TOTAL QUALITY MANAGEMENT AND CHANGES IN MANAGEMENT ACCOUNTING SYSTEMS IN A MANUFACTURING FIRM: A CASE STUDY

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ABSTRACT

This paper explores the emergence of Total Quality Management (TQM), its continuation as well as the management accounting implications in a leading solid tyre manufacturing firm in Sri Lanka, where TQM has been practiced for over fifteen years. The paper adopts the qualitative methodology and case study approach, while the rational-choice perspective and new institutional sociology have been utilized as the theoretical lens. Our findings suggests that both institutional as well as technical efficiency reasons have influenced the implementation of TQM, and that the management accounting system of the firm has been changed to keep up with the TQM system. How management accounting systems get implicated in a TQM environment, although important has received limited research interest; thus this research is a useful addition to the existing literature. This paper also has theoretical merits; it depicts how coming together of a rational-choice perspective and new institutional sociology provides a better understanding on internal and external reasons for implementing management tools (such as TQM). Using a TQM example, our paper provides learning points to practicing managers on how management accounting systems could be shaped to facilitate implementation of management tools.

Keywords: total quality management, management accounting, rational-choice, new institutional sociology, case study

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INTRODUCTION

Organizations in the contemporary business environment cannot ignore quality if they are to survive, and in the recent years many organizations have moved towards Total Quality Management (TQM) in their quest for quality. TQM is an important management practice, which has been recognized as a platform for continuous improvement and business performance. For the purpose of this paper, TQM implementation encompasses the use of different quality ideas and practices, such as analyzing and identifying non-quality costs, such as cost of defects, internal failure costs and external failure costs; quality inspection; conducting quality audits; training and educating employees on quality; creating a quality conscious culture; measuring and managing quality related indicators and reporting on quality (Pipan, Gomiscek, & Kljajic, 2014). TQM is an important management tool, and past research suggests that implementation of TQM could lead to business efficiencies, such as cost reductions, enhanced productivity, quality improvements, and on-time delivery, while enabling organizations to gain competitiveness (Ooi, 2015; Khan, 2003; Sharma et al., 2010; Sharma & Hoque, 2002; Hoque & Alam, 1999; Modell, 2009; Terziovski & Samson, 1999; Week, Helms, & Ettkin, 1995; Boaden, 1997). The literature also suggests that organizations implement TQM due to institutional reasons to gain external recognition and to legitimize their actions (Hoque & Alam, 1999; Modell, 2009; Sharma & Hoque, 2002; Sharma et al., 2010).

Quite apart from the above, management accounting plays a facilitative role to internal managers by providing relevant information for decision making. Amid changes in the operational/manufacturing environment, what counts as relevant information needs to be revisited, and there is growing recognition in the management accounting literature that the adoption of a new management philosophy would require changes to the firm's accounting and control mechanisms (Hoque & Alam, 1999; Sharma et al., 2010; Modell, 2009).Therefore the adoption of a new management tool (such as TQM) in an organization would require changes to organizational control mechanisms; thus TQM has attracted the interest of management accounting researchers. TQM implementation would require key performance indicators (KPIs) developed to include customer satisfaction (Sharma et al., 2010), team incentives (Plenert, 1995) etc. Scholars have also addressed the relationship between TQM and the balanced scorecard (BSC) (Hoque, 2003; Modell,

2009), as the implementation of TQM requires an organization to measure and manage not only financial indicators such as return on investment (ROI), profits and revenue growth, but also non-financial indicators such as on-time completion, quality, innovations and customer satisfaction (Hoque & Alam, 1999).

TQM has been subjected to scholarly inquiry across various industries. This ranges from construction firms (Hoque & Alam, 1999), public sector (Sharma & Hoque, 2002), service organizations (Yapa, 2012), and telecommunication firms (Sharma et al., 2010). Past literature has also explored the link between TQM and organization culture (Kaluarachchi, 2010), as well as TQM and BSC (Hoque, 2003; Modell, 2009). Within this backdrop, in the current body of literature, although important, there is scarcity of TQM implementation studies in the manufacturing context as well as on the resulting management accounting implications. One cannot assume that TQM experiences of other industries as given and extent such findings to manufacturing firms, as the circumstances of manufacturing organizations and the management accounting implications therein are likely to be different due to differences in operational processes. Thus this area needs further inquiry. Our paper addresses this omission in prior literature by probing into a TQM implementation experience and the resulting management accounting implications in a manufacturing firm drawn from the Sri Lankan context.

This study addresses the following research questions: 1) why has the case study firm implemented TQM and what are the reasons for its continuation; 2) how has management accounting practices changed to facilitate the TQM movement? This study strives to fill a gap in prior research and contributes to the current body of knowledge by presenting a TQM story drawn from a Sri Lankan manufacturing firm where TQM has being implemented and sustained for over fifteen years. More importantly, it explores how management accounting gets implicated in a TQM environment. Findings of this research will contribute to expand the existing literature on TQM and management accounting. Theoretically, it depicts how coming together of the dual theories; rational-choice perspective and new institutional sociology provides a better understanding of internal and external reasons for implementing and sustaining management tools such as TQM. This is a useful theoretical contribution of this paper, which

leads to conceptual advancement. It also provides important insights to practicing managers one effective implementation of management tools, such TQM and on orienting management accounting systems to facilitate such implementations.

This paper is structured as follows. Section one provides a background to this paper and reviews past literature on TQM and management accounting. Section two presents the research context, theoretical underpinning and research methodology. Findings of the study are offered in section three; section four provides a discussion of findings and concludes.

RESEARCH CONTEXT, THEORY AND METHODOLOGY

Research Context

The organization under study is a manufacturing company, which we call Beta for confidentiality reasons. It was incorporated in the early 1980s, as a joint venture between a Sri Lankan group of companies and a foreign (Belgium) firm. It produces off-the-road tyres including solid tyres, air tyres, rubber tracks and wheels which are used for material handling, construction and agricultural purposes. It is one of Sri Lanka's biggest exporters of tyres, and sells its products mainly to original equipment manufacturers such as Toyota, Nissan, JCB and caterpillar. The firm has been in the forefront of implementing new management and accounting practices such as TQM, activity based costing (ABC) and lean manufacturing. Beta is an ISO 9001 and 14001 certified company, and has won a number of quality awards and certificates in recognition of its manufacturing and operational excellence. This includes the supplier of the year award, most outstanding exporter award, national productivity award, national green award, and most outstanding supplier award. Keeping with such honors it has been able to sustain significant growth levels during the period of over twenty years of its existence.

Beta has eight production plants, the largest being plant one, the main focus in this study. Currently the firm consists of 6000 employees and 99% are male. The staff and executive strength of the company totals 450, including over 100 qualified engineers. It strives to be a global market leader by being

a low cost high quality producer, while focusing on customers by delivering high performance products to meet their expectation. Empowerment, commitment to the business operations, teamwork and integrity are its core values. It's unique engineering capabilities with a research and development unit, which carries out continuous improvements, on latest technology and production methods, cordial relationship with suppliers of raw materials, consumables and capital goods, strong relationships with state institutions/ banks, and the presence of a formal quality system (TQM) have contributed to its success. Figure 1 shows the organizational structure of the Beta.

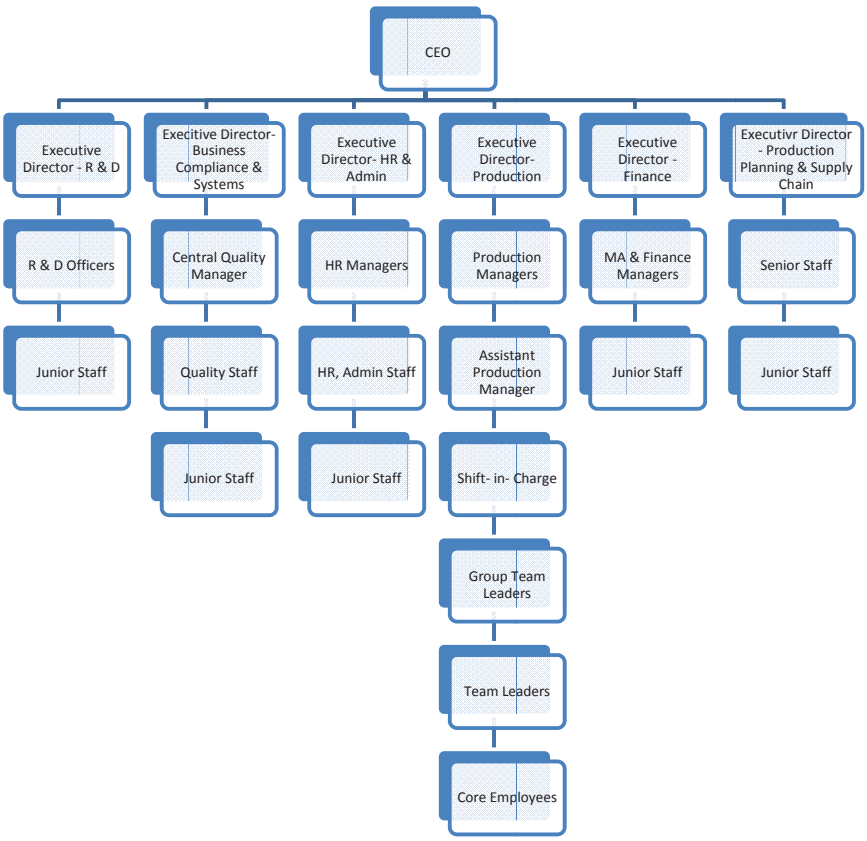

Figure 1: Organizational Structure

As shown in Figure 1, the chief executive officer (CEO) is the head of the organization. While executive directors report to the CEO, department

heads / managers report to the executive directors, and all other staff is supervised by department heads.

Theory

Theoretically, this study is premised on the dual theories; rational-choice perspective and new institutional sociology. The Rational-choice theory strives to explain social phenomena in terms of purposeful human actions towards economic efficiency and rational decisions (Ahrens & Chapman, 2004). Seen from such a perspective, TQM is a tool which would enable an organization to enhance business efficiency. However, from a practical point of view, all organizational endeavors do not necessarily fall within economic rationalities and logic of efficiency. Human actions instead encompass both rational and non-rational elements, and there is a need to go beyond the rational-choice perspective to capture social norms and social structures, as done through new institutional sociology.

Institutional theorists argue that an organization's survival requires it to conform to societal norms and that external pressure such as coercive, mimic and normative isomorphism is significant in this regard (DiMaggio & Powell, 1983). Thus various influences operating in and around an organization may prompt it to adopt specific structures and procedures. For instance, the government and its agencies, legislations, guidelines and standards can be a source of coercive pressure. Professional bodies, and the resulting education, training and professional networks, as well as consultants are important sources of normative isomorphism. Mimetic pressures arise through imitative behavior where leading organizations are emulated by others, resulting in standard responses to uncertainty. Uncertainty is thus a powerful force that encourages imitation. According to the new institutional sociology perspective isomorphism increases the success and survival of an organization. Seen from such a perspective, organizations implement management tools such as TQM for institutional reasons to satisfy external constituencies (Hoque & Alam, 1999; Sharma & Hoque, 2002; Sharma et al., 2010).

Drawing on multiple theories has the advantage of providing a better view of reality by capitalizing on the strengths of each theory and complementariness between them (Hoque, Covaleski, & Gooneratne, 2013).

Contemporary organizations are typically faced with technical efficiency considerations(internally) as well as legitimacy concerns (externally) simultaneously. In this paper, the use of the rational-choice perspective and the new institutional sociology perspective in tandem became meaningful in illustrating how efficiency (improved quality) and legitimacy (justifying organizational actions amid broader external influences) reasons influence the adoption and continuation of TQM.

Methodology

Methodologically, this study adopts the qualitative methodology and single case study approach as the research strategy (Silverman, 2000; Yin, 2003). A qualitative case study approach appeared to be the most appropriate in addressing the research questions of the study, which require an in-depth understanding of why the case study firm implemented TQM and continued with it, as well as how management accounting practices have been changed to facilitate the TQM movement. Initial contacts with Beta were established through telephone calls and request letters seeking permission to conduct the study, and permission was subsequently granted by the human resources department.

The data were collected over a three-month period (August 2015 and October 2015) in two phases, a pilot study and a main study. The pilot study, which was carried out during the month of August 2015 included a face-to-face interview with the central quality manager and a telephone interview with the chief financial officer. These interview encounters lasted for about half an hour each, and enabled us to understand the reasons for the TQM implementation as well as to obtain a general idea about the TQM process and management accounting practices which facilitated the TQM system in the firm. The main study was in September and October 2015, and during this stage nine interviews were conducted.

The main method of data collection was in-depth interviews, each of which spanned half an hour to one hour. McKinnon (1988) notes that careful selection of interviewees is important in qualitative field studies, and in this study interviewees were selected from different hierarchical level of the head office and the main plant(plant one) based on who would be in the best position to provide useful insights (see Figure 1 for organizational

structure).Interviewees included the chief financial officer, central quality manager, business unit controller, plant controller, management accountant, human resource manager, quality executive, quality controller and a group leader in the production department. Selection of people to interview, how many interviews to conduct, organization and coordination of interviews including making contacts, obtaining interview times and confirming appointments became a time consuming and difficult task (see also Irvine & Gaffikin, 2006). Interview questions were prepared based on the literature on TQM and management accounting (see Appendix A). The topics selected for interviews included the driving forces behind TQM, benefits and resistances to TQM, changes in the management accounting systems after the implementation of the TQM. Interview questions were asked in an open ended manner to encourage interviewees to respond in their own ways, and probing questions were also asked when needed (see also McKinnon, 1988). The aim was to gain an in-depth understanding of TQM and changes in management accounting systems in the particular context of Beta. Table 1 presents the interviewee details.

Table 1: Interviewee Details

Designation	Department	Responsibilities
Chief financial officer	Central finance department (head office)	Management and coordination of all financial activities, investigate cost effective benefits plans, attend board/committee/other management meetings
Central quality manager	Central quality department (head office)	Handle quality related issues, formulate quality control policies / procedures, attend relevant meetings
Business unit controller	Business unit - constructions	Preparation and presentation of financial results to the top management, recognize profitable opportunities for business processes
Plant controller	Plant one	Monitor all activities of the plant, evaluate plant transactions as per accounting procedures, handle technical issues of the plant
Management Accountant	Plant one	Preparation and presentation of financial reports and quality control reports

Designation	Department	Responsibilities
Human resource manager	Human resource department (plant one)	Empower employees, handle all employees' issues, facilitate training opportunities to employees
Quality executive	Quality department (plant one)	Contribution to quality control programs, perform various tests and inspections on finished products
Quality controller	Quality department (plant one)	Inspection of products, report quality related issues to the management
Group leader	Production department (plant one)	Handle group members' issues, motivate group members to meet targets

Accordingly, a total of eleven interviews were conducted with nine employees at different hierarchical levels, including top managers, finance managers and non-finance managers, across the two phases of the study. The central quality manager and the chief financial officer who were interviewed during the pilot study were also interviewed during the main study as they were key informants given the focus of this research (quality and management accounting). Interviews were tape recorded and subsequently transcribed. Further, detailed back up notes were taken down during the interviews. Since three employees were more comfortable in communicating in the Sinhala language (mother tongue), these interviews were conducted using their mother tongue. All other interviews were conducted in English language.

Interview data was supplemented by a review of documents on the company's TQM system and management accounting practices and observations of the manufacturing and quality process by visiting the corporate head office and a plant (plant one). Documents reviewed included quality manuals, accounting reports, such as monthly financial statements and variance analysis reports, plant performance report, quality costs report, organizational structure and other documents, such as daily agenda of the production manager. These documentary sources supplemented the interview evidence. Furthermore, data were collected through observation of the manufacturing and quality process of plant one. Quality gates, daily improvement cards and daily problem cards were observed through the plant visit and such details obtained were used in making sense of findings.

Data were also collected through the corporate website of Beta. Such data gathered through multiple methods (interviews, observations and document analysis) were triangulated to ensure that the research findings are credible and compelling (Irvine & Gaffikin, 2006; McKinnon, 1988).

Field notes, interview transcripts and documents were carefully analyzed to understand how TQM implementation in the case study firm took place, and the resulting management accounting implications. Important themes which emerged from the field were identified, and these themes were further drilled down to categories to facilitate the data analysis process (Irvine & Gaffikin, 2006). Then the broad themes and categories were related to the key theoretical concepts of rational-choice theory and new institutional sociology. Such themes included implementation of TQM, efficiency reasons, institutional reasons and continuation of TQM as well as management accounting implications, such as changes in organizational structure, performance indicators and reporting. Thereafter field data was organized around them.

To ensure rigor and maintain quality of the study following strategies were deployed. 12-14 hours were spent conducting interviews and 2-3 hours gathering data through documentary analysis, and 2-3 hours on observations. Qualitative research generally requires a great deal of time on the part of the researcher, but the significant amount of time spent in the field should not be considered as a waste as it ensures the validity of data (Vaivio, 2008; Qu & Dumay, 2011). Such prolonged engagement helps to ensure quality of the research as it facilitates collecting thick descriptions from the field. Further, confidentiality of data was ensured and assurance was given to interviewees that their names will not be divulged (Irvine & Gaffikin, 2006; Qu & Dumay, 2011). Interviewees at the both head office and plant were thus supportive and interested in the research, and freely expressed their ideas about TQM implementation and change in the management accounting systems in Beta. This enabled gaining of a rich in-depth understanding. In addition, all the interviews were tape recorded and detailed notes were taken (McKinnon, 1988) during the interviews along with the interviewees' expressions, feelings and reactions together with personal reflections of the research context. Exercising personal reflexivity in this manner also enhanced the quality of the study. To ensure rigor, the different data collection methods are spelt out in detail in this paper. Further with regard to interviews, the people

interviewed, why and how they were selected, are spelt out to enable the readers to gain a clear understanding on the data collection process, while facilitating traceability of data. Member checking was also followed, by sharing the findings with the relevant participants to determine accuracy.

Within the process of documentary review, a step by step documented history of the quality control system before and after TQM was examined (audit trail). This helped in understanding the background to the emergence of TQM in the firm, as well to corroborate interview findings. Interviewees' opinions were thus cross-checked with documentary evidence and prolonged observations done at the head office and plant. The use of multiple data sources (data triangulation) in this manner facilitated obtaining an in-depth understanding, while enhancing quality (Denzin & Lincoln, 2000; Vaivio, 2008).

FINDINGS

The findings of this study are presented in terms of the reasons for implementation of TQM, its continuation as well as the resulting management accounting implications. As interviewees revealed maintaining quality has been a priority for Beta since its inception and quality control has been in-existence for years in the firm, although in an ad-hoc manner. However, with the introduction of the ISO standard in year 2000, quality had to be continuously monitored and maintained, and the need for a formal quality management system was felt, and given the competitive environment in which Beta operates, eliminating unnecessary costs of production such as non-quality costs (relating to defects, internal failures and external failures) too was vital. Seeing in this manner, while quality consciousness existed in Beta even prior to TQM implementation, a formal quality management system which measures and manages quality through specific indicators and periodic reports on quality was practiced subsequent to TQM implementation.

Implementation of TQM: Efficiency and Institutional Reasons

Beta embarked on the TQM journey as its managing director became interested in TQM and initiated it in the firm. Interview evidence reveals that efficiency and institutional reasons contributed to the implementation, as diagrammatically presented in Figure 2.

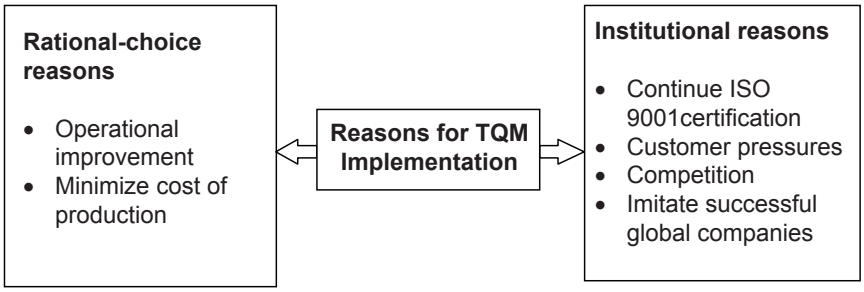

Figure 2: Reasons for Implementation of TQM

While maintaining the ISO status was the initial reason for the implementation, several other reasons prompted Beta to take TQM on board. From an internal front, economic rational reasons such as to gain operational efficiencies and minimize the cost of production, as well as external institutional reasons such as customer pressures, competition, imitating successful global players and maintaining quality certifications became important.

Manufacturing organizations encounter inefficiencies in operations such as defects, scrap and rework and resulting costs, as became evident in Beta. Therefore, eliminating unnecessary costs of production such as non-quality costs was a key reason behind its TQM implementation. The business unit controller-construction remarked; "Our manufacturing system has high cost processes. We believed that high wastage and non-quality cost of production will be eliminated through TQM". Similar ideas were expressed by several others. One interviewee added, "we consider quality of the product as the bark to the tree so we felt that TQM will help us".

From an institutional perspective, maintaining the ISO status became an important reason for the firm's decision to adopt TQM. The central quality manager commented:

> TQM is not a one day transformation. It happened over a time. We had a quality control approach before implementation of TQM. We were trying to transform the quality management system towards TQM concepts in line with the new ISO 9001 in 2000. That was the starting point of transforming our quality system towards the TQM philosophy.

Similarly, the controller of plant one noted:

> We are an ISO certified company so we have to have a standardized quality management system. We have to perform quality audits semi-annually. That is compulsory for ISO certified companies. In the quality audit, we checked each and every system of the plant. So TQM implementation helps us.

Furthermore, interviews with the quality division staff revealed that there was a huge customer pressure from the international market to implement a formal quality system. The main customers of the company are based in Europe and North America, where excellence in quality is essential to meet market requirements as these countries do not import solid tyres if the suppliers do not have a formal quality system. One interviewee elaborated:

> Since we are catering our products to the international market, just having a quality product is not enough to increase our competitiveness. We have to have a formal quality system, like TQM to ensure overall quality of the process.

The competition in the market in which Beta operates has also increased with the emergence of local as well as international (such as Indian) solid tyre manufactures. Within such a setting, TQM was identified as a tool to face market competition by catering to customer expectations. The production manager of plant one remarked:

> We always respect the customer's voice. We want to provide guaranteed quality by implementing a formal quality system such as TQM. Without having a proper and systematic quality system we cannot provide such a guarantee.

Seeing in this manner, enhancing its appeal in the eyes of customers was also a motive behind the TQM implementation in Beta. He further noted that the firm strives to maintain customer confidence, and does not want to lose customers by delivering sub-standard products. Winning quality awards is another reason for implementing TQM. The company uses the TQM system as a basis for other management systems such as safety and environmental management. Furthermore, the firm has been inspired to implement TQM seeing best practices of other firms. It has emulated companies which have successfully practiced TQM over a long period. The quality executive of plant one described:

> Since we are serving the international market, we are always in touch with the leaders in the global market such as Toyota, Nissan, Mitsubishi etc. Most of the global market leaders have implemented TQM as their formal quality management system and they have achieved lot of benefits by utilizing TQM. So we decided to implement TQM as our formal quality system by looking at these successful companies.

As the above interview evidence suggest both internal (efficiency) reason as well as external (legitimacy) reasons became important in the firm's decision to implement TQM.

Continuation of TQM

Subsequent to its implementation, Beta reaped significant benefits, and has continued with the TQM system for over fifteen years. The central quality manager explained:

> As a manufacturing organization we mainly focus on quality, cost and delivery. Among these quality is the number one priority for our company to survive in the market. So we continuously monitor our quality system to ensure the quality of our products. So TQM is important.

Adoption of TQM led to operational improvements in the firm due to proper quality management. The quality controller of plant one explained "before adoption of TQM we experienced lot of system failures, machine

breakdowns. With TQM we were able to reduce those failures and enhance operational activities". The production manager further added "we assigned real persons to the real places to minimize defects". In addition, cycle time of production was high before implementation of TQM, due to inefficiencies of the production planning process. But after the implementation of TQM, these issued have reduced. One of the team leaders directly linked with operations in plant one stated:

> Earlier there were lot of gaps between the modules, so cycle times and quality violations of the production process was high. But with the current practices in operations, we can release fresh output to production within four minutes. We have been able to increase production and productivity of the company.

A comparable idea was expressed by the controller of plant one. He commented "we were able to increase our production by 30% in last three years". Seen in this light, with the adoption of TQM the company has been able to achieve many benefits. Several interviewees commented on this. Particularly, the production manager of plant one pointed out the changes to the production process after TQM adoption. He added:

> We changed the total production system with the implementation of TQM. As a production manager, before TQM I did not have a specific production agenda. But, with TQM I have to continue production process based on a specific agenda.

Following the implementation of TQM, Beta has been able to consistently meet expectations of their customers (in the international market) through providing high quality products. This has helped them to retain customers and build loyalty. Quality controller of plant one remarked:

> As a manufacturing organization, formal quality system plays a vital role in our company. With the implementation of TQM, we were able to enhance customer confidence by providing high quality and reliable products. It has led to enhance our image as well.

Interviewees revealed that effective implementation of TQM has resulted in many benefits and this has led to its continuation (over fifteen years). For instance, prior to adopting TQM in the firm, the management obtained the consent of employees addressed their concerns and provided awareness and what they expect from it through seminars, training programs and workshops; thus prepared its employees for this change (to TQM). Therefore, no resistance was evident and employees willingly contributed to the TQM system. This became a key reason for its continuation. One quality executive added:

> We had a number of awareness sessions, workshops to provide understanding about the quality system. Employees got an idea about the importance of quality by participating in training programs. Although they did not have full understanding about TQM, they had an idea of the consequences, what will happen if they did not follow quality systems. So, employees at all levels accepted TQM.

A human resource manager illustrated, "we gave an opportunity to employees to come up with their concerns and we provided clear solution for those concerns". The firm has a well-developed problem solving mechanism relating to TQM. This encompasses four sequential phases: plan, do, check, act (PDCA cycle), which facilitates continuous improvement. Central quality manager elaborated:

> We utilize the PDCA cycle to perform our TQM practices effectively. In the planning phase, we identify the problems and collect data related to the problems. Then we try to determine the root cause of the problem. In the doing phase, we develop proper solutions and implement those solutions. In the checking phase, we measure and check the results of the solution whether that solution eliminate that problem or not. In the acting phase, we document those results and share the knowledge. This PDCA helps our operations to continuously improve.

More importantly, Beta has a quality culture; it has systems, processes and procedures which are used to sustain quality systems and effective mechanisms to resolve quality related issues, as well as a quality committed management team. Controller of plant one remarked:

> We have different meetings to discuss quality related issues, like management review meetings, quality meetings and performance review meetings. We believe in a formal structure to solve quality related issues. Our top management always involves with quality related issues and they always consider quality as the top priority.

The production manager of plant one reinforced the views of the plant controller. He said, "We have several mechanisms to solve issues at the production level, including daily based monitoring systems, weekly reviews and monthly review meetings. On the other hand, top management always gets involved in solving quality related issues". Problem solving cards and improvement cards are used in the firm as quality enhancement tools. Review of these documents revealed that while, problem solving cards identify production issues, improvement cards generate employee ideas and suggestions for quality improvements. This increases internal customer satisfaction, and facilitate the continuation of TQM. Team leader of plant one remarked:

> We have three values to enhance the internal customer satisfaction. We never produce defective products; we never accept defective products from previous processes, and we never send defect products to next processes.

Such a quality receptive culture influences employees to produce quality products and strive for continuous improvement; this has in turn led to the continuation of TQM.

Management Accounting Implications of TQM

The TQM system of Beta has given rise to management accounting implications in two fronts: firstly, in terms of management accounting practices, encompassing the structure and performance indicators and secondly changes in management reporting.

Changes in organizational structure and performance indicators

Following the adoption of TQM, the centralized organizational structure of Beta has been replaced with a decentralized one. The business unit controller of construction explained:

> Earlier we had a central finance department. With TQM all the plants were split into two business units; business unit-construction and business unit-material handling under the central finance department. Plant accountants report to business unit controllers. Business unit controllers are responsible for the profitability and manufacturing cost of their units and they report to the top management. Supporting functions of business units like health and safety, central engineering and security report to central finance. The current structure (after TQM) is depicted in Figure 3.

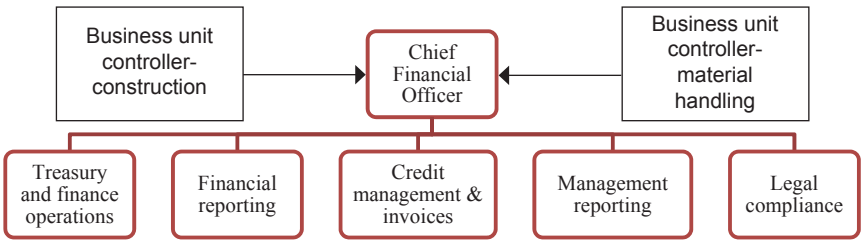

Figure 3: Structure of The Central Finance Department After TQM Adoption

According to the management accountant, before implementation of TQM, Beta only used financial data related KPIs, such as cost per kg. Subsequent to the implementation of TQM, it adopts performance indicators incorporating non-financial areas such as employees, best reputation, people engagement and operational excellence (See Appendix B) in addition to financial KPIs. As he further indicated:

> We have different manufacturing structures called cells. We have different KPIs to measure the performances of the cells. KPIs are linked to the bonus program of the company. Through the bonus program we motivate employees.

Thus financial and non-financial KPIs have been linked to the reward system, and performances of individuals are evaluated based on such KPIs. The management accountant further indicated:

> With the adoption of TQM, Beta shifted to an ABC system from the traditional costing method which was earlier used in absorbing production overheads into the products. This was a significant change. The business unit controller-construction added:
>
> With the ABC method we can identify the activities which do not generate any value to Beta. Then we identify the impact of removing those activities from the production process by conducting sensitivity analysis. After that we are able to eliminate those non-value added activities from our process in a systematical way.

TQM adoption is also linked to variance analysis, and Beta prepares a variance analysis report at the end of every month, which includes actual, budget and variance relating to raw materials, conversion costs and overheads. This helps to identify how variances are reduced due to cost efficiencies arising from TQM. The financial controller commented:

> Raw material variances were affected after implementation of TQM, because the company bought high quality raw materials from suppliers. Earlier we were more concerned about price rather than quality. At the initial stage of TQM implementation there was an impact on overhead variances due to the additional cost incurred on quality. But later overhead variance was declined due to good quality materials.

Beta manufactures rubber based products, and keeping with the wisdom of TQM believes that quality of raw materials is essential in ensuring quality of output. The management accountant of plant one elaborated:

> Before implementation of TQM we purchased our raw materials based on the cheaper cost. If one supplier supplies raw material at a cheaper price we assumed that those raw materials were the

> best. But after adoption of TQM we have shifted our focus from cheaper raw materials to quality raw materials.

According to the financial controller, if there are product quality faults, the firm will either solve the quality issue and continue the manufacturing process or stop the manufacturing process and reject the entire production batch. If those faults are identified after delivering the products, warranty costs need to be incurred. Therefore, the firm realized the need for management accounting tools to recognize quality related costs. The financial controller reported:

> Before adoption of TQM, we incurred additional cost for the process due to quality faults in the production process. That cost will either get transferred to the customer or will get transferred to the profit and loss account (P&L). Both these are negative to the company. With the implementation of TQM, we have introduced some tools to capture these costs. Now we are able to measure not only quality costs but also non-quality costs.

As this quote illustrates, if the firm transfers their additional costs to customers, it will increase the price of products, which will negatively affect its competitiveness. If they transfer these costs to the P&L account, it will decline the financial performance, which will negatively affect the wealth of the shareholders. Although quality costs were not measured under the traditional management accounting system, and those involved in management accounting did not get engaged with quality matters, with the adoption of TQM, there is a renowned focus on identification, categorization and reporting such costs. The management accountant of plant one stated, "my involvement with quality practices has increased due to TQM. Now I prepare quality cost reports to identify costs of quality".

Table 2 summarizes management accounting practices before and after the adoption of TQM.

Table 2: TQM and Management Accounting Practices

Before adoption of TQM	After adoption of TQM
Financial KPIs	Both financial and non-financial KPIs
Lack of quality and reliability of the management accounting information	Increase in quality and reliability of the management accounting information
Traditional budgetary process	Integration of cost saving projects with the annual budget and variance analysis
Centralized finance department	Decentralized finance department
Traditional (weight based) cost allocation method	ABC system
No quality costing and reporting	Provision for quality costing
Annual feedback on performance	Daily/weekly/monthly feedback on performance
Less involvement of finance department team with quality programs	Greater involvement of finance team with quality programs

As reflected in Table 2, before the implementation of TQM, Beta only used financial KPIs, while non-financial KPIs in the areas of employees, operational excellence, people engagement and best reputation became important additions in the post-TQM era. While there was no quality costing and reporting system before TQM implementation, with the adoption of TQM, Beta prepares quality cost related reports, with the active involvement of the finance department. A traditional budgetary process had been employed by the organization before the implementation of TQM, while the focus was shifted to cost saving projects and variance analysis after TQM. All financial and management accounting related activities were under the central finance prior to the adoption of TQM, while in the post-TQM era these activities are allocated to the two business units, construction and material handling based on the production. ABC was adopted after the implementation of TQM to trace production related overheads, due to the deficiencies of the weight based cost allocation method in identifying profit making and loss making tyres. Annual financial statements were used to convey organizational performances before adoption of TQM, and after the adoption of TQM continuous feedback on performance were provided.

As the foregoing suggests management accounting system of the case study firm has been significantly changed to keep up with the TQM implementation.

Changes in Management Meetings and Reporting

In the pre-TQM era, neither were continuous meetings held nor reports prepared to evaluate the performance of Beta. This is in contrast to the post-TQM era where business unit directors hold a management meeting once a month to discuss monthly performance, while plant accountants make a variance analysis presentation. Business unit controller-construction stated:

> After the adoption of TQM, in every management meeting respective heads are required to report the performance of their departments through a presentation. Also at the month end plant accountants prepare a performance report and present it to the business unit directors and then the business unit directors and the business units controllers consolidate all performance reports of their plants and present to the business unit's top management; other areas like health and safety, engineering, quality assurance also report their performances during that meeting.

Our review of documents revealed that the monthly plant performance report encompassed operational KPIs and financial KPIs, for the current month and the previous month. The controller of plant one further added:

> We conduct a plant review in the first and last week of each month. In the first week we discuss the performances of the last two weeks of the previous month and at the last week meeting we discuss the performances of the first two weeks of the ongoing month. At that meeting we discuss about the financial related KPIs, quality related KPIs and financial outcomes of the plant. Plant director and management team of the plant participate in this meeting.

As explained by the plant controller, prior to TQM implementation, management reports were presented as desired by individual plant heads. With the implementation of the TQM, Beta developed a common report format to capture information from several locations within the company. This has also enabled comparison of performance across various plants. As noted above, in the post-TQM era, Beta prepares various reports to capture quality related information. This includes the monthly non-quality

cost report, which captures internal non-quality related cost, manufacturing plant level quality related costs and external customer quality related costs. Management accountant of plant one elaborated:

> With the implementation of TQM we calculate quality costs and prepare a monthly quality cost report which includes all scrap cost, rework cost. I also prepare a flash report daily. These reports aid us to manage operations and reduce cost of quality.

As elaborated by the management accountant of plant one, with the move to TQM, an array of management accounting reports and meetings have been introduced to facilitate the functioning of the TQM system in Beta.

DISCUSSION AND CONCLUSION

This paper explored the emergence of TQM, its continuation as well as the changes to management accounting practices after the adoption of TQM in a Sri Lankan manufacturing company, Beta. Based on empirical evidence gathered from our case study firm it was evident that various internal (technical efficiency) and external (institutional) reasons led to the implementation of TQM. The TQM philosophy was introduced to the firm with the introduction of ISO standards as a means to keep up with the ISO quality requirements. Furthermore, Beta serves the international market and is faced with a significant pressure from customers to adopt formal quality systems to provide an assurance on quality of its products, and implementation of TQM became a means to showcase its commitment to quality and gain market place success. The tough competition encountered from other players in the global market, too acted as an impetus for the implementation of TQM. Supplementing such institutional reasons, operational improvements and reduction of cost of quality and production affected the TQM implementation in Beta. This is comparable with the findings of Hoque and Alam (1999) which suggest that significant external factors such as market pressures, competition and regulatory factors influence TQM adoption.

The literature suggests that during the initial stages of TQM implementation, seminars and training sessions become vital in providing an

understanding of the concept and in educating employees (Hoque & Alam, 1999; Sharma & Hoque, 2002). Similarly, Beta's management organized various on the job training programs, workshops and out-bound training and awareness sessions relating to TQM. Such activities conveyed the essence of the concept (TQM) and its importance, while engaging employees with the TQM practice. Upon adoption, Beta has been continuing with TQM for over fifteen years due to the effective implementation and benefits derived such as quality enhancements, increased customer confidence, operational improvements, increased employee morale, reduction of defects and and enhanced company image, as reported by various other scholars (see for example, Sharma et al., 2010; Sharma & Hoque, 2002; Hoque & Alam, 1999; Modell, 2009).

To keep up with the TQM system significant changes have been instigated to Beta's management accounting system. For instance, financial as well as non-financial performance measures have been incorporated to facilitate the TQM adoption, and subsequent to TQM implementation the firm has laid more concern on variance analysis, to reduce cost of quality and production. With the implementation of TQM, Beta has developed a monitoring and reporting system to continuously monitor financial, quality and the operational activities, and prepares various quality related reports. Seeing in this light, in Beta there is a provision for quality costing after TQM, and the reporting and management accounting system has been changed to facilitate its adoption. Similarly, Hoque and Alam (1999) have identified that as part of the TQM practices, a quality reporting system was introduced within the New Zealand construction company under their inquiry. The literature suggests that organizations are able to obtain a competitive advantage through linking TQM practices with other new management accounting techniques such as ABC (Plenert, 1995). Findings from Beta share similar sentiments, for before adoption of TQM, Beta used a traditional (weight based) cost allocation system to absorb production costs into their products, and with the TQM system it moved to the ABC system to more accurately trace overhead costs to individual products.

Prior studies found that firms hold management meetings on a continuous basis under post-TQM management accounting systems to discuss issues concerning quality improvement programs, cost management, budgeting, firm performance and managerial efficiency (Hoque & Alam,

1999). On a comparable note, following the TQM adoption, Beta conducts management meetings once a month to discuss operational KPIs and financial KPIs of the company. Notwithstanding the above, there are also mismatches between the findings of the current study and past literature. For instance, the findings from this case study suggest that formal meetings are more effective than informal meetings to solve quality and production related issues, and would reduce the reoccurrence of the same problems and lead to a knowledge-sharing culture in the company. In contrast, Sharma et al. (2010) have found that when meetings are formal, employees do not provide their ideas and suggestions, and that informal meetings are more useful in solving TQM related problems.

This study contributes to the literature, theory as well as to practice. It adds to the current body of literature in the areas of TQM and management accounting. Despite its use for manufacturing entities, TQM has gained limited attention from prior researchers. Past studies have been mainly founded upon the public sector and service organizations. This study thus fill a gap in literature by drawing evidence on the practice of TQM and changes in management accounting in a leading manufacturing organization in Sri Lanka. Theoretically, we utilized the dual theories rational-choice perspective and new institutional sociology perspective, and capitalized on the strengths of each theory and complementariness between them (see Hoque, Covaleski, & Gooneratne, 2013) in making sense of our findings. We show how TQM implementation could be linked to (internal) efficiency reasons, and to (external)isomorphic forces. Greenwood (2015) suggests that internal processes are important and is a potential avenue for investigation within institutional theory. In this study the use of the rational-choice perspective and the new institutional sociology perspective became meaningful in illustrating how efficiency (improved quality through internal processes) and legitimacy (justifying organizational actions amid the broader external influences) reasons influenced the adoption and continuation of TQM. We illustrate how internal and external uses could be served through a single TQM system, and bringing together these two theoretical perspectives is an important theoretical contribution of this research. The findings of this study also has practical relevance, for it offers useful insights to practicing managers on effective implementation of TQM as well as how management accounting system could be changed to facilitate TQM.

The current research also provides important implications for future research. While this study was conducted as a single-case study, future researchers could possibly adopt multiple-case studies to offer comparative insights. Such comparisons could be done between manufacturing firms, service sector firms, or state-owned entities(SOE) which have adopted TQM, to find out the differences in TQM adoptions and changes in management accounting systems between organizations in different contexts.

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APPENDICES

Appendix A: Broad interview questions

1. What were the characteristics of management accounting practices before implementation of TQM?
2. What are the changes in management accounting practices after implementation of TQM?
3. Were there any new recruits after implementation of TQM to support quality related MA functions?
4. Do you prepare new reports after adoption of TQM? If so what are they?
5. What changes have occurred in the internal management reporting process due to the TQM?
6. What were the KPIs before implementation of TQM, and what are the KPIs after implementation of TQM?
7. Alongside TQM did you implement any other new management / accounting tools?
8. Who was the initiator of the quality management implementation? What has his background?
9. What are the reasons for TQM implementation, and what are the benefits of TQM?
10. Can you explain the employees' response after adoption of TQM philosophy? How do you motivate your employees towards quality?
11. How do you measure the quality of the products?
12. How do you increase the quality of the product after implementation of the quality management?
13. Could you explain your opinion about top management commitment in related to the TQM?
14. What were the changes have been occurred in the production after the implementation of TQM?

Appendix B: Non-financial KPIs

Employees related KPIs	Best reputation KPIs
• Non-attendance head count • Hourly employee turnover head count • Turnover • Voluntary leave • Training satisfaction • Engineering skills	• % of make to stock (MTS) above std-lead time • % of make to deliver (MTD) above std-lead time • Additional capacity (number of units) • Inventory below min and above max
KPIs for people engagement	**KPIs for operational excellence**
• Accident frequently ratio • Near miss report • Red correction rate • Orange correction rate • Health & safety system implementation status • Non-attendance	• Productivity (kg / manhours) • Productivity (units / manhours) • Cost (USD / kg) • Scrap rate (kg / ton) • Inflow (defectives / production) • Scrap tyres (Scrap tyres Production*100)