

Perceptions of managers regarding supply chain cost reduction in the South African mobile phone industry

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Background: Many industries, including the mobile phone industry, experience a surge in supply chain (SC) costs in the provision of products and services to their customers. Despite this, only a few studies have been conducted on SC cost reduction in South Africa and globally.

Objective: This study seeks to understand the perceptions of managers regarding cost reduction in the South African mobile phone SC.

Method: A qualitative case study was conducted, involving eight willing managers and using semi-structured interviews, observation and documents. Interviews transcripts were analysed thematically with the help of Atlas.ti and a threefold process was followed, comprising data reduction, data display and data interpretation and conclusion drawing.

Results: The findings suggest that mobile phone companies should consolidate their strategic relationships and be efficient, in order to effectively reduce costs in the South African mobile phone SC. To achieve this, whilst South African mobile network operators have to share more and more infrastructure and outsource their operations, other mobile phone companies should re-engineer their operational processes and their reduce costs across the SC.

Conclusion: The knowledge generated from this study should assist South African mobile phone companies to reduce their SC costs and address high-priced mobile services. On the other hand, this study should assist regulating authorities (the Department of Communications and the Independent Communication Authority of South Africa) to gain insights into the challenges faced by the mobile phone industry in South Africa and, therefore, to make appropriate and adequate mobile telecommunication policies.

Introduction

Companies need accurate cost information in order to take strategic business decisions related to the production of goods and services (Mowen & Hansen 2008:8). Anklesaria (2008:2) points out that cost management should be understood beyond a mere price reduction as it involves a longer-term strategy informed by a comprehensive business view. Emphasising the strategic aspect of cost management in organisational process improvements, Eldenburg and Wolcott (2005:9) state that strategic cost management should aim at lowering costs and strengthening the strategic position of business organisations.

To overcome tough business times and remain profitable, companies can embrace innovation as a powerful driving force to generate new avenues of revenue, improve products and achieve service differentiation from competitors, thereby decreasing costs. This enhances customers' experience through better product delivery, a decrease in lead times and cost minimisation (McGladrey 2009:33).

A supply chain (SC) is a network of independent entities that partner to provide goods and services to consumers. This has emerged as a key business platform for effectively achieving business goals and gaining the competitive advantage. Interactions amongst SC members occur in a number of forms, including in particular collaboration. Mangan, Lalwani and Butcher (2008:250) differentiate SC collaboration from SC integration; they point out that collaboration emphasises the nurturing of relationships between SC partners developed over a period, whilst SC integration focuses on aligning and interlinking business processes within a SC. Li (2007:17) notes that the lack of SC collaboration can result in inefficient production, excess inventory and higher costs.

In a study conducted by Sachan, Sahay and Sharma (2005:192), in the Indian agricultural sector, the use of system dynamics grain supply chain model was suggested to reduce costs SC-wide. Wu (2005:66) conducted a study in the automatic test equipment industry and found that

architectural costs are inter-related and are organised in a complex hierarchy. Aqua Management Consulting Group (2008:12–13) conducted a study in the Indian automotive industry and the suggestion was that maintenance of balanced inventory levels, increased inventory returns and better resource utilisation are all key factors for achieving SC cost reduction.

Su and Lei (2008:1627), in their study on SC cost reduction based on process and time analysis, propose a fourfold theoretical SC cost reduction model: SC costing, improving processes, compressing SC time and smoothing interfaces. On the other hand, Anklesaria (2008:2–5) suggests a dual approach to reduce SC costs: negotiating cost and breakthrough ideas. Concluding the above, Su and Lei (2008:1625) maintain that despite the increasing interests in SC costs in industries globally, only limited studies focus on systematic SC cost reduction.

In addition, no available study has examined SC cost reduction in the South African mobile phone industry or in the rest of the world. The research question posed for this study is: how can South African mobile phone companies effectively reduce their costs SC-wide?

The purpose of this study is to understand the perceptions of managers regarding cost reduction in the South African mobile phone SC. The article's structure begins with the mobile phone industry and a review of the literature on SC cost reduction models. This is followed by the research methodology used, then the study findings and the conclusion of this study.

The mobile phone industry

The global telecommunication industry has grown exponentially and developed structurally over the past few decades (Djiofack-Zebaze & Keck 2009:919). It is believed that the contributing factors to these developments include globalisation, deregulation and increased competition (Zekiri 2011:88), in addition to technological innovation, in order to move the data at a greater speed (Hansen 2011:3).

Mobile phone players

From a SC viewpoint, the operational structure of the mobile wireless telecommunication industry is made up of five main players, namely: content providers, content enablers, service providers (SPs), mobile network operators (MNOs) and end users (Sabat 2002a:552).

Whilst content providers design and provide various kinds of services to users, application providers, also known as content enablers, offer mobile applications and platforms, including middleware and application servers, thereby ensuring that the online experience of users is more exciting and entertaining (Camponovo & Pigneur 2003:5; Kuo & Yu 2006:1348; Sabat 2002a:552; Tilson & Lyytinen 2006:576).

Differentiating network operators (NOs) from SPs, Achterberg (2000:359) points out that NOs provide network connectivity that enables communication to occur between two different nodes, whilst SPs use network connectivity for their own communication needs and those of their end users. Brito and Pereira (2006:3) view an SP as a firm that purchases mobile products, such as minutes from a mobile NO (MNO), and then resells them to end users, the final consumers.

The Competition Tribunal (2003:3) highlights the fact that 'the role of service providers is to provide the networks with a customer base'. Emphasising the intermediary role played by SPs, Kuo and Yu (2006:1349) note that SPs purchase all kinds of services from MNOs. They then resell these products and services to consumers with their own brand labels. Similarly, Camponovo and Pigneur (2003:7) note that Internet service providers (ISPs) provide network services through the Internet to other mobile phone players, particularly MNOs, other ISPs and, finally, to the end users.

According to Jing and Xiong-Jian (2011:157), an MNO is a firm that owns a mobile telecommunication network and provides voice and data services to customers. Camponovo and Pigneur (2003:7) add that MNOs also offer a variety of network-related services, including location information, user identification and billing services to customers. Compared to most countries in both First and Third World countries, South African MNOs are involved in the network connectivity, starter packs and airtime businesses. This makes them some of the most powerful players in the industry.

The deregulation of the mobile telecommunication space and the increasing need for competition and better mobile service proposition to consumers at reduced costs have led to the emergence of mobile virtual network operators (MVNOs). According to Burger-Helmchen (2008:99), an MVNO is any company that provides mobile subscription services under its own brand name, without owning a mobile telephony network.

Banerjee and Dippon (2009:76) argue that MVNOs can use a combined package of mobile services and other products, thereby creating some degree of product differentiation – in order to serve certain segments of customers that mere resellers cannot serve. They go on to argue that exploiting such differentiation ability could also be used as a strategic business weapon by both MNOs and MVNOs to differentiate prices (amongst customer niches with different demand requirements) to a degree that mere resellers would be unable to reach (Banerjee & Dippon 2009:76).

In the South African context, there is only one MVNO, Virgin Mobile, which has been struggling to play an intermediary and aggregating role fully, because of the existing oligopolistic and less transformative telecommunication policies or regulations.

The manufacturing industries and the service industries provide a combination of services and products, in order to fully satisfy their customers' requirements (Cloninger &

Oviatt 2007:233). Although providing network connectivity (a service) to customers is the core business of wireless telephone companies, they also offer handsets and starter packs (products).

Product offerings, which are a secondary activity for wireless telephone companies, are vital in the fulfilment of the core business. To ensure a smooth network operation and service provision, handsets and starter packs, as well as network-related equipment, need to be purchased from device manufacturers and mobile equipment manufacturers. Camponovo and Pigneur (2003:5) state that device manufacturers provide various types of physical devices, including mobile phones, personal digital assistants and notebooks with wireless cards, to end users. These then enable them to access a mobile telephonic network and perform various mobile applications. On the other hand, equipment vendors supply the equipment required to build, operate and manage the mobile network infrastructure. These include air interfaces, base stations, routers, switches and network-related transport technologies, as well as the logical infrastructure (Camponovo & Pigneur 2003:5).

Since end users are now more eager for mobile services (data and voice contents) than ever before, mobile phone companies (MNOs, MVNOs, SPs, device manufacturers and equipment vendors, content providers and content enablers) need to bring their costs down SC-wide and offer mobile service at lower rates, whilst at the same time remaining profitable.

Costs in the telecommunication industry

The telecommunications industry spends a huge amount of money on its operating expenditure (Opex). The major components that contribute to the overall cost include information technology, finance, sales and marketing (Katz & Hamilton 2003:32). Mishra *et al.* (2005:3–4) view Opex as the cost associated with the operation and maintenance of the network infrastructure and the provision of services to customers. It comprises labour costs, recurring power costs and licence fees and the per-call termination charges. Emphasising the magnitude of an MNO's Opex, some industry experts outline that MNOs' Opex generally exceeds their capital expenditure (Capex) in value or in figures (Al-Debei & Avison 2009:14; Peppard & Rylander 2006:136).

According to Shayani, Machuca and Jager (2010:96), Capex is the cost incurred by an MNO to acquire the necessary infrastructure to provide a mobile phone service, such as network nodes, ports, software, optical fibres, buildings, first-time installation and spare equipment. Verbrugge *et al.* (2005:1) state that Capex supports the infrastructure of an MNO, that these depreciate over time and that they are critical for the provision of services to customers. Whilst Capex is a one-time cost incurred by an MNO (Al-Debei & Avison 2009:14; Mishra *et al.* 2005:3), it should be noted that Opex is an ever-growing cost for the mobile telecommunications industry (Pattanavichai, Jongsawat & Premchaiswadi 2011:143).

Considering this challenge and the increasing need for cost reduction in the mobile telecommunications industry globally, MNOs should revisit their total cost of ownership (TCO) and decrease their Opex. TCO is a method that provides a comprehensive understanding of all costs for goods and services at different stages of the SC.

In the South African context, the type of Opex that necessitates reduction is SC costs, since the decrease in SC costs is one of the key determinants in addressing high mobile services in the South African mobile phone industry.

Despite the fact that South Africa has the highest mobile phone penetration in Africa, the country has been criticised for being amongst the countries with the highest mobile telecommunication costs in the world (Scherer 2012). Some industry experts have attributed these high mobile telecommunication costs to high mobile termination rates (MTRs), also known as interconnection fees, the prices that MNOs charge one another to terminate calls (ICASA 2011:19; Stork & Gillwald 2012:11–12; Theron & Van Eeden 2011:5) and to the regulator, the Independent Communication Authority of South Africa (ICASA) (Scherer 2012). In an effort to reduce these mobile call prices, because of the consumer outcry over the years, ICASA has now introduced the asymmetric-price regulation, by lowering progressively the MTRs over a period of 3 years from 2010 (ICASA 2011:19). In an interview on Radio 702, Knott-Craig, Cell C CEO, said that lower MTRs do not necessarily result in lower mobile call rates, as expected by the Department of Communications and ICASA, but rather in higher retail call rates (Muller 2012). This is an assertion that is fully supported by Research ICT Africa (2012:1).

Despite the reduction of MTRs through regulations, South Africa still has some of the highest-priced mobile services in the world (Chetty 2011:20–21; Research ICT Africa 2012:1). This suggests that reducing MTRs by means of regulation is not the panacea for lower call tariffs in South Africa's mobile phone market, since there are other factors that need to be considered, including reducing costs SC-wide.

Although the South African telecommunication market has seen rapid growth, the industry is criticised for being oligopolistic and for having high telecommunication costs. To encourage competition in the mobile phone market and to service end users at lower prices, as demanded by ICASA, mobile phone companies should improve the technological capability of their network infrastructure (network operation and wireless service provision) by driving SC costs down.

Literature review

Cost behaviour monitoring

The speed of technological change and the increasing need for reducing costs has constrained companies to revisit not only their production system, but also their costing approaches. This effort should be one of the strategic business weapons

that companies use, in order to monitor their costs effectively and meet their customers' needs continually, as well as to build and maintain a competitive advantage in this industry.

Understanding cost behaviour and putting in place an adequate cost driver monitoring mechanism are pathways to SC efficiency. According to Maher, Stickney and Weil (2006:145), a cost driver measures the activity that causes changes in costs. According to Fawcett, Ellram and Ogden (2007:251), companies that analyse cost drivers generally focus on the processes, activities and decisions that cause costs to occur in their SC. They add that 'cost drivers vary over time and among different products and services' (Fawcett *et al.* 2007: 251).

Mowen, Hansen and Heitger (2009:68) state that identifying and managing cost drivers remain key determinants for ensuring better cost prediction and cost control. Several authors believe that Capex is one of the major cost drivers of the mobile phone industry (Geoffron 2007:37; Harmantzis, Trigeorgis & Tanguturi 2006:108; Sabat 2002b:53). This requires colossal investment and sunk costs that are only recovered in the long term (Al-Debei & Avison 2009:20).

Su and Lei (2008:1627) state that traditional costing tools, specifically designed to analyse production costs, fail to capture SC processes. These authors add that because of this weakness, a number of costing approaches have emerged, including activity-based costing (ABC). This is designed to attribute any costs to those activities, which are measured by cost drivers and the cost to serve (CTS), which are developed to assess customer costs, and the TCO. This is intended to link costs with selected suppliers of products and services (Su & Lei 2008:1627).

From the abovementioned costing approaches, only ABC clearly connects to the concept of cost drivers. Several authors are of the opinion that the basic idea of the ABC method is cost attribution to processes via individual activities measured by cost drivers (Brock, Herrington & Ramey 2007:176; Pospoko & Novak 2008:2).

Managers who understand the cost drivers of their companies and industries should be well positioned to identify those key areas that necessitate cost reduction so that they can implement an appropriate cost-reduction mechanism. When well implemented, this could result in efficient processes, activities and decisions – not only in a firm, but across the SC and also industry-wide.

Supply chain cost-reduction models

This section provides and subsequently discusses various SC cost reduction models identified in the available literature for background knowledge. These models include Bergeron's (2003) shared service model, Su and Lei's (2008) SC cost reduction model based on process and time analysis and Anklesaria's (2008) SC cost-reduction model.

Bergeron's (2003) shared service model

Several telecommunication network operators (NOs) have realised the necessity of using the shared service model in some key functions, in order to reduce their costs (Katz & Hamilton 2003:38). Ulrich (1995:14) considers shared services as the business approach that combines or consolidates services within an organisation. Bergeron (2003:6–7) argues that a well implemented shared service model provides a number of benefits, including cost reduction (increased efficiencies, decreased personnel requirement and improved economies of scale), service improvement, greater focus on firm core activities and the externalisation of any potential profit centre.

The scope of shared service models has been extended to include SC. In South Africa, because of pressure to reduce costs from the regulator, ICASA, the MNOs have embarked on the shared service model in that they have pushed back the network infrastructure and its maintenance costs to the manufacturers (suppliers), but end users still have to pay high mobile service costs.

Su and Lei's (2008) SC cost reduction model based on process and time analysis

Su and Lei (2008:1627–1628) propose a theoretical SC cost reduction model containing four pillars, namely: SC costing, improving processes, compressing SC time and smoothing interfaces.

Supply chain costing: Accurate cost information is a critical factor in all SC decision-making processes. Managers who access accurate cost information make informed decisions about the SC and gain and maintain their competitive edge.

Cost data should be visible, in order to avoid any misrepresentation of the SC cost picture. This requires the building of trust amongst SC partners and openness to each other in terms of sensitive cost information, which should result in the identification of areas for cost reduction in the SC.

Improving processes: Firms perform a number of activities in order to achieve their organisational goals. However, poorly designed processes can result in significant wastage and inefficiencies. Implementing any cost reduction mechanism should first identify the potential for process improvement. Process analysis in SC can play a crucial role in identifying non-value-adding activities. This enables the accurate visualisation of each process in the SC, using factors such as input, output and resources, just to name few.

Although firms find it hard to utilise their potential for every improvement, due to the resistance to innovation and the cost implications, it is important to classify identified areas for improvement considering the cost-saving potential and the ease of implementation. These areas can be ranked in terms of highest potential and easiest implementation. The identification and prioritisation of opportunities are followed by specific projects enabling the application of process improvement techniques; they are designed, according to the highest-ranked areas.

Compressing supply chain time: Most companies have realised the importance of increasing the velocity of materials through the SC, which reduces inventories. Compressing SC time refers to reducing lead time in the delivery of goods and faster stock turnaround times, leading to less physical inventory holding in the SC. The decision to reduce SC time can lead to the increase of inventory turnover in the SC and the lowering of capital and inventory holding costs. To ensure reduction in inventory time, SC partners should invest in the improvement of processes and implement effective coordination mechanisms. Trustful relationships and the application of information technology between firms can enhance the levels of effectiveness in the SC. This should be integrated and synchronised through a vendor-managed inventory (VMI) and postponement.

Smoothing interfaces: The interfaces between business units have increased rapidly due to the growing need for outsourcing materials, components or services and high transaction costs in the total SC cost at interfaces. This poses a challenge for any SC in terms of improving its capability to serve customers. However, smoothing interfaces primarily aims to drive transaction costs down, that is costs incurred to coordinate a transaction, such as the regulated distribution of physical products or information. Firms that seek to increase the efficiency of the interfaces should build and maintain longer-term partnerships or collaborative relationships, ensure that SC processes are effective and lower uncertainty. This would result in massive savings, as both the purchaser and the supplier can control and minimise the buffer inventory levels. Additionally, there should be an effective transfer of information across the SC.

Anklesaria's (2008) supply chain cost reduction model

Anklesaria (2008:2–5) suggests two approaches to reduce SC costs, namely: cost negotiation and breakthrough ideas.

Cost negotiation: The journey for cost negotiation begins with creating robust sourcing teams assigned to purchase volume for a certain price. This is followed by price monitoring, which is aimed at analysing the possible benefits a company can obtain in relation to an industry trend. To outdo the market trend, and to sustain the price monitoring effort, firms graph and map industry price trends against current prices charged for specific products and services. Due to the challenge related to benchmarking competitiveness in the medium term, global award-winning procurement firms tend to benchmark total competitiveness once every 2–3 years.

Negotiating costs require that procurement firms understand the cost structure of their suppliers. Cost models are often used by business functions to inform negotiation and build credibility for buying firms. These models could be obtained either through extrapolation from industry statistics or through visiting suppliers' websites. The ultimate aim of cost modelling is to help buying firms to gain a better understanding of the supplier price structure and to negotiate effectively.

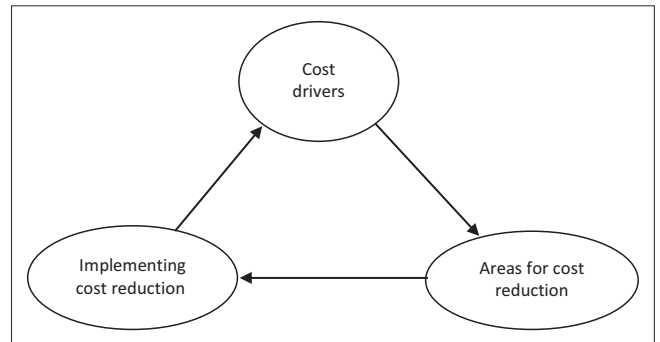


FIGURE 1: Conceptual framework for SC cost reduction in the South African mobile phone industry.

Breakthrough ideas: Business organisations have realised the importance of working together to achieve their business goals. Breakthrough ideas focus on collaboration, particularly establishing and maintaining supplier relationships. Collaboration can yield many benefits to a buying firm, if the strategic emphasis is on supplier-relationship management. Some of the benefits include strong commitment, clear direction and alignment, leadership and governance and shared values. Buying firms have to continually challenge their key suppliers to use leading-edge technology and high quality and levels of safety and reliability at reduced costs.

Wisner, Tang and Leong (2009:27) conclude the discussion on cost reduction; they suggest that companies could reduce SC costs through waste reduction, reduction in purchasing and product distribution costs, reduction in excess inventories and elimination or reduction in non-value-adding activities amongst the SC participants.

As all the above SC cost reduction models were designed for product-generating industries (manufacturing industries), a conceptual framework of relationships forming the basis for data collection and data analysis of this study is presented in Figure 1. This framework is service industry-oriented and is built on a thorough and intensive literature review, and the use of a qualitative research methodology, to investigate key SC cost reduction framework components in the South African mobile phone industry.

The development of the conceptual framework for this study

The framework provides the relationships amongst three major components, namely: cost drivers, areas for cost reduction and cost reduction implementation in the South African mobile phone SC. These components play a key role in the efficiency of mobile phone companies in the South African mobile phone SC.

Cost drivers

Mobile phone companies perform activities or processes that generate costs. The failure to gain a better understanding of these costs could result in high input costs. Because of this, it is important to first put in place a cost control mechanism

that would identify and manage the cost drivers of South Africa's mobile phone companies, since these, as do others in the world, have high operating costs.

Areas for cost reduction

The identification of cost drivers should pave the way for the identification of opportunities or possible areas for cost elimination or reduction in South Africa's mobile phone companies, since cost reduction effort is directly and intricately linked to the control of cost drivers for each activity performed by South Africa's mobile phone companies. The cost structure of mobile phone companies, particularly the operating costs, could help identify areas for cost reduction. The identification of areas for cost reduction via cost driver analysis should ensure that value-adding activities are enhanced and that processes and relationships amongst SC partners (mobile phone companies) are more satisfactory. To this end, there is a tremendous need for process re-engineering.

Implementing cost reduction

Process re-engineering should translate into the implementation of a cost reduction effort, as all identified processes with high costs must either be eliminated or reduced. Cost reduction is not a linear activity or process, but a cyclical process, since it requires a continuous improvement effort. Implementing cost reduction is a cost improvement process, through which South African mobile phone companies can achieve effectiveness and efficiency; any cost reduction effort by South African mobile phone companies would obviously affect all the end users. In addition, integration and collaboration amongst companies could be another way of implementing cost reduction within the mobile phone SC.

The research methodology

This study followed a qualitative approach by using the single case study design to understand cost reduction in the South African mobile phone SC. There seems to be some confusion over the use of the term 'case study' in both academic and practitioner circles. Nieuwenhuis (2007:75) outlines the fact that the term 'case study' can be used for a unit of analysis (for instance, a case of a particular organisation), or for a research method, which is the applicable understanding in this study.

Selection of components and participants

The selection of components for this study was initially framed from the literature review in the mobile phone SC, which included device manufacturers, equipment vendors, content providers, content enablers, MNOs, the MVNO, SPs, mobile

retailers and users. Due to the non-disclosure agreements with MNOs and competition, some components' members declined to participate in this study. The final selection of components for this study comprised three MNOs, one SP and one mobile retail group. Users were taken away from the final component selection, as they could not provide informed opinions on a study that deals with SC cost reduction of their suppliers.

The participants were mainly logistics managers and procurement managers for MNOs, a managing director for the SP and a SC manager for a retailing group. They were knowledgeable about the South African mobile phone SC and willing to participate in the study. The sampling was purposeful and aimed at gaining insights into cost reduction in the South African mobile phone SC. Prior to this, the pilot case study was used to refine the interview protocol and to ensure clarity and unambiguity of the questions to be asked and the procedures to be followed (Yin 2009:92). The main criteria followed in selecting the participants in the pilot case study included: convenience, access and geographical proximity (Yin 2009:93).

The data collection

Eight semi-structured interviews, consisting of open-ended questions, were conducted with six managers from three MNOs (two managers per MNO, but operating in different branches, in order to obtain a variety of opinions), one manager from an SP and one manager from a mobile retail group, as illustrated in Table 1.

These interviews were held between August 2011 and December 2011. They were all pre-arranged to accommodate the work schedules of the participants. The average duration for interviews was one hour and 20 minutes. Interview transcriptions took place after each interview session, taking into consideration the notes made during the interview sessions.

Saturation was reached with the MNO component of the mobile phone SC at interview number six, as the same responses were being received from all the participants. On the other hand, saturation was hard to reach for the other two components (SP and retail), due to the small number of willing participants interviewed.

Although semi-structured interviews were the main data collection approach in this study, observation and documents were also used. The participants were observed for body language, discomfort and hidden meaning during the interview sessions and notes were made to indicate such

TABLE 1: Participants' sample.

Mobile phone components	Number of mobile phone companies	Number of managers per mobile phone company	Total
Network operators	3	2	6
Service providers	1	1	1
Retailing group	1	1	1
Total	-	-	8

observations (Marshall & Rossman 2011:140). A number of documents, which included the annual reports of MNOs and other published reports on telecommunication costs, were collected in order to help identify any potential issues to be addressed in the research question of this study. This form of data collection is accepted in qualitative research, particularly in qualitative case studies (Baxter & Jack 2008:554; Creswell 2009:177; Eisenhardt 1989:538).

Validity, reliability and triangulation

All the interviews were audio-recorded, labelled, transcribed verbatim, validated and securely stored. Data triangulation was achieved in this study, as opinions from different components of South Africa's mobile phone SC were compared and contrasted. On the other hand, method triangulation was used, because multiple sources of evidence, including interviews, observation and documents, were used and compared.

The data analysis

Interview transcripts were analysed with the help of Atlas.ti; a threefold process was used, as proposed by O'Dwyer (2004). This is an adaptation of Miles and Huberman's (1984) analytical framework and comprises data reduction, data display, and data interpretation and conclusions drawing.

In the data reduction phase, the interview data per participant were transferred from the recording device to the desktop and labelled confidentially. Each participant's interview data were carefully listened to via Windows Media Player and reviewed. This led to the identification of preliminary themes, which were noted and refined at a later stage. All the transcripts were transferred to Atlas.ti (version 6.2) and coded using a bottom-up approach. As one transcript was compared with another, in order to build patterns and themes, some similarities and contrasts were identified.

In the data display phase, the links resulting from the data reduction phase were identified via mind mapping. This enabled the authors to link this study to previous ones on SC cost reduction in various industries on a global scale, as indicated in the introduction section. The themes resulting from the data reduction process were reflective of this study's research question. Stand-alone statements were noted; matrices were made using core codes, which helped to make comparisons amongst the different components of the South African mobile phone SC and to identify patterns thereof for refinement at the data interpretation and conclusion drawing stages.

Data interpretation and conclusion drawing investigated the opinions of the participants, across and within the matrix, in order to build a bigger picture of SC cost reduction in the mobile phone industry. Any stand-alone quotation that contrasted with the built big picture was also noted. On the other hand, thick descriptions, as voiced by the participants and any pertinent quotations were selected as signals and indicators of how the participants understand SC

cost reduction in the mobile phone industry. According to Lincoln and Guba (1985:316), a thick description generates a literature base for further investigations in terms of whether the findings can be transferred to other environments. This qualitative case study has sought to develop an analytical generalisation, as people are given the opportunity either to learn from the case for themselves, or to apply the findings to a population of cases (Creswell 2007:163).

The findings

The findings are reported according to the research question and per component, in order to obtain multiple opinions within and across various components of the mobile phone SC; the themes that emerged from the data analysis are discussed in relation to the available literature. For confidentiality purposes, pseudonyms were used for the participants and the names of the companies for which they work were withheld.

Reporting on the findings

The research question was: 'How can the South African mobile phone companies effectively reduce their costs SC-wide?' In order to answer this, the following interview question was asked of the participants:

- What approach could be used to reduce SC costs in the South African mobile phone industry?

Perceptions of network operators on which approach could be used to reduce SC costs in the South African mobile phone industry

In order to reduce SC costs, SC players need to consolidate their strategic relationships:

'Earlier, it was indicated that consolidation could be the answer if one could have one SC company, and one warehouse that distributes all the handsets, so that you could still order them, you still have [*the names of network operators*] that have their procurement, but all goes to one distribution centre and all goes to one or different courier companies, speed delivery, and one starts obtaining that synergy; one starts sharing the towers more. Then [*one would*] start seeing some real cost reduction in the business.' (Timothy, Head of Logistics Department, 50-year-old male)

'Firm relationships between SPs or NOs and retailers and vendors, strategic relationships with original equipment manufacturers (OEMs), consolidation where possible with all service suppliers (3PLs).' (Keziah, Procurement Group Manager, 38-year-old male)

In order to reduce SC costs, SC players need to be efficient through outsourcing:

'Uh, I think that probably rethinking the model of how we work, moving away from Peter Drucker's model, where in order to get a high margin, you have to have everything under your own roof. ... So, now, in order to be more efficient, you have to outsource everything you don't need, not everything completely, but you can.' (Philetus, Senior Procurement Group Consultant, 45-year-old female)

Perceptions of the service provider on which approach could be used to reduce SC costs in the South African mobile phone industry

Nathan pointed out that costs could be reduced in the mobile phone SC by reducing tariffs and making calls more affordable:

'By reducing tariffs, [and] making calls more affordable.'
(Nathan, Managing Director, 40-year-old male)

Perceptions of the retailer regarding what approach could be used to reduce SC costs in the South African mobile phone industry

Raphael believes that retailers should buy directly from OEMs and sell handsets to customers, who would then decide with which of the NOs to connect. NOs need to focus on the infrastructure that is directly linked to their core business, which is providing the network:

'The model suggested is that I, as [a] retailer [need] to buy directly from manufacturers and sell handsets to customers, who [would] decide to connect with any network operator. So my discussion will be now in two ways: I, as a retailer, would go to [name of the network operator] and say that I have this handset, what is the best you [can] give me and [name of the network operator] will give me its price, and apply the same approach to the rest of [the] network operators. ... They [network operators] need to support the infrastructure that is directly linked to their core business, which is to provide network.' (Raphael, SC Manager, 40-year-old male)

Discussion of the findings

Perceptions regarding how to reduce costs effectively in the mobile phone SC

Whilst NOs believe that the consolidation of strategic relationships and efficiency are the avenues to reduce costs effectively in the mobile phone SC, SPs emphasise the issue of affordability, which is the outcome of consolidation and efficiency. From a mobile retailing perspective, MNOs need to be dispossessed of some of their privileges in the industry by allowing retailers to do business directly with the handset manufacturers.

Consolidation of strategic relationships

The success and future of the mobile telecommunication business is dependent on the type of infrastructural management model that is used in satisfying customers' requirements for better mobile services at reduced costs. Berkers *et al.* (2010:3) are of the opinion that infrastructural consolidation could trigger the sharing of data between an equipment supplier and an MNO and result in an increase in equipment vendors in its network. Emphasising operational consolidation, Sabat (2008:90–91) highlights that in addressing the challenge relative to spectrum availability and offering wireless services to customers continuously, carriers or MNOs should embrace the consolidation of their operations and services by the agency of mergers, the acquisition of full or partial production machinery of another MNO or divesting some of their assets.

Because of the high Capex and Opex in the mobile phone industry, as pointed out by several authors (Al-Debei &

Avison 2009:14; Sabat 2002b:53), Frisanco *et al.* (2008:133) suggest that the sharing of sites would be a better option for MNOs to reduce, significantly, both Capex and Opex. According to Sabat (2008:87), NOs willing to reduce their capital and operating costs could be constrained to sign agreements to share access to the network. Berkers *et al.* (2010:7–8) conducted a study on the benefits of sharing, or not sharing the network, when using a business model canvas. When MNOs decide to share the network, it was found that the costs related to radio access network (RAN) locations, IT and service platform were reduced. This discourages any move for spectrum acquisition because of spectral efficiency hike, which, in turn, might lead to future cost savings. The study also found that these cost reductions trigger an increase in costs associated with customer acquisition and retention, because of the insignificantly differentiated value propositions (Berkers *et al.* 2010:7–8).

Hasbani *et al.* (2009:10) add that for MNOs to reduce their costs, they should outsource certain operational functions, such as field operations and network services, on the one hand, and share the infrastructure, on the other hand. According to the Cellular Operators Association of India (2007:5), infrastructural sharing provides an opportunity for MNOs to save some funds for future network expansion requirements and effectively meet their customers' needs.

According to Beckman and Smith (2005:79), it is hard to advocate a particular sharing model because of the variation in optimum from one market to another; but there should be a technical and financial model that enables cooperation and consolidation amongst NOs and the creation of an environment that encourages competition. Arguing on the disadvantage of sharing, Berkers *et al.* (2010:8) indicate that sharing may favour a market structural change, leading NOs to merge or for one NO to acquire another and thereby cripple any competitive actions.

To ensure the dynamism of the market structure, foster fairness and growth and increase competition in the mobile phone landscape, balanced regulating policies are needed. India is the classic and illuminating case of a successful mobile phone industry amongst developing economies. This was achieved through the combination of technological changes and well-tailored and implemented regulatory policies (Mani 2011:5). South Africa needs to be inspired by the developed countries in terms of mobile telecommunication regulations, as well as from other developing countries at a similar level of economic growth, including Brazil, India, Malaysia, Morocco, Thailand and Turkey, that are showing success in mobile telecommunication regulatory policies.

In a scenario in which NOs use third-party operators to save on operating costs, outsourcing becomes the right option. On the one hand, the outsourcing provider can attain highly synergised communication; on the other hand, the external partner can play a facilitating role in

the sharing process, the provision of a neutral government model and the protection of each operator's data (Frisanco *et al.* 2008:130).

In the South African context, there is an increasing need for more and more sharing of network infrastructure between MNOs; competition should shift from the network infrastructure to the prices of products and services offered to the customers. Mobile phone companies should be constantly seeking better ways of consolidating their strategic relationships and reducing costs SC-wide. To this end, collaboration and alliance relationships and horizontal integration (outsourcing of some activities) along the SC have become vitally important issues. These activities would enable mobile phone companies to become more efficient in managing SC processes and in enhancing the sharing of information amongst SC members, as well as thereby improving customer demand forecasting and providing better services at lower costs.

Outsourcing and efficiency

To cope with the increasing competition, changing customers' requirements and cost reduction pressure, many companies, including mobile phone companies, have embraced the operations outsourcing approach. Frisanco *et al.* (2008:136) state that any MNO's Capex and Opex saving effort should be driven by three key factors, namely: full turnkey equipment, operation outsourcing and network sharing. Emphasising efficiency, Yu and Yang (2011:762) believe that MNOs that outsource a variety of contents from specialised content-producing firms can achieve efficiency successfully in the chain system.

Pentzaropoulos and Giokas (2002:604) conducted a comparative study of 19 public operators in the European telecommunications sector on operational efficiency. Their study showed that large revenue operators, medium-sized revenue operators and small revenue operators can all achieve fullness in operational efficiency; full efficiency does not necessarily translate to a higher level of profitability for operators. Liao and Gonzalez (2009:105) point out that in the last three decades, huge technological developments and fierce competition globally have led telecommunication companies to improve their operative machinery and to increase their efficiency and profitability.

Sharma, Momaya and Manohar (2010:43) assessed the performance of telecommunication industries in India. The study indicates that low efficiency players should seek strategic enhancements. To achieve this, the results could be simulated by using efficiency measures, such as Capex or Opex per subscriber, or effectiveness measures, such as the number of products that are newly produced or services produced per billion rupees invested in technology development. The study also indicates that players with high levels of efficiency should anticipate their next growth stages by building differentiation capabilities in the industry in terms of quality, design, technology or internationalisation (Sharma *et al.* 2010:43).

Many companies seeking greater efficiency and cost savings focus on a few key areas and outsource other activities from specialised service providers (Marshall, McIvor & Lamming 2007:245). Berkers *et al.* (2010:4) argue that outsourcers and outsourcees could consolidate their operations, in order to enable the provision of better services to customers at lower costs in countries that espouse outsourcing practices.

Given the oligopolistic nature of South Africa's mobile phone market, mobile phone companies need to shift from a costly and centre-oriented business model – in which most business activities or services are performed in-house – to broader operational outsourcing, in order to drive their SC costs down substantially. MNOs need to outsource their logistical activities from third-party logistics (3PL) providers, as well as their call centre activities, to specialised SPs and to re-examine their network equipment and device acquisition forecasting approach, in order to compress and decrease their SC costs.

Direct purchasing transaction from device manufacturers

The purchasing privileges experienced by MNOs over the years should be revisited, so as to allow retailing companies to deal directly with the device manufacturers. This requires a change in the mobile telecommunication policies and, when well implemented, would lead to cost reduction across the SC, particularly handset purchasing costs because of non-involvement of MNOs, and can offer better propositions for the end users.

Conclusion

Mobile telecommunication is an infrastructural and technology-driven industry globally. Given the high Opex and the increasing need for low-priced mobile services at a profit, mobile phone companies need to lower their Opex. One of the ways to achieve this is to decrease costs SC-wide. The study has shown that the consolidation of strategic relationships through collaboration, integration and efficiency would appear to be the most promising avenue to effectively reduce costs in the South African mobile phone SC. To achieve this, South Africa's MNOs have to share more and more infrastructure and to outsource their operations. Device manufacturers, equipment manufacturers, SPs, content providers, and content enablers should re-engineer their production processes in order to reduce costs across the SC. This should be accompanied by the strengthening of cooperation, integration and collaboration, since SC cost reduction in the South African mobile phone industry requires a concerted effort on the part of mobile phone companies, which, in turn, should result in the reduction of call tariffs.

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Competing interests

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Authors' contributions

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