge Society where the communication and the knowledge are not always moved by direct economic transactions, to consider the concept of added value (it incorporates welfare) to the final users is critical. The third element is the organizational benefit that is the forgotten subject among the three concepts. This concept has to play a key role in the New Economy and by extension in the 21<sup>st</sup> dashboard [Porter 1980, 2000]. Figure II shows a more detailed approach of the three interconnected perspectives of the model: system view, supply / demand view and valuation view. The three views together are a powerful tool to analyze every 21<sup>st</sup> century organization.

What part of the company value is due to systems and what part is due to no-system causes (properly business)? When the value of a petrol company drops in the stock market it may be because the oil reserves are decreasing (no-system depended) or the management is not good (in large part system depended). In general when a telecom company is losing customers is because the quality of service is not enough good (in large part system depended). As systems are critical, the new balanced scorecard have to split the system depended added value from the no-system depended added value. For example, system analysis explains the large amount of mergers that happen nowadays when the organization cost structure is susceptible to resizing techniques. One main component of the last bank-merging wave is to save money by centralizing staff departments and sharing the costly IT systems investments. Just as a man is flesh and blood, the companies are systems and software. In this environment the role of the Information Economics (the economics of the overall information and knowledge industry) in the Economic theory is essential and has to be supported in the organization by an adequately balanced scorecard [Masuda, 1975] [Senge, 1990] [Lane, 1998].

If we want to decrease the digital divide we would make easy that public and private organizations to be catalysts of this change. The big problem is when it understands by New Economy only: to simplify the value chains, to reduce costs and where every intermediate expense or elaborated service is eliminated. With this simple format, Internet is not a useful means for the companies to expand their supply, and more than an opportunity it is a threat that destroys the entry barriers of new competitors. In contrast, what are the citizens of 21st century demanding about the New Economy? The citizens of 21st century where the life

quality and the leisure are key concepts will not understand in medium and long term an Internet reduced to "single window" and they hope developed services that mix the aptitudes of traditional economy with the easiness supported by the New Economy.

21<sup>st</sup> human activity is completely influenced by the **capacity** possibilities (part of the environment variable). Hollywood movies and traditional cultures made to believe that the individual or the team effort is a decisive ingredient of success factor. In contrast, the global businesses are not a baseball game or a romantic script. The individual gave the baton to the team and in the modern organizations the team has to give the baton to the environment (where, the team and the individual are a modest part of this environment). For example the operating system market treats with products of more than 20 million lines of code (knowledge capital) where the social tendencies, the existence of clusters, the business models and the public opinion, all together, are essential to achieve the success. Because of that in the modern models, environment and capacity are not the border of our organization, are a crucial virtual part of our organization. Just as important or more important than the internal organization are the alliances, the links with the research centers or the connection with the icebreaker users (multinationals, young people, trend creators, universities, etc). The real organization edge is not the physical organization: there are no outsiders there are artificial walls.

The number of variables to value in an organization is huge (experience, sector, maturity, synergies, scale economy, technology, etc) and without a contrast method (feedback), all the benchmarking methods are worthless. In addition, the benchmarking techniques do not allow huge innovation because they are forcing the sectors to be similar and because of that, to link the organizations with the research centers is essential as is depicted in figure IV. The stock market is the only benchmarking scenario where there are contrasted rules and thousands of people assuring the data quality. As the same stock market is a contrasted bank of value information, it is necessary to go down one step and to establish a "stock market" of contrasted ideas where a real match between the stock market value and the ideas that support this value is created.

The New Economy products are neither cars nor suits [Toffler, 1980]. The **diffusion** effect of new fashion in clothes or a new car model is easily assimilated by the market that only has to adapt to a new style or new features. In contrast, the information technologies bear important changes that affect the business models, not forgetting the user interface and finally legislation. In this situation, carefully determining the diffusion effect and the methods to accelerate it, becomes critical [Amabile, 1989]. Furthermore, it has to add two always over sighted adjustment effects to the innovation effect: reengineering and integration as part of the re-engineering. The New Market innovation produces without breaking new very complex products and services that require the essential **process reengineering** to obtain simplified solutions accepted by the market. The adjustment process goes together with the internal learning and the external diffusion to complicate the process because it plays in the time delaying the implantation of optimized new business models. To try in a few years to deploy the third generation telecommunication wave (UMTS) over technologies not completely established and full of future (SMS, IP voice, bluetooth, 2.5G, etc) led to the failures that took place. In the real market, reengineering is not a second level concept or nineties old fashion because it interferes deeply in the actual knowledge and investment intensive organizations. Another mistake is to think only in technological language: the concept that beats the technology market is not the strategy or the functionality; the concept that beats the technology is the systems [Stewart, 2003] (systems = business + technology + human).

The New Economy as **innovation** has a part of adventure and a part of consolidated value added [DeBono, 1972] [Drucker, 2002]. In the Old West, the people who invested in gold mines assumed high risk and questionable earnings but for the people who invested in fashion jeans companies (the jeans that the miners wore), the profits were lower but have lasted to the present. The history is repeated and the balanced scorecard of the New Economy has to support both realities: adventure, innovation and risk and complement of the classic value chain contributing to new business opportunities and ways to face new business lines.

In 19<sup>th</sup> century, the companies were capital and workers. In 20<sup>th</sup> century, the companies were departments and business units. In 21<sup>st</sup> century, the companies are **systems** (more than software) [Folgueras, 2006]. Nowadays, important elements of companies are: links with other companies, business models, internal processes, analysis tools, accumulative knowledge, communications with stakeholders, etc [OECD, 2000] [Digital Planet, 2004]. In a big company with hundreds of thousands

of transactions, models that are not supported by systems are worthless. The only possible organization structure is the system structure. Aspects you cannot measure you cannot improve. But if you cannot automatically treat (systems) neither can you measure or operate them, because the concepts of balance scorecard, systems and value added are related [Forrester, 2003] [Abdel-Hamid, 1991].

### 3. CONCLUSIONS

There are many models to analyze the companies business and strategies (Balanced Score Cards, EVA, etc). Under the system and technological point of view there are other theories to manage the systems in the company such as IT Governance, Balanced Score Card for IT, System Strategy Planning and the Cobit initiative. These two perspectives, business and systems, are glued together in the actual theories by alignment of IT with the business (strategy alignment and operational alignment). However in the Modern Economy and under the powerful Internet, the private companies and the public organizations are dependent on the information systems: With hundreds of thousands of transactions the functions that are not covered by systems are impossible to accomplish in the company business. In this scenario aligning systems with business is not enough and it is necessary to integrate both approaches, business and technology, in only one approach: the IG4 model. The main model contributions of the IG4 model introduced in this paper are.

1. To follow the supply / demand schema as the real organizations do.
2. To use dynamic tools in a supply / demand schema facilitates the process simulation when there are several interconnections with feedback and when the value is the value of several years.
3. To control system by system the system depended value from no-system depended value (properly business).
4. To make up added value with economic concepts (profit and productivity) and no direct economic considerations (welfare and leisure).
5. To understand the virtual organization: In an intensive capacity (knowledge and investments) market, the environment and its agreements are crucial and are part of our virtual company.
6. To consider properly the innovation: Five connected terms (market analysis, innovation, learning, diffusion and reengineering) are focused in a changing environment, only one in the traditional cost vision (operation).
7. To avoid the Tower of Babel: The added value is the common language of the cause-and-effect relationships (together with other outcome measures and performance drivers). It allows tally processes.
8. To control the time is as important as control de value added, because the terms external diffusion and internal learning are critical.

This article asks if the classical management reports, which are based on many possible combinations of concepts such as strategy, human behavior, internal processes or technologies are optimum [Mintzberg, 1994]. With the balanced scorecard proposal introduced in this article, behind the glasses of environment, market analysis, innovation, learning, operation, diffusion and added value, it is not seeing the bubble burst and it is only seeing huge opportunities adequately planned in time. If the balanced scorecard incorporates these concepts, we will understand and predict the New Economy.

### REFERENCES

1. Abdel-Hamid, T. and Madnick, S.E, 1991. Software project dynamics an integrated approach. Prentice Hall Software Series.
2. Ahern, D.; Clouse, A. and Turner, R., 2004. CMMI Distilled. Second Edition. A practical to introduction process improvement. Second Edition. Addison-Wesley. Pearson Education.
3. Amabile, Teresa M., 1989. How Work Environments Affect Creativity. IEEE 1989.
4. Bakos, J.Y. And Kemerer, C.F, December 1992.Recent Applications of Economic Theory in Information Technology Research. Decision Support Systems.
5. Boehm, B and Sullivan, K., 2000. Software Economics: A Roadmap. Future of Software Engineering. Limerick Ireland. ACM.
6. Brynjolfsson, E., December 1993. The productivity paradox of information technology. Communications of the ACM. Vol 36, No 12.
7. Brynjolfsson, E. and Yang, S., February 1996. Information technology and productivity: A review of the literature. MIT Sloan School of Management. Cambridge, Massachusetts. Advances in Computers.
8. Davenport, T., 1998. Putting the Enterprise into the Enterprise Systems. Harvard Business Review.
9. DeBono, E., 1972. Lateral Thinking for Management. New York Amacom.
10. Digital Planet, October 2004. The Global Information Economy. Global Insight, Inc. World Information technology and services alliance. Witsa.
11. Drucker, P.F., August 2002.The Discipline of Innovation. Harvard Business Review.
12. Folgueras, A.; Ruiz, B. and García, A, 2006. IADIS International Conference WWW/Internet 2006.
13. Forrester, J.W., 1961. Industrial Dynamics. MIT Press, Cambridge, MA.
14. Forrester, J.W., July 2003. Economic Theory for the New Millenium. Plenary Address at the International System Dynamics Conference. Massachusetts Institute of Technology. New York.
15. Hitt, L. and Brynjolfsson, E., June 1996, Productivity, Profit and Consumer Welfare: Three Different Measures of Information Technology's Value. MIS Quarterly.
16. Johnston, R.E. and Bate, J.D., 2003.The Power of Strategy Innovation. Amacom.
17. Kaplan, R.S. and Norton, D.P., 1996. The Balanced Scorecard: Translating strategy into action. Harvard Business School Press.
18. Kaplan, R.S. and Norton, D.P., March 2006. How to Implement a New Strategy Without Disrupting Your Organization. Harvard Business Review.
19. Lane, D.C., May 1998. Social theory and system dynamics practice. European Journal of Operational Research. Elsevier.
20. Leslie, J. and Lyytinen, K., 2006 Information Systems: The State of the field. Wiley Series in information Systems.
21. Masuda, Y., October 1975. The Conceptual Framework of Information Economics. IEEE Transactions on communications. Vol. COM-23. N° 10.
22. Mintzberg, H., 1994. The Rise and Fall of Strategic Planning. New York: The Free Press.
23. National Research Council of the National Academies, 2003. Innovation in Information Technology. The National Academic Press.
24. Olazabal, N. G., 2002. Banking the IT Paradox. McKinsey Quarterly. Number 1.
25. Organization for Economic Cooperation and Development (OECD), 2000 A New Economy? The Changing Role of Innovation and Information Technology in Growth.
26. Porter, M.E., 2000. What is Strategy? Harvard Business Review OnPoint.
27. Porter, M.E. Competitive Strategy. Techniques for Analyzing Industries and Competitors, 1980. First Free Press Edition.
28. Scott, J.E., 1995, February. The measurement of information systems effectiveness: evaluating a measuring instrument. Data base advances. Vol.26. No 1.
29. Senge, P.M., 1990. The Fifth Discipline. The Art and Practice of the Learning Organizations.
30. Stewart, Thomas A. and letters of other readers. Does IT matter? An HBR debate, June 2003. Harvard Business Review (web exclusive).
31. Stelter, D. et al. The Boston Consulting Group, 1998. The Value Creators. A Study of the World's Top Performers 1993-1998.
32. Sull, D.N., 2000. Why Good Companies Go Bad? Harvard Business Review On Point.
33. Toffler, Third Wave, 1980. New York: Willian Alvin. The Morrow.
34. Ward, J. And Peppard, J., 2002. Strategic Planning for Information Systems. Third Edition. John Wiley & Sons, LTD.
35. Womack, J.P. and Jones, D.T., 2003. Lean thinking. Free Press. First Free Press Edition.



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