

Value-Based Life Cycle Analysis for Occupational, Environmental and Legal Compliance in Organizations

Ostad-Ahmad-Ghorabi,H., Jerlich, J.

*This is the final accepted manuscript of the paper originally published in: Ostad-Ahmad-Ghorabi,H. Jerlich, J. Value-Based Life Cycle Analysis for Occupational, Environmental and Legal Compliance in Organizations. In Proceedings of the 1st International Conference on Industry Safety, Occupational Health and Safety in Organizations, A. Sanayei (editor), 2008.

1 Introduction

A proper sustainable product development line in companies minimizes resources in terms of energy and materials used for products and services. It helps to use a company's resources in the most economic way implying the least environmental impact. This constitutes a benefit for both, the organization and their customers at the same time. By conducting a Life Cycle Analysis of a product or service it is possible to identify improvement options in terms of a better environmental performance of the product and service, less production and/or operational costs, a more functional product for the customer and also legal compliance with environmental laws and regulations. This constitutes a win-win-win situation for all involved actors: the government, the industry and the customer. The aim of a value-based managed organization is to create value, manage value and measure value to again create more value based on the identified improvement potential [3]. Value implies profit, improved environmental performance and safety amongst other parameters in an organization. This sounds very clear and straight forward but what it is really that managers do to distinguish real value adding activities from other ones? Successful companies say that they practice value-based management to guide their decisions. The question that arises is how do companies manage to grow in a financially healthy and profitable way? Without a doubt it is a difficult task for a manager to identify and implement value-adding activities in the stress field of satisfying shareholders as well as stakeholders and at the same time maximizing their own self-interest that is the motivating factor for any individual. This paper tries to map methods and tools used in practice to identify value-adding activities in organizations and introduces an approach of how to integrate these methods into a Life Cycle Analysis (LCA) throughout the entire organization.

2 Methods

To analyze this on a more detailed level it becomes necessary to take a closer look at the methods and organizational processes which are already widely used in practice and capture elements of the necessary data needed for a company-wide integrated LCA. There are a large number of methods widely known and implemented in many organizations. Following basic groups were identified [6]:

- Performance improvement methods
- Innovation management
- Quality standards and industry norms
- Organizational theories and strategy development
- Internal control and reporting systems

Note that the categorization in these groups is not distinctive, method's names may vary and groups may overlap, This makes it obvious though that a clear categorization can only be done by looking at the goal to be achieved by implementing the respective method and the subject area in an organization it is applied to. In each and every group one can particularize again and list methods of that group, meaning that at least the goal of the methods is the same. For example, methods used for performance improvement may be one of the following:

- Measuring Value
- Value Management
- Risk Management/Risk Analysis

- Value Analysis
- Functional Performance Specification
- Lean Production

Same methods as mentioned above may be used for a different goal in a different context. For example risk analysis can be used in business management as well as in financial management. Today companies have to face new requirements every day. Technology changes rapidly, new work processes and methods are developed, product and market systems are becoming more complex; outsourcing to cheaper locations is a daily reality. Innovation and product development are key success factors to prevail in the market. Innovation management has become essential for organizations and is practically implemented in many diverse forms. A company can stay up to date either by implementing an overall method which applies to the entire structure of the organization or it can take advantage of easy to use tools and approaches which promote innovation, creativity, culture or organizational development throughout all business processes of a company. The more the elements are taken into account and the more it is lived throughout the company rather than just applied as a tool, the higher is the chance that the company is successful on its markets.

Quality standards and norms also play an increasing role. In the European Union many rules and regulations regarding environmental issues are governing energy and production sectors, e.g. the directive for energy using products [1]. Depending on the industry a company is active in several other frameworks need to be considered. To be mentioned here are ISO standards that mainly cover the productive sector such as ISO 14001 [4]. In the software industry the Capability Maturity Model Integration (CMMI) [2] has prevailed as a standard in the Anglo-American world that has also gained importance in other industry sectors. SPICE (Software Process Improvement and Capability Determination) based on ISO/IEC 15504 [5] is the European

counterpart that has also crossed into other industries as for example the financial sector. Other names to be noted in this context are for example the European Foundation for Quality Management (EFQM), Total Quality Management (TQM) and Six Sigma as quality standards or quality management methods. To ensure a company's success on the market it should have an adequate product mix paired with the competitive advantage to stay ahead of the competition. In the context of any strategic decisions to be made by a company, life cycle theory is also a tool implemented in organizations which is used and implemented in different shades and levels. All companies have internal control and reporting systems originally required for accounting and tax reasons. Depending on the company's size and its legal requirements based on the ownership of the organization simple to highly integrated and complex methods are in use. This may range from profit and loss statements; cash flow tables and cost accounting with cost-benefit analysis to risk management methods and dividend payout ratio or total shareholder return calculations. Based on the names of the methods and tools it is very obvious that these are mainly used in finance departments for company evaluations and acquiring additional funding in capital markets. These evaluation methods are then used for decision making to achieve strategic company goals. It has to be noted that an adequate internal communication between the different departments in an organization is often missing. Derived decisions can not be implemented effectively due to insufficient internal communication of data or the organizational structure is not designed for cross-departmental use of data. For example often the evaluation results gained in the finance department are not adequately communicated to other departments, such as R&D department or design department. This lack may prevent an effective implementation and realization of decisions and ideas.

3 Results

Development and change are not integral part of the human nature. It is proven by history that change is usually only happening during a time of crisis that initiates and induces change as the only alternative to extinction. Today change is happening in a different speed and it has become necessary to adapt to that speed. Even more, it has become necessary to anticipate the future change in a way that how things are done today can be changed to new ways almost overnight. The developments in science and technology and the dissemination speed of information using modern communication technology make this process possible. However, the human mind is not able to follow. Most of us know this from their own experience in their jobs. Every new method or process introduced in an organization takes a long time to be practically implemented in the thinking processes of employees and managers. By the time a new process is really incorporated and delivers the desired information results, a new process is coming along so that the organization and its people never really catch up with their tasks. A lot of energy and resources are spent for actually very less outcome leading to high inefficiency losses.

In most cases existing processes and methods already produce a huge amount of data and information whereas only a small percentage of it is actually used as a decision basis for strategic management. At this point another inherent factor is the power aspect that comes with having a particular piece of information or not. This is a tool that is often used to master or better prevent unpredictable changes in the daily work environment. This tendency makes transparency efforts in structured organizations, as it is the goal in corporate governance for example, hard to implement. A corporate code of conduct that accommodates all these aspects of human nature has to be present and at the same time the system has to reward people acting accordingly for the benefit of the entire organization rather than individuals only engaging in activities for their own personal advantage. It is also fact

that the choice of methods used largely depends on the maturity of the respective company: each maturity level allows a certain level of process complexity. Every method and process in place has to be suited in several factors: the age of organization and therefore the maturity level of its leaders and the requirement brought upon the organization from the surrounding environment. This encompasses industry context or organizational culture from the organization's point of view as well as from its people.

The main headline in all the efforts an organization is undertaking has to be managing its resources at best without waste or losses along the life cycle of products, services and people. This brings up issues related to integration and harmonization of business resources, including people, processes and technology. The complexity resulting from the use of many different tools and methods used in the same organization has prevented solutions with a central architecture making it possible to process and present information at the right point in place at any time. By implementing one holistic approach the tracing and tracking of all resources of an organization along the entire life cycle of a process, such as product development, human resources or cost accounting, can be facilitated. Without an integrated information flow, making transparency practical while working with human resources at a higher level of maturity, the following problems will emerge:

- Interdependencies between business applications resulting in high maintenance costs
- Hidden dependencies leading to direct data access, in the following to incorrect results and difficult-to-diagnose problems
- Lack of discipline and standards
- Security is largely unmanaged, again leading to power structures based on the access to information

It is necessary to label each activity and task with its financial value. Decision makers can then learn from the consequences of their decisions. Financial systems and operational processes have to be connected again. Long-term thinking has to be instilled; old fashioned values have to be recovered so that a sustainable growth and survival becomes realistic again.

4 Discussion

The diversity of methods, tools and underlying theories used in organizations in all functional areas is very vast. Trying to capture this it evolves into business process management systems rather than individual tools and methods used in individual areas or departments or just for specific purposes. An integrated process acknowledging and using synergies emerging from the information and knowledge flow generated throughout the entire organization combined to encompassing knowledge management systems seems to be the future. This applies to privately or publicly owned companies as well as to non-profit organizations and government institutions.

References

- [1] Directive 2005/32/EC of the European Parliament and of the council of 6 July 2005 establishing a framework for the setting of Ecodesign requirements for energy-using products. Technical report.
- [2] Software Engineering Institute. <http://www.sei.cmu.edu/cmml/general>, Accessed April 2008.
- [3] E. F. Brigham and M. C. Ehrhardt. *Financial Management: Theory and Practice*. 12th edition edition, 2008.
- [4] International Standards Organization ISO. *ISO 14001. Environmental Management Systems-Specification with Guidance for Use*

(*ISO14001:2004*). CEN (European Committee for Standardisation), 2004.

- [5] International Standards Organization ISO. *ISO/IEC 15504 series. Information Technology - Process Assessment* . CEN (European Committee for Standardisation), 2004.
- [6] M. Zairi. *Best Practice: Process Innovation Management*. Butterworth-Heinemann, 1999.