

Measuring Value – Creating Value A Solution for Process Innovation in High-tech Company Networks

Bernhard R. KATZY, Marcel DISSEL and Markus BLUM

Center for Technology and Innovation Management (CeTIM) at University Bw Munich

Werner-Heisenberg-Weg Neubiberg, 85577, Germany

Tel.: +49 (179) 695 68 77, Fax: +49 (179) 695 68 78

email: Prof.Katzy@CeTIM.org, Marcel.Dissel@CeTIM.org, Markus.Blum@CeTIM.org

Abstract In today's rapidly changing business environment, enterprises must continually innovate to stay ahead of competition. Over the last decade process management has been the focus of many organizational efforts, which were designed to increase the efficiency of stable work processes. But what is the organizational impact of new businesses? How does efficiency and performance of processes change, when faced with new products and innovations?

This paper presents a solution for the assessment of process performance for innovative products, ahead of time, enabling management to recognize problems and taking corrective action before these problems escalate. This paper presents a solution that combines process design with easy-to-use performance measurements. The solution consists of methods and tools, which allow analyzing cost- and time performance of business processes and their design. We report a case in the telecommunication industry, where the successful performance of new innovations is the result of efficient processes in tiered supplier structures.

1. What is performance in turbulent business environments?

It is generally accepted what efficient processes are: a given product or service is produced and delivered with minimal costs. And benchmarks with main competitors quickly reveal the real performance of each firm. In turbulent times however, when business radically changes, new technologies develop every few months, and product life-cycles drastically decrease, simple questions become difficult to answer: What is the product? Who are competitors? What are the processes? More and more companies face the situation that innovative products remain in the market for a very limited time only, too short to restructure the business unit for best performance. While some processes are still adapted to outdated products, others are under re-engineering and therefore incomplete. And on top of all a portfolio of new generation products is being prepared by new business development units that will outdate any transformation effort, perhaps before it has even been achieved. This results in decreasing margins and it is no wonder that permanent 'last-minute' actions, become a 'normal' way of managing.

More rapid change requires more executive management decisions. And it does not surprise that the number of reports and decision proposals on board level increases. But less and less accurate data from accounting and other management systems is available because their structure has not been updated for a number of years, and it would take weeks or months for these reports to be produced anyway. For many over-the-weekend tasks the only solution are improvised 'excel-solutions' floating amongst middle management. In the long-run, however, these further obscures sound performance indicators. Especially business development manager face the dilemma of having to report and measure the value of business opportunities of products that do not yet exist, and will be produced by

processes, of which she/he only has less and less knowledge. On the opposite side, if she/he had more understanding of the process performance, she/he would more likely to be able to anticipate future challenges and be able to change process ahead of time.

We found such situations to be typical for many high-tech businesses. Managers in high tech industries, e.g. the telecom industry, face a dilemma that they have performance measurement systems on the one side, which are based on accounting, supplier management, or quality management systems. These systems are based on past data and managers receive the reports only several months after the reporting period expired. On the other side managers in high-tech industries meet business opportunities every day, and they have to invest in the creation of businesses and organizations for future growth.

It comes as no surprise that support for innovation processes is missing. The many approaches that have been developed are built on the assumption of stable business, among them business process re-engineering, business process improvement, and TQM. These have been used in the last decades to improve production and logistics processes. No similar attention was given to the innovation process.

In turbulent markets the innovation process is the very essence of creating value and growth. We define the innovation process as a value creation process where new businesses are developed in order to exploit emerging opportunities. Other terms for this process, used in some companies is business development or new product development.

The change from stable to dynamic business environments has created new requirements for performance management of these innovation processes. The new requirements are twofold, first to look into the future - rather than the past - for any planning activities, and second to provide 'real-time' management reporting. In other words, to simultaneously create and measure value.

This paper presents a performance management solution for innovation processes, integrating both a process design approaches and performance measurement solutions. The solution consists of two technologies: a process design technology tuned for fast application, and a process performance measurement technology that allows for analyzing dynamic cost- and time performance of business processes.

2. Value Creation and Value Measurement – an integrated approach

What you measure is what you get. This old saying holds equally true for innovation processes. We therefore measure value creation, which is the return on each new business or product in the eyes of its investor(s). This differs from traditional accounting methods, where investment calculations are based on the added value (which is the difference between the price of the product and its production cost), and this is a market perspective. Value creation is based on calculating cumulated earnings over the business life cycle deducting direct cost for its delivery. As we are to decide between alternatives of new businesses, the relevant costs (which can be influenced by management in short term) are those costs excluding interest, tax, depreciation, and amortization. In other words, what remains to be analyzed is the cost of creating and then operating the processes, necessary for it.

We therefore combine a process design approach for the (re-)designing and creating value out of innovation processes (e.g. [1] Davenport 1993) with a process based costing approach for measuring the value of these processes. We derived process based costing from activity based costing ABC (e.g. [2] Kaplan and Cooper 1998), however we avoid the complexity of details associated with Activity Based Costing. Both approaches are not radically new and have been validated in many studies over the past years. This paper

endeavors to successfully integrate these two approaches for application in highly dynamic and networked environments. Above all, this includes an extreme orientation towards management accounting and support for real-time management action.

For this purpose the Performance Management Cycle (PMC) has been created. The PMC is an organizational learning cycle (e.g. [3] Zangwill and Kantor 1998), that distinguishes in two levels – Value Creation and Value Measurement. Value Creation analyses and redesigns existing business processes, in order to act on new opportunities derived from innovations. Value Measurement enables short-term measurement and evaluation of the processes designed in order to assist management to make decisions on the opportunities provided. The PMC is depicted in figure1.

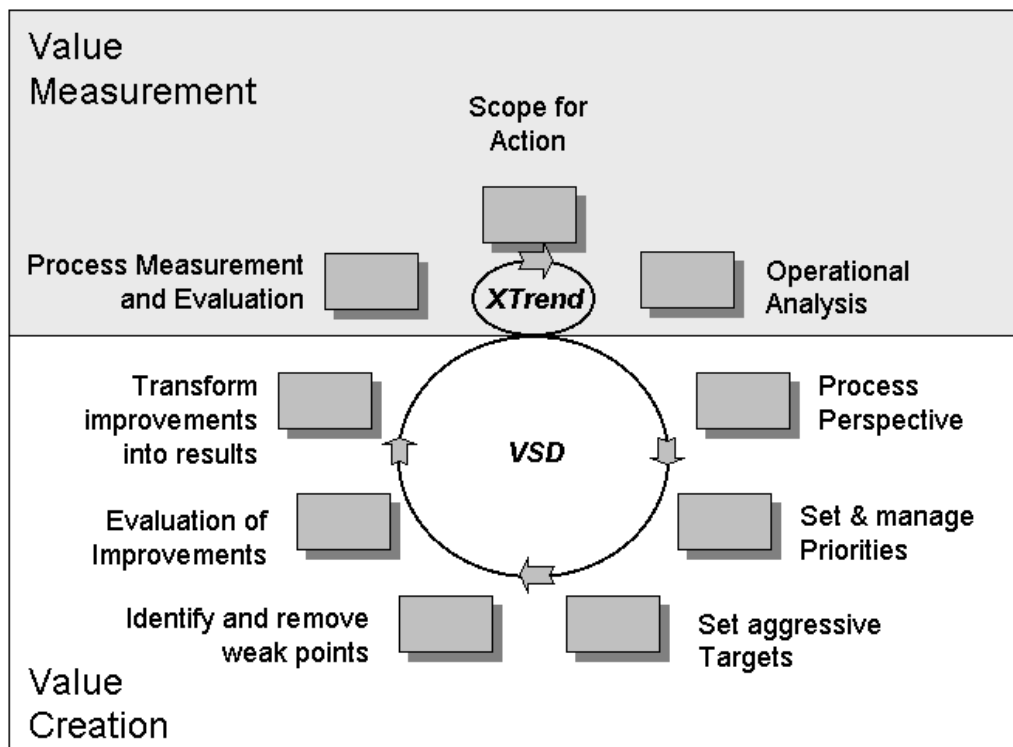


Figure 1: Performance Management Cycle

The PMC starts with a scope for action, which can be e.g. an identification of new business opportunities arising out of innovations or a significant increase of productivity. Based on the scope an operational analysis is carried out in order to identify potential areas for improvements or new investments. The operation itself, the underlying resource configuration and the product or output that they produce are assessed and analyzed relating to their EBIT, market position and potential for growth. This analysis is extensively supported by the Xtrend Performance Measurement System on a qualitative basis, which is further explained in chapter 3.

As previously discussed, value creation is dependent on the design of innovation processes. Therefore the first step of the Value Creation Phase for managers is to focus on these processes, by acquiring knowledge on the real processes that exist in the business and visualizing these. The visualization aids managers in setting priorities for process improvement in order to support the business opportunity. By doing so, aggressive targets in cycle-time and process performance can be defined. The next step is to act in detail on the anticipated frictions of the existing processes for the future business, and using expert knowledge (by for example inquiring expert information from the key actors involved in

the processes). Process improvements can be identified and proposals for implementation can be discussed and subsequently executed. This phase is supported by the VSD, which is further explained in chapter 3.

The PMC now re-enters the Value Measurement phase. Due to the dynamics in the environment it is essential to be able to quickly acquire information about the performance of the newly designed processes in order to make decisions on future business opportunities. This is done by a real-time data collection method (XTrend system) on the performance of the redesigned processes. In dynamic environments managers are better served by having information, which is 80% correct (80-20 rule) but is delivered quickly, than having to wait on precise financial accounting of the processes, which can take months, if at all possible.

The benefits for the manager are twofold: First he/she is able to make process design decision, or in other words create value out of the processes. Second he/she is able to anticipate performance of the processes and later measure the quality of his/her decisions on product profitability and overall performance. Subsequently the manager can learn and act on these results for the next cycle.

3. Performance Management Technology

The PMC is supported by two performance management technologies that enable the value creation and value measurement. The VSD technology contains a software tool that was chosen out of the various range of process modeling tools because it provides easy modeling of the innovation process and a methodology that enables the selection of process improvement options. After implementation of the necessary action points the result of these improvement can be measured as the overall performance of the process or sub-process by the XTrend software tool, which in turn can support the design of future processes for new business opportunities.

3.1 Value Creation through Process Design

We adopt a method and tool (VSD) that was initially developed with a process design approach, aiming to unfreeze the organization, make necessary changes, and refreeze the organization. Such actions have been found inadequate to deal with the turbulent environments of for example the telecommunication industry. Managers of these high tech industries require the capability to continuously update their processes. It is virtually impossible and very impractical to pursue for each market change a widespread and costly BPR project. A process design approach that allows for dynamic and iterative actions therefore becomes a must for these organizations.

The VSD is designed to provide the following benefits:

- The “mental model” of a business process is raised by visualizing the workflow and with that increasing the transparency of business.
- Continuous examination of the efficiency of business processes
- Co-ordination and activities that usually are not considered for modeling can be highlighted
- Working from improvement measures through quantification
- The VSD offers the possibility to model any kind of innovation processes. By using these visual representations management is enabled to anticipate frictions within processes, and prepare improvements.

To analyze business processes, they need to be documented and quantified in a standardized language. The VSD is a tool that allows representation of processes within a company or among cooperating companies, no matter what departments or organization interact in them. It enables an easy and quick analysis and quantification of the processes. One of its great advantages is the ease of learning of the tool, which allows anyone to represent and depict processes following a brief period of training.

The VSD methodology and tool is designed for companies dealing with high frequencies of innovations in rapid change environments. These characteristics can predominantly be found in high-tech industries, such as the information and communication industries. From a business perspective, the likely users of the VSD will be business development managers, project managers, change management coordinators or start-up entrepreneurs.

3.2 Value measurement through process assessment

XTrend technology has been developed to support performance management in measuring real time processes. XTrend is a technology that collates qualitative data and performs quantitative analysis on this data. The unique data collection method of XTrend allows managers to measure the costs of processes, product profitability and the life-cycle revenues of individual products in dynamic environments. From this data the prospective margins of new products can be calculated.

The tool is equipped to provide a usable representation on product earnings and on the process costs, which are the sum of all indirect and direct costs of selected processes. The collation of information is unique in that it combines survey information (dynamic monthly valuation of the processes) with standard cost figures. Whereas the respective cost figures can be entered by management (such as personnel costs and overheads) the employees themselves are entitled to attribute their resources to the various products and processes. This involves monthly on-line employee surveys, inquiring about time spent on selected processes.

Sales forecast are collected from marketing and sales and therefore extend the planning period into the visible future (depending on the market this can be 6-12 month). Trend analysis then allows for margin calculation and controlling of the innovation processes.

XTrend has been tested extensively and have been found extremely user-friendly. These tests have shown that a maximum of 5 minutes per employees per month is required for the data input. Product and process amendments can be made on-line by managers and do not require costly reprogramming or additional software modules.

The core system of XTrend is able to link all data using pre-configured parameters and allocates the activity costs to customized categorization of products and processes. XTrend has pre-configured algorithms to decide the accuracy of the information provided by the employees and automatically warns in case of insignificant results.

In summary, the main strengths of XTrend are:

- Assessment of process performance and product earnings
- Very limited reporting effort (five minutes per month and employee)
- A reporting horizon, which reaches about 6 month into the future
- Seamless integration of managerial analysis and entrepreneurial action

Both the VSD and XTrend have been successfully applied and tested in the case described in the next chapter.

4. Successful Application: Siemens Enterprise Networks in Switzerland

Siemens Switzerland head office is located in Zürich and employs 3900 people. The annual turnover of Siemens Switzerland is 1.1 Billion Euro, with the Enterprise Networks department accounting for an annual turnover in 1999 of 160 Million Euro. The Enterprise Networks department employs approx. 350 people. The department provides tailor made information and communication solutions are in 5 major areas: Voice networks, Data Networks, Application (Hardware and Software) Services, and recently Converged Networks (Voice over Data Networks).

Between 1930 and 1990, the situation prevailing on the Swiss telecommunication market did not invite big changes since this field was dominated by a monopoly which represented the guarantor of a Universal Service. However, at the beginning of 1998, the telecommunication market was opened up to competition. A normal effect of privatization is that besides Swisscom, the Swiss incumbent, new operators enter the market, bringing previously high telecommunication prices for households and enterprises down. Especially taken into account the dropped earnings on products, the liberalization enforces a shift from box moving to more customer oriented service provision.

The second challenge is technological. From an innovation point of view, complexity of the products of the department increased dramatically. The mixture of traditional (PBX) or telephone networks and IP-based networks and the stronger penetration of applications increase complexity, which is visible in converged products where Voice is digitally routed over Data networks such as Internet Protocol (VoIP) and ATM.

An analysis of the average product life cycle for such innovations showed a profound change in the pattern of innovation. Based on the 1995 figures, this curve shows a product life cycle of 3 years, with investments of approx. 10 million Euro per product. Compared with the 1995 curve, in 2000 the market-life cycle has shortened to 9 months, and the required pre-investments have more than doubled. It became clear that the division had to be able to quickly switch from innovation to innovation, rather than to rely on cash cows.

A third challenge was brought by the globalization drive resulting in the listing of Siemens on the NYSE. Subsequently financial reporting had to be converted from the German GAAP to US GAAP. This implied a change from turnover oriented reporting, to EBIT¹ reporting. While Turnover reports volumes, EBIT is based on margins. Sales revenues are diminished by the process cost and therefore link revenue growth with process efficiency gains. Consequently the targets for the local businesses changed and new EBIT margin targets have been set.

All these issues led the management of the department with major problems. Processes were not efficient or non-existing. Innovations were not supported and management did not oversee the financial impact of the broad product portfolio, and therefor faced difficulties in choosing which innovations could provide the necessary EBIT in order to please the board.

In order to cope with these challenges management decided to embark on a department wide effort to design new processes. After a thorough process analysis, involving 25% of the total workforce, the department was able to introduce a new and flexible process framework in order to support innovations such as Voice over IP.

The department created an innovation oriented business house that supported the operational divisions and processes, which allowed them to introduce new innovation more

¹ EBIT: Earnings Before Interest and Tax as a ratio of Sales

effectively. By using an internal market oriented coordination mechanism, the focus was now on spurring profit (EBIT) instead of volume.

XTrend enabled them to deliver the real time reporting of the processes for each business and allowed managers to act upon this information. The system contributed considerably for the management to reach the new EBIT targets. They were now able to quickly make decisions, which businesses and opportunities would be most profitable in the coming months, and could allocate effort on improving the subsequent processes of these businesses using the VSD.

After an intensive period of change, the department was able to come in on target set by the board, where other similar departments were not. The success of the two systems and the organizational impact were apparent, and currently are under further development.

5. Conclusion

Optimizing the innovation process has so far been addressed by process management approaches only to minimal extent. However, innovation processes are essential for value creation in turbulent high-tech environments. In addition there is a lack of measurement tools that evaluate these processes in real-time and focus on future options rather than the past.

This paper has presented a solution that endeavors to fill this gap by integrated performance management approach. The solution actively supports managers in measuring and creating value. The solution is based on the Performance Management Cycle, which supports managers in making dynamic decision making for business opportunities. The cycle is supported by two technologies; VSD – a process design methodology and modeling software, and XTrend – a dynamic process oriented performance measurement and evaluation tool.

The successful application at Siemens Enterprise Networks shows how managers are able to deal with a range of challenges stemming from a very turbulent environment. At the moment further beta-users are using the solution. We would like to refer to our website for further details: www.cetim.org

Acknowledgements

We wish to acknowledge our gratitude and appreciation to the Enterprise Network Division of Siemens, for the access to the case material. The paper is a result of the take-up project “GENESIS” funded by the EU under the 5th framework program. The Genesis project team includes Bernhard Katzy, Marcel Dissel, Markus Blum and Vera Kazei from CeTIM; Maria Aslani and Panayiotis Chrissohoos from Intracom/GR; Laurent Bruelhart and Philippe Voirol from Siemens/CH and Dennis Herviou and Olivier Rerolle from Adepa/FR. The authors thank all of the participants in the Genesis project for their contributions and in particular, for the many discussions that led to the concepts discussed in this paper. The authors take sole responsibility for the work presented here.

References

- [1] T.H. Davenport, Process Innovation - Reengineering Work through Information Technology. Harvard Business School Press, Boston (MA), 1993.
- [2] R.S. Kaplan, R. Cooper, Cost & Effect: Using Integrated Cost Systems to Drive Profitability and Performance. Harvard Business School Press, Boston (MA), 1998.
- [3] W.I. Zangwill; P.B. Kantor, Toward a Theory of Continuous Improvement and the Learning Curve. *Management Science*, **44** (1998) 910-921.