

In Focus: Strategic Performance Measurement

EDITORIAL

In this second issue of the Newsletter from InnKnow we focus on a critical issue that underpins and influences almost all business decisions, processes, activities and results, namely that of **strategic performance measurement**. In this editorial we provide a very brief overview of the field and present the articles contained in this issue.

Before that, however, we would like to express our warm thanks to all our readers for their encouraging comments on the launch of the newsletter and its first issue. This has convinced us that there is room and interest for the publication and it gives us the necessary energy to pursue this venture and plan for its future evolution. We invite you to continue the dialogue and look forward to your suggestions and possible contribution to future issues. We especially welcome best practice case studies from the Greek horizon in the focused areas of the InnKnow center; Innovation, Knowledge Management, Change, Performance Measurement and New Product and Service Development. The next Newsletter will be dedicated to Innovation and Entrepreneurship.

What is Performance Measurement?

Any discrete indicator that compares a real world situation to a pre-defined goal can qualify as a performance metric. Most obviously one thinks of financial indicators when performance measurement is invoked. At the end of the day, return on investment, return on assets, profit and shareholder value are among the most crucial indicators of the performance of a profit making company. However, the route to sustainable business development, that also incorporates the societal side, passes through a complex web of activities and processes where performance in terms of innovation, value added, efficiency and learning are central parameters. For this reason, many companies today have rather complex performance measurement systems in place, with the objectives of identifying the sources of value, prioritizing actions, allocating resources, making decisions and choices, orienting the efforts of people, and developing market and public images.

However, many of the systems used for monitoring performance are either mutually exclusive or strongly overlap. Therefore, many organizations become hosts of a variety of systems that can lead to confusion. For example, a recent internal study in a leading

global hardware manufacturer divulged more than a dozen different systems for evaluating manufacturing performance, and this only within one division.

What is *Strategic Performance Measurement*?

A performance measurement system becomes strategic when it goes beyond a warning system to become a guiding system, and when it is specifically designed to measure how the five central pillars of strategy evolve (Hambrick & Fredrickson, 2001):

- Arenas – Measurement of goal attainment in terms of product/market segments, geographic penetration, and mastery of technology and core value-creating stages in the arenas where the organization wants to be active,
- Vehicles - Measurement of goal attainment in terms of internal processes and activities, joint ventures, licensing/franchising and acquisitions that will enable the organization to move towards the arenas in which it wants to be active,
- Differentiators - Measurement of goal attainment in terms of image, customization, price, styling, and product reliability which are factors that can explain how the company will win on its markets,

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- Staging - Measurement of goal attainment in terms of speed and sequence of the different moves engaged to implement the strategy,
- Economic Logic - Measurement of goal attainment in terms of cost and financial returns that are necessary in order to successfully develop and sustain the strategy.

A strategic performance measurement system must also be transparent and easy to use so that it can function as a decision support system. Since its "public introduction" 10 years ago, the Balanced Scorecard (BSC) method is maybe the performance management system that best and in an integrated way fulfils these criteria.

The Balanced Scorecard

Most readers are probably familiar with the Balanced Scorecard concept that has gained significant exposure and application since it was introduced by Robert S. Kaplan and David P. Norton in a Harvard Business Review article in 1992. The core idea is to link performance measures in four complementary areas: Financial Perspective, Customer Perspective, Internal Business Perspective and Innovation and Learning Perspective. What was revolutionary when introduced, and what certainly is very timely today, is that the BSC leverage "softer" issues of performance measurement by defining measures for innovation and learning aspects of organizational life.

Because the BSC must work as a system, it has the power of bringing together different elements of a company's management agenda: Becoming more customer oriented, becoming more efficient, manage for the long term through innovation and learning, and present satisfactory financial figures. By defining specific indicators in these categories, establishing targets and action plans, and implementing them in an integrated IT system, the BSC becomes a key tool for developing and implementing strategy. The main challenge of a BSC implementation stems from the "integration imperative", which makes the process of selecting metrics and defining targets rather delicate, complex and time-consuming. On the other hand, the implementation of an IT system, usually based on a data warehousing technology, is also a challenge. Once achieved, however, many organizations have discovered in the Balanced Scorecard a very useful tool for managing strategic performance.

The Articles in this Newsletter

The first article reports on a project that consisted of developing a BSC for the banking sector. Second, a methodology for implementing a BSC is presented. These two articles are based on Field Study Projects by students of the Graduate Program in Decision Sciences at AUEB. Performance evaluation in R&D and New Product Development is the subject of the third article. Based on a review of best practices in large manufacturing companies in the electronics sector, different performance measurement approaches are identified and analysed.

Finally, we present some interesting discussions that took place at the second European Academy of Management conference, in which members of InnKnow participated.

There is a vast and ever increasing bibliography on strategic performance measurement in general and the balanced scorecard in particular. We provide a list of references and useful web links at the end of the Newsletter.

Gregory P. Prastacos, Klas Eric Soderquist

BALANCED SCORECARD IN THE BANKING SECTOR

By Yiannis Charalambous and Klas Eric Soderquist

The Greek banking sector has undergone important changes over the last years, related to the coexistence of many environmental and institutional factors: The liberalisation during the 1990s, the Euro zone, movements of consolidation, the evolution of the stock market... Today, Greek banks have developed new strategies and competitive advantages built on modern approaches to management and intensive use of technology. However, an area that still might lag behind these developments is that of performance measurement. In this article we report on a project that aimed at:

- Analysing the balanced scorecard methodology and relate it to the particular needs of banks,
- Identifying best practices of performance measurement in the international banking sector,
- Proposing a customization of the BSC to suit the banking sector,
- Analysing appropriate IT support for implementing the system.

The project was executed by a team of Executive students from the Graduate Program in Decision Sciences, all with working experience in the banking sector.

Cases of BSC Implementation in the Banking Sector

A general driving force behind a BSC implementation, as indicated in a number of case studies, was an important restructuring that was underway in the sectors and/or companies concerned. This restructuring had as a result a plethora of sometimes ill-coordinated change efforts, coupled to an urgency of reducing cost and reinforcing strategic market positioning, a situation that is characteristic for many Greek banks today, as well.

In particular, the banks such as Halifax Bank, Metro Bank, Chemical Bank, Wells Fargo, and National West Bank reaped the following benefits from their BSC implementations:

- (Re)focus on value added processes and productivity leading to simultaneous increase in customer satisfaction and decrease in costs,



- Shift from back-office oriented management to front-office oriented,
- Clearer identification of the value of differentiation in terms of new distribution channels such as e-banking in particular,
- Improved focus in strategy and improved links between strategy and operations.

Market Survey of Greek Banking Sector

Focusing on Greece, a questionnaire was developed with the objective of identifying a bank’s strategic goals, drivers for current and future success, short and long-term objectives, links between desired performance outcomes and existing performance drivers, and, most importantly, current performance indicators used. The detailed results of the survey, that remain confidential, confirmed the need and relevance for multi-perspective performance monitoring approaches such as the balanced scorecard, and it allowed to build a banking balanced scorecard model.

Banking Balanced Scorecard Model

By analysing, comparing and compiling the data from the case studies and the market survey, four strategic themes of highest priority and relevance for banking in general and Greek banks in particular were defined:

- Add and retain high value and potential high value customers,
- Increase revenue per customer (revenue growth strategy),
- Reduce cost per customer (productivity strategy),
- Optimize asset utilization.

On the basis of these themes, a list of specific objectives and quantifiable measures was developed. Figure 1 illustrates some central goals for each strategic theme and perspective in the banking balanced scorecard. To a large extent the goals in the different perspectives support the themes bottom-up as illustrated by the arrows. This bottom-up logic is inherent in the BSC methodology and has been emphasized in later applications and developments of the methodology. There are also many potential horizontal links that will improve the coherence of a global strategic reorientation of a bank. The banking BSC model was completed by assigning specific metrics to the goals defined per strategic theme and perspective. Examples of metrics proposed include:

- Actual revenues on targeted revenues – general and per customer segment, product range... (Financial Perspective),
- Customer satisfaction index, customer retention, depth of relationship... (Customer Perspective),
- Quality, cost and lead-time for new product/service development... (Internal Perspective),
- Employee awareness index (awareness about visions, strategy, technology...), employee competence levels, employee propositions... (Learning/Growth Perspective).

IT System to support the BSC

In a final stage, the team also analysed the conditions for an IT system supporting the banking balanced scorecard model. Particular attention was paid to data base design for collection and management of the large number of data needed to develop indicators to be used in the model.

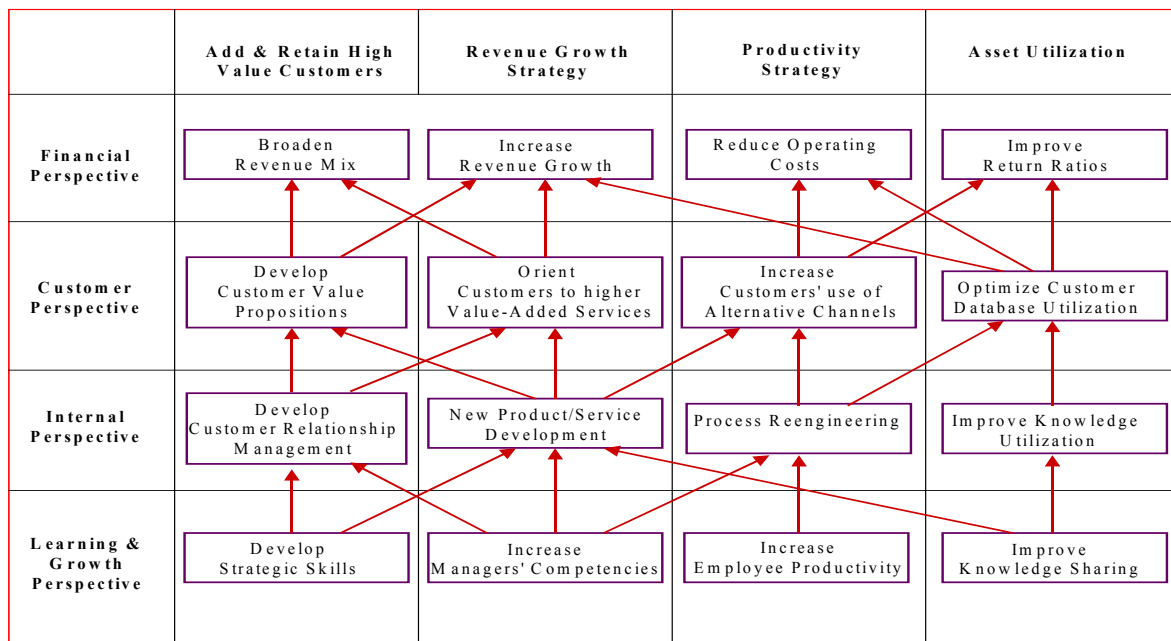


Figure 1. Strategic Theme Mapping.



It was concluded that a data warehousing architecture would be the most appropriate, as the BSC requires multidimensional modelling. For the front-end a prototype was built using some of the key performance indicators (KPIs) that were selected. The software used for the prototype was the Oracle Balanced Scorecard (OBSC), one among different software tools that provide a graphical way of linking strategy and performance through KPIs.

The development of the prototype included the representation of the various strategic themes and the links between the performance indicators inherent in each strategic theme. It also included a preliminary what-if analysis between certain KPIs. This prototype was designed and built in order to assist the banking market with their decision for a complete Balanced Scorecard solution.

IMPLEMENTING A BALANCED SCORECARD IN A SOFTWARE DEVELOPMENT COMPANY

By Alexandros Papalexandris and George Ioannou

Compared to the rich descriptive literature on the concepts of the Balanced Scorecard, there is much less knowledge documented about the actual implementation of a BSC. In this article, we present experiences from a pilot implementation of a BSC system in a large software development company. The proposed approach is based on the Kaplan-Norton model, takes into account the particular characteristics of the software industry and pays special attention to the human resource involvement in the deployment of the model.

The Software Development Company (SDC) is a Strategic Business Unit of a large multinational enterprise. SDC was established in the late 1980s with the objective of developing integrated solutions for communication, information technology and security systems. Its customer base is concentrated in Greece and the Balkans. SDC employs more than 150 people and is growing steadily. In the last few years, SDC had experienced significant changes and rapid growth, and the future is expected to be even more dynamic. Under volatile business and internal conditions, management wanted to:

- Specify the most important drivers of business performance and focus the company's efforts and resources to common goals;
- Capitalize on the main strengths of SDC and depict the areas for improvement;
- Implement a measurement system for the whole business unit, which would not rely solely on financial measures.

Given these circumstances, the BSC model appealed to top management and it was decided to launch a pilot project in which students of the Graduate Program in Decision Sciences of AUER were actively involved.

Application of the BSC at SDC and Method of Implementation

When designing the Balanced Scorecard in the company, the implementation methodology framework provided by Kaplan and Norton (1996) and Vitale *et al.* (1994) was followed, with appropriate enhancements and changes where necessary. The project of preparing, designing and implementing the BSC comprised seven distinct phases as follows.

The **first phase** involved the project preparation, i.e., the visioning, definition and planning for the project, as well as gaining the necessary commitment from the whole organization. It was important to explain how the BSC could add value in the particular business unit. In this phase was also formed an internal project team consisting of nine SDC key employees.

The **second phase** involved clarification of the vision and identification of the strategy of SDC. It included workshops and interviews with the internal project team members and other internal and external stakeholders using structured questionnaires. All outcomes of these activities were reported to the management committee for approval. The result was the identification of the following three most representative strategic issues of SDC:

1. *Increase value added to the mother company.*
2. *Offer high quality services to valued customers.*
SDC aimed at placing more attention to its highest value customers.
3. *Add, retain and develop the intellectual capital.*
First, SDC was committed to ensuring that employees are properly motivated and satisfied so as to minimize turnover in its knowledge capital-intensive activities. Second, it was important to increase the competency of employees by adequate training.

The **third phase** involved the identification and prioritization of strategic goals. It commenced with the financial ones and proceeded to the goals in the other BSC perspectives by asking the question: "If I succeed with my vision and strategy, how will my performance differ for stakeholders, for customers for internal business processes and for my ability to grow and improve?" (Kaplan & Norton, 1996). The project team ranked each strategic objective according to the enterprise-wide significance, the improvement potential and the feasibility of implementation. The result of this phase was the design of a strategy map (Kaplan & Norton, 2001a), which entailed all the chosen strategic objectives and their cause and effect linkages categorized according to the strategic theme and the perspective they most closely represent.

The **fourth phase** involved the selection of the measures for monitoring the strategic objectives (see table 1 for an example).



Strategic Goal	Add new customers
Measure	New customers / Total customers
Measurement Frequency	Three months
Measure owner	Mr. Smith
Target	Increase by 4%
Initiatives	Intensify and improve marketing campaign Organize and sponsor events Contact customers with dormant accounts
Budget	€ 300.000

Table 1. Example of a BSC Strategic Goal Breakdown.

The selection was based on the closeness and ease of monitoring of each potential measure to each strategic objective. The statement "Complexity is the enemy" (Bono, 2000) was kept in mind. According to the BSC philosophy, we were looking to identify the measures that not only *represent* but could also *communicate* more effectively each strategic objective to the whole company. In this process several relevant existing measures were also incorporated in the BSC model.

Further, considerable efforts were deployed in order to reach consensus on the leading key performance indicators to select for integration in the final model. After having selected more than 30 performance measures that would effectively represent each strategic objective and having verified the cause and effect relationships, the most appropriate ones for the organization and the BSC model were selected. This was made possible by examining the interrelations of performance measures (e.g., redundancy) and factors like applicability, communication potential and measurement and improvement feasibility. To further reduce the measures, the internal project team was asked to vote on the measures it considered most suitable and applicable, resulting in a final selection of 20 measures (4 to 5 for each perspective).

The main aim of the **fifth phase** was to decide on a goal (target) for each objective and to determine the measurement frequency (c.f., Table 1). In order to insure that the measurement schedules would be kept and the BSC would continue to be used after the completion of the implementation, a "measure owner" was selected.

Setting the appropriate targets for the measures required a deep knowledge of the particular industry, the competitive environment and a careful examination of best practices and benchmarking against leading companies in Greece and abroad. The final decision about the appropriate targets was always taken after direct input from the owner of the measure, to make certain that he/she would be committed to the improvement of the measure he/she assigned to. Along with the targets, the frequency of the measurements was also defined. Milestones were set for each target according to the most appropriate measurement period. Practice and

experience during the implementation process resulted in more precise and appropriate target-setting procedures as time progressed.

The **sixth phase** involved the development of strategic initiatives for achieving the targets (c.f., Table 1). The project team and the process owners derived the strategic initiatives that were believed to contribute in achieving the targets that had been set. A SWOT analysis for SDC was also used in this phase in order to depict the areas for improvement where the initiatives would be focused. The number of initiatives that the employees provided was overwhelming, as is the case in several BSC implementations (Tempest, 1998). The process of developing the initiatives for attaining the targets resulted in a documentation of all the proposed initiatives preceding the final adjustment of the targets themselves based on the feasibility and the perceived effectiveness of the initiatives. Finally, a budget was appointed for the strategic initiatives that were proposed in order to protect long-term objectives from the pressures to deliver short-term financial performance (Kaplan & Norton, 2001b).

After the design of the BSC for the business unit, the **final phase** included the formulation of the implementation plan for SDC, which involved both the communication and breakdown of measures to all the levels of the organization and the selection of the IT support necessary to monitor the company's performance. Many BSC software solutions have recently been developed, ranging from expensive, complete solutions of large software manufacturing and ERP systems development firms, like the Oracle or the SAP Balanced Scorecard solution, to simple representation media for the measures and the targets that have been set. For SDC, a middle range solution was chosen where data could be fed directly from the database of the company but some manual input was also required. The main reason for choosing not to proceed with a full-blown integrated IT solution was the attempt to promptly initiate use of the BSC by SDC's employees.

The final phase resulted in the presentation of the BSC implementation to all the employees of SDC. The responsibilities of the employees, both in achieving the targets and in constantly "running" and proving their input for the BSC, were explained. A plan was also created to reconfirm the validity of the strategic objectives, the selected measures and the chains of cause and effect on a yearly basis.

Discussion and Conclusion

A BSC may bring many short and long-term improvements. Some documented improvements include increased revenue and profitability, decreased cost and increased customer satisfaction. However, Meyer (1993) rightfully argues that some of the main advantages brought to a company by this tool are the less apparent intangible improvements.

In the particular implementation project we conducted, the use of the direct input from all employees and the attempt to incorporate their



opinions and strategic initiatives in the BSC had a positive effect on employee motivation and morale. This was evident from the increasing score in employee satisfaction questionnaires, but could also be deduced indirectly by a decreasing yearly personnel turnover.

In all phases described above, externally driven guidance and support was mostly serving the role of a facilitator, placing the "burden" of the implementation on the SDC personnel. This way, SDC employees developed a sense of ownership of the project and acquired the knowledge needed to alter any strategic objective and the corresponding measures at any time where the strategic priorities of the company would change. It was obvious that these factors contributed to the success of the project.

Certain weaknesses and shortcomings were also made evident from the implementation project at SDC. The main weakness lied in the complexity and time involved in its development and periodic review. Especially, if there is a need for representing different business units and levels of the company, with development of a Scorecard for each level, the costs may well outweigh improvements in organizational performance (Newing, 1994). Furthermore, since the selected measures are chosen so as to be aligned with the strategic goals of a company at any given time, there is a need for frequent revalidation of the chain of relations and of the measures that are going to be used each time the strategic goals of the company change. Hence, a great amount of time and resources is not only required to develop the BSC but also to fine-tune it so that it will be kept updated and effective.

Recent research (Moriarty, 2001) shows that in a sample of nearly 200 large sized companies 55% using the BSC were satisfied and only 12% were not satisfied. This stands in contrast to users of other performance measurement systems where the survey discovered that only 29% were satisfied with their current measurement system. However, there are also articles that question the overall concept of the BSC and oppose its use as a performance management system (Jensen, 2001).

After having implemented the BSC at a company facing fierce competition and internal changes, and after having viewed both incremental improvements in performance but also an important range of intangible benefits resulting from the implementation and use of the BSC by the company, our view coincides with the views of Mooraj *et al* (1999), who conclude, based on their research, that the BSC is a necessary "good" for companies. Its usefulness and effectiveness, however, is critically dependent on the sequence and content of the design process used to deploy it (Shulver & Antarkar, 2001), as well as on many other predictable and unpredictable internal and external company factors that have not yet been fully rationalized and documented.

In closing, we must note that the BSC is seen to provide more value to a company when it is used as a framework and a guideline for successful strategy communication and implementation and as a system for understanding what really creates value in the company, than when it is used as originally proposed by Kaplan & Norton (1992), namely as a performance measurement system. This statement could be complemented by the view of Schneiderman (1999), namely, that the BSC will fail if the company does not use the information provided to drive changes in its operations.

A paper with the same title as the above article, by George Ioannou, Alexandros Papalexandris, Gregory P. Prastacos and Klas Eric Soderquist, was presented at the 2002 IEEE International Engineering Management Conference, St. John's College, Cambridge, 18-20 August.

PERFORMANCE MEASUREMENT IN R&D AND NPD: AN OVERVIEW OF ALTERNATIVE PERSPECTIVES

By Klas Eric Soderquist and Armelle Godener

The emergence of global competition, and the introduction of concepts such as concurrent engineering, continuous supplier involvement, capability-based outsourcing, and heavy-weight project management have put Research and Development (R&D) and New Product Development (NPD) in the frontline of managerial attention and academic research alike. After a decade of concept and model development in academia, and continuous trial-and-error change processes in business, there is a certain consensus concerning what are the strategic imperatives and key skills of a high performance NPD organization (Table 2).

The question of *measuring* the performance of R&D and NPD at the firm level has gained increased interest in parallel to the general focus on the components of a high performance organization. Numerous different methods have been developed in order to evaluate *outputs* (expected and realized), *inputs* (resources allocated, enabling structures/factors...), and the *processes* involved (project management, learning processes, organizational dynamics...).

There have been several attempts to review and classify R&D and NPD measurement methods (c.f., e.g. Brown and Svenson, 1988; Geisler, 1995; Griffin, 1993; Griffin and Page, 1993; Hauser and Zettelmeyer, 1997; Kerssens-van Drongelen and Cook, 1997; Werner and Souder, 1997). These contributions have been instrumental in developing the area of R&D and NPD performance measurement over the last two decades, from non existing - management should just "have faith" that R&D is a good investment- to a field of scientific rigour and highest strategic importance. However, there is no comprehensive and integrated answer to the basic



questions *why* measure, *what* to measure and *how* to measure R&D and NPD performance.

ISSUES	STRATEGIC IMPERATIVES / KEY SKILLS
Overall Business Strategy and Strategic Management	<ol style="list-style-type: none"> 1. Measuring R&D performance 2. Articulate the company's strategic intent 3. Total Quality Management strategy 4. Project Leadership - power, visions, skills 5. Conducting R&D on a global basis 6. Meeting government regulations
Customer Focus	<ol style="list-style-type: none"> 7. Understanding customer needs 8. Monitoring market developments 9. Customer involvement in the development process
Organizational Context and Process Dynamics	<ol style="list-style-type: none"> 10. Accelerating new product development 11. Working with other organizational functions 12. Use strategic alliances to gain rapid access to enabling technologies 13. Chose and monitor alliance partners very carefully 14. Include strategic implications of technology development in the project selection and screening process 15. Use a parallel development process 16. Use executive champions 17. Capturing and relying upon R&D learning
Teams – Composition and Structure	<ol style="list-style-type: none"> 18. Include a diverse range of functions in project teams, as well as customers and suppliers 19. Capitalize on intellectual capital and focus on learning dynamics in the team 20. Match team structure to project type 21. Match team leader attributes to types of team 22. Establish mission, charter, and contract book for project team 23. Managing ethnic/cultural differences in R&D teams
Technology Strategy	<ol style="list-style-type: none"> 24. Map the company's R&D portfolio 25. Managing Multiple R&D projects 26. Fit with firm competencies 27. Monitoring science and technology development 28. Technology commercialization capabilities 29. Securing intellectual property rights
Tools	<ol style="list-style-type: none"> 30. Use appropriate tools to improve the efficacy of NPD

Table 2. Issues and strategic imperatives / key skills for effectiveness and efficiency of the NPD process (Gupta et al, 2000; Schilling and Hill, 1998; Brown and Eisenhardt, 1995).

We therefore undertook a bibliographical research in order to fill this gap. The topic is essential for managers dealing with the design, implementation and application of R&D / NPD performance measurement systems.

The study was conducted from an integrated process perspective spanning from advanced engineering, through concept development and product planning, to product and process engineering. While many authors use the notion R&D for both fundamental research and direct NPD for commercialisation, we used for reasons of clarity the notion Research and New Product Development (*R&NPD*) for designating the integration of research, advanced engineering and NPD.

Seven Major Measurement Perspectives

High R&NPD performance has been defined in many different ways that constitute possible complementary angles of a performance measurement strategy for R&NPD. Examining these definitions led us to identify seven different R&NPD performance perspectives:

1. A *financial perspective*, where performance is defined as maximising quantitatively measured return on R&NPD investment,
2. A *customer satisfaction perspective*, where high performance is seen as exceeding or at least satisfying customer expectations,
3. A *strategic management perspective*, where performance means goal satisfaction - implicitly understanding that goals refer to whatever goals are included in strategic planning,
4. A *process management perspective* where performance rhymes with optimising quality, lead time and cost, and ensuring project progress according to process related goals,
5. A *technology management perspective*, where high performance is understood as an efficient management of product technology for generating a continuous stream of competitive products,
6. An *innovation management perspective*, where performance is considered as the successful transformation of research efforts into new products, and as the creative application and combination of new or existing knowledge into new products,
7. A *knowledge management perspective* where high performance integrates a qualitative return on R&NPD investment in terms of knowledge creation, knowledge transfer, and knowledge exploitation resulting in enhanced R&NPD capabilities and intellectual assets.

Except for the innovation perspective, these performance measurement perspectives show a great similarity to the critical issues identified in table 2.

Further, the perspectives identified emphasize the potential importance of using different measures in a complementary way, something that naturally leads to confront the seven perspectives to the Balanced Scorecard (BSC) approach to performance management. Our literature review indicate that an extension to at least the seven perspectives listed above might be appropriate for the particular case of measuring R&NPD performance.



Within each perspective we identified the *purpose* of measuring performance, answering the question *why* performance is measured in each specific area. We then identified central *metrics (data)* and *measurement methods* in each perspective, answering the question *what* is measured in each specific area and *how* it is measured. An extensive account of metrics is available upon request.

Finally, we also identified the *phases* of R&NPD projects and the *organizational context* in which performance is measured, answering the question *when* and *where* performance is measured in each perspective. This last point accounts for two important contingency factors in R&NPD performance measurement, namely the organizational level at which the measure takes place (individual, team, function, business unit, corporate), and the phase in which measurement occurs.

Synthesis of the Research

In table 3, we attempt to summarize the literature review in a framework that brings together the different aspects of performance measurement discussed above. We wish to strongly emphasize the importance of the *why* dimension. A clear and comprehensive understanding of the rationales behind each perspective is instrumental before even starting to think about implementing specific indicators or measurement systems.

The "seven-perspective model" deliberately attempts to polarize the different perspectives in order to argue for a broad approach to R&NPD performance measurement. For example, an important number of patents reveals the creativity of a department (innovation perspective) but does not inform on the number of products that will come out of these patents (strategy and KM perspective), nor their commercial success (customer satisfaction perspective). On the other hand, with respect to the different perspectives, some "plain" metrics - such as costs, investments, and lead-time - are integrated in several perspectives. Especially when selecting projects, this complementarity could be translated into scoring tools giving higher weights to metrics belonging to the perspectives considered as crucial, e.g., risk reduction, potential return on investment, attainment of specific strategic goals and so on.

Also, the literature review demonstrates that performance needs to be monitored in all phases of R&NPD projects. Certain metrics, essentially the same as those that are integrated in several perspectives, are proposed in the literature also for several phases. Moreover, when cross-examining perspectives and phases, it appears that all seven perspectives are concerned with most of the phases. This situation reveals the necessity to take every performance measurement perspective into account from the very first step of a project and to continuously measure the performance of specific activities as soon as their effects are observable. We would stress that performance measurement should be integrated in processes in a way that makes

operational staff, middle and higher-level managers perceive their respective goals and related performance benchmarks as parts of their routines and cognitive frameworks.

Contingency factors play an important role for the choice and application of different approaches to performance measurement. In the literature review we have accounted for factors such as the organizational level and the phase in which measurement occurs. Other contingency factors include the *type of industry* (influencing complexity and organization of the R&NPD process), the *organization size* (company size and R&NPD organization size), the *type of project* (new design, technology transfer or design modification), and the *strategic control model* chosen for R&NPD (centralised cost center, decentralised cost center, or profit centers being submitted to internal and or external market control). From a practitioner's perspective it is critical to understand that different contingency factors might have an important influence on the measurement strategy and the measurement system/model. Figure 2 illustrates the complex web of relationships that potentially might exist when the major contingency factors are taken into account.

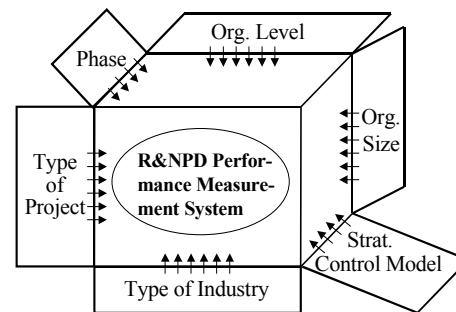


Figure 2. Some major contingency factors influencing the measurement approach.

To conclude, the balanced view of performance measurement perspectives that we have presented implicitly addresses one of the most frequent reservations to R&NPD performance measurement, namely that "pure" financial, customer, or process focus have the downsides of forgetting that R&NPD activities are long-term, that their financial return sometimes needs to be long and uncertain, and that they need to have room for creativity and spontaneous processes of knowledge creation.

A working paper presenting the entire study is available upon request. The research on R&NPD performance measurement is ongoing and we currently explore how world-class manufacturers are using their systems for decision-making.



	Financial Perspective	Customer Satisfaction Persp.	Strategic Management Persp.	Process Management Persp.	Technology Management Persp.	Innovation Perspective	Knowledge Management Persp.
Basic Rational and Objective <i>'Why'</i>	Anticipate the return on R&NPD investment. Maximizing the result of each dollar spent on R&NPD. Selection and cancellation of projects.	Evaluate the market expectations of a new product. Evaluate the satisfaction of these expectations from a launched product.	Assess the contribution of R&NPD to strategic differentiation, and initiation of new strategic orientations.	Evaluate organizational and process efficiency in R&NPD activities through quality, cost and lead-time indicators.	Understanding the technical and commercial effectiveness of R&NPD on a product family basis. Measuring the success of technology synergy.	Evaluating performance in terms of creation or application of new knowledge or creation of new combinations of existing technology.	Capitalizing on experience in order to perennize improvement efforts. Enhance the intellectual capital in R&NPD.
Central Metrics <i>'What', 'How'</i>	Total R&NPD Expenditures. Profit attributable to R&NPD efforts. Financial effectiveness index. Planned vs. actual spending and revenue.	Timeliness of market introduction. Product performance assessed by end users. The degree of interaction between customers, Marketing and R&NPD.	Estimation of business opportunities derived from R&NPD. Percentage of R&NPD results adopted by the company. Fit between technology and business strategy.	Development lead-time. Engineering hours. Conformance and design quality. Effectiveness of communication.	The newness embodied in the core technologies and market applications. Platform efficiency. Platform effectiveness.	Patents generated. Percent of product portfolio developed over the last n years. Level innovation in projects.	Effectiveness in staffing. Transfer rate of new knowledge and technology into product development.
Phases where performance is measured <i>'When'</i>	Pre-project for budgeting. Post-project for control. Data collection all along the process.	Early phases where customer data are interpreted. After market introduction when the product is used by customers.	Continuous goal attainment assessment throughout the process, with an emphasis on early phases focusing on the strategic potential of R&NPD efforts.	Continuous follow up on metrics through project progress monitoring systems and organizational audits.	Measuring efficiency and effectiveness over time as platform architecture evolve and derivative products are developed.	Early phases where transferability of innovation is evaluated. After market introduction evaluating the competitive value of innovation.	In early phases for knowledge creation and transfer of new knowledge. Continuously – "lessons learned" Post project "knowledge audit".
Organizational context of Measurement <i>'Where'</i>	Data collection at the R&NPD operational level, compilation and analysis at the controller level, decision-making at the Financial and R&NPD director level.	In the organizational interfaces between customers, customer representatives, marketing, and R&NPD.	In pre-project stages through expert and top management assessment. In running projects at stage-gates with all functional managers.	Evaluation takes place and results are aggregated successively at team, project, department, functional, and top management level.	R&D management, Top Management, expert level.	R&D department. R&D direction. Aggregation on corporate level.	R&D Department. R&D Direction. HR Department.

Table 3. Summary of the central findings from the literature review on performance measurement in R&NPD.

CONFERENCE REPORT:

The European Academy of Management (EURAM), 2nd Annual Conference on Innovative Research in Management, May 9 - 11, 2002, Stockholm, Sweden

By Konstantinos Kostopoulos

The second EURAM annual conference was hosted by the Stockholm School of Entrepreneurship and devoted to the exploration of "Innovative Research in Management". Around 700 participants, presenting over 450 contributions organized in 46 tracks located in 18 parallel sessions participated during the three days of the conference.

The driving force for organizing this conference were the changes that the new knowledge-based economy have brought to business and management. The complex and dynamic economic, political and industrial context of a Europe in transition has created a fertile ground for innovations in management thinking. The main target of the conference was to present and discuss *novel perceptions of management* in business contexts characterized by an increasing number of opportunities related to technological and organizational evolution as well as to changes in consumer and capital markets.

One of the most interesting tracks was "Managing the knowledge-based firm". For an increasing number of organizations, knowledge capital constitutes the key to competitiveness. Papers of both empirical and theoretical nature, addressing different aspects of how the increased focus on knowledge might enable us to rethink management, contributed to this session.

The research presented emphasized the major challenge for managers to simultaneously achieve *knowledge integration* and *innovation*. Knowledge integration refers to the synthesis of knowledge and the utilization of knowledge for profitable or other value-added outcomes. If knowledge integration shall lead to innovation it must be accompanied by a strong strategic intent (vision) of *exploration* of new opportunities as opposed to an intent of merely exploiting existing capabilities (c.f., Levinthal & March, 1993). In simpler terms, knowledge integration can boost innovation if the knowledge is used for developing new products, services and markets in stead of merely used for improving productivity and reducing cost.

The sessions on the knowledge based firm also revealed the importance of the attraction, retaining and development of key personnel and the need for new mechanisms to manage complex, knowledge-based work. Mechanisms discussed included the establishment of rules and directives, the organization of activities in a time-patterned sequence, and the use of a "common" language to facilitate knowledge transfer and sharing while maximizing the value created by knowledge-based activities.

A subject related to performance measurement and particularly in R&D, was the discussion about how to get scientists and R&D staff "in line" with the rest of the business processes. A tactic proven to be successful in small companies or within R&D business units was what some researchers had labeled "Business Talk". It consists of conducting workshops where the objective basically is to make all managers and expert staff such as engineers and researchers engage in a semi-structured conversation about business orientation and evolution of the organization. The objective of the conversation is to "unpack" opinions, viewpoints, contradictions and potential conflicts between different individuals, then outline a shared vision statement so as to avoid organizational confusion about business orientation. The process should be repeated frequently depending on the rapidness of shifting business conditions (technology, environment, competition)...

A large number of the papers presented at the conference are available for further exploration on the website www.sses.com/public/events/euram/, Tracks and Papers.

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SELECTION OF WEB LINKS

The Balanced Scorecard Institute, www.balancedscorecard.org. Contains a relevant introduction to the BSC, information about vendors, material for downloading, many good links...

Balanced Scorecard Collaborative, www.bscol.com. A professional service firm led by R.S. Kaplan and D.P. Norton (the "inventors" of the BSC). Rich content to explore. Provides possibility to subscribe to the periodical newsletter "Balanced Scorecard Report" and download a sample issue.

Harvard Business School, <http://harvardbusinessonline.hbsp.harvard.edu>. Gateway to numerous articles and case studies on the BSC, including the "classics" by Norton and Kaplan. Accessible through topic index "Management" then "Balanced Scorecard".

Panorama Business Views, <http://www.pbviews.com>. Software demos, on-line journal "Perform Magazine"...

Dialog Software, www.dialogsoftware.com. Software demo downloadable, positively rated by Gartner Group.

Acorn Systems, www.acornsys.com. Software solutions for a variety of performance related management methods. Mainly descriptive site.



Best Practices LLC, www.bestpracticedatabase.com. Contains under the headline "General Management" over 50 papers on BSC, some that are targeted to specific companies/sectors. Most papers cost between \$ 7 and \$ 12. Pay attention to the word count, some papers are hardly more than an abstract!

Also to explore, the websites of international and Greek **consulting firms**.

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IN THE NEXT NEWSLETTER

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