

Toni Mättö
Researcher
University of Jyväskylä
Business administration

17.4.2008

**Quality costs in the public sector:
Purchaser-producer model
Research plan**

RESEARCH PLAN

QUALITY COSTS IN THE PUBLIC SECTOR: PURCHASER-PRODUCER MODEL

INTRODUCTION

Quality cost accounting is used to define the amount of costs generated by mistakes at work and the amount of costs generated by avoiding mistakes, referred to as prevention activities. Quality cost as a concept was conceived in the 1950s by Juran (Juran, 1951). Another pioneer in the field was Armand Feigenbaum (Feigenbaum, 1956), whose PAF-model is still the most widely used typology concerning quality costs.

About two-thirds of total quality costs are being generated by faults (Järvinen et al. 2001). Quality cost accounting has been used in the private sector in the form of improvement projects for long, but public sector has just started using these methods in search for better and more cost-effective service production.

Quality cost accounting is used to improve processes and action. It is helpful in prioritization of the most profitable and effective improvement projects. Studies (Järvinen et al. 2001, Järvinen, 2004, Bland Merle et al. 1998) show that quality costs vary between 10 – 75%, depending on the turnover, organization type (public vs. private) and business sector. Generally, quality costs have been found to be larger in the public sector when compared to private.

Globalization and the easing of market boundaries have led to extensive competition where survival requires the use of all available resources and possibilities. This trend has led to societal changes and tightened the range of available resources in the public sector. Reports (Järvinen, 2004) show that quality cost accounting has been used scarcely in the public sector, most of the exceptions being directed towards healthcare.

In considering public sector performance improvement, there arises the question of which problems or issues should be addressed. Several authors have pondered about the question of public sector efficiency vs. effectiveness, or output vs. outcome (Boland and Fowler, 2000, Bruijin, 2002, Rantanen et al. 2007). This leads to question of what, in fact, should be measured. Efficiency is considered to be the amount of output from certain amount of resources, whereas effectiveness, or outcome is considered to be an achievement of the strategic goal of the organization or satisfaction of customers. For example, public organization doing the waste disposal in the district might measure efficiency in the amount of waste disposal as tons in a certain amount of time whereas effectiveness would be fulfillment of the organizations mission, eg. to keep the city clean.

These authors (Boland and Fowler, 2000, Rantanen et al. 2007) have found that there are certain problems in measuring effectiveness of the public organization. Public organizations are there for different reasons than their private counterparts; their objective is to provide society with predetermined service, whereas private companies are expected to maximize shareholders value with reasonable investments. In public companies, there are many stakeholders with conflicting views and expectations on the public organizations actions. Potential stakeholders for public organizations may include citizens, clients, users, managers, employees, government and elected representatives (Rantanen et al. 2007). Taking into account all the stakeholders may result in measurement and improvement to be directed across conflicting objectives. Another issue related closely to conflicting views is the difficulty in measuring outcomes. Mission of the organization and its effectiveness in fulfilling its mission is not easily measurable and is subject to debate as to when the organization is performing effectively.

These issues concerning measurement of effectiveness coupled with fact that efficiency is found to be much lower in public organizations in relation to private ones points to great possibilities of improvement in efficiency at public organizations, that is, lower quality related mistakes.

McAdam et al. (2002) have mapped existing quality measurement frameworks already at use in the public sector. These include business excellence model (BEM), investors in people (IIP), charter mark, ISO 9000 certification, balanced scorecard and several benchmarking frameworks. These frameworks typically incorporate several qualitative and quantitative measures which are supposedly derived from organizations overall strategy. McAdam et al. (2002) study also points out that measuring quality of service in the public sector does indeed lead to better performance. Presently, there is no framework in use at the public sector that is able to track cost of poor quality, linking efficiency to identified key problems in public organizations process and at the same time be easily integrated into work process, in other words practical.

There is a development process in motion at the Finnish public sector. In the society as a whole, districts and their service structure is being formulated anew. This process is taking place because districts can no longer produce their services the old way. Tasks and required services have been multiplied, while available resources are being reduced. Some reasons for this have been found (Kallio et al. 2006): changes in the Finnish population structure, emergence of new and specialized healthcare methods, society's enhanced responsibility for individuals and more demanding consumers to name a few.

Unbalance between income and expense is not the only reason forcing public sector towards reform, however. Changes in the population structure are moving people in retirement and thus reducing available workforce. This trend has focused the attention towards improvement projects, main target being to get the same amount of services at lesser resources or more services with same resources, that is, to be more efficient.

Another interesting trend concerns mergers between neighboring districts or separate functions. These mergers have started in response to resource cuts and the arrival of new responsibilities. The goal of such mergers has been to cut costs by centralizing some actions. Examples of such actions could be resources directed towards purchasing, planning or administration.

However, in some earlier mergers between the city and its district, unexplainable costs have been incurred. This has been widely attributed as quality cost that has risen from centralizing and new work arrangements. One of these arrangements is separation of work into organization that purchases work and into organization that produces it. Possible problems have been suggested; doing the same work twice, problems in the flow of information or unclear responsibilities in the new field of work. Quality costs concerning these problems and the possibility to cut them has yet remained unstudied area of cost accounting.

Purchaser – producer method is one model that has been aimed at easing the situation. This method has been applied by cities Jyväskylä, Tampere and Turku. Research gap concerning quality costs of such networked activities produces a fruitful research topic.

Purchaser – producer model has been applied in Finland in many public areas, such as healthcare, forest centers, construction and sanitation. Purchaser – producer method has been defined as a “control system and an organizational form where purchasing work and producing work have been separated and purchasers and producers actions are controlled by mutual contracts” (Arpiainen et al. 2006)

Purchaser – producer method could be labeled as customer – supplier chain. However, purchaser – producer method as used in the Finnish public sector involves different stakeholders. For instance, purchaser and customer are not the same thing, nor are the purchaser and funder. Effectively, end-user and customer is the taxpayer, and purchaser buys the produced work with districts funding for the end-user. Several authors have noted this special organization method of work (Bland Merle et al. 1998, Lillrank and Haukkapää-Haara, 2006)

Lillrank and Haukkapää-Haara (2006) have identified 4 important actors in typical purchaser – producer model: These are: 1. Controller who gives the authorization. This is typically the district that authorizes purchasing organization and gives the funds that are obtained from government for purchasing organization. 2. Purchasing organization that evaluates competing work offers, makes purchases and controls the fulfillment of contracts. 3. Producing organizations that produce the work and services ordered by purchasing organization. These organizations may or may not be part of the same organization as purchaser and they may be privately owned businesses as well as public organizations. 4. End users of service. These are typically citizens using the produced services such as healthcare services, streets, sanitation services or legal aid.

Prevention of quality faults has been found (Östbye, 2004) at the private sector to be the most effective and low-risk way of cutting costs and increase profits. Quality assurance is considered much better way of improvement than, for example, acquisitions or increased capacity. Following the same reasoning coupled with fact that public sectors quality costs have been attributed as much higher than private sector, topic of quality presents a very promising area of study in the public sector.

METHODOLOGY

This study focuses on the identification of quality problems in target organizations, creation of development projects to correct the problems and finally on the development of quality cost metrics to track the results of the development projects. This study can be considered longitudinal as after the improvement efforts and placement of metrics, a follow-up inspection is made on the new quality cost levels in the target organizations.

This study gathers preliminary data from five public case organizations and continues the development of quality cost metrics with two public organizations acting in a purchaser-producer network with multiple stakeholders. These stakeholders include users of the service, government, elected officials and managers and employees on both organizations.

To reduce conflicting stakeholder interests, this study is conducted with close cooperation between two target organizations. Personnel from both organizations are active in the identification of quality problems and the development of improvement efforts and quality metrics. In fact, this can be taken as a prerequisite of successful metrics study, as personnel of the case organization have intimate knowledge of the processes in the target organization.

This study is a constructive study with strong emphasis on action research within it. This study aims to develop a new quality cost metrics to organizations working within a purchaser-producer model. Metrics are placed to track changes in cost of poor quality in identified key problems within purchaser-producer network.

Constructive approach is chosen for the study because of the development focused action and testing of constructed system. (Dick, 2002) Implementation of the developed quality metrics into case organizations work processes fulfills important criteria for the constructive research method, a weak market test. Metrics are tested in the case organizations, and metrics system is validated at the end of the study by checking the amount of COPQ they indicate by small team of experts from target organizations.

Constructive approach is a research process for producing constructions. It may be characterized by dividing the research process into phases (Kasanen et al. 1993):

1. Finding a practically relevant problem with research potential
2. Obtainment of general and comprehensive understanding of the topic
3. Construction of a solution
4. Demonstration that the solution works
5. Theoretical connections and research contribution
6. Applicability of the solution

It is important to note that the order of the phases may vary from case to case

Constructive method can be viewed as a type of applied studies. Constructive research is differentiated from analytic model building where solution is created but not tested in practice. Also, constructive method has elements of action research in it, as researcher is actively taking part with case organizations in creating the solution. Finally, constructive method requires the application of solution to organizations activities. This can be expressed as the passing weak, semi-strong or strong market test. In weak market test, at least one manager has applied the construction in question to his or her decision making. Semi-strong market test involves adoption of construction by other companies, while strong market test means that units applying the construction have produced better results than those not using it.

Constructive research can be either qualitative or quantitative by nature. By being innately goal oriented, it is normative by nature. And it typically applies case-method as means of getting the data and designing the construction.

Because intimate knowledge of the organization and its processes are needed to develop quality cost metrics for any organization, case study method is chosen for this paper. This study is conducted in qualitative way, so that improvement efforts and metrics concerning them can be developed. In a qualitative data, one can preserve the timeline of events and their causal relationships. In a quality cost projects, root causes for different quality problems must be found and through analysis of the organizations database and knowledge from personnel, costs can be attributed to these problems.

CONTRIBUTION, RESEARCH PROBLEM AND EXCLUSIONS

As noted before (Järvinen et al. 2001), faults constitute roughly two thirds of the total quality costs accumulated in average organization. This indicates that the most effective way to cut quality related costs is to tackle them at the source. Thus, this study focuses on quality costs incurred from faults in the organizations process. This study identifies key problems causing high cost of poor quality (COPQ) in public organizations, particularly in organizations working within purchaser-producer type network. Thus, study provides insight into key issues hindering work in purchaser-producer network while providing insight into public organizations in general.

Main construction of the study is new kind of COPQ measurement framework that relies on measuring impact of improvement efforts on identified key problems and total COPQ these faults generate. Measures are derived from processes associated with identified key problems along with plans from improvement efforts developed to remedy them. So far, only plausible way to conduct COPQ study has been to make a thorough quality cost identification process involving analysis of organizations accounting data and interviews of the key personnel. This study provides framework for the development of quality measures that are constructed without thorough data analysis and are easily integrated into organizations work processes.

Although quality related improvement projects and studies have been made on many aspects of quality in the private sector, public sector still remains mostly uncharted territory. (McAdam et al. 2002) have found that quality related measurement does improve efficiency in the public sector, thus validating often heard expression what is measured, gets done.

Study's main research problems are:

What are the key problems generating high COPQ in the public organizations work processes, particularly of those working in the purchaser-producer network?

What kind of easily process-integrated measures can be developed to track changes in the COPQ these identified key problems contain?

This study focuses only on public organizations and mainly on purchaser-producer type of work. Because of the noted high levels of fault generated costs and earlier discussion on measurement of efficiency vs. effectiveness, prevention and appraisal costs of quality are outside the scope of this study.

RESEARCH PROCESS

As early pioneers of the quality work (Feigenbaum, 1956, Juran, 1951, Ishikawa, 1985) have stated, to gain savings and efficiency through quality improvement, organizations must identify issues causing COPQ and place improvement efforts to reduce costs that these faults generate. To reduce COPQ, organization must find the underlying root causes that are causing problems in work processes.

To gain understanding of the topic, this study includes a literature review that covers topics of quality improvement, performance measurement, purchaser-producer model and public sector management.

Empirical phase of the study is divided into two parts. First, a field study is conducted with 5 public organizations to gain understanding of problem issues in the public organizations work field. Different type of public organizations are selected that include financial administration department, street- and park maintenance administration unit, street- and park service department, cleaning department and building maintenance department. Also, from this survey it is possible through analysis of the data to find key issues causing COPQ in these public organizations and to find out if there are certain general key issues causing COPQ in different type of public organizations. Survey is conducted with working personnel in organizations ground floor and identifies problems in day-to-day work along with the causes of the problems and their practical consequences.

Second part of the empirical phase is conducted with 2 public organizations that are working within purchaser-producer chain. These organizations make up the city's street and outdoor maintenance service. Other organization delivers the service in the form of street- and outdoor areas maintenance services. Purchasing organization acts as the administrative department purchasing these services. This chain forms a network of stakeholders including purchasing organization, organization delivering the service, district's citizens as end-users and the city's council having the final control over purchasing and producing organization.

Key problems causing COPQ in the work processes concerning both the purchasing and the producing organization, that is, work processes taking place between purchaser and producer, are identified. Quality survey is conducted with both organizations and it is answered by ground floor workers and middle managers from both organizations. Participants in the survey identify problems in their day-to-day work and state their opinion of causes to the problems.

Gathered problem data is classified into fishbone diagrams (Ishikawa, 1985), so that causal relations for the problems can be seen along with all the problem classes. These classes arise from the data and are grouped by the problem field it belongs to. For example, problems related to work motivation could be classified under class "motivation". This type of presentation allows for identification of root causes for quality problems that are identified from both organizations joint work processes.

After analyzing the data from survey, findings will be validated in a joint workshop between these case organizations. In a series of workshops held with the researcher, purchasing and producing organization go through the findings from the survey, identify the key issues to be addressed, estimate the quality costs incurred from these problems, develop improvement projects for the problems causing high COPQ, and finally develop metrics to measure the impact of improvement efforts and the total COPQ these problems contain. Special attention is focused on making metrics easily integrated within both organizations work processes.

Improvement projects are brainstormed in workshops held with case organizations representatives and the researcher. All improvement projects are assigned with expected values for quality cost savings, risks concerning the implementation of the project, key personnel associated with the implementation, project timeline, description of the work, investment costs if any and finally all the necessary information regarding the actual implementation of the project, in short, the project plan.

REFERENCES

- Arpiainen, L., Hilska-Aaltonen, M., Hämäläinen, M., Lassheikki, M., Lillandt, R., Nystrand, H. and Reunala, A.. Tilaaja-tuottaja –malli metsäkeskuksissa, Työryhmämuistio maa- ja metsätalousministeriölle. 2006:05. Helsinki 2006
- Boland, T., Fowler, A. (2000). A systems perspective of performance management in public sector organisations. *The International Journal of Public Sector Management*, vol. 13, no. 5., pp. 417-446
- Bruijin, H. (2002). Performance measurement in the public sector: strategies to cope with the risks of performance measurement. *The International Journal of Public Sector Management*. Vol. 15, No. 7, pp. 578-594
- Dick, B. (2002). Postgraduate programs using action research. *The learning organization*, Vol. 9, no. 4, pp. 159-170
- Feigenbaum, Armand V.(1956). Total Quality Control. *Harward Business Review* 34:6, November-December, pp. 93-101
- Ishikawa, K. (1985). *What is total quality control—the Japanese way?*.Prentice-Hall International, London, UK
- Juran, J.M. (toim.) (1951). *Quality Control Handbook*. McGraw-Hill Book Company
- Järvinen, Pekka (2004). *Laatukustannukset julkisessa palvelutuotannossa*. Julkaisusarja www.aluonet.com, Lahti huhtikuu 2004
- Järvinen, Lemetti, Virtanen, Lillrank and Malmi (2001). *Laatukustannuslaskenta: käyttötarkoitus ja menetelmät; käytännön työkirja yrityskäyttöön ja opiskeluun*. TKK TAI tutkimuslaitos
- Kasanen, E., Lukka, K. and Siitonen, A. (1993) *The constructive Approach in Management Accounting Research*. *Journal of Management Accounting Research*, fall 1993
- Kallio, O., Martikainen, J.P., Meklin,P., Rajala,T. and Tammi,J. *Kaupungit tilaajina ja tuottajina: Kokemuksia ja näkemyksiä Jyväskylän, Tampereen ja Turun toimintamallien uudistushankkeista*. Tampereen yliopisto, 2006.
- Lillrank, P. and Haukkapää-Haara, P. (2006). *Terveystuotannon tilaaja-tuottaja-malli*. Kauppa- ja teollisuusministeriö. Tutkimuspapereita 1/2006.
- Lukka, K. (1999) *Case/field- tutkimuksen erilaiset lähestymistavat laskentatoimissa*. Hookana-Turunen, Heli (toim.) *Tutkija, opettaja, akateeminen vaikuttaja ja käytännön toimija*. Professori Reino Majala 65 vuotta. Turun kauppakorkeakoulun julkaisuja, C-1:1999, s.129-150

McAdam, R., Reid, R., Saulters, R. (2002). Sustaining quality in the UK public sector: quality measurement frameworks. *International Journal of Quality & Reliability Management*. Vol. 19, No. 5. pp. 581-595

Merle Bland, F et al. (1998). Quality costing of an administrative process. *The TQM magazine*, vol. 10, No. 5, pp. 367-377

Rantanen, H., Kulmala, H., Lönnqvist, A., Kujansivu, A. (2007). Performance measurement systems in the Finnish public sector. *International Journal of Public Sector Management*, vol. 20, no. 5, pp. 413-433

Östbye, Jörn (2004). Seminar presentation: How to increase earnings by reducing cost of poor quality. TKK Dipoli. Quality cost seminar 06.04.2005