



Facing up to New Realism:
The case of using the Target Cost Management
approach in healthcare delivery Management

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Dedication

I dedicate this piece of work to my mother – one of the few Black Women who have successfully sacrificed her quest for materialism to support a black man; to help him gain respect in aspects especially in sensitive areas where controlled arguments are rife that the black man is by nature an idiot.

Abstract

This study emerged out of the difficulties to identify the type of management model(s) used by the NHS to manage its care delivery portfolios. Amidst a period of persistent negative returns on care delivery output, questionable quality issues, shrinking resources, public outcry about hospital performances and management distress, this study set up to identify and examine three aspects within operations management and strategy related to the healthcare in general and NHS healthcare delivery management system in particular.

The first is to determine the type of strategic management model deployed by the NHS. Being the principal healthcare deliverer in the UK, the study initially assumes that the NHS deployed a robust cost management model which is hypothetically holistic and runs through the entire care delivery value chain. Investigation presented in this thesis shows that such a model is not in use within the NHS management framework. This vacuum led to the proposal that Target Cost Management (TCM) model could be adopted by the NHS. The main reason for this is that the TCM system will fit well within the NHS benchmarking operation and care delivery requirements.

The second aspect of the study seeks to understand what the TCM model is all about plus the reasons why it is being considered as a more superior system than other costing methods. When compared with the popular cost-plus or the traditional costing system, TCM is identified as being ex-ante, price based, dynamic and strategic, meeting modern cost management needs while others are more ex-post and cost-based and considered outdated. Seeking whether TCM could be applied in the NHS, a case study is designed to test the hypothesis thereby justifying such proposition since there is limited implementation of this phenomenon of interest in other studies.

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Definition of some vital Abbreviations

Abbreviations	Meaning
ABC	Activity Based Costing
ABC/M	Activity-based Costing and Management
ABM	Activity-based Management
BPI	Business Process Improvement
BPR	Business Process Reengineering
CHI	Commission for Health Improvement
DC	Dieses Control
DFMA	Design For Manufacture & Assembly
DH	Department of Health
DM	Disease Management
DRG	Diagnosis Related Group
ECPs	Emergency Care Practitioners
EHC	European Health Commission
GP	General Practitioner (Medical doctor)
HCDVC	Healthcare delivery Value Chain
HCHS	Hospital and Community Health Service
HEFMA	Healthcare Financial Management Association
HES	Health Episode Statistics
HRG	Health Resource Groups
ICT	Information and Communication Technology
IT	Information Technology
JIT	Just-In-Time
LCC	Life Cycle Costing
NHS	National Health Service
NHSFT	National Health Service Foundation Trust
NICE	Nation Institute for Clinical Excellence
OECD	Organisation for Economic Co-operation and Development
OFT	Office of Fair Trading
PbR	Payment by results
PCT	Primary Health Trust
PPR	Patient Process Reengineering
QFD	Quality Function Deployment

R&D	Research and Development
SCM	Strategic Cost Management
SHA	Strategic Health Authority
TCM	Target Costing Management
TPS	Toyota Production system
TQM	Total Quality Management
UK	United Kingdom
USA	United States of America
VC	Value Chain
VCA	Value Chain Analysis
VE	Value Engineering
WHO	World Health Organisation

Definition of some key terms

Word	Definition
Flow	the progressive achievement of tasks along the value stream
Just-in-time	a system for producing and delivering the right items at the right time in the right amounts
Kaikaku	radical improvement of an activity to eliminate waste
Kaizen	continuous, incremental improvement of an activity to eliminate waste
Kanban	A system to regulate pull of products by signalling upstream production and delivery.
Gemba	Where the value is created (Gemba means ‘actual place’ in Japanese) Value is created when people, information, materials, equipment, and processes come together to serve the customer.
Muda	waste or an activity that consumes resources and creates no value
Poka - yoke	A mistake-proofing device to prevent a defect during order-taking or manufacture.
TAKT TIME	Unlike BPR, Lean takes time into account - ‘takt time’= the available production time divided by the rate that customers demand it. This then becomes the pulse for the organisation that sets the pace of production.
Value stream	the specific activities required to design, order, and provide a specific product
TC or TCM	For the purpose of simplicity, TC and / TCM will be used in this study to mean the same thing.

Main key words:

Target costing, Target Cost Management, Operations Management, Healthcare Delivery Management, NHS healthcare delivery operation, disease control management, Healthcare Delivery Value Chain.

Chapter 1 Introduction

This chapter outlines the topic of this thesis and the direction of research. It begins with a synopsis of the background of the research area and study rationale (1.1), and proceeds to examine the evolution of strategic management in healthcare (1.2). It later introduces a brief background of how the NHS is organised (1.2.1), its funding (1.2.2) and the NHS cost management evolution (1.2.3). The aim here is to build up an approach to answer the first research questions which are presented in section 1.2.4 below. The organisation of the rest of the study is covered in section 1.3.

0.1 Background and study rationale

The most recently discussed organisations management hypothesis is that organisations will not succeed if they fail to consistently deliver goods or services at the right time and in the right place (Cooper and Slagmulada 1997, Greasley 1999, Ansari, et al 1997, Ansari, et al 2007). Such organisations are those that are capable of renewal, continually reinventing themselves and the industry in which they operate and compete (Hamel 2002 pp. 12). Drucker (1968), Nonaka (1994) had earlier acknowledged that current society was evolving into a “knowledge society” necessitating a shift in how large business organisations think about innovation, be this technical innovation, product innovation, strategic or organisational innovation.

For the past 10 to 15 years, healthcare delivering organisations have increasingly been seeking to improve the ways in which they deliver healthcare services to their customers. Their aims have been to reduce delivery costs, provide enhanced quality and create accessibility to services. They have also been required to be profitable amidst increasing

scarcity of resources at their disposal. Observations from some very successful industries indicate that operational and strategic efficiency can be gained through the application of more robust strategic management models or a confrontational strategy known as Target Cost Management (TCM) (Cooper and Chew 1995, Cooper and Slagmulder 1997, Ellram 2000, Feil et al 2004). This is an ex-ante cost management system also known as a price-based delivery model (Ansari et al 1997, 2007, Shank and Fisher 1999). According to Cooper and Slagmulder (1997: 2-3), TCM is a confrontational strategy system because it is proactive rather than reactive. This means it contains cost management and value engineering attributes which adopters can use to produce and deliver higher quality products and services that meet customers' (near-perfect) specifications at a cost most attractive to them (usually a lower cost than that of similar products offered by competitors). As this happens, this cost is also able to cover production expenses and bring in returns to the firm in the forms of profits. Shank and Fisher (1999), Ansari et al (1997, 1999, and 2007) also point out that TCM is both a confrontational model and a price based system. Its price-based philosophy rests on the notion that the prospective price of a product or service is determined before production begins. This known market price plus the firm's expected profit level is then factored backwards from the market to the production centre. The essence of this model is that by knowing the price that the product or service will attract in the market, production must be performed at a cost lower than the sales price in order for the operation to attain profitability. Literature shows that firms that have adopted the TCM model have benefited from its confrontational and strategic properties. Large numbers of examples have been drawn from mostly Japanese manufactures. However there are a few Western adopters that have also been recognised in the literature.

The perception that the TCM ideology has led to increased performance, higher productivity, and sustained long term strategy planning within adopters' operations seems to have focused more on the manufacturing sector. This is because a limited amount of studies have actually shown that TCM has, or is being applied in, service delivery organisations such as healthcare deliverers. Similarly, limited attention has been paid to developing models that healthcare organisations can use to strategically manage scarce resources at their disposal, to provide quality care services and to be profitable. Some researchers such as Merode (2004), Porter and Teisberg (2006) for example, have questioned whether this limited attention to developing healthcare specific models has been due to the lack of interest in this area, the complexity of the healthcare system, limited knowledge about healthcare operations, or simply to ignorance.

Swamidass (1991: 243) recommends that “operations and strategic management researchers must have to chart new unfamiliar territory; territory frequented by organisational behaviour and marketing specialists” to expand the scope of production and operations research. Thus increased focus should be laid on how to unlock difficulties regarding research in such areas as healthcare and the service sector as a whole. Glossmann et al (2000) point out that the resources of the healthcare sectors are scarce to the extent that it is necessary to implement “modernisation techniques” that can maximise value and minimise costs. By formulating strategies that are linked to quality, performance and sound financial management hospital executives can create and maintain a competitive advantage for their organisations (Barry 1999:189).

Coincidentally, there has been increased pressure in recent times on many healthcare organisations in the developed world as a whole, and the UK (NHS) in particular, to

effectively manage their resources so that they can provide quality healthcare at affordable delivery costs. This should happen without jeopardising healthcare delivery quality and accessibility (Karvonen et al 2004, D'Estree 2004). The Kings Fund in its various publications between 2005, 2006 has shown the level of intensity of this pressure on the NHS. Similarly, Womack et al (2005: 2) posit that for a healthcare organisation to maximise value and eliminate waste, leaders in healthcare organisations as in other organisations, must evaluate processes by accurately specifying the value desired by the user; identifying every step in the process and eliminating non-value added steps; and making value flow from beginning to end based on the pull; which is the expressed needs of the customer/ patient.

0.2 Evolution of strategic management in healthcare

The healthcare organisations that are at risk of financial loss and even failure are those in which executives fail to recognise the competitive factors in management strategy formulation and implementation (Barry 1999). Porter and Teisberg (2006) mention that the healthcare sector lags behind the other industrial sectors in terms of evolving and implementing strategic or scientific management systems that meet changing times. As a review of practitioners and academic literature of hospital management reveals, while strategic planning is considered to be important to the sector, research in the development of specific models of hospital management is lacking. Porter and Teisberg (2006) further observe that there is a low importance attached to management in the healthcare sector. “Business is almost a dirty word” in the healthcare management concept, and “despite the need to draft and plan required strategies for healthcare, literature on strategies and operations methods for healthcare organisations is in essence non-existent.” Porter and Teisberg (2006: xiii). Moore (2002), Womack et al (2005), Chalice (2005) and Wellman (2005) have all argued, through analysis of various categories, that the healthcare sector is

characterised by structural, strategic and organisational components that create and harbour waste and ambiguity.

Various strategic (cost) management models have been proposed and some have been applied in the healthcare sector. Spear (2005) argues that healthcare variability could be fixed from “inside” by applying the TPS. Womack et al (2005), Chalice (2005), Wellman (2005) and Zidel (2006) propose that lean production methods could be applied in structuring hospital delivery operations, especially by getting rid of waste and improving flow methods. Porter and Teisberg (2006) point out that using more scientific strategic management approaches would redefine delivery process methods so that competition in care delivery would be based on visible value related to results rather than theoretical postulations that are practically inapplicable. These results are defined by analysing quality issues (LOS, access to GP, time lag to diagnosis and operation, rehabilitation facilities etc.), price offerings (delivery or operating costs and access costs by the patients), accessibility to healthcare facilities and other health or clinical outcomes. To sum up, the idea of strategic operations management and the quest for management change in the healthcare delivery system is a recent development to healthcare organisations. This is because most healthcare deliverers of the developed countries are today gradually shifting from a relatively free welfare related, system where healthcare provision was not priced, to a more market competitive system where costing issues are now treated seriously (Ovretviet 2000, D'Estree 2004).

0.2.1 NHS organisation

The way the NHS is organised is complex because its original structure since its inception in 1948 has changed over time (Ham 2004). It is therefore hard for this study to precisely determine the current nature of its organisation. In the simplest terms though, the NHS

organisation can be classed as organised on two levels: notably the upper or macro level and the lower or micro level. The macro level has to do with the state, the ministers of health and the top management of the department of health. This is the top decision making level which is concerned with a holistic national policy and operations perception of healthcare delivery in the country. This is the level that has centralised power to influence the hospitals, trusts etc., to make them adhere to various governments approaches to healthcare delivery. This study is not very concerned with this part.

The micro level however is the level where the care is delivered. This is made up of the various categories of NHS trusts and primary healthcare groups. This is the sector that is closer to the population and where this study is more directed. There are other terms and organisations that can be included in this category such as the health authorities, regional health authorities; special health authorities, district health authorities etc. At this micro level, the NHS is affected in its care delivery by the change in population structure, changes in level of morbidity, introduction of new technologies, and increasing expectations of patients and NHS providers. According to Dixon et al (1997) new technology and changes in expectations are likely to have the biggest effect on NHS operations and are also the most difficult to quantify.

0.2.2 NHS funding

NHS funding is set based upon Government policies and priorities. Most of the funds come from a collection of different taxes and individual national income contributions. Hardy (2006) points out that resource allocations are constantly being refined but these allocations are based on a Public Service Agreement with the Treasury by which funds are allocated directly to primary care trusts using a funding formula. These formulas were designed to

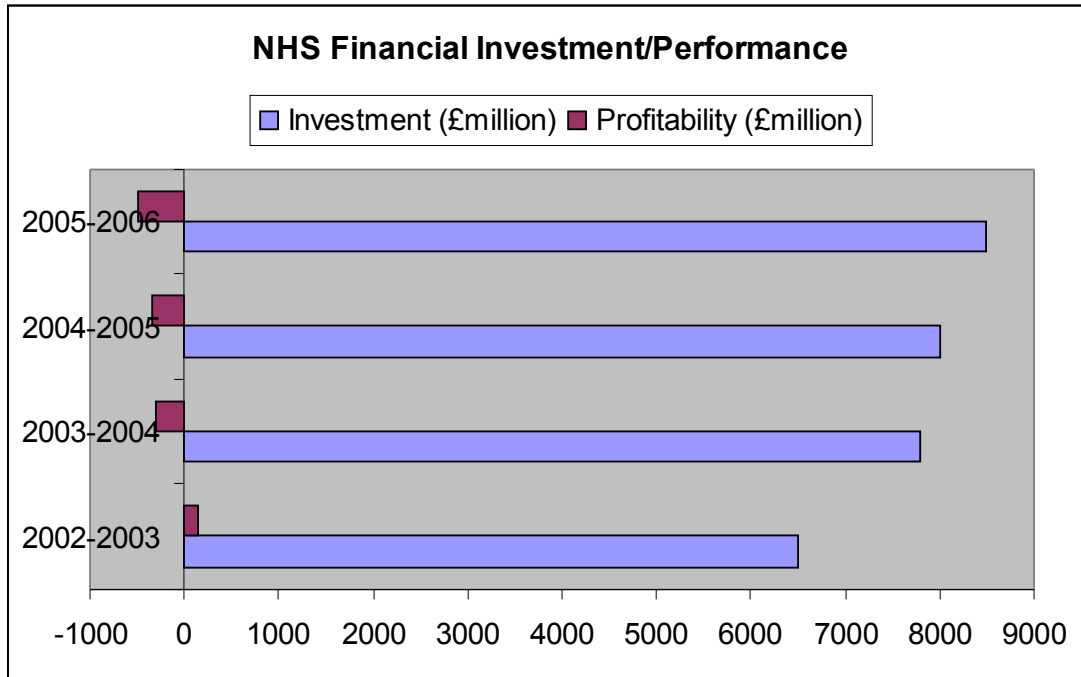
distribute funds to ensure equity of services. The formula used to allocate health resource funds has been found to have components such as weighted capitation targets, recurrent baselines, distance from target and pace of change. However, this study still is not interested in those formulas but the sources of NHS funding. The table below shows the main sources of NHS funding.

Table 1 Sources of Revenue for the NHS

Tax	% of total
Income tax	29%
National Insurance	16%
Value added tax	16%
Corporation tax	8%
Petrol duties	6%
Tobacco duties	2%
Alcohol duties	2%
Other (e.g., individual and private spending)	22%
Total	100%

Source: Hardy (2006) NHS Finance In A Nutshell

Generally the government funding into the NHS is considered as investment because she expects the NHS to either perform at break-even level or make some profits. The figure below shows how the NHS has fared in past years in relation to funding and returns.

Figure 1 NHS Financial Investment / Performance

Source: Author's calculation based on data from Kings Fund (2005) and Her Majesty Treasury 2005

Here it is clear that the NHS has not been meeting its return on investment requirements. More investment in not being met with positive returns except a meagre approximate 1.5% return in the year 2002 to 2003.

0.2.3 Evolution in NHS cost management

The NHS healthcare providers are under enormous pressure to embrace new approaches that improve healthcare delivery operations so that those care deliveries can be sustainable and dependable (Jarrar et al 2001). These new methods are techniques that provide efficient delivery of quality healthcare, at affordable prices and which are accessible to the patients. With competition in place, patients theoretically, have options to choose healthcare Trusts that they believe can meet their healthcare expectations (Propper et al 2003). In this light persistent competition for patients similar to the way private companies compete for

customers will spur efficiency, reduce operating costs and instil best practice management strategies within the various NHS trusts.

NHS healthcare deliverers are also expected to make some profits or at least break – even in their operations (Söderlund et al 1998, Palmer 2005). In due course they are required to make payments for all or part of the public borrowed capital at given interest rates as expected within the operating year. Given that healthcare delivery is the main activity of the various NHS trusts, nationally designed cost guidelines (reference costs) are used for charging patients for healthcare services. Practically, the government is the price giver while the NHS is the price taker. To make a profit or breakeven, the NHS has to provide healthcare at a cost (reference cost) that meets required quality and patient satisfaction (wellness) at a point where this cost will not be higher than the amount of healthcare supplied (Brookfield 2001). This reference cost line (price) is used as a gauge for reimbursement. This approach is properly explained in section 4.4 & 5.3.2 below. To achieve this level of performance and success it is expected that a strategically designed cost and delivery operations management is required. This happens through the formulation and application of appropriate systems that establish objects, activities and instruments.

The main operations that could be described as constituting the cost to the NHS in its process of healthcare delivery are summarised as: consultation time / activities, diagnosis, drugs, theatre time, transport costs, GP work, facility cleaning and medical waste management, laundry, feeding operations, rehabilitation, information management and contacts. A closer look down the value chain would add other components such as the prices of drugs from drug producers, prices of surgical and laundry equipment, hospitality and apparel facilities as well as the availability of qualified staff, among others. Hospitals continue to make losses even with increased funding (see fig 1), which can be interpreted as sinking productivity. Although

it is difficult to measure how much “healthcare” is delivered, the number of procedures performed is used as a yardstick. In 2001 for example, health sector spending through the NHS rose by 11% whereas output was just 3% (D'Estree 2004).

Individual hospitals cost activities differ. For some trusts, management and administrative costs, the cost of clinical negligence, as well as resources spent on non-core issues such as decoration have increased in past years (Moore 2002, the King's Fund 2005, 2006). Generally, the larger percentages of NHS financial resources are spent on payments such as salaries, management and administrative costs. Other amounts are spent to meet recommendations of the NICE. Some hospitals, which lack core competences in certain treatments, send those cases they cannot handle to either private clinics or to other NHS trusts with those competences, and these organisations will also be paid for their services. Huge amounts of expenditure also go on drugs and rehabilitation. The fact that the NHS does not negotiate prices for the drugs it needs means that it is often forced to buy expensive drugs and sell them at the national average prices. When these two aspects of internal and external contingency are put together, it becomes very hard to understand how the NHS costing structure is computed. This is because there does not seem to be any specific holistic model for designing cost and operation management in the NHS. This presents a situation of uncertainty that affects not only lay analysts but also healthcare analysts. There is sufficient evidence from NHS financial reports and publications of the past five years (i.e., 2001 to 2006) which suggests the absence of proper cost management approaches that stratify costing and productivity. This cost management system is not a cost accounting model, but an integrated costing method that runs down the healthcare delivery chain and which spurs productivity and reduces variability. It affects the patient trail from acceptance of patient to patient exit. See appendix 1 for a patient trailⁱ

This vacuum led to the proposal to adopt TCM as a favourable management tool for the NHS. In summary the following factors govern the reasons for proposing TCM as a methodology for NHS cost management improvement.

- TCM is a holistic process of planning operations with the aim to manage and reduce operating and delivery costs. It is an ex-ante cost management model that runs backward from the market (customer needs) to the production or source of delivery. To the organisation, it emphasises the understanding of the markets and competition; it focuses on customer requirements in terms of quality, functionalities and delivery time, as well as price. It recognises the necessity to balance the trade offs across the organisation, and establishes teams to address them early in the development cycle. It also has at its core the fundamental objective of making money, to be able to reinvest for growth and to increase value.
- There do not seem to be holistic methodologies that are being applied to healthcare cost management and operations management as a whole, and the NHS in particular. Recently, Porter and Tiesberg (2006), Spear (2005) and Womack et al (2005) show this lag in USA healthcare management research. In the UK some NHS researchers such as Northcott and Llewellyn (2002), Barden (2005) and others have pointed out this limitation and have called for a rethink of techniques in healthcare delivery management. Since TCM exhibits highly demanded hybrid characteristics as could be identified from its application in other firms, it became obvious that it could be valuable to the NHS.
- Increasingly TCM is being proposed by researchers as a possible solution to healthcare management problems. Specifically Barden (2005) and the Simon Wombell, deputy director of Finance and procurement at the Oxford Radcliff NHS Trust have openly voiced the opinion that adopting the TCM model could improve

the NHS benchmarking culture. In Europe, Merode (2004) found that the attributes of TCM have been applied in other firms with success and if such was replicated to healthcare operations, value could be created.

0.2.4 The research questions

The main questions that formulate this study are as follows

- a) *What is the existing NHS cost management approach or technique?*
- b) *What is target costing?*
- c) *Can the TC system be applied to the NHS?*

0.3 Organisation of the thesis

The remaining six chapters of the thesis proceed as follows:

- *Chapter two* deals with the research methodology applied in the study, analysing which method would best answer the research questions outlined in section 1.2.4 above. It shows that in recent similar studies multiple methodologies, or what is called a “mixed method,” are being increasingly used. The chapter also analyses the research procedure, the sources and types of literature used in the study. As TCM is being researched in various subjects it was imperative to identify the methodology that could relate TCM to healthcare research. Research in healthcare is unusually constrained by various forms of regulation. Thus the ethical aspect relating to this type of study is presented here since the NHS considers student research as falling into the same category as research carried out by any other organisations.
- *Chapter three* outlines the TCM theory, examining the origin of TCM, how some authors define it, and its main principles, characteristics and enablers. A comparison of TCM and the cost plus model demonstrates why TCM is different from most management tools and systems. The chapter then examines the application

mechanisms of TCM system. Thus, this chapter answers the question “*what is Target Costing?*”

- **Chapter four** explores the applicability of TCM in healthcare operations management. The aim is to provide some answers to the question “*can TCM be applied in healthcare?*” The chapter starts by presenting the healthcare quality, patient need and healthcare delivery value chain, its background and the characteristics of healthcare delivery. The chapter also examines the relationship between the TPS and TCM, and the conflicting definitions and characterisation of the two terms in the literature, before considering the two schools of thought currently advocating TCM in healthcare. It proceeds to posit how TCM could be applied in healthcare delivery processes, examining core areas such as understanding environmental uncertainty, and organisational structure. Specific problems are identified and outlined, justifying the reasons for advocating the application of TCM in the NHS.
- **Chapter five** This chapter presents a case study of how TCM could be applied in an NHS hospital, addressing the third research question on the applicability of the model to the NHS. It selects the hospital’s stroke unit to test this hypothesis, localising the application of the TCM model to a particular problem. If it succeeds at this level it can then be institutionalised and diffused. To meet the postulation contained in the TCM theory, a stroke delivery value chain, and various patient trails and models are presented to show how patients and the organisation can connect at various levels e.g., the front, middle and back offices of the hospital. This breakthrough is differentiated from other methods in that TCM does not limit itself to operational efficiency. Rather it is a holistic management model, which also has a strategic tone,

in that it focuses on the product (service quality, cost, organisation's efficiency and the market as well as the employees).

- **Chapter six** presents a critical appraisal of the study. The chapter assesses the TCM application in healthcare and the NHS and determines its feasibility and the extent to which it differs from other operation management techniques and methods, such as lean and TPS. This assessment is based on TCM's implementation and operation efficiency, its strategic role in being customer focused, and how this relates to the shaping of the organisation's management mechanisms. The shortcomings of TCM are also presented and assessed in the light of two main premises – TCM theoretical structural limitations and TCM implementation hindrances. Implementing limitations could be due to various factors including resistance, organisation structure, management's interpretation of the theory, and so on.
- **Chapter seven** recaps the main themes examined and draws a conclusion from the study. Since no research is perfect or complete, there is a call for further study in this area, either by expanding upon this work, or by deeper examination of the research area in general.

1 Chapter 2 Research Methodology

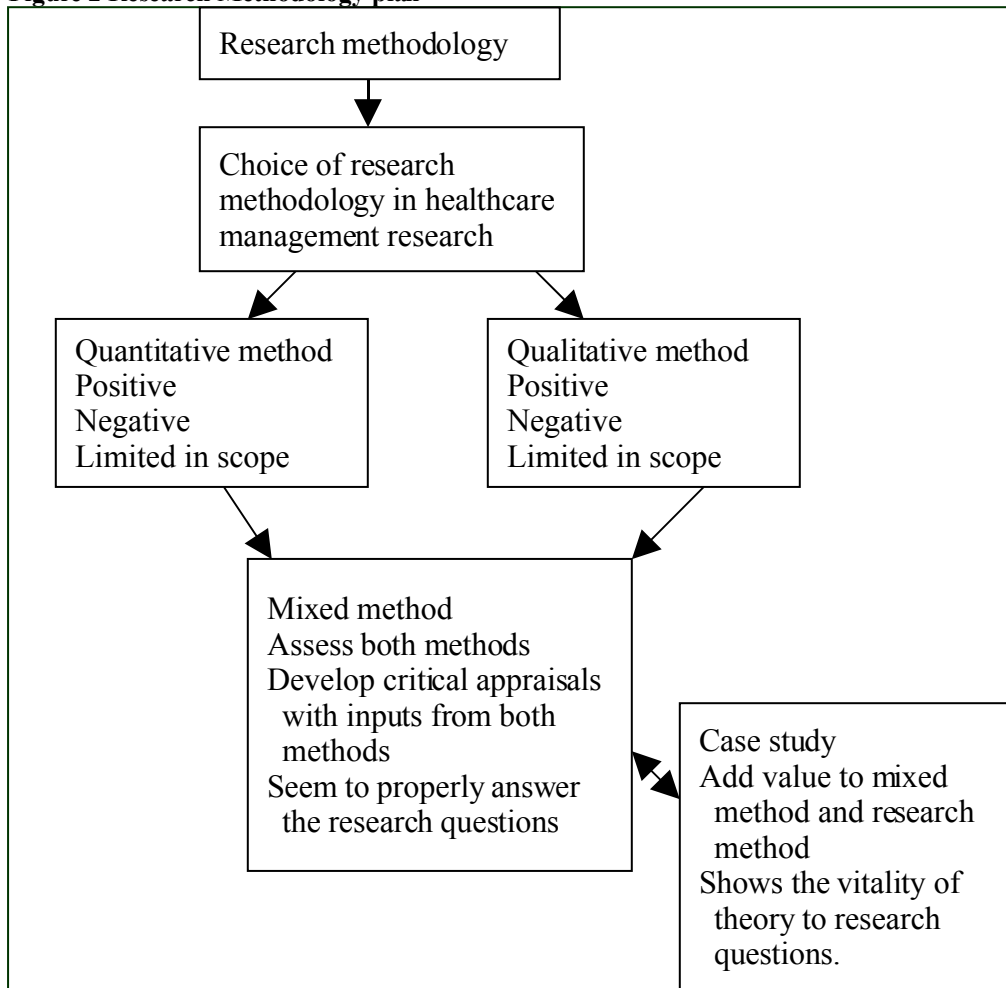
1.1 Introduction

This chapter provides an overview of the methodology used in this thesis and how the methodology answered the research questions. A research method, according to Panneerselvam (2004), is a system of models, procedures, and techniques used to find a result of a research problem. It also includes detailed stages, steps and approaches used as

well as the justifications and the theoretical assumptions, which underlie that particular study. The philosophical structure of this definition forms the basis of this study. The reason for using the definition and approach presented by Panneerselvam (2004) is that research methods are sometimes ambiguous when researchers use such terms interchangeably. For example, some researchers see research methods as a description of data management techniques, while others see it as a process of collecting and analysing data directed by a theoretical vision (Davis 2007). For such reasons the approach defined by Panneerselvam (2004) is used throughout this study.

This study is organised as follows - shown on figure 2 below

Figure 2 Research Methodology plan



Source: Authors' based on study plan

1.2 Choice of methodology

According to Blackman and Benson (2006), the choice of methodology in any research and its design depends on the type of research orientation, its scope and the magnitude of data collection. Consequently, a different methodology could lead to a different understanding of similar questions. These differences can be explored, compared and contrasted to develop more holistic perspectives to complex problems (Blackman and Benson 2006). Therefore selecting a proper methodology in a study is itself a very important part of the drive towards answering the research questions because there are limited studies of this magnitude in healthcare management. For example Sofaer (1999) posits that research in hospital organisations' operations system and management is still young. As such it increasingly attracts the interest of multi-disciplinary practitioners. Because of this there are limited specific approaches used to orientate research methods in the area. It becomes common place to observe practitioners borrowing conceptual frameworks, data collection systems and analytical methods from a wide range of social and behavioural sciences such as public health, medicine, psychology, organisation and operation management (Kirk and Miller 1986, Sofaer 1999, Pope and Mays 2006). They have used quantitative, qualitative and mixed research methods as well as case studies to substantiate their findings.

1.2.1 Quantitative method in healthcare research

Theoretically, a quantitative method is a model associated with numerical representation and manipulation of observations for the purpose of describing and explaining phenomena (Sofaer 1999). Quantitative methods are useful since they possess characteristics that enable them to break up phenomena into easily manageable levels, which create separate elements of an overall conceptual framework or analytic plan (Sofaer 1999). Thus, the purpose of quantitative method is to apply scientific management approaches which have been

developed to increase the likelihood that the information gathered will be relevant to the question asked and will be reliable and unbiased (Davis 2007).

The main quantitative approach adopted in this study was mainly focused on analysing primary data generated from cost information collected from some NHS trusts and secondary data gathered from various databases associated with the NHS. These are the databases of the King's Fund, Adam Smith Institute, the UK National Statistic database, CHI, the Health Commission, the DoH in Scotland as well from magazines and newspapers e.g. the *Financial Times*, *the Independent*, *the Guardian* and the *Economist*. The method used here was a straightforward method in which the data collected was analysed to gain clues about the relationships between NHS operation and the effects of market forces and how these market forces influence NHS healthcare delivery and operation efficiency on the whole. Since NHS hospitals are expected to make profits and healthcare delivery prices are inelastic, this data was analysed to determine the type of costing model that could be used to maximise productivity and reduce variability in operations. In this respect the data that was collected and analysed has assisted in the development of models presented in this study such as the healthcare delivery value chain, NHS delivery price and expected reimbursement model, as well as the designs of various delivery paths.

The use of quantification methods in this study has been limited to some extent despite its powerful attribute of providing clear cut answers to the questions posed. This was due to some weaknesses identified with quantification methods, especially in healthcare management research identified as follows

- i) Time can pose an uncertainty on the quantification variables; before arriving at proper underlying results, the phenomena or some of these variables might have either changed or disappeared (Sofaer 1999).
- ii) Since most of the data used in this study is historic, one is conscious of the dilemma in which external events can occur and have an impact upon the phenomenon being studied. For example, changes within areas such as accounting procedures or clinical observation techniques might mistakenly lead to the conclusion that an intervention decreased costs when, in fact, the changes were illusory.
- iii) Since healthcare delivery is usually a central government policy issue, there is the tendency that policies relating to its effectiveness will keep on changing within the short and near short run period. In the long run however, a new government can come to power and propose totally new approaches in management which would affect already existing quantifying methods making work in progress obsolete (Sechrest 2001).
- iv) Another major defect of quantification methods in healthcare research is that they do not always support the understanding of complex, dynamic, and multi-dimensional “wholes” (Sofaer 1999). For example, it was hard to gather quantifiable data on the changes in the behaviour of the NHS organisations or measure the level of complexity of the various NHS trusts. These components maybe best described in qualitative terms after interaction with members of the organisation.

On the whole, the view of this study is that a very good quantification method is a mix of potentially important independent and dependent variables. Similar research might focus mainly on quantifying the “known”, (those factors that can be reliably quantified), but runs the risk of ignoring vital factors that explain important realities and relationships (Sofaer

1999 pp. 1102). For many reasons (such as the complexity of healthcare organisation as identified by Bowing (1997), Mittman, (2001), and Sechrest (2001)), the level of quantitative method adopted in this study has largely combined the properties of qualitative methods.

1.2.2 Qualitative methods for healthcare research

Qualitative research method can be described as the non-numerical examination and interpretation of observations, for the purpose of discovering underlying meanings and patterns of relationships (Sofaer 1999). Qualitative research has been described by Kirk and Miller (1986) as a particular tradition in social science because it depends in principle on watching people in their own territory and interacting with them in their own language on their own terms (Kirk and Miller 1986). In other fields such as education, sociology, and psychology there is a long tradition of this type of observation (Kirk and Miller 1986, Pope and Mays 2006). As identified with sociology, cultural anthropology, and political science among others, qualitative research is portrayed as “naturalistic”, “ethnographic” and “participatory” (Kirk and Miller 1986, Pope and Mays 2006). Technically, qualitative observations identify the presence or absence of something in contrast to observations that involve measuring the degree to which some features are present or not. To identify something, the observer must know what qualifies as that thing (Kirk and Miller 1986).

Qualitative methods have come very recently to healthcare research, but this does not mean that such methods are intellectually less rigorous than more traditional forms of research (Pope and Mays 2006). For example, one major important factor of qualitative methods in healthcare delivery research is their tendency to be flexible and to easily adjust in time and history (Pope and Mays 2006). The reasons for adopting components of qualitative approach to this study have been based on the belief that:

- Qualitative methods are best at addressing the issue of theory (Sofaer 1999). Health services researchers tend to borrow theories from social science disciplines e.g., economics, psychology, organisational behaviour, political science, sociology, and anthropology. They have done little to develop full-scale, independent theories for healthcare research. Therefore, proposing the TCM approach for healthcare and applying qualitative methods would be within norm in that it addresses the theory. This is because useful qualitative data could be gathered by direct interaction with the organisation, contributing in the long run to the possibilities of building a coherent body of knowledge.
- Besides working well to foster theoretical formulation, qualitative methods could be good in testing the theory. Since this involves studying people in their natural working environment (Kirk and Miller 1986), the method is considered “natural” rather than “artificial.” It also allows for a more dynamic conclusion to results, unlike quantitative research which will always produce less dynamic results (Pope and Mays 2006). Similarly, Mittman (2001 pp. 2) notes that qualitative research in healthcare delivery studies can contribute to finding insights that could not be derived from conventional or quantitative methods.

However, according to Kumar (2005), qualitative methods are limited in that they have been too often applied inappropriately when used as a complement to quantitative methods in hypothesis-testing studies. Qualitative results are more difficult to aggregate and can therefore make systematic comparisons ambiguous. It can also be extremely difficult to replicate research due to the lack of structured design or standardised procedures.

Based on the above differences shown by the various research methods, it is concluded that no one method could conclusively provide the required satisfactory solution,

to answer the research questions. Therefore it is important to investigate if combining the two methods could provide the required approach.

1.2.3 Mixed method

As shown above, adopting only qualitative or quantitative methods in social science research in today's fast changing environment seem to fall short of producing a robust model for research in the subject. According to Creswell (2003) and Blackman and Benson (2006), data collection methods associated with both qualitative and quantitative forms of data are on the increase. Onwunegbuzie and Leech (2006) for example note that diverse methodologies intended to clarify complex research problems have been emerging. For example, multiple and mixed methodologies are being designed such that the research process is driven more by the questions, rather than by other methods. The aim is to explore whether different answers to the same question are discovered or to expand the understanding and application of a new approach in solving complex problems (Onwunegbuzie and Leech 2006). However, such approaches do highlight that there will be differences in outputs depending upon the methodologies chosen, as the need to expand the understanding of one method compared to the other, continues to increase (Creswell 2003).

Holman (1993) points out that combined methodological research approaches are very resourceful in the study of chronic disease and long-term illness, since widening research efforts could provide vital opportunities and broad based perspectives for disease management. Conventional healthcare management and biomedical research have not provided decisive information about the origins or management of the most prevalent contemporary medical problems, such as chronic illnesses (Holman 1993, Oswald 1996, Burn et al 2002). Finding ways to move beyond the limits of traditional research boundaries

can help expand the understanding of some of the most long-term and widespread health problems facing healthcare delivery today. Thus, through combined, sustained and complementary use of qualitative and quantitative research methods, advances in the knowledge of chronic diseases management can be better attained.

1.2.4 Case study

Yin (2003 pp, 1) posits that a case study is one of several ways of doing social science research. Other methods include experiments, surveys, multiple histories, and analysis of archival information. Each strategy has its particular advantages and disadvantages depending on the following:

- The type of research question
- The control the investigator has over actual behavioural events and
- The focus on contemporary as opposed to historic phenomena.

The use of a case study in this study is based on the premise that case studies provide multi-perspective analyses. This means that the researcher considers not only the voice and perspective of the actors, but also of the relevant groups of actors and the interaction between them (Tellis 1997). Case studies are used widely in a whole range of disciplines, such as psychology, anthropology, sociology, criminology, and so on. Since business case studies were first developed by the Harvard Graduate School of Business Administration in the 1920s, analysts have used case studies for over 80 years to discuss particular problems with businesses and how they overcame them (Hamel et al 1993). Case studies often contain both qualitative and quantitative data, adding to the richness and detail of the situation being described, and the problem being analysed.

Case study evaluations, using one or more qualitative methods, have been used to investigate important practical and policy questions in healthcare (Keen and Packwood 1995). Case study evaluations are valuable where broad, complex questions have to be addressed in complex circumstances. No one method is sufficient to capture all salient aspects of an intervention, and case studies typically use multiple methods (Yin 2003). Case studies using qualitative methods are most valuable when the question being posed requires a detailed investigation of a real life intervention, where the focus is on how and why the intervention succeeds or fails, where the general context will influence the outcome and where researchers asking the questions will have no control over events (Keen and Packwood 1995). As a result, the number of relevant variables will be far greater than can be controlled, so that experimental approaches are simply not appropriate.

Although case study is being designed for this research, note has also been taken of criticisms levelled against it. For example it has been criticised on the grounds that case-studies carried out with small numbers of samples offer limited grounds for establishing reliability or generality of findings. Others critics feel that the intense exposure to study of the case biases the findings and thus dismiss case study research as useful only as an exploratory tool.

Despite these objections, researchers have continued to use the case study research method successfully in carefully planned and crafted studies of real-life situations, issues, and problems. Reports on case studies from many disciplines are widely available in the literature.

This study uses a case study and applies a mixture of quantitative and qualitative methods. The case study aims to expand the understanding of the TCM applicability and limitation in

healthcare operations research. The case study's exploratory and hypothesis testing capacity is used to explain how TCM can impact healthcare delivery operations. This supports Ellram's (2006) analysis that case study could be used to clarify situations where there is limited implementation of the phenomenon of interest, in this case TCM in healthcare operation and delivery management. NHS hospitals are required to break even or make profits, provide high quality healthcare, foster accessibility and they operate in a non market environment. Theoretically it would be expected that their costs will be targeted in order to meet the benchmark. This case study thus shows how using TCM can enable the attainment of these benchmarks.

1.3 Research procedures

At the launch of this study, a series of difficulties were envisaged while others were not. The anticipated difficulties were:

- Type and source of data. As explained in section 2.3.1 below, the type and source of data to be used in the study was not clear. Data collected from healthcare organisations are more sensitive than those gathered from non healthcare organisations. This sensitivity is based on political, economic and social issues. This study however did not set to give details about these sensitive issues. However, healthcare organisations have limitations posed by law or the environment and these differ from country to country. For example, data concerning cost and management related issues can be easily collected in Sweden and most Scandinavian countries. Based on differences of the socio – political settings of the UK, it was immediately determined that data collection would be a serious problem here in England.
- The method to analyse the data was also another problem. If the research method was to be more qualitative, which quantitative method best reflected the study remained a

puzzle. The population within the samples and the frequency of the data flow as well as the time frame also were also a problem. Given the time frame, it was immediately hard to determine if doing a time series analysis would be required. This also called for a type of software and the knowledge in using it. For this reason, the scope of the approach had to be limited in order to reduce the scale of the anticipated problems.

- Level of concentration: most research on the NHS, focused on the macro level which gave the initial impression that this study would follow such an approach. There are however some studies that concentrate on operations – related issues at the micro level. For example Gibson et al (2004) studied stroke in Devon where they concluded that there was good knowledge but limited action in solving the problem at hospital level. Probert et al (1999) used the theoretical background of Business Process re-engineering to design a research at operational level at Peterborough NHS trust known as Patient Process Re-engineering. Given that Business Process re-engineering was a popular operations management model used in the UK, his design was very welcome. TCM is not popular in the UK thus it was hard to design how TCM could fit in an NHS hospital. However, the above mentioned studies at micro level spurred the direction of this study.
- Lack of past study. The fact that there was no past study in this direction means that the design to be used for this study would be unique, and without a proper definition of how it could be implemented would be a challenge. However, the role of this research is to show that there is a lack of holistic management models in healthcare management, that operations management research in healthcare lacks robust tools such as TCM and that healthcare systems are well structured to receive tools such as TCM.

Difficulties that were not anticipated before the commencement of this study were as follows

- Lack of enough literature on TCM and healthcare operation management. In the school library there was no documentation of TCM, either electronically or in book form.
- Lacklustre support from healthcare trusts. Although all the NHS trusts contacted were interested in one way or the other, to participate in this study, their support was very weak. They loved the aspect that TCM might lead to improved healthcare delivery and the long-term benefits of higher quality of life. Unlike for example, in Sweden, where in such the research an organisation (hospital) would provide an office with desk, computer and access to most of the tools needed. This was not the case of Exeter. The main reason is to make it participatory and engaging. This however, was not the case with this study and this was not anticipated prior to the study.
- Lack of funds. The costs involved were not expected prior to the commencement of this study. The perception was based by my orientation in Sweden whereby I felt that research of such magnitude would be intensively supported by the institution conducting the study and the organisation in which the case study was carried out. This turned out not to be the case, and as such the scope became limited.

1.3.1 Data collection

Obtaining the data required for this study was a challenge in itself. There exists a huge array of data on various studies of the NHS issues in various areas. The initial orientation of the study was not clear, because at first it seemed that NHS management orientation was dictated more from the macro than the micro level. Initial data collection was conducted in a way that the research results pointed towards TCM adoption at the macro level. Hence, a lot of cost information was collected from fiscal and economics sources such as the Department of

Health, the department of national statistics, The Centre for Health Economics (CHE), and York University, among others. Further investigation showed that NHS healthcare deliverers did have some autonomy in designing strategic management models at micro level. This is important because TCM has the tendency not to work well in areas where there exists political involvement in operations process design (Ansari et al 1997). However, most of the literature on NHS operations decision and delivery model development attributes credence to the effects of government action on an individual trust's management orientation. This promotes the impression that NHS healthcare delivery was being affected more by welfare ideology than the desire to structure and deliver services based of the nature of demand and prices. With the notion that NHS healthcare deliverers are price takers, while the government is the price giver, it became important that some consensus on the type of data required should be reached. Data was thus collected from the following sources.

- (i) Primary sources – exploiting the new law on freedom of information in the UK, some eighteen NHS Trusts and one NHS Foundation Trust were contacted and data requested from them. These NHS trusts cover the Southwest Peninsular Health Authority region in Devon and Cornwall. Ten NHS Trusts responded by sending in data as requested. The Royal Devon and Exeter NHS Foundation Trust provided some annual reports that were already public knowledge. The data requested were mostly spending data on healthcare delivery and a detailed cost breakdown on their balance sheets. This specific hospital data could give a real picture of the cost of care delivered and the amount and the type of care demanded. The amount of care demanded here refers to the amount of components within the HRGs or case-mix combinations in a particular treatment.

- (ii) The source of secondary data is mentioned in section 2.3.1, above. Other source includes the DoH in Scotland, databases of international organisations such as WHO, ECH, and OECD databases. There were two main aims in collecting this data:
- a) To compare reports from various bodies to data collected from primary sources so that a uniform pattern could be determined. This comparison could also paint a holistic picture of the gravity of the situation in terms of cost, quality of care delivered, and profitability or break–even status.
 - b) To fill gaps caused by the lack of data, especially historic data that could not be obtained from the primary sources. Also, comparisons could be made with other countries, especially in areas of spending and investments in healthcare provision, outcomes, and patients’ perspectives of their healthcare systems.

1.3.2 Interview and hospital visits

Two exploratory visits were made to the Royal Devon and Exeter NHS Foundation Trust (RD&E NHSFT). RD&E NHSFT was chosen for two main reasons

1. Accessibility – the trust is located in the heart of the city of Exeter and well connected and accessible to a researcher. Being a Foundation Trust it has more control over its operations, strategic and management decisions and approaches than NHS Trusts. Therefore it was a very good opportunity of observe the type of cost management they use to attain efficiency and grow, and then to determine if the model met that defined in this research. This required regular visits as defined in order to gain from the participatory components as proposed by Kirk and Miller (1986). It was cheaper for the researcher to select the Exeter RD&E NHSFT than others.

2. The Exeter RD&E NHSFT was also interested in investigating means methods, models in which could improve on its operations and care delivery methods. Therefore when this idea was proposed to them they were interested in participating in the study. Therefore visits were organised to the Exeter RD&E NHSFT.

The visit made to the chief operating officer (COO), was in the form of an informal interview, although there were some prepared questions and a brief presentation. The COO showed interest in the idea of adopting TCM as a robust strategic management approach for the NHS. However, the COO felt that questions in this area would be best answered by the financial officer (CFO). The subsequent interview with the CFO was more informal and conversational in character, aiming at exploring and understanding more about the strategic cost management map, the care delivery structure of the hospital, and the nature of their cost management model. Based on the overall discussion, it appears that costing was performed mostly through the application of the HRG tools. Therefore, from the strategic perspective, more needs to be addressed in terms of NHS costing methodology.

1.3.3 Research approach

This study is built on two core assumptions:

- There is a sense of urgency within the healthcare sector in general and the NHS in particular to review its cost management systems in order to attain its operations objectives. These objectives are compressed into the main goal of modern healthcare delivery, which is efficient resource management. Thus, operating in a non-market environment, quality, price, time and customer satisfaction are expected to be synchronised through well-conceived management models or systems.
- Amidst this sense of urgency for healthcare organisations to review their operations and costing systems, healthcare providers are increasingly seeking means to develop

models to improve their operations and meet this objective. They intend to synchronise cost, functionalities, quality, price and time into a model that could target their cost as ex-ante rather than ex-post.

With these assumptions in place, this study was approached in three ways:

- i) Exploratory approach. This was the initial stage of the study where exploratory tools and search mechanisms were deployed to explore the background of costing and management issues in the healthcare sector in general and the NHS in particular. In chapter one, this situation is examined where researchers such as Spear (2005), Womack et al (2005), Chalice (2005), Wellman (2005), Zidel (2006) and Barry (1999) point out that the healthcare organisations at risk of financial deficiency as well as failure are those whose executives fail to recognise competitive factors in management strategy formulation and implementation. Chapter one analyses the extent to which these explorations have been carried out and the outcomes that have been initially generated.
- ii) The second approach was the review of theories and their suitability and appropriateness to healthcare management. During the exploration phase, it was observed that there is low status attached to management in the healthcare sector. Section 1.2 for example expands on this claim, which was crucial in the structuring of a critical theoretical model for this investigation. It shows that various operational management models used in the manufacturing and assembling industries are beginning to be adopted by healthcare deliverers. Due to the ex-ante interest of this study, TCM stood out as a tool that could be of great value.
- iii) The next step of the study approach was to design research questions that would synchronise problems and theory, thus formulating a model in which a proper cost management system could be designed for healthcare management and the NHS.

The first research question relates to the nature of the cost management system or model used in the NHS. To answer this question quantitative, qualitative and exploratory methods were deployed. Quantitative methods were used to extract, assemble and analyse data collected from various sources (see section 2.3.1 for details), and build the cost model shown in figure 11, while qualitative data was used to construct the healthcare delivery value chain (shown in figure 10) and the various care delivery trails. From a review of the literature on best practice in healthcare delivery management, it can be seen that limited best practice methods have been absorbed by the NHS, even though it is expected to attain benchmarked levels of performance, productivity and returns on investment. Chapter one, section 1.2, 1.2.1, and section 4.6.1 provides an assessment of this line of investigation into the NHS cost management model.

The second research question concerns the TCM model. A critical comprehensive investigation was carried out which is presented in chapter three. Given the interest in designing an ex-ante cost management model, the interest in TCM became stronger especially as Shank et al (1999) and Ansari et al (2007) describe it as a hybrid cost management system that can positively impact on the fortunes of adopters. Merode (2004) also supports the view that TCM can be specifically useful to the healthcare sector. In this case the origin of TCM, its characteristics and industrial suitability to the healthcare sector are investigated in chapter three.

Chapter four addresses the next research question of whether TCM can be applied in the NHS. The core determinants are the recognition that most NHS operations are well structured and that healthcare delivery operations could be managed in a manner similar to how

manufacturing firms manage their own operations. A close examination of the structure of healthcare products/services and the structure of TCM reveals that customers (patients) seek to gain similar satisfaction such as cost, quality, time, and reliability in the demand for healthcare services, just as in other non-healthcare products. For the NHS to be successful these components need to be included in healthcare delivery operations strategies. Thus, the theoretical structure of TCM designed for healthcare, will show how core customer requirements of cost, quality and time are incorporated into a health service delivery. Since TCM runs through the whole value chain, a healthcare delivery value chain is designed and various patient trails connected to it.

A case study, presented in chapter five, was designed to show how the stroke sector within the NHS can apply a TCM model in managing delivery of treatments. This condenses the research into a comprehensive critical structure that examines all the research questions directly or partially. At this point both the qualitative, quantitative and case study models have been compressed to form a typical mixed research method.

1.4 Ethical considerations

Even though the freedom of information act in the UK makes it possible to obtain some types of sensitive data from public institutions such as the NHS, there exist certain codes of ethical consideration that make some types of publication relating to healthcare impossible.

The NHS Research and Development Forum (Version 2 18/07/06) provides specific ethical considerations when carrying out research into the NHS. For them “research can be defined as the attempt to derive generalisable new knowledge by addressing clearly defined questions with systematic and rigorous methods.” This involves various internal and external aspects of NHS operation. Clinical audit refers to research that has to do with quality improvement

processes which seek to improve patient care and outcome through systematic review of care against ambiguity. Student research is also examined under the criteria that guide clinical audit.

Apart from contact with top management of the NHS trusts and the Southwest Peninsular Authority to collect some data and related information, no patients, nurses, GPs, or similar staffs were contacted, in order to maintain the ethical aspect of performing research in this area. For the case study reports, they are usually considered to be anonymous and there are rarely ethical issues to be considered as long as consent is obtained from responsible parties. The case study contained in this thesis is a formulation based on the TCM theory, the literature on NHS problems, past studies and press reports. Generally, this thesis does not conform to the terms that require review by the NHS Research Ethic Committee, because its content is very straightforward and contains limited sensitive data. Firms whose names and credentials have been mentioned herein are either those whose information is already public knowledge or those who accept that their information be made public via this thesis.

2 Chapter 3 Literature on Target Costing

2.1 Introduction

This chapter explains the nature of the TCM or TC model, presenting its history, characteristics, applicability and relevance to modern strategic and operations management. The chapter begins by examining the origin of TCM in Japan (although its theoretical basis was conceived in the West), before proceeding to the definitions and major principles of TCM in section 3.4. Given the openness of the system, there is no consensus on a definite

definition of TCM. However, whatever individual definitions have been advanced, its principles remain the same, and make TCM different from other management systems. TCM enablers, the tools and components that make it possible for TCM to be effectively adopted by a firm, are discussed in section 3.5. Section 3.6 compares TCM and the cost-plus system. Analysts posit that cost-plus is the most popular costing system used by the majority of western firms. Advocates of TCM believe that the cost-plus method is out of date, and that TCM is the most dynamic and fits well with today's uncertain business environment. The chapter concludes with an examination of how TCM could be generally implemented.

2.2 Origin of TC

Western researchers refer to the method as Target Costing (TC), apparently alluding to a rough translation from the Japanese word “genkaki-kaku,” meaning the Japanese method of planning and cost management (Hibbits 2003). But Japanese researchers such as Kato (1993), Tani (1995), and Okona (1996) prefer the term Target Cost Management (TCM). They believe that the term “genkaki-kaku” (i.e. TCM) gives the true meaning, characteristics and the psychological attributes contained in the technique. For instance, Tani (1995 pp. 399) mentions that TCM is neither a costing system nor a system for setting target costs. In this study TC means the same as TCM.

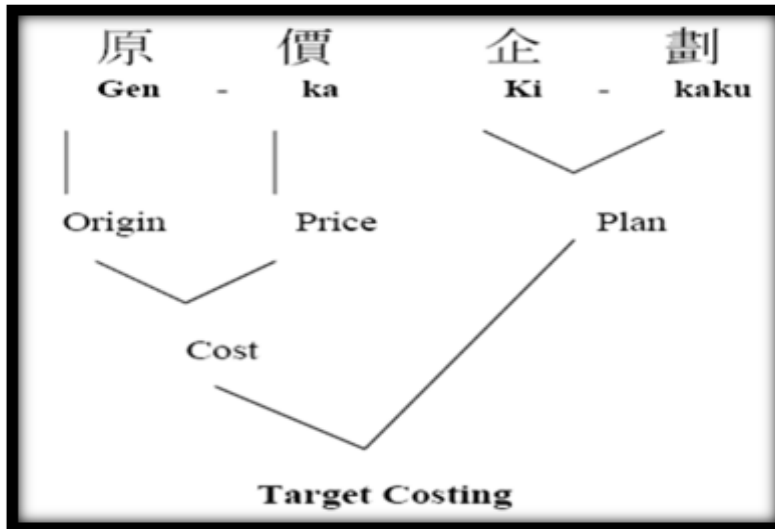
TC or TCM is a cost management technique and a system of profit planning developed by Toyota Car Corporation back in the 1960s. It ensures that new products or services produced meet market determined prices, and a firm's financial returns (Ansari et al 2007). Even though it is already being used by 80% of Japanese assembly firms and 100% of Japanese car manufacturers (Helms et al 2005), only 40% of firms in the USA use a form of TCM as a whole management technique or as part of their management model (Helms et al 2005). In Europe there is no clear evidence in terms of volume of usage because environments adopt

practices differently. However, it is suggested that less than 30% of European firms apply TCM (Ansari et al 2007 pp. 508). The view is that most US and European firms still do cost driven pricing rather than price driven costing.

Toyota started applying TCM in 1963 (Okona 1996, Ansari et al 1997) based on inspiration from General Electric (GE). GE is said to have been using a system similar to TCM by 1947, championed by Lawrence Miles, who is today credited with conceiving the features of TCM. However, his version has been steadily modified by Japanese contingency forces, the effects of globalisation, increased scarcity of basic resources, uncertainties and risks, improvement in technology and the dynamic behaviour of consumers.

It has also been alleged that TC may have been used far before the early 1960s. There is some subjective evidence that Henry Ford might have used it when developing the Model T70 car in the 1900s (Cooper and Slagmulda 1997, Shank and Fisher 1999). Similarly, Feil et al (2004) note that TC was also used in developing Volkswagen cars in Germany in the 1930s.

Fully-fledged TCM operations began in earnest during the periods of scarce resources after World War II, when the Americans created a concept of maximising desirable product attributes while at the same time minimising product costs (Feil et al 2004). This became known as Value Engineering (VE). The Japanese adopted VE to check competition within Japan. Then they combined the VE principles with their idea of reducing product costs at early stages of production, to develop today's TC (Tani 1995, Okona 1996). TC in the west therefore stands for a system of costing plus aspects of VE. Below is a diagrammatic translation of the origin of the term Target Costing.

Figure 3 The origin of Target Costing

Source: Adapted from Feil et al (2004 pp.11)

2.3 Definition of TCM

Some authors have argued that TCM is not a “costing” technique; rather that it is a method for efficient cost management (Tani 1995). Ansari et al (2007) propose that:

$$\text{Target cost} = \text{Target price} - \text{target profit}$$

Where

- Market price and profit are the independent variables, treated as exogenous variables, which are determined by competitive forces in both products and market. Prices are determined by the consumers (what customers are willing to pay) and profit is determined by what financial experts expect as a return from that particular industry.
- The dependent variable is cost – firms have to manage costs to meet external constraint imposed by the product and the financial markets in which they operate.

Generally, it has been difficult for researchers to come up with an agreed definition of TC. Japanese scholars, for instance, have defined it differently (Feil et al 2004). Reasons for these variances in definition could be that TC is applied differently by the various Japanese

adopters and also at different levels. For example, TC is applied by Japanese manufacturers and their suppliers, as well as process-type companies (Tani 1995, Kato and Yoshida 1998, Ellram 2000). Since the characteristics of operations are different in these firms, it may be expected that TC will be structured differently. Therefore numerous definitions and concepts have emerged to provide some understanding of the TC model. Some selected examples are described below.

- a) Shank et al (1999) determine that TC is a financial goal for the full cost of a product or service derived from estimates of selling price and desired profits. The market plays a leading role in determining the operation of the entire industry's value chain and across all functions in the organisation.
- b) Cooper and Slagmulda (1994, 1997) posit that the purpose of TC is to identify the production cost for a proposed product/service such that when the product is sold, a desirable profit margin would be generated. TC focuses on the reduction of the production cost through changes in design. The design phase of the product/service life cycle therefore becomes the focus of cost planning. The perception here is that about 70% to 80% of a product's costs are effectively irretrievable after it has left the designers.

However, after reviewing TC implementation in some Japanese firms such as Olympus Optical, Cooper and Slagmulda (2004) noted that cost reduction was still possible during the production process. Thus TC should be viewed as an integrated cost management program that spans the entire product /service life cycle.

- c) Tani et al (1995) defines TCM as part of a broader product/service cost management process concerned with achieving TC simultaneously with the planning and development of the design of new products or services.

Drawing from above we define *TCM as an ex-ante cost management system that enables the adopter to develop a proper knowledge of its operations based on the expected quality of product and services it offers its clients as well as the expected returns from that product or service to the firm. It is a cost management system that runs through the entire organisation's value chain.*

From the above definition the following meanings can be extracted from the TCM concept.

- (i) TC is a tool. It is a strategic cost management tool used in determining and managing future products costs and thus in setting a strategic tone for the whole product life cycle. It also acknowledges that the product life cycle is getting shorter today than before. It is not, however, an accounting method or a simulation technique. It is a whole cost management structure that combines accounting and operation information for strategic decision making.
- (ii) The tendency to consider the importance of cost at the beginning of the product/service development is vital. It is commonly applied at the development and design stages of product conception and could also be applied during product manufacturing or service delivery stages. This is different from the standard cost control system where such cost controls are limited to the production stage.
- (iii) Within the target costing operating process, many methods of management science are used. Because the managerial objective of target costing includes the techniques of development and product design, a lot is done to improve the organisation to attain high levels of efficiency.
- (iv) The role of IT or ICT has been greatly acknowledged as a revolutionary force for TC application. Japan is one of the earliest users of IT to process and

diffuse information within the various keiretsus, and to robotise its production processes (Drucker 1998). IT in TC has taken automation to the next level and is used to promote and improve knowledge management, organise learning and coordinate operations.

From the above therefore, TCM is a process, tool, system, technique, instrument and method for product or service planning and development aimed at promoting the value and economic sustainability of the organisation. This phenomenon is demonstrated in appendix 2ⁱⁱ.

2.4 Major TCM principles

There are six major principles at the foundation of TC (Ansari et al 1997, 1999, and 2003).

- (i) Focus on Price: This is because price is controlled by market forces. Increasing competition and the complexity of customer demand, means that product designs, material choices, product specifications and tolerances play leading role in determining product competitiveness in the long run. Other factors to include are “make” versus “buy” decisions, production process designs and investment decisionsⁱⁱⁱ. This price led costing approach would assist the organisation to do two things
 - a. Allow the market price to define the product and profit plan. When the price is set backward from the market, an idea can emerge as to how the product profit plan can be structured.
 - b. It will help to provide active intelligence and analysis which can help understand the forces behind the behaviour of market prices.

- (ii) Focus on customers: where customer requirements for quality, product functionality, cost and time, are simultaneously incorporated in product/service and process decisions and guide cost analysis. The value (to the customer) of any features and functionality built into the product or service must be greater than the cost of providing those features and functionality.
- (iii) Focus on design: where conventionally, cost control is emphasised at the product and process design stage. For example, changes in engineering are expected to take place at the earliest possible time before production begins, resulting in lower costs and reduced “time-to-market” for new products. However, Cooper and Slagmulda (2004) point out that cost reduction can still take place during production and delivery stages. However, this is only encouraged at very complex periods, because such ideas can make managers plan to reduce costs during the production process, and may not be a good strategic decision.
- (iv) Cross-functional involvement: where products/services and process teams from different functional positions in the firm are responsible for the entire product/service from conception through to final production.
- (v) Value-chain involvement: where it is expected that all members of the value chain (e.g., suppliers, distributors, service providers, and customers) are included in the target costing process. Target costing presents a unit position because it is not a dichotomised tool but more of an integration and strategic management system.
- (vi) Life cycle cost reduction: Total life cycle cost is minimised for both producers and customers. Life cycle cost includes purchase price, operating cost,

maintenance and distribution cost. Most products today are required to have a shorter life cycle in order to remain competitive.

2.5 Target costing enablers

For the TC model to be effective, it is assisted by certain tools. These tools enable the smooth functioning of TC and are hence known as TC enablers. Weber (1999) points out that TC is an umbrella term that most “best practice” systems work towards satisfying. Therefore, many of the tools that work towards reducing costs and meeting customer satisfaction can be used to meet target costing objectives. Albano et al (2003) present examples of techniques and tools that help to define the following:

- 1) The product: e.g., Conjoint Analysis, Quality Function Deployment (QFD), Product Road mapping (PRM), Market–Feature Tables etc.
- 2) Setting the targets: Conjoint Analysis, Experience Curves, Price road mapping, Competitive Intelligence, Reverse engineering etc.
- 3) Achieve the targets: Value Engineering & Analysis (VE, & VA), Component road mapping, Cost Analysis Tools, ABC/M, lean, Simulation Tools, Supply–Chain Analysis.

A structural presentation of TCM enabler is shown in appendix 5^{iv}

2.5.1 Some important TC enablers

Given that these tools are many, there is little justification to define each of them. Some most commonly used ones are described below.

1. Value Engineering (VE):

The idea behind VE is very similar to activity analysis, which was first developed and used by General Electric (GE). VE is a mechanism Japanese producers use to enhance the value of

products and services. This is measured by the relationship between the functions performed by products and services, and the costs incurred. Different companies define the functions in different ways. Some are geared toward process improvement, while others are focused on satisfying the needs of customers (Yee 1994, Cooper and Slagmulda 1997, Ansari et al 1997, 2003). The process of VE consists of describing the functions of each product, part, and service, and quantifying the components of those functions. VE has, therefore, been used by Japanese firms to attain TC especially through the application of Lean.

(i) Lean management approach or JIT:

Lean emerged in Japan from the Kanban^v system developed by Taiichi Ohno and Shigeo Shingo at Toyota Car Corporation in Japan (Nahmias 2005). Toyota introduced lean to reduce excess work in progress, inventories control, waste and production cost reduction. Today lean has become popular in other sectors and industries (Cooper and Slagmulda 1997, Chalice 2005, Nahmias 2005, Womack et al 2005). The Japanese use it to enhance their drive to achieve TC (Ansari et al 1997, Cooper and Slagmulda 1997).

(ii) Kaizen costing philosophy:

Kaizen works to continuously reduce costs during the production process to ensure that TC is met. Kaizen costing means the complete utilisation of cost reduction potentials. According to Okona (1996) it plays the part of adjusting the operations to move in line with expected targets. Even though it is assumed that 80% of costs are already committed at product planning stage, cost increases are expected to be realised during the actual production process. The effectiveness of TC therefore depends on linkages between cost maintenance and TC. Okona (1996) for example points out that in Toyota production if a TC could not be met at the beginning of production, a special committee of Kaizen cost management drawn from members of various divisions of the firm met to review the situation. Feil et al (2004) also support the view that kaizen costing is closely linked to TC. This linkage is realised by

matching little by little innovative leaps that are initiated by TC within continuous improvement. Therefore the two concepts cannot be treated separately.

However, this view has been challenged; Shank et al (1999) refer to Atkinson et al (1997), who suggest that kaizen costing differs from TC and should be defined and treated separately because they rely on different cost reduction techniques. Atkinson et al (1997) base their argument on two points; that Kaizen costing does not consider customer satisfaction, product profitability and market prices, and that it is internally focused on persistent reduction in costs. However, Atkinson et al (1997) fail to recognise the knowledge sharing, inter-organisation connectivity that is cultured in the TC system.

(iii) Strategic Outsourcing

One of the main futures of target costing is outsourcing. Strategic outsourcing means that some components of a product are produced elsewhere, thus enabling attainment of TC. Factors such as the nature of raw materials (bulkiness), environment and safety concerns, and macro economic factors among others can be important. Where, for example, the cost of transportation of raw material is higher than the price of the finished product, or adds unnecessary cost, it might be cheaper to outsource that component of production to cheaper locations e.g. to the source of raw material. The reverse might be true when the finished product is bulky. Similarly, production can be outsourced to other companies that have core competences in producing those products such as in the automobile, engineering, computing and other similar industries.

Conversely, forms of outsourcing whereby managements opt to get away from purported high costs in face of competition are not likely to be of long-term benefit to those firms. For example, *Business Week* (10th October, 2003) reports that IT firms that outsourced to India claiming lower costs there were still to reap the intended benefits. Also, the environmental

and macro economic policies of those perceived low-cost regions would change with time, forcing another mass movement elsewhere^{vi}.

(iv) Supply chain management:

The term supply chain refers to the entire network of companies that work together to design, produce, deliver, and service products (Hamel 2002). This process from source to factory has been considered a strong enabler to TC. In the past, companies focused primarily on manufacturing and quality improvements within their four walls. Now their efforts extend beyond those walls to encompass the entire supply chain (Ansari et al 1997, 2003). Effective supply chain management helps the firm achieve appropriate inventory levels, the ability to predict and react to shifts in demand, shortened cycle times and faster delivery, real-time visibility into order and inventory status, pricing, and availability of product and material, automated alerts about order or shipment problems, rapid response to market opportunities, and effective target costing^{vii}. Japanese firms rely on conglomerate chains such as the Keiretsu and the Zaibatsus to ensure that this chain is built to guarantee the strength of their supplies.

(v) Evolution in Information technology (IT):

Information technology (also known as Information and Communications Technology (ICT)) is not a production method or model by itself. Its role is mostly as an enhancer of management agendas. Effective application of IT components in production (directly or indirectly) positively correlates with most of the intentions of the JIT system (Nahmias 2005). Within the value chain IT has greatly assisted confrontation producers to position themselves better in a more knowledge oriented market. It thus facilitates easy sampling of the market, checking of competitors' products, and to work directly with consumers. For example, Drucker (1998) points out how Caterpillar could organise its worldwide operations including manufacturing and customer services using IT. Although Drucker did not relate

Caterpillar's operations to TC, Cooper and Slagmulda (1997) and Ansari et al (1997) show that Caterpillar used TC in the 1980s to discipline its depressing performance and check competition from Japanese Komatsu.

2.6 Target costing and Cost Plus method - an assessment

2.6.1 What is Cost plus?

The cost plus system, also known as the traditional costing system, is an approach used by most firms for profit planning. Firms applying the system first estimate a cost of production, and then estimate and add a profit margin to obtain a market price (Ansari et al (1997). According to Ernst and Young (2003) this system is still very popular in many firms despite criticisms levelled against it, where it has been described as being a "close system" approach. Its attractiveness lies in the fact that it is easy to calculate, it requires minimal information and research, and that it is easy to administer.

Emblemsvåg et al (2000) note that cost-plus methods were designed around 1870–1920, during periods when industrial activities were more labour intensive. There was no automation, product variety was small and overhead costs in companies were generally very low compared to today. However, rapid automation emerged between the 1960s and the 1980s, transforming the production and operations systems of firms and warranting re-engineering of their cost management systems.

2.6.2 Weaknesses of cost plus

According to Kaplan and Cooper (1998) the cost plus system is ineffective for feedback and learning because of the lateness of its reporting, its heavy reliance on financial measures, its orientation towards a top-down management direction, its adherence to historic standards

and the fact that it is individually controlled, making it unreliable. Emblemståg and Bras (2000) also add that it can be unfavourable for decision making in that errors caused by capacity utilisation and arbitrary allocation make full absorption costs data inappropriate. A poorly selected cost driver has the tendency to provide inappropriate marginal cost data. Its heavy reliance on production costs tools, ignoring to a greater extent the effects of customers and non-financial information, make the tool a relic of the past. In summary, when compared with TC as a strategic tool, the following differences summarised on the table below can be identified.

Table 2 Comparison of TC and Cost - plus approaches (a summary)

<i>Cost Plus</i>	<i>Target costing</i>
Market consideration not part of cost planning of a product	Market consideration drive cost planning of products
Cost of production determines selling price	Price determines cost
Waste and inefficiency is the focus of cost reduction	Design is key to cost reduction (Product and system design)
Cost reduction is not customer driven	Consumer input guides cost reduction
Cost accountants are responsible for cost reduction	Cross functional teams responsible for managing costs
Suppliers are involved only after product is designed	Suppliers involvement is required early
Minimise initial price paid by customers	Minimise cost of ownership paid by customers
Little or no involvement of the value chain in cost planning	Involves the value chain in cost planning

Source: Ansari et al (1997, pp. 16)

2.7 Implementing Target costing

The characteristics of TCM make it look easy and straightforward to implement. However, implementing TC requires the organisation to acquire a different mind set. For example, for Toyota and many Japanese adopters the TC is a technique, system and philosophy (Feil et al 2004, Cooper and Slagmulda 1997). Based on observations from adopters, successful implementation of TCM is influenced by the following factors.

- i. Top management leadership:*

According to Ansari et al (1997), successful implementation of TC requires that the employees are schooled and cultured to develop the sensitive spirit needed for efficient operations improvement of the organisation. This is only possible where top management involvement and strong leadership are able to drive the culture that encourages employees to spot areas of weaknesses requiring improvement. TC requires cross functional involvement, hence top management arrangement and funding of such a drive is imperative. Business as usual is not a major characteristic of TC (Gagne and Dicenza 1995).

ii. Team orientation:

In a typical TC setting, team working by employees is one of the main successes of its implementation. Most researchers of TC agree that team orientation is a Japanese working culture. This has been attributed to their Confucianism, relating to the teachings of Confucius and his followers, emphasising personal control, adherence to a social hierarchy, and social and political order (Feil et al 2004). Therefore in Japan groups come before individuals, given the added advantage that people feel more comfortable in groups than in isolation. Coherent decisions in meeting tasks is very important, although the head of the organisation still has the final say. Decisions that come from group debate are considered vital. Such a management and decision making system was also observed in the Swedish management style of both adopters and non-adopters of TC.

iii. Trust:

Trust between all the components of the value chain is imperative for successful implementation of TC. It is essential for each party (employees, management, suppliers, and customers) to understand and rely on each other. This helps the organisation to obtain efficient knowledge about the behaviour of customers and the factors that affect market conditions. Factors such as anatomy, participation, co-operation and elasticity are explicitly employed (Feil et al 2004). One example of such trust in Japanese firms is that lifetime

employment offers are common^{viii}. This loyalty and trust makes employees understand changes within the organisation and work at all times to make the organisation successful for their own interest.

iv. Japanese management accounting system:

Contained in the Japanese management accounting system is more information for strategic decision and also non-financial issues, unlike the western management accounting system that relies heavily on financial information (Shank and Govindarajan 1993, Feil et al 2004). The aim here is to enable employees to think strategically and be more market oriented, thereby enabling the effective implementation of TC. Quick communication of financial information among employees is imperative so that employees can understand the performance of their department and the firm.

v. Commitment to work:

While there is expected to be trust between the organisation and worker, the workers are also expected to show a strong commitment to work. Such an attitude is vital for the successful execution of TC. Japanese employees' attitudes towards their work and their employers have been described as remarkable (Feil et al 2004). Referring to a survey conducted by Streib and Ellers (1994), Feil et al (2004) point out that about 80% of Japanese believe that their work comes before their families. Other studies show that Japanese workers are ready to work longer hours and willing to take shorter holidays. Some western critics have argued that TC puts undue stress on workers; for instance, Mehri (2005, pp 24) argues that TPS has "little to do with improving the lives of workers and has much to do with producing vehicles with the least amount of money in the quickest time." Given the difference in approach to work ethics, this view could greatly affect Western observers who may feel that the Japanese TCM system puts excess pressure on workers.

vi. Education:

The notion of continuous improvement came about because of the Japanese interest in learning. Their passion for education has been noted as one of the strongest in the world. Japanese companies are always striving to improve their employees' knowledge through training and job rotation systems (Feil et al 2004). By emphasising comprehensive education, organisation authorities and employees are required to understand the other units within the company. TC implementation will fail if workers (management and ground employees) don't understand the working of their organisation (Ansari et 1997, 2004). The Japanese learning system is characterised by the "learning by doing" approach, leading to continuous change and the realisation of the individual's impact on the environment (Feil et al 2004).

vii. Keiretsu (Business Association)

Keiretsu (Business Association) is a pyramid shaped business structure used by Japanese firms, and is characterised by a major manufacturer at the apex linked to part makers underneath it. The companies work together to develop and manufacture goods from a long-term perspective^{ix}. These legal and strategic networks link organisations to financial centres and to other organisations enabling them to pool resources and reduce costs (Cooper and Slagmulda 1997, Feil et al., 2004). It assists TC in that such co-operation integrates suppliers into the product development process and guarantees the flow of required resources from one end to the other. This provides some degree of effectiveness to the JIT system that feeds the TC operations.

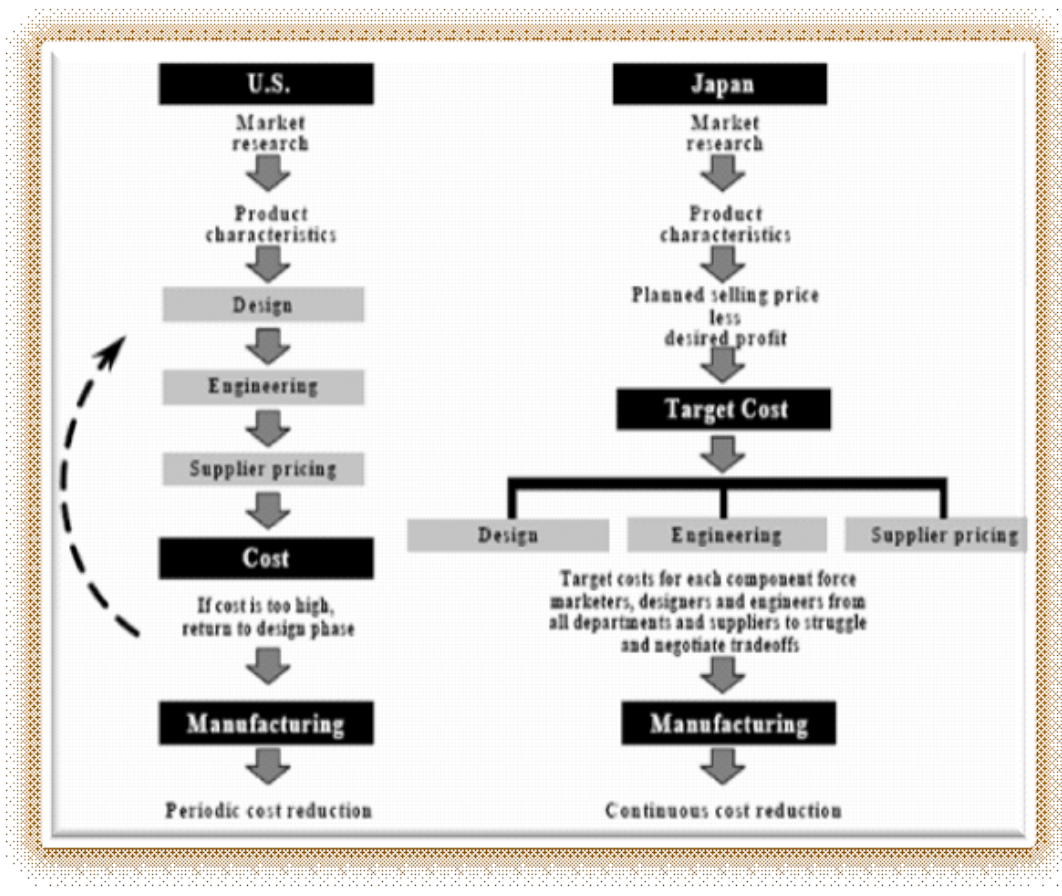
The background of Keiretsu can be traced back to before the Second World War, and the organisations known then as the Zaibatsus (financial cliques) that were dismantled by the allied forces for being too strong and dominant. Despite Western condemnation of the Keiretsu, this style of close cooperation between a producer and suppliers in one group is

increasingly being viewed as a way to cut costs and raise productivity especially to meet increased foreign demand from China and other countries^x.

viii. Information Network

It is postulated that the success of TC in Japan has been due to the excellent information network that exists between customers and suppliers (Feil et al 2004, Ansari et al 1999, Cooper and Slagmulda 1997, 2004). This makes it possible for them to apply on the spot market research characterised by intensive continuous backflow of information on the nature of products in the market, and welcome suggestions on how to improve them. For example, Japanese companies were able to manage the various oil crises, learnt from customers to reduce components in a product, quickly learnt about the effects of environmental changes, and ploughed this back into their production systems. Similarly, Japanese car makers quickly started designing hybrid environmentally friendly cars at a time when there were few advocating solving the problem of carbon emission from car fumes. In the consumer electronic division Japanese Fujitsu, Matsushita, Pioneer, and Panasonic became the first to popularise the modern plasma TV even though it was invented in the US in the 1960s, while Sony started designing attractive digital audio players (e.g. MP3) at a time when consumers demanded digitalised portable products which absorb little portable and homespace.

Figure 5 Western (cost-plus) and Japanese (TCM) models compared



Source Feil et al (2004, pp 14)

2.7.1 TCM Mechanisms

1. Setting the target Cost

The TC philosophy is based on the question “*what should be the product cost?*” This is different from the question “*what does the product cost?*” After a tentative target sales price has been established (based on the factors described above), the desired profit is subtracted to yield the allowable cost. This allowable cost is the management’s highest aspiration, which is usually very hard to attain, and mostly impossible in the short run (Yee 1994, Monden, 1995 and 2000). Successful implementation of the TC principles aided by individual product kaizen obviously gives positive long term results. Allowable cost is usually computed thus:

➤ *Target sales price - target profits = allowable cost*

Or

➤ *Market driven selling price – desired profit = target cost.*

The desired profit is set based on the company's desired return on sales (ROS) rather than return on investment (ROI). Researchers identify that using ROS is reasonable for technical and strategic reasons:

- The technical reason is that given the fast changing market, manufacturers need a wide variety of products in low volumes to survive. It is impossible to use ROI to calculate the profitability for each of these products because many low volume products with shorter life cycles would yield a negative ROI report, giving misleading reports about the firm's performance (Yee 1994).
- For strategic reasons, ROS is preferred for long-term strategies because producers need to focus on the profitability of portfolios of related products and the role played by each product in the product group. Through the ROS method the allowable cost is compared to the estimated cost, which is based on the current standard materials, labour and overhead cost. Meanwhile, serious studies are done on competitors' products and position. Then when all is assessed, the gap between allowable costs and estimated cost is reviewed from various perspectives. The target cost is then established as an attainable target, which will motivate all personnel to achieve.

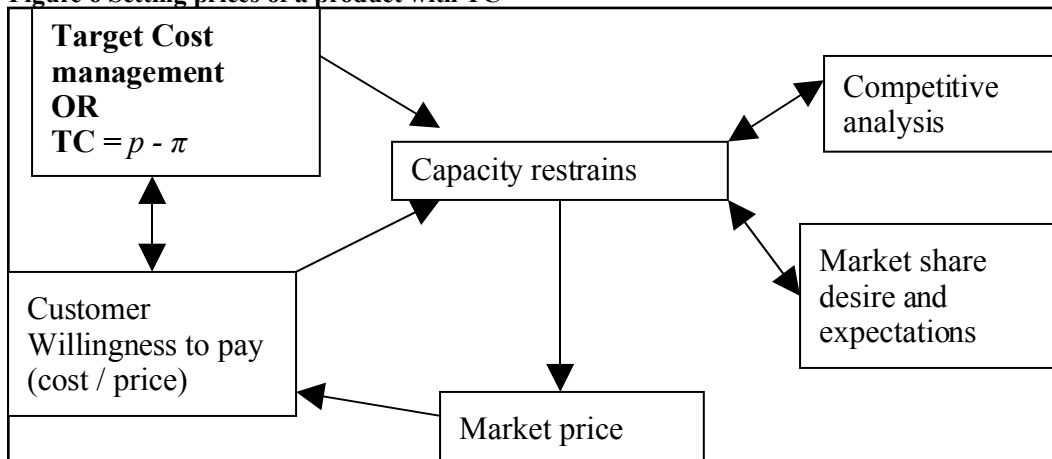
2. Setting Target price

Target costing system is not just the price a customer pays at a time of purchase but also the price to minimise the cost of the ownership. Cost of ownership includes invoice cost plus transportation, repairs and maintenance, services and support and disposal cost (Ansari et al 1997, Monden, 1995 and 2000, Cooper and Slagmulda 1997 etc). The costs associated with

the cost of ownership must be considered at the time the initial purchase is set for a product. Within this context therefore, unlike the cost plus method, setting prices in a target costing system considers the following:

- a) Consumer need, want or taste. This may refer to the physical and related function of the product that will influence the price.
- b) Satisfactory price. This is the price consumers are willing to pay for a desired function and feature.
- c) Competitive position of competitors, their prices, range of products and product functionality.
- d) Market share goal relating to the size of the market a company wants to attain. Most Japanese companies use this strategy to establish long-term projects positioning because attaining this means they are able to eliminate systemic risks, wastes, reduce components in a product, and so on. Toyota and Komatsu are very good examples.

Figure 6 Setting prices of a product with TC



Source: Authors inspired by Ansari et al., (1997)

3. Setting Target prices for new products

Setting prices for a new product is very difficult since the company does not have any historic cost information with which to estimate market behaviour. The most useful and

common strategy is to do intensive market research, studying competitors' products and techniques, and to assess those factors that will help the producer to evaluate the production cost to selling price and assess the expected profit. However, setting prices when the product is going to the market for the second time might be less challenging.

4. Setting target prices for existing products

Setting allowable cost when the product has been in the market for some time is easier because the producer can assess the performance of that product in the market in relation to that of the competitors. Feedback on quality, functionality, new technology, new designs and environmental changes and so on, will help the producers to adjust and restructure the pricing system. The fact that there is historic information about the performance of the last product makes it easier to draft a price plan. Other ways of fixing or adjusting the prices of existing products are as follows:

a. Function based adjustment:

Price added or subtracted based on functionality or value of the function added or removed from an existing product (Ansari et al 1997). Toyota Motors pioneered this system, whereby the price of the current year's car model starts with that of last year's model but is augmented by added features such as an airbag or CD player.

Such a situation, which supposes an increase in price with added features, has been criticised along the lines that it may not be universal. For example critics argue that prices of some products drop as technology improves, as has been the case with computers, cameras, mobile phones, and consumer electronics, among others. For example, Dell computers add new features to their products at a planned target price reduction on the older models.

b. Physical attribute based adjustments:

Here prices are set influenced by the physical attributes attached to the product. Such attributes include weight, horsepower, the effect on the environment, its reliability, and status projection (particularly in cars, for example). Functionality plays a leading role in projecting physical attributes. Caterpillar and Komatsu present a very good example in comparing functionality and physical attributes.

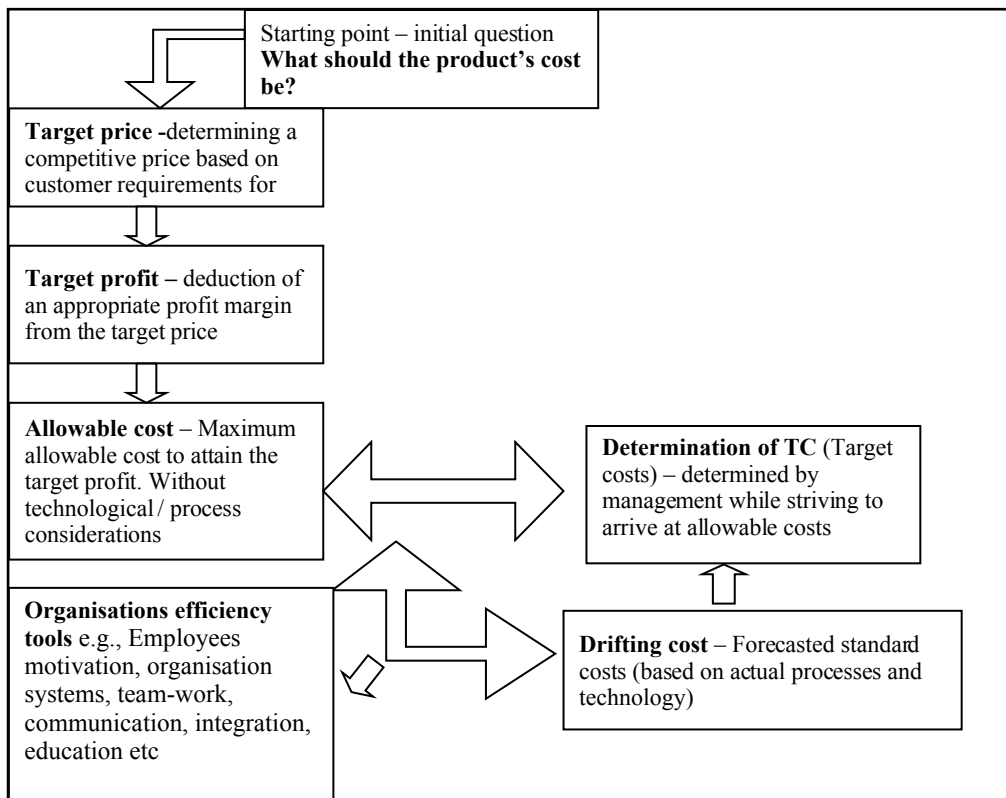
c. Competitors based adjustments:

Here the firm sets a price with an eye on the competitors' prices and their product attributes. The main strategy here is to estimate the differential value that the market places on a competitor's products based on functionality and attributes.

5. Setting target profits

Marketing plays a crucial role in the determination of the target cost. The starting point for a target cost is the estimated selling price for the product determined by market analysis. Sales volume is also estimated and, from the total estimated sales revenue, the desired profit is subtracted. Management determines this desired profit margin with reference to the company's long-term strategy. Retail prices and sales volumes are proposed by the marketing function based on its research and the company's desired market share. Total sales revenue for each new product over its life can now be estimated. The target profit, usually determined by using return on sales, is subtracted from the total sales revenue. The target cost is now determined.

Figure 7 Toyota's target costing approach



Source: Feil et al (2004, pp.16)

2.7.2 Successful users of TCM

The success rate of TCM has been highlighted in the secondary literature, and the list of thriving companies and industries that have successfully adopted TC includes Japanese producers such as Toyota, Nissan, Sony, Matsushia, Daihatsu, Canon, Olympus Optical, and Komatsu (Cooper and Slagmulda, 1997). However, non Japanese firms that have been found to use TC include Mercedes, Alcoa, Goodyear, Rockwell, Texas Instruments, Boeing, DaimlerChrysler, and the North Sea oil industry (Knott 1996, Cooper and Salgmulda, 1997 etc). Nicolini, et al (2000) mentions the UK construction sector. Ellram (2000) identifies semiconductor, automotive and electronic equipment industries as well as the computer peripheral, consumer products, and aerospace original equipment manufacturers as all performing in the TC processes.

2.7.3 Summary and conclusion

The rise of the Japanese firms in the 1970s and the 1980s attracted the study of, and the adoption of their management systems by western firms. These Western adopters aimed to adopt the Japanese cost management systems in order to acquire the competitive strength in the marketplace exhibited by these leading Japanese companies. Some authors such as Cooper and Slagmulda (1997), Feil et al (2004), Ansari et al (1997, 2000, 2007) claim that the philosophical content of the TCM theory is very strong such that organisations' management is able to forecast production and to deliver goods and services that meet consumers' expectations of price, quality, time, functionality and overall satisfaction. Some analysts, however, argue that there is no clear evidence that Japanese cost management systems influence performance because the rise of Japanese companies was perceived to last longer beyond the 1980s, but today many are instead questioning why Japanese firms face difficulties. TCM advocates however, argue that success with TCM is higher than with most other management models. They argue that this is a tool that made many Japanese firms successful abroad and also made Japan the second strongest economic giant of the world.

3 Chapter 4 Target Cost Management in Healthcare

3.1 Introduction

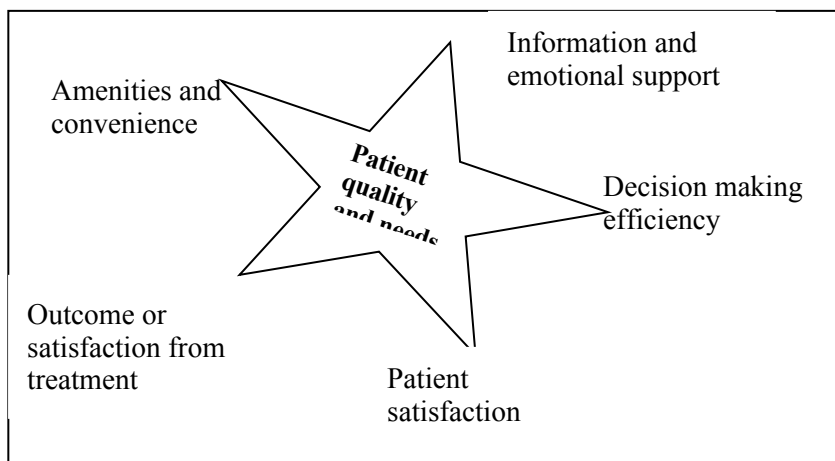
This chapter presents theoretically how TCM can be introduced and applied in the healthcare sector. It begins by examining the dimension of patient quality and needs from the healthcare provider's perspective (section 4.2). This is followed by the presentation of the healthcare delivery value chain (HCDVC) (section 4.3), which reflects the view that TCM runs through the entire value chain of an organisation. The chapter continues by assessing TCM and TPS (section 4.4). This is because literature shows that TPS is already being applied to manage

healthcare delivery while TCM has only been proposed. Therefore its application and use has not yet been fully documented. Yet there is a close relationship between the two ideological formulations which could be misinterpreted. In this light, TCM in healthcare and the TPS in healthcare are analysed in section 4.4.1 and 4.4.2. Then section 4.5 analyses TCM applicability in healthcare operations management, followed by a discussion (in section 4.6) of how the NHS could use TCM principles to structure its operations.

3.2 Dimensions of Quality of Patients care and need

Chilingerian (2004) presents in the “Five Star Quality” model, five main dimensions of patient quality.

Figure 8 Five Star Quality Model

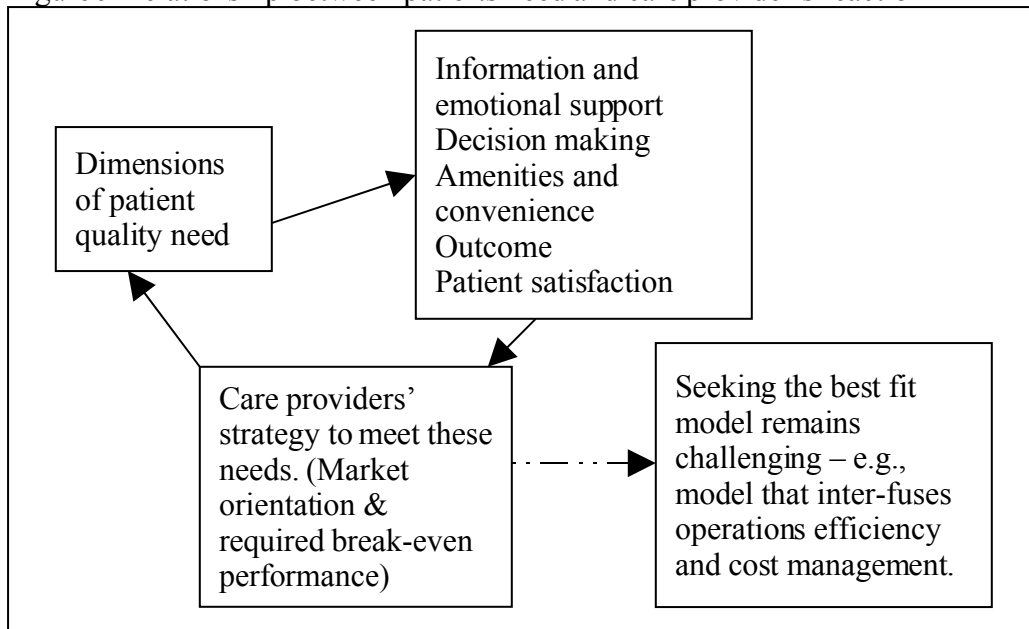


Source: Chilingerian (2004 pp 16)

These are not independent factors, but are required to interact with each in order to create a holistic management methodology. This holistic system is a major requirement for meeting the five star quality model (Chilingerian 2004). The five star quality requirements reflect a situation of higher quality, lower costs and time, and accessibility. Here, healthcare provision starts from the side of the patient or market and is factored backward to the delivery management mainstream. Patient satisfaction and outcome contained in the five star qualities is actually where the TCM application starts, where patients are referred to as customers.

Merode (2003) posits that implementing TCM in healthcare delivery can contribute immensely to achieving the components contained in the five star qualities, as well as other components such as hospital organisational efficiency and knowledge development. Rather than paying too much attention to operational efficiency tools in isolation, Barden (2005) notes that NHS managers need to develop expertise in systems such as process costing, target costing and lifecycle costs. The components of the Five Star Model Quality would help a care provider to build strategies to meet these needs. To build up an ex-ante model leading to TCM implementation, a structure would appear thus:

Figure 9 Relationship between patients need and care provider’s reaction



Source: Author’s calculation

It has already been shown that the TPS and the lean approaches have been successfully applied to hospital operations. Attempting to draw a line between the two concepts has been challenging because authors have not clearly differentiated the characteristics of TPS and the lean management system. Authors such as Spear (2005) seem to apply most of the attributes of lean in their description of TPS. Wellman (2005), writing about lean, describes it as “the

TPS.” The incidence that this might have been limited to differences in terminological interpretation is not clear. With these controversies and inconsistencies, it is hard to establish any prior study in this area. It is important at this point, therefore, to locate the position of TCM within TPS so as to give a clearer understanding of the scope of this study. One very important aspect of TCM application in an organisation is the location of its value chain, as TCM operates throughout this chain.

3.3 The Healthcare Delivery Value Chain (HCDVC)

Most of the idea behind the healthcare delivery value chain comes from Porter’s *Competitive Advantage: Creating and Sustaining Superior Performance* (1985) and subsequent publications. It is likely that most healthcare deliverers already have various delivery value chains which guide them in decision making. However, there is no proper clarification of these value chains in the secondary literature. Burns et al (2002) identify that the main objectives of the HCDVC in a healthcare organisation are to

- Enhance the effectiveness of all activities of the organisation working together to create bundles of goods and services.
- Manage and coordinate the overall process from care delivery rather than focusing more on maximising the interest of one player.
- Establish a portfolio approach to working with suppliers and patients, i.e., decide on which player to work with most closely, and establish the process and IT/ICT to support such relationships.

As contained in the TCM theory, the HCDVC is a series of interconnected linkages which can begin with the employer and end with the provider(s). Stressing the power of partnerships at various points along the healthcare value chain, Steinhart and Aslup (2001)

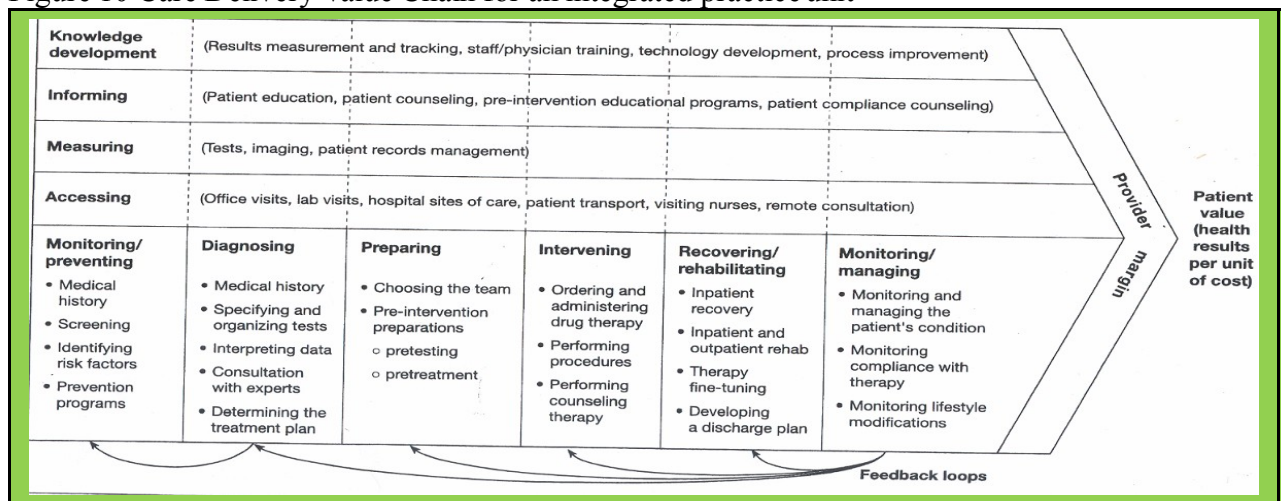
refer to the Japanese keiretsu as an example of a unique type of business partnership, and note that such partnerships can be forged at various points along the healthcare delivery value chain. This can be made possible by configuring a five-entity model, composed of the patient, employer, managed care organisation, hospital, and physician. Japanese firms have formed tightly knit, integrated partnerships acting virtually as a single entity moving towards goal achievement. Within the keiretsu, suppliers have very few customers (often only one) and, in turn, the customer utilises only a limited group of suppliers. By focusing on the needs of the other to achieve their own success, both the supplier and the customer find that some of their success resides in each other's hands.

Fetterolf (2006) also observes that firms within disease management (DM) industries are under enormous pressures to define “the business case” or “the value proposition” for medical management in general and the descriptions of DM or wellness of patients in particular. Robust responses to the broad economic value of service operations (from data of patient admission to outcomes review) need to be properly defined. This will make it easy to assess the full range of services delivered, and the complexities within the cure processes. The HCDVC shows a series of steps and stages in which hospital managers, healthcare insurance brokers, healthcare network, acute care facilities, long-term care facilities, home health agencies, and even hospice care services are interlinked.

The two views outlined above seem to be limited to environments where healthcare deliverers have the power to plan their own supply networks and build their own chains as it may suit their organisational goals. Therefore, transferring concepts from these to environments where healthcare provision is more welfare oriented could be very challenging. However, the mention of keiretsu is important because keiretsu play vital roles for the success of TC.

A theoretically composed HCDVC that seems to fit a holistic view of healthcare delivery has been developed by Porter and Teisberg (2006 pp 204). They argue that “providers should delineate and analyse the HCDVC in a medical condition and for the entire care cycle rather than for particular intervention or service.” The HCDVC would therefore provide a proper framework required to describe healthcare delivery within a care unit and analyse the extent to which it can enhance the location of services, measure results and accumulation of costs. An example of such a chain is presented in figure 10 below

Figure 10 Care Delivery Value Chain for an integrated practice unit



Source: Porter and Teisberg (2006 pp. 204).

Shown above, the care delivery value chain can be designed to fit particular care issues (as will be explored in chapter five). This HCDVC has the following characteristics:

- It provides steps and stages that can assist in structuring care processes. For instance, it starts with monitoring and prevention, which includes tracking patients' circumstances, risk assessment, and conceiving and executing steps to prevent or reduce the consequences of sickness and injuries. The chain then progresses through the diagnosis of sick cases to the monitoring and management of patients.
- Within the various stages of care delivery are other activities such as Accessing, (steps the hospital can take in order to gain access to patients, including private visits

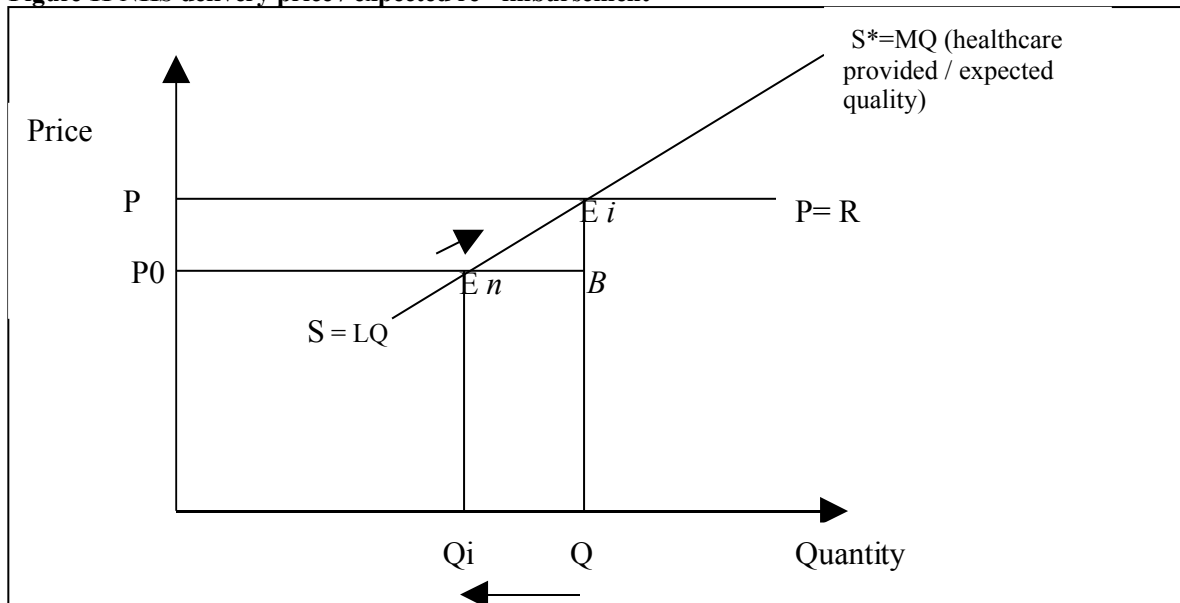
and internet contact), Measuring (of patients' medical circumstances), Informing (activities involved in notifying, educating, coaching, and so on) and Knowledge development (activities related to learning and continuous development so as to improve outcomes).

- The feedback loops provide information that is used in the short and long term to improve the services delivered. Feedback migrates from department to department and through the whole delivery chain.

3.4 TPS or TCM

Evidence that the TCM approach is applied as a strategic management system in healthcare delivery has not been properly established. This does not, however, entirely undermine the view that TCM might be in use by some healthcare deliverers, since TC is defined, structured and applied differently in different organisations (Kato and Yoshida 1998). Similarly, some organisations might be using the system without calling it TCM, or calling it TC but using just some of its components. For example, Zelman et al (2003) posit that TC usage is popular in healthcare management especially when the government is the price setter and the provider is the price taker. Here, the organisation is given a set price (reimbursement baseline) and the provider must control its operating and delivery costs to ensure that overall costs do not exceed that reimbursement upper limit. Such a situation is shown in figure 11.

Figure 11 NHS delivery price / expected re - imbursement



Sources: Authors calculation based on Zelman et al (2003).

Assumptions and description of the figure

- S = healthcare supply including required quality.
- MQ = maximum quality (extremely high level of quality – this could be considered as waste).
- LQ = lowest quality of healthcare (extremely low unacceptable level of quality).
- Ei= reimbursement equilibrium
- En= Least acceptable care provision and new equilibrium
- Q = quantity of care delivered. This quantity relates to the number of case mixes and components of the HRG rather than the amount of people who demand healthcare.
- Hospitals charge only price (P) as prescribed by the reference cost manual or reimbursement upper limit. Thus P=R means delivery price is equal to reimbursement. P is have the characteristic of perfectly inelasticity and can not be adjusted to meet increasing delivery costs.

At E_i , $PQR=0$. Healthcare delivered here at expected maximum quality at given price will be equal to 0 or breakeven. At E_n , $PQ_i=1$ or >1 . This is a profitable area in which to operate.

NB: $1=$ profitability, $0=$ break even.

If a hospital can provide healthcare within area P, E_i , B, P0, then performance will range between break-even and profitability. According to Zelman et al (2003), this is what is already happening.

Demand for healthcare in general is always high and the law of demand, prices and supply depends on how healthcare is delivered (whether through the welfare controlled system or through the free market system). This is because healthcare markets lack the characteristics needed to determine a “market” price that reflects the economic value of the resources used. This study thus determines that the demand for healthcare in the market economy is influenced by the assumption that additional care provided can lead to additional marginal utility. The demand curve in such circumstances would slope downwards from left to right. In the case of the NHS, such a curve could not be composed for this theory because NHS provision is characterised by welfare. It becomes difficult to determine if an increase or decrease in the demand for healthcare is influenced by price or by factors common to the consumption of free goods (moral hazard). The major weakness with this argument is that Zelman et al (2003) have not given a detailed definition and description of TC from a particular theoretical standpoint, making it difficult to determine if they are referring to meeting “target costs” or “non-exceeding targeted costs,” which are wholly different interpretations of the TCM concept.

Amidst all these differences, two major groups of authors have advocated the application of TCM (as defined in this study) to healthcare operation management. At the same time Spear (2005) advocates the “Toyota Production System” (TPS) while others have

relied on Lean production management approach. The two ideologies are explored in the paragraphs that follow.

3.4.1 First School: Target costing in healthcare

This school defines TCM as a process used to set a cost target for a new product or strategy to improve the competitiveness of existing products. It follows that TCM is a strategy for product planning and not just a cost reduction technique. It is also defined as Target cost = Target price minus Target profit. This postulation is made by Merode (2004) where he further posits that if the TCM model is applied to healthcare delivery operations, its properties could support solutions to problems such as patients' (customers) needs, develop integrated solutions to costs and management adaptation to strategy. This will lead to a "re-engineering" of the healthcare value chain and the healthcare organisation as a whole. For Merode, two dimensions could greatly contribute to determining this:

- The extent to which patients' needs are central to providers' strategy, which influences value creation by creating services around patients rather than around processes or otherwise.
- The level of standardisation of processes, which will determine the cost structure of services. Standardisation requires a certain volume which will support the creation of learning opportunities and the possibilities to organise operations and delivery priorities around patients' needs. This may make it even worthwhile to create so-called product lines where diagnosis and/or treatment are translated into the layout of buildings (Merode 2004). Referring to Kaplan and Cooper and Slagmulda (1997), Merode (2004) notes that in TCM the cost of a new service is no longer an outcome of the service design process; it becomes an input into the process. Care delivery would be designed from the patients' side of the value chain and then factored

backward to the healthcare centre. Here, using TCM's innovative doctrine, continuous improvements will create room for new service improvements at no extra costs.

The other advocates for the application of TCM in healthcare are Eldenburg et al (2004). They point out that although the Japanese developed TCM from the manufacturing sector, where it has been largely used, most of its principles could be applied to the healthcare and service sectors. According to them, healthcare organisations focusing on cost commitment can develop a new product line at a price that will maximise volume. Using techniques that analyse the relevant time and cost to provide a particular service, healthcare organisations can develop a production plan to provide the service at a special target cost (Eldenburg et al 2004). Since a large proportion of the cost in many healthcare and service organisations is fixed, capacity levels have a great impact on the variability of cost. With ample capacity, fixed cost will not be part of TC; however, when there are capacity limits, the cost of increasing capacity or using capacity more efficiently enters into target cost. Since the quality of the delivery process will also have a substantial effect on the perceived value, TCM is an appropriate tool that has the potential to evolve the healthcare delivery system to meet expected targets of costs, quality and availability, and accessibility.

3.4.2 Second school: The Toyota Production System (TPS) in healthcare

Authors such as Spear (2005), Charlice (2005) have advocated the Toyota Production System (TPS). According to Spear (2005), the TPS approach is being applied in some healthcare operations in the USA, where he notes that the TPS works very well in healthcare delivery, in the same way that it works for the Toyota production factory. Its main design is structured to reduce waste, reduce work uncertainty, increase patient through-flow and improve healthcare

delivery quality. However, in the article “Fixing Healthcare from Inside, Today”, Spear (2005) does not define the TPS and its characteristics. It cannot be presumed that he is referring to TCM because the nature of his explanations and approach are more characteristic of lean management methods. Smalley (2005) clarifies that the TPS is a complete production system, comprised of many methods and techniques, and not limited to mere problem – solving tips. It is a whole management system that includes lean, Value engineering and various cost management and organisation efficiency techniques used by the Toyota Corporation (Smalley 2005).

In an earlier publication Spear and Bowen (1999) describe the TPS as a systematic way to pursue the twin goals of perfectly satisfying customer need and creating meaningful work for every member of an organisation. They posit that TPS emerged from Toyota Motor Corporation’s desire to close the productivity gap with competitors while operating within a severe capital shortage and selling to a small and diverse market. The outcomes of TPS according to Spear and Bowen (1999) are the deployment of superior product and service quality, shorter lead time, low costs and a physically, professionally and emotionally safe working environment. According to Spear and Bowen (1999) a “Rules–in–Use” principle containing four organising codes was identified, breaking down activities within the TPS:

- Any improvement must be made in accordance with the scientific method, under the guidance of a teacher, at the appropriate level of the organisation closest to the work.
- The pathway for every product and service must be simple and direct, with no divergences or loops.
- Every customer–supplier connection must be direct, and there must be an unambiguous yes–or–no way to send requests and receive responses.

- All work activity shall be highly specified as to content, sequence, timing, location and expected outcome.

In summary, this principle's main goal is to see that activities, connections, pathways and improvements have built-in tests to signal problems automatically

Translating the above principle to healthcare application, Spear (2005) seems to have focused more on the operational and organisational side of the TPS. He mentions the positive affects of the TPS on patients and the organisation but there has not been a pre-established cost, quality and flow benchmark. According to his finding, significant cost savings were made but he has not indicated how these cost savings were targeted in the first place, amidst the need to meet high quality and flows. However, the choice to focus on the operations and management side of his study suggests two things:

- a) There might have been enough information about external requirements such as patients' needs, expectation, cost of treatments and the patients flow pattern. In this case there would be no need to benchmark operation efficiency goals to costs.
- b) There might have been an urgent need to fix internal operations. Probably most of the problems observed by healthcare providers in the USA are internally generated and require operational efficiency tools. Spear (2005) has thus not described the limit of the TPS and his own limit in his study.

Essentially, authors have not fully established the sometimes subtle differences between TC and the TPS. For example, most researches of the TPS relate it to the lean management system. This is misleading and would account for poor implementation of results. For example, Smalley (2005) points out that Toyota uses the following formula to calculate and project production [$Profit = (Price - Cost) \times Volume$]. This is similar to formulae given by

advocates of TCM. Smalley (2005) also stresses that Toyota focuses on making real, quantitative improvements in line with the core principles and metrics, and tools are deployed or invented along the way to meet those improvements. Isao Kato,^{xi} a retired manager of Training and Development for Toyota in Japan, says “there are two principle pillars of TPS: -

1. JIT (Just-in-time) and Jidoka or automation with a human touch – a quality control process and
2. Four specific aims –
 - i. Deliver the highest possible quality and service to the customer,
 - ii. develop employee’s potential based upon mutual respect and cooperation,
 - iii. reduce cost through elimination of waste in any given process, and
 - iv. build a flexible production site that can respond to changes in the market.

If you can truly accomplish these aims you should be a successful company.”

The above indicates that the TPS system operates more towards the TCM than the lean system. For example, to deliver the highest possible quality to the customer, data has to come from the market that shows customer reaction to products. Lean does not have access to customer information except that provided by the sales or research and development department. Lean thus seems to focus mainly on the simpler waste eliminations and flow techniques aspects in manufacturing. A complete TPS has the characteristics as shown in appendix 5^{xii}. Based on the theory therefore, applying TCM to healthcare and the NHS in particular can tremendously assist in improving healthcare operations in the following ways:

1. It can serve as a great tool to improve delivery and reduce operation costs. Deliverers are able to define operational dimensions and to determine whether to focus operations on patients’ needs using the various market information techniques

contained within the model, or to focus more on operational efficiency and cost targeting models.

2. Healthcare delivery is a people-intensive, customer-responsive service-delivery system that requires tools and methods that respond to patient needs, such that the organisation tries to create a balance with resources. TCM is more patient or market facing.
3. The healthcare delivery system has well defined structures in which processes can be easily understood. Thus, in implementing TC system the aim will be to coordinate these structures rather than restructure them. According to Ewert and Ernst (1999) TCM is a strategic coordination tool.
4. The cost of providing healthcare is certain, unlike that of manufacturing products that might fluctuate uncontrollably. Similarly, there is always high demand for healthcare and it is easy to quantify the cost of curing patients and the expected time to cure most illnesses. The role of TCM is to discipline operations to meet expected delivery cost targets.
5. The healthcare sector is currently persistently affected by changes in technology which affect delivery costs. In other industries technological advancement helps to reduce prices and delivery costs. But in the healthcare sector, the reverse is true; in the USA technological changes within the healthcare sector have been identified as a major cost driver and source of healthcare inflation (Porter and Teisberg 2006). New technologies within healthcare facilities are usually expensive to buy, install and operate, and sometimes require specific skills. But the long run effect can greatly reduce lead time and cut costs while providing customer satisfaction; for instance, the introduction of minimally invasive surgery (MIS) in hip arthroplasty, which reduces the mean LOS to 4.4 days compared to 5.7 days when using other methods^{xiii}. Thus if

costs are not well targeted in anticipation of such contingencies, healthcare would hardly meet anticipated productivity even with the best waste elimination techniques.

6. Most NHS healthcare deliverers are reimbursed based on the description of the diagnosis content on the HRG. This means that when a surgical procedure is carried out the procedures are trapped in the HRG codes and from there hospital reimbursement can be calculated. The NHS costing system has recently been modified with the introduction of a payment by result (PbR) system. By this system, providers would be compensated based on case mix - adjusted activities, the amount of patients treated and their length of stay. If TCM method is applied, costs will be adjusted by backward calculation i.e. from the costs expected to be incurred in the treatment to expected operations.

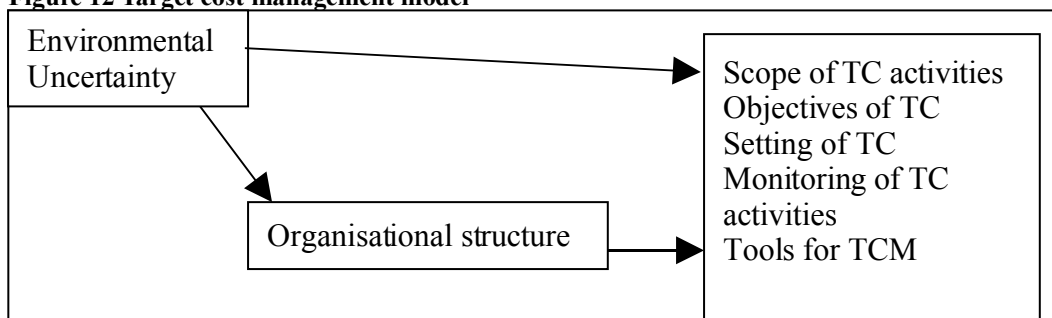
To summarise, the TPS according to Smalley (2005), is not just about “flows” or “pulls production” or “cellular manufacturing” or many of the catchphrases frequently used. For over fifty years TPS in Toyota has been primarily concerned with making a profit and satisfying the customer with the highest possible quality at the lowest cost in the shortest lead-time, while developing the talents and skills of its workforce through rigorous improvement routines and problem solving disciplines. TPS literature from Toyota states that the aim is mixed, with the twin production principles of Just in Time (make and deliver the right part, in the right amount, at the right time), and Jidoka (build in quality at the process), as well as the notion of continuous improvement by standardisation and elimination of waste in all operations, to improve quality, cost, productivity, lead-time, safety, morale and other metrics as needed. This clear objective has not substantially changed since the first internal TPS training manual was drafted over thirty years ago (Smalley 2005).

3.5 Target costing process in healthcare

As earlier mentioned, most healthcare deliverers are price takers. This type of system operates within the NHS, where the government (through the DoH) sets trust prices at what is known as a national tariff or the reference costs. Reference Costs provide the only source of unit cost and activity information for a wide range of treatments and procedures delivered to NHS patients from NHS resources. The Tariff, derived from Reference Costs, underpins the PbR policy (a new form of reimbursement) of providing a national price schedule for treatment commissioned for patients in England.

Reviews of the literature show that problems in the hospitals and NHS in particular are caused largely by environmental, management and operational uncertainty similar to those that affected the Japanese firms who came up with the TCM system. As such, the hospital can apply the TCM technique using the following procedures shown in fig 12, drawing on the work of Tani (1995).

Figure 12 Target cost management model



Source: Based on the idea of Tani (1995)

As shown above, TC can be attained in two ways. Usually the reason for adopting TC is environmental uncertainty. Then it can either be applied by

- Defining and choosing tools and selecting implementation methods of TC direct or

- Defining and choosing implementation tools and methods through the organisation's structures. Using this second method has been deemed most appropriate because it is believed that environmental uncertainty is a continuous process that first affects the organisation. This adjusts and influences its operation patterns, consequently changing the way it delivers its products or services. In this way, according to Nonaka's (1994) models of knowledge creation dynamism, organisation members would be encouraged to pursue new knowledge when confronted by change in the external environment. Given this scenario, turbulence in the organisational environment may act as the mechanism for the knowledge creation process required by the TCM adopters.

External environmental activities (activities that take place outside the hospital) have enormously affected hospital operations in past years. When similar effects were observed by Toyota in the 1960s, a "contingency theory" model was used to learn how the company evolved its system to check risks and uncertainties caused by environmental changes (Kato and Yoshida 1998). The following contingency variables, according to Tani (1995), explain the efforts a TCM adopter made to make TCM systems adaptive to decision environment, strategy and organisations structure. They are

- Complexity and uncertainty of decision environment
- Corporate/business strategy
- Organisational structure or degree of decentralisation

Today, healthcare organisations (NHS) have seen their external environments evolve to similar levels as observed by the Japanese in the past. This evolution can be properly explained below as follows

- a) Rapid changes in technology: New and more efficient drugs, improved equipment and surgical methods that reduce surgical side effects and shorten recovery times have emerged. These drugs and equipment have not come cheap. Unlike other industries where innovation in production techniques have the tendency to reduce production cost and lower the prices of those goods and services, technological evolution in the healthcare sector has instead increased delivery costs, triggering higher inflation rates in this sector than in others. The fact that healthcare delivery prices are regulated in most countries (such as the UK where healthcare delivery is offered free of charge for UK residents), means that hospitals are not expected to generate a significant amount of resources from the effects of such market forces.

Healthcare environmental uncertainty is, in summary, the effects caused by the rising costs of delivering healthcare services pushed by technological changes. This has led to the rise in the cost of drugs and other hospital components. Understanding such environmental features could assist in developing models for providing least cost healthcare to patients. Since the TCM model is more market oriented in an ex-ante manner, if employed as part of the organisation operations system, it could assist in anticipating long and short term changes in the market.

- b) Labour supply

Healthcare delivery is a labour intensive activity. Many healthcare deliverers in the developed world have suffered from a shortage of basic labour supply that affects their efforts to meet higher demands for high quality healthcare. The NHS has relied to a greater extent on imported labour, employing staff such as physicians, nurses, lab technicians, and so on, from abroad. The Philippines, India, South Africa and other developing countries of the Commonwealth of Nations have been the main suppliers of these skills to the NHS^{xiv}. Persistent shortages and increased demand for home grown staff means that cost for

healthcare staff had to increase in order to attract the required skills. This is a contingency problem which is difficult to blame on the environment. For example, it is argued that staff motivation in the NHS has been so poor that key staff such as junior GPs and nurses have been moving abroad for better prospects^{xv}. This means that the NHS lacks the tools, methods and models to assess, recruit and retain vital skills. The TCM puts staff motivation as one of its key characteristics. Thus all workers, high and low grade (porters, cleaners, and ward attendants, etc.) need to be motivated, since their contribution is vital for efficiency.

c) Other environmental uncertainties

Competition from other healthcare providers, changes in hospital management systems by successive governments, macro economic effects, the involvement of the European Union's harmonisation of healthcare, etc., all put extra pressure on NHS hospitals in one way or another.

3.5.1 Organisation structure

Organisational structure generally refers to the way in which the interrelated groups of a firm or establishment are constructed, the ways in which an organisation divides and co-ordinates its tasks. One of the key concepts in understanding organisational structures is the way they perform division of labour, and how they foster communication between workers and departments or sectors (Collis and Montgomery 1998). This organisational structure is influenced by variables such as the environment, the size of the organisation, technology, and the organisation's strategy (Tani 1995, Collis and Montgomery 1998). In analysing organisation structure as an influence on the firm's performance, it is vital to reflect on the particular demands, constraints and uncertainties posed by its environment.

Organisational structure has many elements, but at this point the knowledge and knowledge creating capabilities of the organisation are the most relevant to the TCM model. This is

because it influences the organisations' capabilities to use knowledge as the major trigger for continuous innovation. It is perceived that Japanese TCM adopters have maintained a competitive advantage in the market place due to their ability to structure organisations such that knowledge creation promotes innovation and reduces uncertainty in operations and strategy (Nanoka and Takeuchi 1995, Kato and Yoshida 1998). According to Nanoka and Takeuchi (1995), knowledge is created through four modes in the organisation:

1. From tacit knowledge to tacit knowledge or socialisation that creates sympathised knowledge.
2. From tacit knowledge to explicit knowledge or externalisation that creates conceptual knowledge.
3. From explicit knowledge to explicit knowledge or combination that creates systemic knowledge.
4. From explicit knowledge to tacit knowledge or internalisation that creates operational knowledge.

At every stage of knowledge creation there is a spiral accumulation of knowledge that is diffused to other components of the organisation. The organisation cannot create knowledge by itself. The creation of tacit or individual knowledge is the basis of the organisation's knowledge creation. This is organisationally amplified through the four modes outlined above and crystallised at higher ontological levels. Interaction between tacit and explicit knowledge will become higher in scale as it moves up the ontological level.

3.5.2 Linkage to TCM

TCM objectives can be designed and defined after exploring the effects to the environment and the role of the organisations' structure. These two factors will heavily influence the

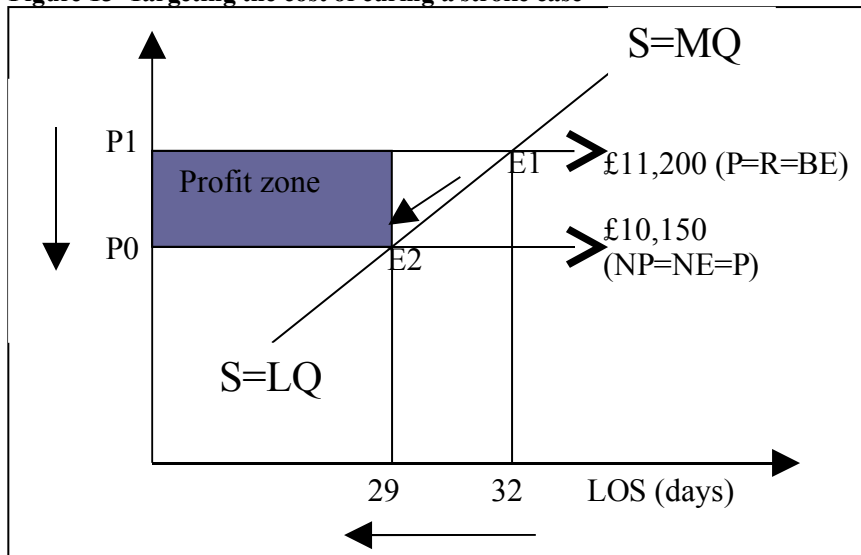
success of the TCM application. The following points will guide the formulations of TC objectives.

- (i) The aim(s) of implementing TC should also be assessed. Sometimes TC implementation is just to attain organisational efficiency, reduce and cut down waste, improve customer satisfaction, improve delivery speed, or attend to workplace ambiguity. Such objectives should be captured by the firm's overall objectives.
- (ii) The nature in which TC is organised is also crucial to its implementation. It will be pondered whether to organise it around functions, processes, and departments, through the care delivery chain, etc., depending on interests. Will it be selective, i.e. used on major operations such as heart surgery, stroke, or plastic surgery? Such views are important for its efficient implementation.
- (iii) The methods used in setting target costs.

Since TC requires the question 'what should be the new product or service's cost?' or 'what would be the reviewed product or service cost?' a formula '*Target sales price - target profits = allowable cost*' is usually written to seek the TC.

In healthcare therefore the question would be "how much will it cost to provide this service? For example, if stroke caused by a severed artery averages 32 days to treat and costs £350 per day based on reference cost, the expected reimbursement would be 32 x £350 (£11,200) everything being equal." The question now is: "Can this target be met and is there anything that can be done to reduce that cost e.g., by reducing the days of in- hospital stay, non value added treatments, ensuring that the patient is not infected in the cure process, and so on?" Such a situation can be presented as follows

Figure 13 Targeting the cost of curing a stroke case



Source: Author's calculation

P1= given price and reimbursement upper limit. Price is perfectly inelastic and at point E1 (Equilibrium), £11,200 is the price for 32 days stay in hospital.

Therefore:

Price (p) = reimbursements and (R) = break even (BE)

P0= New price (NP) = new equilibrium (NE i.e., E2) = Profitability area where (P) for example can be attained through

Saved LOS = 32 – 25= 3 days. Translated in monetary terms will be £1050 (3 x £350) savings. In terms of benefit through reimbursement therefore, the healthcare unit will gain £11200 + 1050 = £12,250. That is, re-imbursement upper limit is £11,200 plus the saving of £1,050 gained as a result of the patient getting better quicker for three days less.

S=LQ = healthcare supplied and least unacceptable quality.

S=MQ = healthcare supplied at unacceptable high quality.

Reducing in-hospital LOS, for example, could be a strategic decision because such a reduction will create spill over effects and benefits to other services provided. However, any

hasty action could lead to either longer LOS, readmission, or death, thus affecting quality. Readmission is caused when a patient is discharged from the hospital without properly getting well, and is brought back for similar treatment. This is an additional cost to the healthcare provider because they are usually not compensated for such cases, especially if the decision to discharge the patient was made by the care provider. Legal actions are also rife in such circumstances.

- (iv) Instead of using Returns on sales (ROS), Returns on treatment (ROT) could be used, as this relates to treatment, and every illness has its own characteristics. Individual treatments, except those for illnesses with no cure, have a treatment map which can be revised and non-value added activities eliminated. Such a possibility can be through creating individual or groups of illnesses delivery value chains.
- (v) Implementing TC requires monitoring to ensure compliance. It is important to define who has responsibility for this (for instance, top management, line managers, senior nurses, or external consultants).
- (vi) Tools for TCM. There are many tools and enablers, as presented in section 3.4. Some are simple and others are complex. It is imperative that tools matching the expected level of implementation be carefully selected. Tools and enablers such as VE, Kanban and kaizen methods can be used and then gradually improved to progress to a much higher level of sophistication in the long run. In healthcare, the tools used to define products, those used to set targets and those used to achieve target cost might be ideal to use.

3.5.3 Conclusion

There is substantial evidence to show that the TC theory, its processes and institutional designs can effectively contribute to decision making for healthcare cost and operations management problems. Given that TCM has greatly evolved and some of its enablers are being experimentally applied in healthcare delivery in some countries, there is some amount of consensus that it could make some positive changes for NHS operations if adopted.

3.6 Target costing in the NHS

Simon Wombwell, Deputy Director of Finance and Procurement at the Oxford Radcliffe hospital NHS trust, mentions in the Healthcare Financial Management Association (HFMA) Newsletter that with the culture of benchmarking activities within the NHS, using TCM could perfect the benchmark model. This is because services are designed at pre-decided prices, thus a benchmarking procedure becomes sensible and worthwhile when an ex-ante model is applied. Activities such as operations costing, length of stay, delivery efficiency, accessibility, waiting time, patient satisfaction, and prevalence of hospital acquired diseases, and so on, are being compared between hospitals in the country. One aim of benchmarking and comparisons has been attributed to the zeal to promote the spirit of competitiveness within NHS hospitals. A second reason is to inform the public about hospitals that are the most efficient and provide value for money. This will force poor performing hospitals to improve, and conforms to the spirit of market orientation being pursued by the department of health (DoH)^{xvi}. Despite all these comparisons and benchmarks, hospitals are still not meeting the required quality and financial goals. Since new management ideas and practices develop in response to complex problems, it is necessary to identify the specific problems that affect healthcare delivery operations within the NHS. These problems will be approached within the

framework of investigating the strategic, management, and organisational factors, which work together to form a unified model for operations and delivery efficiency.

3.6.1 NHS SPECIFIC PROBLEMS

1. Strategic problems

Nwabueze (1999) posits that the NHS trusts face the following types of strategic problems that stifle effective and efficient care delivery.

- i. Existence of more managers than is required, many of whom are labelled idle directors.
- ii. Unresponsiveness to customer demand as well as lack of operation and delivery planning controls.
- iii. Lack of strategic focus and vision where many NHS CEOs do not have knowledge of their business and hence lack the direction to lead their hospitals.
- iv. Poor communication between various departments, directorates and units.

2. Management problems

- i. Limited management charisma and functional synergies
- ii. Limited problem solving – it is hard to identify and implement new technologies and methodologies that can assist in problem solving.
- iii. Lack of innovation and creativity.
- iv. More active at crisis response.
- v. Failure to recruit and retain highly talented and motivated staff.
- vi. Mistrust between clinical and non-clinical staff, consultants versus administrators, existence of professional conflicts.

3. Organisation style and system problems

- i. Organisation rigidity which prevents hospitals from evolving to meet changing needs.

- Design problems characterised by various command and control systems at various layers and stages of hierarchy. This contributes to weak decisions at almost all aspects of delivery operations, management and strategy.
- Structural design issues such as ward design are said to play a big role in healthcare outcome. This is because it affects the physical, psychological and structural wellbeing of recovering patients (Nord 2003).

Patient recovery is said to positively correlate with the class of ward a patient is placed in (Nord 2003). Designing a hospital ward for strategic management purposes aims at conceiving a structure whereby maximum care can be delivered to a patient such that the hospital obtains the optimal least cost delivery of such care (Nord 2003, Cortvriend 2005). Therefore, wards would be composed of components that encourage quick recovery, such as those that provide high levels of comfort and privacy, reduce noise and provide patient dignity. Ward conception and design could also consider single sex, enclosed wards for specific types of illnesses, such as stroke or air borne diseases. Staff would also have sufficient space and clear vision to deliver the best possible care required from them (Nord, 2003). Cortvriend (2005) notes that improved ward design can benefit healthcare in the following ways:

1. Reduce operating costs not only of the building but the service, as it leads to increased retention and efficient working patterns.
2. Affect health outcomes by reducing length of patient stay.
3. Design contributes to healthcare quality, patient and workers safety.

4. Costing

- i. Lack of costing approaches and techniques that provide efficient, consistent and timely costing information required for decision making (Dawson and Street 2002, Northcott and Llewellyn 2002 pp.189). Ellwood (1996a pp 25) points out that the NHS uses a very crude and inconsistent costing approach which results in it being impossible to obtain costs that are accurate and comparable.
- ii. Fergusson (2001) notes that there has been faulty information identified in the reference cost database. Some of the main problems have to do with the inconsistencies and weak conformance with the way in which data is submitted by trusts into the database. This raises concern about the quality of data when the minimums and maximums for key healthcare resource groups are examined.

3.6.2 Factors favouring the application of TCM in NHS delivery operations

TCM has been applied to, and proven effective in the manufacturing/assembly sector. Users have reported improved operation, which delivers value at lower costs and has assured customer satisfaction. Ellram (2006), Ansari et al (1997), Cooper and Slagmulda (1997) and others show how Toyota and other TC adopters integrate cost and operations to deliver quality products and services. After examining the principles of TCM and the characteristics of the healthcare sector, another question emerges: why apply TCM to the NHS? The main assumptions that guide this argument are:

- The structural nature of healthcare processes. Womack (2006), Spear (2005), Wellman (2005) among others have documented that healthcare processes are similar to those of manufacturing firms. Treatment of patients goes through processes from the front side of the hospital to the end part. This is similar to management firms in their production and operation processes and their value chains.

- Healthcare deliverers are seeking methods to improve their operations and reduce increasing delivery costs and thus achieve competitive advantage. NHS is required to operate at break even levels or even make profits as well as provide accessibility and high quality healthcare to the public. Thus the drive to attain patient satisfaction and efficient operations management needs to be interwoven.
- Demand for healthcare is always high while healthcare providers are price takers and are reimbursed based on nationally assessed average costs such as reference cost within an HRG. With limited market options for care providers such as creating artificial shortages so as to increase prices, or reducing quality so as to drive down delivery cost, their operations need to be targeted.
- There are no management theories or models specifically designed to define operations in the healthcare sector as in the manufacturing sector. Researchers have started borrowing conceptual ideas from business management, operations management and sociological methodology.

The above, therefore, if the NHS is to adopt TCM, will be influenced by the following factors.

1. Competitive advantage

Competitive advantage is gained when a firm produces and markets products or services more efficiently than its competitors (Porter 1985). Efficiency here refers to least cost utilisation of resources to produce optimal quality that satisfies consumers. Porter (1985) mentions two main approaches to competitive advantage, namely differentiation and cost advantage. With differentiation the firm tries to be unique in the way it provides its services and product to its customers. Delivering similar products or services as competitors, the firm tries to gain superiority in product quality, functionality and customer services such that

customer satisfaction would drive market value and market share, thus creating an advantage over competitors.

Cost differentiation, on the other hand, is where the firm tries to provide the best quality at lower prices than competitors. This might be achieved through exhibiting operational efficiency, efficient management system, reduction in operating waste, or time to market. Lower cost acts as a great form of differentiation especially when the quality meets customer specification. However, delivering a product at the lowest possible price does not in all cases mean that such firms are competitive.

It is suggested that very low prices could repel potential customers, especially in healthcare delivery where patients' perception is that good healthcare doesn't come cheap given the technical complications involved in medicine. In the USA, for example, Veteran hospitals which provide very low cost care are not as attractive to patients as other providers, such as the private-for-profit healthcares or church hospitals. However, according to Porter and Teisberg (2006 pp. 107), "high quality healthcare should be less costly." When efficiency is improved through the entire cycle of provision for the right medical condition, quality will be high and cost lowered. It is important not to think that there is an inevitable cost versus quality trade-off in healthcare delivery (Porter and Teisberg 2006).

With the introduction of competition in the NHS (Propper et al 2003, Ham 2005), most NHS trusts are seeking means to attain competitive advantage over their peers in delivering healthcare. They want to attain the Five Star Quality content in their delivery activities (shown in section 4.2 above). This has not been easy to achieve, probably because much focus is placed on operational efficiency models. TCM can pave the way to competitive advantage by analysing cost and activity data across the organisation, creating different types

of targets. Today it is possible to quantify and trace the cure processes of many types of illnesses. Data for curing (for instance) various heart problems, stroke, hip problems, and cancer can, when analysed, be factored into decision making, and management can determine and eliminate all non-value adding objects from the process. Then a costing process can be established to create routes for cost leadership and differentiation. For example, there are different types of stroke, with various causes and risks. When a hospital is confronted with making a decision on how to handle stroke cases, it is important to pose questions such as the type of stroke common to that hospital, the cost of curing it, the core process involved in providing that care, and whether those processes are vital. TC can thus be established to deliver that service at a cost that will be advantageous for both patient and provider.

2. Sustainable knowledge development

Drucker (1968) and Nonaka (1994) note that modern society has been changing to a more knowledge based one. This requires a shift in thinking concerning innovation in large business organisations, irrespective of its relation to technical innovation, product innovation, or strategic or organisational innovation. It raises questions about how organisations process knowledge and, more importantly, how they create new knowledge.

A paradigm for managing the dynamic aspects of organisational knowledge creation processes is thus vital (Nonaka 1994). Analysing the NHS in terms of its design and capability to process information imposed by the environment is an important approach to interpreting certain aspects of its delivery activities and its ability to be flexible.

3. Organisations' operation efficiency

The TCM theory contains methods and tools to provide improvement in operational efficiency within an organisation and can thus be applied to the NHS to achieve similar objectives. Operational efficiency occurs when the right combination of people, process, and technology are employed to enhance productivity aimed at creating value for the business

operation (Porter 2001). TCM enablers such as leans, value engineering, and information technology can work well in the NHS to build up functional structures that would improve learning and, coordinate and signal changes that occur in the care delivery process.

The advantage of using this approach is that healthcare operates in functional structures which encourage integration and easy coordination. According to Womack et al (2005) medical care is delivered in extraordinarily complex organisations, with thousands of interacting processes, much like the manufacturing industry. Many aspects of the TPS and other lean tools therefore can, and do, apply to the processes of delivering care.

However, the fact that hospital structures tend to operate around functions and not patients could prove resistant to integration due to internal complexities. Big NHS hospitals, for example, have been identified as having departments which tend to protect their professional methods or techniques. More positively, however, lack of integration might lead to the growth of clusters of specifically built skills centres within healthcare units that could promote internal core competences, capable of improving the treatments of certain particular illnesses. On the whole, it is however vital that strong relationships grow within departments and functions (clinical and non-clinical). Process standardisation is an important requirement to realise integrated patient care both in mono-disciplinary and multi-disciplinary settings. It is necessary for people working together to understand their processes, and so Merode (2004) and Eldenburg et al (2004) suggest that through TC, NHS hospitals can standardise their services in various efficient ways.

4. Attaining efficient cost management models

In most cases, cost management systems (as an organisations' strategic force) would be expected to be designed to support the organisation's operations and strategy (Kaplan and Johnson (1987). It has been difficult to find evidence of this occurring within the NHS,

where cost management provides misleading targets for managerial attention, and fails to provide relevant sets of measures that reflect the technology, product processes and competitive environments in which it operates (Dawson and Street 2002, Northcott and Llewellyn 2002, Audit Commission 2006). The data presented is usually distorted, exaggerated, and too late to be used in reducing cost or providing productivity and market projection (Ellwood 1996 and others). This is characteristic of the Cost plus system. TCM can reverse this type of approach, providing an ex-antes cost structure and management model for NHS. However, it should be noted that TCM management is not a costing method. Thus, its success is still dependent on the effort of NHS-wide improvement determination.

5. *External factors – pressures from the government and stake holders.*

- (i) Improvement in technology has brought various benefits and curses to the NHS, creating additional pressures to improve its operation systems. New and improved cures have been developed with specialist drugs becoming increasingly expensive. Highly innovative and sophisticated surgical equipment has been developed and is being marketed at high cost. This equipment can greatly improve the quality of care being delivered and meet factors in patient satisfaction such as faster recovery and minimal side effects. In hospitals with high capacity, instituting such methods can be good in reducing waiting times, LOS, increased through flow and improved returns on treatment.

Similarly, there are the effects of IT on treatment. In countries such as Canada and USA there is talk of tele-health, defined as the use of advanced telecommunication technologies to exchange health information and provide health care services across geographic, time, social, and cultural barriers (Gagnon et al (2005)). This technology has the potential to increase quality and access to healthcare and to lower costs. Given the problems

most NHS trusts have with patient records, appointment schedules, and the pressure to adopt a working IT system, this potential can be achieved through TCM, as IT is an enabler to TCM.

- (ii) Controlling inflation: The proliferation of technology and associated higher costs has led to an increase in inflation within the NHS, defined as the persistent increase in the delivery cost of healthcare caused by increased prices of new surgical equipment, drugs and cost of labour (DoH 2002). According to the DoH (2002), inflation in the NHS is generally higher than inflation in the retail sector. NHS inflation is referred to as Hospital and Community Health Service (HCHS) Inflation. This is a retrospective index which measures inflation in both the hospital and community health services. For 2005–06 the DoH estimated that HCHS inflation will be 4.2%. If technological changes are behind these increases, then slowing technological progress will also limit access to healthcare. Unlike other industries where such changes have brought prices down, in healthcare technological change is the cost driver. A method of targeting costs which includes inflationary inputs makes more sense in estimating operations, delivery costs and prices.
- (iii) Another external pressure comes from the government, the public and other stakeholders. These groups or bodies want to see a modern healthcare system that delivers healthcare in such a way that will significantly improve the quality of life of the population. They also want to see a healthcare system that effectively manages resources by providing value while eliminating waste by all means. The healthcare system is able to report results on operations, make projections without losing a grip on the main goals and direction of the system. Since it seems that many NHS trusts are short of meeting some of

these goals, implementing TC could be of interest to the government and stakeholders as they will be able to analyse ex-ante operations and cost as well as the ex-post structure of the organisation.

Manifestations of this external pressure can be seen in a review of the NHS funding system. Before 2004, the NHS funding and reimbursement system was conducted through block contracts and cost per volume systems^{xvii}. After 2004 the payment by results (PbR) or cost per case system was introduced, first used by NHSFT and expected to be applied to all NHS trusts by 2006 (Roger et al 2005). The argument is that the PbR could be a method to induce hospitals to target their costs, because delivery is already targeted and healthcare will be reimbursed only on the case mix adjustments for which information can easily be retrieved from the HRGs and diagnostic codes. As such, non value added components in the treatment will not be compensated. In this case, healthcare deliverers have no choice but to target their costs and scale down components that do not add value.

To sum up, a requirement for competitiveness in healthcare is forcing deliverers to redesign their operation systems. Costs and customer services are increasingly driving success in the market. Proven differentiated service levels can significantly add value to a hospital's brand name, just as with manufactured goods. Failure to meet service expectations results in customer noise and negates marketing and organisation morale. However, operations managers at hospitals are still too focused on running operations effectively in a business-as-usual manner and taking limited steps to achieve step-change improvements in operational performance.

4 Chapter 5 Case study – the Stroke Unit

4.1 Introduction

This case study examines how and why the TCM approach is proposed for adoption in healthcare operation, specifically in the management of a stroke unit. Literature and data for this case study have been gathered from various NHS trusts in the Southwest Peninsular Strategic Health Authority. Additional input has come from the DoH and information on length of hospitalisation, cost of stroke and readmission collected from the HES database.

The chapter starts by examining the reasons for choosing stroke among other illnesses to test the TCM hypothesis. It briefly examines the major causes of stroke and the gravity of the situation that warrants a management tool such as the TCM model. One major approach considered in designing the model at this stage is the assumption that a proper management model for the treatment and management of stroke is when its causes and other support factors are known (Porter and Teisberg 2006). The stroke delivery value chain is examined in section 5.3.1 in order to illustrate that TCM theory runs through the entire value chain. It also shows the interconnectivity of major components such as the main resources and the required skills in dealing with stroke. Section 5.4 presents the manifestation of TCM in the stroke department, presenting the management aspects required in designing a cost methodology for the NHS, since it is a price taker and is required to provide a certain quality of healthcare at a given price. This section also presents various stroke patient trails to show how with TCM patient delivery components could be structured from patients and factored backwards to the hospital. Therefore, market orientation is a key part of this discussion.

4.2 Why choose stroke among other illnesses?

Choosing stroke for this experiment is based on the following factors.

- (i) Lack of an effective management methodology for stroke management in most NHS hospitals. For instance, Stone (2002) points out that the UK (through the NHS) has one of the worst outcomes for stroke compared to other developed countries. In terms of cost (although there doesn't seem to be a costing methodology used to provide an accurate costing method), the National Audit Office (2005) reports that it costs the NHS about £2.8 billion a year to handle stroke cases^{xviii}.
- (ii) Stroke is the second biggest cause of death and disability in the UK. There is increased pressure on the NHS to devise proper management methodologies to manage it. The House of Commons Public Accounts Committee found that about 550 lives could be saved annually if specific approaches were conceived to strategically manage stroke; for instance, if patients spent more time in specialist hospital stroke units^{xix}. Most of the disability and death emanating from stroke could have been prevented had there been methodologies, systems and techniques to manage the illness (Stone 2002) (Porter and Teisberg (2006).

These methodologies would aim to meet quality dimensions such as those mentioned by Chilingirian (2004, figure 8), including patient quality and satisfaction, information and emotional support, amenities and convenience, decision making and outcome.

From the above, cost, quality issues, operation efficiency and organisations management system can be summarised as the major contingency problems affecting the stroke unit. Similar contingency problems have been properly managed in other industries by applying a

more holistic cost and management model that starts from the customer (patient) and then runs backward through the specific hospital's operations and decision mechanism.

4.3 Gravity of the situation - stroke

After coronary heart diseases, stroke is the second highest killer. More than 130,000 people a year have a stroke in the UK, leading to 67,000 deaths in 2002 (Wolfe et al 2006). It was estimated that stroke consumed 7.4% of spending on community health, 5.5% of hospital care and 4-5% of the total expenditure of the NHS (Wolfe et al 2006). A House of Commons Public Accounts Committee found that 110,000 people who suffered a stroke each year in England could be saved if the NHS treated the condition as a medical emergency in the same way as a suspected heart attack is treated^{xx}. Some strokes are either treatable or preventable at the earliest stage. Consequently, when there is a high number of deaths and physical incapacities from an illness that could be managed, it becomes a cause for concern to the public and the healthcare sector as whole.

➤ What is a stroke?

According to UK Stroke Association (2006), a stroke can be defined as a brain injury caused by sudden interruption of blood flow by a blockage (ischaemic stroke) or a bleed (haemorrhagic stroke). It causes brain tissue to die, known as cerebral infarction. An infarct is an area of dead tissue, and can be tiny or affect a larger part of the brain. A stroke is sudden and the effects on the body are immediate^{xxi}. Stroke therefore is a medical emergency and requires patients who feel the symptoms to contact the hospital immediately.

➤ Causes of stroke

Several factors have been identified to cause stroke. Some of the risk factors are stronger and harder to modify such as old age, family health history and gender. Other factors such as lifestyle and the environment can be modified and managed. Knowledge of the risk factors

for stroke is important because such awareness can assist the adoption of efficient interventions.

➤ *Clinical problems with stroke*

Clinical problems are defined as those that affect the healthcare unit as a result of stroke. The most serious problems to healthcare are cases admitted in the hospital's emergency units, treated as inpatients. These are serious cases and make up the bulk of NHS stroke cases. The major problem here is that their treatments and activities cost the NHS more than outpatients. Sometimes it is not only the delivery operations that account for these high costs. The following clinical problems could be classified thus.

- (i) Cost: as earlier mentioned, according to the National Audit Office (2005), managing stroke costs the NHS about £2.8 billion a year. This is in terms of delivery costs of treatment and rehabilitation, which is either direct or indirect (e.g., cost of meeting clinical and surgical activities within the stroke unit, namely diagnosis, in-patient stay cost, surgery cost, drug cost, lab tests cost). The cost of drugs to cure most strokes cases will continue to rise, especially as those drugs prove to be effective.
- (ii) Length of stay: Stroke cases are usually treated as emergencies, and hence are always in the acute care service. According to the National Audit Office (2005), stroke cases admitted to the emergency and intensive care unit account for 20% of all emergency cases and they take about 25% longer LOS than most other illnesses^{xxii}. Conventionally the longer the LOS of a patient in the hospital, the more costly it is for the hospital (Younis 2004, Saint et al 2006). An inpatients' bed is the NHS's most expensive resource, thus the lower the LOS for stroke the better for the hospital as a whole (Black and Pearson, 2002).

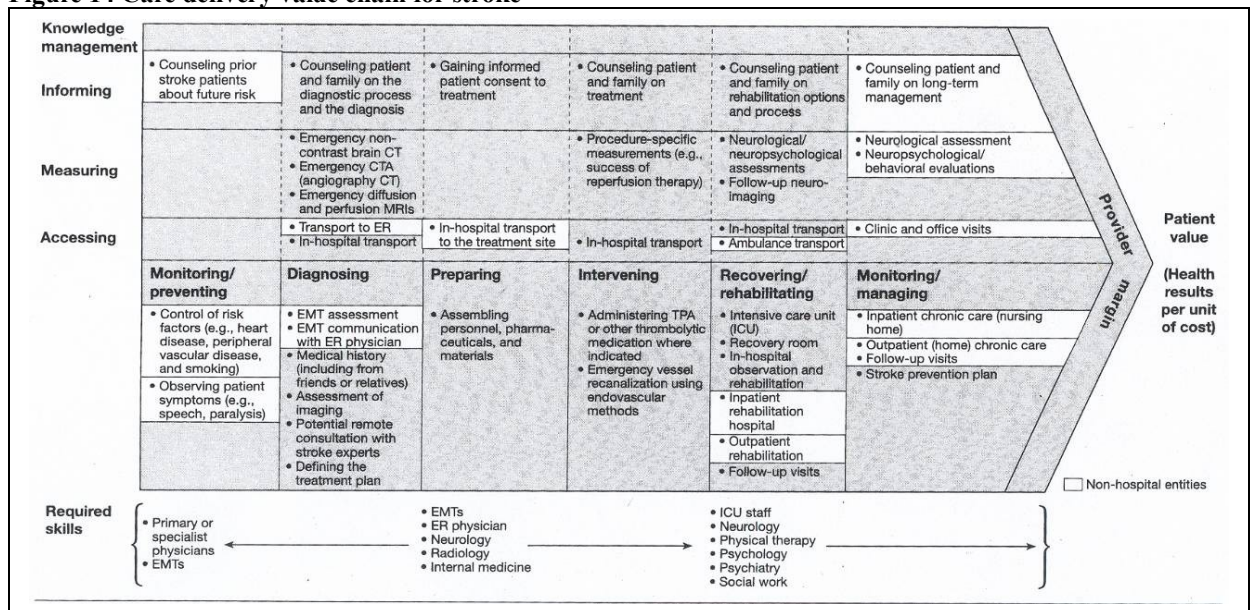
- (iii) The problem of readmission, which may occur because the hospital wants to receive the benefits of lesser LOS when the patient has not fully recovered. Other causes include hospital acquired diseases, mistreatment, or medical error (Carey, 2002). It is postulated that the longer the LOS, the more the patient is exposed to the risk of acquiring a hospital infection (Excellus 2002 pp. 2, Spear 2005).
- (iv) Post stroke effect: Post surgery for stroke victims poses serious problems to the stroke unit. Since there are different types of stroke requiring different case mix interventions, for proper stroke management procedures (diagnosis, treatment and rehabilitation) to be performed effectively, quick access to the hospital, quick action, coordination and planning is the key (Gibson et al 2004). The National Health Commission (2006), determined that post stroke management is poor in most NHS trusts^{xxiii}.
- (v) Finally, in the DoH national stroke strategy conference held on March 1st 2006, it was acknowledged that while there was the need for timely management of all stroke patients, there was the need to design proper approaches and targets on how to manage stroke clinically. Its costs and operations were foremost but it was also acknowledged that there were major barriers to successfully meeting stroke management targets. For example, there is a lack of qualified staff (nurses and other specialists to answer emergency calls), radiologists focusing on machines rather than patients, differences in opinion among radiographers about scanning procedures of stroke patients and a low number of specialists per head of population compared to other countries^{xxiv}.

When TCM method is implemented, its theoretical characteristics can aid integration of operations components and will give a sense of what the market can offer to the healthcare provider.

4.3.1 Understanding the care delivery value chain for stroke

Target costing supposes that management operations run through the whole value chain. Therefore, for TC to be effectively used in delivering care for stroke it is vital that the stroke delivery chain is well designed and understood. It is true that implicitly, such value chains might be in existence in various hospital delivery plans or as an NHS wide structure, but there is no documented evidence of its explicit presentation in literature. Figure 14 shows a theoretical care delivery chain for stroke.

Figure 14 Care delivery value chain for stroke



Source: Porter and Teisberg (2006 pp. 405)

From the illustration above, it is clear that the best possible approach to tackling stroke is to carefully manage the defined components that run through the value chain above. These components are made up of clinical (in-hospital) and non-clinical (out-of-hospital) issues. It

P_0 = New price established by the healthcare provider within acceptable range.

Q = quality. This is otherwise the case – mix combinations or adjustments in a cure process or procedure given by the DH. Q = original quantity provided at P . Q_i is the new quality established by the healthcare provider.

R = reimbursement. At this point Q healthcare provided at given price P will be reimbursed R . This is least expectation of the healthcare provider.

E_i = Break – even point. Expected equilibrium where Q healthcare is provided at price P , This is the break-even point

E_n = new equilibrium. This is a profitable equilibrium where healthcare Q_i is provided at P_0 .

S = healthcare supply line which also contains required quality.

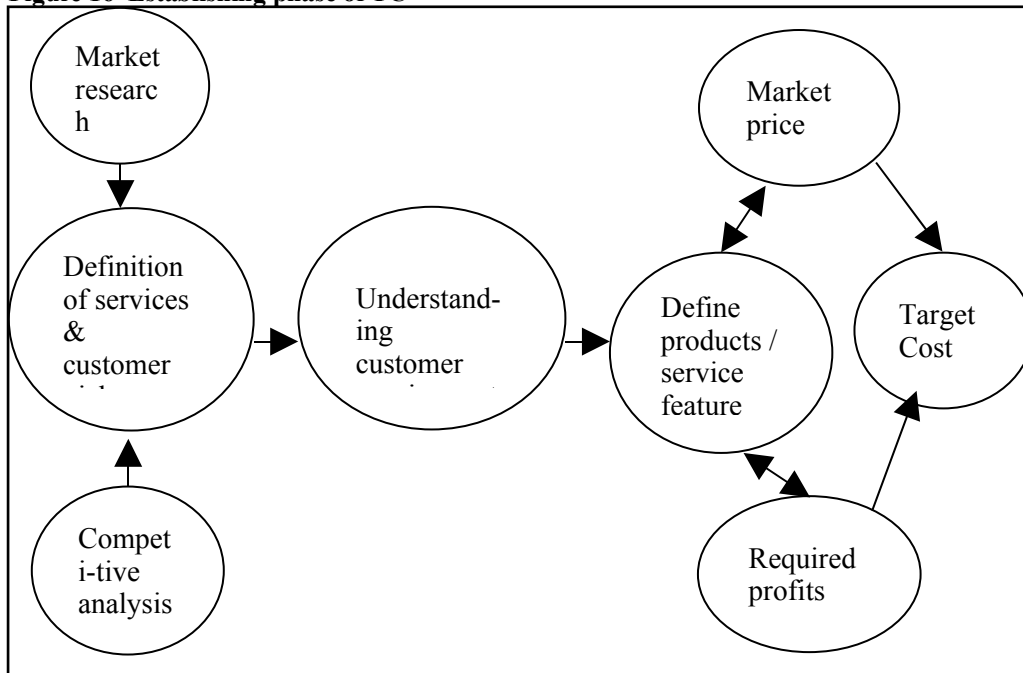
LQ = Least expected quality of healthcare delivered. Beyond E_n the quality of healthcare delivered is unacceptable. Therefore the least acceptable healthcare delivered is at E_n .

MQ = Maximum amount of healthcare delivered quality. Above E_i quality becomes wasteful and costly as this quality becomes more than the hospital can afford. A general acceptable quality is E_i .

Discussion

The above diagram shows a situation where a proper costing method could be devised if market expectations (returns) are known. “ P ” is the given price, known to the NHS as the reference cost or national tariff set by the government. The NHS is required to provide care that will meet “ R ,” the reimbursement upper limit. This is attained when an equilibrium is established between supply and demand at the prescribed price ($P=R$). Thus “ P ” is perfectly

inelastic because prices could not be increased to meet increases in operation or delivery cost. In this case a downward slopping demand curve could not be designed because the demand for NHS healthcare is not based on the effect of price on demand. It is based on the amount of combinations or case mix adjustments within the HRG components used to provide the care. Since every stroke case has its own particular combination required for its cure and that a given bundle of quality is required from each combination, E_i is the optimal level of quality expected within the care provision at price P , while E_n is the least acceptable quality level. E_n can be provided at price P_0 if operations are properly managed and costs targeted. The aspiration of a healthcare manager would be to try to provide care within the area P_0 , P , and E_i , B . Line "S" represents the delivery care supply line or the delivery care system. Thus theoretically, achieving TC without making sacrifices in service functionality and quality, inter-organisational cost management systems are designed to create downwards cost pressures on the entire value chain leading to movement from P to P_0 . The objective of these inter-organisational systems is to identify innovative ways to reduce the costs of components supplied by the chain. As such there will be movement from Q to Q_i , and a new equilibrium will be created at E_n . An example of how such a process can be designed to meet E_n for the treatment of stroke using the TCM model is shown in figure 16 below.

Figure 16 Establishing phase of TC

Source: Ansari et al (1997 pp. 25)

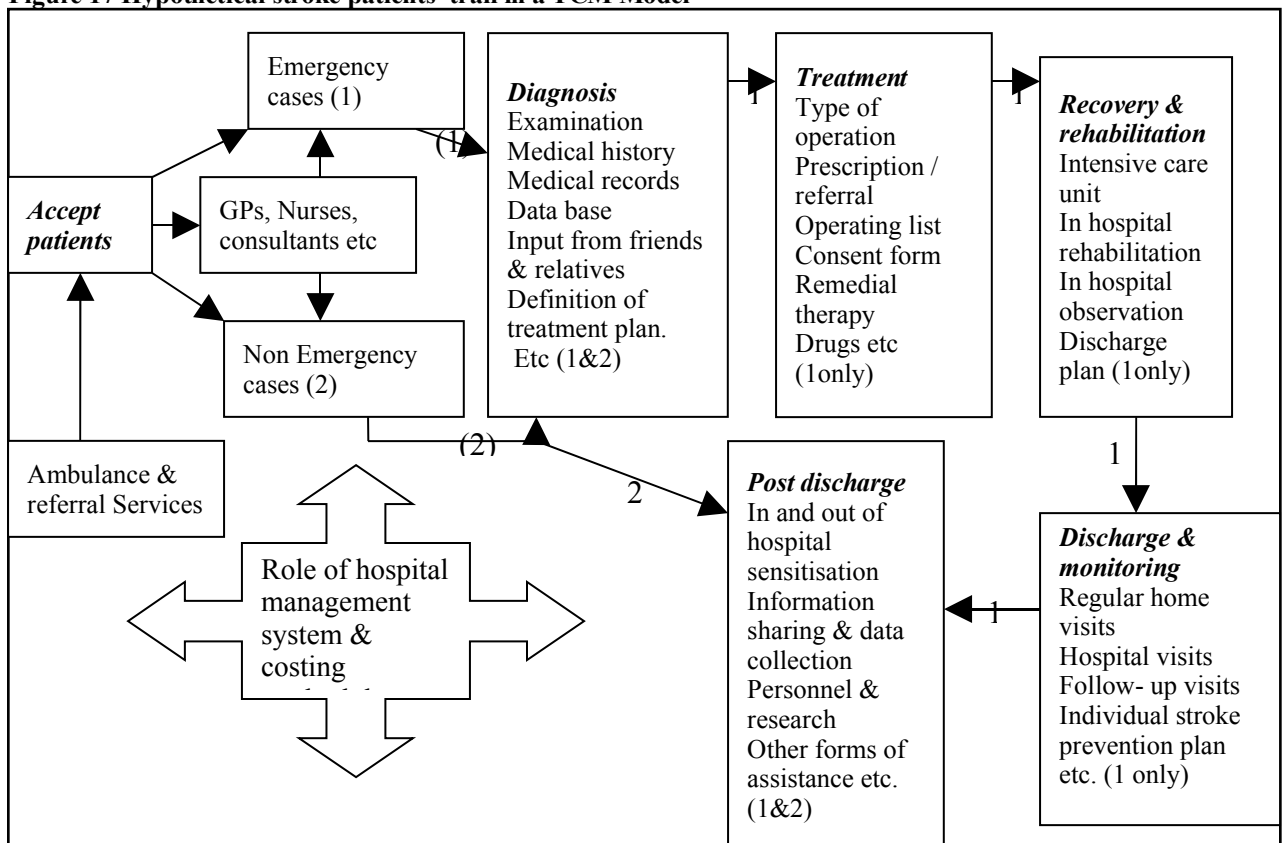
Figure 16 shows that seven major activities occur in establishing TC:

- Market research provides information about customer needs and wants. This is used to define the service and the market niche the hospital plan to exploit. This market niche defines the class of patients by criteria such as lifestyle.
- Competitive analysis relates to the nature of competitors' services and customers' reactions to those services as compared to what they give. It also examines the power of technology in the market and what competitors have.
- Customer or market niche – analysing the characteristics, size and the variability within the market. It samples competitors' information and helps to open up focused “soft spots” to get to the customer This feeds into customer base.
- Customer requirements – this involves specific service related information from customers (patients). Customer input is very vital in perfecting this aspect of care delivery.

- Service characteristics - relates to setting specific requirements. This contains the quality variables defined by the organisation, based on national expectations.
- Market price – establishes the price of service acceptable to customers and capable of withstanding competition.
- Required profits – This is the core of the whole process. For the NHS, reimbursements and savings made by managing waste are very valuable. Reimbursement will act like the returns on sales common in the manufacturing area, although healthcare has returns on treatment (ROT) and will be compensated by PbR

To attain the above reimbursement and ROT targets, operations would follow a patient trail similar to that presented in figure 17.

Figure 17 Hypothetical stroke patients' trail in a TCM Model



Source: Author's calculation based on case study design

NB:

- 1 = Emergency cases and they follow the whole process which goes through the whole cycle of treatment as shown on the figure above.
- 2= Non – emergency cases. They do not complete the cycle. After consultation with the GPs and nurses, they are diagnosed and sent straight to post discharge stage where they are provided with prevention and post discharge tools.

Shown above is a trail which considers the TCM assumptions and posits how those key values are used to meet the needs of the stroke unit i.e., to attain *En*. This shows that patients are accepted either through referral, appointments, or in an emergency situation. They are received by GPs, nurses, consultants etc. and are subsequently sifted and directed to either emergency or non emergency units. After diagnosis, the non-emergency cases are most likely directed to post discharge facilities, which are out-of-hospital. The serious cases, are hospitalised and processed through various approaches to treatment. They recover and are rehabilitated. Later, they are discharged and monitored. After a period they are placed in post discharge facilities. This is the process that can give a picture of cost management along the various stages.

Most TCM researchers observe that the TCM system has no impact on how the costs of a product or service are computed, but rather affects the way in which costing information, already available, is used provided those costs are reliable. TCM in the stroke unit will thus be designed to create or review its costing (accounting, cost reporting and expenses planning) structure in such a way that its underlying results reflect the expectations of the department. Referring to the analysis made by Kaplan and Johnson (1987), the costing approach design within the TCM framework is that it provides timely and accurate information to facilitate efforts of cost control, measure and improve productivity, and to devise improved production processes. It also needs to report accurate service costs such that pricing decisions can show

clearly the performances of the department as a whole. Following the TCM principles, for this cost structure to work well in the stroke unit the following operating cost drivers or procedures need be properly understood and well planned:

- (i) Understanding and implementing the HRG procedures. Understanding the HRG for the stroke unit is vital in that different HRGs will affect different types of strokes. For example, strokes caused by swelling in the brain will be different from those associated with heart problems or diabetes. Understanding the causes of stroke and its different types is vital for cure management to take place.

Due to cost pressures, some critics argue that hospitals should only focus on treating the specific illness diagnosed at a particular time. This means that when a patient has been admitted with a particular illness, even if another problem is identified while the patient is in the hospital, staffs are recommended to diagnose that as a separate illness (Stewart 2003). The reason for this is that additional diagnosis would tamper with the HRG analysis during reimbursement. For stroke cases, however, this could be very dangerous because stroke patients have the tendency to harbour multiple illnesses, and one type of illness can trigger a more complicated stroke situation. In adopting methodologies such as the TCM model shown above, customer value will be defined as the least cost combinations of inputs that will lead to wellness at the given cost. By defining the customer niche and requirement the least cost combination will potentially meet customer/ patient requirements.

- (ii) Managing the LOS. LOS is very important because it has the potential to increase operating costs in providing a care service. According to Brooks and Farrington-Douglas (2007), the NHS could save £975m a year by discharging patients promptly. Longer LOS correlates positively with higher operation cost, as demonstrated by Parrott (2000), Tierney et al (2004), and Roger et al

(2005). Discharging patients promptly from hospital would also reduce the waiting times for other patients and in many cases, reduce the overall number of beds needed, thus promoting access to healthcare services (Brooks and Farrington-Douglas 2007).

Proper management of LOS is not the same as radical reduction of LOS. The former relates to the tendency whereby proper care is taken for admitted patients such that they are immediately released when they get better or well. Here, only patients needing acute services need to be admitted; some reports show that too many patients are being admitted who do not meet admission criteria (Stewart 2003, Brooks and Farrington-Douglas 2007). In other cases the term “bed blocking” has been used to describe the situation where patients already fit for discharge remain in hospital beds. One reason for this is a lack of proper linkage between the hospital and rehabilitation or community services. Some older patients after treatment lack proper community or old people’s homes to go to^{xxv}. With the application of TCM, at the time of admittance a plan for discharge would be immediately developed.

On the other hand, radical reduction in LOS means reducing the time an in-patient spends in the care unit. This can be due to the fact that the patient made a quicker than expected recovery and thus is naturally released. Where quicker discharge is management induced, it can lead to readmission or death. This is not a good indication for the healthcare trust. A system such as TCM links the operations of the value chain such that the external features required to reduce LOS (such as rehabilitation) could be quickly devised.

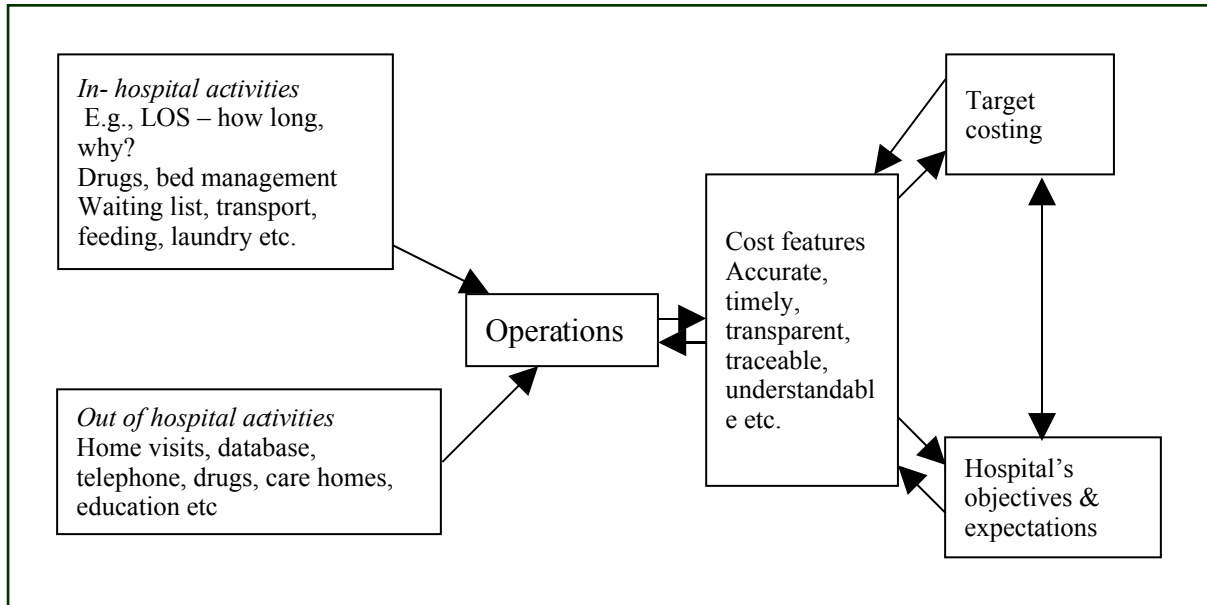
- (iii) Understanding payments by results (PbR). PbR is a case mix adjustment system for reimbursement to hospitals for the care they provide to patients. This means that costs originally have to be targeted in the long run before they are incurred. This system is similar to the TCM idea mentioned by Zelman et al (2003) and shown in figure 14. The Kings Fund^{xxvi} notes that PbR has been

successful in countries such as Australia and Sweden in reducing waiting time and LOS, as well as providing more transparent hospital activities. Trusts are compensated based on how they provide care and this depends on the accuracy of their records. Those with encoded activities, or no data at all for care provided will not be compensated. The codes and data are the underlying tools that determine reimbursement. Components not related to that particular treatment would not be compensated for during reimbursement. In essence, hospitals that do not target their cost will not be able to meet the terms of the PbR.

(iv) Accounting and costing systems. The expectation from all organisations is to provide accounting information that is timely, accurate and reliable, so that its underlying information can be used to make far reaching strategic decisions. TC welcomes any type of cost accounting system because its most essential factor is “how to use the accounting figures.” TC requires that information provided by an accounting method possesses the following characteristics.

1. Tracability – where it can be traced to the source—data on how cost is driven
2. Quick – required in the right time and the right sequence. It should not be provided so late that it will not be used.
3. The underlying figures should be easy to understand by employees with limited financial or accounting knowledge.
4. Information on how costs respond to volume, size, time etc., should be shown.
5. Cost must be transparent and all employees should have access to cost information.

Using the above TC determinants, the following cost model would be designed for the stroke unit and act as a methodology that assesses the nature of cost variation within the sector:

Figure 18 The role of accounting or costing methods in TC

Source: Own calculation inspired by Ansari et al (1997)

As shown in the figure above, the accounting method within the framework of TCM in this case affects operations differently. In-hospital activities and out-of-hospital activities are accounted for differently and their attitude towards operations planning is different. When both are analysed, it generates individual cost features which meet hospital expectations and TCs. This will suggest how to effectively plan healthcare delivery. The key issue here is that the cost feature should contain the values of accuracy, transparency, traceability, and ease of understanding, among others.

To conclude, establishing an effective costing method is just one aspect of the TCM model. The costing methods which possess the characteristics mentioned above are closely linked to the effective operations method which connects to customers' (patients) expectations. As Hamel (2002 pp 100) points out, "having the most efficient costing model does not mean having the lowest costs of production and of the product in the market". Lower cost of production and ultimately of the product is a factor of various strategic combinations of operations tools and models which also relates to the type of tools and model and how they are deployed.

4.3.3 Market orientation

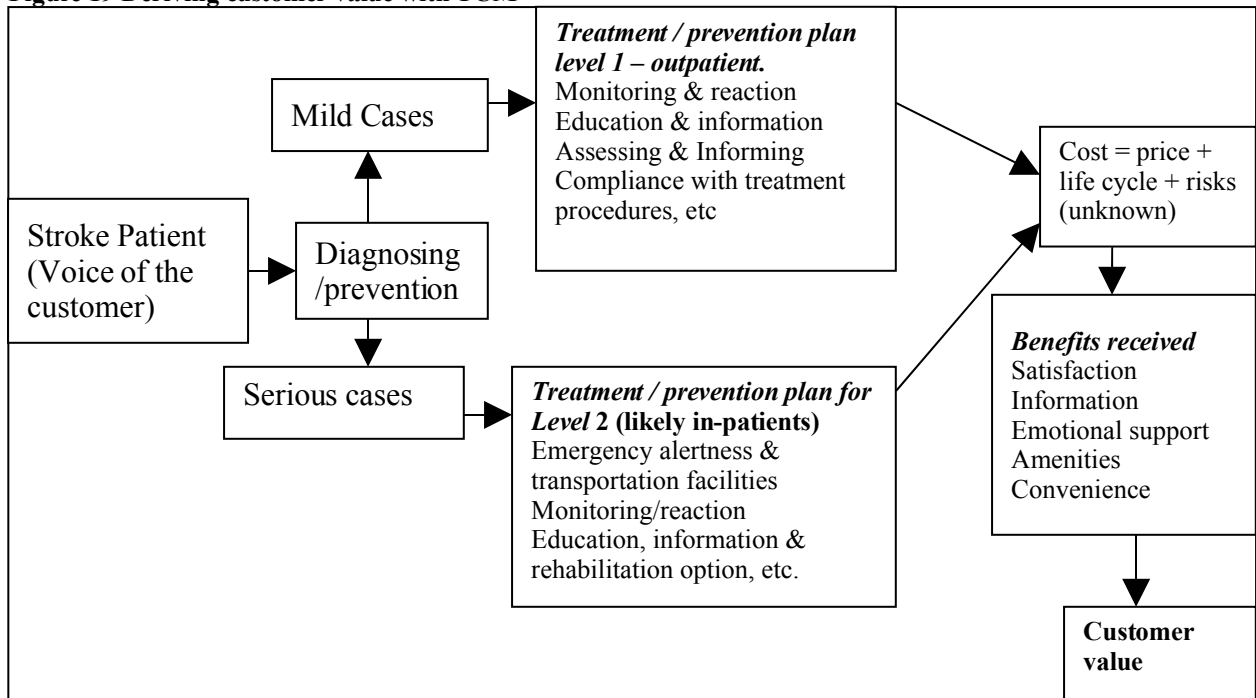
The next step in designing TCM in the stroke department is to define its level of customer focus. Success in TC implementation requires a backward approach strategy, where the market determines the price quality definition for the product or service. This is known as price based costing which is retrospectively factored back to the organisations' operations system. The tendency where the market (customer) influences the organisation's operating system is referred to as market orientation, because the organisation tries to respond to the market's needs.

NHS trusts are likely to have a sort of customer service department that gives them the capabilities to respond to customer needs. However, being customer focused and learning to listen to what the customer wants is a complex issue that goes beyond just taking in information (Ansari et al 1997, Silvi 2006). Understanding what the customer wants means asking the right questions, absorbing the answer into a proper mental model of the market, communicating that model to the other members of the management team, and then acting on it (Ansari et al 1997). As this process becomes refined, management broadly shares market information as well as customer perceptions of its product or service as against those offered by competitors. Market orientation therefore means sequences of activities to acquire, communicate, interpret and remember knowledge (Ansari et al 1997). For the hospital therefore, their system procedures, routines, files, and data banks are designed to aid such a process. Managers can accept or reject the information and data while simultaneously prospecting improvement methods perceived workable for the organisation. So the main question asked here is what do the patients or potential stroke sufferers need in order to be

satisfied with the services offered? There are two main categories of stroke patients, patients with mild effects and those with serious effects.

- (i) Mild effects are those sufferers who can regain near – or normal levels of activities through rehabilitation. Their level of disability is minimal. But these patients have to be monitored and prompted for treatment, as well as allowed access to preventive care facilities. Patients might, for instance, stop taking medication, thinking that they have fully recovered. Recent research from Nottingham University^{xxvii} shows that monitoring mild stroke sufferers is missing in NHS delivery planning. The effect of this is that such sufferers usually see their cases degenerate into more serious ones.
- (ii) Serious cases are those patients whose health has deteriorated significantly, and who usually need emergency treatment. Delivery operations in such cases require quick action, with these patients becoming in-patients, placed in acute environments. They will have been brought to the hospital by ambulance services and are now treated in isolated stroke units.

Being market oriented following the TCM methodology, systems and methods can be defined such that patients receive treatment according to the levels of care needed and not where more focus is placed on the seriously ill. This will make the hospital derive proper patient value. Patient value thus aims to put the patient at the centre of care planning strategy, operations and delivery, with wellness and patient satisfaction as the end result. Translating customer value through the TCM approach is shown below in figure 19.

Figure 19 Deriving customer value with TCM

Source: Own Calculation based on input from TC theory & Chilingerian (2004).

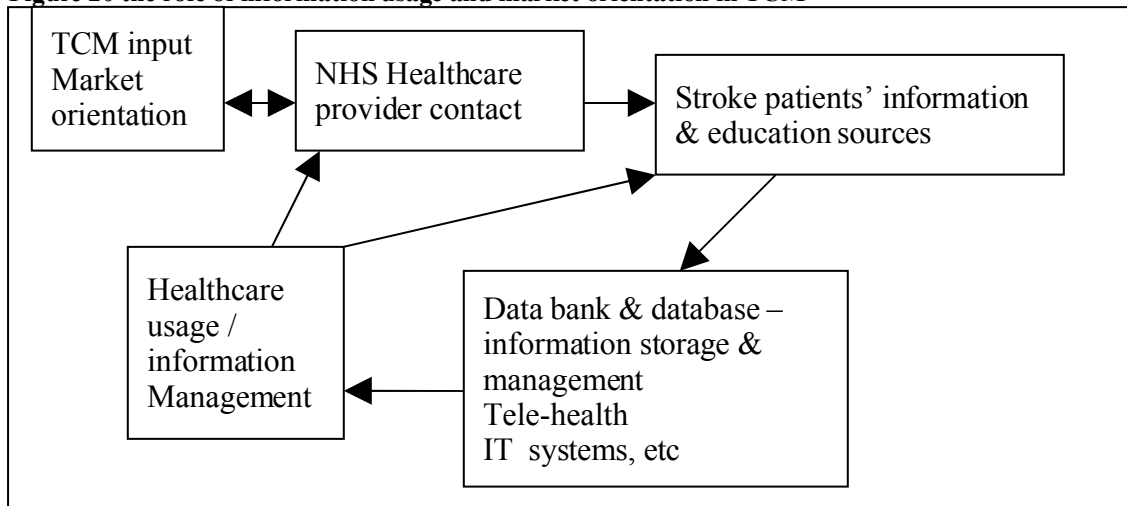
This shows a structure within stroke units that attempts to define patient value. It starts from the patients and then moves to diagnosis and prevention. Within that, two main types of stroke (serious and mild) are separated. In either case, the most effective strategy is applied to attain least cost cure. The cost of each will be assessed by adding the price plus life cycle cost plus risk. The risk factor in this model is that even though all the patients are registered in the hospital database, uncertainties may occur that deflect the operation targets and might increase costs. For example:

- The numbers of sufferers increase through migration from other illnesses such as epilepsy, heart diseases, diabetes, mental health and so on, such that one of those illnesses can trigger a stroke, making it more serious than would have been expected.
- Even though every precaution has been taken to register suspected stroke cases in the database, there would still be those whose health history is not known by the healthcare community.

One major factor that fosters market orientation is the availability of data. This is a major problem affecting the NHS as it struggles with the difficulties of data collection and storage. The poor quality of data and the lack of collaboration from GPs and nurses is also an additional problem. For example, according to Kmietowicz (2004), too few NHS doctors and nurses understand the reasons why collecting information on how their hospital or department is performing, matters. Hence, they are very reluctant to contribute to the process. The Audit Commission, in the report “Information and Data Quality in the NHS” (2004), points out that better understanding by NHS frontline staff of what auditors are trying to achieve through the collection of data, and through the wider use of the data collected in the staff’s own work, could improve its quality.

Data for stroke cases can be divided into two main groups according to the seriousness, and nature of the cases. All cases would be monitored differently, although the end result would be education, prevention, accessibility and provision of cure when stroke becomes evident.

Figure 20 the role of information usage and market orientation in TCM



Source: Author’s calculation

As the figure above shows, links with the customer are created concurrently with the healthcare provider through IT systems or “tele-health.” This shows the responsibilities of the

patients and those of the care provider. To be really customer friendly, the stroke patients' needs as shown above are linked by various communication and data storing devices in a "customer friendly" healthcare unit. The NHS environment is more conducive to data collection because all residents are required to register with a GP. To be customer focused as described in the TCM theory, data has to be collected, separated and treated independently and stored correctly for retrieval.

4.3.4 Operations

After determining and understanding customer value, the acquired information is then factored into the design of processes and service delivery. Theoretically, these processes are those that would deliver customer satisfaction and create value for their healthcare. New drugs and treatments are continuously emerging, and Trusts have to make difficult strategic decisions about how to invest in such areas based on the information obtained from patients. Therefore, for operations to meet the needs of the customer, systems have to be initially redesigned in the manner outlined below.

(i) Redesign of operations system

Redesigning the operation system according to TCM is to organise the production and delivery structures so that when services are offered, they can provide higher than expected value to the patients while also providing similar value to the healthcare unit. According to Knott (1996), Ellram, (2000, 2006) Helms et al (2005), implementing TCM requires both physical and psychological adjustment. For the NHS the following would occur.

1. Physical redesigning would occur when the mode of care delivery is totally re-engineered from the previous structure. For example it might be required that stroke patients are admitted and housed in secluded stroke units rather than being mixed with other patients, as currently observed. Other options could be that stroke patients

be treated in regionally designed specialist hospitals where skills are concentrated. This might also be cheaper because this concentration of skills leads to increased specialisation and core competences which might reduce costs. Patients could also be outsourced to other NHS hospitals with limited stroke cases.

However if the hospital decides to treat them within its unit, enablers of TC such as lean management technique, value engineering, IT, kaizen and so on, will be applied to assist in eliminating waste, improving flows, ensuring quality at source (such as eliminating medical errors or mistreatments), standardising operations, making it visual, and engaging and respecting every worker's expertise. In a stroke unit one can expect a physical redesigning life cycle outlined in appendix 28^{xxviii}.

The chart mentioned in appendix 28 shows hospital's reaction to customer and patient demand and value in the stroke unit, and illustrates a treatment cycle. Customer and patient value is the aim of this healthcare provider. The unit struggles to attain that value by first designing stroke prevention systems. With fewer patients coming to the unit because their situation was prevented through early detection, the hospital's resources are less stretched. The next point is information given to the healthcare provider and the patient. Here when cases come through and are diagnosed, data is kept to make prognosis for the future planning and to determine how many resources would be committed. For those that have been diagnosed and their problems identified, therapy and rehabilitation will be added to create customer value which is the aim of the care provider. When this is fully configured, the result will be the following:

- A. Eliminating waste in the sector, waste being defined as those things that use resources but do not add value from the end users' perspective. Examples of possible waste in the stroke unit are:
- i) over-processing (excess checking and inspection, duplication of documents, delivering meals for discharged patients, complexity in moving patients across organisational boundaries),
 - ii) corrections (correcting errors of all types, apologising to patients, time used in finding lost test results),
 - iii) inventory (excess inventory of supplies, stocking of unnecessary or obsolete materials, paperwork waiting to be processed),
 - iv) waiting time (length of waiting list, waiting for in-patient bed, staff waiting for arrival of specialised services, time patient spends in queue for various health related services, bed blocking),
 - v) search time (time spent looking for people, supplies and equipment),
 - vi) transportation (too many stages in the movement of patients, goods and materials),
 - vii) Space (needed due to inefficient flow, haphazard storage and storage of unnecessary equipment),
 - viii) Complexity (complex processes that inhibit regular flow, existence of organisational boundaries that limit and frustrate patients).
- B. Re-engineering of the flow process. As a service organisation that is operation orientated, moving work through functionality could be difficult and thus likely to slow down continuous flow processes. To avoid the temptation of prescribing solutions that may not work, experimental flow designs that have been successful in other industries could be tried. Methods such as the use of stickers, kanban cards, on – line booking and assessment methods can increase through - flow. Analysts such as

Nahmias (2005 pp 458) propose various queuing and simulation methodologies that can support through-flow designs in healthcare.

- C. **Guaranteeing quality at source.** Using the lean and value engineering approach, Toyota checks errors with tools such as the “mistake proofing” method. This method uses high and low tech means to detect errors from the customer end of the product life cycle. Recent developments in technology in the medical sector have introduced many mistake-proofing strategies that are being used by various process improvement teams applying the TPS in various hospital departments in the USA (Wellman 2005). The method helps to eliminate steps, reduce handoffs, standardise work and implement visual systems (Wellman 2005). TC operations ensure that an error, irrespective of its triviality is never passed on to the next stage or level. It must be dealt with as soon as possible. Medical errors of various sorts cost the NHS immensely (Moore 2003).
- D. **Homogenising operations.** This is a very challenging, but core aspect of TC operation. This is the core of the reliability of Toyota operation system, and seems to be the most difficult part to translate to healthcare management. This is because observers argued that
- i) patients are different, and using a standard method to provide care does not make sense,
 - ii) creativity in the medical sector would be hampered if a standardised system is used,
 - iii) that it minimises the use of clinical judgment, and
 - iv) given the nature of healthcare in encouraging continuous development, it is expected that dynamic methods of operation are also encouraged.

The above knowledge is important because the system can now be designed to cater for a few patients with exceptionally specific needs while the majority of stroke patients use a standardised system.

- E. TCM physical redesign can give the system a “visual view” of processes, as noted by Spear (2005) and Wellman (2005). When a process is made visual, the use of (for example) signs, supply and equipment location markers, work in progress locators, production rate indicators, and work stoppage lights, can greatly assist workers to know what they are required to do and when. Visual view can greatly assist in reducing waste and costs.
2. Psychological – attaining physical changes or improvements in the operations, understanding and fully implementing TC perfectly does not guarantee that the desired results will be attained. Psychological changes are required to help absorb new methods and approaches of production. Reviewing the literatures of re-engineering management systems shows a consensus that a shift in thinking is needed for any new management tool or system to be fully implemented. TC requires that a new way of doing things is recognised for it to fully work. For example, team work becomes more important and the role of the manager in dictating operations and management option is reduced in favour of consensus seeking. This is a common feature with most Japanese and European TCM adopters. However, resistance to change has been pointed out as a major reason for the failure of TCM implementation and success in most western organisations (Ansari et al 1997, 2007).

Within the NHS, such resistance to change is already emerging as authors propose the introduction of the TPS and lean in the NHS. Two main counterarguments are that:

- Patients are not automobiles, and thus moving patients through the wards would not require tools such as lean because individual patients have specific needs. Some health economists such as John Appleby^{xxix} argue that efficiency programmes have often meant patients spending less time with doctors. He adds that the NHS was certainly inefficient in places, but the challenge was to address this by applying more complicated systems. According to him, care could be designed better, but quite often change requires time and money which isn't always available. Health care is a complicated system that cannot be compared to car factories.
- Advocating tools such as TPS or TC makes doctors treat cost factors as more important than patient care. This is based on the argument that accessibility to healthcare should not be constrained by costs (welfare ideology).

The importance of, and the expectations from, the psychological factors are that management psychology should tone towards the ability of managers to accept to explore change. This could be the catalyst for the successful testing and application of tools such as TCM in healthcare management. Views along this line of thinking specifically addressed to TCM and the NHS has been raised by Simon Wombwell of Oxford Radcliff NHS Trust (see section 4.6) and Barden (2005).

4.4 The management perspective

The role of management in the success of TC is crucial. While management is becoming more robust and dynamic, there is also the need for managers and team leaders to be very dynamic and charismatic. All organisations, either failing or succeeding, will always boast of a robust management and blame failure on other factors. For example, NHS managers are said to have the tendency of distancing themselves from failures. They have been found to be distracted from responsibilities on the ground, while focusing on issues that are irrelevant to

patient care. For a sector such as the stroke unit to be successful, management responsibilities and capabilities have to be taken seriously. Theoretically, a management organisation chart in a TC system looks as shown in appendix 30^{xxx}.

This figure in appendix 30 shows six departments fully linked to a central management. These are the main sectors of the organisation that interrelate to foster efficient flow and coordination of activities. They are all interconnected with each other and with the core management or top management (central). Theoretically, this means an efficient flow of synergies. Within a stroke unit therefore, the departments perform the following:

Top management: this is the core of management in the traditional sense (i.e. where the goals and management objectives are drafted). The top manager could be a manager or a leader able to take actions or delegate functions. This is very important in a stroke unit where things happen very fast and quick actions are required. Campbell and Goold (1998) point out that strong strategic leadership performs synergies through: i) knowledge and skills e.g., pooling insights into a particular process or function, ii) coordinated synergies, iii) shares tangible resources, such as saving money by sharing physical assets or resources.

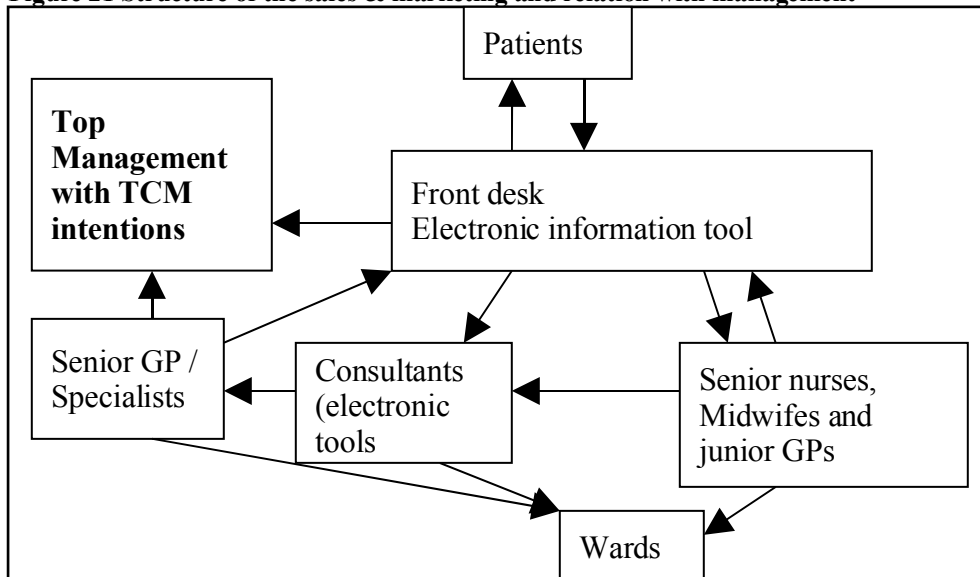
Value chain management, Compliance & working of the VC / data processing centre. This department sees that there is a flow within the VC and that the various departments work in accordance with the objectives of the organisation's goals. They process data that emanates from the sales department and pass results and findings to the top management for appropriate assessment.

Accounting department, financial analysis and cost centre: working directly with the VC and the sales departments (not exclusively), they carry out financial and also non financial analysis and perform various costs. Kaizen costing also takes place, where teams are sent to the operation centres to make sure that operations are carried out within cost limits. However, it might be hard to perform kaizen costing in healthcare due to the complexities of medical

issues and healthcare. But the fact that continuous attempts are carried out to reduce costs means that such efforts could generate positive results in the long run.

Marketing, sales and customer relations/Data collection: in most hospitals this is considered the front desk activity. However, there may be some back offices that deal with patient information. These are vital parts of the hospital as they are the first point that patients/GPs make contact with healthcare/hospitals. This department gets in contact with patients, gets information from them and also provides information on how to prevent illnesses and on the services available to them. To enable senior GPs to spend less time with patients, senior nurses and junior practitioners could be placed in this area so that they can handle minor cases and deal with patients with mild cases. Junior practitioners will have a first hand understanding of patients' positions and thus can assist in reshaping the operation processes of the sector as they progress in their profession. By the time they have become mature in their profession, they will have a proper understanding of the hybrid patient management system from in-take to discharge processes.

Figure 21 Structure of the sales & marketing and relation with management



Source: Author's design inspired by Norén, D., & Crawford, A., (2003)

As shown in figure 23 above, patients' first contact is the front desk which is equipped with electronic information tools. The front desk is also supported by senior nurses, midwives and junior GPs. They diagnose patients and determine the state of their health and decide whether to send them to wards, consultants or senior GPs. All the activities are supported by IT tools and the final action goes electronically to the management.

- a. Research development, process/service design & improvement centre: this is where research and development on how to improve healthcare outcome is carried out. This section also studies new techniques and recent developments in the sector and processes problems and complaints. Some NHS hospitals have tended to outsource some parts of this sector to foreign cheaper countries such as India and the Philippines^{xxxix} with the effect of an increase in medical errors due to misinterpretation of data passed from consultants and GPs. One justification for outsourcing could be the absence of such a department.
- b. Production planning, level of productivity and quality assessment centre: this is a crucial sector because waste can accumulate if planning is not well conceived and executed.
- c. Human resource, knowledge and learning directorate & management centre: TC sees the empowerment of employees as a strong tool for success. One of the best ways to empower employees is to provide them with learning and training possibilities and opportunities. Therefore, knowledge management is considered a necessity within the organisation. This department would also oversee the development and execution of trust within teams.

For the Japanese, TCM adopters consider that team working is important because people tend to feel secure while working with each other. For the NHS however, increased

immigration of healthcare workers, racial profiling and the recent terrorist incidents in the country could question the required level of trust.

4.5 SUMMARY

The above chapter provides a care scenario on how TCM could be applied in a specific department in an NHS hospital. The principles of TCM means that the management goal for production is set, based on the expected price to be gained from customers and it should be an ex-ante structure. This chapter has tried to outline and critically examine a customer friendly background within the stroke unit. The stroke delivery value chain shows a holistic approach that works with the TCM philosophy. The various trails give a picture of how clarified an efficient cost management method is when designing a delivery system that targets customers and market niche. TCM thus seem to have a future in the healthcare structure.

5 Chapter 6 Critical Appraisals

5.1 Introduction

This chapter assesses the feasibility of applying TCM to healthcare delivery operations, starting with an assessment of the compatibility of TCM to healthcare delivery. Because past studies have not shown that TCM has been implemented in healthcare operations, it is important to consider why there might be difficulties in implementing TCM (for instance, because of the complex nature of healthcare). A discussion of operation efficiency and strategic components follows in sections 6.4 and 6.5 respectively. The extent to which TCM is useful as a tool to improve the cost management method system integration which fosters

synergies is assessed in section 6.6, and a general criticism of target costing is examined in section 6.7. Then section 6.8 presents the criticism of TCM.

5.2 TCM compatibility in healthcare

While Merode (2004) mentions that TC could be applied in healthcare delivery, authors such as Zelman et al (2003) feel that it is already being applied at the level of reimbursement assessment for healthcare delivery. Eldenburg et al (2004) posit that although the Japanese developed TC from the manufacturing sector, where it has been dominant, most of its principles could be applied to the healthcare and service sectors. Other views in that direction have been limited to the lean and TPS approaches. While lean is known to be an enabler of TCM, and not a full TCM system, TPS system application to healthcare has been vague and limited in precision. Full evidence of TCM application in the healthcare sector is thus lacking.

5.3 Implementation assessment

Advocates of TCM such as Albano et al (2003) and Helms et al (2005) argue that the system is a simple, straightforward process which has the capacity to positively affect the “health and profitability of many, if not, most businesses.” They posit that TCM does not call for the expertise of specialists, large-scale software implementations, or complex management structures and procedures. What it requires is a logical and disciplined common sense that can infiltrate the organisation’s existing procedures and processes. This contrasts with other management models such as BPR and Six Sigma which in most cases require large scale expensive management consultants and various forms of software which have the potential to make the process of implementation more costly. For example, Nahmias (2005) described BPR as a business tool with a high price and gradual returns, and notes that BPR has shown a

meagre 30% success rate when the time and cost involved are assessed. TC on the other hand is quoted as consistently reducing product/service costs by up to 20 - 60%, although this depends on the product and market circumstances (Albano et al 2003). According to Shirouzu (2006) TCM gradually moved Toyota Car Corporation from obscurity to world leader in automobile production, surpassing General Motors. Ansari et al (2007) points out that the application of TCM by Korean firms such as Samsung and LG has propelled them to growth in areas such as semi conductors and electronics, seriously challenging traditional market players in the area such as Motorola Ericsson.

The cheap implementation of TCM could offset anticipated higher operations costs. This however remains a factor to be assessed by healthcare deliverers interested in understanding and benefiting from the system. Within the NHS, healthcare deliverers know their expected delivery costs, given that they are price takers. They know the levels of quality expected, prices or costs to be reimbursed at given care delivery rate, the various cost drivers such as LOS, HRGs and case mix adjustments, and PbR indexes. It is easier here to plan operations based on market perceptions than in the manufacturing sector. This is because prices are stable in the NHS healthcare market and the degree of competition that could pressurise operations is not as present as in the manufacturing sector. Could, then, TCM really work here?

Some authors, such as Davila et al (2004), argue that TCM is a complicated system to implement. One major reason they advance is that TC is too time consuming, especially when time to market is very short. The time it takes for technical inclusions and calculations of market requirements is compensated by shorter approaches such as the cost-plus method. The cost-plus approach is often quicker and does not involve an iterative, inclusive approach to reduce the gap between current costs and target cost as in target costing (Helms et al 2005).

This can affect hospitals most when trying to deal with emergencies or when dealing with cases where proper knowledge for managing them has not yet been properly established. But as a tool for proper cost management, the NHS would probably not be affected by the time to market effect on the whole.

Differences in organisations' culture can also impede the smooth implementation of TCM. This is especially so if cultural factors make it difficult to modify working patterns, staff assessments and promotion, or to deal with increased work pressures, and so on. For example, workers might want a favourable balance of work and family life as observed in the Scandinavian countries and to some extent France (Crompton and Lyonette 2005). In Japan, workers prefer longer working hours. If TCM requires a culture of increased work load and longer working hours, then it is not likely to be supported in cultures where working longer hours is not the way of life. Healthcare requires a regular working system and overloading physicians and nurses or consultants is not a traditionally encouraging approach to improve efficiency. Being a physically demanding form of operation and the fact that precision is a guide to success, overloading workers in hospital activities would not be theoretically possible. TCM would not meet implementations expectation in such circumstances in a healthcare delivery system.

- One major advantage of adopting TCM is collective input of organisations' operation management and decision making machinery. According to Kato and Yoshida (1998), workers, irrespective of their role in the organisation, have a say in contributing to the decision making mechanism of the firm. This places them in the organisation's decision making organ rather than at the rear as mere workers. This sense of belonging encourages increased participation in operations and the identification and solving of problems. In most Japanese adopters of TCM, there are 'employment for

life' working contracts, to which some studies attribute "loyalty and sense of belonging." The contribution of workers as well as of the top management makes a TC full package.

- One advantage of the TC philosophy is that it can be modified to suit specific industries. Some TC implementers fail to achieve results because they tend to apply TC in the same way as specific Japanese firms have done. Of course, drawing from successful organisations is valuable but according to Ansari et al (1997) western firms are not patient enough to gain from TCM. They apply TCM in a hasty way and rely on consultants. Cooper and Slagmulda (1997) posit that the power of TC lies in understanding its core concepts and its specific adaptability features. Kato and Yoshida (1998) point out that the category of Japanese industries that use TCM model ranges from auto-makers to other manufacturers as well as their various Keiretsu, some of which may be service deliverers.

A major deficiency here is that TCM might be suitable for the Japanese environment but not for other environments. For example, a lack of basic raw materials and greater distance from their major markets in the USA and Europe, makes Japanese firms use systems like TC to naturally manage their resources in order to reduce production costs. The Japanese geography and lack of oil induces their firms to reduce the components they put in their products; for instance, cars had to be narrower with limited components, and be fuel efficient. Given their high level of urbanisation, pollution had to be reduced through the production and sale of environmentally friendly vehicles. This contrasts with the USA, where the reverse is true with regard to geography and the nature of the products produced (for instance, car sizes, fuel economy and component input). The persistent fluctuation in crude oil prices and the

problems posed by non–environmentally friendly machinery means that Japanese production methods through TC are being re–examined in various American production institutions.

TC could also be good for the automobile and other fast moving assembly organisations, but its effect on the services or healthcare sector remains to be tested. Identifying the weaknesses of TCM in the automobile section could be a perfect turnaround for it to be better applied in the healthcare sector given that it is also a fast pace environment and possesses most of the characteristics of the manufacturing firms.

5.4 Operational efficiency:

- Applying the notion that TC works through the entire value chain, the healthcare delivery value chain presented earlier gives an idea of how TC Theory can work in the healthcare sector. Using the treatment of stroke as a case study, linking TC to the management of stroke gives a glimpse of how operations can be better planned from the customer (patient) perspective across the whole value chain. Similar steps can also be taken in dealing with other complex illnesses such as diabetes, heart disease, and cancers, among others. With this delivery value chain presented, the view that healthcare delivery follows processes can be justified. When processes are clearly mapped out, ambiguity, uncertainty, time and equipment can be designed to fit the demand of the processes. Given well managed floor space, sufficiently trained staff as well as well configured flow processes to transmit activities to all levels of the organisation, care delivery and management is made easy. Integration of health care processes and non–healthcare features will trigger improved institutional and organisational learning in a more diversified manner. For instance, a specialist may share ideas about new discoveries or surgical techniques that can be tested in other

sectors. If the patient is considered as the customer who needs to be satisfied, their role in designing wards and defining type and mode of treatment that matters to them, can help management effectively plan realistic utilisation of hospital resources. Operation efficiency is a practical route to customer satisfaction, elimination of waste, and efficient time and space management within the hospital.

Attaining operation efficiency in the NHS could be very complex, given that the NHS organisation is itself complex (Propper et al 2003, Ham 2005). This complexity comes from the fact that the NHS is the type of public institution that is centrally controlled and that some organs have not evolved with changing times. This explains why in the 1990s there was a negative correlation between care delivery and quality despite the adoption of market friendly competition methods (Propper et al 2003). There might also be some difficulties in integrating various departments in the NHS because most hospital operations tend to radiate around functions rather than patients. Thus the goal of achieving team work facilitation and cross functional efficiency through the adoption of TC theory in practice could be very hard. Although the NHS is said to be independent, government intervention in (for instance) the recruitment and placement of GPs, consultants, purchasing of drugs, and so on, is still very important. TCM would not succeed where such is the case.

Cross functional organisation as presented by the TCM theory is a great idea and if fully instituted it can lead to improved operations and production but this is far from being achieved in the hospitals (Merode 2003). It is difficult for organs in most firms to fully integrate as recommended by TC. For example, the accounting domain sees TC as a limited term and hence most accountants have not used it to make production changes, even though they have access to cost data (Helmset al 2005).

However, even though the hospital sector is characterised by various barriers, Spear (2005) argue that most of these barriers are just layers within the organisation to foster ambiguity and also to secure the positions of some overzealous professionals. He argues that the TPS can break through these boundaries and increase integration in the various hospital departments.

5.5 Strategy

Well-implemented TC in hospitals can assist in defining long and short term strategies. This agrees with the view proposed by Shank and Fisher (1999) that TCM can be a very value strategic tool when well implemented. Ewert and Ernst (1999) also posit that TCM was more of a coordinating and strategic cost management model for firm's profit planning. Scarce resources and uncertainty as observed in the healthcare sector today call for properly designed models that can assist in building up solutions (Porter and Teisberg 2006). Strategy in this instance is referred to as "proper" because every top manager has a convincing strategy for his organisation's operation (Hamel 2002). But the question remains whether this strategy meets the aspiration of the organisation and the extent to which management is confident that the organisation's strategy is up to the task of delivering long term superior returns. No firm will embrace a course of radical innovation unless it believes that strategy decay is inevitable (Hamel 2002). Many NHS organisations have strategies that enable them to plan and provide long term care that meet the aspirations of the patients and stakeholders. Despite these strategies, analysing hospitals' end of year reports for several years shows that many trusts have posted losses. The question then follows, how much life is left in their strategies?

The perception that healthcare operations cannot be designed in the same way as in other industries because treating patients is different from assembling cars is somewhat misleading. The fact that length of hospitalisation and the cost of most illnesses can be determined immediately after consultation and diagnosis, the existence of the HRG and the reference cost database that provides clinical combinations, requirements for treatments and case mixes, means that there exists information to use in building strategy. As shown earlier, NHS hospitals are supposed to compete for patients, are price takers and are also expected to provide a given amount of quality of care for a given cost ceiling. They are also expected to at least break-even or make a profit. It is expected that some sort of strategy to attain these objectives can be found. Propper (2003) points out that there is limited evidence of the impact of competition in healthcare in the UK, despite this being the central plank of the NHS reforms of the 1990s. This could be due to the absence of a strategy set to make a hospital competitive. This occurs at a time when many NHS providers are making operating losses.

Eldenburg et al (2004), Merolds (2004), and Ansari et al (2007) all argue that TC can work very well as a strategic tool in hospital management just as it is used in the manufacturing sector. This is because today, the business office of a healthcare centre is no longer just a cost centre. It is also a profit centre with opportunities to maximise revenue and profits. Healthcare deliverers can thus not afford to be less efficient given the limited margin in which resources are squeezed tight. Reimbursements above given targets are no longer honoured by the government. Healthcare must use strategic tools such as TCM to reduce waiting lists, LOS, rate of readmission, and quality, through the creation of stratified flow processes and cost systems that match the long term objectives of the care deliverers.

However, an effective strategy is the product of the CEOs who accept that their organisations are facing strategy decay. Since strategy is an institutional design for growth, differentiation and survival, it is better designed in the way that best fits the organisation. TC may provide some approaches on reaching achievable strategy in the healthcare, but it might or might not fit the aspirations of the firm. A better understanding of the core principles of TC and proper implementation will determine the extent to which it will be necessary and the sector or level of activities that best suit it (Ansari et al 2007).

5.6 Improving the Cost management methods

The right kind of competition in results of medical condition over the care cycle will lead to a major improvement in efficiency which will in turn drive a huge improvement in quality. Quality and cost must improve simultaneously (Porter and Teisberg 2006). Several researchers have documented that the financial information provided by the cost plus methods is usually flawed and unreliable. Most cost plus adopters post financial results late, which might not be important in planning operation and production. An additional effect is that using such data for production and operation will always lead to misleading outcomes. Cost plus adopters maintain cost structures that satisfy the need of the managers and accountants rather than the holistic overview of the whole firm's operations. This has been considered a contributing factor to some of the present day problems observed in most NHS hospitals.

Through employing a system such as TCM, operations costing will be integrated into the core of the hospital operation from the front to the back of the patient trail. Attention would be paid to both financial and non financial aspects of the operations. For example, while accountants are dealing with the various incomes and payments, other staff such as nurses,

consultants, GPs, and management can also understand the behaviour of these incomes and expenditures. People working in the catering, and laundry departments, for example, will also understand the effects of their actions on the entire cost structure of the hospital. When nurses fail to make sure that patients comply with their curing processes and as a consequence stay longer in the hospital, the effect will be increased waste and more cost.

Cost management process in this sense will be designed so that it is timely, simple to understand, affects all workers and encourages their participation, and is also able to provide reliable information that assists in decision making. Costing is the affair of all in the hospitals and is able to provide clues on how to continuously reduce waste and cut costs.

5.7 System integration and the fostering of synergies

One of the main characteristics of TC is that it creates room for system integration. This means the various departments are integrated so that the organisation's aims and objectives would affect every facet of the firm. Thus, Collis and Montgomery (1998 pp. 31) note that "no control system can be assessed in isolation." The effectiveness of control systems depends upon the degree of fit within the organisation's particular set of resources and business (Collis and Montgomery 1998). Integration increases the chances of synergy formulation within the organisation. Two or more units of the organisation will generate greater value working together than they could apart (Campbell and Goold 1998). They will be able to share knowledge on know-how, coordinate strategies, share tangible resources and pool negotiating power, and so on. For hospitals, even if departments are not working together per se, clinical specialists and hospital business professionals among others can share ideas. For this reason there must be a forum within the operations methodology of the organisation to allow for that to happen.

Within most NHS organisations various departments and sectors work in exclusion from each other (Nwabueze 1999). There is lack of data about patient safety issues, failed treatments or errors, etc. As pointed out in section 4.6 above, databases are missing or not available to safely store patients records. That linkage which makes various departments and systems operate as an integrated whole is lacking. This factor is deeply rooted in the way hospitals were designed in the past, when welfare forces dominated. Hospitals were not required to give cost accountability as price was not put on healthcare provision (Burns et al 2002). But as time changed and accountability and efficiency became more demanded, hospital organisations have not reflected these changes in their strategy formulation and operation systems. This could be blamed on lack of systems and methods to assist in formulating and designing such integrated approaches.

TC works with the value chain and as demonstrated in chapter 5 above, it can be applied to healthcare delivery to integrate the whole system. In implementing TC, top management can easily design means to spread synergies (working together) and integration will be easily transmitted into the rest of the organisation's sectors. TC already contains synergy in its characteristic and theoretical structure. Thus, when well implemented in healthcare delivery, those benefits will be quickly shared and transmitted, creating additional value with existing resources. But when it is poorly managed, it can undermine the organisation's confidence, and erode the trust among the various units. Thus the extent of its success depends upon the management's understanding of the organisations' needs, objectives and determination to integrate various sectors. It will also depend on the perception of the staff and department heads in relation to their objectives to attain efficiency and growth.

Therefore “*can target costing be applied in the healthcare sector and the NHS?*” Based on the above analysis, the most ideal answer is that “*yes, TCM can be applied in healthcare and the NHS*”. TCM can be applied to the whole organisation, part of it, or even used in specific project planning, analysis and execution. For that, healthcare providers can choose the level, boundaries and the extent to which they would want to use the concept. The theory can also be modified to suit a local or particular industry’s needs. Therefore, this study does not advocate that in healthcare, the TC theory is applied as if it were an automobile or electronic assembly firm. Rather, the value creating aspects of TC (such as its ability to provide theoretical frameworks and institutional methodology to help in programming operations) can be absorbed into healthcare operations.

5.8 Some criticisms of TC

Most of the literature on TCM has praised the approach as being a revolutionary tool that improves organisational operations and strategy in a fast changing market environment. It is still believed that the success of many Japanese producers and exporters has been facilitated by their adoption of TCM methods. However, researchers of TCM are also able to point to some weaknesses within the model. These weaknesses can be subdivided into two categories, namely structural and application weaknesses.

1. Structural weaknesses can be defined as those weaknesses associated with the theoretical formulation of TCM technique, such as the following:
 - a) Designed as a long range technique, continuous use of TCM can make it hard to identify areas of cost reduction. Good control systems will make the organisation more effective such that improvement efforts throughout the organisation’s operations system will lead to fewer opportunities to further reduce or cut cost (Tanaka 1993). Such a situation is believed to be happening today in Toyota Motor Corporation,

where the chief Executive (CE) Katsuaki Wantanabe has questioned the core tenet of kaizen – an arm of TCM (Shirouzu 2006). This is because Mr. Wantanabe feels that Toyota may be losing its competitive edge amidst quality concerns and recalls. Theoretically, TCM cost cutting and management assumptions seem attractive but practically, it might have limits when implemented and in continuous use.

- b) Some authors feel that the attainment of target costs as defined by the theory might ultimately lead to increased pressures on the labour force. Kato (1993) Tani (1995) Kato and Yoshida, (1998) conclude that hitting the target costs while reducing time schedule is becoming impossible, as the cost targets derived from the profit plan are extremely demanding. Hence, if target costing functions are integrated sufficiently at different stages of the production function of an organisation, the results of one can cancel out the other (Kato 1993, Okona 1996).
- c) Another structural weakness posed by the theory is the argument that beyond a certain point, comprehensiveness begins correlating positively with complexity and negatively with measurement precision (Kato 1993. Tani 1995). A system becomes more difficult to understand as its structures incorporate more variables and measurements (Bayou and Reinstein, 1998). The long-term continuity of cost reduction techniques suffers from the usual difficulties of predictability beyond one year. Waiting for more reliable predictions can cause problems such as acting too late to respond to market demands (Bayou and Reinstein, 1998). As the uncertainty of future demand increases, target costing becomes less effective. In an uncertain environment, target cost prices, sales volume and profit appear as unclear notions of future objectives rather than concrete figures, until more reliable economic forecasts become available (Bayou and Reinstein 1998).

Unlike manufacturing, which is characterised by various forms of uncertainty, healthcare management could benefit from TC in that demand for healthcare is always high and with the reimbursement systems known, providers are aware of how much it costs to provide a particular healthcare service. Understanding that inflation in the healthcare sector negatively rather than positively affects its delivery prices, TC can be used as a variable in determining future delivery costs.

2. Application weakness occurs as a result of the inability to apply the TCM principles as required, or that it is poorly applied. Japanese researchers themselves have identified application weaknesses as summarised below.
 - a) Of the Japanese companies that use TC, not all of them perform similarly well all the time. For example, Mitsubishi Motors Corporation (MMC) has been heavily affected by scandals concerning a history of hidden defects and technological malpractice. *Business Week* magazine (August 2, 2006) describes the MMC as “money-losing Mitsubishi Motors” pointing out that it differs from the other Japanese automakers (Toyota Motor Corp. and Honda Motor Co.), who report profitability. Nissan Motors, for its part, almost went bankrupt until it was salvaged by the French Strategist Carlos Ghosn, then head of Nissan when Renault took over. These firms all apply the TCM system and authors such as Ansari et al (1997), Cooper and Slagmulda (1997) had used these firms as case studies to show the success of TCM.

With varying performances of TCM implementers, it is suggested that target costing alone might not provide the long-term strategy required by a firm to succeed. While the literature is very explicit in its approach, practical attainment of the intended objective might not be the point (Kato 1993). Toyota Corporation itself has accepted that there are limits to its efficiency and Target costing drive. For example, in 1998 it took 21.6 hours to assemble a car in the

USA, more than 10 hours faster than GM. In 2005, it took 21.3 hours, while GM had almost caught up. There have also been quality problems; in 2005 Toyota recalled 2.38 million vehicles more than the 2.26 million vehicles it sold (Shirouzu 2006). This shows that Toyota is being caught not only by manufacturing problems but also by design flaws. The term “kakushin,” a revolutionary change in the design methods of cars and factories to halve the amount of components used in a car, is being advocated as a replacement for Kaizen (Shirouzu 2006). This will usher in a new chapter in car design, which will also see the creation of new fast and flexible plants. As Katsuaki Wantanabe notes, “At least we are beginning to know where our problems lie now. Our big fear is that those issues should not get stuffed in the drawer somewhere.” (Shirouzu 2006)

- b) Connecting target costing to normal profits is logical when the company operates at profitably near normal levels. However, when operating beyond normal profits, especially in a series of losses, basing target costing on normal profits can lead to unrealistic goals (Bayou et al 1998). During this time top management often welcomes any rational cost reduction methods. In a comprehensive, integrated, and dynamic system concerned with long term cost reduction targets, secrecy often becomes an essential constraint. Some competitors would pay dearly to acquire a manufacturer’s target cost development for the next period for a major product (Bayou et al 1998).

Despite the above-mentioned weaknesses, target costing has still been acclaimed more than most other modern costing methods. Of course there can never be any management method without some weakness. Analysts see these shortcomings of target costing as easy to correct weaknesses, compared with other management and costing methods, making target costing still an attractive method.

6 Chapter Conclusion and further research

6.1 Introduction

This chapter draws the conclusions from, and summarises the outcomes of, the study. It recapitulates themes of the study as well as its contribution to the field. The study process is reviewed, noting how it presents a contribution to research.

6.2 Recapitulation of the background and study rationale

The central themes of this thesis are that management approaches, strategy and product/service delivery methods in many organisations and industries have evolved with time. This evolution has been visible in the manufacturing and assembly industries to a greater extent. In the service sector, some changes have been identified in the banking, insurance and fast food sectors. But the healthcare sector does not seem to have evolved in a similar rhythm to the manufacturing sector. Some authorities attribute this to reasons including the tangibility and characteristics of the goods produced, complexity and the type of industry and organisations. Chapter one demonstrated that researchers in management, strategy and organisation studies had identified this lapse and had called for the expansion of research into fields such as services and healthcare delivery management. Despite this interest, recent studies show that limited research is being carried out to build methodologies for healthcare delivery operations and research.

The second theme of this study was the role of the consumer in driving the changes within the operation management and strategy of organisations. The customer's importance in competition has become such that the customer has become the major driver for organisations efficiency. Accordingly, this study showed that most firms, even hospitals and the NHS,

claim to be more customer focused. In this respect, many firms are trying to adopt price-based costing systems or TCM methods in planning strategy for organisation and operational efficiency. TCM has been described as being a holistic management system, that focuses on customer's want, price (where the market sets the price), which is then later factored back to the firm's operations system. TCM is an open system (externally and internally generated) and very dynamic which makes it applicable to a whole project, specific aspects of the project, or the organisation's entire activities. TCM, however, is not popular as a management technique used by many western firms, who prefer the opposite of TCM, the cost-plus management system.

The third point of focus in this study was to examine the possibility of adapting the TCM system to healthcare delivery operations. Pressure continues to mount on the healthcare system to improve their performances amidst increased investment in the sector and dropping care delivery quality and financial returns. When firms such as Toyota and many Japanese firms experienced similar uncertainties in the past, TCM was adopted and it transformed their operations. Although healthcare delivery is quite different, operations here are well structured and designed similarly to the manufacturing or assembling firms.

6.3 Recap of the research questions and aims of the study

As healthcare became the central theme of this study, it was observed that costing issues were more responsible for its negative performance. Thus, cost management was defined as a system and not an economic simulation method or a cost accounting tool. In this regard the research questions were designed as follows:

- Investigate NHS cost management system or technique. This was clarified as not being an accounting system or method, or a form of simulation costing method. The

costing system had the characteristics of what Cooper and Slagmulder (1997) describe as a sophisticated cost management system that creates intense pressure to reduce cost over the entire life of the product across the entire value chain. Kaplan and Johnson (1989) describe such a cost management system as that which is timely, accurate, simple, and has the ability to aid in decision making and strategy formulation. Based on the review of literature and contact with healthcare trusts, it was established that there was not enough evidence to suggest that such cost systems exist in the NHS despite efforts to instil related approaches.

- The second question aimed at understanding what the TCM system was. It started by describing TCM as a superior integrated strategic cost management method; ex-ante in character that could fully assist firms in reducing operating costs and assist them attain profitability. The system also works to satisfy customer needs such as quality, functionality, cost, and availability (time). Based on the definition and characteristics of TCM it was established as an open system that works internally but is influenced by external factors. As such, many implementers from various industries have benefited from it (Ansari et al 1997, 2007, 2000, 2007, Cooper and Slagmulder, 1997, Skank and Fisher 1999, Ellram 2000, 2006 etc).
- The next question was to determine whether TC could be applied in the NHS. It was observed that despite the lack of prior studies, some authors do agree that hospitals possess structures that can support the TC technique. After seeking to understand the extent to which strategic cost management had evolved in the management structure of the NHS, it was pointed out that TC costing might be used in the NHS not as a costing method, but as a means to manage reimbursement. Past studies on TC reveal that TC may be in use in some organisations, but is termed differently. It thus becomes more difficult to rule out the existence of TC in the NHS just because the

term is not used. However, if the assertion that TC is not being applied in the NHS is based on the study of the characteristics of the NHS costing system, then it is clear that TC does not exist in the NHS.

6.4 Recap of the research method and case study

The absence of a concrete past study of TCM in healthcare delivery made the selection of an appropriate methodology difficult. Popular research methods such as qualitative and quantitative methods were assessed and it was determined that despite their usefulness, they each had various deficiencies that made them not individually suitable to answer the research questions. Due to these weaknesses authorities agree that mixed methods containing data from both approaches are being increasingly used in healthcare research. Therefore a mixed research method was designed and the empirical aspect added to the study in order to enrich the research results.

Therefore to concretise the attachment of TCM to healthcare management, a case study was designed, following the analyses of Tellis (1997), Yin (2003) and Ellram (2006), where case studies are described as useful where there is limited implementation of the phenomenon of interest. Even though the case study method has also been criticised for being limited to a small sample, its ability to integrate various approaches and its real-life features makes it useful for social science research and research of this magnitude.

TCM model was thereafter proposed based on three main premises.

- The first is that NHS hospitals are required to be competitive in a non-market environment. They are price takers and are supposed to deliver quality healthcare, make it accessible, be customer focused and be able to break-even or make profits without increasing prices or limiting quality or supply. There is no way they can

achieve this operation efficiency and break-even or profitability without targeting their costs unless they sacrifice certain service delivery.

- The second issue was that the NHS operations system is similar to a manufacturing firm. Services are delivered in a well structured manner that follows sequences such as those shown on figure 17 and appendix 1. Therefore the entire care delivery value chain shown on figure 10 and 14 need to be attended to, and configured so that operation deficiencies are not only cost accounting or financial issues. They are also operational issues. Thus an integrated cost management system which runs through the chain and the various patient trails had to be determined. Past study did not show that such an integrated system exists in healthcare or NHS but that benchmarking is a reality in the NHS.
- The third point was that TCM is an integrating tool that works for profit, efficient operations management and it has been successful in Japanese and western firms that have similar operation structures as the healthcare. Compressing these views it was thought that TCM would fit well with the needs of the NHS.

Before designing the case study to test the hypothesis, two informal conversational interviews were held with the Chief Operating Officer and the Chief Financial Officer of the Royal Devon and Exeter NHS Foundation Trust (RD&E) hospital. These visits gave an insight into the background of the NHS costing and management approach. Other NHS trusts were contacted and data gathered to support the design of the case study. The stroke case study was selected because stroke is a very serious problem affecting hospitals, requiring both internal and external operations. To test and confirm a structural relationship between healthcare and the manufacturing firms, the delivery value chain for stroke was designed to build a framework on how a least cost method could be conceived. This was to correlate with the TC theory which works through the entire value chain.

6.5 Recap of assessment of TC in the healthcare sector

Even though TCM theory is still a new and less researched management technique some healthcare researchers hold that TCM could be applied in healthcare just as it is applied to solving problems in the manufacturing sector. Zelman et al (2003) posit that TCM is already being used in healthcare where care deliverers are price takers and the government is the price giver. Since this is similar to the NHS system, it became clearer that not only costing issues are at stake in the NHS. There is also the need for improved operational efficiency and for the costs to be targeted. The models designed and presented in figures 11, 13 and 17 were developed to show this relationship. Other proponents of TCM application in healthcare delivery management are Merode (2004) and Eldenburg et al (2004). The common aspect of these authors is that they try to use the term TC as described within the theory and as used in Japanese manufacturing. The fact that there are differences between healthcare and the manufacturing firm might make it a bit hard for implementation. However, differentiating between the healthcare and the manufacturing sectors might provide a clearer approach on how TCM could be applied in healthcare. In summary table below TCM and manufacturing firms have the following tabulated similarities and differences

Table 3 Similarities and differences between the NHS and Manufacturing firms

<i>Similarities</i>	NHS	Manufacturing firms
Market facing	Patient orientation	Customer focus
Operation process / importance of the Value chain	Well defined operation path and value chain important	Well defined operations and value chain very important
Profitability	Break - even required	Profitability very vital
Operations efficiency	Very important	Very important
Environmental Uncertainty	Very important	Very important

<i>Differences</i>	NHS	Manufacturing firms
Market	Non – market pricing	Market influences pricing
Type of products dealt with	Intangible healthcare delivery services. Cure for sick	Mostly tangible goods whose quality and functionality could

	patients	be physically appreciated
Ownership & funding	Public ownership funded from taxes and individual National Income contributions	Private share holders and funding from private market offerings.
Management	Managers and politicians with higher levels of bureaucracy	Professional capitalist business managers with theoretically lesser levels of bureaucracy
Evolution of management ideas	Very low and slow reaction to changing times	Evolves faster and changes faster with time
Effects of technological changes of product/services	High tech changes lead to higher costs of delivery	High tech changes leads to lower costs of delivery
Business philosophy	Welfare orientation	Profit making orientation

Source: Author's calculation

The above differences when factored into the goals of healthcare, can be restructured to meet expectations for example the business philosophy for healthcare could tip slightly towards profit making. The second dimension examined in chapter 4 is that other authors used terms such as TPS (Spear 2005). Although TPS is not TCM there are similarities in their characteristics. This is demonstrated in the figure on appendix X. This relationship although different but related to Toyota, shows that authors and researchers are increasingly interested in researching tools of this magnitude for application to healthcare delivery operations and management. Therefore the proposing TCM for this study is within norms and when analysed with the cure operation process it would be justifiable to conclude that TCM could be of great importance to the NHS if adopted.

6.6 Summary of major contributions

This research has been multidimensional in character, with contributing insights from production and operations management, management accounting, organisations and corporate strategy, competition theory, value chain management and healthcare management studies. The practical and scientific contribution is similarly divided into a variety of domains. The following summarises some of the core contributions:

- Findings from this study have supported suggestions and assumptions that the healthcare sector is lagging behind other industries in terms of designing its own strategic management model. Although there have been calls for the expansion of strategic management research methods to healthcare management, progress in attaining that has been slow. This study has noted supporting arguments for such views from Porter and Teisberg (2006), Oswald et al (1995) and Burns et al (2002), among others. Searching within the NHS has also observed the absence of a holistic management systems that can assist the NHS manage its operations and target its costs. Being a price taker and expected to at least produce at break-even performances, it would be expected that some cost management models designed on the lines of that defined by Kaplan and Johnson (1987) would be met. This has not been the case. As such, this thesis has thus taken strategic cost management and Operations Management theory further into healthcare production and delivery.
- The project has also contributed to search for robust costing methods that could be adopted by the NHS. The TCM costing method described in this study is meant to be a holistic management system that spans the whole value chain. It is therefore not an accounting model or economic simulation method, but a form of total cost management system which integrates product operation, strategy, decision system and organisational learning. Most of the literature on NHS strategic management indicates that many forms of costing methods are used. These methods however, work in isolation and satisfy independent departmental aims.
- TC presented in this study shows TCM in healthcare at the delivery level. This is a significant contribution because the TC model that has been proposed by some authors for use in healthcare operations and delivery management seems to be at the operations efficiency level. This means they try to design TCM as lean management

system or a form value engineering model. Therefore as these proposals have been very descriptive, no study has shown steps and methods describing how TC had been or could be applied in healthcare delivery. This study presents a pioneering step towards a TCM model that can be accessed right across the whole care delivery chains and patient trails.

- Target costing has not been presented here as a quick fix to operations and delivery management problems in healthcare. Given that healthcare is a complex organisation, TC would be expected to meet various barriers in its implementation. Differences in the interpretation of variables and the requirements of specific healthcare might affect implementation direction and therefore results. Thus, caution should be taken where structural differences present themselves where the TCM principles might be analysed differently.

6.7 Limitations

As this study is meant to provide unique and original knowledge to the academic arena and to interested laymen, there are a number of limitations worth highlighting. These limitations could be classified as being either associated with specific study objectives or general issues relating to the study.

The first limitation is the absence of past studies where TCM or similar methods have been applied in healthcare delivery research. Presenting a preliminary study in this manner might have ignored vital issues expected by readers. Although some authors have mentioned the application of TCM in healthcare operations, no detailed study has yet been carried out to link the theory to practice. The operations side of TCM (such as lean application) has been more popular. Terms related to TCM such as the TPS have also been used to research

healthcare management issues. TCM per se has not been used in healthcare as it has been used in the manufacturing sector. Thus it became a problem because analogy could not be drawn from past works.

The second limitation relates to limited availability of data and literature that could provide better guidelines for such a study formulation. It is worrying that some comparative studies that exist, or magazine articles are not considered as credible sources even if they provide some important information that might support the study. The NHS's code of conduct in research is applied the same way to both academic researchers and newspaper publishers. Some researchers believe that drawing from suggestions given in magazines and news papers is not credible enough. This has been a strong limitation to this study because TCM is interested in market perception for product and service design. This perception can sometimes be better expressed in news papers and magazines.

This study could have progressed to a higher level if there had been required co-operation with institutions and enough funds. The main research institution in which this study was performed lacked the basic tools to support such studies. The library lacked knowledge of TCM and healthcare management thus books and electronic data required to support such a study were almost absent. Relationships between researcher and institution in terms of timely diffusion of information, planning of required training, catching up with diversity and internationalisation, need to be improved. Research students have a variety of backgrounds and they continue to be students and the school has its role to help research students succeed. This also accounted for the worry over the availability of enough funds, and thus constrained this study.

Since TCM is a Japanese concept that has been largely used by firms in sectors such as manufacturing, assembly and exportation, it could have been interesting to investigate if the

concept was used in the Japanese healthcare delivery system. Some healthcare quality researchers such as Øvreitveit (2000) have conducted studies on the Japanese healthcare quality improvement system. Others such as Imai (2002), Yoshihara et al (2004) have studied healthcare costing and reforms in Japan. It was hoped that one could draw from them and others to determine if TCM management was being used as a healthcare delivery management tool and if so, how it was working. Unfortunately, this proved not possible at this stage. The frustration here is that leading western researchers of TCM such as Cooper and Slagmulder, Ansari, Bell and others have used Japanese firms as a base from which to draw examples of TCM model and to diffuse the ideology. This study thus was constrained by the need to limit investigation within known or available knowledge.

Another major limitation to this study is that it was hard to obtain the major sources of NHS trusts' incomes. For TCM to be properly used within an organisation as a costing, operations and strategic tool, the various potential sources of how that organisation generates income have to be analysed. In the case of the NHS, one way income is generated is through prescription charges. This also acts as a buffer against moral hazards because through it one could determine if operations principles and guidelines are closely followed. However, this was not determined to be relevant to this study and thus sources of NHS income were limited to reimbursement.

Another limitation to this study is the inability to produce details and causes of stroke. It is true that listing or analysing the causes of stroke could make the study look more like medical research. But the introduction of management in the healthcare sector means that healthcare managers need to understand causes of illnesses in order to plan proper strategies of how to manage them or prevent them. For example, Porter and Teisberg (2006 pp.403, 407 and 409) present individual care delivery value chains for chronic kidney diseases, stroke and

breast cancer treatments respectively. In all cases they advocate that proper prevention and cure of these illnesses are best when their causes are properly mapped out. The stroke case study presented in this study did not contain convincingly structured causes that really fit the arguments presented. That part of the study was thus constrained by lack of unanimity in formulating causes of stroke.

Finally, healthcare operations can be divided into three structures:

- a) The front office (customer or patient contact)
- b) Middle office operations (diagnosis, cure and related issues)
- c) Back office (discharge, rehabilitation, education and follow-up).

These structures deal with both in and out patients. This study focuses more on in-patient activities because in-patients are those who are very sick and this affects the hospital's operational efficiency since more resources are consumed in attempting to provide cures for them. Healthcare deliverers need to show clearly the above three characteristics and define effective management that will configure it to the levels of perfection required.

6.8 Conclusion

The above paragraphs have given a step-by-step summary of this study compressing it into one whole. It has critically looked at the approach of TCM in healthcare and the NHS and has provided benefits and some likely pitfalls of the TCM methodology.

In essence this study aimed at identifying that healthcare delivery organisations just like manufacturing firms need to design robust management techniques that can assist them in improving their operations. Even though such perceptions had been raised by researchers in operations management and management science in the past, limited attention had been paid

to it. Today, most healthcare deliverers including the NHS are under enormous pressure to improve their operations in order to achieve required expectations from them which includes operations efficiency, quality care, and accessible care. As well as that hospitals or NHS trusts must attain break-even performances. Given that benchmarking is already an operation norm within the NHS, it will require that, a holistic management tool or a method of that magnitude be adopted such that a combination of both operational efficiency and cost management components will give the NHS trust desired results. This is why this research first questioned what the NHS cost management model was. The expectation was that upon investigation a cost management system, which is holistic in character and which runs through the entire value chain on a large scale and the patient trail on a smaller scale would be identified. That was not the reality. It turned out that parallel tools and methods, which focused on smaller scale operations and corrections, as well as more reliance on cost accounting methods, economic simulation and similar methods were more prominent. Limited attention thus was paid to non-accounting or costing issues. Further in the study, more investigation showed that the NHS healthcare operations and care delivery system is structured just like a manufacturing firm even though their end products are different. This means patients are received into, and treated in, hospitals just as a manufacturing firm receives raw material at this end and turns it to final goods which come out at the other end. NHS care service deliverers benchmark activities while trusts are also expected to make a profit or at least break-even. Operating in a non-market environment it was determined that the best way to attain operations efficiency and profitability or break-even was to seek means of adopting the TCM model in the NHS. As shown in the study, TCM is a market orientation (ex-ante) model in which the cost of delivering a service can be determined before the service is designed. Figures 11 and 13 for example show how target costs can be designed when limited flexibility from the market assist the firm's financial and operations performance. It is

expected that TCM would run through the entire care delivery value chain and specifically through the care patient trail e.g. figure 17 and appendix 1.

Evidence showing that TCM is being applied in healthcare delivery is not explicit when compared with the way TCM is related to the management approaches of other industries. This accounts for the major gap in the research in this area. It has also been noted that TCM can be defined and interpreted differently as shown in chapter three. As such, TCM has been defined, its origin, characteristics and the practicalities of its applications shown, in the whole of this chapter. Further examples of firms and the types of industries that have successfully applied it (e.g., see section 3.7.2) and weaknesses of the system or criticisms of TCM (see section 6.8) have also been shown. This study thus has not posited that TCM is a flawless management system. The argument it has presented is that although there be some weaknesses in the system, as time passes, these weaknesses could be adjusted. For example this study shows how the managing director of Toyota has called for the review of Kaizen which forms part of a holistic TCM system (details in section 6.8). This is aimed at making adjustments that occur as a result of changes taking place in the market. Empirically, this study has shown why and how the TCM model can be applied in managing a particular case in healthcare – that is stroke. It has presented a stroke delivery value chain and a stroke patient trail. These show similarity with organisations that applied TCM and it has been observed in chapter five how TCM in the stroke unit can combine both operational efficiency and cost management to improve the care delivered to the patient.

By proposing the adoption of the TCM in healthcare, this study has stress the need for management models to be adopted in healthcare operation. It has contributed support to the view that healthcare operations are structured just like those of manufacturing firms and can take in operational management models that can assist in its operation. This study has also opened up a new area in the search for management solutions in healthcare management. It

has extended management accounting and, operations management models to healthcare management research. This is done by clarifying the concept, identifying its theoretical foundation and setting its strength and weaknesses. Lastly this study has empirically tested the hypothesis and has shown that TCM can be applied in healthcare operations. This means the NHS can also adopt it. Its application or implementation efficiency remains the responsibility of individual healthcare trusts and the NHS or the DoH since the successful application needs support and commitment of top managers.

6.9 Suggestions for further research

This research has raised the question of evolution of strategic cost management within healthcare, specifically examining the NHS costing method or model. In proposing the application of TC to management of operations and delivery in the NHS, there are still some studies that need to be made in the future to improve on such a drive. This could be looked upon in two dimensions. The first dimension is to understand the underlying theory (TC/TCM).

- TCM theory is still an under-researched area (Ansari et al 2007). It is vital therefore that core concepts and their characteristics are properly understood before linking them further to such a study. The Toyota Production System (TPS) has lots of similarities with TCM. But they are not the same. I have tried to describe their differences in this study but it would be valuable for the research community to get a proper definition, and characteristics of the TPS. There are different interpretations of the term. Spear (2005) and some Japanese researchers such as Okona (1996) seem to describe the TPS as lean. Feil (2004) and Cooper and Slagmulda (1997) point out that Lean is an enabler of TC, meaning that the role of lean is limited to operation efficiency. According to Smalley, president of the Art of Lean Inc., the TPS is not all

about flows but about cost reduction and profit making. Some research organisations such as CIMA are already carrying out a study on the NHS which they term “Target Costing in the NHS: Reforming NHS from within” (2005). Although their topic resembles Spear (2005), they seem to be following the right direction by defining TCM systematically. They draw examples from Spear (2005), but their approach is more expanded than Spear’s. CIMA’s study however as at April 2008 is still inconclusive and they also need collaborators.

- The next area of future research is to try to make sense of the evolution that has been taken place in the NHS within its strategic cost management. It is well documented that manufacturing firms have evolved their cost management approaches to withstand changing times and uncertainty (Kaplan and Johnson 1989, Stauffer 1998). This study has shown the relationship between the NHS and manufacturing firms. The NHS also faces uncertainties and they are required to produce certain margins in an environment where there is no market. The question remains, from strategic management perspective, ‘how have the systems, methods or approaches used to manage healthcare delivery operations evolved to meet the changing requirements of hospitals?’
- The next area of further research could be to examine factors that might favour and those that might limit, the NHS from adopting and implementing models like TCM systems? Cooper and Slagmulda (1997) identify theoretically, various factors that would influence the successful implementation of TCM in a production setting. The approach in this sector is straight forward given that market forces and customer requirements are easily known. Also more research has been carried out in that sector to determine characteristics, values and production flows. In healthcare there are various limitations which can be described as structural, perception and resistance.

Further research could try to examine how to unlock these limitations so that tools such as TCM could be implemented in the healthcare sector.

- The last area of interest for further research is to understand the disease management such as stroke and their life-cycle cost within the NHS. Given the benchmarking attitude of the NHS and its non-market structure as well as the fact that quality, cost and accessibility need to be balanced for break-even performances to be realised, could adopting the TCM which operates within the value chain assist in providing a proper understanding of disease management such as stroke or heart etc? Could this assist in creating a life-cycle cost management model for the NHS?

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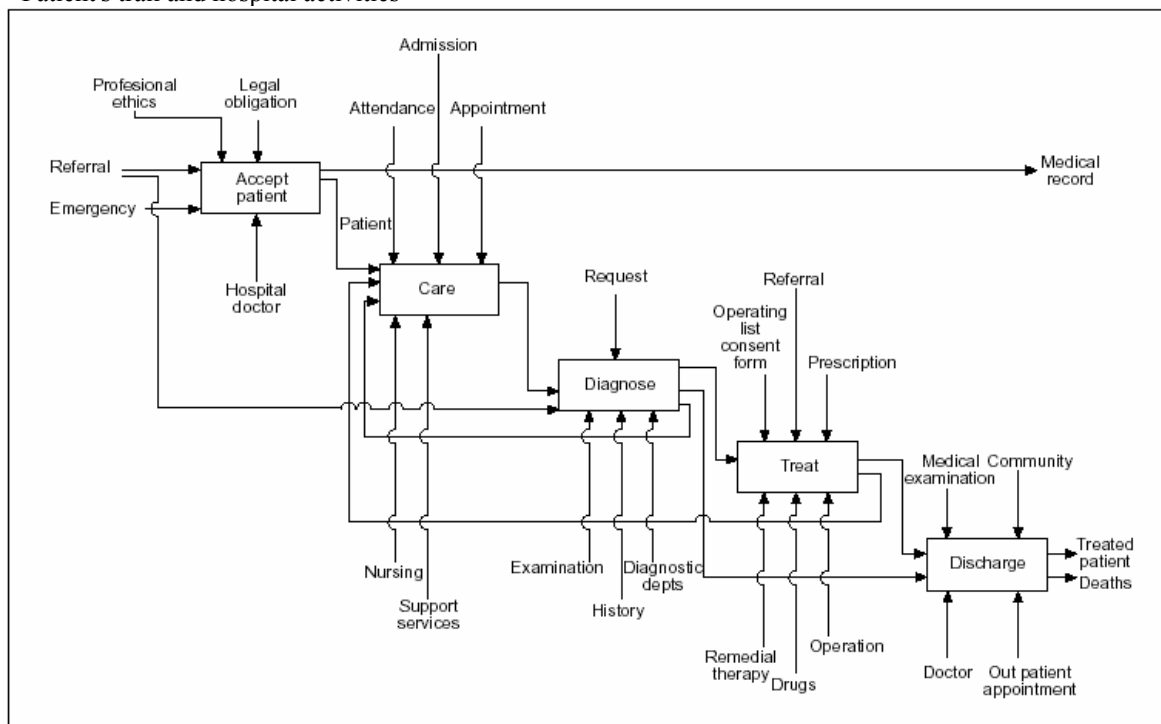
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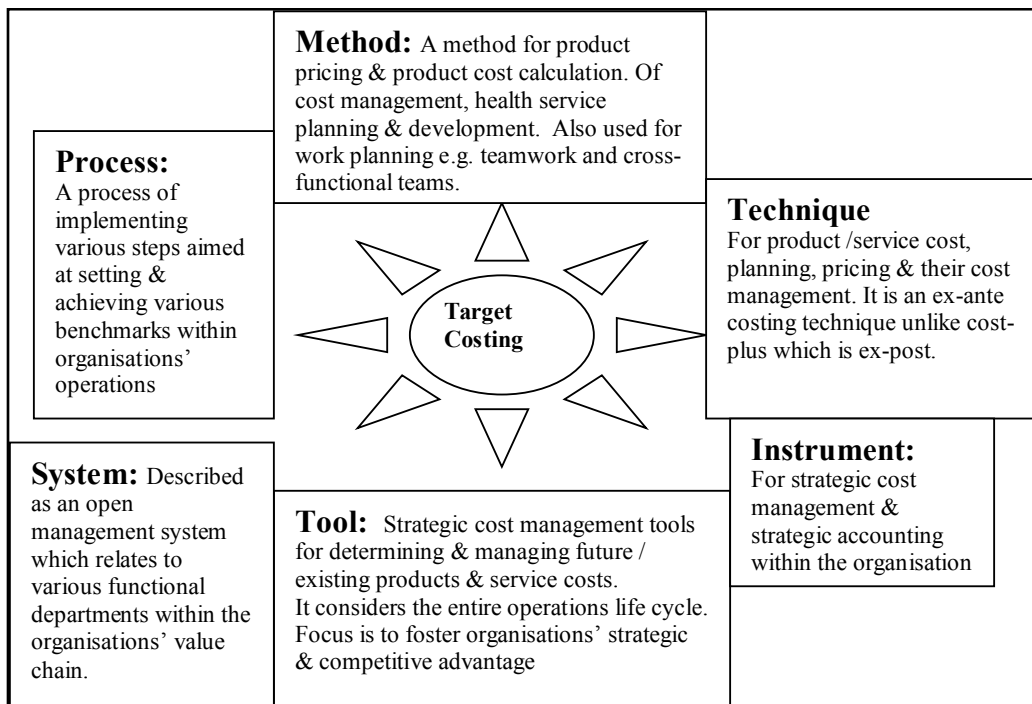
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i Patient's trail and hospital activities



Source: Shaw and Maycock (1994)

ii



Value of Target Costing

Source: Author's based on theory / inspired by Cooper et al, Ansari et al (1997)

iii Price – led costing in obtaining TC is calculated thus

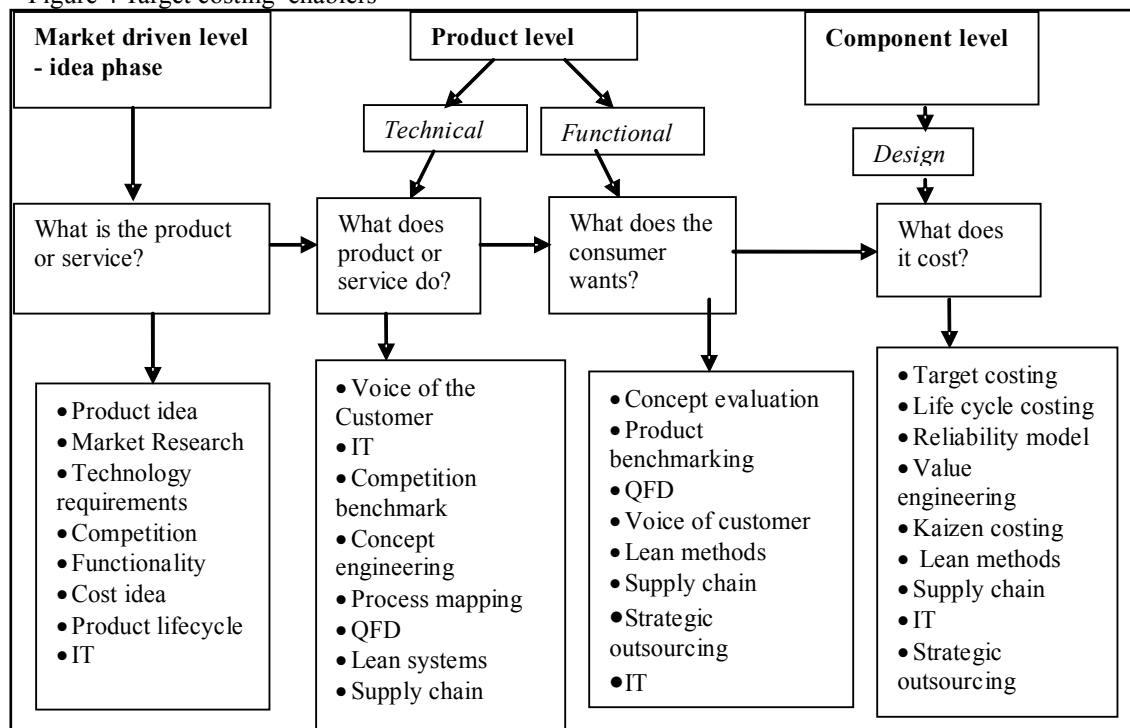
$$C = P - \Pi$$

Where: C = Target costs

P = Competitive market prices

Π = Target profit

iv Figure 4 Target costing enablers



Source: Author's calculation supported by Ducharme et al (2002)

v Kanban is a Japanese word meaning card or ticket (the 5s) relating to the means by which lean is implemented (Nahmias 2005).

vi Gartner Says Skills Shortage in India's Call Centres Has Negative Impact on Service Delivery. Based in the US and delivers IT related technology insights and solutions to various top firms in the USA and beyond, reports that the current shortage of skilled labour is hurting the Indian call centre industry. The Indian government agrees, saying that the demand for qualified employees in call centres will reach 1 million by 2009. According to Gartner, the shortage is due to the growing demand for offshore business process outsourcing resources. A shortfall in qualified staff can raise costs, lower quality and increase security risks for service providers. Gartner recommends that companies investigate carefully before engaging with an India call centre provider. Organisations should inquire about attrition rates and security measures, and ensure that adequate security mechanisms are built into contracts.

Source: <http://www.itbusinessedge.com/search/?ps=1705>, Published: 9/12/2005 | Date Reviewed: 9/22/2005

vii For example Kwah (2004: iv) shows the effect of non strategic outsourcing by looking at how some Western firms fared in the towns of Székesfehérvár and Győr in Hungary, described as investment miracles in the early 1990s after the collapse of communism in Hungary. Companies such as IBM, Ford, and Philips became established in the economic life of the region. These firms came to benefit from cheap labour, lower wages, competitive prices, and shorter distances to market in Western Europe and generally lower cost of production. American IBM invested heavily in Székesfehérvár where it manufactured hard disc drives while German Audi became the biggest investor in Győr where it manufactured almost all its engines in that town, as well as the Audi TT sports car and other models. By 2000, much of Western Hungary faced a severe labour shortage; consequently companies in Székesfehérvár and Győr had to import labour from Slovakia at a significantly higher cost. This labour shortage started deterring future investors from moving to this area. The expected effects started falling in place – labour costs started rising and the currency forint appreciated significantly to 23% in dollar terms. The cost issues that attracted companies to the area started to prove elusive. In October 2001 IBM announced closure of its factory in Székesfehérvár, and Japan's Kenwood also announced the closure of its factory in 2003 in the same town. At that period, investors have been moving from Hungary to cheaper China, India and other Eastern European countries. The Hungarian government's response to the rise in unemployment caused by the closure of these factories is that they had relied too much on foreign investors and too little to encourage strong domestically owned companies. Consequently, outsourcing which is not typically strategic will not help in cutting cost and would not enable TC objectives.

viii Lifetime employment was also caused by the effects of labour shortages witnessed during the Japanese economic miracle in the 1960s.

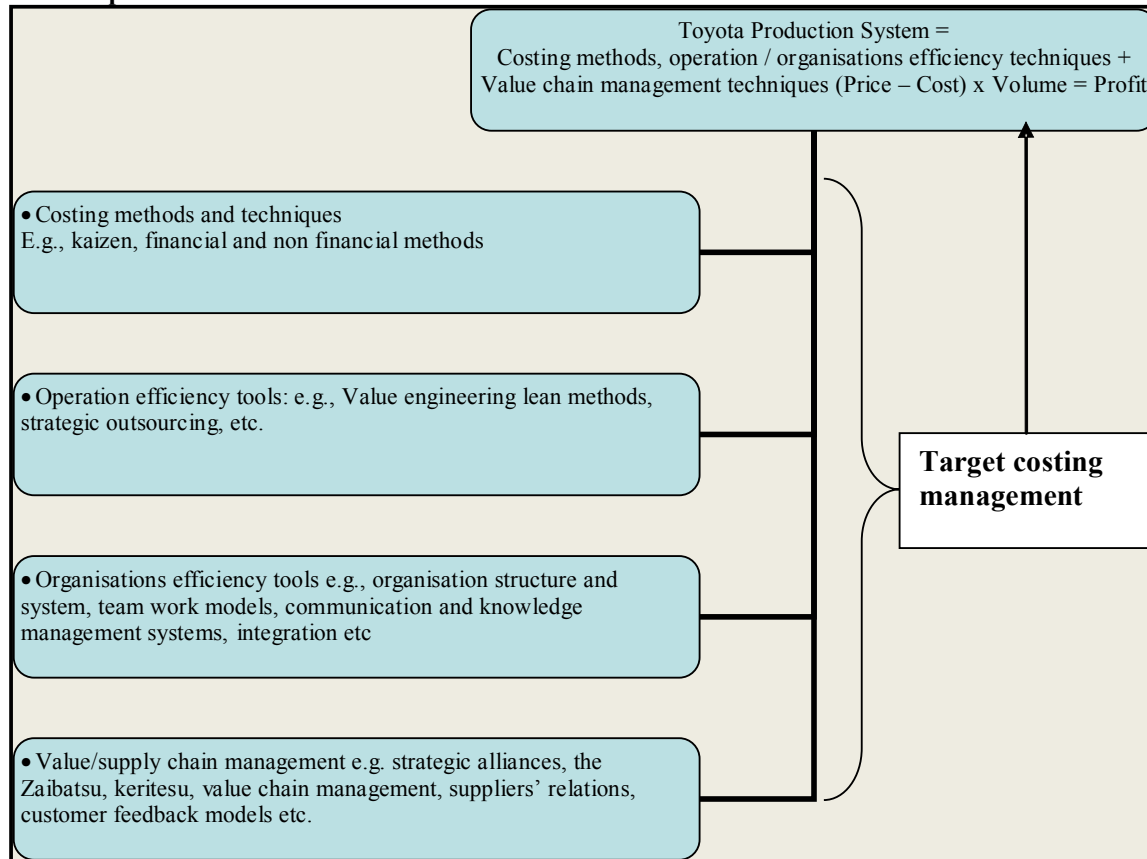
ix <http://web-japan.org/trends/business/bus050905.html>

^x <http://web-japan.org/trends/business/bus050905.html>

^{xi} TPS versus Lean: Additional Perspectives:

http://artoflean.com/documents/pdfs/TPS_versus_Lean_additional_perspectives_v3.pdf

^{xii} **A Complete TPS**



Source: Author's based on the understanding of the theory.

^{xiii} Minimally Invasive Total Hip Arthroplasty at Exeter – Exeter Total Hip System on www.exeterhip.co.uk/ex_pag_min- incision.htm

^{xiv} UK migration watch – briefing paper 5.4. health –

http://www.migrationwatchuk.org/Briefingpapers/health/foreign_nurses.asp

^{xv} Ibid

^{xvi} The Griffiths report 1983 (Ham. 2004), presented by Roy Griffith (one time deputy chairman of Sainsburys supermarket) recommended that if the NHS was made to operate like a private business its delivery efficiency could improve and that managers would be responsible for driving the NHS towards attaining these “business-like” features. Since then the DoH has persistently and gradually steered the NHS towards the market. Lapsley (1994) and Jones (1999) mention the introduction of the internal market in 1991, one of the consequences of the Griffith report. The internal market or the quasi market describes the modalities in how hospitals compete for patients.

^{xvii} Block contracts: Where hospitals are paid overall for their delivery operations. The effect here is that it allows for considerable variations in prices for operations across the country, in line with their actual costs to hospitals (although the calculations have often been rough and ready). In addition, hospitals were often paid even when they under-performed, failing to carry out number of operations required of them (Kings Fund 2005 - http://www.kingsfund.org.uk/resources/briefings/payment_by.html).

Cost per volume: where providers are compensated on the basis of the amount of patients received and treated in the unit. This reflects work load but not quality. Hence a pattern where higher volume leads to higher compensation and vice versa is observed. (Centre for Health Economics – York University WP6).

^{xviii} http://www.nao.org.uk/publications/nao_reports/05-06/0506452es.htm

^{xix} BBC 10th July 2006 <http://news.bbc.co.uk/1/hi/health/5166598.stm>

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^{xxi} The UK Stroke Association (2006) – www.stroke.org.uk

^{xxii} http://www.nao.org.uk/publications/nao_reports/05-06/0506452es.htm

^{xxiii} http://www.healthcarecommission.org.uk/newsandevents/pressreleases.cfm/cit_id/3455/FAArea1/customWidgets.content_view_1/usecache/false

^{xxiv} DOH National stroke strategy conference 1st March 2006 – Work shop 7 - diagnostic issues

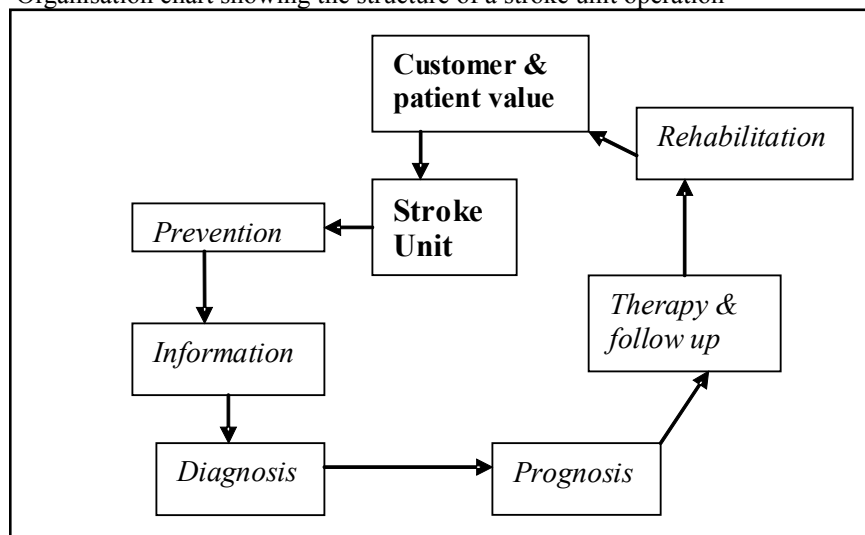
^{xxv} <http://society.guardian.co.uk/NHSstaff/story/0,,506177,00.html>

^{xxvi} Payment by Results - http://www.kingsfund.org.uk/resources/briefings/payment_by.html#section6

^{xxvii} See details of the report at : <http://research.nottingham.ac.uk/NewsReviews/newsDisplay.aspx?id=215>

^{xxviii}

Organisation chart showing the structure of a stroke unit operation



Source: Author's designed based on Norén, D., & Crawford, A., (2003)

^{xxix} Institute of Quality Assurance: <http://www.iqa.org/publication/c4-1-125.shtml>

^{xxx}

^{xxxi} NHS outsourcing plan exposed- www.easf.org.uk (20.02.2006), Health Business Magazine: Clinical process outsourcing <http://www.healthbusinessuk.com/default.asp?id=149>