

Quality management in enhancing firms' financial performance in global operations

Kari Jussila, M.Sc. (Physical Electronics), M.Sc. (Economics)
Aalto University, Department of Industrial Engineering and Management
P.O. Box 15500, FI-00076 Aalto, Espoo, Finland
E-mail: kari.jussila@aalto.fi

Juhani Anttila, Academician, M.Sc. (Electrical Engineering)
International Academy for Quality (IAQ)
Aalto University, Department of Industrial Engineering and Management
Rypsikuja 4, FI-00660 Helsinki, Finland
E-mail: juhani.anttila@telecon.fi, www.QualityIntegration.biz

***Abstract:** Quality management consists of coordinated activities to manage the firm with regard to fulfilling its stakeholders with different requirements. This article focuses on understanding the quantification and dynamics of the financial performance, which is the main interest of the firm's owners and management as a basis for the business continuity. The quantitative financial information is needed internally for supporting managerial decision-making and externally for serving the needs of the various stakeholder groups. This article considers how the firm's financial performance is generated in its global operations. Through splitting these operations into business processes, we are able to consider both quality and financial performance, and their interrelated risks together in an effective and consistent way. For this, we use TDABC methodology and present a case study in the bicycle industry.*

Keywords Finance, TDABC, Performance, Quality Management, Global Operations

1. Introduction

In this article, we consider the management of the organizations by focusing our approach in questioning how the firms' financial performance can be enhanced as an element of the corporate-wide quality management in global operations. Our article builds on the authors' extensive business and quality experience as Senior Manager, Board Member and Advisor of various business organizations, combined with the multidisciplinary action based case study research we have carried out together during the last five years. Hence, our consideration builds on our findings from practical business cases and confirms the practical utility of this research.

In the organizational context, management consists of coordinated activities to direct and control a firm (ISO, 2015), comprehensively as an entirety, as a system. Prerequisites for good management are clear management principles (Anttila and Jussila, 2011), effective managing tools, and efficient managing infrastructure (Senge, 1995). Today, it is generally understood that quality management is not any distinct management discipline, but it is seamlessly integrated with all actions in business management. In fact, we say that quality management equals the quality of management (ISO, 2015). Quality management is based on recognized principles (Anttila and Jussila, 2011), and practical managerial infrastructure and tools (Senge, 1995). Management principles are fundamental truths or propositions that serve practical management actions as the foundation for a system of belief or behavior or for a chain of reasoning. Managerial tools include means, methodologies and even theories to be used for organizational management. Many of these means have been particularly recognized as professional quality tools. In addition, Juran considers in his classical Trilogy Model (Juran, 1988) that quality management and financial management are analogous subjects.

Well-known quality management principles of the ISO 9000 standards (ISO, 2015) have direct links to quality management. They consist of eight principles, of which the seventh principle, “Factual approach to decision making”, is closely related to business facts and measurements. Performance excellence models (quality awards criteria) also include good management principles that emphasize the importance of business facts and information in management. The American Malcolm Baldrige Model (NIST, 2010a), for instance, defines eleven core values and concepts for excellent management. One of those, “Management by fact”, is very relevant to our topic, and the financial results is an important assessment item. In all situations, this factual management principle has significant links with all other management principles.

Holistically, organizational performance consists of four categories of performance (NIST, 2010b): (1) product, (2) customer-focused, (3) financial and marketplace, and (4) operational. The managerial control refers to performance evaluations (measurements) and actions based on their results. This equals the most well-known general model, PDCA (ISO, 2015) that describes four consecutive management activities:

- P: Planning activities what should be done and what results should be achieved
- D: Getting the obligations done according to the plans (P)
- C: Checking what was done (D) and what results achieved
- A: Acting rationally taking into account the observations and results of the checking (C).

The PDCA model should be applied in three different scopes (the triple PDCA) (Anttila and Jussila, 2011), linking strategic and operative management under the same kind of management procedure:

- Control: Daily operations are managed through operational processes so that the planned results are achieved. Observed non-conformities are rectified in connection with control.
- Prevention and operational improvements: This especially means solving acute problems, preventing non-conformity.
- Breakthrough improvements: This includes innovating and implementing strategically significant changes in the way the organization operates.

The first two items are fact-based rational actions, whereas the third one is related to creativity and innovations. The quality profession has developed many methodologies and proved managerial tools to analyze the results of the evaluation and risk management, and to carry out performance improvement actions, which also includes the financial focus of this article.

In our thinking, when we talk about quality, we approach the concept of quality by following the definitions approved by the International Standardization Organization. Concerning quality management, we follow the ISO 9000 definition of *Quality Management* that states that it *consists of coordinated activities to direct and control the firm with regard to quality, i.e. fulfilling the needs and expectations of all of the stakeholders* (ISO, 2015). Hence, the concept of quality is a perception, closely related to the psyche of each individual stakeholder. Essentially, from the firm’s point of view the perceived quality can be interpreted as the multi-dimensional quantity, indicating how well the needs and expectations are fulfilled among each of the different interested stakeholders.

Although the financial performance is a basis for the firm’s overall business continuity, in the recent years the firms’ short-term pursuit of maximizing shareholder value and profit have reached a disproportionate value over other business performance dimensions and the firm’s long-term strategic perspectives, and its long-term interaction with its stakeholders. However, in today’s severe global business environment, the firm’s financial performance is constantly at stake and it had to be continually followed from all of its dimensions.

In this article, we follow the concept and practice of Time-Driven Activity-Based-Costing (TDABC) (Kaplan and Anderson, 2004). This methodology is utilized for understanding the quantification and dynamics of the firm's financial performance. TDABC studies have shown that at a minimum 20-40% of the firm's customers and products are unprofitable, but the challenge is to know which ones. This result fits well with our long-time experience in this topic. Hence, understanding the firm's financial performance, and its relationship with the firm's profitability are tough but rewarding tasks when trying to enhance financial value in today's fierce competition. Related to this, we present some results of a particular case study research, showing how the external and internal analyses can be utilized in identifying strategic opportunities available for the firm.

Considering the scope of our article, the TDABC approach is relevant because also all of the indirect costs, including those related to the quality and other performance improvement activities, are allocated to processes and finally further to products and customers, hence indicating the financial impact of these activities on the firm's financial performance.

2. Insight into operations in global business environment

During the last decades, the rapid growth of the world economy had been driven by the even faster rise in international trade, which in turn was the result of both technological developments and concerted political efforts to reduce trade barriers (IMF Staff, 2001). Thirty five years ago, in the turn of 1970s/1980s, it was widely believed that international trade, free from restrictions, tends to maximize the value of income in a world in which factors of production cannot move across the independent nation-states (Grubel, 1981). The liberalization of the world trade was supposed to decrease the gap in the standards of living between the industrial world and the developing countries. Thereafter, this liberalization process, together with innovations in information technology and logistics solutions, has caused dramatic changes in the world trade, where a major part of production moved to developing countries, making this process financially reasonable also for the developing countries (Ferreira, 2009; Gylling et al., 2015, Jussila et al., 2014, Jussila et al., 2012).

Hence, globalization has radically changed the operational environment where the firms operate, and how firms organize the management of the related activities, i.e. manufacturing, sourcing, logistics and management of external resources, into their operations networks. Making decisions related to operations networks is a complex remit and the multitude of topics to be considered may be overwhelming. The firms' operations networks have to be managed within dynamic, interacting and interrelated business ecosystems (Stacey, 2001), which consist of independent members who have their own interests and are operating in different locations in varied financial, social, political, juridical and technological environments. Especially issues related to sustainability, which has its environmental, economic, and socio-ethical dimensions, are becoming fundamental for the long-time well-being of each firm and each society, and the globe at large.

3. Utilizing Time-Driven Activity-Based-Costing (TDABC) in enhancing the firm's financial performance

Financial and market position are important characteristics of the firms' performance. The firm's internal accounting supports decision-making by delivering relevant information to the management. The external accounting produces the legal bookkeeping, which gives a snapshot of the firm as a juridical financial entity. Financial indicators, calculated from the profit and loss statement, balance sheet and cash flow, serve the needs for the quantitative financial information of various interested parties (stakeholder groups) of the firm, and especially those of the corporate management and the owners. In this exercise,

TDABC can be utilized as a link between the external and internal accounting, and between the financial and process management.

Relevant cost information is naturally a prerequisite for understanding a business operations' profitability. The quantification of the operations networks' financial performance has proved in many cases difficult, especially when it covers the whole supply chain from end-to-end. We claim that the profit improvement potential within the supply chain and at the corporate level can only be known by a bottom-up analysis in which the calculation for financial performance is done per product, per manufacturing operation and per customer. In order to be able to do this, we have to be able to allocate these costs into specific projects and further to activities.

Anderson, the co-inventor of the concept of the Time-Driven Activity Based Costing (TDABC) (Kaplan and Anderson, 2004), claims that "there always are customers that are unprofitable, but the challenge is to know which ones" (Anderson, 2004; Anderson, 2011). The same challenge also relates to product profitability; "within the firm's portfolio there normally are products which are very profitable but also ones which are making losses". "Although most firms try to understand their financial performance through profitability and cost analyses, they unfortunately are not often very accurate nor integrated in the firm's financial management and control systems. Hence, they are not holistically used for the purpose of improving the firm's profitability at the corporate level" (Anderson 2008).

The traditional ABC accounting has been widely implemented in many types of business organizations. However, the real applicability of these ABC tools has been largely criticized by business managers and other practitioners (Everaert et al., 2008) since it has often proved difficult to describe the firm's actual processes financially without adding more and more nuanced new activities in the model, thereby increasing the complexity of the model. The Business practitioners have even criticized the relevance of the ABC methodology (Ibid.) since the reliability of the information concerning activities included in a traditional ABC model is dependent on the data, which for the most part is based on interviews and surveys, being hence sensitive to the behavior of the interviewed employees.

In 2004, to overcome these practical difficulties related to the usability of ABC, Kaplan and Anderson (Kaplan and Anderson, 2004; 2007) developed TDABC as a revised version of an ABC analysis. When creating the TDABC methodology, they designed the concept of "time equations", which is used to model time drivers to describe how time is spent on a particular activity. In TDABC the organization's resource expenses are allocated to support and operating departments.

The difference of the cost allocation between the TDABC Model and the traditional ABC Model is the following: In TDABC, the activity costs are allocated further to products (and customers) by applying time equations that take into account the main cost drivers related to each activity. In the traditional ABC, the allocation is based for the most part on work estimations collected from interviews and surveys. In TDABC, the cost estimates are based on direct observations of processing times of different activities in the organization, not on the subjective estimates where and how people and other resources spend their time.

4. Case study of utilizing TDABC in global business environment

We illustrate our approach to the topics of this paper by presenting an action-based case study research in a Finnish SME bicycle manufacturer, Helkama Velox, serving primarily its home country markets. (This article partly builds on certain earlier studies, see e.g. Journal article (Gylling et al., 2015), Book Chapter (Jussila et al., 2014) and Globalization workbook (Jussila et al., 2012)).

Helkama Velox has its own factory in Finland, but since 2005, it has also sourced its end products from the Far East. In 2007, when this research was started, Velox's profitability had been unsatisfactory for several years. Therefore, the firm's management raised the make-or-buy issue as an alternative to its own manufacturing in Finland, with the obvious goal of enhancing the firm's long-term survival potential. The strategic question was whether contract manufacturing in a lower cost location (i.e. offshore outsourcing) would bring a cost advantage over the firm's own production in Finland. By that time the firm's main competitors had located their manufacturing operations in low cost countries where they have high production volumes of standardized products and typically have a price advantage over Velox for the standard products.

A single case study method, connected to operations management research, was used in this study. The research included both qualitative and quantitative analyses, and it was carried out in two phases, in 2007–2008 and in 2010. These research phases were coordinated with the firm's manufacturing location decisions to respond to changes in its market environment. More precisely in autumn 2008, the firm's management decided to outsource its production of one bicycle model (*jopo*, a particular bicycle brand in Finland) to the Far East, and in spring 2010, the firm made the decision of backshoring the production of these bicycles back to the firm's own factory in Finland, see also e.g. (Kinkel, 2014).

The aim of this project was to contribute to the research by presenting a practical firm study, which explores how outsourcing and backshoring decisions were made in a period that was characterized by particularly high uncertainty in the company's severe business environment. The results of this study are available in detail in a few papers, of which a descriptive case study (Jussila et al., 2014) and a journal article (Gylling et al., 2015) describe this research descriptively and academically.

The required make-or-buy product costs were analyzed by comparing the total manufacturing costs at the firm's factory with the total landed costs of the sourced bicycles in the firm's factory warehouse. In order to make this cost analysis, the researchers constructed an accounting model, by which the firm has continuously been reviewing its competitive situation and simulated the financial outcomes of different management decisions. Hence, this case study also describes a firm's need for responsiveness for immediate actions when operating in dynamic and global competition.

The analyses were done in two steps:

- The firm's own production costs, using Time-Driven Activity-Based Costing (TDABC) (Kaplan & Anderson, 2004), and
- The product costs of the sourced bicycles, using the concept of the fully-loaded Total Landed Cost (TLC) (Enslow, 2006).

The first phase of the research was carried out in 2007-2008, by analyzing the manufacturing cost allocations in Velox and comparing the production costs with the sourcing costs of the bicycles at the firm's own warehouse. This was done by in-depth research of the firm's internal accounting methodology and files. As a result of the efforts, the researchers developed a costing model which was adopted as an operative management tool, replacing the old management accounting system. This part of the research was finalized in the fall of 2008.

During 2008-2010, the major part of *jopo*'s production volume was outsourced to a Taiwanese bicycle manufacturer due to the increased cost advantage of the bicycles produced outside of the Eurozone. During this period, the firm continuously reviewed its competitive situation and analyzed the financial outcomes of different alternative scenarios. In May 2010, Velox management made the decision to repatriate *jopo* production from the contract manufacturer in Asia back to the firm's own factory in Finland.

The second phase of the research was carried out in April-August 2010. In that phase, the researchers reviewed how the firm's business had evolved after the first phase of the field study by focusing on the decisions that were made regarding the firm's operations network in the aftermath of the financial crisis of 2008, and participated in evaluating the make-or-buy comparisons of the *jopo* bicycles based on the effect of changes in production costs and the EUR-USD exchange rate..

Figure 1 below summarizes the cost reasons for both the offshoring and backshoring decisions that Velox made in its bicycle manufacturing locations during the period of 2007-2011. The figure illustrates the change in in-house production costs for the selected bicycle models and contract manufacturing costs that occurred between the two manufacturing location decisions. The figure focuses on the variables that the costs are most sensitive to, i.e. the exchange rate and the unit cost of production in the company's own manufacturing plant versus the cost of using a contract manufacturer.

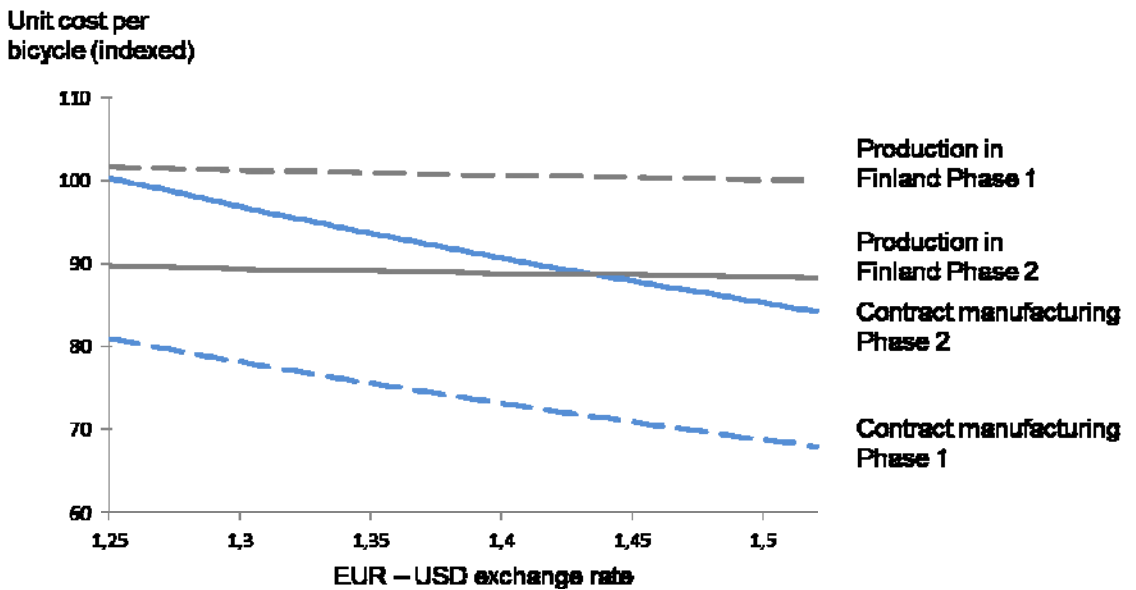


Figure 1. Make-or-buy comparison of the *jopo* bicycles based on the effect of changes in production costs and the EUR-USD exchange rate. Phase 1 = situation in 2008, when contract manufacturing was more favorable than manufacturing in Finland. Phase 2 = situation in 2010, when the trade-off EUR-USD exchange rate was about 1,45, i.e. manufacturing in Finland was as favorable as contract manufacturing. (Gylling et al., 2015).

Hence, we can conclude our case study in the following way: Velox is a manufacturing SME operating in the competitive global market and experiencing high volatility in customer demands, rapid fluctuations in the currency rates as well as changes in the suppliers' operational flexibility and pricing. Changes in cost allocation procedures, the EUR-USD currency ratio, prices for contract manufacturing and cost savings in its own production due to downscaling and changes in the manufacturing process changed the cost advantage from 32 percent in favor of offshoring to a 4 percent advantage for in-house manufacturing within two years. This change in the cost advantage, combined with closeness to consumer trends and responsiveness to sudden demand fluctuations, were the reasons for the revised location decision.

High uncertainty in the business environment imposes requirements for a firm's responsiveness in its operational choices, such as make-or-buy and production location decisions. In the Velox case, despite the offshoring decision of the *jopo* product to Taiwan, the firm carried on with the capacity reserved for this product in its own factory. This flexibility eventually enabled the backshoring decision.

This case study gives an example how good management principles can be followed in an SME company which is operating in severe business environment.

5. Summary

In this article, we consider the management of the organizations by questioning how the firms' financial performance can be enhanced as an element of the corporate-wide quality management in global operations. In our thinking, when we talk about quality management, we follow the ISO 9000 definition that states that Quality Management consists of coordinated activities to direct and control the firm with regard to fulfilling the needs and expectations that are generated by different stakeholders in the firm's business community. Hence, also in this context, the topic of business measurements, and measuring financial performance in particular, is challenging. Understanding the firm's performance, and its relationship with the firm's profitability are tough but rewarding tasks.

In today's severe global business environment, the firm's overall performance is constantly at stake and it had to be continually followed from all of its dimensions, of which those related to quality and profitability clearly determine the firm's competitive position in the market and form a basis for the firm's overall business continuity in the long run. However, in the recent years, the firms' short-term pursuit of maximizing shareholder value and profit have reached a disproportionate value over other product characteristics and the firm's long-term interaction with its stakeholders.

Moreover, in the global business environment we have to remember that the Earth's resources are not unlimited, and hence the prevailing judgements on market capitalism and shareholder value maximization will not be sustainable for a long time. The fierce competition and the motto that "The winner takes it all" cannot be tolerated as a good and sustainable management principle, considering the future of our own societies in the 21st century. We have to take into account that "sustainable development meets present needs without compromising the needs of future generations", and that "in sustainability, long-term and holistic thinking is essential rather than the short-termism which currently dominates" (Dunlop et al., 2015). Further: "In order to create a sustainable future for all of us what we should do is to embed risk management into our strategic planning" and for this, "We need rather a much deeper, clearer, analytical understanding of the interrelated developments of the world and the relationships among their components" (Ibid.).

In this exercise, we also need effective tools for quality and financial management and efficient managing infrastructure, and excellent understanding of processes and their management. Financial and market position are important characteristics of the firms' performance. We have noticed in practice that TDABC is a concept that can be utilized as a link between the external and internal accounting, and between the financial and process management. Hence, in this article, we followed the TDABC methodology for understanding the quantification and dynamics of the firm's financial performance. Related to this, we presented some results of a particular case study research, showing how the external and internal financial analyses helped to identify strategic opportunities available for the firm.

References:

- Anderson, S., 2008. Personal communication. London, April 14, 2008.
- Anderson, S., 2011. Acorn Systems, Inc: the Acorn difference, www.acornsys.com/company/the-acorn-difference/, accessed 7.10.2011.
- Anttila, J., Jussila, K. 2011. From the Quality Management Principles to the Good Management Principles – A Business-Integrated Approach to Quality Management. The 8th China Shanghai International Symposium on Quality and the Forum of International Academy for Quality, “*Quality, Innovation, Inclusive Growth*”, Oct.31-Nov.2, 2011, Shanghai, China, ISSN 1004-7816.
- Dunlop, I., Kanninen, T. and Aaltonen M., Foreword by President Tarja Halonen, 2015. Manifesto For A Sustainable Planet. Transforming Global Emergency to Opportunity and Action. Available at <http://www.helsinki.sustainabilitycenter.fi>. (Accessed 18.08.2015)
- Everaert, P., Bruggeman, W., Sarens, G., Anderson, S.R., and Levant, Y, 2008. Cost modeling in logistics using time-driven ABC. Experiences from a wholesaler. *International Journal of Physical Distribution and Logistics Management*, 38(3), 172–191
- Ferreira, J. ,Prokopets, L.,2009..Does offshoring still make sense? *Supply Chain Manag. Rev.* 13(1), 20–27.
- Grubel, G., 1981. *International Economics*, Revised Edition. Richard D. Irvin, Inc. Homewood, Illinois.
- Gylling, M., Heikkilä, J., Jussila, K. and Saarinen, M., 2015. Making Decisions on Offshoring and Backshoring: a Case Study in the Bicycle Industry. *International Journal of Production Economics*, in April 2015 (Vol. 162, April 2015, 92–100), ISSN: 0925-5273 & Published online January 28, 2015
- IMF Staff, 2001. *Global Trade Liberalization and the Developing Countries*, International Monetary Fund, <http://www.imf.org/external/np/exr/ib/2001/110801.htm#>. (Accessed January 2012)
- ISO, 2015. ISO 9000:2015. Quality management systems – Fundamentals and Vocabulary. ISO. Geneva.
- jopo*, a Finnish bicycle brand, <http://www.jopobikes.com/>.(Accessed 15.8.2015)
- Juran, J. M., 1988. *Juran on planning for quality*. Juran Institute, Inc. The Free Press, New York.
- Jussila K., Anttila, J. and Gylling, M., 2012. Enhancing Financial Performance in Global Operations. Available at Aalto University, Department of Industrial Engineering and Management, BIT Research Centre. Unigrafia Ltd, Helsinki.
- Jussila, K., Gylling, M. and Saarinen, M., 2014. The dynamics of make vs. buy decisions in a global economy: a firm study. In Slepniov, D., Vejrum Waehrens, B., Johansen, J. (eds.), *Global operations networks: exploring new perspectives and agendas*, Aalborg University Press.
- Kaplan, R., Anderson, S., 2004. Time-driven activity-based costing, *Harvard Business Review*, 82(11), 131-138.
- Kaplan, R., & Anderson, S. (2007). *Time-driven activity-based costing: A simpler and more powerful path to higher profits*. Boston: Harvard Business School Press.
- Kinkel, S.,2014. Futureandimpactofbackshoring-some conclusionsfrom15years of researchon Germanpractices.*J.Purch.SupplyManag.*20,63–65.
- National Institute for Standards and Technology, NIST, 2010. Malcolm Baldrige Criteria for Performance Excellence. NIST. Washington 2010.
- National Institute for Standards and Technology, NIST, 2010. Malcolm Baldrige National Quality Award, Award Criteria. NIST. Washington 2010.
- Senge P., Roberts C., Ross B, and Kleiner A.: *The Fifth Discipline Fieldbook*. Nicholas Brealey Publishing Limited, London 1995.
- Stacey, R., 2001. *Complex Responsive Processes in Organizations: Learning and knowledge creation*, Routledge.