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Toni Mättö

Implementation of Quality Cost Management Tool in Dyadic Purchaser-Provider Relationship Context

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ABSTRACT

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This research deals with research areas of management accounting and networks, introducing a cost management tool with quality emphasis previously used in single organization setting into inter-organizational setting. Research focuses on dyadic relationships, particularly to purchaser-provider model. Two public organizations working within a purchaser-provider relationship are studied. Data is gathered through triangulation of observation, survey, interviews and workshop results. Data gathered is analyzed through contingency theory complemented with theory of organizational trust and transaction cost economics. Open-book accounting is introduced as a concept to illustrate the amount of needed information exchange when coordinating mutual cost reduction efforts.

Research method applied is interventionist case study carried out as an action research. Implemented cost management method is studied in its implementation process and changes required for it to work in network context are analyzed.

Research contributes to literature in several ways, first, it explicates existing cost management tool as currently conceptualized in the literature and further specifies the theory on the tool applied by testing its boundaries in dyadic setting. Second, it answers demands to focus on mutual co-operation in place of one-way implementation originating from focal firm. Third, using contingency theory it provides knowledge on variables that influence changes both in pre-adoption and adoption stages of cost tool implementation in dyadic context. Fourth, it proposes the concept of network as a generic contextual variable instead of handling it as a matter of size. Fifth, it analyzes the success of the tool's implementation in the network context and provides a further specified model for cost management success evaluation. Sixth, it uses transaction cost economics coupled with the theory on trust to explain division of costs and benefits gained from the implementation of the specified cost management tool.

Research findings indicate that cost management tool introduced in a wider context of dyadic relationship changes in comparison to existing literature on the cost management tool. Identified differences are classified into differences arising from organization specific factors, differences caused by proposed network context of dyadic relationship, differences caused by the environment, technology based factors and reasons attributed to differences in individual factors.

Research also indicates that trust plays a significant role in determining how the costs and benefits incurred from improvement initiative in dyadic relationship are divided. It is seen that trust is strengthened by the time organizations spend in mutual coordination and improvement efforts. The level of open-book accounting required is found to be modest, although some information related to work procedures, problem areas and certain costs are required to facilitate improvement and to lower costs.

Keywords: contingency theory, networks, public sector, cost management

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Toni Mättö

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1 INTRODUCTION

Finnish public sector is undergoing a series of developments. In the society as a whole, municipalities and their service structures are being formulated anew. This process is taking place because many of the municipalities can no longer produce their services the old way. Tasks and required services have been increased, while available resources are being reduced. Some reasons for this development have been identified (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.

Imbalance between income and expense is not the only reason forcing public sector towards reform, however. Due to changes in the population age distribution there are growing number of retired people and thus reduced available workforce. These developments have focused the attention of the public sector 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 in the public sector concerns mergers between neighboring municipalities or separate functions performed by public organizations. 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 the neighboring municipality, 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 one organization that purchases work and on the second that produces it. Various studies have given possible explanations for these unexpected costs; doing the same work twice, problems in the flow of information or unclear responsibilities in the new field of work (Kallio et al. 2006, Lillrank and Haukkapää-Haara 2006).

Review of quality failure costs found in the literature (Krishnan 2006) points towards possibilities of improving efficiency at public organizations by reducing quality related mistakes. Krishnan's review shows some indication that quality failure costs are generally higher at public organizations when compared to private sector.

Quality cost accounting is used to improve processes and action. It is helpful in prioritization of the most profitable and effective improvement projects (e.g. Järvinen et al. 2001). Studies (Järvinen et al. 2001, Järvinen, 2004, Merle Bland, 1998) show that quality costs vary between 10 – 75%, depending on the turnover, organization type (public vs. private) and business sector. Quality costs concerning aforementioned problems and the possibility to cut them has yet remained scarcely studied area of cost accounting.

Purchaser – producer method is one model that has been aimed at increasing efficiency at the public sector. This method has been applied by cities Jyväskylä, Tampere and Turku. Purchaser – producer model has been applied in Finland in many public areas, such as healthcare, forest centers, construction and sanitation. Purchaser – producer model has been defined as a "control system and an organizational form where purchasing work and producing work have been separated and purchaser's and producer's actions are controlled by mutual contracts" (Arpiainen et al. 2006).

Purchaser – producer model could be labeled as customer – supplier chain. However, purchaser – producer model as used in the Finnish public sector involves different stakeholders. For instance, purchaser and customer is 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 funding from the municipality on end-user's behalf. 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 four important actors in typical purchaser – producer model: These are: 1. Controller who gives the authorization. This is typically the municipality 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 in 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 (Östbye, 2004). This provides basis for quality initiative in the public sector. The management of quality related costs in inter-

organizational context, such as purchaser-provider relationship depicted here, offers a novel area for the application of cost management tools in inter-organizational cost management domain (IOCM). The topic of IOCM has been largely ignored in the accounting literature (Hopwood 1996, Van der Meer-Kooistra and Vosselman 2000). Hopwood (1996) states that changes in network context concerning the quality, costs and service delivery have been the subject of such neglect. Also, there is a lack of research that takes into account both perspectives of the dyadic setting as previous studies have been mainly concerned with application of IOCM tool from the buyer's perspective (Cooper and Slagmulder 2004, Caglio and Ditillo 2008, Mouritsen et al. 2001). Finally, in studying IOCM or any other management accounting practice, it must be studied under relational context in which it occurs (Hopwood 1983). Thus, a relationship such as purchaser-provider context, must be taken into account when devising a study to explore it. In studying quality related problems and their costs in purchaser-provider context, this study offers a novel perspective into study of IOCM. Also, a decade ago in 2001 Zimmerman expressed concerns that management accounting had failed to provide any substantive body of knowledge. In their response, Malmi and Granlund (2009) argue that there is a need for expressing practical solutions and testing their limits. This would lead to refinement or refutation of the existing model and provide theoretical contribution while at the same time having a practical relevance. In testing a cost management tool in a wider context of dyadic relationships and reporting on the encountered issues this study is both providing theoretical refinement of the cost management tool as well as showing practical use for the organizations involved.

1.1 Research problems and exclusions

Main interest of this study is the actual implementation of quality cost management tool taken from Malmi et al. (2004), labeled "collaborative approach for managing project cost of poor quality" (CAMP) in dyadic context. This study is interested in changes that are required to utilize a cost management tool previously used in single organization setting, at inter-organizational setting. Tomkins (2001) argues that these single-organizational tools can be used in dyadic or network contexts if this larger context is taken into account. However, some conflicting arguments exist. Kulmala et al. (2007) argue that difficulties in enclosing sensitive cost data may lead to problems in implementing old, single-organizational tools in larger context. Hence they argue for the need for new tools. Also, research on cost management tools conducted in single organization setting (Anderson 1995, Anderson and Young 1999, Anderson et al. 2002) have found that when implementing a cost management tool, contextual and implementation process factors seem to correlate with perceptions on the cost management tool effectiveness. While implementation process causes some possible changes into final cost

management tool layout, network relationship can be seen as a contextual factor for cost management tool implementation. This implies that contextual factors along with processes during implementation have an effect on the effectiveness of the cost management initiative's outcome. Therefore, research on the mentioned factors on inter-organizational cost management setting adds a valuable perspective on the implementation issues of the cost management tool.

Study's research problems arise from this debate and are presented as:

P1: Can the tool aimed at cost reductions in single organization setting be used in dyadic settings?

To achieve understanding of the primary research problem, several facets of the problem need to be addressed. Firstly, tool may need certain modifications both before actual implementation to accommodate network setting and during the implementation because of the network setting and organizational factors. Secondly, needed information exchange between partners to achieve success in implementation must be addressed before analyzing the possible success of the implementation. Thirdly, success itself needs to be verified through analysis of implementation success literature (Malmi 1997, Anderson and Young 1999). Finally, profits and costs attributed to newly planted cost management initiative must be divided between partners. For this, transaction cost theory and literature on trust provide a background.

Therefore, main research problem leads to first set of complementary questions of

P2: if so, what, if any, modifications are needed to ensure that the cost reduction tool functions in this dyadic setting?

P3: how does the cost reduction tool change during implementation process in this dyadic setting and what factors cause this?

P4: What kind of open-book accounting does the cost reduction tool require in the network context?

Study is positioned in the discussion on IOCM literature as well as quality literature. IOCM discussion implies the use of network literature and a context of inter-organizational setting. Theories used to analyze the implementation of IOCM tool in this inter-organizational setting are theory on organizational trust, transaction cost economics (TCE) and contingency theory. Also, discussion on open-book accounting (OBA) is used to understand the needed information exchange when applying the chosen tool. Caglio and Ditillo (2008) have reviewed existing IOCM literature and constructed a three-dimensional classification for the studies conducted within it; first dimension is the unit of

analysis where the number of relationships are shown. That is, study is conducted as either focusing on dyadic relationship or larger network. Study at hand is focused at dyadic relationship. Second dimension is the point of view; this means that findings are reported as either from the single organizational point of view or the study takes into account perspectives of other organizations in the setting. While many studies have considered mainly only the perspective of the focal firm (Mouritsen et al. 2001, Caglio and Ditillo 2008), this study considers the perspectives of both the purchaser and the provider. Lastly, third dimension refers to type of arrangement in question. This means differentiating bilateral arrangements from multilateral ones. Caglio and Ditillo (2008) also divide the multilateral agreements to one-to-many and many-to-many arrangements. As purchaser-provider relationship implies the bilateral arrangement between two organizations, this study is considered thus focusing on bilateral issues. Caglio and Ditillo (2008) note that there is a methodological reason for choosing to study dyadic relationships rather than entire networks; focus on dyads enables the definition of theoretical models that could not be built without simplifying network complexity.

Caglio and Ditillo (2008) also classify work done on the inter-organizational issues between vertical and horizontal linkages. Studies are therefore divided into research done on complementors as well as on competitors. Also, research is divided into functionalist explanation and non-functionalist research. While the former is relatively straightforward and the study at hand can be classified to research done on complementors rather than competitors, latter demands more attention. Functionalist approaches are more concerned with increasing production efficiency, incorporation of innovations (Cooper and Slagmulder 2004), improvement initiatives (Dekker 2003, Mouritsen et al. 2001, Seal et al. 1999, Carr and Ng 1995), division of profits (Dekker 2003, Cooper and Slagmulder 2004), trust issues (Cooper and Slagmulder 2004, Dekker 2003) as well as coordinating and managing interdependencies (Dekker 2003). Non-functionalist approaches, on the other hand, have focused on socially constructed identities and meanings (Chua and Mahama 2007), rules and routines that link different institutions and activities (Coad and Cullen 2006), re-presentation and re-translation of corporate identity and phenomena (Mouritsen et al. 2001) or depiction of the organizational system as an abstract symbol for disembedding and re-embedding transactions (Seal et al. 2004). While the latter area of research has contributed to the literature by analyzing accounting phenomena through socially constructed realities and study of different symbols and meanings, functionalist research has directed attention towards measurable outcomes such as initiatives, efficiency and division of profits. This study presents an attempt to replicate existing single-organization cost management tool in IOCM interface. It contains an element on the construction of improvement initiatives with attempt to increase efficiency in case organizations. Study also analyses the data gathered through trust between dyadic partners and transaction costs to see how the division of profits and costs is achieved. The

focus on efficiency gains and improvement along with understanding of the issues needed to achieve this shows movement towards functionalist research.

This study contributes to literature in several ways, first, it explicates existing tool (Malmi et al. 2004) as currently conceptualized in the literature (Dekker 2003), secondly, it provides new information on the usage of IOCM to joint reduction of costs, thus answering demands to focus on mutual cooperation (Mouritsen et al. 2001, Cooper and Slagmulder 2004, Coad and Cullen 2006) in place of one-way implementation and provides evidence on the actual use of IOCM. Third, it provides valuable quality cost data and problem classifications as well as improvement data to add to quality literature. Fourth, it provides contribution in illustrating contextual elements that may rise in implementing cost reduction tool in IOCM interface. This contribution is achieved by using contingency theory to understand changes required to chosen tool in different stages of adoption when moving to dyadic setting. Fifth, it is a novel approach in using quality related tool in IOCM setting with theories of trust, TCE and contingency theory in the same study. Sixth, tied to discussion on practical examples of management accounting theory put to use (Malmi and Granlund 2009) and implementation success factors (Anderson and Young 1999, Malmi 1997), it analyzes the concept of successful implementation and provides possible guidelines to measure success of the tool's network implementation.

Sixth area of contribution leads to complementary research problems presented as:

P5: How can the success of a particular implementation project be determined?

P6: How can the implementation stages and market test on the tool be analyzed?

Also, to achieve some indication on the treatment of cost savings and costs incurred to achieve these savings in the partnership setting, this study uses transaction cost theory to seek answers into how the costs and savings are divided between partners. This is expected to shed light on partnership decision-making and the impact of trust and transaction costs:

P7: How are the costs and cost savings caused by the implemented cost management tool divided between case organizations?

Finally, one product of this study is a 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 (Järvinen et al. 2001). 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.

This study focuses only on public organizations and more precisely on purchaser-provider relationship context. Further, because of the noted potential for improving efficiency in the public sector by lowering fault generated costs (Krishnan 2006), this study focuses on quality failure costs and efficiency. Therefore, prevention and appraisal costs of quality are largely outside the scope of this study.

1.2 Methodology

This sub-chapter illustrates methodological choices and presents the ontological and epistemological assumptions as well as positions the study into management accounting research literature. Assessment of contribution, achieved validity, reliability of the study, generalizability of the results and consideration of the role of the researcher are more thoroughly considered at the end of the thesis.

In its most simple dichotomy, methodological choice can be divided into qualitative and quantitative approach. Qualitative approaches have been labeled in various terms such as naturalistic, interpretive or phenomenological (Morgan and Smircich 1980, Tomkins and Groves 1983, Ahrens and Chapman 2006). Ahrens and Chapman (2006) point out that qualitative as an attribute refers to the general approach taken in the study while being totally independent of the choice of methods such as interview, observation and the use of questionnaires. Qualitative methodology offers an alternative to positivism. While positivism makes the assumption that empirical reality is objective and exists externally to the subject which, in turn leads to epistemological stance that it can be studied objectively and verified by empirical methods (Chua 1986), qualitative research means movement towards subjectivist view (Morgan and Smircich 1980). Subjectivist view of the reality in the extreme leads to epistemological reasoning that world can only be understood through processes which human beings use to make sense of the world. Thus any form of objective knowledge is disputed. Morgan and Smircich (1980) have devised a subjectivist-objectivist continuum for positioning research according to chosen ontological and epistemological assumptions. This continuum, in turn, is based on the notion of interpretive and functionalist paradigms described by Burrell and Morgan (1979). Morgan and Smircich (1980) advice caution when separating quantitative research from qualitative ones; dichotomization between these approaches is oversimplified. Methodological choices must reflect the link be-

tween the theory and the method, type of world view chosen, research question posed and the techniques adopted. Also Ahrens (2008) has cautioned from making too strict distinctions between objective and subjective approaches.

Movement towards qualitative research means acknowledging that the world is not a closed system of concrete, measurable structures but rather a construction of social relationships where human beings may actively contribute to its creation. Morgan and Smircich (1980) point out that when research question is posed in a way that emphasizes the social world as an open-ended process, closing the study within narrow snapshots of empirical query in fixed point in time does not do justice to research subject. In such a situation, different approaches are required and these tend to focus on qualitative features of the target phenomena. Morgan and Smircich point out, however, that quantitative methods may add to understanding of the processes of social change studied. This statement is verified by Eisenhardt (1989). Morgan and Smircich (1980) continue that to do effective research on the process of social change, one can no longer remain as an external observer but must rather investigate the subject from within and employ appropriate research techniques. This is consistent with Jönssön and Lukka's (2005) argument that studying the subject from within is not only done to understand the meanings and actions of the actors but also to communicate and act in unison with them. Otherwise the researcher risks to be regarded as an outsider and receives only basic information intended for outsiders. This so called emic perspective refers to studying human behavior from inside the system while etic perspective is the study of the subject from the outside. Authors point out that the etic perspective is however needed in all types of academic studies. The researcher must be able to move from etic perspective to emic and back again to analyze the findings received from the inside as an outsider. (Ahrens 2008, Jönssön and Lukka 2005, Suomala et al. 2011)

As noted, the study of social change in organization requires more subjectivist view and the use of qualitative research methodology. However, another choice must be made regarding the use of interventionist or non-interventionist research. This choice of the level of intervention has often been left in the background while it has been routinely assumed that intervention should be minimized and research has been positioned merely in terms of positivism and its alternatives. (Jönsson and Lukka 2005). Non-interventionist research tends to explain management accounting issues on the conceptual level. It may test or illustrate prior theory, or even in the case of lack of theory construct new theoretical frames. In order to make a contribution findings must be generalized to illustrate their meaning. Non-interventionist research is typically ex-post facto: research examines what has taken place in the past. This is why non-interventionist case research typically uses interviews and archives for their data (Jönsson and Lukka 2005).

Interventionist case research differs by placing the researcher directly involved with something that is going on in the cases selected. Therefore, intervention is seen as one of the research weapons. An ex post facto is not even an option for the researcher, as he/she has to conduct the research along the flow

of life in the target organizations. Empirical data collection comprises of interviews, archives and observation but the latter is usually dominating method. Jönssön and Lukka (2005) argue that the key advantage of interventionist research is the opportunity to collect more subtle and significant data than what is possible through more traditional methods. Interventionist study makes it possible to examine and observe what actors actually do in different situations, thus giving lot of potential for emic understanding. Interventionist research is characterized by a clear orientation to solve practical problems. This leads to the strength of the practicality and relevance in terms of the issue studied since problems and their solutions has "by definition" these inherent.

Jönssön and Lukka (2005) categorize different approaches of interventionist studies; constructive research, action science, design science, clinical research and action research. Also worth mentioning is the innovation action research promoted by Kaplan (1998). Clinical research refers to interventionist research where the major focus is on solving the problems of the client organization. While all interventionist research, according to Jönssön and Lukka (2005) have this element, it is strongly emphasized in the clinical research tradition. Action science is a stream of research suggested by Argyris et al. (1985). It is defined by promoting learning in the client system and this way contributing to general knowledge. Jönssön and Lukka (2005) see action science as a variant of action research. This is supported by the view in Argyris et al. (1985) of the founder of action research, Kurt Lewin as the first true action scientist. Design science was introduced by van Aken (2004). It attempts to develop "field-tested and grounded technological rules". According to Jönssön and Lukka (2005) it comes close to action science, although handling the theoretical issues in different way.

Constructive research was developed by Kasanen et al. (1993). It refers to problem solving through the construction of models, diagrams and organizations. As examples of such constructions they present the ROI-measure or DCF-technique. They present the construction itself as central point in the research and offer the "market tests" for its applicability. Constructive research tries to combine theoretical contribution of the construction with the starting point on interventionist action. Major difference to action research is the emphasis on the actual construction. This study uses an instrument of constructive research, a market test (Labro and Tuomela 2003) to test the applicability of the tool in wider context. Their proposition about market test concerns the evaluation of the construct in terms of external validity. Thus, aspects of the construct that could be transferable to other organizations are considered. In terms of failed parts of the construction, it is possible to explore factors that could cause failures in other organizations. (Labro and Tuomela 2003, Lukka 2000). Labro and Tuomela (2003) propose a market test, where construct is proposed to pass the weak market test if it has been used in the case organization at least once. As the market test gets stronger by organization using it regularly or other organization adopting it to produce better results, construct can be said to have passed semi-strong or strong market test. They acknowledge that it is typically impossible to pass semi-strong or strong market tests within a medium time

span and thus they have concentrated on nuances concerning the weak market test.

Innovation action research, presented by Kaplan (1998) is a form of action research that documents a limitation in existing practice, identifies a new concept to overcome this limitation, applies and improves this new practice through use, publication and teaching thus forming a innovation action research cycle. This, in turn, leads to enhancement of the existing theory

According to Coughlan and Coghlan (2002), Action research is characterized by several characteristics;

1) It is research in action as opposed to research about action.
2) It is participative
3) It is concurrent with action
4) It is comprised of a sequence of events and an approach to problem solving

Also, desired outcomes for action research (AR) are the solutions for practical problems in target organizations added with learning from outcomes and a contribution to scientific theory (Coughlan and Coghlan 2002). This research incorporates the use of action research as a research method. Research problems presented earlier are tied to the improvement method labeled CAMP. This tool requires the implementation of predefined steps to solve practical, quality related problems in the case organizations. It involves participation of the researcher in the implementation of the tool as an observer and as a presenter of working guidelines. The scientific contribution is sought by answering research problems from the findings received from implementing CAMP in a new context. Therefore, interventionist research approach is needed to address the aforementioned issues and as action research offers the most suitable approach from the interventionist approaches, it is covered in more detail.

1.2.1 Action research

Action research is founded in the work of Kurt Lewin (1946). He viewed action research as a way to conduct change experiments to solve real-life problems in social systems and contribute to basic knowledge in the social sciences. He defined action research in his book as "a comparative research on the conditions and effects of various forms of social action and research leading to social action" that uses "a spiral of steps, each of which is composed of a circle of planning, action, and fact-finding about the result of the action".

AR is usually contrasted with positivism. Whereas the aim of positivism is to create universal knowledge or laws and thereby the knowledge is seen as universal and applicable over wide situations, knowledge created in AR is situational and thereby not as easily generalizable although Lukka and Kasanen (1995) have argued that case research is generalizable through contextual generalization relying on link between business context and embedded structural

relationships. In AR, data is contextual and must be interpreted. The basis for validation of knowledge is the AR cycle formed from different phases consisting of planning, doing and measuring the results.While positivist science tends to see the position of the researcher as detached and neutral, action researcher is immersed in the setting, becoming both the researcher and the actor of change. (Coughlan and Coghlan 2002).

Gummesson (2000) presents 10 major characteristics of the action research:

1) Action researchers take action rather than merely observe. They are agents of change
2) AR involves two goals; both to solve a problem and contribute to science
3) AR is interactive. It requires co-operation between the researcher and the research subjects and therefore continuous adjustment to new events. In a sense, research subjects become co-researchers.
4) Aim of AR is holistic understanding. Organizations are seen as dynamic socio-technical systems and this requires ability to work with complexity.
5) AR is about change. It is applied to understanding, planning and implementing change in case organizations.
6) AR requires an understanding of the ethical framework. This refers to how the researcher works with the members of the organization.
7) AR can include all types of data gathering methods. These include both qualitative and quantitative tools such as interviews and surveys. Data collection methods are themselves a form of intervention and forms of data collection as, for example, interview may generate feelings of anxiety or suspicion.
8) AR requires pre-understanding of the case organization's environment. This refers to knowledge that the researcher is actually bringing into the case organization.
9) AR is conducted in real time, although instances of retrospective AR have also been applied. It is thus usually written as it unfolds.
10) Goodness of any AR research must be judged by its own criteria.

AR can be seen as appropriate in situations where research problem relates to describing series of actions over time in any given group, community or organization. Understanding as a member of the group how and why actions taken change or improve some aspects of the working system; and understanding the process of change or improvement in order to learn from it. (Coughlan and Coghlan 2002)

Coughlan and Coghlan (2002) differentiate six steps in AR that relate to data gathering and performing action. These are

1) The data gathering phase. It can be divided into hard and soft data. Hard data is information such as statistics, financial accounts and reports. Soft

data is obtained through observation, discussions and interviews. The term softness comes from the perceptual nature of the data and possible differences of interpretation. Important part of data comes from participation and observation of team work and problem solving, but also from both formal and informal interventions in the improvement project.

2) The data feedback phase. Researcher takes the data and feeds it back to client system, thereby making it available for analysis.
3) Data analysis. This phase is collaborative with the researcher and the members of the target organization. This is based on the assumption that members of the case organization know their organization best.
4) Action planning. This is a joint activity where AR project steering group and the senior management set the responsible people for different actions and assign the time schedule.
5) Implementation. The planned actions are implemented. This involves making the desired changes and following through the plans.
6) Evaluation. This involves reflecting on the outcomes of actions taken, both intended and unintended.

1.2.2 Case study method

The qualitative, interventionist approach coupled with research problems presented earlier demand that this inquiry is made in the chosen context. As Otley (1980) notes, when studying processes by which an accounting system develops and is changed, research requires an approach that lets the researcher to have close contact with the organization. Also, as researcher needs to unravel a complex pattern of interaction, he needs to be able to focus deeply on organizations he is involved with. Otley (1980) continues that these arguments strongly support the idea of case studies. Case research is not as much a methodological choice as it is a choice of what is to be studied (Stake, 2005). As this compares the case in question to unit of analysis, it is important to describe what it is that the researcher wants to know from the target organization. In the study in question, an existing tool is implemented in inter-organizational context and changes brought by this dyadic setting and organizational factors are documented. These findings constitute the main contribution of this study.

Fletcher and Plakoyiannaki (2010) present several misconceptions often linked to case study research. First of these is a statement "The empirical unit is the unit of analysis". However, this is not the case as in the study at hand; unit of analysis is the case organization to be studied whereas the empirical unit is the unit of observation. These include teams and single participants at different phases of the study.

There are different opinions whether to make sampling decisions early on (Yin, 2009) or merely take the case study process as an iterative process where theoretical and empirical choices may shape the case study boundaries (Ragin, 1992). Fletcher and Plakoyiannaki (2010) call this dilemma a misconception of "early decision on sampling is best". Yin's (2009) notion is that cases should be selected and evaluated before data collection. Specification of cases beforehand

ensures fit between research questions and empirical evidence. However, Ragin (1992) accepts the idea of changing case study boundaries when empirical choices or reconsideration of the focus demands this.

In the study described here, case organizations were obtained according to Yin's (2009) notion that cases must be selected to fit in with the research questions. As the aim is to identify and analyze differences contextual factors cause on cost management tool's implementation in dyadic interface, research requires the cases to be specified according to that context.

Yin (2009) and Ragin (2002) have other differences relating to pursue of knowledge besides the selection of cases and timeline of specifications. Yin's view is more positivistic in nature, implying that truth is obtainable through case study research. Raging's view states that truth is socially constructed and contains many different opinions. This leads to the idea that there is no single truth to be obtained; rather different interpretations (Plakoyiannaki, 2010). When the focus of the study is centered on identification of quality failures present in organization's work processes, information obtained through team sessions, interviews or data analysis is considered to be the truth. A consensus is sought through series of workshops regarding the relative importance and existence of different quality failures. By feeding back the results to organization on regular intervals through the workshops, validity of the data is also increased (Otley, 1980)

According to Fletcher and Plakoyiannaki (2010), the question whether to include a single case or multiple cases for sample size is the best known and most discussed in the literature regarding case studies. They present a misconception of "A single or multi-case approach is an either/or decision". The question whether to include multiple cases in a study or just one is often thought of as either concentrating into depth of one case or breadth obtained through multiple cases. Eisenhardt (1989) argues that when the case study researcher is interested in making contrasting or differing observations for the advancement of propositions or replication of findings, multiple case approach is best suited. It follows that if the case study researcher is interested in explaining the phenomena or contextualizing the data, single case study may be better suited (Dyer and Wilkins, 1991). This study of the quality failures within the purchaser-producer network contains two organizations working within purchaser-producer model. Data from case organizations is analyzed with within- and cross-case analysis. This means that case organizations are analyzed independently as well as together. However, quality problems of the purchaser-provider organizations are related to their mutual interface and thus cases are studied also together.

Finally, Fletcher and Plakoyiannaki (2010) present a misconception of "the more cases, the better". As authors note, researchers following positivistic logic (Yin, 2009, Eisenhardt, 1989) argue that multiple cases are preferable to single case studies since theoretical strength comes in part from comparative multi-case scenario. However, some authors (Ahrens and Dent, 1998, Dyer and Wilkins 1991) argue that single case design allows to generate deep insights and

richness of data from investigated phenomena when using only a single case as unit of analysis. Ahrens and Dent (1998) continue "*richness presupposes a deeper appreciation of accounting in its in organizational and social settings and of information more broadly. Small samples permit closer engagement with the field and rich descpritions of organizational practice build on such closer engagement*". Thus, when seeking to understand the context of the implementation process and organizational factors causing changes in the implementation process, it is essential to form a broad understanding of the case organizations. Also, this study requires rich problem related data from case organizations to achieve its quality improvement and cost reduction goal; thus, study uses a single pair of case-organizations that are analyzed in depth with multiple methods through extensive improvement project. The study is therefore leaning towards single-case setting as these organizations form a case-study pair. However, case still contains data from two separate organizations and thereby ensures an abundance of empirical observations.

Luft and Shields (2003) have reviewed existing research on management accounting, particularly on the focus of such research. They present several studies grouped by either focusing on the causes of management accounting or their effects noting that studies focusing on complete causal chain of explaining how the management accounting takes a certain form and moving to explain its effects on organization are rare. This study focuses on identifying reasons that a predefined cost management tool takes a certain form during implementation at target organizations. The form of the tool is also considered, adding to the knowledge about implementation process. This study is focused on explaining why the chosen tool changed from the form presented in the literature into something else and what was the outcome, mapping the causes for management accounting. However, results of the improvement are also discussed and so effects of the management accounting receive some attention. Luft and Shields (2003) note that linking explanations of management accounting's causes into its effects create a "valid and more complete causal chain". Studies lacking this complete view may be criticized about possible conflicts between explanations of causes and effects.

Case studies typically utilize several data collection methods such as interviews, questionnaires and observations (Eisenhardt 1989, Lukka and Kasanen 1995, Lukka 1999, McKinnon 1988). This study is no exception. Lukka and Kasanen (1995) argue that through triangulation of data collection methods it is possible to counterbalance the impossibility of conducting statistical inference, thus making generalizability of the results possible. Eisenhardt (1989) also notes that triangulation of data sources serves to strengthen the findings of the study as patterns from one data source can be corroborated by the evidence from another, thus making the findings more grounded in empirical data. This study uses questionnaire to start the improvement project, observations during the workshop periods coupled with written data received from the workshops and finally concludes the data collection by follow-up interviews done after the improvement projects are ended. Another data synergy that can be attainable is the usage of qualitative data alongside quantitative sources. Eisenhardt states

that use of quantitative data may indicate relationships and keep the researcher objective when looking into qualitative data. Use of quantitative data also serves to strengthen the findings received from qualitative source. Morgan and Smircich (1986) have also noted this synergy, although reminding that quantitative techniques play only partial role in explaining the process of change. The data used in this study is mainly qualitative in nature, formed from interviews, open questions in the questionnaire and observations. However, teamwork based data collection phase involves in some parts validation of the survey data following Ishikawas (1985) guidelines for identification of root causes for quality failures as well as the pareto diagram for grouping of quality failures. Ishikawa's methods involve some quantification of the data. This leads to grouping of different quality failures as well as their prioritization using statistical tools such as pareto diagram. Thus, findings from preliminary survey and workshops are further validated through statistical methods.

Järvenpää and Pellinen (2005) write that through their analysis of several dissertation and licentiate thesis', they have noted a tendency to employ several theories in order to support different parts of the study's interpretations. In addition to multiple theories, they note that multiple approaches are also often employed in single dissertation. Thus, constructive and interpretative approach may be employed in the same setting. This study is no exception; this study aims to test the boundaries of a chosen cost management tool in a larger context of dyadic setting, thereby contributing towards theory refinement approach (Keating 1995), further elaborated by Vaivio (2008). However, this study also employs the contingency theory to understand changes in the tool's application when moving from single organization setting into dyadic context. Contingency theory is complemented with the use of transaction cost economics and trust to ground the study's starting point in theory. In line with Järvenpää and Pellinen (2005) observations, this study seeks to interpret changes in the tool's implementation process through contingency theory, while at the same time testing generalizability and application of the tool through market testing (Labro and Tuomela 2003) in the spirit of constructive studies (Kasanen et al. 1993). Järvenpää and Pellinen (2005) note that by including multiple theories in a dissertation, it is possible to bring many viewpoints into pursued contribution.

1.2.3 Methodological positioning

As noted, qualitative research usually indicates movement towards subjectivist view of the world, although as has been noted by Ahrens and Chapman (2006) that some qualitative research has shown functionalist leanings. Action research as an interventionist research method (Jönsson and Lukka 2005) for qualitative research data has also been mainly associated with anti-positivist view (Coughlan and Coghlan 2002).

In line with Kakkuri-Knuuttila et al. 2008, Ahrens 2008 and Chua 1987 this study rejects the Burrell and Morgans (1979) idea of strict distinctions between subjectivist and objectivist paradigms. Rather, as Ahrens (2008) notes, "interpretive or qualitative study sees that social reality is emergent and subjectively cre-

ated yet successfully objectified in social intercourse" and "Strict distinctions between objective and subjective approaches to research make no sense". Framework derived from this distinctive thinking, such as Morgan and Smircich (1980) subjectivist-objectivist continuum that further classifies approaches into six different epistemological approaches on the subjective-objective continuum is useful in positioning research, however. Therefore, using Morgan and Smircich (1980) subjectivist-objectivist continuum, this study rejects the idea that the social world is a closed system comprising of determinate relationships that are accurately observable and measurable. This study accepts the view that networks are open-ended sytems and that knowledge can be acquired by understanding processes of organismic change. As Tomkins and Groves (1983) note, this type of research could focus on the impact of change in the real-world environment. In this sense, research depicted here has some functionalist leanings as characterized by Ahrens and Chapman (2006) and conducted by Granlund and Taipaleenmäki (2005) as well as Malmi (1997). As Ahrens (2008) has noted, social reality is subjectively created. This has some implications for the network that is studied. The network context is in certain parts unique social construction comprising of people that are working in the social environment. Thus, the knowledge gained is not readily transferable to other contexts without testing. Therefore, this study does not aim to provide highly generalizable results across wide array of contexts, although Lukka and Kasanen (1995) argue that qualitative research has a potential for providing at least somewhat generalizable findings through contextual generalization. The issue of generalization is further discussed at the end of the thesis in conjunction with the issues of validity and reliability.

Keating (1995) differentiates qualitative case studies according to their theoretical purposes; theory discovery, theory refinement and theory refutation. Vaivio (2008) further elaborates on the meaning of these groups and compares theory discovery to exploration of an unknown territory. This type of research seeks to explain a new phenomena. It may provide a rich description, thus allowing to discern preliminary theoretical findings. Theory refinement studies, on the other hand, start with clear existing theoretical focus and objective. Research has the theoretical framework already established when the fieldwork begins and thus observations are through these lenses. Vaivio (2008) notes that although theoretical framework exists already in the field work phase, this does not mean that observations are forced into chosen framework but rather theory is refined through empirically grounded interpretations. Keating (1995) further classifies theory refinement studies into theory illustration and theory specification studies. Theory illustration study seeks to explain the use of theory in a wider perspective. It increases the plausibility of the theoretical framework through demonstrating its applicability in a certain context. Theory specification studies, on the other hand, take an existing theory as their starting point and revise their underlying assumptions to accommodate special organizational, social or institutional context. Finally, theory refutation studies seek to show

through empirical evidence that existing theory is not applicable to certain setting and practice contradicts the theoretical assumptions.

This study falls under Keating's (1995) theory specification type of studies. Using existing theory on organizational networks further focusing on purchaser-provider model and a cost reduction tool grounded in quality theory and action research principles, this study seeks to explore the applicability of such a tool in inter-organizational cost management domain. This research seeks to show the implications of using an existing tool in a wider context, thus showing the modifications and theoretical refinement needed in both the predefined, existing tool and the network theory.

Data for this study is gathered trough triangulation of methods as typical for qualitative case study (Eisenhardt and Graebner 2007, Jönsson and Lukka 2005, Malmi and Granlund 2009), using qualitative survey, workshop material, observation and follow-up interviews. This helps in a study to counter the threats to validity by using multiple methods (McKinnon 1988, Malmi and Granlund 2009). Survey results are also analyzed through Ishikawas (1985) pareto diagram, which can be thought of as an quantitative analysis tool. This combination of qualitative and quantitative analysis enhances the data validity as noted by Eisenhardt (1989) as well as Morgan and Smircich (1980). Validity and reliability are further discussed at the end of the thesis.

Ahrens and Dent (1998) offer a two-dimensional model for positioning a research according to technical-organizational dimension and a sample size continuum. resulting in four different areas of research. This results in studies that focus on technical practice and use small sample size, possibly one organization, and those that focus on technical practice and use several case organizations. Accordingly, there are also those that research organizational aspects of management accounting and use either single case setting or several organizations. Ahrens and Dent (1998) note that distinctions between technical and organizational aspects may be blurred, resulting in a mixture of the two choices. In choosing an organizational perspective, research seeks to explore linkages between accounting and organizational processes. This means that research sees accounting as an organizational phenomenon embedded in social context. In describing technical practice, research contributes to the understanding of accounting as a technique. Emphasis is on technical properties of a new system and its relevance to actual or theoretical management decisions. Possible areas of inquiry include the exploration of modifications and changes arising from the introduction of a new technique into target organizations. This is in line with this research's attempt to introduce a CAMP model into purchaser-provider model. This research is thus classified according to Ahrens and Dent (1998) classification as a research focusing on technical aspects and using two case organizations as sources of data. Focusing on technical aspects can be seen as somewhat more functional-objectivist perspective on research as the focus on social networks gives room for technical analysis.

To sum up, this study is conducted as an interventionist study (Jönsson and Lukka 2005) showing functionalist leanings further classified as an action

research study that uses qualitative sources of data analyzed through both qualitative and quantitative methods to further specify existing network- and cost management theory in relation to chosen tool and analyzes changes in implementation process through contingency theory in a special context of purchaser-provider model. Element of constructive research, a weak market test, is also used to test generalizability of the modified tool.

1.3 Anticipated contribution

In their recent article, Malmi and Granlund (2009) talk about management accounting (MA) research. They note that the mainstream research at present is trying to capture the causes and effects of MA (Luft and Shields 2003) as well as explain its practical functioning (Hopwood 2002). But in trying to explain the causes, effects or practical functioning of MA, Malmi and Granlund argue that we are essentially trying to use that understanding for the creation of better practices for the users of MA. They note that demands for practice oriented and relevant research (Kaplan 1998, Kasanen et al. 1993) have had only minor impact on research community. This debate was provoked by Zimmerman (2001) who argued that at the time, empirical MA literature had failed to produce "substantive cumulative body of knowledge". Zimmerman argued that MA had failed to develop theories to explain observed phenomena.

In their response to debate, Malmi and Granlund (2009) propose an extension to the concept of theory in order to make MA more relevant to actual practitioners. Their proposition to find some regularities on organizational life that could be applied from one organization to another given its specific context seems to demand an interventionist approach and problem-solving efforts (Jönsson and Lukka 2005). Malmi and Granlund (2009) raise the point that ontological and epistemological assumptions of the interpretive and critical research traditions have views contradicting their propositions. However, for research that at least in some parts acknowledges functionalist paradigm and has a concern for organizational improvement (Ahrens and Chapman 2006), their proposition seems of great interest.

Malmi and Granlund (2009) argue that in MA, there are a number of normative theories or constructs (Kasanen et al. 1993). Examples given include activity-based costing (ABC) and balanced scorecard (BSC). These are not regarded as actual theories by many researchers, even if they do instruct what should be done and why. Malmi and Granlund (2009) propose a status of preliminary theory for these normative constructs. One such construct could be seen to be the CAMP model (Malmi et al. 2004) presented earlier. A preliminary theory such as this should receive attention to test its limits. This would lead either to refinement or refutation of existing theory (Keating 1995). This type of research would have practical relevance in addition to theory refinement (Malmi and Granlund 2009). The type of research that would include both practically relevant solution and theoretical contribution is also proposed by Suomala et al.

(2011). The research presented here is directed towards implementation of CAMP model in a special context of purchaser-provider model and IOCM domain, thus leading to theory refinement research as proposed by Keating (1995) and discussed earlier. Although the CAMP model cannot be regarded as actual theory, but rather built upon quality theory, cost accounting theory and action research principles, arguments presented above hold true for this tool. There is a need to explicate existing constructs and develop more contingent claims about their applicability, that is, to see where its limits lie (Malmi and Granlund 2009). This claim is confirmed by Dekker (2003) who states that contribution can be achieved by explicating existing tool as currently conceptualized in the literature. Malmi and Granlund (2009) propose an interventionist research (Kaplan 1998, Kasanen et al 2003, Jönsson and Lukka 2005) to answer this call. One such interventionist research type is the action research presented here. Also, the construct tested in this research is given the market test as proposed by Labro and Tuomela (2003) to further test its applicability in wider setting of dyadic relationship. This test is conducted to further test the tool's limits as proposed by Malmi and Granlund (2009). Finally, Malmi and Granlund (2009) draw the line between consultancy and interventionist research by reminding that constant theory connection is the differentiating factor between research and consulting. They also consider validity of an interventionist research to be presented by implementation; what works in practice is true.

This research is anticipated to contribute to literature in several ways. First, it explicates existing tool (Malmi et al. 2004) as currently conceptualized in the literature (Dekker 2003) and shows new information on the applicability of the CAMP tool in a new context of purchaser-provider model. This is expected to lead to theory refinement and further specification in terms of the tool applied in larger context. Secondly, this research is tied to debate on the cost information needs when applying such a tool in inter-organizational cost management domain (Tomkins 2001, Kulmala et al. 2007). This research is anticipated to provide answers as to what kind of information exchange is needed when applying a cost management tool in dyadic interface. Also, several authors have argued that there is a need to focus on mutual co-operation and two-way perspective in place of prevalent focus on only the focal firm (Mouritsen et al. 2001, Cooper and Slagmulder 2004, Coad and Cullen 2006). There has even been a remark about lack of evidence about IOCM tools being actually used (Tomkins 2001). This study answers these calls by displaying an implementation process of a cost management tool in dyadic interface with the focus on two-way perspective. Thirdly, this research is aiming to provide valuable quality cost data, problem classifications data as well as improvement initiatives related data to add to quality literature, particularly on the previously under-represented purchaser-provider model. Fourth, this study is expected to provide answers as to what modifications actually happen when the tool is implemented in a new context and whether this changed tool is applicable to larger context, thereby answering recent demands for relevance seeking and boundary testing of an existing tool (Malmi and Granlund 2009). Finally, this research can be argued to

be a novel approach, as no previous study has focused on a quality related cost management tool to be implemented in IOCM interface with the aim to study changes that occur along the implementation process. This study contributes to literature by using theories to understand a phenomena while also further specifying theory concerning cost management tool and its implementation boundaries. Changes that happen in the implementation process are analyzed through contingency theory, while transaction cost economics and trust are used to understand division of costs and benefits resulting from the tool's implementation. Cost management tool's applicability is tested in wider setting and verified through market test (Labro and Tuomela 2003), while its success is also evaluated ex-post (Malmi Malmi 1997, Anderson and Young 1999).

1.4 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 cost of poor quality (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, cost of quality, performance measurement, purchaser-producer model and public sector management.

Empirical phase of the study is constructed as follows: empirical phase is conducted with 2 public organizations that are working within purchaser-provider relationship. 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, municipality'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.

After this empirical research process, gathered data is analyzed in relation to theoretical framework constructed and presented in chapter 5, consisting from topics of trust between inter-organizational partners, inter-organizational cost management, transaction cost economics and open-book accounting. Research problems are answered through the framework presented.

2 QUALITY

Chapter is organized as follows: First an attempt is made to define quality. Then, Total Quality Management is introduced as larger model covering quality initiatives. Third, principles and different views on quality costing are introduced. Fourth, a brief review on quality studies in the public sector is presented. Finally chapter is closed with some notes on Finnish quality studies.

2.1 About quality

Quality is a term that has many different meanings, depending on the situation and of the context in which it is used. According to Hardie and Walsh (1993) each definition has its own supporters and various schools have grown over different definitions. Early pioneers include such as Juran (1985, 1999), Deming (1986), Feigenbaum (1991), Taguchi (1986), Ishikawa (1990) and Crosby (1979).

These influential authors have defined quality in different ways: According to Juran (1985, 1999), quality is freedom from deficiencies. This means freedom from errors that require rework, result in field failures, customer dissatisfaction etc. Juran (1999) differentiates two meanings for quality; either higher quality services and products achieved through increased spending leading to increased costs or higher quality through reduction in errors, rework and field failures leading to lower costs.

Deming (1986) defines good quality to mean predictable degree of uniformity and dependability at a low cost with a quality suited to market. Feigenbaum (1991) describes quality to be "the total composite product and service characteristics of marketing, engineering, manufacture and maintenance through which the product and service in use will meet the expectations of the customer.

Well known Japanese quality guru Taguchi (1986) expressed quality to be "the loss a product causes to society after being shipped". Taguchi's methods

are mostly statistical in nature and rely on statistical quality control. Taguchi's loss function is a well known quality tool.

Crosby's (1979) definition of quality is "conformance to requirement". This means the ability of the product or service to stand up to requirements set by the customer. In Crosby's view, customer has to define his expectations in specific terms. After this, quality can be measured continually to determine conformance of the product or service to these specifications.

Like Taguchi (1986), Ishikawa (1990) approaches the concept of quality from a statistical perspective. He provides several statistical tools for quality control and improvement. Ishikawa (1986) defines quality through four aspects of quality: quality, cost, delivery and service. Quality contains quality characteristics in its narrow sense. These are performance, purity, reliability, appearance etc. Cost refers to aspects of quality related to cost and price. From these arise the cost control and profit control. Important factors under this aspect are unit cost, losses, productivity, number of defective products etc. Delivery refers to quantities and lead times, measuring such variables as production volume, inventory, consumption, production plans etc. Finally, service refers to problems and needed services after the products have been shipped. These include warranty work, compensations due to defective products, instruction manuals, after-sales service etc. In Ishikawas's view, although quality is often understood as the quality of the product, it can also be viewed in wider sense, meaning also the quality of the management and quality control.

All these definitions have in common the interest in errors and failures in the product and its manufacturing process, focus on the properties of the product or service and product's ability to meet the customer expectations.

One attempt to classify quality definitions into different groups is done by Garvin (1984). He classified different quality definitions into five groups: transcendental, product-based, user-based, manufacturing-based and value-based. Transcendental group refers to quality as a superior performance, a product or service of the highest standard. In this class quality can only be recognized through experience. Product-based group understands quality as a measurable variable; products can be ranked against each other. Higher quality is taken to mean also higher costs. User-based approach focuses on the customer and understands the quality as being able to satisfy the wants of the customer. Manufacturing-based approach defines quality as conformance to manufacturing standards. Deviation from specifications means deviation from quality. This approach often uses statistical process control (SPC) tools to help in manufacturing quality control. The value-based approach defines quality as providing performance at a reasonable price, therefore describing quality as providing value for money.

2.2 Total quality management (TQM)

Total quality management, TQM for short, is a system of management that is somewhat hard to define. It is devised to suit users own beliefs and academic and managerial experiences (Martinez-Lorente et al. 1998). It is one of the more widely recognized quality management systems, however, contributed to by influential quality pioneers such as Crosby, Deming, Juran, Feigenbaum and Ishikawa, most notably the latter two (Martinez-Lorente et al. 1998).

TQM has been defined by ISO standardized quality vocabulary in ISO 9000:1987 as being a "management approach of an organization based on the participation of all its members and aiming at long term profitability through customer satisfaction including benefits to the members of the organization and society" Later, ISO added to definition some emphasis for stakeholder value in its quality vocabulary (ISO 9000:2000). In recent years, term for TQM has been dropped out of ISO 9000 definitions standardization vocabulary in the 2008 version (ISO 9000:2008).

Although some people, according to Kirchner (1995), have mistakenly taken ISO 9000 and TQM to mean the same thing, ISO 9000 is a standardization model that must be separated from the company wide system for improvement that TQM represents. (Kirchner, 1995). While the two systems have much in common, TQM is a much more comprehensive system, keeping inside it 95% of the things covered by ISO 9000 (Kirchner, 1995; figure 2.1). According to Kirchner (1995), only two things covered by ISO 9000 and missing from TQM are quality records and customer-supplied product control.

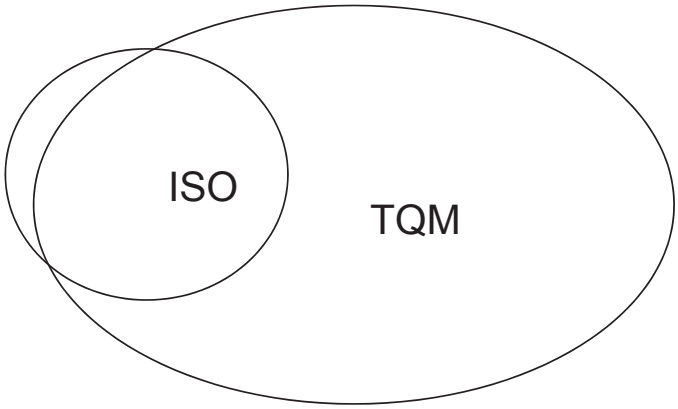

FIGURE 2.1 TQM and ISO 9000 relationship: Visualized from texts by Kirchner 1995

According to Powell (1995) TQM's origins can be traced to 1949 when Japanese scholars and engineers formed a committee dedicated to Japanese productivity improvement. One of the early quality pioneers that took part in the committee

was Kaoru Ishikawa, attributed to be one of the major contributors for TQM development. (Martinez-Lorente et al. 1998). Ishikawas statistical techniques for quality control form the basis for quality control in early TQM. Another major contributor to TQM is Feigenbaum (1961-1999), whose concept of total quality control comprises much of the TQM system.

Several authors have focused on the dimensions of the TQM (Dewhurst et al. 1999, Duggirala et al. 2008, Lau and Anderson, 1998). Lau and Andersson 1998 note that while there is no uniform definition of TQM for all the different sectors and organizational types, some elements associated with TQM can be noted. These are classified under three different areas of TQM; totality, quality and managerial aspects forming the Total Quality Management. Totality implies the requirement for employee participation in quality improvement, sense of quality ownership in each employee, involvement of all levels in the company and systems thinking in the development. Under quality, some dimensions can be noted. These are focus on the internal and external customer, emphasis on continuous improvement, training for technical skills and knowledge and innovation encouragement. Managerial aspects of TQM include requirement for commitment from top management, establishment of values and purpose for the company, need for leadership and need for organizational culture changes (Lau and Andersson 1998). Dewhurst et al. (1999) also acknowledge the difficulties in defining TQM, stating that different organizations and different researchers have their own definition for the term. However, after analyzing existing literature they have come up with similar findings than Lau and Andersson (1998), identifying uniform qualities of TQM as need for top management support, customer and supplier relationships and employee involvement.

Duggirala et al. (2008) have studied the use of TQM on public sector, focusing on health care. They have identified different dimensions present in the TQM, particularly on health care sector. These are requirement for top management commitment and leadership, employee involvement as part of human resource management, focus on process management, measurement of quality and performance, focus on information systems, error, safety and risk management, culture of service, need for continuous improvement, benchmarking and governance and social responsibility. Added to the list is healt care specific dimensions for TQM which include facilities and infrastructure, focus on patients and union influence (Duggirala et al. 2008).

While strict definition for TQM is not easily reached, these authors provide similar descriptions for some dimensions of TQM, both on the private and public sector. These include need for employee participation, requirement for top management support and leadership, focus on customer and need for continuous improvement.

2.3 Quality costing

American Society for Quality (ASQ) defines cost of quality as "the cost of not creating a quality product or service". Every time work is redone, the cost of quality increases. Examples include the reworking of a manufactured item, retesting of an assembly, rebuilding of a tool, correction of a bank statement or replacement of a food order in a restaurant.

It follows that any cost that would not have been expended if quality were perfect contributes to the cost of quality. (Quality costs committee, ASQ 1999)

Total quality costs are the total of the costs incurred by investing in the prevention of defects and nonconformities to requirements, appraising a product or service for conformance to company quality levels and failing to meet requirements for internal and external customers. (Feigenbaum, 1991)

Schiffauerova and Thomson (2006) argue that as many companies in modern business environment consider quality to be a critical success factor, any serious attempt at improving it must take into account the costs associated with achieving quality. They state that since one purpose of continuous improvement programs is the achievement of quality at lower costs this can only happen is these costs are identified and measured. Analysis of the organization's cost of poor quality (COPQ) serves also as a link between improvement actions, costs associated with them and customer expectations. This can be seen as the coupling of reduced costs and increased benefits (Schiffauerova and Thomson, 2006).

Schiffauerova and Thomson (2006) have made a recent review of different COPQ models and best practices. As Plunkett and Dale (1987) have stated in their older review on COPQ literature that most COPQ models follow Feigenbaum's classification to prevention, appraisal and failure costs (PAFF model), this is also found on Schiffauerova and Thomson (2006) review. However, some different cost classifications can also be found in the more recent review. These include ABC based cost classifications, opportunity cost classification or Crosbys (1979) model classifying costs into conformance and non-conformance costs. ABC costing models separate costs into value-added activities and non value-adding activities while opportunity costs are based on Feigenbaums (1991) classification, adding the opportunity cost to PAFF model (Schiffauerova and Thomson 2006).

In the quality cost literature there are two conflicting views on the need for failure prevention and appraisal activities in relation to quality costs. (Crosby 1979, Juran 1999) Classical view, or the minimum cost approach (figure 2.2) holds that there is an optimal point for the amount of prevention and appraisal actions that is somewhere before zero defects depicted by failure costs curve. This means that it is not advisable to try to reach the point where quality failures no longer exist since the cost of prevention and appraisal actions would at some point exceed the amount of failure costs saved. In contrast, modern view, or the continuous improvement approach, (figure 2.2) states that optimal

amount of prevention and appraisal actions are where the quality failures no longer exist. While this increases the amount of costs due to prevention and appraisal actions, decreased failure costs make up for the loss, thereby saving in total COPQ. (Martinez-Lorente et al. 1998; Schiffauerova and Thomson, 2006)

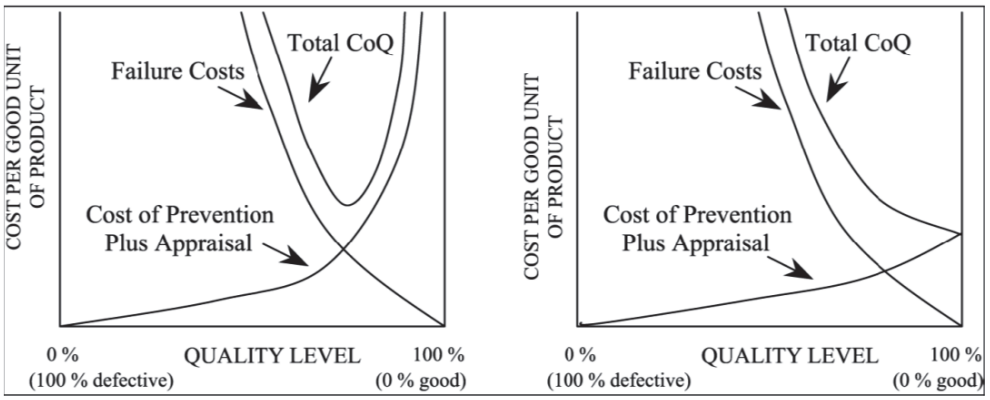

FIGURE 2.2 Views on economic level of COPQ (Schiffauerova and Thomson 2006)

Crosby's (1979) classification of quality costs divides total cost of quality (COQ) into costs arising from conformance ensuring actions and costs from non-conformance caused by quality failures. Feigenbaum's (1991) classification divides quality costs into prevention, appraisal and failure costs. While these are different classifications, Crosby's model is similar to Feigenbaum's. Crosby has united prevention and appraisal actions into one class of conformance costs which depict the cost of ensuring the things are done right the first time, leaving the cost of non-conformance to cover internal and external failure costs (Schiffauerova and Thomson 2006, Crosby 1979, Feigenbaum 1991). Crosby believes in continuous improvement striving for zero defects while Juran (1999) believed there is an optimal point for prevention and appraisal actions. In Juran's view the optimum quality level was below the zone of perfectionism, that is, it is not advisable to strive for zero defects but rather optimize the amount of total COQ by relaxing prevention and appraisal actions when compared to proponents of zero defects model.

Both the classical view and modern view have been the object of much debate (Foster, S. 1996; Schneiderman, 1986), with support for the modern view (Crosby, 1979; Hall, 1987; Leonard and Sasser 1982) as well as the classical view (Juran, 1999; Nicholls, 1992). Feigenbaum (1991, p. 112) agrees with advocates of the continuous improvement in that increases in prevention costs lead reduction to the total COQ over time. This happens because high expenditures in appraisal costs are no longer needed and failure costs decrease due to preventive measures.

Burgess (1996) argues that both the classical view and modern view can be reconciled within a single model. He states that classical view could be right in certain constrained time scale while using an infinite time horizon as perspec-

tive the modern view would be better suited. Similar findings can be found on Gilmore's (1990) earlier study about behavior of quality costs over time. These authors argue that over time, the total cost curve depicted in figure 2.2 starts to move towards downward trend. Recent study by Seokjin and Nakhai (2008) has also found mixed results concerning the behavior of quality costs in relation to quality improvement initiatives. Authors argue that with firms whose quality improvement programs are highly effective, quality costs tend to decrease over time while less effective quality initiatives tend to lead to higher quality through higher total costs.

Schiffauerova and Thomson (2006) argue that since traditional cost accounting attributes costs by the categories of expenses instead of activities, COQ elements often need to be gathered or estimated through other methods. Foster (1996) describes possible data collection methods for quality costs of the company. He states that data can be obtained by variety of means like expert review, simulation, questionnaires or case research method. Tsai (1998) presents a hybrid of ABC-COQ model where ABC and COQ systems are merged for a common database in order to supply various cost information elements needed for COQ estimation and tracking. Robison describes a team-based approach aiming to identify problems in the process as well as related quality costs (Robison, 1997).

Schiffauerova and Thomson (2006) state that companies rarely have a realistic idea of how much profit they are losing through poor quality. Even the companies that track the COQ elements, understate their results according to Schmahl et al. (1997). Large number of quality related problems have also proven to be difficult to grasp and quantify, therefore remaining outside the quantified quality costs (Sorqvist, 1997). Schiffauerova and Thomson (2006) state that although reasonable amount of information is obtainable about quality costs in general, there is very little information on published studies about possible ways to collect quality costs. They also argue that literature reveals very little about evidence on what costs are to be included or excluded when quantifying COQ.

In spite of difficulties in quantifying existing quality costs and defining quality elements to be included in COQ calculations, several authors have come up with quality costs as percentages from annual turnover. Seokjin and Nakhai (2008) have studied the literature on quality costs and state that total quality costs in manufacturing range from 5 percent to 30 percent of turnover depending on the study. Quality failure costs are estimated to be about half of the reported COQ in manufacturing. Gryna et al. (2007) argue that service organizations failure costs amount to 30 percent of annual operating expenses on average. Omachonu et al. (2004) have studied quality costs in manufacturing and have come up with smaller percentage of total COQ as percentage from turnover. They present their findings as totaling 3,67 percent from annual turnover in manufacturing. Of total COQ their study indicates that most of the quality costs are generated by internal quality failures, totaling over 70 percent of total COQ. Krishnan, S. (2006) has made a small literature review on amount of quality

costs found in organizations. Most of the studies mentioned indicate quality costs to average somewhere in the vicinity of 20 percent in manufacturing with some indications that public sector COQ is notably higher.

2.4 Quality research in the public sector

Quality issues have been studied from many perspectives in the public sector. Micheli et al. (2005) identify the issue of efficiency vs. quality. They raise the question whether it is efficiency or quality that performance measurement is trying to capture when conducting public sector studies. They argue that quality is often neglected when examining the public sector performance and that efficiency is measured as the amount of output that is produced with given resources. In this equation, it is often seen that quality of the service does not change with new efficiency demands, rather quality as a concept is seen as a complication best avoided. Erridge et al. (1998) have noted the linkage between new public management reforms (NPM) and quality issues. In the nineties NPM reforms on the public sector were demanding commercialization of the public services and yet quality initiatives, such as TQM were needed to produce high standard quality service in line with the practices from the private sector. Authors have identified different models that have been used on the public sector for quality initiatives. These include citizen's charter in the UK, European quality model (EQM) and the TQM. Authors have studied a case organization's quality initiatives through EQM principles.

The use of TQM on the public sector has been studied more closely by Dewhurst et al. (1999). In their study, Dewhurst et al. start by defining elements associated with the TQM, coming up with 10 elements most commonly associated with TQM in the literature. These elements are then analyzed in relation to operating characteristics of a public organization. Authors conclude that some elements of TQM can prove to be challenging to implement in a public organization, such as customer focus. However, focus on team work, use of improvement tools, training and the availability of information are seen to have similar positive effects in the public organization when compared to private sector.

Donnelly (1999) has studied quality strategy in the public sector. He notes some differences between public sector and the private sector. These differences have their influence on the quality management in the public sector. These include importance of particular mission and responsibilities of the public organization, range of different stakeholders, available strategic choices in the public sector, different logic of quality in the public sector and nature of customers and decision-makers. Donnelly argues that logic of quality is largely different in the public sector; as improved quality means retaining old customers and attracting new, public organization can reach its capacity for service quickly. This happens because most public organizations are not revenue generating and funding for the production of services is fixed in a certain timeframe. Thus, improved quality is not so one-sidedly good thing as in the private sector.

McAdam et al. (2002) have studied the applicability of TQM on the public sector. To achieve this, authors have included in their study six different quality frameworks that incorporate some of the elements of TQM to various degrees. These frameworks are business excellence model (BEM), Investors in people, ISO 9000, benchmarking, charter mark and the balanced scorecard (BSC). Through triangulation of focus groups, surveys and interviews, authors have drawn several conclusions; public sector seems to demonstrate improved performance when using some quality framework to improve its functions. Second observation is that in the UK public organizations seem to prefer BEM and investors in people as frameworks for quality improvement.

Redman et al. (1995) have studied the use of different quality tools and techniques in the public sector. They identify over 30 different tools or techniques available for quality work in the organization. These include customer satisfaction surveys, quality training, different quality improvement projects, quality teams and circles, quality days, benchmarking and the use of statistical process control (SPC). In their study carried out in 1995, authors have found that UK public sector has established the use of quality tools relatively well as a whole. They note, however, that in the more resource oriented area such as technical skills or competitive benchmarking there is a considerable lack of expertise when compared to private sector.

COQ literature on public sector is very scarce; while quality has been studied on the public sector on several different perspectives, namely different models in use (McAdam et al. 2002) and different quality tools in use at public sector (Redman et al. 1995), COQ studies in the public sector are still few in numbers. Barber et al. (2000) report on a study that focused on civil engineering projects and quality failure costs contained in them. They note that in civil engineering, prevention and appraisal aspects are hard to separate from other costs and failure costs amount to majority of total COQ and thus failure costs are most relevant costs to examine. Authors present a method called workshadowing for quality cost estimation. This method relied on researchers observing the work of different construction teams for short periods while taking notes on every quality problem and failure that the team faced. Costs were then estimated according to time delay it caused or resources it used while making an estimate of the overhead expenses included. They report an amount of failure costs totaling 16% from total budget of the organization. Excluding costs calculated to time delays costs amount to 7% of budget. Authors also report that 4% of the different quality problems amounted to 68% of total quality costs, thereby implying that relatively few most important problems generate the largest quality failure costs in the organization.

2.5 Finnish research on quality cost management

In Finland, quality costs have been studied from different perspectives. Sippola (2008) presents a constructive model for embedded software business. Model aims at measuring quality costs on a real-time basis on the software business environment. Developed model is tested in another case organization. Tervonen (2001) has focused on quality improvement and use of TQM in organizations and motives behind quality initiatives. His findings highlight the importance of employee level participation in quality improvement as well as customer demands and desire for improvement as primary motors behind organizational quality improvement initiatives. His data was collected through interviews. Malmi et al. (2004) propose a collaborative approach for measuring and managing the cost of poor quality. They present a construct for measuring quality failure costs through team based workshop sessions.

3 PURCHASER – PROVIDER MODEL

Chapter is organized as follows: First, concepts of networks and dyadic settings are discussed briefly as an umbrella term to cover purchaser – provider model. Then, definition of purchaser – provider model is presented and different stakeholders defined. Short review of prior studies and findings is presented. Also, an overview of Finnish studies centered on purchaser – provider model is presented. Finally, linkage between new public management and purchaser – provider model is noted.

3.1 Networks and dyadic settings

Much has been discussed on networked activity in general and different authors have called relationships where two or more organizations have mutual linkages as inter-organizational relationships, inter-firm settings, hybrid organizational forms or networks. There is, however, some ambiguity on different terms and their meanings (Oliver and Ebers 1998, Caglio and Ditillo 2008, Tomkins 2001). For example, some authors have positioned themselves on contributing to discussion about networks while discussing dyadic relationships. (Caglio & Ditillo 2008). More exact expression would be to state that study is positioned under concept of networks but focused on dyadic settings within it. This study is an example of such a research setting. Others have used the term 'network' to mean specifically innovation networks (Tidd et al. 1997) or defined different types of networks (Castells 1996).

In this study, network is understood as a concept covering linkages with two or more organizations having a mutual relationship, while dyadic relationship is understood as a relationship with two autonomous organizations. That is, networks can be examined as dyadic relationships or multilateral relationships with several organizations. (Vesalainen and Varamäki 2006). Author acknowledges that some different interpretations of the concept exist; Tomkins (2001) considers dyadic settings to be either relationships or alliances but labels

networks to be formed of complex configurations of several alliances or relationships between more than two organizations, thus leaving dyadic setting outside this concept. Vesalainen and Varamäki on the other hand have constructed a classification for different networked activities. They divide networks as either dyadic settings or multilateral relationships and into organizational relationships or business relationships. Inter-organizational relationships and inter-firm relationships are considered in this study to mean the same thing.

Typically, networks are situated as being somewhere in the middle between vertical integration and pure market transactions. Vertical integration means the organization of work activities under single organizational setting whereas market oriented approach means using so called arm's length transactions where transactional parties have no relationship before or after the transaction. (Anderson and Dekker, 2010, Cooper and Slagmulder, 2004 Varamäki et al. 2006) These hybrid forms of governance and relationships have been studied through different concepts such as trust (Dekker, 2004), open-book accounting (Kajuter and Kulmala 2005), Inter-organizational cost management (IOCM) (Cooper and Slagmulder 2004) as well as through different theoretical lenses like social networks theory (Kohtamäki, 2006), transaction cost economics (Anderson and Dekker, 2010), actor-network theory (Mouritsen et al. 2010), knowledge-based approach (Grant, 1996) institutional theory (Scapens and Varoutsa 2010) and resource dependence model (Casciaro and Piskorski, 2005)

3.2 Purchaser – provider model

Purchaser – provider model (PPM) as it is abbreviated in this study has been labeled in different terms by different authors; it has been characterized as purchaser – provider relationship (Gray and Ghosh, 2000), labeled specifier & provider model (Moll and Hoque, 2008) and alternatively referred to as purchaser – producer model (Lillrank and Haukkapää-Haara, 2006). These terms are considered to mean the same thing in this study. Terms "provider" and "producer" are used interchangeably.

PPM can be considered as being a unique kind of supply chain that as a concept is located under networks and more specifically dyadic settings. It can be understood as one type of hybrid governance form with dyadic setting located between vertical integration and market oriented approach (Cooper and Slagmulder, 2004). Purchaser-provider model 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, Lillrank and Haukkapää-Haara, 2006) According to Lillrank and Haukkapää-Haara (2006), PPM contains four different actors and functions: the purchaser, the producer, end-users and principal / financier that is usually the county. They also identify a fifth group of actors influencing action within PPM that are regulators of action such as government and trade unions (Figure 3.1).

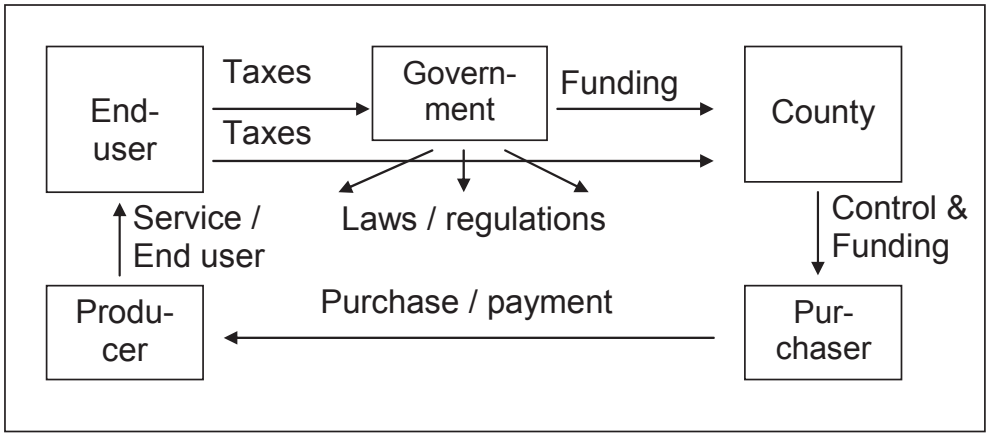

FIGURE 3.1 The PPM stakeholders and action (developed from Lillrank and Haukkapää-Haara, 2006)

Lillrank and Haukkapää-Haara (2006) describe different actors in purchaser-producer network. County is usually the actor whose mandate empowers the purchaser to issue orders and purchases towards the producer. County collects taxes from citizens as well as receives funding from the government. County then directs funds for the purchaser so that it can fulfill its purpose. Purchaser evaluates, makes tendering and places orders. Purchaser then controls the fulfillment of contracts it has made with different producers. Producer has the necessary resources to produce the services purchased by the purchaser. Producer may be public organization whose resources are obtained from the county or private organization that exists for profit. Moll and Hoque (2008) refer to these as internal and external providers. Although producers and purchasers are both governed by same laws and regulations, producers are independent entities within PPM and have their own decision power. End user is either citizen, client or patient depending on the setting and context that is being examined.

Another classification of purchaser – provider split is offered by Van Gramberg and Teicher (2000). They separate PPM into vertical, horizontal and complete models. In vertical model providers report directly into one CEO governing entire PPM organization. In horizontal model both the purchasing organization and the providing organizations exist in same operational groups. Finally, complete split is a case where organizations are externally corporatized.

According to Ellwood (1996), PPM can be understood as an internal, or quasi market that are not typical markets. They are not evolved from existing demand and supply but are rather created by an organization that wants to redefine supply and demand by providing new relationship between stakeholders. Organization creating the purchaser-provider relationship can act as a regulator, imposing regulations and restrictions to dictate the nature of the market. For this internal market to operate efficiently, Ellwood (1996) suggests that competition and tendering for different providers is based upon price. This way

purchasers are directed towards the most efficient provider. For price-based tendering to work within a PPM setting, prices should reflect resource consumption, be comparable between different providers and volume of activity should determine the contract value in linear way. Finally, Ellwood (1996) states that for price-based tendering to create efficiency in PPM purchasers must respond to price signals gained through tendering. However, Fischbacher and Francis (1998) have found that purchasers exhibit considerable loyalty towards their chosen provider and do not want to change providers according to prices easily. Authors note, however, that while purchasers seem to be price-insensitive, they are concerned with quality. Laing and Cotton (1996) differentiate two types of quality: technical quality that is based on the service provided and functional quality that is based on the way the service was delivered.

Fischbacher and Francis (1998) express concerns that in some cases purchaser's bargaining power limits the working of the market mechanism in PPM. This point is raised also by Ellwood (1996) who states that monopolistic providers may hold great influence on the market. Bryan and Beech (1991) propose monopsony to ensure purchaser's power on the market. According to Porter (1980) several conditions must be met for buyer to have any influence on the market: buyer's purchases are large relative to seller's sales. Services purchased must present large enough proportion of the purchaser's costs for it to look around for cheapest price. Services must be largely undifferentiated to enable tendering. Transaction costs need to be low enough to change provider. Purchaser must have low enough profits for it to have incentive for cost savings. Quality issues should not be largely relevant to purchaser as it affects tendering. Finally, purchaser must have enough information about process to make decisions.

PPM is usually associated with recent reforms of the public sector that strive into commercialization of the services, business oriented relationships between public organizations and market-inspired action of the public organizations. These reforms are called under an umbrella term the new public management (NPM) and the PPM can be considered one organizational form inspired by the NPM reforms. (Siverbo, 2004). NPM is a global phenomenon that has been adopted at the public sector in different countries to varying degrees. Similarly, PPM has been adopted in some countries whereas in others it has not taken hold. Examples include dominance of privately funded services in the United States and in the other extreme Scandinavian publicly funded and produced services in Finland (Lillrank and Haukkapää-Haara, 2006). Other countries with examples of PPM model in place, mostly in the health care, are the UK health care (Carruthers et al. 2007, Gray and Ghosh, 2000), Swedish health care system (Siverbo, 2004), Australian water supply (Moll and Hoque, 2008) and New Zealand health care system (Ashton et al. 2004).

Fisbacher and Francis (1998) state that although PPM has achieved some savings through improved efficiency, expenses have been incurred at the same time from model related management costs. Ellwood (1996) argues that these new costs have come from higher transaction costs due to additional activity

systems, resource usage and comprising of detailed contracts between the purchaser and the provider. Van Gramberg and Teicher (2000) emphasize costs from contracting. These are seen to be costs arising from writing contract specifications, overseeing bidding, monitoring contracts and correcting works that fall under specified standards. Duran et al. (2005) also focus on contracts between purchasers and providers and state that purchasing in PPM can be very complex due to detailed contracting process. Contracting parties should be involved in contracting starting from the planning process and have an input on the contractual output. This way both the purchaser and the provider are made accountable for reaching the targets defined in the contracts. This means that other stakeholders like the funding organization should not endorse only one side in the bargaining process. Authors differentiate several different contracts that are used in the purchaser-provider interface.

Moll and Hoque (2008) present a recent effort to create performance metrics within the PPM. Metrics are grouped under different classes that include customer related metrics, environmental metrics, employer metrics, commercial metrics, quality metrics and accountability metrics. Purpose of the metrics system was to improve accountability and to communicate objectives and targets to organizational members. Authors describe their metrics system as consistent with the BSC performance measurement.

Ashton et al. (2003) have studied the contracts and the contracting process between two major stakeholders of the PPM; purchaser and the provider. They state that while contracting has the potential to bring a number of benefits to PPM interface, it is likely to bring additional costs in the form of transaction costs. Although it is hard to define whether savings outweigh the costs, some beneficial outcomes are pointed: contracting between the purchaser and the provider may increase the focus on quantity, quality and costs of the services produced. It may encourage greater technical efficiency and increase the amount of funding opportunities to providers. Finally, it may improve resource allocation by forcing purchasers to give greater consideration to prioritization of services. On quality embedded in the contracts, authors note that most PPM contracts include some measures of quality. Usually they are in the form of quality standards specified in the contracts and fall into four broad categories: effectiveness, efficiency, acceptability and safety. Siverbo (2004) points out that as purchasers and providers are influenced by mutual contracts, from the efficiency point of view tendering of services with different providers before contracting is essential. Also, evaluation of the services produced is needed to ensure that the provider does perform the activity ordered and specified in the contracts. Brignall and modell (2000) express concerns that PPM might actually cause a decrease in the service quality. As purchasers are made in greater extent responsible for their costs and resource consumption through formalized contracts and tendering, there exists a possible trade-off between costs and quality. This point is also raised by Van Gramberg and Teicher (2000).

Van Gramber and Teicher (2000) argue that an examination of the new public sector managerialism and the tendering of services brought by NPM

should take into account different elements such as the structural separation of the purchaser-provider split, the development of managerial strategy, management of contracts, financial aspects and the management of quality.

3.3 Purchaser – provider model in Finland

One of the most comprehensive reviews on the use of PPM in the Finland has been done by Kallio et al. (2006). Authors have focused on their study on the three PPM-pioneer cities in the Finland; Jyväskylä, Turku and Tampere. Their aim was to form an understanding about the working of PPM model and organization of the service production in the cities. Other goals were to find out about targets set for the PPM as well as examine whether cities had sufficient resource-base and organizational culture base to implement PPM. In their study authors have found that cities have developed cultural and organizational competencies prior to adapting PPM on a larger scale. Goals for implementing PPM have been on the case cities to clarify the division of political power and organizational independence as well as focus on the contracts between PPM stakeholders. Authors raise concerns that PPM may promote sup-optimization as there is no clear unit that would be responsible for coordination of different PPM models at national level. Other concerns include the possibility of purchasing organizations getting too large and resource consumptive as well as possible problems at competing on market based environment that has not been traditional way of working in the public sector.

Lillrank and Haukkapää-Haara (2006) have studied PPM in the health care sector which has been the most common sector in different countries to apply the PPM. Authors have mapped the organizational structure of the Finnish PPM and linked different stakeholders and their relations to the model (Figure 3.1). In their study they analyze the effects of various institutional elements such as power, motivation, ambitions and contracts on the purchaser-provider model. They differentiate several actors in the PPM model (Figure 3.1) of which the most important are purchasers, providers, end users and the principal. They also acknowledge the effect of the legislators on the working of PPM model. They have noted the existence of quasi markets and relative independence of the PPM stakeholders. Authors argue that relevant value adding elements of the purchaser-provider split are transparency of the economic factors between relationship partners, possibility to develop control mechanisms through mutual contracts, relative independence of the PPM stakeholders and competitive markets.

Arpiainen et al. (2006) present their findings from study that focused on the use of PPM on Finnish forest centers. Forest centers are organizational units that direct funding for the use and care of Finnish forests as well as monitor the compliance of different stakeholders with the laws concerning forestry. Arpiainen et al. (2006) focused on the applicability of the purchaser-provider split on the Finnish forest centers. This meant the option of lowering the pro-

duction of services in the forest centers and increasing the outsourcing of services accordingly. However, authors note that inspection services are the jurisdiction of forest centers and cannot be outsourced since the legislation demands the inspection to be made by authorities in the forest centers. Arpiainen et al. (2006) suggest that forest centers should increase the use of PPM on the information collection efforts by outsourcing the function and increase knowledge base among the personnel of the PPM. Authors present their definition of PPM in the organizational environment of forest centers by stating that in the forestry sector forest owner is regarded as the purchaser while the forest center is the provider. Among the difficulties mentioned in applying PPM in forest centers are the government productivity program and lack of available resources. Also the mentioned legislation forbids the outsourcing of inspection activities.

Also, Hyvönen and Järvinen (2006) have studied the purchaser-provider model in use at Finnish health care. In the Finnish health care sector, purchaser-provider model has been implemented in the form where hospitals provide health care services and the municipalities purchase them according to community contract. Hyvönen and Järvinen (2006) have studied how the budgetary bias continues to prevail at health care sector in spite of the introduction of contract based budgeting, where revenue and expense should be equal. Their results indicate that changes in budgeting practices incorporated prevailing institutional practices into intended new setting, thus causing the old institutionalized behavior to reproduce itself.

3.4 New public management (NPM)

The concept of new public management (NPM) has been associated with the reform of the public sector in the 1980s and the 1990s. There has been some debate on the origins of the NPM (Lapsley, 1999), some researchers emphasizing performance measurement which indicated discrepancies between budgets and actual expenses (Jansen, 2008). Others have pointed out that in the 1980s, many politicians, academics, citizens and private sector representatives were criticizing public sector for its inefficiency and ineffectiveness, resulting in public sector transformation (Van Helden 2005). Still others emphasize a broader shift towards public accountability (Hood, 1995). NPM has been characterized as being a restructuring of public services towards decentralizations and corporatization, adopting of a new management focus, introduction of markets or quasi-markets for public services, rationalization of the public services and the focus on quantification for efficiency gains (Lapsley, 1999).

Hood (1995) associates NPM with seven different dimensions of change; firstly, a movement towards decentralization of public organizations into separately managed corporate units, each assigned its own public service or product. Relationships between these new entities are governed through corporatized style contracts. Second, a shift towards greater competition between public sec-

tor organizations as well as between the public sector and the private sector. Third, the adoption of management practices from the private sector. Fourth dimension of change is the movement towards greater discipline in resource use as well as search for less costly ways to deliver public services. Fifth, an adoption of hands-on-management, that is, more active control of public organizations by visible top management. Sixth trend is the movement to more explicit and measurable standards of performance in terms of range, level and the content of services provided. Finally, seventh dimension of change involves attempt to control public organizations in more uniform way according to preset output measures.

Siverbo (2004) associates PPM with recent wave of large scale reforms done under the NPM trend. Starting from 1990s many services offered by the public sector have been demanded to be organized more efficiently and effectively. To achieve this, public sector has been subjected to various private sector management techniques and adoption of so called quasi markets were purchasers and providers have been separated (Brignall and Modell, 2000). Dunleavy and Hood (1994) view the NPM as consisting of various trends that include moving to more transparent budgets in accounting terms, viewing organizations as a network of contracts linking incentives to performance, forming quasi-markets by introducing purchaser and provider distinctions, opening up provider role to outside competition and allowing purchasers to change providers if needed. Some authors have identified PPM to be more clearly associated with NPM reforms (Brignall and Modell, 2000, Foster and Scott, 1998) while some authors merely describe NPM as an umbrella term consisting of different elements and ideas that can be used separately according to situation and needs (Ferlie et al. 1996).

Ter Bogt (2008) regards the NPM as a functionalist approach as one of the most important objectives of the NPM is the aim to increase economic efficiency and effectiveness in the public sector. A functionalist approach to organizations presupposes that organizations as well as the individuals within it rationally choose the means to achieve set objectives. Therefore, in order to ensure organization's continuity, its choices are based on the improvement of efficiency as well as effectiveness. However, some authors see that organizational changes are not implemented only to boost economic efficiency and effectiveness (Scott 1995, Oliver 1991). They argue that expectations, values and rules outside and inside the organizations play a significant role in decisions to introduce management changes. Thus, institutional theory broadens the view from functionalist approach into structures in society as well as social and cultural aspects such as rules, power, interests and habits. An institutional framework combines economic, social, political, cultural and historical dimensions in the analysis of organizations and change processes (Greenwood and Hinings, 1996).

Pollitt (2002) proposes a four staged framework that can be used to analyze the adoption of NPM. At first level, the discursive convergence, people are talking and writing about the same concepts, such as performance budgeting or TQM. At this stage the conceptual agenda is converging. This level of adoption

could be researched, for example, by using documentary analysis and textual deconstruction in studying government documents, professional publications or political speeches. At second level, decisional convergence, authorities publicly decide to adopt a particular form or technique. Pollitt (2002) raises as an example the national citizen's charter, one part of which contained a quality award for those organizations which met the set standards. Second level of NPM adoption could be researched by collecting reform announcements and analyzing them through documentary analysis. At third level, which is practice convergence, public sector organizations begin to work in similar ways. One example would be the adoption of performance based pay arrangements in the public sector organizations or the use of defined quality initiative in several public organizations. Pollitt (2002) argues that this third level is more difficult to research as the entry to public organizations may be limited. This level requires extensive field work with a research project and sufficient access to case-organizations. Fourth and final level of adoption is the results convergence. At this level implemented reforms produce their intended or unintended results so that the outputs of the public sector activity begin to converge. An example given by Pollitt (2002) is the results of TQM lowering hospital waiting times in every jurisdiction. According to Pollitt (2002) the fourth level is the hardest level to study as the final outcomes are very hard to define and comparing results across organizations and jurisdictions is harder still. Pollitt (2002) states that there is a lack of research done on the third and fourth levels of NPM adoption. One reason for this is the easiness of research done on the first levels when compared to later levels. Thus, there is a need for research concentrating on the adoption of a defined technique in public sector organizations in the NPM reforms context. Also, Van Helden (2005) notes in his literature review of management accounting research conducted at public sector context that cost accounting and related research is lacking in the public sector context. He also notes that there are very few studies focusing on the applicability of cost management tools in public sector context. The implementation of the cost management tool CAMP depicted in this research offers a view on the third level of NPM adoption as suggested by Pollitt (2002). Also, this research offers information on the issues in cost accounting on the purchaser-provider relationship and public sector context. Finally, this study is an example on the research concerning the actual applicability of a cost management tool in a wider context.

Although some studies show that NPM has stopped the increases in public spending (Pollitt and Bouckaert, 2000), evidence of greater efficiencies and effectiveness has not been demonstrated according to Lapsley (1999).

Van Gramberg and Teicher (2000) demonstrate a case where NPM has failed to transform the puclic organization into more managerialist model. Reasons for this are identified to be the government's continuing authoritative presence and tensions rising from the structure of the NPM reforms. While PPM was seen to be essential part of the reforms, many problems arose from the new model. Managers were inexperienced to supervise and formulate complex contracts between PPM sides and services were demanded outside the

newly formed contracts. Other problems included difficulties in separating purchaser's and producer's functions as well as poor information flow between organizations.

Adolfsson and Wikström (2007) have studied the use of quality systems in the NPM context; they focused on the quality dialogue tool which is aimed to collect quality data and to improve operations at target organization by using group meetings and sessions. Authors state that their research shows how the quality dialogue model presented a way to measure performance with qualitative measurement features. They contrast the tool with the balanced scorecard which features more quantitative measures than the quality dialogue tool.

Kurunmäki (1999) has studied accounting in NPM context in the Finnish health care sector. Research by Kurunmäki aimed at defining the concept of accounting entity and whether health care unit constitutes such an entity. The question was whether there exists a shared belief among all parties in the legitimacy of the hospital as an accounting entity. She describes in her study the effects of creating a NPM accounting entity; accountability of the hospital had to be redefined, cash based reporting had to be changed into accrual accounting as well as the use of financial reporting to measure the ability to survive in the competitive environment, thus providing tools for management to evaluate and control the operations of the hospital.

4 FIXED PROCESS IMPROVEMENT METHOD

Process improvement and quality cost reduction tool used in this study follows the guidelines and method set in the Malmi et al. (2004). Authors call their construction "a collaborative approach for managing project cost of poor quality". Collaboration in the name of the construct refers to the use of workshops during the improvement process in target organization while management focuses attention on the managerial aspects of managing quality costs. Finally, this construct is developed and used under project conditions, that is, in organizations whose business is formed from many, at least partially separate projects with different scales and restraints. This chapter describes in more detail the starting point for the process improvement implemented in this study's case organizations.

4.1 Theoretical connections of the improvement method

Quality cost reduction method called collaborative approach for managing project cost of poor quality constructed by Malmi et al. (2004), shortened from now on as CAMP is based on quality literature. Authors mention Juran (1951) and Feigenbum (1956) as Juran established the framework for cost of quality and Feigenbaum divided quality costs into prevention, appraisal, internal failures and external failures (PAFF) categories. These quality pioneers established the groundwork for quality improvement methods in defining quality and its categories.

Authors have adopted as their starting point suggestion from quality literature that quality reduction should always start at the classification and quantification of existing quality costs (Atkinson et al. 1994, Ansari et al. 1997), point raised recently by Schiffauerova and Thomson (2006). Starting from this quality costing perspective, root-cause analysis (Ansari et al. 1997) and cost-driver analysis (Atkinson et al. 1994) have been suggested as methods for identifying quality improvement initiatives that provide the best potential cost reduction.

These methods identify quality costs according to PAFF-model (Feigenbaum 1956) and determine the causes for these quality costs. This way the root cause for quality cost can be identified. By totaling all the costs caused by any root cause the financial impact of a quality issue can be calculated. Finally, potential benefit from any suggested solution is estimated by subtracting any required investments from expected savings.

Another key element in the CAMP method is the use of workshops to save time and effort in data collection, avoid going back and forth between different departments and creation of shared understanding between members of the organization. Use of workshops for problem-solving is not new; Malmi et al. (2004) mention Ishikawa (1985), Harrington (1991), Nonaka and Takeuchi (1995) and Nonaka et al. (2000). CAMP method has most influence for its use of workshops from Nonaka et al. (2000) and Ishikawa (1985). Nonaka et al. (2000) separate different organizational levels for knowledge creation, stating that middle managers are in the most crucial place for information flow. This is because they are situated at the middle of vertical and horizontal information flows. Other levels include top management that participates in leading knowledge creation and workers with tacit and explicit knowledge. One influence of the CAMP-method comes from Järvinen et al. (2000) whose knowledge creation procedure separated the process into three staged string of workshops.

CAMP utilizes cause- and effect charts, also known as the fishbone diagram, developed by Ishikawa (1985). This quality tool offers the possibility of illustrating linkages between quality problems divided into separate groups such as problems related into coordination of activities (Figure 4.1 appendix). Arrows represent the direction of the cause- and effect chain, indicating that a cause for certain problem leads to another issue in organization. Entire presentation for quality problems in organization is therefore divided in different problem groups and all groups are illustrated with a fishbone diagram grouping all problems under single class into one chart, ending with several fishbone diagrams, one for every category of quality problems. Finally, CAMP uses pareto diagram by Ishikawa (1985) to group identified quality problems into pareto chart (Figure 4.2 appendix), where it can be seen in a single graph how the quality problems in organization are divided between problem categories.

4.2 Process improvement method

In the figure 4.3, process improvement method's different stages are illustrated in chronological order. This process can be understood as a fixed concept (Emsley 2007). It can be described as having certain fixed characteristics such as workshops implemented in fixed order, tasks attributed to different workshops, quality costs understood in terms of PAF model, procedure to identify quality failures, quantify them and to generate improvement ideas. CAMP consists of three separate workshop days held with different members of the case organization. All three workshops include tasks to be accomplished within scheduled time for the

workshop. In addition to workshops, method consists of some data collection, possible complementary interviews to acquire quality cost data and some work phases for the researcher in the spaces between the workshops.

Malmi et al. (2004) have developed the construct during their study and the description here illustrates the final version of the CAMP method that was tested in case organization Valmet. Before the actual process improvement method, authors of CAMP had access to organization's internal reports associated with different cost calculations and risk assessments. This helped to get acquainted with case-organization beforehand and make some preliminary estimates on certain quality costs. Actual process improvement starts with a quality survey (appendix) sent to case-organization's members handpicked beforehand. As these members then take part in the first workshop, it helps to ensure that participating persons have the knowledge of the preliminary survey they have taken part in. Survey gathers information on the existing quality problems found in the organization by asking survey respondents to list the problems that they have encountered in their daily work. Respondents are also asked to rank problems according to their significance by using point scoring on a scale of 1 to 3. Requested information includes description of the problem and respondent's view on the causes of the problem. Although questionnaire that was sent to Valmet included questions about possible improvement ideas for the problem, this is not the original form. Valmet's management wanted to include the improvement ideas to the project in early phase to counter negative thinking on personnel's' part.

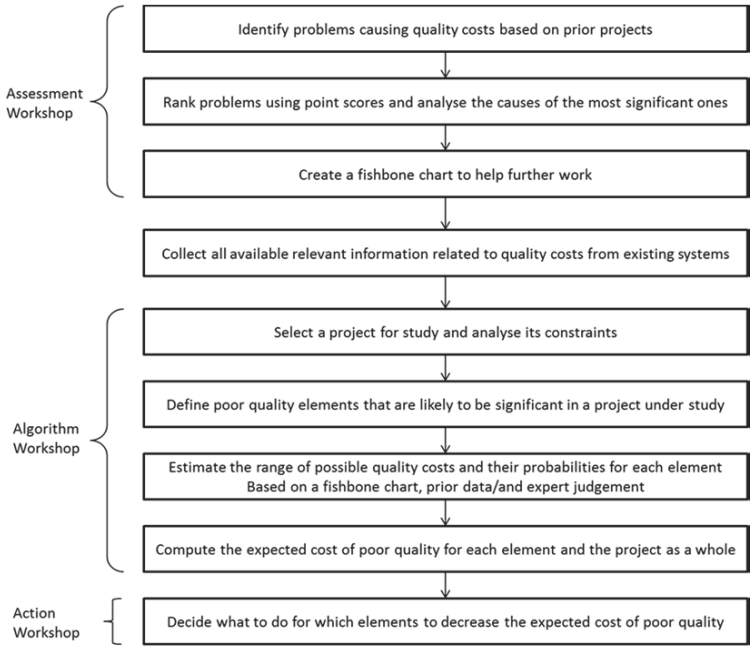

FIGURE 4.3 Process improvement steps in chronological order (Malmi et al. 2004)

After the quality problems survey, researcher constructs a pareto diagram (Ishikawa 1985) where problems found in the survey responses are grouped under classes representing the problem area; ie. class labeled information deals with problems that are connected to information flow. These classes then show the size of each problem class and give some indication on the impact that a certain problem class has on the organization. For example, if a class labeled "information" would contain half of the problems found in responses this would indicate that case-organization probably has its major issues revolving around information related problems. With this information available, CAMP proceeds to first workshop. Another tool used in this phase is the fishbone diagram, also called cause-and-effect chart (Ishikawa 1985). Fishbone diagram is constructed to show all individual problems, their causes and impacts, that is the cause-and-effect string of every quality problem found in the quality survey responses. Malmi et al. (2004) state that fishbone diagram is constructed by researchers based on the available survey data and through mutual understanding of the workshop participants during the workshop.

During the first workshop, called the assessment workshop, researchers help the participants to understand and modify fishbone diagrams, after which participants rank problems in team based work methods using point scores. Authors note that although researchers created the fishbone diagram they did not take part or any active role in the decision- or proposal making. One aim of the first workshop is to validate the fishbone diagram by possibly modifying the fishbone diagram with the personnel during the workshop. Another aim is to analyze further those problems that are found significant during the assessment workshop. It is mentioned in the figure 4.3 that in between of the first two workshops researchers should collect all the available cost information from existing systems to help as a starting point for quality cost estimation taking place in the second workshop.

Second workshop participants are middle managers that have familiarized themselves with the available CAMP data before participating in the second workshop, named algorithm workshop. During this workshop, aim is to take a selected project from the organization's business portfolio and use it to analyze project constraints in relation to problems found in the survey and illustrated in fishbone diagram. Middle managers participating in the workshop are chosen so that they have knowledge about the chosen business project and are then assigned to work in teams. One task in the algorithm workshop is to identify the most significant problems in relation to selected business project and make an estimate on the possible quality costs for these problems. Different probabilities are assigned to the worst case scenario, best scenario and normal scenario. An expected value calculation is then made to get the quality cost for the problem. Summing up all the problem costs related to selected project a COPQ estimate is then obtained. It is noteworthy that CAMP calculates quality costs per project and as authors note, it is not possible to cross project boundaries with this calculation due to difficulties in the calculation and participating personnel's unfamiliarity with the projects outside their own. Finally, teams in algo-

rithm workshop are tasked with brainstorming improvement ideas for problems related to the chosen business project as well as common projects outside the selected business project. Prioritization of these improvement ideas are left for the senior management in the last workshop.

Third workshop, called action workshop, is held with senior management of the organization. Focus is on prioritization of the improvement ideas constructed in the second workshop. Each participant is asked to rate the improvement ideas with either 1 or 0 as a score for prioritization. These points are then summed to achieve a priority list for improvement ideas. Authors note that prioritization is not based on monetary values, that is, quality costs but rather strategic viewpoints of the management. Authors note that although CAMP had a starting aim of also creating quality cost metrics to track changes in quality costs in relation to improvement ideas being chosen for implementation, Valmet management decided to use data collection procedures already in place and considered existing metrics of scrap, rework, penalties and warranty work sufficient for quality tracking.

4.3 Cost tool Implementation

Vrakking (1995) defines implementation as a case study where aim is to provide the implementation of a certain innovation within organization the best possible chances of success with minimum of effort and cost. He states that implementation literature tends to provide case descriptions where authors link their experiences and learning to higher levels of abstraction. Therefore, at its heart, implementation deals with the introduction of management innovation into organizational life while at the same time dealing with the necessary abstraction of the implementation results for research purposes.

The issue of implementing management control systems, such as cost management tools in organizational life has been addressed in various ways in the literature. It has been studied through contingency theory (Anderson and Young 1999, Anderson 1995, Krumwiede 1998) as well as change theory (Kasurinen 2002). Studies have also tried to map reasons for implementation failures (Malmi 2007) and success factors (Anderson 1995, Anderson and Young 1999). Finally, there are some definitions on what constitutes a successful implementation (Anderson and Young 1999, Malmi 1997).

Kasurinen (2002) studied an ongoing implementation process of BSC system through accounting change theory. Aim of his study was to understand the context of change. Kasurinen further developed change model presented by Innes and Mitchell (1990) and refined by Cobb et al. (1995). Kasurinen added three different sub categories to concept of “barrier for change”. These he calls confusers, frustrators and delayers. Examples of these classes are uncertainty about the project’s future role as confuser, existing reporting systems as frustrators and inadequate information systems as delayers. He also recognizes organizational structure that has become outdated as a potential barrier to change.

Other noteworthy issues are possible resistance to change and differences on views between managers and workers. Further addition to change models literature has been offered in recent article of Länsiluoto and Järvenpää (2010) where authors recognize the importance of individual actors and their changing status.

In contingency theory, implementation process has been addressed in various ways. While many researchers have considered the implementation process as a single process (see Krumwiede 1998), others have separated implementation process into different stages, the most simple cut being the separation of implementation process to adoption and infusion stages (Cooper and Zmud 1990) or pre-adoption and adoption stages (see Krumwiede 1998). Still other models exist; Kwon and Zmud (1987) separated implementation process into six staged model consisting of initiation, adoption, adaptation, acceptance, routinization and infusion. The most rigorous cut of stages is offered by Krumwiede (1998). He divides the process of implementation into three stages of non-adopters, the adoption stage and six stages of post-adoption stages of implementation. The division of implementation process into different stages in the literature is used because it is suggested that success factors differ and vary in importance during the different stages of implementation (Anderson 1995). This view of varying importance of variables at different stages is confirmed in Krumwiede's (1998) results. Thus using a separation of stages to study implementation process makes it less likely to have conflicting results. The study offered here considers the implementation process in a two-staged model, dividing the process of implementation into pre-adoption stage and adoption stage. Thus, considerations before actual implementation are considered separately and possible changes in implementation phase are considered separately. This results in findings about the start-up changes separate from changes during the ongoing implementation, as suggested by research problems presented earlier.

Krumwiede (1998) distinguishes between different possible stages of rejection for implementation of a management tool; in his six staged post-adoption implementation process the possible rejection of the tool can occur in initiation phase. In this scenario, organization considers initiation but ultimately rejects the management tool. After adaptation phase, in the analysis phase, another chance for rejection may occur; if the tool is implemented but found to be unfit after analysis it is abandoned at this stage.

Some contextual success factors for implementation has been offered in the literature (Anderson and Young 1999, Anderson 1995), as well as some possible reasons for failures (Malmi 1997). Malmi recognized different contextual reasons that resulted in resistance to change. Mentioned contextual reasons for abandoning the cost management tool are economic reasons, political reasons, concerns for accountability increase and engineering culture contradicting the use of cost management tool. Malmi also states that while it may seem as a failure if cost tool's data is not used in any way after implementation, in some cases it may be that data itself suggests no further actions. Anderson and Young (1999) focus on success factors, documenting contextual reasons for cost man-

agement tool to give accurate data as well as reasons that promote the actual use of data; they find that accuracy of the system is related to adequacy of resources devoted to implementation process and beliefs of the management that change is actually needed. Use of the tool's data is related to many different contextual variables, including top management support for the project, union support for the project, project resources, respondent's commitment to organization, decree of rewarding from good results and likelihood of layoffs.

Anderson and Young's (1999) implementation success factors and their division into data accuracy as well as its use leads to their definition of a successful implementation: firstly, the new tool must provide data that is more accurate than the data that would have been obtained with old system. Secondly, results must also be used in further improvement efforts in some way. Malmi (1997) defines a success as an ability to make correct diagnosis of the situation. While this part is similar to Anderson and Young (1999) definition of more accurate data, Malmi (1997) also states that implementation may in some cases be considered successful even though no actions would be conducted after implementation. An example given is a case where ABC system provides insight that there are no emerging, strategic uncertainties, so no actions are needed. This information, while being valuable does not require any actions to be taken. This is in contradiction to Anderson and Young (1999) definition that requires the usage of data in some improvement effort.

5 THEORETICAL FRAMEWORK

This chapter contains the theoretical foundation of the study; it incorporates the impact of trust on network relationships and extension of traditional transaction cost economics from make-or-buy decision into make-buy or ally decision. Contingency theory is introduced as a means to understand changes required for the tool in dyadic context; both before implementation and during implementation. Open-book accounting is presented as a means to examine the need and implications for open-book accounting in inter-organizational cost management setting when using the chosen tool. Finally, these concepts and theories are integrated into theoretical framework for this study.

Theoretical framework provided here is used to answer research problems presented in the introduction. The main research problem, whether the chosen tool can be used in a dyadic setting can be answered through implementation effort depicted in chapter 6 and through evaluation of the project. The evaluation is done with the help of debate on implementation success factors (Anderson and Young 1999, Malmi 1997).

Complementary research questions all address different parts of the main research problem, starting from modifications needed to the tool for it to function in the larger context of dyadic setting. These modifications are analyzed through contingency theory (Chapman 1997, Chenhall 2003), making it possible to understand the changes required both before actual implementation and during the implementation (Krumwiede 1998). These problems, P2 and P3 are further described in introduction.

Another needed information on the implementation success of the chosen tool in dyadic setting concerns the open book accounting (OBA) required for it to work (Tomkins 2001, Kulmala et al. 2007). This is the P4 presented in introduction. Therefore, the concept of OBA is needed to analyze the amount of needed information exchange between partners for the chosen tool.

As mentioned, in order to properly answer the main research problem, success of the implementation is an essential evaluation (P5). Therefore, to evaluate the success ex-post, debate on success of the implementation (Malmi 1997, Anderson and Young 1999) is used to evaluate project in terms of success.

Also, to answer the problem of generalizability (P6) study uses an extension to constructive research (Kasanen et al. 1993), market test proposed by Labro and Tuomela (2003).

Finally, to analyze possible cost savings gained from the tool and also the costs attributed to the implementation of the tool, transaction cost theory and concept of trust is used in the study. Transaction cost theory coupled with trust is widely used pair (Dekker 2003) to reflect on the partners' decision-making and their mutual division of costs and benefits. Therefore, they are used to answer research problem 7 (P7).

Inter-organizational cost management (IOCM) provides the context of the study as well as the area where the two case organizations operate in relation to their cost management efforts.

5.1 Trust in inter-organizational setting

Tomkins (2001) defines trust as "the adoption of belief by one party in a relationship that the other party will not act against his or her interests, where this belief is held without undue doubt and in the absence of information about other party's future actions". This definition of trust takes into account due suspicion in situations where other partner's own self-interest would be to act opportunistically. It also emphasizes that trust is placed before actual events that trust is placed upon, take place. Other definitions exist; Adler (2001) defines trust as "subjective probability with which an actor assesses that another actor will perform a particular action, both before he or she can monitor the actual action and in a context in which it affects his or her own action". This definition of trust is somewhat similar in assumptions to Tomkins' (2001) view in that it takes into account the timeline of trust in relation to events that are "trusted". However, this definition also emphasizes context in which things happen, thereby including the possibility of feared as well as welcomed actions. (Adler 2001) These definitions of trust differ from the strict transaction cost economical (TCE) view of Williamson (1985) who considered trust to be merely an expression of calculated risk. However, many scholars (Van der Meer-Kooistra and Vosselman 2000, Cooper and Slagmulder 2004, Dekker 2004) agree that trust cannot be viewed purely in instrumental terms and that TCE should be complemented with relational or trust aspects.

Different disciplines approach trust in different ways; economists tend to view trust as a calculated or institutional factor (Williamson 1985, 1981, Rousseau et al. 1998). Psychology defines trust in terms of trustors and trustees while focusing on internal cognitions that raise from personal attributes. (from Rousseau et al. 1998). Sociologists see trust as socially embedded in relationships between people or institutions (Zucker, 1986).

There are several classifications of trust by different authors. Adler (2001), for instance, divides trust into three sources of trust. First is the familiarity through repeated interaction that leads to trust. Second, trust may come from

calculation by assessing costs and benefits that the other party might get by exploiting vulnerability. Third, values and norms can express trustworthy behavior that leads to trust. Adler also distinguishes three mechanisms through which trust is generated; firstly, trust can be constructed through direct personal contact, secondly through a network of other already trusted parties or thirdly by understanding the way institutions shape other actors' norms and values. Adler notes that these mechanisms on trust are complements rather than substitutes as they tend to build on each other.

Kamminga and Van der Meer-Kooistra (2007) (See also Sako 1992) differentiate three instances of trust; contractual trust, competence trust and goodwill trust in transcending order. In contractual trust, partners need to be at least confident that other partner follows the contracts. Competence trust is related to trust in other party's competence in a situation where both partners contribute to the relationship while information asymmetries and uncertainty is present. Vélez et al. (2008) further divide competence based trust on competencies perceived in technological, economical and partnering capabilities. Finally, goodwill trust is trust that other partner will not act opportunistically even though it might have the possibility to do so. Sako (1992) considers this type of trust to involve establishment of mutual system of values and norms as well as a perception of friendship between partners in a context of mutual interchange. Vélez et al. (2008) see the competence or capabilities based trust to be based on relatively objective perceptions while goodwill-based trust is seen to be based more on the subjectively created perceptions on another's non-opportunistic behavior and benevolence. Of the mentioned types of trust, Sako (1992) argues that in inter-organizational relationships, goodwill trust and competence based trust are of particular importance.

Rousseau et al. (1998) offer another classification of trust; they use their cross-disciplinary view in differentiating trust into calculus-based trust, relational trust and institution-based trust. Calculus-based trust, based on economical view of trust as a calculated factor relies on credible information such as reputation and information on another's competencies or goodwill. Relational trust emerges from continued relationship between the trustee and the trustor, thereby providing information from the present relationship itself. Finally, institutional trust is based upon institutions such as laws and society's norms and values which ensure the trusting side can rely on, for example, contracts. It can be noted that state of institutional factors could also undermine trust if trusting side cannot view them as enforcing trust.

This analysis of different disciplines and their views on trust provides, in addition to typology, a definition of trust as "a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another" (Rousseau et al. 1998). One way to look at trust as willingness to rely on another based upon positive expectations could be seen in organizational relationships as goodwill-trust and competence trust (Kamminga and Van der Meer-Kooistra 2007, Sako 1992)

Vélez et al. (2008) raise the point of the relationship between trust and management control. They state that this relationship is very complex and open to debate and that management control systems and trust have usually been seen as alternatives. However, Lindenberg (2000) maintains that trust and management control are complementary in a sense that management control stimulates trust building and in turn trust supports the development of management controls. Tomkins (2001) argues that trusting in someone enables to act as if the uncertainty was reduced although it does not reduce actual uncertainty. He considers trust to be alternate uncertainty absorption mechanism to increased information. Tomkins seems to consider, like Lindenberg (2000) that trust is complementary with control mechanisms as he states that certain amount of trust is needed to even start contracting with the other party and after contracting trust complements contracts as every detail cannot be thought of beforehand due to existing uncertainty. Other authors have argued that trust can substitute for management control rather than complement it. Van der Meer-Kooistra and Vosselman (2000) give an example; in their study they compared control practices of two different organizations concerning their inter-firm relations and found that while other relied on strict management control and bureaucracy-based control pattern, other organization based its control choices mostly on trust. This means that trust-based control left many possible risks outside relationship contracts when compared to bureaucratic control mechanisms. Similarly, Kamminga and Van der Meer-Kooistra (2007) have come up with findings that trust is a possible substitute for management control. They differentiate three types of management control patterns in inter-firm relationships; content-based control pattern, consultation-based control pattern and context-based control pattern. In the content-based pattern asset specificity and information asymmetries are relatively low, thus leading to low uncertainty. In this case trust has only minor role as any problems can be avoided easily with contracts. Whereas in context-based control pattern, level of uncertainty is high because relationship and activities involve tacit knowledge leading to information asymmetries and asset specificity. In this environment partners will exercise only loose control mechanisms and rather create trust and good atmosphere as a substitute (Kamminga and Van der Meer-Kooistra 2007). Vélez et al. (2008) add to this discussion by reflecting on the findings of Tomkins (2001) that at the early stages of the inter-organizational relationship management control systems have a positive association with trust but when trust has reached a certain level, the introduction of new management control system may cause harm to the relationship. Vélez et al. (2008) argue that their evidence seems to point to the contrary; in an evolving inter-organizational relationship, even when the trust is well established, management control systems may actually work to build more trust. This is explained by the trust acting as a basis for further cooperation, which in turn demands more management control and thus greater levels of trust to maintain cooperation. Dekker (2004) offers one way to conceptualize the relationship between management control systems and trust. In somewhat similar fashion to Tomkins (2001), Dekker (2004) argues that rela-

tionship between the amount of trust and management control may be non-linear. Thus, trust will substitute formal controls whenever sufficient level of control is realized for the transaction taking place. Partners will not risk any higher control in fear of damaging the relationship. However, Dekker (2004) refers not to the stage of the relationship between partners like Tomkins (2001) but rather to the level of trust at a certain point in time and the level of needed control.

According to Dekker (2004), another point that sheds light on the relationship between management control and trust is that trust should not be viewed as direct effect on control mechanisms but rather moderating effect. This means that the use of control to manage transaction hazards depends on the level of trust. Drawing from Tomkins (2001), Dekker argues that the level of transaction hazards in relationship influences the use and level of control mechanisms while the trust only influences the association between transaction hazards and management control, thus becoming a moderating effect rather than direct influence.

Thirdly, Dekker (2004) stated that different purposes of control interact with trust in different ways. For example, while high level of goodwill-trust may diminish concerns for transaction hazards, formal control mechanisms may be needed for coordinating different tasks between partners. Dekker (2004) views this point to be under-represented in the literature.

Kautonen and Kohtamäki (2006) have analyzed endogenous and exogenous factors influencing trust between relationship partners, where endogenous factors are those that influence trust from within the relationship and exogenous factors are those that arise from the business environment. In their presentation (figure 5.1) determinants of trust are divided into exogenous, endogenous and network determinants; endogenous determinants are further divided into the length and depth of the relationship and expected future benefits. Network determinants consist of possibilities to get information regarding the partner from third parties, reputational effects from opportunism and third party guaranteeing certain transactions between the relationship partners. Institutional or exogenous determinants that influence trust between parties are rules, regulations, norms and traditions. These determinants influence network costs, strategic focus, relationship stability and the capacity to learn through trust. In the model 1) transaction costs can be lowered if trust is increased; 2) trust is seen to promote possibilities for investments through lower appropriation concerns; 3) commitment and loyalty are seen to follow from higher trust and 4) knowledge sharing and disclosing of sensitive information leads to learning if trust is increased.

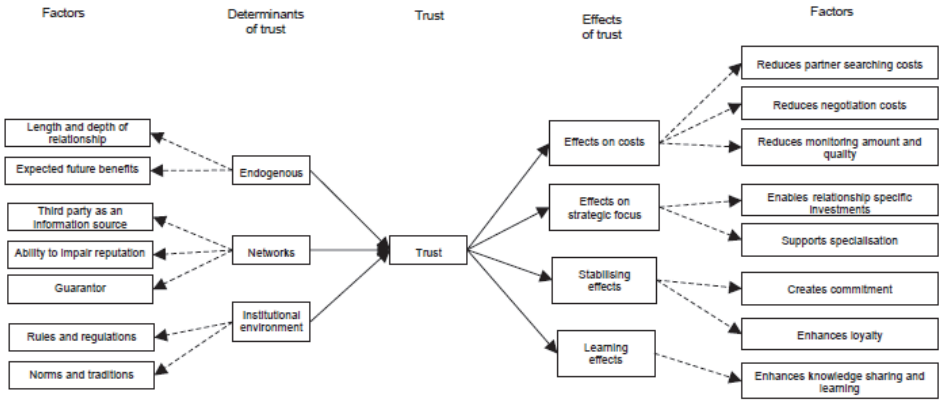

FIGURE 2. Determinants and effects of trust

FIGURE 5.1 Determinants and effects of trust (Kautonen and Kohtamäki 2006)

5.2 Transaction Cost Economics (TCE)

Transaction cost economics (TCE) is based on the work of Williamson (1981, 1985). He coined the term new institutional economics, which in his view covers the theory of TCE (Williamson 1985). TCE in its basic form considers only two organizational alternatives, either organization makes a component itself or buys it from an autonomous supplier. Thus mixed modes such as franchising, joint ventures etc are disregarded. (Williamson 1981).

Williamson (1981) thought of TCE to be applied in three levels of analysis; first, overall structure of the enterprise asks how the operating parts should be related into another. Possible examples are divisional form or holding company. Second level of analysis focuses on the operating parts and asks what activities should be performed within the firm and which of them should be outsourced. This can be thought of as defining the boundaries of the firm. Thirdly, TCE is concerned with how the human assets are organized, that is, to match governance structures with the attributes of different work groups.

TCE is a dominant theory in the analysis of the economics of inter-organizational relationships (Anderson and Dekker 2010). Its key predictions are that the outcome of organizational boundaries becomes through managerial decisions to lower costs of doing business and mitigation of exchange hazards is achieved through organizational design, governance and control choices. Exchange hazards can be described by various titles; opportunism, appropriation concerns and transaction hazards. Exchange hazards arise between profit maximizing transaction partners because of the information asymmetries. Because of this asymmetry it is too costly to write complete contracts that would cover all the possible outcomes and as a result, partners are exposed to the risk of opportunistic behavior by the other side. (Anderson and Dekker 2010).

Transaction costs are divided into ex-ante transaction costs and ex-post transaction costs. Ex-ante costs include costs like partner search, negotiation, contract development while ex-post costs are incurred from monitoring, enforcing contract compliance and dispute resolution activities. An important part of TCE includes factors explaining the birth of ex-ante and ex-post costs. These factors are asset specificity, uncertainty and frequency or duration of the transaction (Williamson 1985). These factors explain the influence of transaction costs over governance modes when two concepts of human behavior are taken into account; bounded rationality and self-interest. Bounded rationality refers to notion that decisions might not be optimal because decision makers either have limited information at disposal or the cost of data collection would be too high. Self-interested behavior on the other hand causes opportunistic behavior which is harmful to the relationship at hand. (Anderson and Dekker 2010 Williamson 1985)

Asset specificity refers to possibility of alternate uses for any given resource. This means that asset is considered specific if it has no alternate use outside the inter-organizational relationship. TCE recognizes several kinds of resources, such as physical assets, human assets, dedicated assets or goodwill assets. If the asset specificity is high, transaction parties have only few alternate uses for the considered resource and thus they become more immersed in the relationship. (Anderson and Dekker, 2010) Asset specificity is considered by Williamson (1981) to be the most important dimension concerning transactions. Joskow (1988) further elaborates on the Williamson's asset specificity classes; site specificity reflects ex-ante decisions to minimize transportation and inventory costs. Once fixed in place, these assets are highly immobile. Physical assets concern investments in equipment or machinery that involves transaction-specific design characteristics and thus have lower value in other uses. Human asset specificity concerns investments in relationship-specific human capital that often arises through learning. Finally, dedicated assets refer to general investments made by the supplier because of the anticipated selling of large amounts of services or products to purchaser. If the contract would be terminated prematurely, it would leave the supplier with excess capacity.

Another important concept influencing transaction costs is the uncertainty. Geyskens et al. (2006) divide this uncertainty into two different kinds of uncertainty: environmental uncertainty and behavioral uncertainty. Environmental uncertainty limits the possibilities of specifying the transaction beforehand and therefore causes higher transaction costs. Behavioral uncertainty refers to difficulties in monitoring behavior of the transaction partner ex-post.

Frequency or duration of the transaction reflects the volume and value of transactions over time. This factor influences exchange hazards as specific transactions that would take place frequently in market setting would require constant monitoring while transactions that take place only occasionally would not require as much monitoring and therefore would not need the establishment of a hierarchy. It follows that in the presence of asset specificity, more fre-

quent transactions makes more hierarchical governance mode desirable when compared to market setting (Williamson 1985).

Williamson's (1985, 1981) idea was that organizational boundaries would reflect cost minimizing decisions made by the management. This results in traditional TCE informed make-or-buy decision, that is, organization will either make the component it needs itself or buy it from the open market. This decision is made by calculating the costs of doing the component in organization and comparing these costs against costs from buying the component from outside. These two extremes are also called vertical integration and market transaction setting. However, TCE literature has since acknowledged the existence of hybrid governance modes, such as joint ventures, supply-chain partnership, purchaser-provider split etc (Anderson and Dekker 2010, Cooper and Slagmulder 2004, Dekker 2003, Geyskens et al. 2006). In these hybrid transaction modes organizations enter into more complex and typically incomplete contracts than those found in the market transaction mode. Because of the incomplete contracts, some risks remain for opportunistic behavior and so different control mechanism are needed. Examples are measurement done in the network interface or collaborative work in the partnership (Anderson and Dekker 2010, Cooper and Slagmulder 2004). Part of this contract complexity comes from the difficulties in calculating transaction costs with any accuracy. Walker and Weber (1984) theorize that this is likely to lead into diminishing importance of transaction costs in decision making and rise in the influence of qualitative factors.

Nooteboom (1992) defines transactions as events in a process of economic exchange in which a product is transferred across a technologically separated interface. According to Nooteboom (1992) there are costs involved at different stages of the exchange process; the stages of contacting, contracting and control. In the contacting phase costs are incurred from the search for suitable partner and from marketing in case of supplier. In the contracting phase costs rise from attempts to foresee possible problems and risks attributable to the transaction and from providing measures for control which in turn serve to protect from risk. Finally, in the control stage costs rise from execution, performance monitoring, possible renegotiations, arbitration and possible losses from discontinuation if the transaction is terminated.

Olmos (2011) has studied the role of TCE in contractual choice between relationship partners. She notes that the level of contractual formalization is important factor as it influences the investments and costs incurred by contracting parties in governing a transaction. Her findings suggest that asset specificity, argued as the most important characteristic of TCE (Olmos 2011) is, in fact, not a strong predictor of the level of formalization for transactions where relationship parties enjoy a high level of trust. Primary reason for this phenomenon is the possibility of the contractual parties to reduce transaction costs without resorting to high formalization procedures. Another finding is that because of the bounded rationality, the more complex a transaction is, the more likely it is that oral contract is negotiated.

Blomqvist et al. (2002) have focused on the partnership formation between the purchasers and providers. They consider hybrid governance modes situated between vertical integration and market orientation partnerships and interpret them as individual contracts between parties. The aim of such contracts is to create benefits for all partied included. Blomqvist et al. (2002) argue that although the topic of transaction costs is well covered in literature, previous literature fails to recognize transaction benefits. They propose a model which accounts for different transactional, managerial and partnership benefits. Concerning the traditional make-or-buy decision, they argue that choosing to make certain activities oneself, firm can build on cumulative learning and follow economies of scope. Also, it may utilize competence enhancing innovations and may exploit monopoly power. These benefits they label management or firm-internal benefits. When the firm decides to utilize market approach it can exploit incentives coming from competition, benefit from economies of scale through specialization and use flexibility coming from many possible partners operating in the market. In the market oriented approach, firm may also cope with uncertainties. This they call transaction benefits. Authors argue that when uncertainty, danger of opportunism, complexity and asset specificity is high, there are only few providers of service and there is no trust between partners, vertical integration is the best choice. Likewise, when danger of opportunism, uncertainty and complexity are low, transactions do not need any specific investments and there are many potential partners, market option is the best choice. Authors recognize hybrid governance form and regard it as a hybrid situated between market choice and vertical integration which are preferred only if there are determinants speaking for insourcing and outsourcing at the same time. This means that while there would have to be uncertainties, danger of opportunism and high asset specificity, there has to be high powered incentives present influencing towards outsourcing. They also argue that precondition for networks is the presence of economies of scale and scope at the same time. Possible failures in partnerships are explained with asymmetric information and potential opportunism. Possible solution for avoiding these problems is the build-up and presence of trust between partners (Blomqvist et al. 2002).

5.3 Inter-organizational cost management (IOCM)

Cooper and Slagmulder (2004) define inter-organizational cost management (IOCM) as formalized buyer-supplier interactions with the objective of identifying opportunities for joint cost reduction. This could take the form of representatives of both the buyer and supplier meeting to identify ways to lower overall costs between partners. As Mouritsen et al. (2001) note, joint relations means that firms place not only their own activities but also those of the partners' as objects of management and control. IOCM has been mostly associated with different management accounting techniques ranging from

target costing (Cooper and Slagmulder 2004, Carr and Ng 1995, Mouritsen et al. 2001) to value chain analysis (Dekker 2003) and total cost of ownership (Wouters et al. 2005)

Coad and Cullen (2006) note that early studies on IOCM were influenced primarily by TCE. Studies were centered on two themes; make-or-buy decision and on the relationship between suppliers and buyers that could provide possibilities for cost reductions. Using of IOCM implies, however, that relationship between partners exists between hierarchy and market orientation and several researchers have argued that these relationships require joint cooperation beyond traditional organizational boundaries, thus extending from traditional view of the TCE (Van der Meer-Kooistra and Vosselmann 2000, Cooper and Slagmulder 2004).

Cooper and Slagmulder (2004) continue that as the use of IOCM is situated between market oriented action and vertical integration; it is characterized by incomplete contracting and information asymmetries. In using the IOCM firms develop relational contexts that cannot be situated into dichotomy of markets and hierarchy as expressed by Williamson (1985). One outcome of developing such hybrid forms of governance is the complexity of the make-or-buy decision. (Gietzmann 1996). This complexity is caused by the difficulties in quantifying transaction costs, thus presumably leading to diminishing importance of transaction costs in decision making process. Complexity of the decision making process in turn places new demands for accounting systems when implementing IOCM (Cooper and Slagmulder 2004).

Cooper and Slagmulder (2004) identify target costing as the primary IOCM method in their sample firms but note that the key extension required for IOCM is to involve both the supplier and the buyer in the joint management of costs as target costing does not involve the supplier in the buyer's decision making process. Coad and Cullen (2006) also see that the central concern for IOCM is to involve all the partners in the relationship to modify cost structures and thus create value for participants.

The use of target costing has also been studied by Mouritsen et al. (2001) who also illustrate the role of target costing as originating from the buyer. This causes problems as the buyer does not know the cost structure of the supplier and imposing cost targets for the supplier may not be helpful in this case.

Cooper and Slagmulder (2004) consider several attributes also linked to TCE that influence the relational context of partner firms using the IOCM. They identify design dependence, resource sharing, supplier participation and bilateral commitment as the most important interactional characteristics influencing the relational context. Design dependence is based on the TCE; as relationships between organizations are based at least in some degree to specific investments made in the relationship and switching costs associated with them (Williamson 1985), design dependence arises from the split of responsibilities between the buyer and supplier. Resource sharing can take the form of increased asset specificity through integration of teams between the buyer and the supplier or through sharing of strategic information. Both of these resource sharing com-

mitments have an effect on the efficiency of the supplier-buyer relationship. Supplier participation refers to the point where supplier is involved in the final product development process. Earlier participation and joint co-operation is seen to lead to more efficient product development process. Finally, bilateral commitment is achieved through stability of the relationship and increased collaboration between partners. (Cooper and Slagmulder 2004)

Findings in Cooper and Slagmulder (2004) seem to indicate that as cost tool becomes more complex and demanding, more there is co-operation and hybrid linkages. That is, more complex the tool to be used in IOCM, farther the hybrid form goes from the pure market perspective. Also, authors argue that firms adopt different kinds of IOCM tools because they believe this will lead into cost savings and superior performance. This anticipation is calculated by comparing expected returns or savings from IOCM tool to costs in implementing it.

IOCM literature has raised the question whether cost management efforts over organizational boundaries require new cost management tools or if existing tools can be applied to inter-organizational setting by applying a wider context in implementation. Tomkins (2001) argues that no new tools are necessary, only the practices in the use of these tools are necessary, while Kulmala et al. (2007) provide contrary evidence. Tomkins' view is however supported by Kajuter and Kulmala (2005) who found that tools used in IOCM setting either did not change or were only applied in wider context.

IOCM has been studied also from the evolutionary perspective (Coad and Cullen 2006). They draw from three different branches of literatures labeled evolutionary theories. Different branches incorporated into study are institutionalization (Veblen 1909, Burns and Scapens 2000), concept of capabilities (Penrose 1959) and learning and change (Penrose 1959). Their aim is to study the transformation of existing structures as well as emergence and spread of new ways of doing linked to IOCM. Coad and Cullen (2006) found that these concepts of evolutionary theories were evident in the evolution of IOCM techniques within organizations.

Agndal and Nilsson (2009) differentiate methods found in the IOCM literature into three different areas; the application of target costing in IOCM context (Cooper and Slagmulder 2004, Carr and Ng 1995, Mouritsen et al. 2001), trade-off techniques and continuous improvement (Cooper and Slagmulder 2004) as well as philosophies and techniques related to supplier's costs such as OBA (Seal et al. 1999, Kulmala 2004). Target costing aims to identify the cost at which a product should be manufactured by determining the selling price beforehand. This cost is derived by determining the expected selling price from the market and then subtracting the expected profit. When target cost is broken down to component levels of producing the service or product, supplier is usually involved in the process. Agndal and Nilsson (2009) note that the level of cooperation in application of target costing in IOCM context varies and purchasers may approach suppliers in varying ways. Thus, target costing may be used to promote mutual cost reduction efforts or pressure suppliers into price

reductions. Agndal and Nilsson (2009) offer several examples of the trade-off techniques and methods for continuous improvement associates with the IOCM field. They mention quality-function-price (QFP) trade-off technique (Cooper and Slagmulder 2004), inter-organizational cost investigations in broad terms as similar to QFP-analysis and value engineering or value analysis as tools for reaching the target cost. Finally, techniques related to supplier's costs utilize supplier's costs for inter-organizational purposes. Examples mentioned are disclosed cost data and open-book accounting (OBA). Somewhat similar in design, these methods use the provision of cost information across organizational boundaries for either purchaser's or mutual benefit. Agndal and Nilsson (2009) seem to imply that open-book accounting usually carries with it more cooperative spirit. They raise as the purpose of OBA the mutual reduction of costs, particularly supplier's, by identifying critical areas of improvement (Seal et al. 1999). OBA is then seen as a way for two or more organizations to work together, rather than a costing technique. As noted by Kulmala (2004, 2005), the provision of cost data can involve risks for the supplier in terms of opportunistic behavior from the purchaser's part. Thus, the level of trust in a relationship affects the willingness to disclose sensitive cost information (Kajuter and Kulmala 2010) and the level and type of information may vary in terms of perceived risk (Kajuter and Kulmala 2010, Table 5.1).

Agndal and Nilsson (2009) differentiate six activities that can be identified under IOCM; supplier evaluation and selection, concept discussion, joint product design, joint process development, price revisions and product and process redesign. In *supplier evaluation and selection,* purchaser tries to find a supplier whose processes and suggested solutions offer the best chance of becoming integrated with respective processes and solutions of the purchaser. IOCM may potentially serve in informing the buyer about the supplier and thus reduce buyer's vulnerability. *Concept discussion* involves the purchaser and the supplier jointly establishing basis for calculating costs. At this stage general or main features of product are in focus and details concerning it require further attention. *Joint product design* is seen as an important phase for cost reduction activities since large amount of costs are determined at this stake. *Joint process development* stage addresses product design alternatives, manufacturability and related costs. At this stage possible QFP trade-offs are implemented or on-time delivery is ensured. *Price revisions* during full-scale production are also a part of the mutual exchange process; cooperation may continue for years and buyer or supplier may need to adjust prices. These revisions are meant to adjust for cost or price changes in the market. Finally, *product or process redesign* may be needed if cooperation spans several years. New manufacturing technology or initiatives for improvement might be possible reasons for such redesigns. According to Agndal and Nilsson (2009), principles of OBA for identifying possible improvement areas, continuous improvement initiatives or process improvements are introduced in this area of IOCM.

Suomala et al. (2010) note in their recent article that evidence on the cost management tools being used in the IOCM context is still lacking, despite calls

for such studies (Håkansson and Lind, 2004). Suomela et al. (2010) point that such studies would be needed for several reasons; increased outsourcing, focus on core competences and efforts for low cost sourcing are some of the examples on recent trends highlighting the importance of cost management over organizational boundaries. Thus, recent discussions about IOCM should be complemented with examples of real life techniques and actual applications of them. Also, since network context may vary over network setting to another, examples are needed to explore possible sources of variation as well as their contingent factors (Chapman, 1997).

The study at hand can be situated in the IOCM related activities group of continuous improvement and product or process redesign area of IOCM as presented by Agndal and Nilsson (2009) and addresses recent calls for actual instances of cost management tools used in IOCM context (Håkansson and Lind 2004, Suomala et al. 2010).

5.4 Open-book accounting (OBA)

Open-book accounting (OBA) is the practice of revealing cost information between organizations (Kajuter and Kulmala 2005, Kajuter and Kulmala 2010). Other terms for this activity are open-book costing or open-book transparency (Kajuter and Kulmala 2010). Open-book accounting is usually seen to serve a purpose in IOCM by highlighting different cost reduction possibilities through coordinated, collaborative actions of partner firms (Kajuter and Kulmala 2010, Lamming 1993, Mouritsen et al. 2001). Lamming (1993) continues that this openness of the cost data is prerequisite for making cost reductions through joint efforts.

Open-book accounting can be seen as a method that helps organizations in supply chain to better coordinate their co-operation. Transparency of the cost data makes it then possible to make certain interventions to achieve cost savings through different projects (Mouritsen et al. 2001). Coad and Cullen (2006) note that information sharing is central to the concept of IOCM. This means that co-operating organizations share cost and performance information to analyze and adjust different activities. Again, Kulmala et al. (2007) note that difficulties in disclosing cost data to network partners may lead to problems in implementing old IOCM tools. This argument reflects the need for new cost-accounting tools. There are contrasting views however; Tomkins' (2001) argument for the use of existing tools may highlight the importance of trust in inter-organizational setting.

Kulmala (2010) states that as open-book accounting has potential positive outcomes, it also entails a risk; organizations agreeing to open-book accounting accept a risk of the disclosed information to be used opportunistically by the supply chain partner. Thus, many firms are reluctant to agree to this transparency of the cost data. Carr and Ng (1995) found in their study that the attitudes of the suppliers towards open-book accounting can differ totally even inside the

same network. Reactions range from total openness to reluctance to disclose any cost information.

Kajuter and Kulmala (2005) note that open-book accounting is still a fairly new practice with empirical evidence found mainly in dyadic settings. In these settings, customer usually requests for the cost information of the supplier. Supplier, in turn, sees the request either as a cooperative proposal or opportunistic behavior. Kajuter and Kulmala (2010) break these alternatives into different components; cooperative intentions are manifested as an intent to search for potential cost reductions between the two firms, willingness to reorganize processes according to identified cost savings and willingness to support supplier's implementation of the required changes. Opportunistic behavior is seen as an attempt to compare supplier to its competitors, willingness to put pressure on the supplier to achieve lower costs and indifference towards mutual processes or interface between the two firms. These issues reflect the potential positive outcomes of the open-book accounting as well as its potential risks. Since these issues are based on the perception of other's goodwill, open-book accounting is related to the concept of trust.

Kajuter and Kulmala (2010) also note that supplier, too, may use the transparency of the mutual cost data for either co-operative or opportunistic reasons. Co-operative behavior is characterized by the intend to utilize customer's knowledge to improve work processes or products, willingness to provide non-manipulated cost data to the buyer and willingness to participate in the development of mutual operations. Opportunistic behavior, on the other hand, is seen as an intend to hide technical details from cost data, providing of manipulated cost data or unwillingness to participate in any activity beyond its own operations.

Kajuter and Kulmala (2010) have made a typology of different types of open-book accounting. They distinguish between multilateral and dyadic open-book accounting. Disclosed data can be either planned costs or actual costs, costs can be disclosed in detail or they can be aggregates or only specific details. Information flow can be either one-way or two-way depending whether both firms share information or only one. Finally, open-book accounting may be imposed by the stronger organizations or it may be based on trust and mutual willingness. These classifications are summarized in table 5.1.

Characteristic	Type of open-book accounting
Inter-firm relationship	Dyadic or multilaterial
Type of cost data	Actual or planned
Extent of disclosure	Full disclosure or limited disclosure
Information flow	One-way or two-way
Basis	Trust based or power based

TABLE 5.1 Types of open-book accounting from Kajuter and Kulmala (2010)

Failure risks attributed to the practice of OBA are varied; from their case evidence Kajuter and Kulmala (2010) offer several situations where cost information either will not be shared or the practice does not get hold. Suppliers might not experience any benefit in disclosing cost information and main contractors, that is, the purchasers might not offer any win-win solutions. Some suppliers will think that accounting information should be kept in-house. Network members might fail to produce accurate information and thus produced OBA-data will be useless or misleading. Suppliers might be concerned about possible risk of opportunism on the purchaser's side. Suppliers might not have the capacity and lack the support of contractor to produce needed cost data. Finally, network members might not come to an agreement on the principles of open-book practice to be applied. Suomala et al. (2010) note, however that it is problematic to label failures in OBA simply in terms of "OBA not taking place". On some occasions the decision to not to apply OBA would be a good strategy. When firms do decide to apply OBA, Suomala et al. (2010) present several possible aims for this activity; short-term cost reductions, price revisions of the supplier's services or products, fine-tunings of the relationship, for example delivery rate issues, agreements on pursued cost objectives or demonstrations of mutual commitments. Suomala et al. (2010) also note that although OBA is generally portrayed as a means to improve the supply chain and consider the applicability of improvements (Kajuter and Kulmala 2005, Kajuter and Kulmala 2010), OBA may also have certain non-collaborative applications. These include the mentioned price negotiations where OBA may be used for raising competition between suppliers or keeping suppliers alert. Thus, practice of OBA is not necessarily tied into partnering but may also be used in opposite ways, for example to complement control strategies. Finally, authors argue that although OBA may be used to complement control strategies, OBA cannot be seen as a management control mechanism but rather a vehicle for affecting a system of controls by improving programmability of actions and influencing assessments of performance.

Kajuter and Kulmala (2010) state that there is no coherent theory of OBA to be used but several theoretical perspectives can be used to analyze it. Authors argue that contingency theory may explain the situations where OBA can be applied successfully and agency theory might provide a possible way to analyze information asymmetries and conflicts of interest between suppliers and purchasers. Authors provide as an example the concept of trust that can be viewed as mitigating the agency problem. Other possible theories contributing towards understanding the concept of OBA in authors' view are transaction cost economics, game theory and evolutionary theory. Kajuter and Kulmala (2010) offer a contingency based framework for analyzing OBA in networks; factors influencing the use of OBA are divided into exogenous environmental factors such as decree of competition and economic trend, network specific factors and endogenous factors. Competition is seen as a factor influencing the cost reduction pressures and favorable economic trend promises new business op-

portunities influencing the need for OBA. Network-specific factors include the type of network, type of product, infrastructure of the organizations and social nature of relationships. Authors note that OBA takes place mostly in hierarchical networks supplying functional products or services. Networks are long-term oriented and adequate infrastructure of costing tools and support for cost accounting exists. Endogenous factors include firm size, capability of cost accounting systems, competitive policy and the level of commitment. These endogenous, firm specific factors are considered by the authors to be very relevant for the practice and shape of the OBA (Kajuter and Kulmala 2010).

Kulmala et al. (2002) argue that if organizations are looking for mutual relationships striving for win-win situations, OBA is one prerequisite for such a situation. This arises from the necessity for the customer and the supplier to calculate profit. Authors extend the argument by stating that traditional cost management practices have limited their scope to boundaries of the single firm and thus new cost management techniques are needed in inter-organizational context. They also note that there is very little information on any kind of cost management tools in inter-organizational context.

According to Kulmala (2004), case evidence suggests that IOCM seems to be purchaser's responsibility, which in turn justifies the selection of purchaser's view as starting point. Purchaser does the most cost accumulation efforts in the supply chain. Similar observation has been made by several researchers (Mouritsen et al. 2001, Cooper and Slagmulder 2004, Coad and Cullen 2006), although in a more critical way; the perspective of one relationship does not provide a comprehensive picture on the exchange of cost information taking place. Kulmala's (2004) findings also indicate that cost management projects differ in suppliers' objectives; therefore actions taken and final results are different from one project to another. Purchaser's objectives, on the other hand, were same in all the studied cases. Cost information transfer seems to depend on the power balance between participating firms, amount of trust present in the relationship and the volume of mutual business. Thus, high level of trust, significant business volume and position that is not dominant seems to increase supplier openness towards practice of OBA. These same factors are, according to Kulmala (2004) the ones that promote successful application of OBA in a relationship.

5.5 Contingency theory

The contingency approach to management accounting is based on the idea that there is no universal system that is applicable to all organizations operating in different contexts. Rather, contingency theory suggests that particular features of an accounting system depend on the circumstances of the organizations, namely external circumstances and internal factors. The contingency approach assumes that management accounting systems are adopted so that managers may achieve organizational outcomes or goals. If any given MA system or tool is found to be appropriate, then it likely provides better information to its users

who can then make better decisions to achieve organizational goals. (Haldma and Lääts, 2002)

Founding studies of contingency theory are usually considered to be Burns and Stalker (1961) study, Woodward (1965) and Lawrence and Lorsch (1967). Therefore, it can be said that contingency theory originated from England and United States roughly in the same period of 1960s. Burns and Stalker (1961) presented the environmental contingency factor and argued that in stable environments mechanistic style of management would be the best choice. Problems and management tasks are broken down into specialized actions and each individual is assigned to complete his own tasks. Formal communication, procedures and rules are in place to ensure as little deviation from set patterns as possible. Absence of immediate threats and change is argued to be the enabler for mechanistic control. Organic style, on the other hand, is used in unstable conditions where change is frequent and unfamiliar situations and problems arise. Continuous adjustment and redefinition of tasks is needed and therefore employees are given situational authority to complete tasks. Team decision-making, participation and problem solving are central to organic management (Burns and Stalker 1961). Lawrence and Lorsch (1967) studied structure and functioning of organizations in the United States roughly at the same time as Burns and Stalker made their seminal study in England. One of the major arguments of Lawrence and Lorsch (1967) was that people create organizations in order to better solve environment-related problems they are facing. To achieve this, organizations are differentiated in the formal structures even in the several subsystems within the organization. Woodward (1965) focused on her studies on the importance of technology as contingent factor influencing organizational characteristics. Woodward argued that the structure of organizations as well as the style of management are contingent upon the technology used by the organization. This included aspects such as hierarchy of authority and span of control. Further, objectives of the organization determine the technology to use.

External circumstances and internal factors are further classified into different key variables that describe the influence of the contextual factors on organizational structure and management accounting systems. These key variables are the impact of environment (Burns and Stalker 1961), technology (Woodward 1965), structure (Lawrence and Lorsch 1967) and size. Since their introduction in the 1960s, these key variables are confirmed as descriptors of fundamental, generic elements of context (Chenhall, 2003). Recent additions to these generic elements of context are the national culture as contextual element (see Harrison and McKinnon 1999 for review) and organizational strategy (see Langfield-Smith 1997 for review) as another element of context. Early writers and founders of contingency theory (Burns and Stalker 1961, Lawrence and Lorsch 1967, Woodward 1965) all argue that while organizational structure is contingent upon the uncertainty of the task organization is facing, task uncertainty relates to technology. Task uncertainty is seen to originate from either environmentally induced innovation (Burns and Stalker 1961, Lawrence and Lorsch 1967) or internal production set-up (Woodward 1965). Hence, this addi-

tional contextual factor of task uncertainty is seen to be tied to contextual element of technology. (Donaldson, 2001)

Haldma and Lääts (2002) offer a depiction of the theoretical framework of the contingency theory (Figure 5.2):

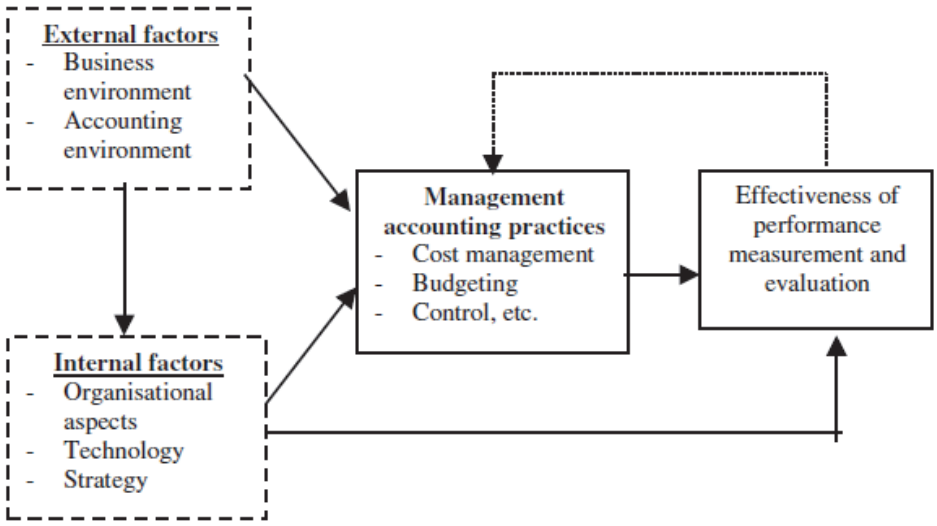

FIGURE 5.2 Theoretical framework of contingency theory (Haldma and Lääts 2002)

Figure 5.2 highlights the impact of internal and external factors to management accounting practices, such as budgeting, control or cost management. External factors illustrate features of the external environment at the level of business and accounting. These have an influence on the organization specific factors as well as to management accounting practices; eg. competition may influence organizational strategy and at the same time have an impact on the application of the chosen cost management method. Internal factors are divided into broad categories of organizational aspects, technology and strategy. (Haldma and Lääts 2002) Among cost management methods, contingency theory has been applied to target costing and activity based costing, for example (Luft and Shields 2003). While effectiveness of performance measurement and evaluation is influenced by management accounting practices themselves, also internal contingent factors influence the performance measurement and evaluation process.

Chenhall (2003) makes a distinction between specific and generic definitions of contextual variables; for example, when considering environment as contextual factor, specific definitions refer to particular attributes in the environment such as level of competition or material availability. Generic definitions, on the other hand, attempt to capture the effects of specific definitions in a generalized way. Thus, specific definitions are grouped under more general contextual factor. In this way it becomes possible to construct taxonomies of context relating to use of different management control systems in more tracta-

ble way. However, to make recommendations in a single case, it becomes necessary to identify specific attributes of a more generic contextual factor. (Chenhall 2003).

Chenhall (2003) provides a more detailed review of the most important contextual variables on general level; he starts with external environment and notes that this contextual variable is at the foundation of contingency studies. Its most important aspect is the uncertainty of the environment. (Chapman 1997). Another important characteristic linked to environment is the risk it contains. Risk involves attaching certain probabilities to particular events, whereas uncertainty is defined as situations where probabilities cannot be calculated and even different elements of the environment may not be predictable. Khandwalla (1977) provides a list of other environmental variables. These are turbulence, hostility, diversity and complexity. As Chenhall (2003) notes, still others have been suggested, if not established. These include dynamism (Duncan 1972) and controllability (Ewusi-Mensah 1981), for example. Propositions concerning the environment are 1) the more uncertain the environment, the more open the management control system is 2) more hostile the environment, the greater the reliance on formal controls 3) if management control is focused on tight controls and external environment is uncertain, flexible interpersonal interactions are used to complement controls.

Technology as a contextual variable refers to processes of the organization and the way they are run. It included the hardware, such as machines and tools, as well as materials, people, software and knowledge. Three important types of technology are recognized in the literature (Chenhall 2003): complexity, task uncertainty and interdependence. Complexity is linked to standardization of work, where highly automated processes and small-batch technologies present increasing levels of complexity (Woodward 1965, Chenhall 2003). Task uncertainty refers to variability in tasks required by the processes and the possibilities to analyze the methods for performing the tasks. It also contains unanalyzable tasks causing control difficulties. Finally, interdependence is understood as the relationship between adjacent processes. Possibilities range from pooled processes having no direct relationship with each other to reciprocal hacing two-way interdependencies. High interdependence increases the level of coordination difficulties. A proposition concerning technology as a contextual variable states that increased automation in processes increases the amount of formal control. (Chenhall 2003)

Organizational structure concerns the formal specifications of different roles in the organization for its members, teams and groups. It also entails the tasks for different members to ensure that needed activities are done. Structure influences efficiency of work through motivational influence, information flows as well as control systems. It also plays a part in shaping the direction organization is going (Chenhall 2003). Lawrence and Lorsch (1967) defined the structure as the way in which the organizational sub-units work in accordance to intrapreneurship and the way different sub-units act in accordance to organizational goals. These they called differentiation and integration. Burns and Stalker (1961)

divided structure into mechanistic and organic approaches. The choice of structure has been seen in contingency theory as finding the proper fit between structure and environment; for example Burns and Stalker (1961) argument that turbulent and uncertain environment would need organic management. Propositions offered in Chenhall (2003) for the structure as contingency factor are 1) sophisticated technology and decentralized structures are associated with formal control mechanisms 2) high task uncertainty and environmental uncertainty is associated with more informal control 3) organic organizational structures are associated with future oriented management control systems and implementation of activity analysis and cost analysis. 4) team based structures are associated with participation and comprehensive performance measures

Size of the organization can enhance the efficiency of its activities by providing opportunities for specialization or division of labour. Large organizations may have more power to control their environment and their task uncertainty may be decreased. Also, large organizations may develop close associations with their suppliers or customers, thus making the entity even larger as boundaries between organizations are blurred. Proposition offered are 1) large organizations are associated with more formalization of procedures and specialized functions 2) large organizations tend to be divisionalized 3) larger sized organizations tend to emphasize budgets and participation in budgeting (Chenhall 2003)

Finally, strategy (Langfield-Smith 1997) and culture (Harrison and McKinnon 1999) are among the more recent contextual variables added to literature. Strategy differs from other contextual variables in that it is not an element of context but means to influence other contextual variables such as technology or environment. Strategy as a means to influence other contextual variables hold several propositions 1) conservatism, defender orientation and cost leadership are associated with formal controls 2) entrepreneurial strategies involve both formal and informal controls. Culture as a contextual variable focuses on the effect of national culture on the organization. This involves proposition that actors in different cultures respond in distinctive ways to management control systems (Chenhall 2003). Chenhall notes that as national culture is still in somewhat exploratory stage, propositions concerning it cannot be presented other than that it is associated with the design of different management control systems.

Management accounting research has applied different theories of contingency research to address different levels of analysis; psychological stream of contingency research has focused its explanations primarily at the individual level and small subunit level. This stream of research provides a basis for understanding individual level events caused by higher level attributes such as characteristics of organizations. Different stream of contingency research called a contingency theory of organizations addresses organization scale events and explain these by organization specific contingencies as well as environmental factors. Thus, in this stream of research there is no analysis at actor level, rather models aim at providing a basis to link attributes at organizational level. Also,

contingency studies have usually directed their attention towards either contingencies influencing the implementation of management accounting practices, such as cost management methods, or alternatively to contingencies influencing the performance measurement. Difference between these two perspectives are in the treatment of management accounting as a central concept; to focus on performance measurement and contingencies influencing it, research is aiming to provide reasons for management accounting systems' effects. On the other hand, if research is focused to find contingencies influencing the implementation of management control system, it is aiming to provide causes for management accounting. In other words, contingency research usually either treats MA as either dependent variable or independent variable. It is possible, and indeed suggested that studies should be aimed at explaining both the causes of management accounting as well as their effects. (Luft and Shields 2003).

Most of the contingency studies have been conducted as a quantitative studies aiming for generalizations through statistical reasoning. These studies have utilized large scale, cross sectional questionnaires into several organizations, thereby examining the interaction of certain predetermined contingent variables. The results of qualitative studies in contingency theory can be seen as providing a needed starting point for quantitative study. (Chapman 1997). Qualitative study, then, could be used to identify emerging aspects of management control systems, such as different cost management tools and investigate settings where they could be beneficial. Chenhall (2003) notes that studying the role of novel control practices is necessary to ensure that such research is relevant. He continues that the generation of propositions concerning novel relationships, processes between them and their contextual setting are best identified and expressed using qualitative case studies. Finally, there are very little studies on contingency theory being applied to implementation of management control systems, particularly in the public sector. (Chenhall 2003). Also Kajuter and Kulmala (2010) note that contingency theory may offer a good framework for identifying instances were OBA may be used successfully.

Also, Tillema (2005) notes that previous contingency studies have been a subject of much criticism, largely because of the research method used in most of the studies; namely survey method (cf. Chenhall 2003). Tillema (2005) sees the dominance of the survey based contingency studies as resulting in incomplete view on the management accounting systems sophistication. Thus, Tillema argues for more contingency theory based, qualitative case research on management accounting systems.

Chenhall (2003) notes a functionalist contingency based approach to research and defines it as an approach that assumes that management control systems, such as cost management tools, are adopted to assist managers to achieve organizational outcomes and appropriate design of the system is influenced by the context in which the organization operates. This approach considers the utility of management control system in achieving a purposeful outcome.

Anderson and Young (1999) have identified in their study contingent factors influencing the implementation of activity-based costing systems in two

organizations. Their data is collected through questionnaires and interviews and analyzed through structural equation modeling, forming thus a quantitative study aiming to make certain predictions. On Luft and Shields (2003) classification they have conducted a study aiming to provide answers as to the cause for management accounting taking certain form, in this case ABC system implementation. Further, they have aimed at providing clues on both individual level and organizational level as to the factors influencing ABC system implementation. Their findings suggest that while organizational level contingency factors influence both the outcome of the implementation project and the process itself, also individual contingent factors influence the ABC system evaluation and success. Through interviews they have achieved a definition for a successful cost management method implementation; first, the new tool must provide data that is more accurate than the data that would have been obtained without it. Second, results must be used in improvement efforts. Finally, they provide a list of statistically tested contingent factors influencing the implementation project of ABC tool. These contingent factors include individual characteristics such as disposition to change or process knowledge. Other contingency factors are grouped under organizational factors, technological factors, task characteristics and environmental factors, thus providing both external and internal contingency factors influencing implementation project. As significant, they raise adequate resources for implementation, belief that change is needed, top management support, participants commitment to organization, likelihood of layoffs, rewarding of good performance and quality of project inputs. Significant contextual factors were found in all contextual groups of individual characteristics, organizational factors, technological factors, task characteristics and environmental factors (Anderson and Young 1999).

5.6 Finnish research on accounting in networks

Several Finnish researchers have focused on the study of networks, many of them on the networks' implications on accounting. Researchers have studied trust in networks (Kautonen and Kohtamäki 2006), governance structures of networks (Kohtamäki et al. 2006, Kohtamäki 2006), performance measurement in networks (Varamäki et al. 2006), network management (Järvensivu and Möller 2009), network modeling (Varamäki and Vesalainen 2003), information needs of the partners in networks (Tenhunen 2006) as well as open-book accounting (Kulmala 2003, Kulmala et al. 2007).

Kautonen and Kohtamäki (2006) have divided trust into exogenous and endogenous determinants where endogenous determinants are considered to be those factors that influence trust from within the inter-organizational relationship whereas the exogenous factors are those forces that are related to business environment and influence trust from outside the relationship. Kautonen and Kohtamäki (2006) offer an institutional economics view on the concept of trust where institutional environment affects the relationship through formal

and informal institutions. These institutions are, for example, political, economical and juridical rules.

Kohtamäki et al. (2006) and Kohtamäki (2010) have studied governance modes of partnerships and Kohtamäki (2010) has also incorporated the learning aspects in partnerships in his research. Kohtamäki (2010) approached partnership learning by analyzing the effects of governance structures on learning. His research data consisted of 43 interviews on the subject of 199 customer-supplier relationships. As a method of study Kohtamäki (2010) used statistical analysis. Findings indicate that relationships should be actively governed by managers to promote learning. Although trust has been emphasized as a prerequisite for learning (Håkansson et al. 1999), Kohtamäki (2010) argues for the need for complementary hierarchical mechanism. Although three distinct mechanisms are used to govern relationships; price, hierarchical and social mechanisms, he raises the social and hierarchical governance as the most important. According to study, the ability to apply multiple governance mechanisms at the same time promotes the best environment for relationship learning. Kohtamäki et al. (2006) used comparative case study to study the effects of different governance modes to partner's perceptions of the relationship. Their evidence points out that customers use different mechanisms of governance simultaneously in most of their partnerships with suppliers. Some customers required contracts and quality systems from their suppliers, some even went as far as to use threats to force suppliers into developing their processes and management. One of the studied firms used double-sourcing policy to develop competition between suppliers. It was found that trust was rarely developed systematically but rather left to be built on the side. Evidence also points out that strong use of control usually resulted in suppliers deeming it unreasonable. Kohtamäki et al. (2006) argue that there is a fine line between too strong control and reasonable control and if the customer crosses this line, it results in feelings of mistrust from the supplier. Authors emphasize trust as being very important for the development of the relationship. Kohtamäki et al. (2006) state that their research suggests that to avoid using too strong control leading to mistrust, customers should aim to develop a shared mindset of the appropriate governance structure.

Varamäki and Vesalainen (2003) have focused on multilateral co-operation between small- to medium enterprises (SME). They note that although some research has been done on the dyadic partnerships and bilateral relationships, multilateral networks have been neglected, although many new business ventures involve multiple organizations. Their approach is theoretical as they use literature review to model possible advantages and prerequisites for successful co-operation between business partners. Their main point is that in building a co-operation between firms, one must realize the type of co-operation sought as the prerequisites of different models are emphasized differently in the literature. Literature review also suggests that co-operation leads to more co-operation, that is, when organization joins a network, new possibilities for partnerships open. Authors argue that challenge then is to get SMEs activated in partnering with other firms.

Järvensivu and Möller (2009) present in their recent article a contingency based framework of inter-organizational network management. Their framework encompasses four perspectives on the network management; institutional perspective, functional view, management task view and the role perspective. Their aim is to provide a metatheory for networks, thus helping in positioning network research. They use framework created by Tsoukas (1994) for general management issues in explaining different levels of management in network context. Framework created by Tsoukas (1994) has 4 distinct levels of management where each level makes the one above it possible. The fourth level, causal powers, makes management functions possible by placing management in its socioeconomical context and thus explaining how management is given its causal powers. Three different powers are identified: control, possibility to direct subordinates for co-operation and drive towards efficiency and effectiveness (Tsoukas 1994). Third level examines different management functions that are necessary for defining management tasks. Finally, management tasks define the management role, which is the most context dependent layer. Järvensivu and Möller (2009) use this framework in defining the inter-organizational management and its different contingency levels. They take a view on networks which characterizes networks as long-term relationships where mutual trust, collaboration and expectations play an important role. Järvensivu and Möller (2009) argue that management control and cooperation as suggested by Tsoukas (1994) play an important role also on network management. Järvensivu and Möller (2009) argue that on the third level of management, value creation rests on the same managerial requirements in both intra- and inter-organizational arrangements. On the level two, they note that detailed functions are basic building blocks of management for networks; however there are some contingencies that are identified as influencing required management tasks. Different types of networks require different tasks. This is influenced by contingencies such as structural patterns of the network, environment and type of value creation sought. The most important contingencies according to Järvensivu and Möller (2009) are distribution of power in network, clarity of the cognitive frame of the actors, level of strategic intent in the network and the value creation logic taken. While characteristics of the network determine needed management tasks, characteristics of actors define the role each actor plays in managing the network on level one. Authors argue that these roles are, in turn, related to each actor's resources and capabilities (Järvensivu and Möller 2009).

Tenhunen (2006) has studied management accounting in networks, particularly on the needs of different partners regarding the information needs. Study was conducted using theme interviews centered on the topic. Tenhunen (2006) raises as the most important factor the disclosing of sensitive cost information on the networks. Evidence gathered by Tenhunen is varied; on two cases, information, particularly cost information, was distributed across the network while in other two cases focal firms did not deem the cost information relevant for the competitive advantage. In developing network wide cost accounting tools, the impact of the focal firm becomes particularly important. It

must justify the initiatives to supplier firms in terms of advantages gained (Tenhunen 2006).

Also Kulmala (2003) has studied information needs and cost management in Finnish manufacturing networks in his thesis; he presents his findings on a study where the main objectives for case organizations were to increase competitiveness and reduce costs. To meet these objectives, it was found that cost information from the network was needed to reduce costs, increase cost awareness and to develop products for the network. Kulmala (2003) presents cases where open-book accounting was used very extensively; disclosed information covered all customer-specific costs in addition to variable- and direct costs. Also quality of the cost information was deemed high. His findings indicate that cost accounting should be aligned with the need of the networks by presenting accurate and useful information and this information should be distributed in the network both multilaterally and vertically. In practice, Kulmala's later research (2007) has indicated certain instances where the disclosing of the information was not achieved due to problems inherent in the network context or the tools implemented in the network. He argues that problems in the network context may lead to failures in implementing cost tools into inter-organizational interface. (Kulmala et al. 2007).

Finally, another example of a management accounting study on networks is the research conducted by Varamäki et al. (2006). They have focused on creating a network-level performance measurement system, especially for SME networks. Authors also operationalize the constructed measurement system, discussing the challenges linked to building performance measurement systems in the SME networks. They also use the results to analyze the case network. Authors state that network-level performance measurement system emphasizes win-win thinking between the focal firm and its partners. In their framework, Varamäki et al. (2006) incorporate financial perspective, customer perspective, processes of the network, network action, network culture as well as resources and competences to form the basis for analyzing performance measurement in networks. Following Varamäki and Vesalainen (2003), authors state that multilateral networking offers several benefits, including learning possibilities, cost saving opportunities, credibility in the markets and innovativeness. Varamäki et al. (2006) present a performance measurement system that comprises measures focused on different areas of networking such as; network culture, network resources and competencies, different models of action, network processes, customer perspective of the network and different financial key ratios indicating network value. One of the key findings from this study attaches the meaning of common measurement system to shared goals and strategies at the network level; using the same measurement system seems to promote perception of mutual goals and unity.

5.7 Synthesis of perspectives

To answer the research questions presented in the introduction, this study incorporates concepts of IOCM and open-book accounting. It also uses theories of trust, TCE and contingency theory to form its theoretical basis. Research questions are covered in this chapter along with discussion found on the literature concerning them. Also, theoretical connections they require for analysis is presented.

P1: Can the tool aimed at cost reductions in single organization setting be used in dyadic settings?

This question is tied into discussion on the possibilities of performing existing IOCM techniques in the inter-organizational interface. There are conflicting views in the literature as to the possibilities of implementing the tools in inter-organizational setting; Tomkins (2001) argues that no new tools are necessary, only practices must be adapted to the context in which they are used. Kulmala et al. (2007) provide evidence to the contrary, stating that problems in achieving transparency in cost data may lead to implementation failures. Kajuter and Kulmala (2005) offer evidence partly supporting Tomkins' (2001) view by showing that target costing system was merely extended beyond single organizations' boundaries whereas other cost accounting systems were not changed at all in implementing them to inter-organizational setting. To answer the main research problem, complementary questions provided below must be answered. Also, by making an effort to implement the tool in the chosen context and evaluating it through literature on implementation success factors (Anderson and Young 1999, Malmi 1997), answer may be found.

P2: if so, what, if any, modifications are needed to ensure that the cost reduction tool functions in this dyadic setting?

Tomkins' (2001) view is that existing cost management tools can be used in inter-organizational setting, thus becoming IOCM tools if they are modified to accommodate larger context. Although all accounting analyses performed in inter-organizational setting must take into account at least two organizations, rather than one, Tomkins (2001) argues that multi-organization collaboration has fairly obvious consequences and thus there is no need new techniques. However, these tools must be modified to cover activities of two organizations, thus the tool must be fitted into larger context.

Several authors have expressed concern for so called arms' length IOCM tools where only the buyer's perspective is taken into account (Mouritsen et al. 2001, Cooper and Slagmulder 2004, Coad and Cullen 2006, Agndal and Nilsson 2009). These authors highlight the importance of taking all the participants in the network or dyadic setting to jointly perform IOCM techniques to achieve

lower costs. This implies that any tool to be used in network interface for cost management must place both the suppliers and the buyers in mutual, coordinated effort for cost management.

Through contingency theory, possible modifications that are needed before actual implementation process may be understood. This means that all the needed changes to accommodate larger context must be put in place before proceeding with the implementation, thus being in line with Tomkins (2001) that if these tools can be adapted to wider setting, at least this wider setting must be taken into account.

P3: how does the cost reduction tool change during implementation process in this dyadic setting and what factors cause this?

This question addresses the issue of whether the cost tool that is implemented in inter-organizational setting differs from the fixed method offered in the literature (Malmi et al. 2004) due to implementation differences caused by the inter-organizational setting. This question is partly linked to concerns raised in the Malmi and Granlund (2009) article about explicating existing management tools in different context. Thus, this research answers in its own right to demands for applied science by testing the tool's boundaries. Dekker (2003) expresses the view that by illustrating possible differences in implementation one can add to the literature by showing a current conceptualization of the tool in the literature. Modifications happening due to contextual reasons during the implementation process must be mapped to complete the evaluation of the tool in a new context. Contingency theory may be used to understand contextual elements that cause these differences when compared to tool's representation in the literature on single organization cost management efforts.

P4: What kind of open-book accounting does the cost reduction tool require in the network context?

This debate is centered on the open-book accounting (OBA) and its importance in implementing IOCM techniques between dyadic relationship partners. Kulmala et al. (2007) argue that failures to disclose sensitive cost information to network partners may result in the implementation failures of the IOCM tool. Coad and Cullen (2006) also highlight the importance of information sharing, stating that it is central to the working of IOCM. Partners must share cost and performance information to analyze and adjust their activities accordingly. Whether the chosen tool needs OBA for dyadic implementation and in what form it requires the case organizations to share information, must be analyzed in order to answer P4. Therefore, the concept of OBA is needed for this analysis.

In answering the main research problem and determining if the chosen tool can be used in larger context, one must analyze the implementation in terms of success or failure. This can be thought of as a decisive factor in that determination. Previous literature has offered some guidelines to evaluate suc-

cess of any given implementation effort (Malmi 1997, Anderson and Young 1999); it must provide new data that is more accurate than the previous data. Also, Anderson and Young argue that the obtained data must be acted upon. Using these guidelines as starting point, analysis of the success of the implementation may be conducted. The problem P5 is then of the form:

P5: How can the success of a particular implementation project be determined?

To answer demands on generalization of the results (Lukka and Kasanen 1995, Labro and Tuomela 2003), an element of constructive research, a market test is conducted on the tool in its final form after implementation. This evaluation is also tied to discussion on practical conceptualization of a chosen tool in literature (Malmi and Granlund 2009, Dekker 2003).

P6: How can the implementation stages and market test on the tool be analyzed?

Also, to achieve some indication on the treatment of cost savings and costs incurred to achieve these savings in the partnership setting, this study uses transaction cost theory to seek answers into how the costs and savings are divided between partners. This is expected to shed light on partnership decision-making, trust and transaction costs with the help of transaction cost economics and trust:

P7: How are the costs and cost savings caused by the implemented cost management tool divided between case organizations?

Dekker (2003) states that whenever organizations jointly perform a cost management in the value chain by implementing a certain tool they might encounter three issues: firstly, in performing of the cost reduction at inter-organizational interface, organizations need to share sensitive cost and performance information with each other. This may lead to concerns about possible opportunistic behavior as expressed by the TCE. If organizations are ready to share this information, second concern may rise: a fair division of costs and benefits. Tomkins (2001) states that on the division of benefits, one must first calculate whether investment actually provides return in excess of the costs it creates. Another point is that organizations must feel they are receiving a fair share of the benefits before they are willing to participate in the project. Thirdly, in regards to asset specificity, any resources or assets invested in mutual project, organization investing the asset must be confident that this asset will not be appropriated by the other party. Dekker (2003) also draws a link to trust issues by stating that organizations need to be in this situation fairly sure that opportunistic behavior does not occur. Either organizations need to trust each other sufficiently or they need to implement sufficient formal controls. Thus, Dekker also implies that trust is a possible substitute for strict contract controls.

Self-interested and opportunism related view (Williamson 1985) of the TCE has been complemented in the literature with different relational or trust based perspectives (Cooper and Slagmulder 2004, Dekker 2004, Tomkins 2001). Coad and Cullen (2006) note that while TCE has provided insights into organizational activity, it has its limitations concerning inter-organizational activity. Since organizational relationships are very complex by nature, TCE alone cannot capture all relevant information needs, trust or control systems (Tomkins 2001, Dekker 2003). Due to this complexity on the decision making, accounting and information systems have been subjected to new demands and emergence of IOCM is an example of the effort to handle these demands (Cooper and Slagmulder 2004). Although inter-organizational context has attracted some attention recently, little attention has been given to cooperation between independent organizations on the subject of cost management (Van der Meer-Kooistra and Vosselman 2000). Thus, cost management in the inter-organizational context (IOCM) is linked to decision making complexities and TCE. TCE on the other hand, has been complemented with trust and relational perspectives to account for the shortcomings in dealing with inter-organizational settings (Dekker 2003, Tomkins 2001).

It can be noted that IOCM has been studied extensively through target costing technique (Mouritsen et al. 2001, Carr and Ng, 1995, Cooper and Slagmulder, 2004), although this method has been argued to be only "arms's length method" as it does not involve the supplier in the decision making process. That is, for the joint reduction of costs, IOCM tools are needed that use perspectives of both the supplier and the buyer. (Cooper and Slagmulder 2004). IOCM has also been studied through TCE on several occasions (Cooper and Slagmulder 2004, Dekker 2003) as appropriation concerns have raised opportunism related issues in inter-organizational context. Dekker (2003) divides these into issues related to the exchange of sensitive information, issue of dividing costs and benefits and the appropriation of specific assets in line with asset specificity.

Trust between independent organizations striving for relationship has been studied in conjunction with open-book accounting (Carr and Ng 1995, Dekker 2003, Seal et al. 1999). It has also been argued that trust is a prerequisite for open-book accounting to take place (Carr and Ng 1995). Kajuter and Kulmala (2010) also note that opening of the cost data to organizations outside organizational boundaries entails a risk of opportunistic behavior. This linkage is related to the perception of trust between partners. They also present a classification of open-book accounting into different classes according to the level of information shared, context in which it is applied and the way information is shared in the relationship (table 5.1). Open-book accounting is usually seen to serve a purpose in IOCM by highlighting different cost reduction possibilities through coordinated, collaborative actions of partner firms (Kajuter and Kulmala 2010, Lamming 1993, Mouritsen et al. 2001). Kajuter and Kulmala (2005) note that empirical evidence on the open-book accounting in the IOCM context is very limited. Thus, in line of previous literature and discussion, concepts are linked in this study as figure 5.3 illustrates. Purchaser-provider model can be

seen as a type of networks, particularly a dyadic relationship. Within any network that has mutual cost management schemes, one must first define the type of cost management method used and also define the amount of open-book accounting needed. In the study of IOCM, various perspectives have been used. Present study incorporates contingency theory and TCE complemented with trust to explore the implementation of IOCM tool in case organizations C and D (figure 5.3).

Dekker (2004) provides a framework linking organization theory, transaction cost economics and trust into predictive model on the effect of transaction costs, needed amount of control and trust. Mutual interdependence between the partners and task uncertainty lead to coordination problems while factors influencing transaction costs drawn from transaction cost theory influence appropriation concerns. These factors are asset specificity, environmental uncertainty and frequency of transactions taking place. These coordination problems and appropriation concerns, in turn, influence partnering organizations to spend time and effort in finding a good partner to mitigate these problems and to design suitable control mechanisms to manage these problems. Investing efforts on finding a good partner reduces needed control. Finally, trust plays a role in affecting the relationship between appropriation concerns and coordination problems. Increasing goodwill-trust and capability-trust is, according to model, expected to reduce the strength of the relationship between these control problems, therefore affecting the relationship between the partner selection and the needed formal controls.

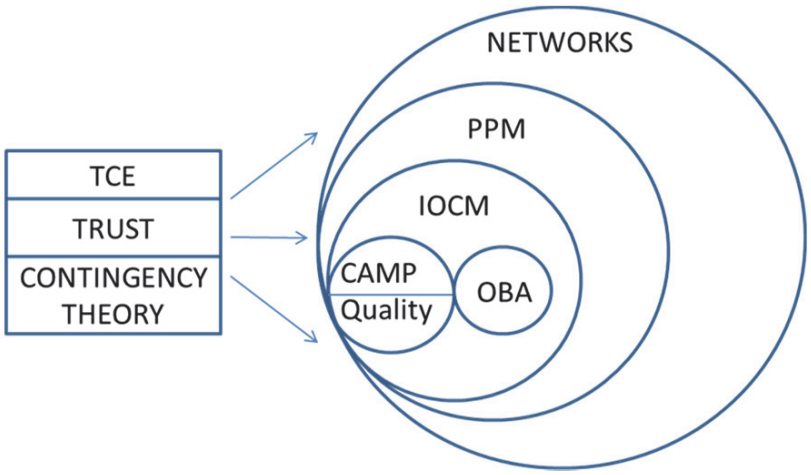

FIGURE 5.3 Concepts and theories in the study of IOCM [1]

[1] TCE: Transaction cost economics
PPM: Purchaser-provider model IOCM: Inter-organizational cost management
CAMP: Collaborative approach for managing project cost of poor quality
OBA: Open-book accounting

6 CASE CD

This chapter contains the detailed description of the improvement project CD. Case organizations C and D are presented, after which the project is described in full. Finally, short discussion on the chapter is presented.

6.1 Case setting

The study's empirical data is gathered at two case organizations forming a purchaser-provider relationship. Data is gathered in conjunction with quality cost reduction project implemented at the two organizations' interface. These organizations are in charge of street- and park maintenance administration at purchasing side and maintenance and street construction services at the producer side. The quality cost tool is used to identify important quality failure areas in the purchaser-provider interface and thus the most important quality problems causing high failure costs in the studied relationship (PPM). Corrective actions are developed in the process, quality costs are estimated and finally, metrics tracking the change of quality costs in different areas of work attributed to specific quality problems are placed to organizations forming the PPM. While this tool is implemented and the cost project carried out, researcher observes the differences in implementation and startup when compared to the model presented in the literature.

Results from the project consist of identified quality problems in organizations' working processes, quality costs attributed to these problems and corrective actions developed to reduce quality costs in the most effective areas. These results are also compared between the results from Malmi et al. (2004) implementation of CAMP method. Data is in the form of problem area classifications, workshop discussions, fishbone diagrams, improvement project plans, follow-up interviews and working papers from meetings held between the researcher and members from organizations.

Chapter is organized as follows: First, an overview of the organizations C and D is presented. Then, project starting conditions are illustrated along with

the results from the preliminary quality survey. Third, workshops are presented in the order they were held in the project. The descriptions of the workshops contain the presentations of the teams as well as the data that was generated during the workshops. Workshops are presented in the order they were held; first workshop for validation of pre-constructed fishbone diagrams and identification of important issues, second workshop for improvement ideas, third workshop for quality costing and finally, fourth workshop for metrics generation. After presenting workshops and their results, follow-up interviews are illustrated. Finally, discussion on the case CD is offered.

6.2 Case CD – Organizations in purchaser- provider relationship

Organizations C and D are public organizations that are working within a purchaser-producer relationship in line with the model presented in more detail in the chapter 3. Organizations C and D are situated in a medium sized Finnish city. Organization C is a part of the city's urban design and city planning department. Its areas of responsibility and different departments are the city streets, parks, harbor, outdoor lighting, garbage disposal and parking monitoring. Part of the city's streets are maintained by the government organization, but about 400 km of streets are maintained and administered by the organization C. Organization C also handles all license applications and administrative work for street system. Organization C also handles city's park areas, keeping them clean and constructing new park areas as needed. It designs park areas in line with the city's expansion and construction plan and monitors the construction work. These services organization C buys from the organization D. Harbor services, outdoor lighting and garbage disposal is bought from other service providers, both private and public. Garbage disposal and lighting maintenance is bought from a private service provider on basis of tendering, harbor services from a public organization in charge of the harbor areas service production. Parking monitoring is employed through organization C's own personnel. This case focuses on the study of services provided by the organization D along with organization C's own work processes; thus street- and park maintenance, their planning- and administration, construction, work processes and mutual interface between organizations C and D are the main focus areas of this case. Organization C's annual budget for street- and park maintenance is in the vicinity of 30 million Euros and it employs around 30 employees that are in charge of administrative work for street- and park maintenance and service purchases or street monitoring. Half of the services purchased are from different private contractors and other half is purchased from the organization D.

Organization D is a public organization that produces construction and maintenance services for streets and park areas, including planting and placement of flower areas and trees in the parks. In connection of park- and street maintenance services it offers land- and depth measurement services. These measurement services are used by the land- and lot department of the city. It

also produces logistic services, such as the movement of sand and gravel or heavy maintenance equipment. During winter, organization D maintains city's streets by keeping the snow from the streets, sanding them and moving the snow to designated locations. In the summer it keeps the streets clean from gravel and dirt. It also maintains the street sign system. Its construction services are offered for street- and park areas, where it builds park areas including plants and trees, bridges, water drainage system, parking lots and groundworks for different constructions. It sells its services mainly to the street- and park maintenance of the city (organization C) but has as its customers also private enterprises and households. Organization D employs around 200 employees added with 100 temporary employees in the summer. Its annual turnover is little below 20 million Euros.

6.2.1 Start of case CD

Project work for case CD with organizations C and D started in late 2007. Before this, researcher had presented the outline of the project along with anticipated results to the management on both organizations and received approval for the project to proceed. Both organizations expressed their aims regarding the project to be better understanding of the other organization's work processes and views as well as problems in their mutual interface. Organizations wished to get a clearer picture about the problems existing in the interface between purchaser and producer as well as getting the work processes more integrated through focused problem solving. It was agreed at this point that organizations would brainstorm metrics at the end of the project to create a possibility for tracking the results of the study as improvement initiatives would be implemented. Project was scheduled to take about 6 months with 10 employees participating from both sides in the project until project would reach quality costing phase. In this phase employees from both sides, totaling 8 employees selected from earlier participants on the basis of knowledge about work processes and quality issues were selected to form a quality team in charge of the quantification. Management of the both organizations took part in the research project in the form of executive group meetings where the researcher acted as presenter of the results obtained so far and described the present state of the project as well as outlines of the next phases for the project.

Expected results were tied to work phases, starting from quality survey e-mailed to selected participants from both organizations. Participants were selected by the organizations; organization C selected 10 people that were knowledgeable about contracts as well as purchasing and design of the services produced by the organization D. Organization D selected 10 people that were knowledgeable about contracts and operations needed to produce the services for organization C. Project was carried out with both organizations' participants taking part in the workshops and surveys at the same time to create combined data from the interface between the two organizations. This method made it possible to create discussions with both sides of the PPM present at the same time and to identify existing problems and create solutions with purchaser and

producer working together. This was needed to ensure that both views were taken into consideration and to utilize expertise found on both sides of the relationship. Expected results from the first phase of the project were combined problem classifications and fishbone diagrams constructed from the data of participants from both sides. Second phase was planned to be the improvement projects brainstormed in the second workshop with both organizations' participants present. This phase was expected to deliver improvement projects for the problems present in the PPM interface. Third phase was to quantify problems found on the interface for both organizations. This phase was conducted with separate teams for both organizations as quality problems were examined by the quality costs they generated to the target organization. These costs were the planned results for the third phase and could be combined at the end of the phase to create a database of quality failure costs for both organizations together with the possibility of looking at them separately. Fourth phase was expected to create metrics for tracking the improvement projects chosen for implementation. These metrics were planned to be created in a joint workshop with 4 middle managers from both organizations for 8 participants total.

To enrich the data in the survey phase, survey was sent to 10 people from both sides in addition to selected 20 participants for the main project. Of the 40 sent questionnaires, purchasing organization returned 13 and provider returned 12, totaling 25 answers. These answers were very rich in data, containing 52 different problems analyzed with cause- and effect diagram for the producing side and 41 different problems with cause- and effect diagram for purchasing side, totaling 93 different cause- and effect lines. Researcher created a new type of fishbone diagram presentation for PPM project (appendix 7.1). In this presentation, producer side has been put on the left side of the presentation and the purchasing organization on the right side, creating a presentation with two different organizations working within PPM model to be viewed at the same time. This required the problem classes to be recognized from the data for purchaser and producer separately and then to be combined by summing them. From all the different problems expressed in the questionnaire answers, 8 different classes could be recognized in terms of different areas they related to; these were problems dealing with lack of resources or use of resources, problems in mutual trust between purchaser and producer, problems with cooperation between PPM organizations, problems related to mutual contracts concerning the work purchased and produced, lack of time or problems with scheduling, problems related to information and finally problems generating extra work. These classes were shorted for *resources, trust, cooperation, contracts, time, information and extra work*.

Size of the problem classes are on some parts clearly different for two organizations (figure 6.1); problems classified under different headings for the producer were 12 problem lines for *resources*, 10 lines for *trust*, 10 lines for *cooperation*, 5 lines for *contracts*, 5 lines fir *time*, 5 lines for *information* and 5 lines for *extra work*. Problems classified under different headings for purchaser were 10 lines for *resources*, 9 lines for *information*, 7 lines for *contracts*, 6 lines for *time*, 4 lines for *extra work*, 3 lines for *cooperation* and 2 lines for *trust*.

Most notable differences in this early data were on organizations' views on the importance of the problem classes of *trust*, *information* and *cooperation*. Differences in *cooperation* and *trust* can be seen to be linked in principle. Low trust in other side of PPM can lead to problems in cooperation. This interpretation is backed by the preliminary fishbone data; in the cause- and effect problem lines there are some examples of this relation; in one problem it was stated that purchaser does not appreciate producer and treats it as an outsider although in respondents view they should be seen as producing services for the city in cooperation. This under appreciation was seen in the questionnaire-answer to lead to problems in cooperation. Other respondent stated that purchaser values private contractors over public ones and that was seen to produce trust issues, ultimately leading to problems in cooperation. Preliminary data suggests that the producer sees mutual trust to be a major problem in the work process interface between PPM sides whereas purchaser sees it as a minor issue.

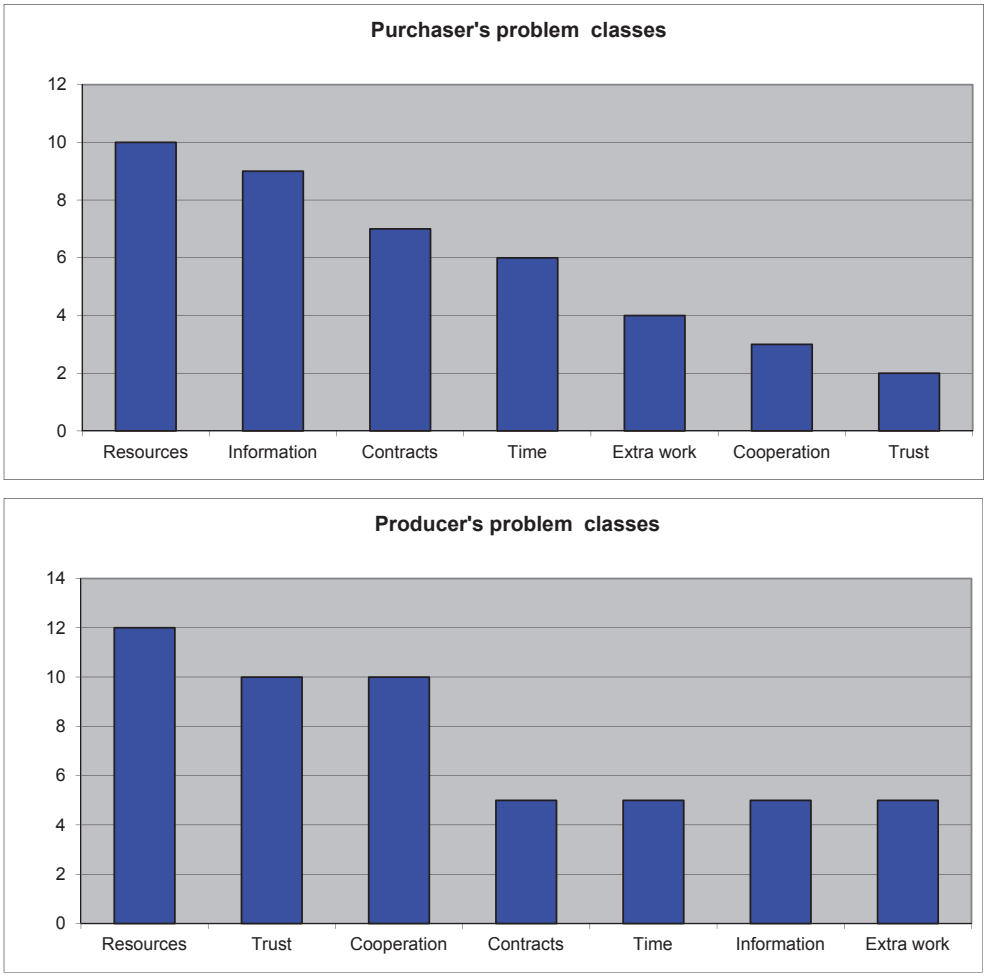

FIGURE 6.1 Separate pareto of problem classes for case CD

Also, problems put under the information distribution class were somewhat different for the purchaser and producer. Purchaser had 9 lines put under the *information* class whereas producer had 5. Preliminary analysis on the constructed fishbone data seems to imply that purchaser considers information related problems more important than the producing side. Problems seem to be related to problems in information flow between contractors, purchaser and producer on both sides. Also, respondents on purchaser's side seem to consider unclear invoices to be an issue since this was mentioned on several problem statements. On the other hand, respondents on producer's side consider ordering of services to be an issue originating from purchaser's side.

When respondents' answers and problem statements are put under mentioned problem classes and united in a single pareto presentation (figure 6.2) for clarity and ease of comparison between figure 6.1, problem classes become somewhat different in relative size:

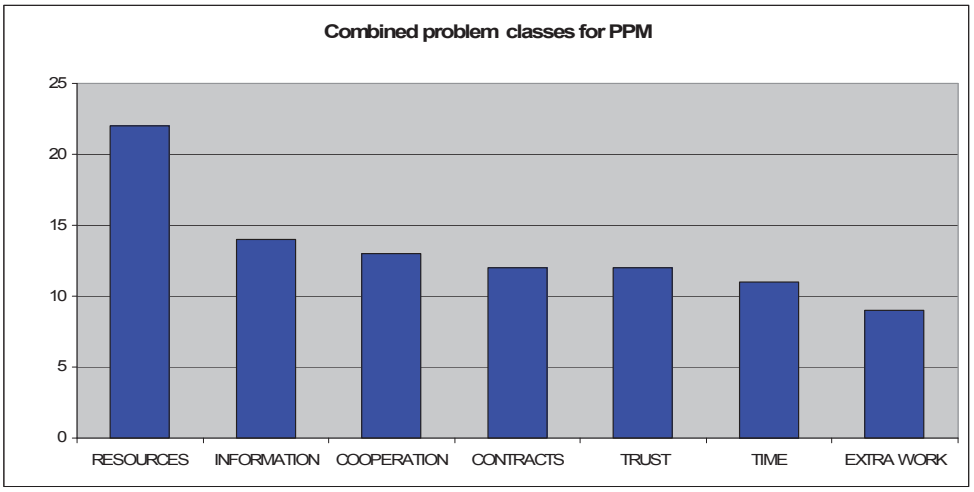

FIGURE 6.2 Joint pareto of the problem classes for case CD

Largest problem class in the combined data was *resources*. This problem class was highly prioritized by both organizations according to preliminary survey data. Problem class consisted mainly of problems dealing with lack of resources, lack of personnel, delayed material resources, problems in getting materials on site and lack of proper construction equipment. Some examples of the problems listed under *resources* are delayed offers for construction site. This problem recognized by the purchaser is caused, according to respondent, by the lack of personnel resources in producer's side. Lack of personnel resources leads to delays in the making of offers, which in turn leads to uncertainties about whether investment budget is going to cover the expenses. One of the problems on producer's side dealt with late material delivers by the subcontractor. This leads to delays in construction work as needed materials are late on the site. Also, lack of personnel resources and construction equipment on the producing

organization was seen to delay fulfillment of construction orders. Purchaser recognized inadequate storing of construction materials leading to low quality materials as they are deteriorated over time in inadequate conditions. This leads ultimately to poor construction quality and safety issues. It could be noted that some of the problems under this class are seen by the respondent to originate outside of the organization, as in earlier examples from subcontractor or producer. One other example from the data is problems in quality assurance of outside consultant working in the construction project. This leads to faulty designs causing delays in construction as plans have to be redrawn. This implies that PPM model is a complex network where some of the problems originate outside of the purchaser-provider relationship.

Second largest problem class contains problems relating to flow of information and its distribution. This problem class is somewhat different in size for the producer and purchaser. Organization C's problem class graph shows information to be second highest problem class while in the producing side information is ranked relatively low with 5 problems relating to information flow. On the producer's side problems relating to information are delayed designs, bad information flow between purchaser and construction consultant leading to conflicting demands concerning producer's construction work, delayed orders, withholding of information from purchaser's part causing difficulties in work planning for the producer and problems in information flow between purchaser and private constructor causing difficulties at construction site for the producer. On the purchaser's side, problems related to information flow are diverse; Purchaser sees for the most part problems in information flow originating from the producer. Unclear specifications concerning construction work takes time to go through and thus delays work orders back to producer. Invoices coming from the producer are seen on some cases to be missing relevant information and thus cannot be verified. Construction schedule estimates are unclear on producer's part, which in turn causes difficulties in responding to customer queries. Also, one of the respondents stated that in some cases producer does not notify purchaser of the finished construction work which causes delays in the use of properties as well as missing documents. It seems that problems related to information quality or its distribution are in many cases seen to originate from other side of the PPM and thus hard to affect by other organization.

Third class, cooperation, is also different in size for PPM sides. Producer's answers had 10 problems that could be classified under this heading while purchaser had only 3. Thus, 10 people out of 12 respondents recognized this problem to be a major issue and only 3 out of 13 respondents on purchaser's side recognized a problem relating to cooperation. Problems in cooperation are seen by the organization C to be originating from the producer, however being only a minor issue. Purchaser sees that producer does not appreciate cooperation as reports are missing information. Also, one of the respondents stated that ordering from the producer is very complex issue because producer keeps the wrong people in charge of the negotiations. Producer's problem lines that are classified under cooperation are excess bureaucracy that is manifested in too many re-

ports, slow response from the purchaser for extra work queries and unclear PPM boundaries causing confusion in the employees. One noteworthy observation from this data is that while purchaser sees the reports to be unclear and delayed, producer sees them in some cases to be excess work and pointless bureaucracy.

Fourth class in the combined problem classes is the *contracts*. These are problems related to mutual contracts between the producer and the purchaser. Classes are about the same size in the individual graphs and problems under this class are fairly similar on both sides. Respondent in the organization C stated that there were some disagreement between PPM sides about what works were included in the contracts. This resulted in time lost in arguments. Another problem related to disagreements on contract issues was the interpretation of the quality standards in the contracts. Some of the construction work and street maintenance was seen by the purchaser to fail quality standards expressed in the contracts. Producer, however, felt that this discrepancy was caused by the expected standards not being covered by the contracts. Most of the problems under this class were very similar to already mentioned; there were disagreements on both sides about what things were covered by the contracts. Some of the causes were seen to be outdated contracts, outside customer complaints about work quality and unclear contracts that allowed too much interpretation to take place.

Fifth combined problem class is centered on problems related to *trust* issues. This problem class is another example of issues that are considered to be of different importance by the PPM sides. Respondents from purchasing side considered trust issues to be of little importance in terms of different problems attributed to this class. Only 2 of the answers could be labeled under this class, while on the producing side, respondents identified 10 different problems that could be considered related to trust issues between organizations. As discussed earlier, trust issues can be considered to be linked with cooperation; this interpretation was backed by the data. Problems identified to be centered on trust issues were leading to problems in cooperation. On the purchasing side, one identified problem was suspicions that producer was unable to take responsibility of its own mistakes and thus made invoices that included fixing those mistakes. In purchaser's view these should have been handled by the producer with no extra cost. Another problem that one respondent stated was under appreciation of purchaser's work by the producer. This led to questioning of purchaser's work techniques and ultimately stressful work situations. Although these problems could be considered important, they could be identified in only 2 of the 41 different problems and thus could be isolated incidents or centered on few employees. Producing side, however, considered trust issues to be fairly important problem area in terms of answers attributed under this class. There were total of 10 different problems of 52 total, making it cover about one fifth of all the answers. These problems reflected mostly the producer's perception that purchaser did not trust the producer and treated it as an outsider rather than business partner. Several examples highlight this interpretation; one respondent

stated that purchaser does not trust the producer and this leads to the purchaser demanding certain work techniques on construction sites rather than letting the producer decide for themselves. Other example was a response that stated the problem concerning needed extra works on site. Purchaser wanted to go through every extra work in detail to decide if it was necessary for the particular site. Respondent saw this as an expression of mistrust and stated that these works he had mentioned were all necessary and eventually they were always accepted by the purchaser. The problem of mistrust is expressed again in one statement where one respondent described a problem where purchaser occasionally demanded extra reports and descriptions of the work done on site even though purchaser's representative came to site for inspection. This was seen as yet another expression of mistrust originating from purchaser. One respondent also stated that purchaser seemed to value private contractors over organization D which was a public organization. This caused the feeling of discrimination and prioritizing of private contractors on construction sites.

Sixth problem class contained problems expressed in the responses that were related to *time*. This covered problems related to lack of time, scheduling or delayed documents. Both sides of PPM had expressed fairly equal amount of problems related to time, making it equally prioritized problem, sixth in combined problem class pareto graph. On producer's side, problems were centered on delayed construction plans coming from the designer leading to lack of time in preparation of construction, too tight construction schedules putting pressure on work activities and personnel or construction orders that were received from the purchaser with very low time frame for completion. Purchaser saw the problems centered on time to be centered on producer's lack of resources to complete the work in time, lack of coordination on producer's side leading to schedule overruns, purchaser's own customers demanding extra designs on very short notice leading to pressure on producer and lack of tendering leading to high starting offers and thus delayed schedules because of the needed extra negotiations. In this problem class it can be seen that both sides of the PPM see several of their problems originating from the other side of the PPM; purchaser sees that producer is under-resourced, under-coordinated and making too high starting offers while producer sees that purchaser makes unexpected extra orders on short notice or demanding impossible timelines for projects.

Final problem class in the problem class pareto is *extra work*. Problems that were directly centered on issues causing extra works on construction site or extra works for employees, such as searching for needed documents, were put under this label. Extra work is defined in this class as either a needed change or extra construction on site or extra work in terms of working hours for a single employee or team that relates to, for example, searching of documents or making of reports. Extra works on construction site were mostly producer's problems while time lost in clarifications, evaluations and paper work were problems for the purchaser. This is in line with the roles of the organizations; organization D produces the services and thus works on the construction site while organization C has more administrative role. Respondents from the producing

side identified several possible causes for unexpected extra works on site; unclear or insufficient construction plans coming from the designer, insufficient coordination of construction work or problems in the contracts that include too few works causing much extra work in tendering and negotiations. Purchaser identified the problem of extra tendering causing difficulties in tracking of costs, insufficient documenting of extra works leading to time lost in clarifications later on and extra works done without offers leading to negotiations on the compensation for the producer.

6.2.2 Fishbones and 1st workshop in case CD

First workshop for the PPM research project with organizations C and D was held in the middle of the January 2008. First part of January researcher had received the responses from quality problems survey from both sides of the PPM and constructed preliminary fishbone diagrams and pareto graph from the problem classes. This preliminary fishbone data was to be presented at the first workshop and teams consisting of both the producer's and purchaser's employees had the chance to discuss combined diagrams and problem class pareto in teams. Aim was to go through all of the data and make modifications where necessary, find the most important problems through mutual discussions with representatives from both sides of the PPM, enrich the data with new problems or insights and finally present the findings for all participants at the end of the workshop. All the participants and the management on both sides of the PPM had received the preliminary fishbone data in advance so that less time would be lost in actual workshop for familiarizing with the data. For the first workshop, organizations C and D had selected from the survey respondents 8 participants each, totaling 16 participants for the first workshop. From these 16 expected participants, all 16 showed up for the first workshop day. These 16 participants were divided into 3 teams with 5-6 members from both sides of the PPM working with designated parts of the fishbone data. This was, as in earlier cases, done to ensure that there was no parallel team work taking place. Some of the participants were not knowledgeable about fishbone diagrams in advance, so the researcher spent the first hour of the workshop by presenting the way they were read and understood and outlining the workshop day. Along the day researcher also went through the teams to ensure that everything was understood and provided clarifications where necessary. Researcher also spent the time teams were working on the data by discussing with team members and observing the team discussions.

During team discussions, it became clear that of the problems in the fishbone diagrams, one class was discussed actively in every team; *resources*. One of the participants from the producing side commented construction business of the early 2008 during team discussions "*situation in the construction business is so active at the moment that there is a clear lack of resources that can be seen as lack of competent construction workers and lack of heavy construction equipment*". Issues affecting material resources were works that were ordered on short notice outside the contracts and changes in the construction plans. This was expressed by

one of the participants "*Long delivery times for materials coupled with extra works that are given very short notices and last minute changes in the construction plans tend to cause trouble on the site*".

After team discussions, teams presented their findings to all participants for discussion. Team 1 presented that to date, PPM sides had implemented only short term resource planning and this was one reason for heightened problem levels in the resources area. Winter and summer conditions affected the need for resources as in the winter, roads had to be kept clean from the snow, salted and sanded. In the summer, producer needed different equipment for the streets as they had to be cleaned from the gravel and dirt, watered as necessary and most of the street- and park maintenance work was done on the summertime. Work programs needed to change accordingly. In the resource planning, one proposal that the team 1 offered was coordination of work done in the PPM interface in which producer would provide a list of extra works needed with clear descriptions and purchaser would be committed to order those works. Contracts would be updated to cover the purchase price, quantities and needed reporting for extra works. In this way, extra works could be taken into work design phase and at least some of the schedule and budget overruns could be avoided. Team 1 also highlighted one of the problems in the information area; slow responses to compensation claims for the damages. This problem existed because work done by the producer was in some cases complained about by the end user, and purchaser had to check with the producer what was done and evaluate whether there was any liability. This problem can be enlightened by an example: if resident slips in the icy road and files damages claim to purchaser, who is the administrator and owner of the area, purchaser has to check with the producer if the streets were sanded or salted recently to determine if there is any liability. One solution for this was offered by the team 1: GPS connection to purchaser from the plowing vehicle. This would ensure information about vehicles paths and the work done on a real-time basis for the purchaser and speed the handling of street specific customer complaints and claims.

Team 2 stated that lack of resources was a major problem in the construction at the moment and it affected the producer's subcontractors as well. Team 2 brought up the possibility of purchaser's intervention on producers behalf. This possible solution meant that purchaser could make a request for work offer on construction consultant that had heavy construction equipment. This way by teaming up with a consultant construction could be completed in schedule with the help of equipment from the consultant. Another problem that team 2 expressed was the problem of lost time due to clarifications. Construction designs were insufficient on some occasions and did not take extra works into account. When the need for these extra works appeared, time was lost in negotiations with the purchaser and schedule overruns could not be avoided.

Team 3 stated during their presentation that the issues discussed where in line with the previous presentations. Lack of resources and issues causing it were the main problem issue on both sides at this time. Team 3 also presented the problem of undated contracts. Present contracts did not cover usual extra works and resulted in budget and time schedule overruns as well as time lost in

negotiations with the partners. This problem could be at least in some part resolved by negotiating extra works into contracts as specified earlier. Team 3 also expressed the problem of construction designs coming late from the outside consultant. This was caused partly because of the lack of resources on consultant's part and also because of purchaser's lack of resources for monitoring and control. Delayed designs were linked to the problem of *information* distribution. Design invoices to the purchaser were sometimes missing some important information and sending them back for clarifications was a slow and difficult process as expressed by representative of the purchaser.

During discussions at teams and in the presentations it became clear that problems dealing with information flow and resources were the main interest areas for both sides of the PPM. These problem classes are also two largest single areas in the combined problem class pareto graph. One curious insight is the lack of discussion on problems dealing with trust issues. These were second largest problem class in the producer's individual problem class pareto. However, group dynamics and problematic issue to bring up in team discussions along with purchaser's low priority for this issue could explain the absence of issues linked to *trust* in the presentations.

After presentations, researcher was given papers from the presentations for writing. Researcher had also written down the discussions taken place during the presentations. These materials researcher wrote down and sent to participants as well as to the management on both sides of the PPM for review and possible feedback.

6.2.3 Second workshop and improvement projects in case CD

Second workshop for the PPM research project was held in the middle of the February 2008, about a month after the first one. This had given enough time for the researcher to write down all the discussions, presentations and modifications to fishbone diagrams. Also, these materials were sent for review to all participants and they had the option of adding their thoughts between the workshops. After no additional comments were received, this material was the basis for second workshop.

Same 16 participants as in the first workshop were invited for the second workshop and of the 16 expected, all arrived. Aim of this workshop was to go through all the material done so far and construct improvement ideas as solutions for important problem issues. Material included fishbone diagrams constructed from the quality problems survey and modified according to first workshop results, problem class pareto graphs and discussion material as basis for problem issue considerations. Teams were constructed to form three different teams with both PPM sides present in every team, therefore totaling 5-6 members on every team. As usual, material was handed to the teams in a way that parallel work could be avoided. This meant handing different problem classes and cause- and effect problem statements contained in the according fishbone diagram to different teams. Therefore, one team received *resources* and *time*, for example while another received *trust* and *information*. Once again,

teams were able to choose what problems they would address and were expected to form several improvement ideas considered on earlier mentioned dimensions. Teams consisting of both the purchaser and producer made it possible to discuss problems with both views present. As in earlier cases, teams were expected to present their results for group discussion for the end of the workshop. During team work, researcher observed team work, gave instructions about the material as needed and discussed with different team members. For the presentation, teams had formed 9 different improvement ideas linked to different problems presented in the material, 2 to 4 ideas were obtained from every team.

First improvement idea presented by team 1 was centered on the problem of insufficient reporting. This problem existed because work reports and descriptions were sometimes made in haste at the work site and they were missing some of the important information required; this could be working hours done on the site, description of the work or materials used. This in turn made it difficult to reply to end users' queries as well as evaluate incoming invoices. Insufficient reporting was also causing trouble for the producer as work documenting and tracking was coming harder. As a possible solution for this problem team 1 presented a construction and implementation of up-to-date work tracking and reporting system. The solution consisted of installing GPS tracking devices for all vehicles in use at the producing side. This would make it possible to track work in progress in real-time. Evaluated time needed for implementation was 9 months divided to 1 month needed for information seeking, 4 months for purchase and 4 months for implementation. Expected benefits included precise reporting, improved work planning and monitoring, improved information gathering for further use, liability evidence through work records and possibility for quick responses to customers concerning different queries. Some identified risks were possible technical problems or incompetence's in using the updated equipment, missing information and insufficient technical support. These were, however, considered by the team 1 to be fairly low risks regarding this project. Some possibilities were also identified coming from this project; work tracking in real time, possibilities for aiding the work planning and possibility for damage reporting. These were considered to be highly valuable improvements and very probable outcomes from the project. This project was discussed by the participants and found to be viable option for improvement.

Second improvement idea presented by the team 1 was focused on the problem of customer feedback coming to wrong personnel. This problem was experienced by the producer, purchaser, outside constructors and affiliated water supply center. Incoming phone calls to wrong people from end-users were causing interruptions in the work process on construction site as well as in the administrative work. This was caused mainly by the ignorance of the customers and missing information on the proper customer service contacts in the web pages or phone book. As a solution, team presented the possibility of forming a united customer service center for all the mentioned parties and distributing information about change through available channels, such as service desk, web

pages or phone books. As a possible tracking metrics for the improvement project it was suggested that as customer calls were fairly constant in amount it could be tracked how many phone calls would be directed in the future to this unified service center. As a result of this project, level of experienced customer service would increase and working would be more efficient for both PPM sides as there would be less interrupting phone calls to wrong persons. Project was evaluated to cost very little as existing personnel resources would be sufficient to cover workload with proper coordination of personnel. As possible risks it was stated that customer calls could be misdirected from the center if it was not sufficiently informed, customers would not start to use the center or service center would become overloaded. These risks were seen to be fairly small, however. Possibilities were as mentioned, low interruptions and better customer service.

Team 2 started its presentation by starting a discussion about cooperation between purchaser and the producer. They stated that at the present there were too little mutual meetings and hence insufficient coordination of activities. Obvious solution for this problem was to increase the number of meetings between construction field managers and purchaser's representatives. As a positive effect enhanced internal information distribution would be enhanced. Team 2 also stated that improvement ideas done at the second workshop should be evaluated and processed in a mutual meeting at a later date as part of enhanced coordination of activities. Costs for the project were little; it would require working hours only as much as the meetings would take and would increase internal and external information distribution as well as boost trust and motivation between PPM sides. Team 2 presented that one obvious risk was failure to get the meetings going as many people would have to be in the same place at the same time and finding mutual time could prove to be a problem.

Second problem and corresponding solution presented by the team 2 was the problem in keeping up with the schedules. This problem was linked in many ways to earlier mentioned problems like late construction designs, extra orders given on short notice or lack of resources for both personnel and the heavy equipment. Some possible solutions presented by the team 2 were updating of schedules and better resourcing in the early stages, regular meetings with the purchaser and the producer regarding the project at hand, more even distribution of construction sites between the site managers working on the field and possible extra orders presented to the producer earlier by the purchaser. Tracking of results for these improvements would be very straightforward; completion of the construction evaluated against the original schedule with possible extra works taken into account. Some results presented by the team 2 for these improvements included: better and more accurate use of the resources, yearly work schedule would not be exceeded due to different construction sites keeping better within in their respective schedules, better end-user satisfaction due to works completed on time and saved working hours due to lesser need for clarifications and information seeking. These improvements did not require any new resources as they were possible to integrate to other meetings held be-

tween the purchaser and the producer. It would require only some changes to be approved by both parties and was to be a negotiated issue for later date. Two risks considered fairly relevant were also identified: team 2 was somewhat skeptical about finding the sufficient commitment for the changes for both sides of PPM and also considered the risk of schedule overruns to be a moderate risk even if these improvements were applied.

Third problem and its solution concerned issues dealing with extra works and negotiations about them. This problem was too, a part of interlinked problem network united by cause- and effect relations as the problems of negotiations concerning extra orders was a part of a larger problem concerning contracts and their coverage. Team 2 stated that the problem existed in part because some of the extra works that should have been covered by the contracts were not. At the present, working time was lost due to unnecessary negotiations concerning price, time and quantity of the resources for the extra orders. Another part of the problem as producer saw it, was the problem of extra orders given on unfinished sites with short notice. Yet another problem linked to this issue was the problem of lost or insufficient documenting concerning the agreements and work done on the sites. For this problem area, team 2 presented as possible improvements the use of e-mail for documenting agreements done on site. This meant that whenever the representative of the producer agreed on some extra work and its price with purchaser, possibly on the site, it would be documented and verified by the producer with e-mail. This e-mail would cover agreed price, effect on construction schedule and description of the work done. Purchaser would respond to this e-mail by agreeing to order it. This way the needed documents would be available for both sides. Possible start time for this improvement was any time when the procedure was accepted by both sides. One verification method for assuring that e-mails were sent was to check in the work meetings whether they had been sent. This fairly simple procedure would save working time as time needed for information seeking after-the-fact would decrease. Cost tracking would also become easier as needed documents would be available. Only cost was evaluated to be time taken by the writing of e-mails while cost savings were evaluated to be fairly large. Possible opportunity would also rise from this solution as the saved money could be used proactively for needed construction activities outside the yearly schedule.

Team 3 started their presentation by examining further the problem of insufficient information distribution. This problem was especially high regarding the contracts; some employees were uncertain about what contracts really covered or where the quality standards had been placed. One comment on the information distribution was received when one of the producer's representatives stated that "*One problem that is clearly associated with this is the problem that purchaser does not distribute needed information for the produce. They have no real plan for their maintenance works*". He was referring to the problem of unexpected extra works coming outside contracts to the unfinished construction site. This had the effect of forcing rescheduling on construction projects and causing more time lost on negotiations concerning the extra work. As mentioned earlier, this was on purchaser's view caused partly because of the end users demanding

changes from the purchaser. As a solution for the issue about contracts, team 3 presented that meetings dealing about contract coverage and associated issues should be held with both sides of the PPM present, both before and after the negotiations for the yearly maintenance contracts. Every level of the management as well as field workers should be present at these meetings. Problem for these meetings would be costs in lost work time due to large amount of people scheduling meetings and associated high risk of some people skipping these meetings even if invited due to high work load.

Second problem that team 3 presented along with some ideas for solution is the insufficient preplanning. This problem is centered on problems that arise from inadequate yearly construction plan and according schedule. As in many cases, this problem is also interconnected to other mentioned problems, such as contract issues, problem with unexpected extra works and ultimately time schedule overruns. One obvious and already in other instances mentioned solution is to make yearly budget earlier and include some of the more frequent extra works in to the contracts. However, yearly budget can only be done after the monetary budget for the year has been clarified. So this restricts the making of maintenance budget to a certain point. One way of checking whether the system works is to track the fulfillment percent of the yearly maintenance schedule. This can be calculated in terms of completed works and comparing it to all scheduled works for the year, taking into account the percentage of the unfinished works. Better planning and more inclusive contracts would result in better cost tracking for the purchaser and better resource management for the producer, ultimately resulting in better quality for the end user. This improvement would not require any new resources but would result from better coordination of work activities and better planning of the maintenance schedule. One identified risk was that maintenance schedule cannot be completed in time to allow for resource planning and coordination of work activities, mainly because of the limits on the time frame of the completion imposed by the monetary budget. Purchaser knows its budget for the year at a certain point, after which maintenance budget can only be constructed. This risk was evaluated through discussion to be fairly low on probability but very high on impact.

Third problem analyzed by the team 3 was centered on insufficient contracts. This problem has been examined on other instances, however, and team 3 had little to add. They stated that results were expected to include better quality, time savings and easier planning of resources. This problem was discussed only briefly due to it being repetition on some parts.

Finally, fourth problem recognized by the team 3 to be highly relevant and in need for the solution was the issue of problems in the asset register. Registers were outdated on both sides of the PPM. Solution for this issue was to apply a constant updating system by committing personnel resources for the task. In some parts this solution had already been implemented but it required some further refining, mostly on the purchaser's part. Purchaser had to update their registry so that planning of maintenance activities could be better implemented and needed information for the planning was accurate in the future. This improve-

ment effort was considered to be very demanding to accomplish in terms of labor hours and was considered to take 2 years from 2 persons working full time, after which it would be easier to keep the registry updated on a regular basis by the appointed personnel. One important issue to be recognized at this point was in team 3's presentation the risk of registry, once updated, to fall behind and become once again outdated. This risk was considered very low in probability due to committing personnel for the task but extremely high in impact.

After workshop these problem discussions, presentations and corresponding solutions were handed to researcher who wrote them down as complete presentations and sent them to participants as well as the management for review and possible additions. After second workshop, planned step was to go through the analyzed problems and solutions and evaluate associated quality costs for these problem-solution pairs. For organizations this was needed to prioritize improvement projects and to evaluate their impact and for the researcher to know the magnitude of problems present in this PPM network.

6.2.4 Quality costing workshop in case CD

Third workshop for the research project CD started at the end of March 2008, three months after the project had started and over 5 months after the talks with the target organizations C and D had started. Selected participants for the project came to the workshop, totaling 16. Plan was to quantify all the quality costs generated by the problems found in the earlier phases of the project. Costs were to be attributed to particular improvement project were applicable. For example, if constant re-designing of the construction plans would have been found to cost 20 hours of work for the producer, the cost of this problem would be directly linked to improvement project aiming to improve construction designing. Thus, costs that were directly caused by the problem with improvement project brainstormed for it could be used for prioritization of the improvement initiatives.

Researcher presented at the start of the workshop the outline of the day and stated the purpose of the workshop. Aim was to quantify existing quality *failure* costs that were linked to a particular problem presented in the cause- and effect diagrams; ie fishbone diagrams. These costs were to be evaluated in terms of lost working hours, materials or other quantifiable costs. Costs were to be evaluated for both sides of the PPM using teams looking into either purchaser's COPQ or the producer's COPQ. 2 teams were constructed, 1 for purchaser and 1 for producer. Both teams had 8 members and had the possibility of dividing the given material inside the team. Team 1 consisted of the producer's participants while the team 2 consisted of the purchaser's participants. Results were asked to be presented at the end of the workshop.

Producer's team was the first to present the results from their quality costing workshop. They had gone through all relevant problem lines that contained the main problem along with causes for the stated problem and its consequences. First problem presented by the producer's team was the problem of construction designs coming late which caused problems in the materials acquisi-

tion. For the producer this meant time lost trying to influence designers to act in schedule. Also, delayed designs caused often other problems for the construction. It forced the producer to act in a hurry and possibly buy more expensive materials or higher costs due to hurried tendering for subcontractors. It was evaluated that 2 employees working in material acquisitions and 2 employees in charge of the construction sites lost 15 days of working time in a calendar year. Also, it was known that general site changes such as buying more expensive materials had cost 20 000 Euros earlier year. Added to this sum was the total of 60 working days for affected 4 employees and higher costs due to hurried tendering 50 000 Euros.

Second problem presented by the producer's team was the issues in yearly maintenance schedule and budget. Often budgeted monetary resources run out during the construction and it had to be postponed to the next year while the construction site remained unfinished. This in turn caused extra costs as site had to be maintained over the original schedule. Costs consisted of many site constructions and dismantlings during the waiting periods, maintenance activities on site during waiting, material loss during waiting, construction of temporary traffic routes and logistic costs for the materials transported between sites. All these issues combined were estimated to cost the producer around 50 000 Euros a year.

Third quantified problem was centered on issues in contracts. Contracts were not adequately inclusive, which resulted in the large amount of extra works on site. Extra works meant more negotiations and clarifications towards purchaser as extra works outside the contract had to be negotiated before start. This problem was linked to the construction designs mentioned earlier as it contributed towards the mentioned 20 000 Euros a year in materials acquisition. Additional costs came from employees who lost effective working time on waiting and negotiations on extra works not covered by the contracts. It was estimated to cost 80 full working days a year for the organization D.

Fourth problem dealt with a situation where another contractor was dismantling producer's tree- and flower plantings or street construction sites. This situation occurred when another constructor was forced to remove plantings or street constructions to gain access to pipes or electrical cords, for instance. Work phases should have been done in different order. This, in turn, was caused in producer's view by the problems in purchaser's information distribution regarding the works of another contractor. It was estimated that problems in information distribution affected 2 projects a year, totaling quality costs in 40 hours for 6 persons, totaling 240 working hours a year.

Fifth issue was centered on problems with producer's maintenance schedule. In producer's view, purchaser was lacking in proper plans for the yearly maintenance, which caused large construction orders to appear on very short notice. This made it difficult for the producer to plan its own work schedule and increased the costs related to construction. Unexpected orders increased the needed overtime, resulting in overtime for 10 persons 2 weeks each. This cost could be seen from the organization D's work lists. Unexpected work orders

had also the effect of delaying existing sites, thereby increasing costs related to idle heavy machinery. This was estimated to be in the vicinity of 20 000 Euros.

Sixth problem was an unclear maintenance contract between PPM sides resulting in uncertainty about site responsibilities. On some instances producer did not know whether certain site such as park or street area was under its responsibility. Unclear maintenance contract was caused in large part because of the outdated site- and quantity list which detailed the sites and assets under purchaser's control. This problem caused some areas of the county to be ignored for some years, resulting in higher costs when maintenance was started at the site. Problem affected few remote parks and street areas in lower use. Costs resulting from this problem were either personnel overtime or material costs resulting from loss in the area. This, for example, could include park benches or plantings. Overtime was estimated to be 2 weeks for 4 persons, totaling 8 weeks overtime. Material costs were in the vicinity of 5000 Euros.

Seventh problem analyzed from the producer's side of the fishbone diagram was the problem of unclear orders coming from the purchaser. This was caused in the producer's view by the uncertainties of the purchaser concerning their assets and their condition. This, in turn was caused by the outdated assets list. Result of this cause- and effect problem chain for the producer was that it had to use extra work hours to clarify the specifications for the work order. 2 persons working in the billing had to use time to clarify specifications from the purchaser and count an offer for the purchaser. Often purchaser changed the specifications once and the offer had to be calculated twice. This was estimated to cost 4 days worth of work for 2 persons in the billing and affecting 10 projects a year, totaling 640 hours a year lost in work that could be seen as quality failure cost.

Eighth problem was concerned with coordination between different construction projects. At present, it was seen that lack of coordination between projects had led to low communication between project teams, resulting in reduced working speed at sites and reduction in work security. This problem existed because different contractors were not communicating between each other. This problem was also linked to the lack of information coming from the purchaser concerning other orders sent to different contractors. Lack of communication between different actors had led to situations were another contractor had, for example, closed roads leading to producer's construction site in order to do its own construction. Another example of the problems was increased traffic in the construction site due to changed traffic routes. This problem caused pauses in the use of heave machinery and work time lost due to changes in traffic routes resulting in work security issues when employees had to be more careful for bystanders' security as well as their own. Producer had the hourly rates for the use of heavy machinery. This figure was multiplied by the number of hours lost due waiting. While this figure could be verified from the site work lists, an estimate had to be added for the lost working hours due to security issues, resulting in a total of 48 400 Euros.

Producer's ninth analyzed problem was the inability to do regular extra works without gaining approval for each extra work from the purchaser separately. This caused the producer to lose working time in finding the person responsible from the purchaser and in some cases time lost in negotiations. This issue was centered on problems that had to be done but still separately negotiated. Thus, extra works that were either possible to leave outside the construction project or were unique enough to be excluded from the maintenance contract were not considered a problem in this sense. Pauses in the resource use and waiting time was estimated to cost 10 000 € for the heavy machinery and lost working hours to total 240 coming from 6 persons each losing 5 days and 8 hours.

Tenth problem presented by the producer's team was construction designs that were lacking in details or unclear in some parts. This was caused in the producer's opinion either by the incompetency of the designer or the tight schedules originating from designers. Unclear and lacking construction designs, such as electrical or water designs caused lost working time in search of needed information from the designers as well as time lost in extra works on site resulting from insufficient starting designs. This problem was considered to be very important issue by the producer's team and it was estimated by the team that it affected 6 site managers per year, 2 hours per project and 10 projects a year, totaling 120 working hours for site managers. Also, office personnel was affected by the issue, resulting in 50 working hours lost per year due to needed clarifications for the designs. Changes in already built constructions that could have been avoided by sufficient designs were estimated to cost between 1000 and 10 000 Euros for one site, depending on the scale of the change work. Waiting time was estimated to cost for heavy machinery 60 000 Euros. Total cost for this issue was estimated by the team to be in the vicinity of 120 000 Euros, thus becoming the most influential problem in terms of quality cost. This problem was also seen to be by the team to be an important issue.

Adding all the problem costs together estimated total failure costs for the producer were in the vicinity of 2,5 % from annual turnover. This figure does not contain quality costs coming from prevention or appraisal actions, merely external and internal quality failure costs. Summary of the quality failure costs is presented in the appendix.

Purchaser's team had somewhat different presentation. They had come to a conclusion that some of the problems were so closely connected that they had to be analyzed as a group. Some of the different problems on purchaser's side on the fishbone diagrams were describing parts of the same, much bigger problem issue and thus costs could be evaluated on the group of problems forming this issue rather than separately as parts of it. There were also many instances of single problems describing one type of work related problem, however, and these could be handled separately.

First problem presented by the purchaser's team was incoming calls that disrupted working. These calls were often misplaced and coming to a wrong person. This was caused in part by the ignorance of the end user about right

contacts. This minor issue caused efficiency loss in the work resulting in total estimate of 110 working hours lost a year. This estimate was done by estimating that about a total of 30 minutes was lost per working day from a single employee answering to misplaced phone calls.

Second problem analyzed by the purchaser's team was issues with consultants. Construction consultants, mainly electrical or water works designers were having problems in their quality assurance, resulting in flawed or unclear designs. This problem was the same as mentioned in producer's presentation but it was analyzed in terms of costs incurred for the purchaser. Some of the costs for waiting times in construction sites was ultimately suffered by the purchaser as producer could bill the purchaser on some parts of the waiting time. This was seen by the purchaser to cost in the vicinity of 100 000 Euros per year. Also, 3 persons were affected by excess work load resulting from needed clarifications from the designers. These persons were estimated to lose 1 working hour per week for 45 weeks a year for a total of 135 working hours a year lost in unproductive work.

Third problem was considered a minor issue dealing with delayed materials delivery for the site. These materials were not connected to actual construction as they were park benches and similar items that could be set after the actual construction. These delays were estimated to cost 20 working hours a year from 1 person dealing with such acquisitions.

Continuing with minor issues purchaser's team presented the problem of invoices containing insufficient information. While this problem was considered irritating it was infrequent enough to be considered a minor issue. Problem caused the affected employees to lose efficient working time in search for needed information from the producer. Invoices were sometimes missing the time and date information as well as description of the work done. This, in turn, made it impossible to verify invoices without first searching for the information. It was estimated that the person in charge of handling invoices lost 2 working hours a month for a total 22 lost working hours a year.

Fifth problem presented by the purchaser's team was an issue that affected completed construction sites. In some cases producer's construction team did not notify the purchaser about completed site and thus the inspection and use of the site was delayed. This problem was estimated to cost 150 hours of working time for the purchaser when inspection had to be done on short notice and other work activities were piling up due to late completion announcements.

Sixth problem was a large group of different problems that were descriptions of different parts concerning the same main problem. This problem concerned the maintenance contracts. There were some unclear parts in the contracts that could be interpreted in several ways. Also, descriptions about sufficient work quality levels such as acceptable amount of snow after plowing were too vague, allowing the PPM sides to make their own interpretation about quality standards. This resulted in differences of opinion about works that were included in the contract, ultimately causing difficulties in the planning of investments when future costs were impossible to determine. This also caused time

lost in negotiations about different work orders concerning whether they should be included in the maintenance contract. This was estimated to cost the purchaser working time lost in negotiations, affecting 4 persons and taking 34 hours a year for each person, totaling 136 working hours.

Seventh problem was a group of issues linked to the same problem area; schedule overruns. From different cause- and effect lines several causes for this problem could be identified: lack of resources at construction site, insufficient coordination of personnel resources, insufficient planning of work activities and too optimistic starting schedules. These problems together resulted in schedule overruns in many construction projects, ultimately leading to lesser performance in terms of customer service and work quality. Purchaser's team also stated that indirect costs resulting from customer dissatisfaction could not be evaluated easily and were estimated to be relatively high. Working hours lost because of these problems were estimated to be 126 hours of work, coming from 3 persons for 42 hours each. This working time was estimated to come from 42 working weeks for each person and estimated to cost 1 hour for every week. Other costs resulting from prolonged construction sites and schedule overruns were caused by delayed sites. This happened because delayed sites would delay the start of another site, thereby causing a chain reaction that could not easily be stopped. Costs estimated to be caused by schedule overruns and problems from lesser performance and quality were 60 000 Euros.

Eighth problem presented by the purchaser's team was considered by the purchaser to be largest problem in terms of cost influence. It had been recognized by the organization even before the research project and evaluated to cost the organization in the vicinity of 1 million Euros. Problem was insufficient tendering which resulted in higher costs for orders on regular basis. On purchaser's view, one contributing factor for this problem was low amount of available competition between constructors, as well as obligation to buy certain street services from the organization D, thereby limiting possibilities for tendering.

Ninth problem was insufficient reporting of work activities coming from producer. This problem was partly linked to problems 4 and 5 presented earlier by the purchaser. Invoices were sometimes missing information and completed construction sites were not reported early. However, work reports were also sometimes missing dates and descriptions about work activities and therefore basis for cost calculations was inadequate. In case of missing dates, it became impossible for the purchaser to respond into damage claims done by the end-users. Also, insufficient reporting made it harder for the purchaser to report back to its own customers about sites and work status. Another problem caused by insufficient reporting was inability to monitor quality levels described in the contracts. Insufficient reporting caused efficient working hours to be lost when employees had to contact the producer for extra information regarding their reports. This was estimated to affect 1 person handling reporting to end-users and costing 2 hours of work for 45 weeks of work a year, totaling 90 work hours.

Finally, tenth quantified problem by the purchaser was a lesser problem of complicated work ordering process. This was caused by the producer's way of

keeping both the site managers and upper management in the ordering process, thereby making it more complicated. Purchaser's team stated that better expertise for the order negotiations was with the site managers. However, producer wanted to keep top management in the ordering process to ensure that all decisions were approved by the top management. These complications were minor issues, however and were estimated to concern only 1 person whose working time was lost 47 hours a year in finding the right contacts from the producer.

Adding all the problem costs together estimated total costs for the purchaser were in the vicinity 4 % from annual turnover. As in producer's case, this figure does not contain quality costs coming from prevention or appraisal actions, merely external and internal quality failure costs (See appendix for summary).

Both the producer's and the purchaser's problems were often linked in many ways to other problems and thus they were analyzed in some parts as groups. Presentative team had estimated the costs relating to problem as well as issues directly relating to analyzed problem, thus forming an estimate of the total costs from the group of problems describing the larger issue connected by different problems stated in the fishbone diagrams.

Finally, both teams had tagged the relevant costs that were directly linked to brainstormed improvement initiatives. This was done to make it possible to prioritize improvement projects at later date. First solution presented by the team 1 in second workshop addressed the problem of insufficient reporting. This was estimated by the purchaser to cost 90 work hours. Second solution was centered on getting the phone calls to right persons. This was estimated by the purchaser to cost them 110 working hours a year. On second workshop, team 2 presented as the first solution better coordination of activities. Problems linked to this solution were quantified by the producer as costing 48 400 Euros. Second solution by the team 2 concerned schedule overruns and improvement to it by better resourcing. This solution had not directly attributable costs from either side. Third solution by team 2 was addressing the problem of complicated negotiations for extra works. This problem had costs attributed to it by both the purchaser and the producer. Purchaser attributed costs from the problem of unclear contracts, resulting in total of 136 working hours. Producer attributed costs from the problem of negotiations concerning extra works a total of 240 working hours and 10 000 Euros. Team 3 presented in the second workshop 4 solutions, with the first one addressing poor information distribution. Linked problem had costs attributed to it by the producer from the problem of purchaser's insufficient maintenance planning a total of 800 working hours and 20 000 Euros. Second solution from team 3 was centered on poor preplanning of maintenance schedule. This solution had no attributable costs from either side of the PPM. Third solution from team 3 was aimed at fixing issues with contracts. Matching problem was estimated by the producer to cost 640 working hours and 20 000 Euros. Fourth solution presented by the team 3 at the end of the second workshop was outdated assets register and its updating. This was attributed by the producer with costs from unclear work orders coming from

purchaser and unclear maintenance contracts resulting from outdated assets lists. Both problems had a total combined cost of 5 000 Euros and 960 working hours.

This material was given to researcher to write it down and sent it to participants as well management on both organizations for review. All the material acquired so far was to be used as a basis for the last workshop centered on the construction of quality cost tracking metrics.

6.2.5 Metrics and follow-up in case CD

Workshop 4 started in the middle of the may, 2008, little over month after third workshop. During this time, researcher had written down material from the third workshop, sent it to participants and management on both sides of the PPM and had some time to organize all the material for the fourth workshop. This workshop was attended by 8 participants, 4 from both organizations. Participants were chief executive from both organizations and 3 middle managers from both organizations. Workshop participants were selected so that persons attending it would have the best possible knowledge about development of operations, field work, cost structure of the organization and finally the possibility to make decisions. Aim of this workshop was to pick improvement solutions that had the most potential and create metrics to track the solutions' impacts. These metrics were anticipated to be both monetary metrics helping to evaluate the change in quality costs and on the other hand metrics that could help in evaluating changes in the impacts target problems were having on both organizations. Participants had received the project material beforehand and had familiarized themselves with the data. Workshop started by joint discussion about those problems and solutions that would have the most potential for implementation. Managers prioritized 7 different problems that had improvement projects brainstormed for them. Other 2 were left to be looked at a later date. These were the establishment of the service center for phone calls and internal information distribution concerning contracts. Prioritized 7 solutions needed to be coupled with metrics to help evaluate the effect the solution was having on both organizations. 8 participants were divided into two teams with decided problem-solution pairs for both teams. Teams were mixed with participants from both the producer and the purchaser. After distributing these problem-solution pairs to the teams discussion started within the teams. Results were asked to be presented to workshop participants at the end of the day.

During the day, team 1 had prepared a presentation that was centered on four different problems with possible solutions and quantified costs attached to them. First problem concerned outdated asset lists. During presentation it was stated by the participants that an implementation plan was already in place for this problem and project team had been appointed for the task. It was planned that the updating of lists would start at early 2009 and evaluated to take several years to complete. This project was not labeled with metrics at fourth workshop since the project team was appointed for this task and team 1 was concerned

about doing the same work twice. It was projects team's task to create schedules for different stages of the project as well as create the needed metrics for tracking.

Second problem analyzed by the team 2 was focused on issues with maintenance contract. Problem with maintenance contract was, as discussed in more detail earlier, that unclear work quality descriptions were giving rise to possibility of interpretation about whether to include different works into contracts and hence possible differences of opinion about prizes. It was decided during the discussion that quality standards in the contracts would be examined and written in a more definitive manner. Also, prizes for different work activities were to be in line with work standards. This updating of the maintenance contract was evaluated to be done in few weeks time. Team 1 presented as possible metrics for this problem-solution pair the amount of extra works done outside the maintenance contract in the construction site. This figure could be measured and compared in the future against the amount of extra works outside the contract from other years. Figure could be presented either as Euro amount of costs or difference of percentage in the yearly amounts. This metric seemed easy to use and an efficient way of seeing whether the updating of maintenance contract had made any difference.

Third problem with solution attached to it was the scheduling of maintenance activities. This meant the yearly schedule of works to be done, constructed by the purchaser and it formed the basis for ordering of work activities from the producer. Up until present, problem had been that yearly budget and according schedule was not finished on time, causing problems for the producer in terms of its own work planning and resourcing. It was agreed that a project would be implemented were both sides would go through the needed information for the work schedule so that producer's planning would get easier. Also, it was agreed that planning of resources would be done on closer cooperation between PPM sides in the future. As a metric, team 1 presented that maintenance scheduling and the needed information coming without delay would be a sufficient metric that could be evaluated in terms of delay if needed.

Fourth problem was insufficient reporting of the work activities. This had the solution brainstormed that included the implementation of up-to-date work reporting system as discussed earlier. During discussion it was agreed that a team would be appointed that would include some computer personnel familiar with the type of system as well as administrative personnel. This team would be tasked with placing the metrics and time frame for this project.

Team 2 started by describing the results concerning the problem with extra works. This problem existed because sometimes decisions were done on the site between the representative of the purchaser and the producer's site manager and no reports were made or send to administrative personnel. This made it difficult to track work activities being made or costs being generated. As discussed earlier, the solution was that all agreements done on the site were to be sent as e-mails by the site manager to purchaser's administrative personnel containing details about work order that was agreed upon. This information was needed to ensure that all extra works were actually needed. Sometimes top

management wanted to postpone some extra works for a later date and descriptions about work activities were needed for this purpose. It was agreed on discussion that this solution would be implemented and new work methods would be put in place, obligating the use of e-mail notifications for extra works. As metrics, team 2 presented that any deviations from the reporting protocol would be tracked and thus effect from the new protocol could be seen when figures would be compared on a yearly basis. Target was set at zero deviations though it was stated by both sides that this target was very hard to reach. It was also agreed that any decisions for extra works would be followed by work offers within 2 weeks time and invoice would be sent within 1 month from the completion of such extra work. These time frames would also be tracked from now on, forming a comparison database for different years.

Sixth problem, presented by the team 2 was delayed schedules. This problem, as presented earlier, concerned delayed construction sites that were leading to postponement of other sites, thereby creating a link of delayed schedules that was hard to catch on. As a simple metric, team 2 agreed to place a metric for tracking the sites that were completed on schedule and comparing them to those that were delayed, taking into account the starting time in case the site was delayed because of another site in the chain. It was agreed that 1 weeks delay was acceptable and would not be considered a delayed construction. It was agreed during the discussion that all construction projects would be monitored in the project meetings and schedule timeliness would be reached by dedication from both sides. This would affect the amount of short notice extra works coming from purchaser and the actual work done by the producer.

Last problem-solution pair, presented by the team 2, was focused on the coordination of work activities between PPM sides. It was agreed that the present state of coordination was insufficient and that mutual meetings would be held in the future to ensure sufficient coordination of work activities. The target was set at 2 meetings a year for site managers from producer and administrative personnel from the purchaser.

After these presentations and discussion during the presentations, material was handed to researcher to write down after which it was sent back to management on both sides. This workshop concluded the research project, leaving both organizations to carry out implementations for improvement projects chosen at this workshop.

After about 2 years the case CD had ended, researcher went to organizations C and D to do follow-up interviews about case CD. Interviews were done with top management of the organizations separately and aim was to see whether results obtained from the study, including metrics, were implemented in the organizations and whether improvement efforts had been successful. Interviews were done as structured interviews as researcher asked specific questions generated beforehand (see appendix). Questions were created to obtain information about improvement efforts, quality cost levels, metrics in use, state of the PPM interface between the two organizations and level of commitment to ongoing improvement.

Description of the problem	Description of the solution	Description of the metrics
Outdated assets list	Project team for updating lists	Responsibility of the project team
Unclear contracts; quality standards badly defined, work orders unclearly defined, variation in work prices	Updating of the contracts	Amount of extra work activities outside of contracts; either EUR amounts or % of yearly total
Schedules for maintenance activities late	Coordinated planning of activities and resourcing with both PPM sides	Maintenance schedule on time / late by x days
Insufficient reporting of work activities	New work reporting system and reporting instructions	Responsibility of the appointed project team
Insuffiecient reporting of extra works done on site. Tracking of costs difficult	On-site agreements sent as verification through e-mail	Amount of deviations from the reporting protocol; yearly comparison
Delayed schedules on construction sites	Project meetings and monitoring	Amount of sites delayed; number of days
Insufficient coordination of work activities between PPM sides	Mutual meetings	Meetings per year compared to target

TABLE 6.1 Constructed metrics on case CD / workshop 4

First researcher interviewed top management of the organization C. During the start of the interview it became clear that both organizations had gone through large restructuring of working conditions due to new areas of responsibility and larger scale of operations. County had issued to organization C new areas to maintain and develop in addition to old areas; this had direct influence on contracts and work orders directed towards organization D. Both organizations had expanded their scale of operations in the form of new employees and county had given extra funding for operations. These large scale changes in the operating conditions for organization C had made it difficult to invest needed resources for implementation of improvement efforts and tracking of metrics. However, head manager stated that the results from the case CD were consid-

ered very important still and adequate attention would be given to the results now that the restructuring was nearly complete.

Of the improvement efforts generated in the case CD some had already been implemented. New reporting system described earlier had been implemented in cooperation between both organizations. Main user of the reporting system was organization D and real-time data about different work actions could be seen by both organizations. Another improvement effort had been utilized; all customer inquiries were now directed into one large reception center were all the calls were taken down and areas of responsibility were determined. This way it was possible for the personnel to quickly check what inquiries were under their responsibility and act accordingly. Regarding the reporting of extra works agreed on the field there were still problems. It seemed that new reporting orders were not followed on some occasions, mainly due to extra work load they presented. About the update of the maintenance contract it was stated that contracts were still updated continuously on the basis of need and no lasting contract could be reached at this point. Updating of the assets lists had commenced right after the case CD but it was still going as the work amount it needed was considered massive. Every piece of property had to be catalogued and reported into database according to new rules. This meant that park benches, lighting posts, water posts etc had to be moved into database according to their location and amount. Organization C had employed 4 personnel for this task and it was anticipated to last for indeterminate amount of time. Thus, in the follow-up interview it became clear that also the improvement initiatives left without corresponding metric in the fourth workshop were considered and carried out.

Top manager from the organization C stated that due to restructuring of working conditions and new responsibilities it had been impossible to invest resources for evaluation of the improvement efforts. Most important improvements had been implemented but tracking of results had not been utilized. However, he stated that metrics were considered important in the organization and they would be evaluated and implemented in the near future as resources would become available. Thus, organization C had no knowledge about the changes in the quality failure costs or changes in the amount of quality failures but these were going to be tracked in the near future.

After this set of interviews, researcher went to organization D to interview top management with the same set of questions.

The restructuring of work responsibilities and conditions had had a similar effect on organization D. The amount of work had increased and new personnel had been recruited. This had, in turn, directed resources towards work training and restructuring efforts. Thus, also in organization D some of the results from case CD were not fully utilized. Top manager in organization D stated that they had recruited as much as 60 persons to cover all the new responsibilities imposed by the county and their scale of operations had increased from 18 million Euros to 20 million Euros.

He presented similar observations than the management in organization C. He said that evaluation of improvement efforts in the form of metrics was not largely utilized in parts because of the large restructuring that had started right after the case CD had ended. He stated that basic work processes had remained the same, however, and thus results were largely applicable to present situation. He said that results from the project CD had been used on some occasions to present the problem areas to employees and to train them.

Concerning the improvement efforts findings from the interviews were largely similar. Organization D had paid half of the new work reporting system that allowed both organizations to track heavy machinery and cars through GPS navigation type system. Organization C had contributed funds for the other half. Organization D received more accurate information through this system as it was planned to be used later on as a compensation basis for subcontractors. Subcontractors were using the same reporting system and thus working hours could be verified through this real-time tracking system. CEO of the organization D said that this system seemed to be very good and that it had been used for 6 months now. Of the customer inquiries he stated that this was still a problem as inquiries were directed to organization D although the right place would have been organization C. This meant that although incoming queries went to right person when they reached organization C, sometimes these queries were directed to wrong organization, that is, the producing organization although the administrative organization would have been the right place. One of the major points the top manager raised in the interview was better trust between organizations. He stated that "*this can be seen in many things. Cooperative spirit in the meetings is definitely different, trust issues are no longer that relevant and there is general consensus on PPM interface*". About extra works he confirmed the observations from organization C that they were still a problem as reporting was not confirmed through e-mail as was the purpose. He stated that this problem could not be solved completely as extra works were in the nature of construction business. New constructions were relatively easy to predict but repair and maintenance work was always hard to predict in terms of work actions that were needed. Thus, extra time or money could be needed to complete the repair- or maintenance construction sites. He also confirmed that contracts were continuously updated and clarified and that unchanging contract was not expected to be reached. He also stated that continuous improvement was largely inherent in their work-processes and that no definitive projects were ongoing in that area. One major contribution of the project CD on his evaluation was the improvement in trust between the organizations. Finally, he stated that as extra work related metric of changes in Euro amounts and percentages was relatively easy to use and informative, it had been implemented in the organization.

Another set of follow-up interviews were conducted three years after the case CD had ended. Aim of the interviews was to find out if the metrics developed in the case CD had been utilized in the organization C as they had indicated an interest in the first set of follow-up interviews towards developing it further. Another aim was to find out if updating process concerning the longest improvement effort had been completed. Also, some clarifications were asked

concerning the starting issues of the case CD. To this aim, two interviews were conducted in the organization C; managing director of the organization C as well as the manager of construction was interviewed.

Managing director of the organization C commented on the metrics that they had implemented the site delay metrics in the past year and amount of extra works were now tracked. Construction manager commented, however that this metric had proven to be difficult in two ways: firstly, metric didn't indicate the scale of the extra work, thus adding up small and big works without comparison. Another problem concerning this metric had been found out to be difficulties in defining extra work. Although in most parts this had been relatively straightforward, there were instances in which the work could be thought of inclusive of the original work or being an extra order, depending on the view. On the maintenance metric construction manager commented that it required a mobile device capable of transmitting real-time data to databanks. Without it the tracking would be too cumbersome to achieve. Managing director noted that these mobile devices were planned to be purchased in the course of next year, thereby completing also this metric. On the delays in construction activities managing director commented that it had been left unattended, although the interview seemed to inspire him as he remarked "*we are not currently tracking the amount of delays, although we should. Actually, we must look into this in the near future. These interviews are good in a way that they actually revive the issue and push us into considering these things again*"

Implemented metrics were in their early stages and some of them yet to be implemented in the next year. Thus no actual data from the metrics indicating the development of failure rates was available. However, when asked about generated data, construction manager said that "*the amount of extra works is still a problem, almost the same as always. Perhaps a slight decrease in the amount of extra works can be noted*." Thus, metrics data seems to be at the time of the interviews still largely inconclusive.

When asked about updating process CEO commented that although the project had proven to be very time-consuming and was still in progress, it was anticipated to be completed near the end of the year. He repeated the comment from the earlier follow-up interviews that the municipal merger had caused new assets to be identified and thus prolonged the project.

During the second set of follow-up interviews it became clear that metrics were thought to be valuable to the organization, more so than in the producer's side. Most of them had been implemented and the rest were going to be utilized in the near future, whether through new mobile devices or other arrangements. Merger had prolonged the actual implementation of the metrics but they were going to be eventually implemented, although seemingly in a slow pace.

6.3 Discussion on the case CD

This case study relies on data gathered from two case organizations working within a purchaser-provider dyadic relationship. Contracts between them form the basis for such relationship and determine the expected quality standards for work, prizes for work activities as well as responsibilities and rights for both parties.

Method of quality research and improvement described here relies on Ishikawas pareto analysis and fishbone diagrams (Ishikawa, 1985) as well as directions given by Malmi et al. (Malmi et al. 2004), Feigenbaums (1956) classifications, methodology discussions about case and action research principles as well as researcher's developed techniques for purchaser-producer research, most notably the cause- and effect illustration for PPM model described earlier (see appendix).

Problems found were often linked to other problems in the organization or other organizations in relationship with it. Many of the problems in case CD were linked with issues on the other side of the PPM. Best example of this are issues concerning contracts between the two organizations. Many problems were caused by unclear statements in the contracts, undefined quality standards or problems in negotiating or defining extra work activities for construction sites. Numerous examples described in the case CD illustrate this point. This abundance of relations and cause- and effect linkages between problems in case CD when compared to single cases (i.e. Valmet) is partly because of the type of data; two organizations were contributing to project CD from the start.

While trust issues and lack of cooperation was seen in the preliminary data as the major problem areas by the producer's participants in case CD, during the project it became clear that PPM sides wanted to focus on problems related to resources and lack of information. There are some possible explanations for this; firstly, in the *combined* problem class pareto *resources* and *information* classes are considered highest. This happens because of the purchaser's high priority for these problems. Another possible explanation is purchaser's dominant role as the buyer of services and thus issues considered important by the purchaser are handled. Findings from this project don't provide any evidence for this possibility, however. During the research project it became obvious that improvement efforts were picked and created in a mutual agreement. Finally, third possible explanation for the lack of improvement projects constructed to tackle trust and cooperation issues could be the nature of the problems; it is more easy to grasp resource- and information related problems than difficult and sensitive trust issues.

One indicator of organizations' eagerness for improvement is highlighted in case CD. Both organizations were already implementing some solutions based partly on the problems found early on in the research project. These actions were brought to researcher's attention during workshops held in the re-

search project. An example of such solution is the updating of asset lists which had commenced even before fourth workshop.

Quantified quality costs on case CD are somewhat lower than those found in the literature. However, this study has focused solely on quality failure costs, both outside and internal and some examples can be found on the literature of similar levels of quality *failure* cost. It can be seen in case CD that a clear minority of problems were high above others in terms of generated quality failure costs, that is relatively small percentage of problems generated the majority of costs. Some heavy machinery related problems on producer's side and lack of tendering on purchaser's side were causing very high levels of failure costs in PPM interface.

Metrics developed in case CD are easy to use, simple, and metric data requires little work to gather. This seems to indicate organizations, at least those within PPM need indicators of performance that require little extra effort to implement.

In the follow-up interviews the top management of the organization D evaluated that trust issues had been largely improved and were no longer that relevant. Cooperation and trust between organizations had been improving after case CD had ended. Organization C had never considered it to be an issue in the first place. Most important improvement efforts had been implemented and were considered mainly successful but metrics for their evaluation were largely left unimplemented, mainly because of the large scale restructuring that happened right after case CD had ended. This resulted in organizations having no real knowledge about the present state of their quality failure costs or the direction they were heading into but organization C's management stated interest in turning their attention towards generated metrics now that the restructuring was done.

Researcher visited case organizations C and D in the early 2010 for follow-up questions regarding the research project. Aim was to see how improvement efforts were implemented in the organization and whether constructed metrics were used actively in the PPM interface. At the end of second set of follow-up interviews all the improvement efforts were implemented at various stages or were going to be. Of the metrics organization C had plans for 4 metrics while organization D had only used the metrics on extra works.

One interesting direction towards future research on metrics about quality costs and case setting described here relating towards purchaser-producer model and problem dynamics within it would be to gather data about long term implications for use of the metrics in organizations working within PPM. Also, replicating the given case setting with different organizations within PPM model would make it possible to see if metrics would be equivalent to ones described here and coupled with long term research make it possible to see their impact on improvement efforts needed and done on public sector.

7 FINDINGS

This chapter contains the discussion of the results obtained from the case CD and their reflections on the theoretical framework outlined in the chapter 5. Results from case CD are analyzed to obtain answers for research problems illustrated in the introduction. Through discussion on the findings, several conclusions are drawn to illustrate the relevance of chosen theoretical concepts on the implementation of cost management tool within inter-organizational setting.

The project CD started in response to multiple pressures; in the spirit of NPM, municipality had begun to change the traditional way of public sector work. Organizations in the municipal area were expected to cope with new efficiency pressures and they were expected to find cost savings in the newly organized way of doing. One effort to reach efficiency gains was the introduction of purchaser-provider model on the public sector service production. Service production was reorganized into purchasing organization and the producing organization. Although this was expected to reduce costs, one of the unexpected results was that separated organizations were in an unfamiliar territory; their new responsibilities were somewhat unclear and control mechanisms were yet to form. (Lillrank and Haukkapää-Haara 2006). Other pressures were seen in the effects of population structure change and the demands for same amount of services with more limited resources as well as new responsibilities of the public sector.

In this situation, organizations C and D were both looking for possibilities to save costs of doing business and on the other hand to reduce the problems inherent in the work activities, partly caused by the new re-organization of the activities and responsibilities. Tomkins (2001) notes that investment must earn the required rate of return for the risk attached to it and participants must feel that they are receiving a fair share of the expected profits before considering mutual investment. These things must be considered on a project-to-project basis before starting any mutual project. In addition, exchange of sensitive information (OBA) (Kajuter and Kulmala 2010) as well as a fair division of costs and benefits (Dekker 2003) are important things to consider before starting a mutual

project. CAMP implementation project was presented as relatively lightweight tool to be applied in terms of working hours needed from organizations' part. In addition, costs related to actual cost management project were considered small. Improvement initiatives brainstormed in the CAMP procedure would create the need for evaluating division of costs and benefits; this was thought to be done later when the nature of initiatives was clear and the preliminary plans for initiatives were created. However, both organizations were implicitly confident that division of costs and benefits would not become an issue.

Pressures to cut down costs as mentioned earlier were one influencing factor in the organizations' decision to start the mutual IOCM tool implementation project. Costs and work hours estimated for the project amounted to 3 and a half full working days for ca. 20 persons coming from the planned workshops, added with some minor time from preliminary survey and decision making. Actual calculations regarding the cost – benefit ratio on choosing to start the project were to researchers knowledge utilized in an arms' length decision influenced by the pressures to clarify the current situation and reduce existing costs in the new way of working.

7.1 Starting considerations

In an effort to address expectations coming from the municipality concerning efficiency boosts, quality related cost management tool was introduced into purchaser-provider interface. This point was raised in the second round of follow-up interviews once more. The CEO of organization C stated that "*the purpose for us in starting this project was to seek efficiency gains and make the work environment more functional in terms of problems encountered*." Aim of the project was to achieve cost reductions and identification of certain problem areas were joint activities had become unclear or work processes were causing different problems in the daily work. From the start, it was clear that organizations C and D wanted joint problem solving and mutual project to address these issues. This is highlighted by the comment in second round of interviews by the CEO of the organization C: "*we had some thoughts of possible problem areas beforehand, particularly from the mutual interface between us and the producer, which was the area we wanted to focus on in the first place*" This is in line with demands from the literature that when applying IOCM tools in the inter-organizational setting one should more actively involve both the supplier and the buyer in the joint reduction of costs to achieve improvements (Cooper and Slagmulder 2004, Coad and Cullen 2006, Mouritsen et al. 2001).

Tomkins (2001) argues that there is no apparent need for entirely new IOCM techniques to be introduced in inter-organizational setting; rather the larger context of networks must be taken into account when implementing such a tool in IOCM context. Although some arguments are offered in the literature, mainly relating to problems in achieving open-book accounting between the partners, thus leading to failure of the IOCM tool and the need for new tools

(Kulmala et al. 2007), this issue was not encountered in the case CD. Organizations agreed to share the needed information to each other, possibly for several reasons. First, organizations C and D were looking to achieve long-time relationship for the joint production of services required as expected by the municipality in the spirit of new re-organizing. Organizations C and D were the largest actors in the area concerning these services and thus any opportunistic behavior would severely hamper the ability of both organizations to perform their business as substitutes would be hard to find. Second, organizations had mutual contracts covering the production and purchasing of the services and although incomplete as the literature on the subject predicts (Williamson 1985, Anderson and Dekker 2010), it had an effect in reducing to some extent the uncertainty and appropriation concerns surrounding the relationship. Although the improvement process described in detail under chapter 6 required relatively little sensitive information concerning the costs of the organization, willingness to provide information on the discovered problems and areas of unclear activities were needed from both participants. Also, to quantify the discovered problems in monetary terms, certain amounts of cost data was requested from both organizations. This covered mainly certain overhead costs and hourly rates attributed to problems as illustrated in more detail under chapter 6. If the participants had been unwilling to part with any of this information, joint reduction of costs would have become problematic as Kulmala et al. (2007) demonstrate in their study. However, given the willingness to provide certain areas of inside information for the partner organization, the project could be started with the fixed cost reduction tool (Malmi et al. 2004).

Kajuter and Kulmala (2010) provide a classification of OBA information (table 4.1, p. 46) to estimate the amount of information and type of OBA used between organizations in mutual relationship. Using this classification, the information exchange that took place in case CD can be classified as follows:

The implementation of the IOCM tool in question took place in dyadic relationship, more precisely a type of supply chain classified as purchaser-provider split. The type of cost data shared in the process was actual in a sense, since overheads and certain other cost information as illustrated earlier were based on calculated data. However, certain cost elements were estimated during the tool's implementation process as the quantification of identified problems demanded in certain parts an estimate done by the group based on earlier experiences. Thus, type of cost data shared in the process was based on actual calculated overheads and other costs such as material costs etc, but calculations on the impact of quality related problems contain an estimate as to the amount of working hours lost or materials lost, for example. Therefore, adding to classification offered by Kajuter and Kulmala (2010), type of cost data revealed contained elements of both the actual costs and planned costs. Extent of disclosure was limited to problem data and associated costs, mainly hourly rates, included with overheads and some material costs. Information flow was agreed as two-way as both organizations were willing to provide the needed information for mutual analysis and cost reduction efforts. Finally, the use of OBA was based

on trust and the necessity arising from the need to cut costs through joint cooperation. The working of the cost tool illustrated here required openness on the part of problem areas identified in the organizations' interface and mutual operations. Although actual cost data was not needed for the first level of analysis, mutual comparison of the identified problem areas was achieved through monetary prioritization. However, improvement method as described in Malmi et al. (2004) was originally implemented with comparative importance of different problems prioritized through point-score heuristics, thus making it possible to implement in inter-organizational setting in a limited way with no real cost information sharing taking place. It should be noted that this somewhat restrains the possibilities achieved from the tool but in no way prevents it from functioning. Monetary prioritization used in the case CD deviated from that offered by Malmi et al. (2004) as the original tool contained the actual monetary quantification of the identified problems but was done at the end. In case CD, organizations wanted the problems ranked by their monetary value as focus was on the savings that could be achieved through reduction of these identified problems. Thus, working of the cost tool required limited type of OBA to work in full efficiency in case CD but it could have been implemented with no actual cost data as illustrated by Malmi et al. (2004). This way, actual costs would have been left for organizations to calculate independently and possibly without disclosing them to relationship partners. It must be noted, however, that certain amount of inside information not related to actual costs must be shared for this cost management tool to be applied in IOCM context. This disclosure of inside information to IOCM partners and its positive outcomes to cost management are noted by several researchers (Seal et al. 1999, Dekker 2003, Kajuter and Kulmala 2005).

7.2 Differences in implementation

CAMP – method as described by Malmi et al. (2004) is implemented in their setting at Valmet and Nokia, both project-based organizations. This is also the case in the organizations C and D. However, Malmi et al. (2004) concentrated on a single project at a time whereas case CD covered the entire operations of organizations C and D during the project. Several reasons can be noted. First, both of the organizations C and D are small when compared to Valmet or Nokia, thus making it possible to include sufficient amount of personnel in the IOCM project to cover entire operations and smaller scale makes it possible to analyze problems crossing individual project borders. Second, problems found in the case CD were not, for the most part, project specific as suggested by Malmi et al. (2004) but rather issues that were coming up on several separate projects. Third, team based work in case CD was organized to cover multiple projects as the same people were in charge of several projects and teams frequently crossed their work activities with other projects. This can be traced to coordination of work activities in organizations C and D, probably resulting from smaller scale

of activities. Fourth, difficulties expressed in Malmi et al. (2004) to quantify cross-border project problems didn't seem to rise in case CD. Participating employees had cross-border knowledge that allowed them to recognize issues that usually related to several different projects, thus making it possible to estimate costs without concern for project borders. These differences highlight, for the most part, context specific reasons arising from smaller scale of operations when comparing case organizations from Malmi et al. (2004) to case CD. The problem of quantifying cross-border project problems as illustrated by Malmi et al. (2004) did not arise in case CD and this was discovered in the middle of the implementation project, thus making it possible to quantify costs from problems crossing project borders. This change is related on the one hand to smaller scale, and on the other hand to different organization of work activities.

During implementation of the CAMP – method in case CD the tool's risk assessment was directed by the steering committee towards more improvement idea specific risk thinking when compared to the Malmi et al. (2004) COPQ related risk assessment. This change was agreed before improvement idea generation of the second workshop. Agreed change resulted in risks to be associated with different improvement ideas generated by CAMP. That is, every improvement initiative that participants came up with had to be estimated for the risks it contained for the partners. These risks involved considering the possibility that costs for realizing the initiative would be larger than expected, the risks for target problem not reduced or the risks of possible adverse outcomes illustrated in chapter 6; possible examples include adverse effects on work motivation or difficulties in getting the time for meetings. On comparison, Malmi et al. (2004) used risk assessment directed more towards different COPQ levels; that is, quality costs were estimated for different levels; high, low and medium. According probabilities were assigned to each level, thus arriving at EV calculations for COPQ. This change in case CD resulted from the desire to enrich the improvement initiatives with background information and help in prioritization of improvement projects. This change can be attributed to refinement of the improvement method and organization specific preferences. Another example of such changes is the composition of the preliminary quality survey. Whereas Malmi et al. (2004) incorporated the improvement initiative creation into the survey in Valmet case, in case CD survey was directed solely on the quality problems. This change resulted from the Valmet's desire to prevent negative thinking on the project start whereas organizations C and D were not concerned that negative thinking would arise from the identification of problems at project start.

One difference in the cases arose in the startup of case CD; composition of participants for the workshops held within CAMP was different in case CD when compared to Malmi et al. (2004). Whereas Malmi et al. (2004) had a clear-cut division of participants ranging from line workers in workshop 1 through middle management in workshop 2 to senior management in workshop 3, case CD was organized in less clear-cut way. It was agreed on project start that par-

ticipants selected for workshop 1 focusing on problems would be the same participants coming for second workshop aimed at brainstorming initiatives for improvement. However, third workshop aimed at quantifying identified problems in monetary values was agreed to comprise of specially selected middle management and quality knowledgeable personnel. Finally, fourth workshop for decision making and metrics was reserved to senior management in line with Malmi et al. (2004) illustration. These changes originate partly from the context of smaller organizations having less hierarchical levels and partly from the desire to keep the line personnel involved in improvement and creation of initiatives. Related to this change was the division of workshops from three different workshops held in Malmi et al. (2004) case to four different workshops held in case CD. This change resulted from the desire to seek more data for efficiency reasons. Quantification of identified problems and improvement initiatives were divided into two different workshops to allow for enough time to generate quality initiatives as well as go through all the identified problems in detail. This change can be attributed also to the pressures of both organizations in case CD to produce services for less resources and municipality's expectations for efficiency gains.

One important modification that is in line with Tomkins (2001) idea of using existing cost management techniques in IOCM context is the modification of the tool for IOCM context. Original version of CAMP was used in single organization setting and when moving into inter-organizational context, some modifications became apparent. The data gained from case organizations C and D had to be presented together and the problems found on both sides had to be analyzed in mutual workshops. This resulted in the presentation of pareto graphs (appendix) in both united graph and divided graphs for comparison. This resulted in network level problem classes as well as individual organizational problem classes. Another modification needed for this network context was the construction of fishbone diagrams in the manner that allowed both the purchaser's and the provider's problems to be presented in single graph (figure 6.1 appendix). This construction emerged in researcher's work phase to accommodate the need for mutual development and information sharing. This change illustrates and provides evidence on the Tomkins (2001) view that existing techniques can be successfully implemented in inter-organizational context although this larger context demands some context-related modifications to the tool being implemented.

Although actual data is different in several parts (for detailed discussion, see chapter 6 on case CD), one point is worthy of note: Malmi et al. (2004) generated 54 different improvement initiatives for senior management to go through, whereas case CD generated only 9 different initiatives in spite of longer time frame available for brainstorming. However, these 9 initiatives were very rich in detail and had risk assessment attached to them that covered expected costs incurred, possible adverse outcomes and risks attributed to implementation (chapter 6). One reason for this smaller amount of initiatives comes from the working methods of teams participating in workshops; teams

were trying to generate detailed solution ideas to problems that were already seen as high priority problems identified in workshop 1, thus leaving less important problems aside. This point is highlighted through workshop 4, in which senior management recognized the initiatives as high priority and accepted them all, although some were postponed to be implemented at later date and 2 of the initiatives were left without corresponding metric. Malmi et al. (2004) do not elaborate further on the composition of their improvement initiatives, thus making direct comparison impossible.

Although metrics construction was also included in the Malmi et al. (2004) CAMP plan, it was not followed through in the Valmet case. Reasons are not fully elaborated but Valmet seemed to be content on using old metrics system to follow up on the initiatives progress and results. Case CD however shows the construction of a metrics system (Chapter 6) for tracking of results from constructed initiatives. As organizations C and D had no existing metrics system, usage of old system was not an option. Moreover, organizations were interested in creating a possibility for tracking of costs through time as expressed in the steering committee. On follow-up interviews it became clear, however, that metrics system was incorporated only partially due to reasons discusses in more detail at chapter 6.

One major difference in cases is the focus on failure costs on case CD whereas Malmi et al. (2004) seem to try to capture entire COPQ within a specified project. This change of focus was initiated because organizations C and D wanted to seek direct efficiency gains through reduction of costs and on the other hand organizations had no clearly developed quality system allowing for in depth analysis of prevention and appraisal costs. Malmi et al. (2004) offer little accounting detail to show where their analysis has led them. This they note themselves, stating that they have been more interested in managerial action and change. This makes direct comparison of accounting information related to quality costs difficult.

Finally, one important difference is the way quality problems were prioritized. Malmi et al. (2004) used point-score rankings to prioritize quality problems at early phase, whereas case CD relied on monetary values in prioritization. The chosen method in case CD is in line with conventional quality literature based on monetary calculations as organizations C and D used the impact of problems on their cost structure as their prioritization base. This change was implemented to show the monetary values to participants for information purposes and efficiency seeking reasons.

Differences of the implementation process between Malmi et al. (2004) and project CD are summarized in table 7.1. These differences cover different stages of the improvement process and are related to different contextual factors.

Malmi et al. (2004)	Project CD
Implemented in project setting	Implemented organization wide
Organizational data	Network data
Hierarchical participation	Less hierarchical participation
Metrics system not implemented	Metrics system partially implemented
Abundance of initiatives	Few well detailed initiatives
Focus on entire COPQ	Focus on failure costs
Three stages of workshops	Four stages of workshops
Risk associated with COPQ	Risk associated with improvement projects
Point scores for prioritization	Monetary values for prioritization

TABLE 7.1 Summary of implementation differences

It has been suggested in the literature that network can be considered as blurring organizational boundaries and therefore increasing the size of the entity, ultimately resulting in larger entity (Chenhall 2003). This, in turn means that contextual variable of size may have larger impact on the tasks and processes of this entity. Also, network context causes certain changes in itself concerning the implementation of the cost management tool in mutual interface between two organizations; one of these direct influences of the network structure on the implementation of CAMP tool is the data handling demands that have been debated by Kulmala et al. (2007) and Tomkins (2001). When CAMP is implemented in interface between two or more organizations, certain amount of OBA is required to achieve mutual improvement through problem identification and prioritization. While disclosing such information between partners was never a difficult thing in case CD, it certainly may pose a problem in some instances as suggested by Kulmala et al. (2007). However, the network context in improvement causes the obtained data to be handled differently; it must be displayed in a manner that entails both organizations in a single display. This is required so that improvement initiatives and prioritization may be handled for both organizations with all the participants present. This last point gives raise to another change that is caused by the network context; both organizations have participants present through the improvement efforts, thus differing from situation where single organization has initiated an improvement effort. Resulting situation in dyadic setting has implications for cultural influences, open-book accounting and team-work success when employees from two organizations are mixed in groups for workshops. Network structure has been differentiated in this study from the size and structure as contextual variables in a way that allows analysis between network context and size and structure as general contextual variables (table 7.2). Research question 2 (Q2) is addressed in part by these findings; data must be presented in different way, participating organizations must be placed at simultaneous, mutual improvement efforts and certain inside information must be shared.

Size has an influence on the implementation of CAMP tool also outside the discussed network context. Most clearly size associated impact on the implementation process was the size of the organizations C and D causing the improvement process to be implemented organization wide. That is, in Malmi et al. (2004) case organizations were so large that improvement efforts had to be focused on a project-to-project basis. In comparison, cases C and D were small enough that organization-wide processes could be handled together, as discussed in more detail at the start of the chapter. While size affects both single-case initiatives as well as network initiatives for the consideration of either project-based implementation or organization wide implementation, it can also be argued that size as network variable has this effect; that is, if the total size of networked organizations is large enough, CAMP-project is forced to be implemented in project basis. This indicates that networked activities do increase the size of the considered entity as borders become blurred. Another change caused by the size of the organizations, although indirectly, is the size that has influence on the hierarchical structure of the organizations; both organizations C and D have relatively low levels of hierarchy when compared to organizations like Nokia and Valmet. This, in turn, causes the workshop participants to be selected in slightly different way. Both organizations were able to choose participants for themselves; both of the organizations decided that the line-workers, which were very knowledgeable of the processes across organizations, should attend both the workshops 1 and 2. This differs from the case of Malmi et al. (2004) were organizations had a clear-cut decision of putting line-workers at workshop 1 to indicate problems, middle-management for workshop 2 to brainstorm initiatives and finally top management to consider the options and make decisions. In case CD, line-workers consisted of people knowledgeable about organization-wide processes and team leaders with very informal ties to their teams. Thus, it became natural to include these blurred two levels of hierarchy at both workshops. Also, individual factors may have provided a context in which decisions were made; top management in both organizations ultimately decided the composition of participants for the workshops. These changes are other examples of changes in implementation that were considered at start and thus influenced the project at its starting phase (Q2).

One of the noted differences between CAMP application in network context and the Malmi et al. (2004) application in single organization setting is the implementation of the quality tracking metrics. Both cases share the fact that metrics system was not fully implemented, but differ in the degree that metrics were used. While Malmi et al. (2004) did not implement them in any way due to case organizations' willingness to continue with old metrics, in the case CD metrics were created and partly implemented. One of the possible reasons for total absence of metrics system implementation in Malmi et al. (2004) case is the existence of old metrics in case organizations. In case CD organizations did not have any quality related metrics in place. During follow-up interviews in case CD it became clear that metrics had not been fully implemented. CEO of the organization C told the researcher that the merger between municipal area and

the center county had been very taxing on the organizations. This merger had increased the responsibilities of both organizations in terms of work areas, new recruits and new tasks to complete. Organization C had also received new assets to be catalogued and this had been considered a very laborious task. These changes had happened near the end of the project CD and thus metrics system was left partly unimplemented. CEO of the organization C also told that they were planning to implement metrics in the near future when "*things about the merger had quieted down*". This is an example of environmental turbulence as contextual variable causing changes in project implementation. Possibilities of the environment to affect implementation of the cost management tool range from slight changes or delays to actual failure of the implementation project. In this case one part of the project, metrics system implementation, was delayed for organization C and only partly implemented in organization D.

In case CD, workshop participants comprising of employees from both organizations were working within mixed groups. This meant that every workshop team had members from both the purchaser as well as the provider. In brainstorming improvement initiatives for the problems found and validated in workshop 1, teams generated significantly less improvement initiatives than in the case of Malmi et al. (2004), totaling 9 initiatives. However, these initiatives were very detailed and rich in data as discussed in chapter 6. Thus, the time available for brainstorming initiatives was focused differently in the cases; it seems that in Malmi et al. (2004) teams developed rough guidelines on plenty of initiatives while in case CD teams were trying to develop initiatives that were planned in detail. It seems that in case CD teams had prior knowledge on the key issues hindering smooth work processes; after identifying key issues in workshop 1, participants were focusing their attention towards the most critical problem areas. Teams were working well together, despite the fact that they were comprised of personnel from different organizations. This is explained by the constant touch the work teams in both organizations were having with the members on the other organization, as well as cross-border project knowledge acquired through working on several projects throughout the year. Teams seemed to know what problems would require more immediate attention and thus could plan the initiatives in more detail without having to fear that initiatives would be rejected by top management. This is confirmed by later developments discussed in chapter 6 as all of the improvement initiatives were accepted by the top management steering group. More flat hierarchical structure and information flows between top management and line-workers coupled with the composition of teams having some middle management inside them could explain the knowledge of the key issues and needed improvements. Also, prior experience from the team based work in normal work routines explains the ease at which the workshop teams seemed to adapt to the situation of forming initiatives in groups, perhaps allowing for more detailed discussion. Thus, these differences could be traced to organizational structure as contextual variable, with only few hierarchical levels and team-based structure. Also, task composition consisted of cross-border project work.

This study observes differences between the treatment of quality costs in terms of improvement method; while in Malmi et al. (2004) they seem to try to capture entire COPQ in terms of the project they were focusing in, case CD was focused on identifying only failure costs and associated problems. While case CD captures entire operations of both organizations, it does so only on quality failures and their costs. While this may seem like a tradeoff between the scale of the improvement project and types of quality costs captured, actual reasons for this choice are varied; first, size of the organizations indeed may have had an influencing factor on the choice to focus only on failure costs. In this way, entire operations could be captured. Second, task composition as a technological variable in the case CD is such that preventive measures and inspection activities were relatively low on the purchaser's side. Purchasing organization was in charge of administration of assets as well as purchasing and planning of services from the provider. Provider, in turn, provided park- and street construction and maintenance services. While provider certainly had some inspection activities in place, preventive measures were more in ad hoc terms. There was no clear quality criteria established for preventive or appraisal activities. Third, Seokhin and Nakhai (2008) estimate that quality failures comprise 50% of all COPQ, while Omachonu et al. (2004) estimate it even higher, at 70%. This would suggest that failure costs would be most effective way to cut costs. In a steering committee meeting for the start of the project, it was decided by the steering committee that failure costs would be in focus. While researcher was prepared to focus on entire COPQ, it was seen also by the researcher as a rational choice to focus on the failure costs because of the non-established prevention and appraisal methods and estimated high amount of failure costs. Therefore, the focus on failure costs analyzed through contingency theory yields several results; individual factors played a certain role both from managements' as well as from the researchers' part. Task composition and organization of activities as technological contextual factors caused in part the focus on failure costs. Finally, size as a contextual variable may have had a relatively low impact as the inclusion of prevention and appraisal costs would make the scope of the project larger.

One of the noted differences in the implementation of the CAMP in project CD was the amount of workshops. This change was initiated by the researcher as it was evaluated that if the workshops for quantification for problems and brainstorming for initiatives would be combined, this would make a serious risk for obtaining insufficient data. Therefore, researcher suggested in the starting meeting for the steering group that workshops would be held separately, allowing enough time for generation of good quality improvement initiatives as well as creation of sufficient prioritization data. This was agreed by the steering group as their focus was on obtaining real results and efficiency through the improvement project. Therefore, as a contextual factor, amount of workshops is caused largely by individual factors, although NPM related efficiency seeking may also have a substantial role in convincing the management to deploy more working hours to improvement project.

Although point-score prioritization was tried as a starting point for problem evaluation, it was only used in phase 1 when problems were highlighted for workshop 2. Thus, after workshop 2, management decided to use monetary values for problem prioritization. After problems were quantified, subsequent improvement initiatives were prioritized according to costs their target problem was causing as well as costs or savings incurred by the initiative itself. This change is in line with conventional quality literature, although management decision to change prioritization base was probably largely due to more familiarity and efficiency related issues. Management put their attention to monetary values right after they were available, thus trying to achieve the most savings with least expenses. Although contingency theory might have relatively little to say about efficiency seeking, individual characteristics could be traced to this decision; management may feel more comfortable speaking the "money-language".

Finally, one noted difference is the handling of risk evaluations in cost tool implementation. Although Malmi et al. (2004) used risk evaluation in quantification of COPQ, this was deemed as unnecessary and too time consuming. It would have required employees to create three different COPQ levels for each problem, while considering the risk that the high-end or low-end risk for COPQ would actually realize. This choice was decided in the starting meeting with the steering group by negotiating with the management of both organizations how to proceed with different phases. Thus, this decision is merely reflecting individual choices and efficiency seeking drive that was present in the project.

Findings indicate that several contextual variables may have an impact on the implementation of the cost management tool in inter-organizational interface. Also, network is identified as a unique contextual variable that is further discussed in 7.1.3. Contextual variables vary in the way they influence the implementation project; some of the changes have been made in the start of the project, while others have happened along the way.

Empirical data on case CD suggests that differences to fixed method found in the literature can be attributed to several, different generic elements of context (Table 7.2). First, network context causes some modifications in the design of the tool to be used. In line with Tomkins' (2001) view, existing tool that is adapted from single organization setting needs to be modified to account for larger context. This means that data derived from the tool must be presented and analyzed with two or more participants' input at the same time. Also, two or more participants need to be placed at simultaneous, cooperative improvement and tool must be adapted to co-operative work taking place between participating organizations. Good examples presented in this study are the use of workshops for two organizations' participants at the same time and constructed joined pareto (appendix) and joined fishbone diagram (appendix). These modifications are needed for the cost reduction tool to function in the dyadic or larger setting, thus answering in part to research question 2 (Q2); data must be presented in different way, participating organizations must be placed at simulta-

neous, mutual improvement efforts and certain inside information must be shared.

Another type of difference between literature illustration and actual implementation of the tool comes from conventional contextual reasons; these include size, structure, technology, individual reasons and environment. These elements of context influence the implementation of the cost management tool at different phases of the project; some influence the starting phase of the project, thereby constructing the tool's implementation outline in certain way. Others influence the project while it is being carried out. This confirms suggestions in the literature (Krumwiede 1998, Anderson 1995) that different stages of implementation are affected by different contextual factors. Stages used in this study are pre-adoption stage consisting of decisions made about the implementation and adoption stage consisting of the actual process of implementation. Examples of changes initiated in the starting considerations of the case CD are the decision to capture entire operations, to focus on failure costs, to decide participants for the project and the amount of workshops. Examples of changes initiated during the project are the use of monetary values for prioritization, interruption in the implementation of metrics system as well as number and detail of initiatives.

Type of differences in CAMP implementation when compared to literature
Network context dependent modifications (size and structure)
- Participants from several organizations at joint coordination; network
- Data handling demands for fishbones and pareto; network
Organizational aspects (size and structure)
- Implemented organization wide instead of project based; size small enough
- Hierarchical structure causes differences in participation; less levels of hierarchy
- Few well detailed initiatives caused by team bases structure, levels of hierarchy and task composition of cross-border project work
Individual factors
- Internal handling of risk for projects; project risk estimated
- Managerial decisions on participants for workshops
- Four workshops instead of three; researcher and steering group agreed
- Monetary values for prioritization; researcher and steering group agreed
Environmental factors
- Metrics system only partially implemented; turbulence (merger)
Technology based factors
- Focus on failure costs; task composition holds little prevention & appraisal
- Task interdependence between organizations causes data display changes

TABLE 7.2 Contingency factors influencing IOCM tool implementation

7.3 Network as generic contextual variable

It has been suggested in the contingency literature that networks could be considered as an entity of larger size in terms of contextual impact (Chenhall 2003). Seeing the network in this way, network context would influence the implementation of any cost management method in terms of its size. This would influence, for example, the scope of the project; larger size would make it hard to capture entire operations in single improvement project while smaller size would make it possible. Recent article by Järvensivu and Möller (2009) seems to express similar views; they argue that management of value creation rests on similar requirements in both the inter- and intra-organizational settings. Thus operating in a network would make no difference: "planning is planning,

whether achieved through trust or authority" (Järvensivu and Möller 2009, p.657). While this seems to be partly true in light of presented findings, networks have some unique characteristics; they are formed of two or more independent organizations with mutual linkages. Interactions between organizations often develop into a type of supply-chain partnerships with an implied sense of sharing in knowledge, decision-making and rewards (Tomkins 2001). While these partnerships do blur the boundaries between organizations as suggested by Chenhall (2003), as Tomkins notes, accounting analyses for two or more organizations need to capture effects through at least two organizations. These organizations might have different structures, different sizes, different task compositions as well as different control mechanisms. Environment as contextual variable would probably be the same for organizations working within a mutual network, however even this might not be the case if organizations would be situated in entirely different areas. (Figure 7.2)

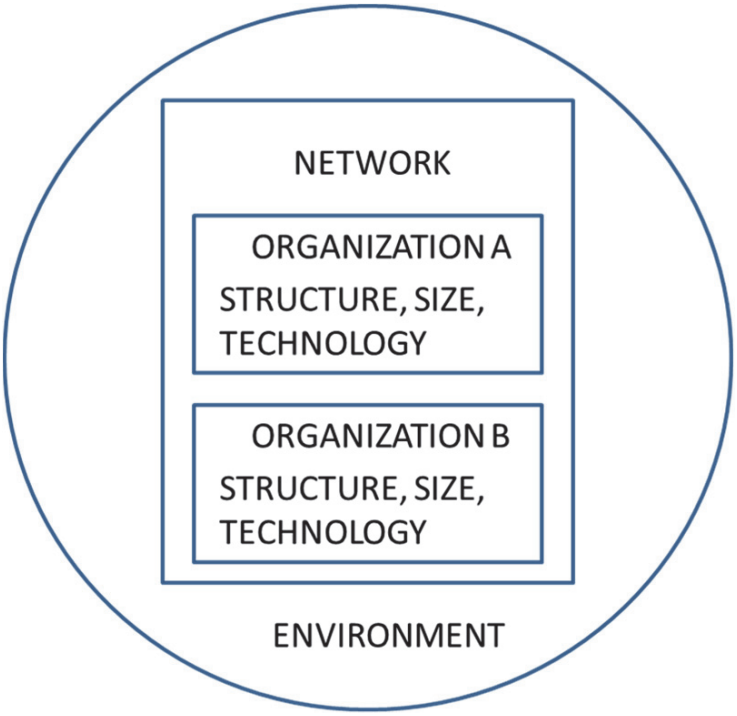

FIGURE 7.2 Generic contingency elements and network

While clearly affecting mutual improvement efforts because of its size, networks have other, unique effects on the improvement method being initiated. Like Tomkins (2001) notes, mutual partnerships have an implied sense of sharing in knowledge, decision-making and rewards. When this fails there is a chance the entire implementation project fails. (Kulmala et al. 2007) Also, this study finds that networks have a few, clear effects on the mutual cost

management method; network context forces two or more organizations into mutual improvement, thereby causing people from different organizations to be working together for common goals. This might have implications for work efficiency, information sharing or cultural conflicts. Another clear impact of network context on improvement efforts is the handling of data. Data must be accommodated to display two or more organizations in single presentation. While in some cases this would not present any real changes, in others it does. This study presents a new model for displaying cause- and effect relationships and presents a combined pareto diagram (chapter 6). Therefore, this study proposes the network to be treated as a more generic contextual variable which, in turn, is influenced by the environmental context and containing differing structures and sizes within participating organizations.

7.4 Improvement initiatives, trust, and sharing of costs and benefits

During the implementation of CAMP tool in the dyadic interface of purchaser and the provider, 9 different improvement initiatives were created. These initiatives were rich in detail and were considered from various perspectives, such as the problem they addressed, needed resources for the initiative to be carried through, associated risks and the plan for its completion. Improvement initiatives were by their nature plans that affected both organizations and addressed some mutual problem. These problems were linked to incomplete contracting, coordination problems, information asymmetries and control of work activities.

In line with TCE, it is too costly to try to capture all possible situations in contracts, thus leaving them incomplete and in some cases, open to interpretation. This, in turn, leaves contracting organizations open to possible opportunistic behavior by the partner (Williamson 1985, Anderson and Dekker 2010). Appropriation concerns give raise to the problem of fair distribution of costs and benefits; suggested initiatives from CAMP are expected to enhance efficiency by lowering costs caused by the addressed problem. These savings must be distributed between participating organizations (Dekker (2003). Organizations must feel that they are receiving a fair share of the benefits before they are willing to invest in an initiative with costs and risks involved. Finally, asset specificity is a possible factor influencing the willingness to contribute resources for such an initiative. If investment has little or no alternate uses, risks involved in the initiative get higher as investment has no value outside relationship. Tomkins (2001) continues that before considering asset specificity or appropriation concerns on committing resources to an initiative, one must first calculate whether it actually produces benefits over estimated costs. One feature of the improved initiatives discussed here is that they are already thought of as containing enough benefits to outweigh the costs. This is one possible reason for

differences noted earlier on the amount of initiatives in CAMP implementations of Malmi et al. (2004) and case CD.

Problems and corresponding solutions concerning incomplete contracts can be noted directly on two of the initiatives. These two initiatives focused on the problem of insufficient information on contracts. This problem affected several persons in both organizations that should have been more knowledgeable about the contracts. Problem was exemplified in uncertainty about quality standards and their level. This affected daily work and caused numerous queries to be made on the work results. It is further elaborated by the comment of the provider's representative "*Purchaser does not distribute needed information for us*". Unexpected extra works were coming up outside contracted work, causing more negotiations. While the actual improvement of having "information meetings" and distributing information had no substantive costs, any asset specificity or appropriation concerns to consider, the problem itself is an example of information asymmetries causing high transaction costs in terms of lost time and re-negotiations.

Another example of problem-initiative pairs that are linked to the problem of incomplete contracts are seen in schedule overruns and extra works. Both are the result of incomplete contracts as present contracts did not cover all the possible outcomes nor needed extra works on the site. This was seen by the participants to partly exist because of the failures in contract negotiations, partly because of the impossibility of defining perfect contracts. Information flow was also seen as problematic; on several occasions reports were not done or documentation was missing. This issue existed because of the time consuming workload it presented. As a way to cut these costs due to information asymmetries and high transaction costs from re-negotiations participants offered new reporting system that would enforce proper reporting and documentation on the site as well as better schedule control through more accurate use of resources. Costs involving new reporting system were estimated to arise from work hours directed towards reporting and documentation; these costs were attributed to purchaser's site managers through reporting hours used and purchaser's representatives through needed documentation efforts. As for better and more accurate use of resources, costs were seen as very little and it was stated that the planning required could be done on existing meetings.

Another interesting improvement initiative and its further developments that sheds light on transaction cost issues on present dyadic setting is the installment of GPS tracking system on providers' heavy equipment that is discussed in more detail at chapter 6. The initial problem was centered on insufficient reporting affecting both organizations as there was no readily available information on work progress for provider's own internal control or purchaser's control on the order's fulfillment. Both organizations considered the initiative to be very useful as the provider would be able to utilize it in its own internal reports as well as tracking its own subcontractors' work progress and the purchaser could track the fulfillment of its own orders from the provider. However, while actual benefits outweighed the costs from the installment, it

was not clear at the start who would benefit the most and thus how the costs would be distributed. The software and associated equipment would be used and operated by the purchaser, but the real-time tracking information would be available also to the purchaser. After follow-up interviews made two years after initiative was first created it became clear that the purchaser had agreed to fund half of the project while provider would pay for the other half. It seems that thorough negotiation process and precise calculations to verify exact percents of the benefit / cost ratio were thought of having higher transaction costs than the decision to fund it evenly. At the same time, this exemplifies the build-up of trust between organizations as noted by the CEO of the provider: "*this can be seen in many things. Cooperative spirit in the meetings is definitely different, trust issues are no longer that relevant and there is general consensus on PPM interface*". The decision to half the costs and fund the project together can be seen as an expression of such general consensus. While the initial problem reflects the costs caused by information asymmetries and following problems with their associated costs, the actual solution is an example of division of costs and benefits and the impact of heightened trust and sense of collaboration between organizational partners.

Finally, one major initiative presented in the workshops was the solution for outdated asset register. This problem concerned both organizations, although in different ways. Purchaser's asset register was highly outdated and this was reflected in purchaser's possibilities to plan its work activities. As the purchaser had no clear picture of all their assets at the time, work orders could not be on some occasions delivered early. This resulted in extra works that the producer deemed to be outside contracts. Costs were considered to be fairly large as the updating of the asset register was seen to take a very high amount of work hours. However, during follow-up interviews it became clear that provider had not funded this initiative as it was left for the purchaser to find personnel for this task. Purchaser had deemed it important to complete its asset register so that it had full knowledge of its own assets. Also, the new merger had increased the purchaser's asset base and thus made it even more important. At the time of the follow-up interviews the task was still running and register was been updated. This was considered to take substantive, although an indeterminate amount of time.

On terms of cost structure, lighter side of the initiatives is represented by two projects; construction of customer service center and increased cooperation by mutual meetings. These initiatives concern both the purchaser and the provider as calls and queries were coming to wrong persons on both organizations and coordination between both sides concerned mutual meetings. Both initiatives were considered to use very little extra resources as service center could be constructed with existing resources and proper work coordination; also better organization of work activities through mutual meetings was considered to be achievable through regular meetings. Thus, division of costs or benefits was not considered problematic; merely through collaboration and better coordination certain costs could be lowered.

On the issue of trust, although preliminary survey indicated that provider experienced some trust issues at the start of the case CD towards the purchaser while purchaser did not experience these issues, this did not seem to affect mutual co-operation and work in workshops. This can be seen in the coordinated initiatives achieved through the case CD as well as handling of the initiatives and their implementations. Latter point was discovered in the follow-up interviews. Also, the comment of the provider's CEO on trust verifies that trust had been built up during the increased time working together and probably in some parts through the mutual cost management project depicted here.

Several of the issues deemed to be more important ones are centered on the issue of incomplete contracts and problems it has generated. These problems were taken into focus on several initiatives and follow-up interviews confirm that most improvement initiatives linked to these problems were either implemented or were going to be. As metrics were constructed but used only partly, level of total failure costs after initiatives remains a mystery. However, follow-up interviews indicate that metrics and their implementation are still deemed as topical. CEO of the purchaser commented that "*these things we have done are still considered important and metrics are going to be taken under new evaluation once this merger is complete*".

In answering research problem P5 on the division of costs and benefits, associated transaction costs are divided based on mutual trust and notion of long-term partnership. Partners are willing to invest in improvement initiatives even in situation where they themselves are not main users of improvement application. At the same time, costs are in some cases relatively small compared to organizational size and therefore transaction cost calculations are more easily done by so called "arm's length" decisions and investment decisions are easier to direct towards trust building and mutual partnership.

7.5 Applicability of the CAMP model in other settings

In the following, contextual factors identified earlier and their influence on the generalizability of the tool in other settings is considered. Also, the notion of successful implementation on different levels is considered. Finally, these areas are considered together to form the basis for evaluating applicability of the CAMP tool in other settings.

7.5.1 Contextual factors and generalizability

The CAMP model and its application depicted here is different from the one presented in the literature (Malmi et al. 2004) on several parts. It has been shown that these differences have happened on both the pre-adoption as well as the adoption stage of the implementation process. Several contextual causes for these changes have been highlighted; individual reasons, technological reasons, organizational reasons and environmental reasons. Also, a unique

contextual element of network setting has caused some of the changes from literature version for the tool depicted here. Changes brought by the network context place employees from two organizations into simultaneous improvement work at the same table. While demanding cultural compliance and work organization efforts by the employees themselves, it provides an opportunity for problem solving and data generation crossing organizational boundaries. Also, data handling demands enter the equation when tool that is previously used in single organization setting is introduced into dyadic setting. One influencing factor is the presence of open-book accounting. If organizations are willing to disclose information for the tool to be used, data must still be handled from both organizations in unison and presented together. Thus, a different kind of fishbone diagram was needed and fishbone diagram for purchaser-provider split was introduced (figure 7.1). Pareto diagram presented earlier was also affected as problem groups were shown in both unified presentation and separate presentation, thus making comparison possible. While contextual elements vary when moving from organization to organization and from dyadic setting to another, contextual element of network, particularly the dyadic setting, has similar implications for any dyadic setting considering the implementation of the tool depicted here. When introducing the tool in any dyadic setting, information obtained must still be granted the permission to be shown for both parties and identified problems must still be presented in single presentation for unified improvement. Thus, presented fishbone diagram for dyadic setting (figure 7.1) is a needed construct in the dyadic implementation of the CAMP-model. Also, employees from both parties must still participate in the improvement process. Thus, these changes can be argued to be constant in any dyadic setting implementing the tool depicted here.

While studying a similar setting of public sector purchaser-provider split would reduce the risk of differing contextual influence on the implementation process, the impact of non-network related contextual elements (see chapter 7.2) in other dyadic settings would have to be verified in future studies. However, certain things can be said about the contextual elements of structure and size; first, size can be argued to be an influencing factor that has similar implications in other dyadic settings. That is, if the dyadic pair forms a sufficiently small pair, entire operations may be handled with single project. Other noteworthy implication concerning organizational structure is the matter of project based work. If work activities are organized in project-type work, knowledge of the employees participating in the improvement process must be cross-border project knowledge. Otherwise, problems presented in Malmi et al. (2004) may materialize as employees are not capable of identifying and solving problems touching multiple projects. So, either cross-border project knowledge or organization of work activities in process-based manner is also needed to capture entire operations in single improvement project. That is, if the work is organized into different projects, employees need the cross-border knowledge to effectively improve multiple projects; otherwise improvement work may not be completed covering

entire operations. If, however, activities are organized into process work, employees may have the knowledge needed to improve entire process.

Also, a structural organization of hierarchy, which is partly influenced by organizational size, will probably have the same effect on other studies. If organizations are formed with only few levels of hierarchy, then the needed knowledge for process improvement and decisional authority is not as clear-cut as in larger organizations holding multiple levels of vertical hierarchy. For example, if teams are formed in a way that project leadership is integrated in the working teams as in case CD, the decisional authority and knowledge of the shop-floor problems is situated inside the work teams. This, in turn, leads to same teams being appointed to both workshops 1 and 2. Also, if organizational size is small enough to include only few project leaders, it would not be practical to form the workshop 2 only from project leaders.

Other contextual variables may influence the implementation process in different ways, differing between separate research projects. Environmental turbulence or uncertainty may affect the implementation process in more dramatic ways; certain unforeseen events may cause the process to be halted, rejected or shape it into new form. Krumwiede (1998) provides some possible points of rejection in the implementation process; first possible rejection spot for tool implementation happens in the initiation phase. In the initiation phase organization may consider implementing the tool but reject the idea. Another phase is the analysis phase where after implementing the tool it is considered but rejected. Labro and Tuomela (2003) offer similar rejection spots in their consideration of the tools' application to the organizational life. They offer four rejection spots; rejection before considering implementation, rejection after consideration, rejection after unsuccessful implementation and "tried once but not actually used" which may be considered a rejection after analysis in Krumwiede's (1998) classification. Environmental uncertainty may affect the implementation process at any stage with variable outcomes; for example in case CD the unanticipated merger of the municipalities put things in motion which resulted in new responsibilities to both organizations, new areas to cover and new employees to be trained. This, in turn, resulted in constructed metrics to be left aside for future evaluation until things had quieted concerning the merger. This unanticipated environmental influence halted the metrics implementation in the case CD. Likewise, it can be argued that environmental uncertainty may play a part in rejecting or shaping an implementation process at any stage.

Use of monetary values for prioritization and focus on failure costs can be argued through quality literature; use of monetary values for quality costs is in line with conventional quality literature and failure costs have been shown to be highest single class of quality costs. (Omachonu et al. 2004). However, individual reasons, both researcher's, employees' as well as management's play a part in deciding the way problems are prioritized and the way costs are taken into account. In these changes the influence of the researcher is also visible as it was rationalized to management in the steering committee meeting that failure

costs are generally deemed to be highest class of quality costs and the approach is in line with conventional quality literature. Failure costs were thus seen by the management to be fitting base for prioritization. Monetary values were also chosen by the management. Another change in the implementation process was the number of workshops. This, too, was agreed on the preliminary steering committee meeting as the organizations involved were ready to invest time needed to carry through four different workshops. This change was suggested by the researcher and approved by the management on both sides as the aim was to gather more data and hence increase internal validity as well as improve chances of getting sufficient amount and detail of improvement initiatives for the management to consider. Labro and Tuomela (2003) show that in interventionist case studies, which also describes the study depicted here, it is even desirable to have the researcher's influence in some parts were his knowledge of the research area furthers the goal of the study. For example, Labro and Tuomela (2003) describe a case study were the researcher went as far as to design the actual model to be tested in the case organization.

Finally, when considering the treatment of risk or the amount of initiatives, individual reasons may affect how they are taken into account. Management may want to consider risks involved in improvement initiatives, focus their attention into evaluation of quality costs or perhaps include both. In the case CD the former was selected as the evaluation of quality costs were kept simple and efficient. The risk involved in improvement initiatives is linked to the amount of data produced by the teams. Although in case CD teams produced only 9 different initiatives, in Malmi et al. (2004) they produced 54 different initiatives. However, the produced 9 initiatives were very thoroughly considered and rich in detail. Individual reasons play a part in shaping the data gathered from organization as well as its composition. Also, the workings of two organizations and team cohesion may influence the results achieved. It is difficult to predict what the results from different study would be in terms of data amount and composition.

Tomkins (2001) argues that single-organizational tools can be used in dyadic or network contexts, if this larger context is taken into account. However, some conflicting arguments exist; Kulmala et al. (2007) argue that difficulties in enclosing sensitive cost data may lead to problems in implementing old, single-organizational tools in larger context. Hence they argue for the need for new tools. Also, research on cost management tools conducted in single organization setting (Anderson 1995, Anderson and Young 1999, Anderson et al. 2002) have found that when implementing a cost management tool, contextual and implementation process factors seem to correlate with perceptions on the cost management tool effectiveness.

The network context influences the implementation process in dyadic setting on data handling demands and organizational participation as discussed earlier. In addition, the open-book accounting must be achieved at least in problem data for CAMP tool to function in dyadic setting. Of the discussed contextual elements none inhibit the implementation process, although the form of the

resulting tool may vary between different dyadic settings. One exception is the environmental uncertainty which may stop the project due to unforeseen events taking place.

7.5.2 Implementation success

There has been some debate on the subject of implementation as to what extent can an implementation process be considered successful (Anderson and Young 1999, Malmi 1997). While both mentioned papers demand that data is more precise than what organizations had before, Malmi (1997) argues that in some instances implementation that doesn't lead to further action may be considered successful if the data received from the new tool indicates no need for further action.

Thus, these authors differ on the views about the usage of the data. While Anderson and Young (1999) demand that the obtained data is actually used in the organizations involved, Malmi (1997) argues that if the results seem to indicate no need for further action, this phase is not actually needed. This study offers one specification to debate mentioned. CAMP project and its success can be evaluated with three dimensional model; the analyzing stage, the cost management stage and the cost management effectiveness evaluation (Figure 7.3). In this way, success of the project is analyzed in terms of information obtained, its impact on cost management and finally, the tracking of results obtained from cost management decisions.

When reflecting on the success of the improvement project labeled here as the case CD, several points may be raised on the analysis phase; first, this study generated arguably more data than the organizations had before. Resulting classifications and problems along with their improvement initiatives were a rich addition to organizations' knowledge base. Second, the process of describing and brainstorming existing issues does the work of transforming tacit knowledge about problems into explicit descriptions. As the employees go through their work-encountered problems and describe them in detail, assisted by the tool's ability to transform them into diagrams and presentations, data becomes more precise. Third, when creating quality cost information in the absence of any pre-existing information, it can be argued that information that is obtained is an addition.

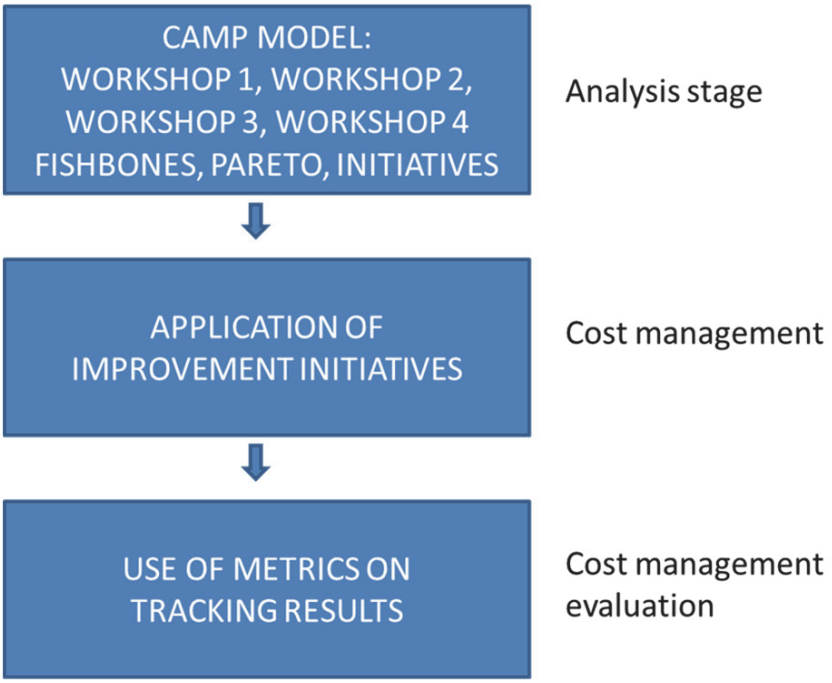

FIGURE 7.3 CAMP tool implementation success model

Thereby, case CD generated clearly more data than organizations had before and following the mentioned reasoning, it can be argued to be more precise. This fulfills the data requirements presented by both Malmi (1997) as well as Anderson and Young (1999). Although Malmi (1997) doesn't seem to be as strict on the demands for data use, Anderson and Young (1999) insist that data must be acted upon in some way. This leads the reasoning into cost management phase in figure 7.3.

Cost management is defined as an application of management accounting concepts, methods of data collection, analysis and presentation in order to provide the information needed to plan, monitor and control costs (CIMA 2005) Verbeeten (2010) has studied cost management practices in the public sector at Netherlands and he notes that previous NPM developments have placed more emphasis on different cost management systems in the public sector. He argues that although cost management methods should help managers in reducing costs his findings indicate that cost management is mainly used for accountability reasons rather than managerial decisions. He also notes that Netherlands has a Nordic style of public management. However, this study conducted in Finnish public sector provides evidence on the contrary; cost management project provided information on the costs and classes of different work related problems as well as initiatives to address these found problems. This had the aim of reducing costs as well as making the work more problem-free. As the CEO of the organization C stated in the second round of follow-up interviews: "*the pur-*

pose for us in starting this project was to seek efficiency gains and make the work environment more functional in terms of problems encountered." Also, the constructed improvement initiatives totaling 9 different projects were all carried out in the organizations C and D. This provides evidence on actual use of cost management information to reduce costs through action by implementing solutions found. It should also be noted that prioritization of problems was also conducted in the project and costs attributed to different problems had their part in this process. Similar results have been shown by Arnaboldi and Lapsley (2005) in terms of using cost-related information to decision making. It can be argued that cost management was conducted in full concerning the information provided by the project CD. This is evident in the actual realization of all the improvement initiatives generated after problem prioritization. Therefore, it can be argued that cost management was implemented and resulted in applied phase in the project CD aftermath.

Project CD generated metrics to track down quality related costs as well as to allow for tracking the impact of the improvement initiatives in terms of problems encountered in the work environment. These metrics were devised to track the amount of extra work, schedule overruns, reporting protocol deviations, delayed sites and number of meetings. Metrics are discussed in more detail in chapter 6.2.5. These metrics are the final stage of improvement project CD as the project started from the analysis stage where all the needed information on quality problems, related costs attributed to problems, improvement initiatives as well as the metrics are constructed. The cost management phase entails the actual cost management that is conducted through the application of improvement initiatives as an example of information use for cost management purposes. Finally, the use of metrics is the actual cost management evaluation where the impact of improvement initiatives is evaluated. This phase was affected partially by the municipal merger as discussed in chapter 6.2.5 in detail. In the first round of follow-up interviews it became clear that almost none of the metrics had been implemented. However, CEO of the organization C expressed interest in coming back to metrics once the change processes started by merger had been completed. In the second round of interviews it was revealed that organization C had implemented the metrics on extra work as well as on the schedules. CEO and construction manager both agreed that also maintenance program would be evaluated in the near future when mobile devices needed for it would be available. Organization D implemented metrics on extra works but left other metrics unimplemented. Therefore, it may be stated that cost management evaluation was only partially implemented and more so in organization C. Actual data on the progress of costs and quality problems remains unachieved due to time related constraints as data would be available only in the near future and only on the implemented metrics. Construction manager of the organization C commented however, that due to improvement initiatives the amount of extra work "might be somewhat diminished" when she commented that "*on the amount of extra works, I m not entirely sure, but I feel that there is a slight decrease in them. They do remain a problem, however*". This might provide a slight indication on the impact of the cost management actions.

However, the cost management evaluation stage can be said to be only partially successful and mainly in the organization C. Therefore, success of the project CD and its impact considered together provide some points on the overall success of the implementation considered in comparison to points raised by Anderson and Young (1999) and Malmi (1997);

First, data provided by analysis stage can be argued to be richer as well as more precise. Second, data has clearly produced notable cost management actions as all the improvement initiatives were eventually carried out. The impact of cost management efforts remains to be validated as only part of the metrics were implemented by second round of follow-up interviews and data from them was not available at the time. In line with demands from aforementioned authors, data has been generated and it can be argued to be an addition to organizations' knowledge base. Data has produced cost management actions, in other words, managerial action has resulted from the data. In these terms, project CD and its impact can be considered a success, although as a limitation, the effectiveness of the improvement initiatives cannot be shown at this time.

To sum up, results indicated the need for improvement on several areas as discussed in the chapter 6. The need for improvement was addressed through 9 different improvement initiatives, all of which were accepted in the final steering committee meeting. In the follow-up interviews the work done on initiatives was confirmed. Although municipal merger analyzed here through contingency theory stopped the implementation of generated metrics for a while, initiatives were either completed or in the process at the time of the follow-up interviews. Project CD generated clear actions from both organizations towards improvement and as indicated by the CEO of the organization D, was directly contributing towards the building of trust while CEO of the organization C was interested in developing metrics further. Therefore, it can be argued that project CD was a successful project.

7.5.3 Applicability of the CAMP tool in other settings

Applicability of the CAMP tool to other settings is influenced by several factors; first, successful implementation in project CD encourages further IOCM efforts although results of this study are confined to particular setting. Tomkins (2001) maintained that a cost management tool that had been developed for use at single organization setting could be transferred to network settings, given that the larger context would be taken into account. Skeptical view was offered by Kulmala et al. (2007) who noted that particularly problems in open book accounting might set an obstacle for such transfer. However, success of the CAMP implementation in project CD does seem to validate Tomkins' (2001) view that cost management tools are transferable to network settings, at least in dyadic form. Second point follows that open book accounting which is needed for mutual cost management efforts might be more easily achieved at the public sector, where recent developments and cost saving demands in the wake of NPM have put more pressure to public sector organizations for mutual cost saving schemes. Also, many dyadic pairs in the public sector are former organizational

units that are separated in the recent NPM reforms into purchasing and producing sides. Thus, they may be more inclined to share information than their private counterparts. Third, contextual reasons may either inhibit or influence the implementation of cost management tool in dyadic setting. Results of this study indicate that cost management tools develop during implementation, particularly when moving from single organization setting into dyadic setting. While there were many changes ranging from minor modifications into larger changes, none seem to inhibit the implementation of the CAMP tool into dyadic setting. Exception to this might result in some settings due to unforeseen events caused by environmental context. This is exemplified by the metrics system left for further review in the case CD. Also, tool does require at least sharing of problem data to be implemented in dyadic setting. Other contextual elements may change the tool implemented in different setting in comparison to result obtained here as discussed earlier. Fourth, network as a contextual element presented in this study changes the implementation process of the cost management tool in two ways; it requires two or more sets of data to be handled together, as both organizations contribute to data pool. Also, employees of both organizations need to be united in common improvement efforts. Although these changes are verified only for the CAMP tool presented in this study, it is probable that any two-way cost management efforts (Mouritsen et al. 2001, Cooper and Slagmulder 2004, Caglio and Ditillo 2008) would need the same changes.

7.6 Stages of implementation and weak market test

Another point of interest regarding the implementation process is whether the implemented tool has passed the rejection points as suggested by Krumwiede (1998) and Labro & Tuomela (2003). Finally, weak market test as introduced by Kasanen et al. (1993) and elaborated by Labro and Tuomela (2003) offers a chance to evaluate whether the tool has passed the implementation process into actual use. In the following, these issues will be considered along the applicability of the implemented tool in other dyadic settings.

As discussed earlier in more detail, different authors have separated the implementation process of a management tool into different phases. This has been justified because of the notion that different contingent factors influence different phases of the implementation process. Most rigorous classification of different stages is offered by Krumwiede (1998) where the implementation is separated into 10 different stages. From a different point of view, Labro and Tuomela (2003) separate the implementation process into 8 different stages. Their focus is on the notion of market test and whether the implemented tool passes this usage test. Also Cooper and Zmud (1990) have separated the implementation process into different stages. They use 6 different stages of implementation. They differ from Krumwiede (1998) in that they only consider phases after initiation of implementation whereas Krumwiede considers three

stages of non-adoption and transition phase from non-adoption to adoption. All of these views have in common the idea of an integrated system in the most extreme end of usage. This means that the tool reaches a repetitive, ongoing status. While it is possible to use CAMP tool depicted here on an ongoing basis, it is neither practical nor cost-efficient to conduct repetitive workshops after the project data has been gathered and analyzed. However, if successful, generated metrics will be used in an ongoing basis and may reach an ongoing state of usage in the organizations. In the case CD depicted here, metrics were not fully implemented but were mostly put on hold until merger between municipalities was complete. Thus, no part of the process CD reached any ongoing state as an improvement process although some of the metrics were implemented in case organizations at various stages. However, it should be noted that this was never the aim of the project, excluding the metrics part of the process. CAMP tool is meant to be used as problem identification and quality cost calculation technique that further points out possible ways to improve processes and correct failures. Next, an evaluation of the CAMP tool in relation to Cooper and Zmud (1990) and Labro and Tuomela (2003) implementation stages is offered.

Considering the non-implementation stages of Krumwiede (1998), it is sufficient to state that the CAMP tool was implemented at least to a certain degree considered here. Krumwiede (1998) and Cooper and Zmud (1990) model both share similar implementation phases, although Krumwiede (1998) calls the last state of infusion as integration phase. The latter description is chosen in this study to reflect the notion of integrating the tool into constant use in organizations involved. Also considered here is the Labro and Tuomela (2003) model that explores the extent of the tool's usage within the organization in relation to weak market test. As in Krumwiede (1998), excluded from the Labro and Tuomela model are the phases of non-adoption as the point here is to analyze the phases after initiation. Combining the mentioned models and their mutual relations then takes the form of figure 7.4. On the left side, Labro and Tuomela (2003) stages of usage are depicted in relation to Cooper and Zmud (1990) stages of implementation on the middle. Cooper and Zmud model also contain the spots for possible rejection of the tool in initiation phase or abandoning of the implementation efforts in the analysis phase. When comparing the Labro and Tuomela (2003) model into Cooper and Zmud (1990) mode, certain similarities can be noted. The definition of "tried once but not actually used" in Labro and Tuomela seems to refer to abandoning the implementation after initial adoption and analysis. "used once" refers to tool being used once without taking any ongoing form in the organizations involved. Starting from there, usage of the tool increases through ad hoc usage to regular use, either in parallel with the old system or replacing the old system. The ongoing use of the tool in Labro and Tuomela (2003) model is similar to phases of routinization and integration in the Cooper and Zmud (1990) model. In the Cooper and Zmud model, acceptance marks the commitment of the organizational members to use of the application and its results. Routinization marks the usage of the tool in the organization as a normal activity while in the integration phase the tool is used in

integrated manner to support organizational work. Therefore, regular or ad hoc use of the tool in Labro and Tuomela (2003) model is comparable to routinization and integration phases of the Cooper and Zmud (1990) model.

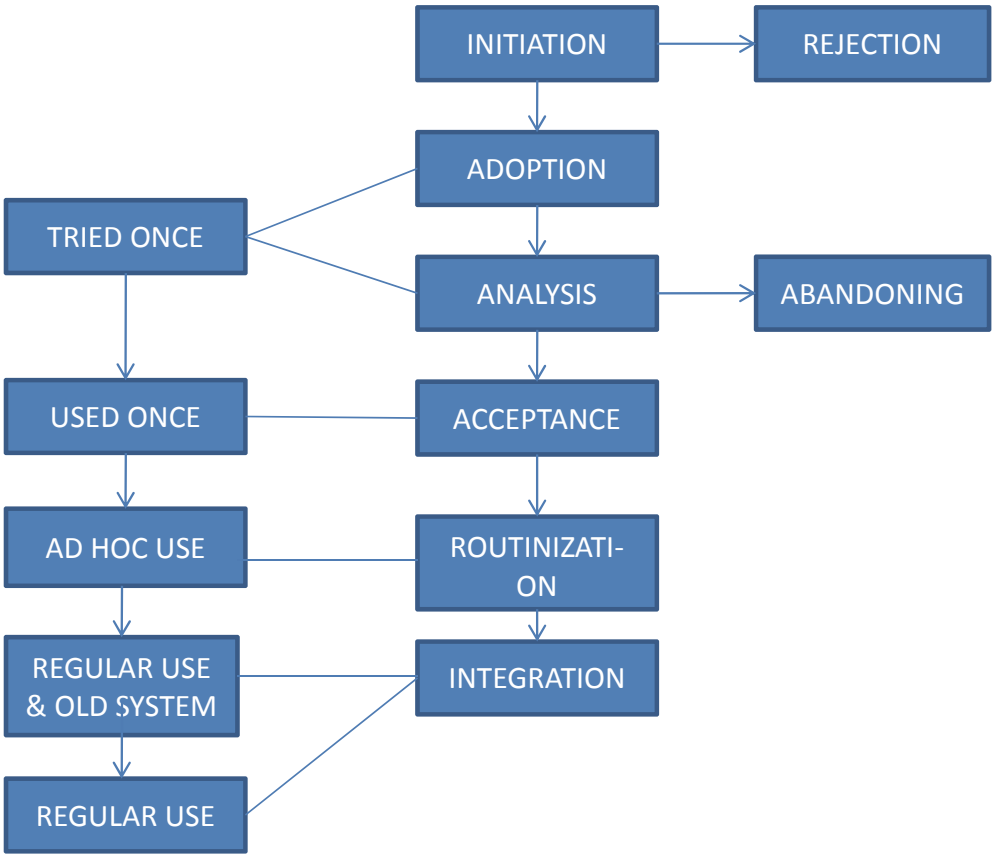

FIGURE 7.4 Different stages of implementation (integrated from Labro & Tuomela 2003, Krumwiede 1998 and Cooper & Zmud 1990)

Analysis of the project CD in relation to figure 7.3 can be started at the initiation phase. After presenting the CAMP tool and its outline to management of the both organizations C and D, a consideration of the tool's implementation started at both organizations. Excluding Krumwiede's (1998) pre-adoption stages, this marks the first possibility to abandon the tool without committing any resources to its implementation. However, after considerations, CEOs of both organizations decided to devote resources to implementation of the CAMP tool. This marks the passing of adoption phase, which in the Cooper and Zmud (1990) model is described as the investment of resources towards implementation efforts. In the analysis phase, application is developed and installed. In this phase the tool becomes available for use in the organization. The empirical pro-

ject of CD is mainly situated in this phase. The results of the project CD were analyzed and if they had been deemed as unnecessary or unfit, this would have resulted in the abandoning of the project. This would be similar to Labro and Tuomela (2003) category of "tried once but not actually used". However, results of the project were agreed upon on the final steering group committee meeting and improvement initiatives were all accepted for completion. The actual completion of initiatives was verified in the follow-up interviews. Thus, the CAMP tool in project CD was accepted and used once. After this stage, both the Labro & Tuomela (2003) model as well as Cooper & Zmud (1990) model proceed into routinization and integration phases were the tool becomes more or less constantly used. The CAMP tool depicted here does not pass into these phases with the exception of few metrics. Rather, it passes the acceptance phase of the Cooper & Zmud (1990) model and becomes used once as in Labro and Tuomela (2003) model.

The aim of the project CD was not to become a constantly used application in the organizational life, but rather provide organizations involved with quality cost data that is linked to problems found in their working processes and finally provide improvement initiatives to address these issues. Only part of the tool aimed for constant use was the metrics system which was put on hold in the organizations due to unforeseen events discussed earlier taking place. It can be noted that CEO of the organization C expressed interest in the follow-up interviews to pursue the application of metrics once the merger and the upheaval caused by it had quieted down and last set of follow-up interviews confirmed that few metrics had been implemented and some were going to be implemented in the near future. Thus, metrics developed in the case CD may achieve a ad hoc usage status as mentioned by Labro and Tuomela (2003). They argue that the first phase to pass the weak market test for the tool can be the "used once" category. Although the weak market test gets stronger if the tool goes to constant use in the organizations, they state that if the tool initiates notable actions, even if used only once, it can be considered as passing the weak market test. The application of the CAMP tool in the purchaser-provider interface was completed in the project CD depicted in this study. The results of the project were accepted and used in both organizations as confirmed in the follow-up interviews. As discussed in chapter 6, all improvement initiatives were eventually accepted and implemented as part of cost management efforts. Also, CEO of the organization D stated that trust between partners had increased as a result of the project, thereby directly contributing towards their mutual work efforts. Thus, new reality created by the construct as expressed by Labro and Tuomela (2003) can be noted on several areas; first, the rich data obtained through workshops and survey added into organizational knowledge base, also fulfilling the criteria of Malmi (1997) for successful implementation. Second, tool's results in the form of improvement initiatives were accepted and used in a wide scale. That is, every initiative was accepted for completion. Thus, improvement initiatives were accepted, resulting in action as demanded by Anderson and Young (1999). Third, mutual trust between organizations C and D was heightened as a

result of the project, thereby changing the reality through the construct. Therefore, it is argued that the CAMP application in this study passes the weak market test.

7.7 Role of the public sector

This study has been conducted in the context of public sector organizations working within a purchaser-provider model. In addition to contextual factors offered earlier, some points may be raised concerning the public sector and its impact on the study and its results:

Concerning the open-book accounting that was discussed earlier, there is a possibility that public sector organizations, PPM organizations in particular, have more ease in disclosing information to their partners. There are at least two possible reasons; first, many organization working within PPM relationship are former organizational units separated into purchasing and the producing side. Second, public sector organizations might be more open concerning their information exchange. For example, many public organizations provide information outwards relatively easily; i.e. annual turnover or budget was available for organizations C and D in their web pages.

Another discussion worthy of note is the stakeholder differences between private companies and public sector organizations. First of all, although PPM organizations are generally independent organizations with their own decisional authority, county or municipality has a say in their decision-making. This is applied through direct interventions as well as through funding (figure 3.1). Also, customers that are using the services provided by PPM pair are usually not paying for the service directly. Rather, citizens pay taxes and comparable payments to government and the municipality, which in turn provides funding to purchasing organization. Thus, public sector organizations face a different stakeholder environment and their differing influence on the work environment when compared to private ones. More detailed discussion on the consequences of these stakeholder differences are outside the scope of this study and its data.

One of the contextual elements directly concerning this study is the application of IOCM tool in public sector context. Lately, public sector organizations have been applying private sector tools in the wake of NPM reforms conducted in the public sector. This trend has been studied through IOCM only a short time. Thus, there has been relatively little research efforts conducted on the debate central to this study; whether the tools used in private and single organizations are applicable in totally different context of public sector dyadic pairs. One point of interest concerning future trends is the remark by CEO of the organization C during second round of follow-up interviews "*I believe we are going towards privatization and in the coming future these organizations are more subjected towards market forces, just like the private companies*". Whether this is the case, time will tell. In any case, public sector organizations have been working in different political and structural environment when compared to private organizations.

This study has mapped some contextual factors that have caused changes to cost tool's application when moving from single organization setting towards networked activities, while at the same time also making transition from private sector companies towards public ones.

8 CONCLUDING DISCUSSION

This chapter provides the discussion based on the findings described earlier as well as the contribution of this study. Also, conclusions drawn from the findings discussed are presented along with assessment of the study and future directions.

8.1 Contribution and discussion

This research contributes to literature in several ways; first area of contribution is the theory refinement (Keating 1995) concerning an existing quality cost management tool. This was achieved by implementing the tool previously presented in single organization setting (Malmi et al. 2004) in a new context of purchaser-provider dyadic relationship. Contingency variables influencing the implementation of the tool in a new context were explored. The stages of implementation were divided according to Krumwiede (1998) into pre-adoption and adoption stages so that differences between contingency variables according to implementation stage could emerge. Contingency variables were classified according to contingency literature (see Burns and Stalker 1961, Woodward 1965, Lawrence and Lorsch 1967, Chenhall 2003) into organizational aspects of size and structure, individual factors, environmental factors and technology based factors. Also, network was proposed as a generic contextual factor replacing the idea of networks as merely units of larger size (Chenhall 2003). In this study, it was found that networks have certain individual characteristics that clearly differentiate them from organizations of similar size. While partnerships typically blur the boundaries of organizations to some extent, organizations involved will still have different internal structures, control mechanisms and size. Therefore, it was proposed that networks be considered as a generic contextual element in its own right (figure 7.2). This implies that when implementing a cost management tool in networks, certain effects arise from the network context. Network context forces two or more organizations into mutual improvement,

thereby joining personnel from two organizations with possibly different values, culture, structure and working methods, into same table. Also, data handling is affected in CAMP network improvement so that data must be accommodated to display two or more organizations in a single presentation. To achieve this, new model was constructed to display cause- and effect relationships and pareto diagrams in a combined presentation (chapter 6).

There were also other contingency variables distinguished from networks influencing the implementation of the CAMP tool in a new context, starting with size and structure. It was implied that after crossing a certain threshold in size, it becomes unfeasible to capture entire operations in a single improvement project (Malmi et al. 2004). However, this threshold was not reached in case CD because both organizations combined together formed sufficiently small entity. Thus, entire operations of both organizations were explored in case CD. Organizational levels of hierarchy, that is, organizational structure was found to influence the implementation of a CAMP tool in dyadic setting. Due to low amount of hierarchical levels, improvement efforts were attended by both ground floor workers and medium management in mixed groups. Ultimate decision making power was still retained by the top management. The implication is that in smaller organizations with less hierarchical levels improvement efforts may be captured in whole and improvement efforts themselves are achieved with more input from the ground floor.

It was also found that individual factors, both caused by the researcher as well as the management had an effect on the implementation project. These influences ranged from risk evaluation of improvement projects and amount of workshops to prioritization of improvement projects with monetary values.

An example of environmental influence was experienced when the coming merger between neighboring municipalities forced organizations to postpone the implementation of the constructed metrics (table 6.1) to later date. Finally, technological aspects were influencing through task composition to focus on failure costs incurred from the identified problems. Organizations had relatively few prevention and appraisal measures in place and incurred quality costs from these areas were hard to obtain. Also, purchaser's tasks contained by nature very few prevention or appraisal measures.

Contribution from the CAMP implementation was broadened to include the consideration of the success of the implementation (Anderson and Young 1999, Malmi 1997) as well as applicability of the refined model and its market test (Labro and Tuomela 2003). While Anderson and Young (1999) argued that a project may be considered successful if it provides new data and the data is actually acted upon, Malmi (1997) argued that also projects that provide new data but fail to lead into action may be considered successful in certain cases. An example was given where new data confirms that status quo is the most feasible plan of action. Project CD generated arguably more data into both organizations' data bases in the form of constructed initiatives, problem data consisting of cause- and effect chains, quality cost information and constructed tracking metrics. Also, it can be argued that it is an extension of existing knowledge base

of the organizations. Improvement initiatives are also an example of actions that are implemented because of the newly available data as all of the initiatives were eventually implemented. The project itself was separated into analyzing stage, cost management stage and cost evaluation stage (figure 7.3). Success of these stages was considered separately, thus forming a new model for success evaluation of the cost management project. While cost management is defined as an application of management accounting concepts, methods of data collection, analysis and presentation in order to provide the information to plan, monitor and control costs (CIMA 2005), there were some arguments in the literature that cost management methods are mainly used for accountability reasons in the public sector rather than actual managerial decisions (Verbeeten 2010). This project provided evidence on the contrary by gathering information and forming initiatives in the analysis stage of the given model, carrying out cost management decisions in the cost management phase and finally constructing metrics to track results of the cost management efforts in cost evaluation phase. However, due to environmental turbulence as unexpected contextual influence, the metrics were not fully introduced. Rather, organization C had implemented four out of five from the metrics at the time of the second follow-up interviews while organization D had only implemented metrics on extra work. Thus, while two first stages of the model can be considered successful, cost evaluation stage was only partially successful in terms of weak market test provided by Labro and Tuomela (2003). The analysis and the cost management efforts, however, pass the weak market test according to Labro and Tuomela (2003). The efforts depicted here fall under the category "used once" in their categorization, thus entering the zone where the construction can be deemed as having passed the weak market test. Applicability of the refined CAMP model was explored; Tomkins' (2001) view that existing tools can be used in network setting was validated at least in relation to CAMP tool. The requirement for OBA was deemed relatively light but still necessary; organizations must share certain inside information for CAMP tool to work in dyadic setting. Successful implementation of the CAMP tool encourages further efforts to implement cost management tools in IOCM setting.

This research explicates existing tool (Malmi et al. 2004) as currently conceptualized in the literature (Dekker 2003). Debate provoked by Zimmermann (2001) was addressed in 2009 by Malmi and Granlund. To answer Zimmerman's (2001) demands for knowledge generation and practical relevance for management accounting, Malmi and Granlund (2009) proposed a need to express practical solutions in organizational environment. Implementing a tool previously introduced in the literature (Malmi et al. 2004) into new context of dyadic relationship serves to test the tool's boundaries and further refines theory (Keating 1995) concerning the tool. This theory refinement concerning the implementation of the cost management tool into IOCM interface forms the main contribution of this study.

According to Lukka (2000), constructive studies may provide contribution by two different ways; they can provide a construction that is novel and serves

to present a new means for achieving certain end. Another option is to further develop or refine a theory (Keating 1995). Although this study followed an interventionist action research methodology, this study also offers a construction presented in the chapter six (table 6.1). While the main contribution of this study comes from theory refinement as presented in line with Keating (1995), secondary contribution of this study arises from construction of quality cost metrics to track quality failure costs and their progress after implementing improvement initiatives detailed in chapter six.

Metrics were developed to track quality failure costs incurred from the problems that had improvement initiatives generated for them. In total, five different metrics were generated for the mutual interface of the organizations C and D (Table 6.1). These were amount of extra work activities, maintenance schedule timeliness, deviations from reporting protocol, number of site delays and meetings per year. These five metrics comprise a matching entity; a problem is defined, a solution is generated and finally a metric is placed to track the results from the solution. Of the initiatives, all were carried out, although asset list updating was still going on at the time of the second follow-up interview and was expected to be finished during the year 2012. Of the metrics, four were implemented at various stages in organization C and only metric on extra works were implemented in organization D. There were no results available for the researcher concerning the actual progress of the monetary costs from the metrics as they had been implemented after the case CD had ended and were yet to produce any substantial amount of information. During the second round of follow-up interviews in organization C, it was, however, told that the amount of extra works which was tracked for the longest time, showed slight improvement. While the construction of the metrics and their relation to problems and improvement initiatives is complete and can be deemed successfully created, the metrics can only be partially deemed to pass the weak market test. This is more evident in the organization C which showed more interest in the actual measures and their results as confirmed in both rounds of follow-up interviews.

Third area of contribution arises from the use of TCE coupled with trust to explore division of costs and benefits incurred from the improvement project CD between case organizations. Although the amount of information gained from TCE and trust in relation to CAMP tool is smaller when compared to information obtained with contingency theory, certain insights were gained illustrating the relation of trust and management control as well as the influence of TCE.

Traditional transaction cost economics considered trust to be merely calculated risk (Williamson 1985). Since then, authors have focused on the notion of trust to complete the predictions of TCE (eg. Dekker 2003). Another movement from traditional TCE is the consideration of the so called hybrid form. Originally TCE predicted that organizations would choose the form of business from pure market orientation or vertical integration depending on the transaction costs incurred (Williamson 1985). Since then, authors have began to investigate

the hybrid forms of governance that are situated somewhere in between of the two extremes (eg. Cooper and Slagmulder 2004). This research is an illustration of such a case; traditional TCE is complemented with the notion of trust in an effort to gain insight into division of profits and costs in a hybrid governance structure.

Improvement initiatives generated in the case CD demonstrate the impact of trust in decisions concerning whether to carry out the generated improvement. Transaction costs calculation determine if the initiative is viable in the first place; this was estimated through workshop calculations for every initiative, thus guaranteeing a starting point for comparison and prioritization. This leaves for consideration how the costs and benefits incurred from the initiative are to be divided between partners? In the preliminary survey conducted in the case organizations it was found out that the provider had several concerns and issues with trust in regards to the purchaser. Purchaser, on the other hand had no such concerns. By carrying out the improvement project together, trust had been building up between partners. Also, working together, as governed by mutual contracts, has had a positive influence on trust. This is verified by the comment of the provider's CEO during follow up interviews conducted two years after the project had ended (see chapter 6). Caglio and Ditillo (2008) note that earlier literature on inter-organizational cost accounting systems have had hard time to explain the notion of trust between partners. This is attributed to the type of research done on the field, particularly of the one-sided perspective to cost management. When studying inter-organizational phenomena, one cannot capture the notion of trust as easily if the focus is solely on one subject.

During the follow-up interviews the division of costs and benefits and the impact of trust was illustrated; good example among the initiatives is the implementation of GPS project where the provider had the equipment installed and used the system for tracking its work progress and vehicles throughout the municipal area. System was also used to track provider's own subcontractors and was the basis for compensation negotiations. Purchaser was directed an information feed from the system, and although purchaser used the system in lesser extent, it had agreed to fund half of the project for provider. After doing work together and conducting the project CD, such decisions were possible. This is tied to debate on whether trust is a substitute for control or rather a complementary factor merely increasing the amount of total control (Lindenberg 2000, Van der Meer-Kooistra and Vosselman 2000, Tomkins 2001, Kamminga and Van der Meer-Kooistra 2007).

Lindenberg (2000) argues that trust and management control are complementary and management control stimulates building of trust and vice versa. This position holds that more trust does not mean less control but rather more effective control. In contrasting view, Kamminga and Van der Meer-Kooistra (2007) offer results that seem to indicate trust being a possible substitute for strict management control. Additionally, Van der Meer-Kooistra and Vosselman (2000) offer similar results. Chiles and McMacking (1996) argue that when trust in a relationship is sufficient, transactional parties tend to make lower es-

timation of appropriation risk and therefore need for complex contracts or calculations for them are decreased. This is highlighted by the GPS example given. Findings from this research suggest that trust tends to build up by doing together and over time trust substitutes strict management and contractual control to some extent.

Primary research question was presented as:

P1: Can the tools aimed at cost reductions in single organization setting be used in dyadic settings?

As noted earlier, this question is tied to discussion on the possibilities of using an existing cost management tool such as target costing (Cooper and Slagmulder 2004, Carr and Ng 1995, Mouritsen et al. 2001), value chain analysis (Dekker 2003) or total cost of ownership (Wouters et al. 2005) in wider setting of dyadic relationship or networks. Also, there has been debate on the possibilities of using such tools in IOCM setting as Kulmala et al. (2007) have expressed doubts on the willingness of organizational partners to disclose needed information to mutual cost management initiatives. In contrasting view, Tomkins (2001) has expressed an opinion that existing IOCM tools are transferable to larger context as networks and their implications could be relatively straightforward. However, IOCM tools have been studied mainly on the perspective of the focal firm and existing evidence on the mutual management of costs is scarce (Cooper and Slagmulder 2004, Mouritsen et al. 2001, Caglio and Ditillo 2008).

This research has implemented the illustrated quality cost management tool called CAMP successfully, as argued earlier, into purchaser-provider interface, thus providing an answer to the main research problem. Purchaser-provider model illustrated in this study is a type of supply chain approach that has some differences largely attributable to public sector perspective. Organizations depicted here have certain responsibilities towards a public service provision, are in some parts answerable to municipality, provide their services to citizens of the municipality, obtain their funds through public funding and their mutual relationship is governed with contracts partly influenced by the municipality. Taking into account these differences it can be said that the IOCM tool in question can be introduced into dyadic interface when organizational relationship context is similar to purchaser-provider model. Many-to-many or one-to-many approaches involving more than two organizations and thus forming a larger network are outside the scope of this study and require further research. However, dyadic relationships that do not fall under strict definition of purchaser-provider split have certain similarities in spite of differences presented. All dyadic partners operate and are governed through mutual contracts and involve only the two organizations when excluding outside stakeholders. Thus, one important prerequisite for tool's IOCM implementation regarding the disclosing of sensitive information can be approached similarly. That is, although

future research should confirm it, implication is that the tool presented here can be implemented in any dyadic relationship if certain needed information is shared and possible modifications are done. Successful implementation of CAMP in dyadic setting offers a managerial implication: co-operative efforts to reduce costs in supply chain or purchaser-provider split can be achieved through the use of existing methods. Thus, there is no apparent need for entirely new cost management techniques for the dyadic settings.

Dekker (2003) states that one avenue of contribution is the conceptualization of certain tool in current literature. This research further refines theory (Keating 1995) concerning cost management tool labeled CAMP and expressed earlier in the literature in Malmi et al. (2004). It illustrates the use of CAMP – method in larger context and provides information on the needed accounting information and changes originating from larger context, thus providing a conceptualization of the tool in larger context. This extension is directly related to demands expressed by Malmi and Granlund (2009) to make management accounting research more relevant by explicating and extending existing research through actual use and practice of theoretical models.

Finally, Otley (1980) presents a model for contingency research that requires a study using contingency theory to define contingency variables, make hypotheses concerning their impact on organizational processes, define the accounting system being studied and finally, make at least an attempt to measure the effectiveness of the new accounting system. As an example of these four requirements he gives technology and environment as contingent variables, impact of the variables on organizational shape or centralization and definition of technical or behavioral aspects of the accounting system being implemented. Attempt to measure effectiveness must be understood in the context of the organizations and the system being implemented. Otley (1980) argued that at the time of his article, very few studies had incorporated all the four elements in any contingency theory based study. In this study, contingency variables influencing the implementation of the CAMP tool in dyadic setting were identified. These were grouped into pre-adoption and adoption phases to allow for comparison between stages. The contingency variables were classified into environmental factors, individual factors, technology based factors, organization specific factors and the proposed network context. The influence of the variables on the implementation process were explored and defined as presented in chapter 7. The management accounting tool labeled CAMP was defined and presented through its technical aspects, first in chapter 4 as a model, then in chapter 6 through case description. Finally, measurement of the effectiveness of the new design was implemented in the form of metrics, although these were only partially implemented, implying a slight decrease in the amount of extra works. Also, as found in the follow-up interviews, the amount of trust had been heightened to a level where it was no longer considered an issue.

8.2 Conclusions

This research generates its results based on the gathered data, analysis of the data through theoretical framework illustrated in chapter 5 and interpretation of the results. Gathered data and the follow-up interviews indicate that trust substitutes control to some extent as has been illustrated with improvement initiatives as well as through build-up of trust over time as expressed in the first round of follow-up interviews. This finding is in line with previous studies of Kamminga and Van der Meer-Kooistra (2007) and Van der Meer-Kooistra and Vosselman (2000). Also, Chiles and McMacking (1996) have found similar results to this study in arguing that building of trust seems to lower the estimated appropriation risk and reduce the need for complex contracts or calculations. This indicates that certain transaction costs attached to decision on initiative can be overlooked if the trust is reasonably high between partners and the transaction costs are fairly low in relation to organizational size and scale. Also, this research avoids the problem of looking at trust through one-way perspective which is prevalent in much of the IOCM literature (Caglio and Ditillo 2008).

This research has gathered data from two case organizations working within purchaser-provider setting. When looking at the gathered data, one can see certain differences taking place when compared to earlier literature on single-organization settings (Table 6.1). These differences happen at the very start of the project as well as along the way. Also, larger context places demands on the applied tool; two organizations need to participate in mutual improvement, data must be displayed to present both organizations and certain inside information must be shared. These findings indicate that although certain amount of inside information is needed to generate results for cost management, it does not require extensive amount of data. Information on the inside processes and related problems are needed however to achieve mutual improvement initiatives. This study does not find problems indicated in Kulmala et al. (2007) but rather verifies Tomkins' (2001) assumptions on the possibilities of using existing tools in larger context.

Dekker (2003) has stated that contribution arises from explicating existing tool as currently conceptualized in the literature. Although focused at achieving practical relevance, similar demands have been expressed by Malmi and Granlund (2009). This research has implemented a cost reduction tool into dyadic interface with earlier discussed modifications, thus explicating the tool in larger context.

The cost management tool depicted here, labeled as CAMP, can be implemented into larger context of dyadic setting. This encourages further efforts to implement IOCM tools into network settings, both dyadic and many-to-many. Implication is that it is not mandatory to develop new techniques for cost management in networks, rather certain contextual elements must be considered. These contextual elements differ between the phases of the implementation, that is, between pre-adoption and adoption stages.

Success may be evaluated for the project according to Malmi (1997) and Anderson Young (1999). However, more complex model offered here makes it possible to analyze every stage of the cost management effort separately. That is, project analysis stage may be conducted successfully (Malmi 1997), cost management may be conducted successfully (Anderson and Young 1999) but the cost evaluation stage may not be deemed entirely successful. This is the situation in case CD.

The CAMP tool can be utilized according to principles given in this study at other purchaser-provider relationships, although certain contextual elements mainly associated with structure, technology and size may differ and the final outcome of the implementation may differ from the influence of these elements. Network variable is expected to influence implementation similarly in any dyadic setting.

Finally, some comments on the quality side of improvement can be offered. The amount of quality failure costs found on this study seem to be relatively low when compared to earlier literature (Seokjin and Nakhai 2008, Gryna et al. 2007, Krishnan 2006). Similar results to this study have been found, however (Omachonu et al. 2004). Low amount of quality failure costs found can possibly be caused by the decision to leave certain external failure costs outside. For example, customer dissatisfaction and its long-term results were not considered in the workshops as dissatisfaction is not easily measurable or estimated.

8.3 Assessment

In the following pages, issues concerning the relevancy of the research, as well as points about validity and reliability are raised. Finally, also generalizability of the results are explored.

8.3.1 Relevance

There has been numerous demands to focus on IOCM through mutual cooperation (Mouritsen et al. 2001, Cooper and Slagmulder 2004) as at present focus has been largely on the point of view of the focal firm (Mouritsen et al. 2001, Cooper and Slagmulder 2004). Tomkins (2001) has also expressed doubts as to actual use of IOCM in network or dyadic settings. Malmi and Granlund (2009) have expressed concern that management accounting is losing its relevancy and thus stated the need for explicating existing management tools and on the other hand trying them in larger context. This research does both of these. Also, as target costing has been the main method used in IOCM literature (Mouritsen et al. 2001), this research adds to the literature a novel approach by introducing a cost management tool with quality emphasis.

This study contributes to literature in several ways. First, it explicates existing tool (Malmi et al. 2004) as currently conceptualized in the literature (Dekker 2003). Secondly, it provides new information on the usage of IOCM to joint

reduction of costs, thus answering demands to focus on mutual cooperation (Mouritsen et al. 2001, Cooper and Slagmulder 2004, Coad and Cullen 2006) in place of one-way implementation and provides evidence on the actual use of IOCM as doubted by Tomkins (2001). It also addressed debate on the applicability of single-organization cost management tools in IOCM context (Kulmala et al. 2007, Tomkins 2001). This research also provides a proposition of network as a generic contextual variable influencing the implementation of a cost management tool. Literature on the success of the implementation is added with a more refined, case-sensitive version of evaluation model for the success of management cost accounting tool.

8.3.2 Validity

Validity refers to the question whether research measures what was originally intended. This research focused on the actual use of cost management tool specified earlier, introducing it in a larger context. Aim was to find if the tool was applicable to larger context and if so, what the needed changes were on pre-adoption stage and on the other hand, changes occurring in the adoption stage. Also, this research aimed to find out what kind of sensitive data was needed to carry out the improvement project. One factor influencing validity of data is the time frame of research. Although project CD time frame can be considered fairly short, data gathered through the research project contains preliminary survey done in organizations C and D. Also, two sets of follow-up interviews were done two years as well as three years after project had ended, thus increasing validity of the research. Research and data gathering methods were derived from the theoretical grounds presented in (Malmi et al. 2004), thus allowing for direct comparison and increasing validity.

Data for this study is gathered trough triangulation of methods as typical for qualitative case study (Eisenhardt and Graebner 2007, Jönsson and Lukka 2005, Malmi and Granlund 2009), using qualitative survey, workshop material, observation and follow-up interviews. This helps to counter the threats to validity by using multiple methods (McKinnon 1988, Malmi and Granlund 2009). Survey results are also analyzed through Ishikawas (1985) pareto diagram, which can be thought of as an quantitative analysis tool. This combination of qualitative and quantitative analysis enhances the data validity as noted by Eisenhardt (1989) as well as Morgan and Smircich (1980).

Eisenhardt (1989) observes that triangulation of data sources serves to strengthen the findings of the study as patterns from one data source can be corroborated by the evidence from another, thus making the findings more grounded in empirical data. This is achieved in the study by using a questionnaire to start the improvement project, observations during the workshop periods coupled with written data received from the workshops and finally concluded with the data collection by follow-up interviews done after the improvement projects are ended.

Also, the nature of CAMP model is such that research findings are fed back to the members of the organization for validation multiple times. This is

done after workshop phase has ended and possible changes to acquired data are made at the start of the next workshop. As Otley (1980) notes, close contact with the organizations and feedback of the findings to research subjects serves to enhance validity of the findings.

8.3.3 Reliability

Reseach reliability deals with possibilities of obtaining similar results through repetition of the research. Although every case is a unique construct, case could be replicated in similar settings. This would require a supply-chain approach, preferably a purchaser-provider setting. Also, as research was done in public organizations, this research is replicable more directly on the public organizations. One factor influencing research reliability is the influence of the researcher. Although this research is done as an action research, where researcher has a role in the improvement project, this role is deliberately left as only a small influencing factor. This is achieved through the researcher's role being left rather as an observer after the working methods have been introduced to the improvement project. Thus, validity of the research for measuring what was intended is strengthened and reliability is improved. However, certain issues remain when conducting action research through fixed process improvement method. These issues are mainly connected to the introduction of the working methods and whether researcher's influence affects the reliability of the research. Although actual organizational names and certain cost data are hidden, process problems and costs attributed to problems are presented, thus allowing for comparison to possible future research projects.

Certain modifications to the introduced cost management tool were done in the project start-up. While some of the changes had been introduced by the management of the steering group, certain smaller changes have elements introduced by the researcher. These are discussed in more detail at chapter 7. The change for the amount of workshops was introduced by the researcher to increase the available time for problem quantification and initiative brainstorming. While it may be argued that interference of the researcher in the process decreases reliability, in this case it is easily replicable with new settings testing this study. Also, while decreasing reliability of the study for this pointed variable, the change increased the available data, thus making the study more reliable on other parts as the amount of time for data collection was extended. Another discussed change was the use of monetary values for prioritization. This change originated from the organizations' members and was also rationalized by the researcher. Thus, observation was made that the change was more in line with conventional quality literature. The change of focusing into failure costs was influenced by several things. Firstly, task composition on the purchaser's side was such that it had no earlier appraisal or prevention methods in place. Second, failure costs were anticipated by the researcher to be the single largest group of quality costs. Finally, organizations wanted to focus on the costs of doing things wrong as highlighted in the second round of follow-up interview in the organization C.

In the interventionist research, there always remains a question of researcher's interference in the organizational life, whether deliberate or unintended. It is always in question whether another researcher would achieve exactly the same results in any given qualitative study. However, in terms of qualitative, interventionist case study, it is argued that this research does not create unnecessary concerns for reliability.

8.3.4 Generalizability

Lukka and Kasanen (1995) argue that although case studies are typically thought of as having difficulties in obtaining generalizable results, the same goes for statistical studies. Reason for this is that both types of research rely on inductive reasoning and therefore researcher can never be sure if the reasoning holds true to general population as is the case in deductive approach. In case studies the usage of statistical inference is compensated by large theoretical or practical relevance to research subject, thorough analysis and interpretation and triangulation of research methods. The relevance has been argued earlier in this paper and supported by demands presented by several researchers (Dekker 2003, Malmi and Granlund 2009, Mouritsen et al. 2001, Cooper and Slagmulder 2004, Tomkins 2001, Kulmala et al. 2007). Research depicted here uses triangulation of research methods for obtaining data consisting of survey, interviews, observation and document data obtained from various sources such as workshops, organizational databases and public information. Analysis is carried out in several stages allowing for very rich presentation and thorough analysis of the obtained data.

Lukka and Kasanen (1995) point out that there are three contrasting views on the generalizability of the case studies; the one that denies altogether the possibility of generalizing in case studies as statistical reasoning cannot be carried out, the one that denies rationale of generalizing because it represents modernism and finally the one that moderates these views by stating that properly conducted case studies can produce generalizable results. Lukka and Kasanen (1995) argue that generalization to a reasonable extent is possible from a properly conducted case study. This generalizability can be realized in a number of ways; to build an argument that the substantial results of a case study hold true for other cases, the transfer of some kind of structural similarity to other cases, to describe certain phenomena in widely valid manner or identification of real mechanisms which function as tendencies in the production of phenomena. Although this research does not aim to produce highly transferable results over wide variety of case settings, there are certain arguments towards generalization from this research; it is anticipated that the process of implementing a depicted CAMP model into purchaser-provider interface could be reproduced at other purchaser-provider type relationships and it is anticipated that the process could be replicated at other dyadic relationships willing to disclose process failure information to partners. It is also anticipated that CAMP model can be implemented in other dyadic relationships as well, if the prerequisite of process information sharing is achieved. In implementing the depicted

tool in many-to-many or one-to-many networks the applicability of tool needs to be tested in future research.

Finally, contingency research poses a challenge to qualitative case study. It is clear that statistical generalization of the contingency variables is impossible in qualitative case study. However, this research does not aim for such generalization, rather it searches for case-specific contingency factors influencing the cost tool implementation and proposes a generic contingency factor to be tested in future research. As Chenhall (2003) notes, the creation of propositions and variables for quantitative contingency research is best done through qualitative case study.

Some points can be said about generalization of the results, however. The implementation efforts conducted in case CD can be argued to be successful in light of the earlier discussion and findings. This encourages further efforts towards dyadic pairs in the public sector. Although results are applicable firstly only to a particular setting, certain contingent factors can be argued to have similar effect on the implementation of CAMP tool in any dyadic partnership. Firstly, network context as a proposed variable causes certain modification in any given context when applying CAMP tool into dyadic setting. It places two separate organizations into mutual cost management efforts and demands certain amount of OBA; that is, information must be given to some extent outside of the organization. Also, information must be displayed for two organizations rather than one. This affects the presentation of the results. Participants from two organizations are present at the same time in the improvement efforts, thus possibly resulting in cultural and team based conflicts as mentioned earlier. Second, size influences the implementation of the CAMP tool in dyadic setting much like in single organization setting. If at any given setting size of the case exceeds certain threshold, improvement projects must be handled on a project-to-project basis rather than organization-wide. Thus, it is more likely that dyadic pair will exceed this threshold, although depending on the size of the organizations involved. Results seem to validate Tomkins' (2001) view at least on the CAMP implementation that existing tool can be transferred to larger setting and that tool requiring only modest amount of information exchange like CAMP does not seem to give raise to any OBA related problems. However, this situation can only be argued to hold true for particular setting as in some other case organizations might not be inclined to share any information. As noted, public sector may be more inclined to share information due to its nature, particularly those working within purchaser-provider model as these organizations are usually former units separated into two organizations.

8.4 Future research

This study has demonstrated the linkages between the TCE, OBA and trust when considering the implementation of IOCM tool in dyadic setting. It has also identified contingency factors influencing the CAMP tool's implementation

process. However, it would be interesting to see what kind of results would be obtained from replicating the tool in somewhat larger context. This would require a network of organizations striving for coordinated reduction of costs and would result at least in larger start-up changes to the tool than depicted in this dyadic setting, thus challenging Tomkins' (2001) assumptions that existing tools can be utilized in inter-organizational context even further.

This research has identified several different contingency factors influencing the implementation process of the depicted CAMP cost management tool. It has been proposed in this study that networks could be considered as a distinct, generic variable of context separated from basic assumption of merely larger size. This proposition is strengthened by the findings that networks have their own influence on the implementation process separate from those influences that size has. However, the testing of this proposition as well as the related generalization would be more than welcome in further studies.

Also, as Chenhall (2003) has noted, generation of propositions concerning novel relationships, processes between them and their contextual setting is best achieved by qualitative case studies. However, quantitative testing is needed to either reject or establish these propositions. It would be an interesting avenue for research to construct a quantitative study for testing propositions found in this study concerning contingency factors influencing the CAMP tool's implementation.

YHTEENVETO

Globalisaatio ja markkinoiden avautuminen ovat johtaneet kiristyneeseen kilpailuun, jossa selviäminen edellyttää käytössä olevien resurssien ja mahdollisuuksien hyödyntämistä niin yksityisellä kuin julkisellakin sektorilla. Kehitys on johtanut yhteiskunnallisiin muutoksiin sekä kiristänyt julkisen sektorin varainhankintaa ja resurssien käyttömahdollisuuksia.

Suomessa on käynnistymässä kuntauudistus, jolla pyritään toiminnan uudelleenjärjestelyillä korottamaan tuottavuutta (Kallio et al. 2006). Kuntien lakisääteiset velvollisuudet ovat lisääntyneet samaan aikaan kun käytettävissä olevien resurssien määrä on pienentynyt. Joitakin syitä viimeaikaiseen kehitykseen voidaan osoittaa olevan väestörakenteen muutoksessa, uuden tekniikan käyttöönotossa varsinkin terveydenhuollon alueella sekä kuntien korostuneessa vastuussa yksilöistä. Muiden muassa Jyväskylässä, Tampereella ja Turussa on vastattu tehostamisvaatimuksiin ns. tilaaja-tuottaja–mallin käyttöönotolla. Kaupungin toimintoja on jaettu palveluiden tilaajaosapuoliin sekä tuottajaosapuoliin.

Tilaaja-tuottaja–mallia voidaan pitää eräänlaisena toimitusketjun muotona (Lillrank ja Haukkapää-Haara 2006). Tilaaja-tuottaja–mallin mukaisesti toimiva toimitusketju pitää tyypillisesti sisällään 4 erilaista toimijaa: 1. Toimeksiantajat / toiminnan rahoittajat. Toiminnan rahoittaja on tyypillisesti kunta joka antaa valtuutuksen ja varat tilaajaorganisaatiolle tilata tuotteita ja palveluita. 2. Tilaajaorganisaatio joka arvioi kilpailevia työtarjouksia, tekee hankinnat ja valvoo sopimusten noudattamista. 3. Tuottajaorganisaatio joka tuottaa tuotteet tai palvelut jotka tilaajaorganisaatio on tilannut. Tuottajaorganisaatiot voivat olla julkisia organisaatioita tai yksityisesti omistettuja organisaatioita. 4. Tuotteiden / palveluiden loppukäyttäjät. Nämä ovat tyypillisesti kunnan asukkaat jotka käyttävät tuottajan tuottamia palveluita, esim. terveydenhuoltopalveluita, puistoja tai lakiapua. (Lillrank ja Haukkapää-Haara 2006) Tällaisissa toimintojen uudelleenjärjestelyissä on kuitenkin havaittu toiminnan laatutasoon liittyviä ongelmia sekä osaoptimointiin liittyvä vaara. (Brorström ja Nilsson 2006)

Erilaisten johtamistyökalujen soveltamisesta organisaatioihin sekä verkostorajapintaan on keskusteltu tieteellisessä kirjallisuudessa. Tomkins (2001) toteaa yksittäisiin organisaatioihin kehitettyjen menetelmien olevan käyttökelpoisia myös laajemmassa mittakaavassa. Esimerkiksi verkostoihin voidaan Tomkinsin mukaan siten soveltaa samoja menetelmiä kunhan tämä isompi konteksti otetaan huomioon. Toisaalta Kulmala et al. (2007) epäilevät tällaisten menetelmien käyttömahdollisuutta laajemmassa kontekstissa, viitaten mm. ongelmiin tiedon jakamisessa verkoston osapuolten välillä. Kirjallisuudessa on myös puhuttu tarpeesta erottaa johtamismenetelmän käyttöönottoprosessi toteutusta edeltäviin vaiheisiin sekä itse toteutusvaiheeseen (Krumwiede 1998). Aiemmissa tutkimuksissa on usein keskitytty tarkastelemaan yksipuolista kehittämistä esimerkiksi yrityksen alihankkijoilleen asettamien tavoitekustannusten muodossa. Onkin esitetty myös tarve keskittyä kaksisuuntaiseen yhteistyöhön jossa sekä toimittaja että tilaaja pyrkivät yhteisesti parantamaan toimintaansa. (Mouritsen

et al. 2001, Cooper ja Slagmulder 2004, Coad ja Cullen 2006). Näin siirrytään yksittäisen organisaation näkökulmasta molemminpuoliseen verkoston kehittämiseen. Lisäksi tarvetta erilaisten kirjallisuudessa esitettyjen johtamismenetelmien esittämiseksi käytännössä on ilmaistu mm. Dekker (2003) sekä Malmi ja Granlund (2009) taholta. Tähän kirjallisuudessa käytyyn keskusteluun liittyen tämä laskentatoimen väitöskirja tarkastelee kontingenssiteorian avulla niitä muutoksia joita tarvitaan kustannusten pienentämiseen tarkoitetun laatutyökalun soveltamiseksi yritysverkostossa sekä niitä tekijöitä joilla on vaikutusta itse käyttöönottoprosessin aikana tapahtuviin muutoksiin.

Tutkimuksen tieteellinen kontribuutio perustuu edellä esitettyyn keskusteluun ja rakentuu pääongelman (1) ja sitä täydentävien kuuden ongelman (2-7) varaan:

1. Voidaanko yksittäisissä organisaatioissa käytettyjä kustannusjohtamisen työkaluja soveltaa laajempaan kontekstiin tilaaja-tuottaja rajapinnassa?
2. Mitä mahdollisia muutoksia kustannusjohtamisen menetelmään tulee tehdä että se voidaan toteuttaa tilaaja-tuottaja rajapinnassa?
3. Miten ja miksi menetelmä muuttuu toteutusprosessin aikana sovellettaessa sitä tilaaja-tuottaja-malliin?
4. Minkälaista tietojen jakoa kohdeorganisaatioiden välillä kustannusjohtamisen työkalu tarvitsee toimiakseen verkostokontekstissa?

Pohjautuen Malmi (1997) ja Anderson & Young (1999) esittämiin näkemyksiin toteutusprosessien onnistumisesta, tutkimuksessa tarkastellaan myös sitä miten kehittämisprojektin onnistumista voidaan arvioida. Tutkittaessa johtamismenetelmän sovellusta uudessa kontekstissa tulee voida arvioida sitä miten onnistunut kyseinen sovellus lopulta oli. Lisäksi arvioitaessa menetelmien käytettävyyttä yleisemminkin tulee ottaa kantaa siihen onko menetelmä otettu käyttöön organisaatioissa joihin sitä aiottiin soveltaa (Labro and Tuomela 2003). Tutkimuskysymykset viisi ja kuusi ovat siten muotoa:

5. Miten toteuttamisprojektin onnistumista voidaan arvioida?
6. Miten toteuttamisvaiheita ja menetelmän markkinatestiä voidaan tarkastella?

Lopuksi, tavoiteltaessa kustannussääntöjä verkostomaisessa toiminnassa herää kysymys siitä miten saadut säästöt ja toisaalta kehittämisestä aiheutuneet kustannukset jaetaan verkostossa toimivien organisaatioiden kesken. Tähän kysymykseen vastaamiseen käsillä olevassa tutkimuksessa käytetään apuna transaktiokustannusteoriaa sekä teoriaa organisaatioiden välisestä luottamuksesta. Seitsemäs, täydentävä tutkimuskysymys on siten

7. Miten kustannukset ja säästöt jotka aiheutuvat uudesta kustannusjohtamisen menetelmästä jaetaan sen käyttöönottoon osallistuneiden organisaatioiden kesken?

Tutkimuksessa käytetään toimintatutkimusta, jonka juuret ovat Kurt Lewinin (1946) työssä. Tutkimusaineistoa on kerätty havainnoinnilla, kohdeorganisaatioissa tehdyillä haastatteluilla, kyselyllä sekä pienryhmätyöskentelyn kautta.

Tutkimustuloksien mukaan tarkasteltu kustannusjohtamismenetelmä muuttaa muotoaan laajemmassa kontekstissa, sekä ennen käyttöönottoa että varsinaisen käyttöönoton aikana. Verrattaessa muuttunutta menetelmää kirjallisuudessa esitettyyn (Malmi et al. 2004), havaittuja muutoksia voidaan luokitella erilaisiin kontingenssiteorian mukaisiin luokkiin. Näitä ovat organisaatiokohtaiset tekijät, ympäristöstä johtuvat tekijät, organisaatioiden käyttämästä teknologiasta johtuvat tekijät sekä yksilölliset tekijät. Lisäksi tutkimuksessa esitetään yhtenä kontingenssiteorian luokkana propositio verkostokontekstin vaikutuksesta kustannusjohtamismenetelmän toteutusprosessiin.

Organisaatioiden välinen luottamus vaikuttaa tutkimustulosten perusteella merkittävästi kustannusten ja säästöjen jakamiseen verkostossa. Luottamus toisaalta kehittyy yhdessä tekemisen kautta, sekä varsinaisen toiminnan että yhteisten kehittämisprosessien avulla. Tutkimuksessa esitellyn kustannusjohtamismenetelmän (Malmi et al. 2004) soveltaminen verkostoon ei vaadi suurta määrää tiedonjakoa verkostossa toimivien organisaatioiden välillä. Kuitenkin joitakin sisäisiin prosesseihin liittyviä tietoja tarvitsee jakaa osapuolten välillä että yhteisessä toiminnassa ilmenevät ongelmat voidaan tunnistaa ja korjata. Lisäksi joitakin kustannustietoja, kuten työtuntien hinta, joudutaan jakamaan kustannusvaikutusten arvioimiseksi.

Tutkimus myös avaa uusia tutkimusaiheita; tutkittaessa kahden organisaation yhteistoimintaa ja siinä ilmeneviä muutoksia kustannusjohtamisen käyttöönotossa herää kysymys siitä, miten toteutusprosessi toteutuisi laajemmassa verkostossa. Siten jatkotutkimus voisi keskittyä tarkastelemaan tämän menetelmän käyttöönottoa monenvälisessä yritysverkostossa.

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LIST OF ABBREVIATIONS

ABC: Activity Based Costing
AR: Action Research
ASQ: American Society for Quality
BEM: Business Excellence Model
BSC: Balanced ScoreCard
CAMP: Collaborative Approach for Managing Project (cost of poor quality)
CEO: Chief Executive Officer
COPQ: Cost Of Poor Quality
COQ: Cost Of Quality, refers to total cost of quality
DCF: Discounted Cash Flow
EQM: European Quality Model
GPS: Global Positioning System
IOCM: Inter-Organizational Cost Management
NPM: New Public Management
OBA: open-book accounting
PAF or PAFF: Prevention, appraisal and failure (internal and external) costs
QFP: Quality-Function-Price
ROI: Return On Investment
PPM: Purchaser-Provider Model
SME: Small to Medium Enterprises
SPC: Statistical Process Control
TCE: Transaction Cost Economics
TQM: Total Quality Management

APPENDIX

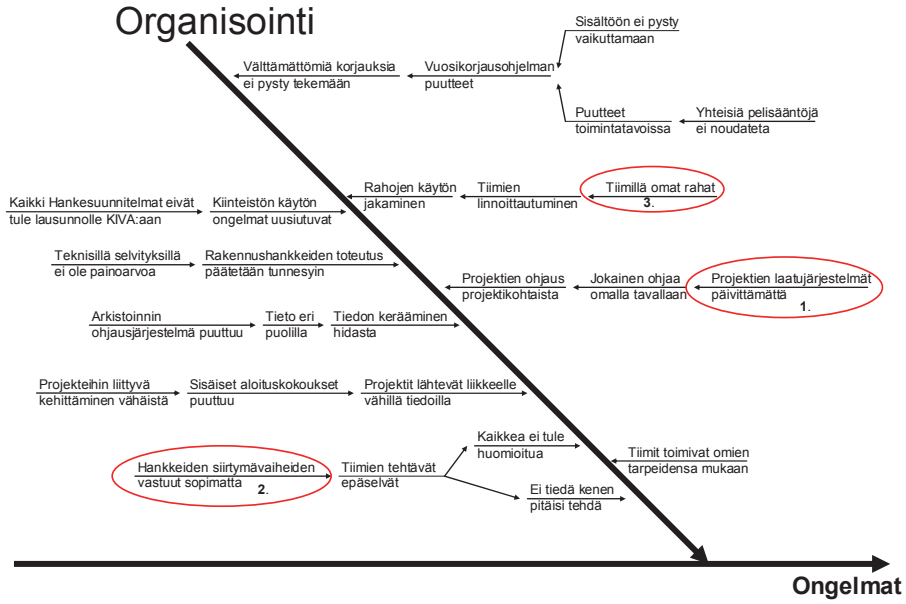

FIGURE 4.1 Basic fishbone diagram – example with important problems highlighted

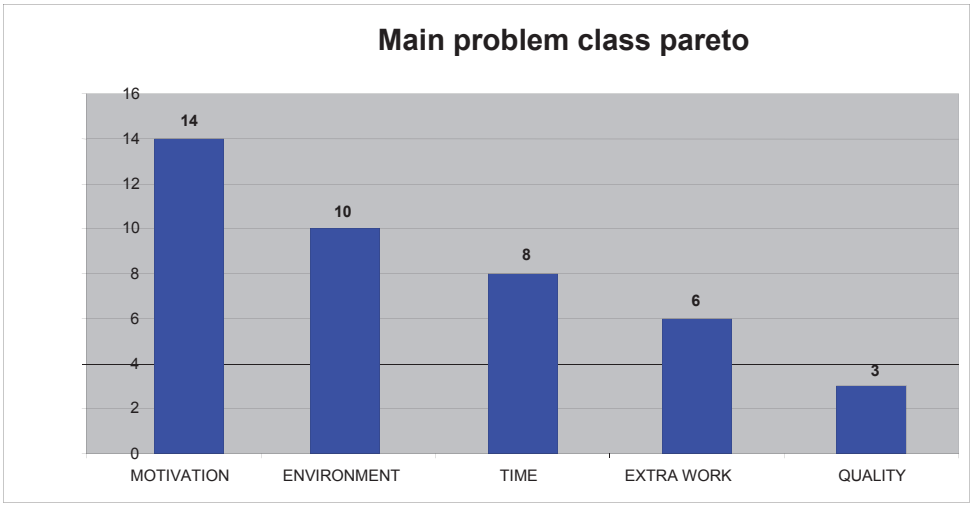

FIGURE 4.2 Pareto of problem classes - example

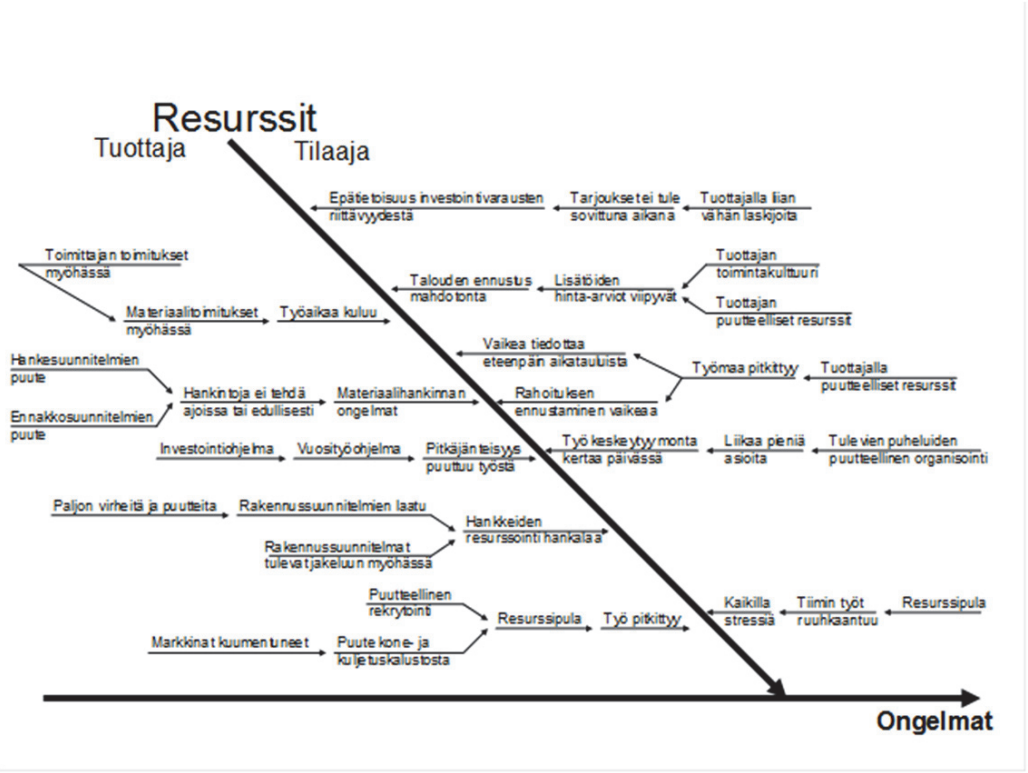

FIGURE 7.1 New purchaser-producer model fishbone

Quality problems survey

Organization:

Provide short descriptions of problems in your work. Descripe how the problem affects your work and your opinion on the cause of that problem.

Description of problem:	**Importance**:
Effect on work:	
Cause of the problem:	

Description of problem:	**Importance**:
Effect on work:	
Cause of the problem:	

Description of problem:	**Importance**:
Effect on work:	
Cause of the problem:	

Description of problem:	**Importance**:
Effect on work:	
Cause of the problem:	

Description of problem:	**Importance**:
Effect on work:	
Cause of the problem:	

Follow up questions 28.4.2010

What is the general evaluation about the quality project done in the case CD?

What, if any, improvement efforts were implemented as a result of the case CD? What is their present state?

Has the quality work continued in the organization? Has the improvement efforts continued in regards to PPM interface?

What, if any, metrics generated in the case CD were implemented in the organization?

Has the organization tracked the changes in quality failure costs?

What is the evaluation of the present state of the PPM interface between the two organizations?

Has the organization continued to develop new metrics for use in the tracking of quality costs or failures?

Follow up questions 2.9.2011

How well is the project CD in memory?

What were the main reasons for giving green light to the project? What were the things that you sought from the project?

What was the main criteria for choosing people that participated in the project?

What is the present status of the improvement initiatives, in particular the updating process?

Has there been any work done on the metrics developed in case CD?

Are you conducting continuous improvement in some way? What about concerning the mutual processes between purchaser and the provider?

What are the challenges in todays work environment?

How would you evaluate the present status of purchaser-provider model?

Data sources and contact hours

DATA SOURCES

Preliminary quality problem survey
- 40 sent (20 per organization), 25 received
- purchaser 13, provider 12
- 62,5% response rate
- 93 problems identified
- purchaser 41, provider 52

Fishbone diagrams
- 10 fishbone diagrams under 7 classes

Pareto diagrams
- 7 problem classifications
- Associated point score ranking

Improvement initiatives
- Total of 9
- Risk / reward assessment
- Complete project plan

Quality cost data
- Costs spanning entire operations on both sides
- Costs calculated for each problem identified
- 4% COPQ purchaser, 2,5% COPQ provider calculated from turnover

Purchaser-provider contracts and business directives
- Maintenance contract
- Business contract
- Business description papers
- Municipal directives

Observation notes / field notes
- Workshop observation
- Workshop remarks and informative speeches
- Research project field notes

Follow up interviews
- Two sets of follow-up interviews in years 2010 and 2011

CONTACT TIME

	Persons	Hours	Amount
Contact and preliminary observation		2h	3
1st workshop	16	8h	
2nd workshop	16	8h	
3rd workshop	16	8h	
4th workshop	8	4h	
3 Project steering committee meetings	8	2h	3
Follow-up interviews			
- Kari (28.4.2010)	1	2h	
- Tuula (28.4.2010)	1	2h	
- Veli-Jussi (28.4.2010)	1	2h	
Second set of follow-up interviews			
-Kari (2.9.2011)	1	1h	
-Tuula (2.9.2011)	1	1h	

Total hours 48h direct contact time

PROJECT TIMELINE

Contacting	1.-30.9.2007
Project start	11.10.2007
Preliminary survey	25.10.2007
Provis. report & fishbones	5.11.2007
Workshop I	10.1.2008
Steering committee I	24.1.2008
Workshop II	15.2.2008
Workshop III	27.3.2008
Steering committee II	3.4.2008
Workshop IV	19.5.2008
Steering committee III	25.5.2008
Final report / ex. summary	2.6.2008
Follow-up interviews	28.4.2010
Second set of interviews	2.9.2011

QUALITY FAILURE COSTS

PROVIDER COPQ

Construction designs coming late	
- Problems in material acquisition	30 working days
- Site changes	20 000 €
- Hurried tendering	50 000 €
- Construction site changes	30 working days
Issues in yearly maintenance schedule and budget	
- Constructs dismantled, material loss	50 000 €
Uninclusive contracts	
- Extra negotiations on site	80 working days
Third party work overlaps construction	
- Dismantling of completed constructs	240 working days
Provider's maintenance schedule	
- Needed overtime	100 working days
- Existing sites delayed	20 000 €
Unclear maintenance contract	
- Overtime	40 working days
- Higher material replacement costs	5 000 €
Unclear orders	
- Needed clarifications	80 working days
Lack of coordination between projects	
- Unnecessary waiting time	48 400 €
Unnecessary control	
- Needed approvals and waiting time	30 working days
- Idle machinery	10 000 €
Unclear construction designs	
- Needed extra works	15 working days
- Information seeking	6 working days, 2 hours
- Construction changes	120 000 €
Work time lost	651 working days, 2 hours
Total monetary amount lost	323 400 Euros
COPQ from hours and Euros	ca. 2,5% from turnover

PURCHASER COPQ

Incoming calls disrupting work	
- Misplaced calls	13 working days, 6 hours
Problems in construction consultants quality assurance	
- Billed waiting time	100 000 €
- Needed clarifications	16 working days, 7 hours
Delayed materials delivery	
- Lost time in acquisition	2 working days, 4 hours
Insufficient info in invoices	
- Search for information	2 working days, 6 hours
Delayed inspection	
- Coordination problems, work delayed	18 working days, 6 hours
Issues in maintenance contracts	
- Time lost in extra negotiations	17 working days
Schedule overruns	
- Delayed sites piling up	60 000 €
- Lesser performance, lesser quality	15 working days, 6 hours
Insufficient tendering, low competition and obligation to purchaser fixed amounts	
- Orders contain higher costs	1 000 000 €
Insufficient reporting	
- Needed information requests	11 working days, 2 hours
Complicated work ordering process	
- Time lost contacting personnel	5 working days, 7 hours
Work time lost	104 working days, 4 hours
Total monetary amount lost	1 160 000 Euros
COPQ from hours and Euros	ca. 4% from turnover

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