

Systematic Study On Impact Of Service Characteristics On Cost Drivers With Reference To Telecommunication Services In India

Dr. Megha Mehta

Senior Faculty, Ajeenkya Dy Patil University
School of Management, Pune, Contact no. 9767439768
megha.mehta@inurture.co.in

Abstract: This study assesses the impact of service characteristics, viz. intangibility, inseparability, heterogeneity, perishability, on cost drivers of telecommunications services firms operating in an environment of increasing competition and customer expectations. Referring value chain, four cost drivers of telecommunications service provisioning are identified, viz. operating, marketing, employee, and capital expenditure. Responses to questionnaire on impact of service characteristics, competition and customer expectations on cost drivers are analysed using factor analysis. The analysis resulted in five factors, identified as structural cost drivers, viz. service drivers, service design, service positioning, customer service, and service capacity. The structural cost drivers are then analyzed using structural equation modelling. A statistically significant relationship of 'service drivers' influencing 'service design' and 'service positioning', which in turn, affecting 'customer service' and 'service capacity' is observed. Observations and findings are summarised projecting service characteristics as leverage in creating value in an environment characterised by increasing competition and customer expectations.

Keywords: service characteristics, service drivers, service strategy, cost driver, telecommunications services, structural equation model.

INTRODUCTION

The strategy, traditionally, is about how the firm creates value in the long run. It is the basis of achieving competitive advantage, for example, by investment to acquire scale economies for lowest possible cost, or by investment to create brand value and command premium prices for differentiated products and services. In the long-term, the cost structure of the firm to a large extent is determined by the decisions concerning these two areas of organisation design and value proposition (Anderson, S.W., 2006). The economic analysis of competition, wherein market is assumed to be perfect, rely on achievement of low cost (McGee, J. 2015b) and in turn, rely on control of cost behaviour of the firm. The understanding of cost behaviour requires understanding the complex interplay of the set of cost drivers at work in any given situation (Banker, R.D. and Johnston, H.H., 2006). The concept of cost driver acknowledges that there is no single factor (e.g. product volume) that drives cost. Strategic cost management literature proposes two kinds of cost drivers, the structural cost driver and the executional cost driver. Structural cost drivers are concerned with the economics of structure, technology choices, scale and scope economies, and executional cost drivers are concerned with continuous improvement in areas of quality and productivity (Anderson, S.W., 2006; Shank, J.K., 1989). Services are different from products and make a difference to the strategists of the service firms (Segal-Horn, S., 2003). The characteristics of services viz. intangibility, inseparability, heterogeneity, and perishability contribute to the differences in services from products. Each of these four service characteristics influences the cost drivers of the services firm. The services, and service provisioning processes, of a service firm are designed as per the requirements of the consumer and may undergo change with the change in customer expectations. According to Johnston, R. 2015, changing customer requirements as a result of entry of new competitor, or different strategy/positioning adopted by

existing players influences the service strategy of the firm. The changed customer requirements and increased competition also affects the cost drivers of the services firm, a telecommunications services firm in particular for this study. In order to cope with, firm need to deploy dynamic capabilities that facilitate developing sources of competitive advantage, each time it faces the changed environment (Boulton, J.G., Allen, P.M. and Bowman, C., 2015). The aim of this study is to analyze the cost drivers and factors impacting cost drivers of telecommunications services firm, in an environment of increasing competition and customer expectations. The next section describes the research problem followed by a development of conceptual framework describing concept of cost driver, and identification of cost drivers and factors affecting cost drivers of telecommunication firm using literature review and semi structured interviews. The section that follows briefs about research methodology and characteristics of the data collected through survey questionnaire. The identification of structural cost drivers using exploratory factor analysis and development of structural model using confirmatory factor analysis forms the next section. Finally, the study concludes with observations and findings, and conclusion.

RESEARCH PROBLEM

Telecommunications sector in India offers immense opportunities for profit. However, what it takes to succeed in the fiercely competitive Indian telecommunications market is changing rapidly. There are continual developments in regulatory framework, technology advances, competition, and customer preferences over the last two decades. Each of these factors has its own impact on telecommunications service firms in India. Telecommunications services firms are striving for competitive advantage. The sources of advantage in one circumstance may be inappropriate in another circumstance. Cost advantage has been the primary basis for competitive advantage in any industry. In industries

where competition focuses on product differentiation, sooner or later, cost efficiency will become prerequisite for survival due to intensifying competition (Grant, R.M., 2008). Firms need to deploy dynamic capabilities that facilitate developing sources of competitive advantage in order to cope with changing environment (Boulton, J.G., Allen, P.M. and Bowman, C., 2015). Most of the research in the area of strategic management has been in manufacturing industries. The same is true for research in strategic cost management leaving very little representation of services and service firms in strategy research. Services are different from products and make a difference to the strategists of the service firms (Segal-Horn, S., 2003). Costs in service sector are increasing and hence service organizations strive for continuous improvements by cost control and process improvement. This study aims to analyse the element of cost, or cost drivers, of telecommunications services firm. In analysing these cost drivers this study also seeks to explore the factors impacting cost drivers. The characteristics of services viz. intangibility, inseparability, heterogeneity, and perishability contribute to the differences in services from products. The first question this study seeks to answer is

- i) Do service characteristics, viz. intangibility, inseparability, heterogeneity, and perishability, affect cost drivers, e.g. OPEX, CAPEX, etc., of service firms?

The services, and service provisioning processes, of a service firm are designed as per the requirements of the consumer and may undergo change with the change in customer expectations. In addition to customer expectation, competition may influence the costs of the service firms. The second question this study seeks to answer is

- ii) Do service drivers, viz. competition and customer expectations, affect cost drivers, e.g. OPEX, CAPEX, etc., of service firms?

And finally, the study aims to assess the interrelation among various identified variables.

CONCEPTUAL FRAMEWORK

Johnston, R. (2015) highlights critical issues for service firms while developing a strategic plan. These include the development of objectives rooted in drivers of strategy at corporate level; understanding of the market, the environment, the size and the nature of competition; identification of the potential target market; and assessment of the perceived needs and the expectations of target customers. The service firms, according to Johnston, R. (2015), need to ensure that these areas support each other while at the same time are consistent with the direction of change. There are two major approaches to strategy development. The first focuses upon threats and opportunities that are presented by the macro-economic environment, in which the firm operates, and this lies at the heart of Michel Porters' 'positioning' approach in determining different value propositions. The second approach, the resource-based view (RBV), is about leveraging firm's capabilities and internal resources to attain and improve the competitive advantage (O'Regan,

Philip, 2016). The decisions in these areas, for a service firm, lead to development of the service concept and degree of focus. The service concept and the focus dimensions together determine the range of services and the scope of identified market and is another critical area identified by Johnston, R. (2015) in designing service strategy. The next critical areas for a service firm, according to Johnston, R. (2015), are about decisions involving service package, its environment and delivery processes, in addition to identifying performance objectives in managing resources and activities, and differentiating service offerings. Historically, cost advantage has been the primary basis for competitive advantage in any industry. In industries where competition focuses on product differentiation, sooner or later, cost efficiency will become prerequisite for survival due to intensifying competition (Grant, R.M., 2008). The economic analysis of competition, wherein market is assumed to be perfect, rely on achievement of low cost (McGee, J. 2015b) and in turn, rely on control of cost behaviour of the firm. The understanding of cost behaviour requires understanding the complex interplay of the set of cost drivers at work in any given situation (Banker, R.D. and Johnston, H.H., 2006).

Cost driver

The concept of cost driver acknowledges that there is no single factor (e.g. product volume) that drives cost. There are numerous factors and a complex interplay of these factors causes or drives cost, influencing the cost behaviour of the firm. According to strategic cost management concept proposed by Shank, J. K. and Govindarajan, V. (1993), in addition to the volume that drives cost, structural choices and executional skills are important in assessing and answering what causes or drives cost. Strategic cost management assumes two forms in aligning the firm's cost structure with its strategy. One is structural cost management conceived from strategic positioning of the firm and the other is executional cost management for operational effectiveness. Thus, giving rise to two kinds of cost drivers – the structural cost driver and the executional cost driver. Structural cost drivers are concerned with the economics of structure, technology choices, scale and scope economies, and executional cost drivers are concerned with continuous improvement in areas of quality and productivity. Structural cost drivers are always considered in the context of strategic choices about economic structure of the firm that drives costs. In contrast, the executional cost drivers are not related to alternate choices. For each executional cost driver 'more is always better'. Improved quality, better capacity utilization, more workforce productivity, etc. are always preferred (Anderson, S.W., 2006; Banker, R.D. and Johnston, H.H., 2006; Shank, J.K., 1989). Besides cost driver, strategic cost management rely on notion of value chain in assessing and answering what causes or drives cost (Shank, J.K., 1989). The value chain is the linked set of end-to-end value creating activities from sourcing of raw material to delivering finished product to the end user. Value chain, introduced by Porter, M.E. (1985), is the firms' sequence of primary business activities concerning product design and development, operations, and logistics. In case of typical manufacturing organisations, value chain includes designing, marketing, delivering, and

supporting its products in that order. Porter's value chain also includes support activities such as firm infrastructure, human resource management, technology development, and procurement. The value chain for fundamental manufacturing business as a sequence of production, distribution, and then consumption is quite different from service organisation. Service organisations follow another sequence wherein distribution occurs first followed by simultaneous production and consumption of services (Segal-Horn, S., 2003).

Cost drivers of telecommunications services firm

The strategic cost analysis as a process involves defining value chain of value-creating activities with associated assets and costs, and then identifying cost drivers that drives each of these value-creating activities, and finally identifying the different course of actions in achieving competitive advantage either by controlling cost driver or redefining the value chain (Banker, R.D. and Johnston, H.H., 2006). The value adding, and cost driving, elements of telecom service providers can be categorized in few broad categories. Gruber, H. (2005) identified four such costs categories viz. Network Operations Costs, Customer Acquisition Costs, Investment Costs, and License fees. At a higher layer these can further be grouped in two broad categories capital expenditure (CAPEX) which includes investment costs and license fees, and operational expenditure (OPEX) constituting network operations costs and customer acquisition costs. Bharti Airtel Limited with its one of the major objective as a cost efficiency prominently mentioned OPEX and CAPEX productivity ratios in its annual report for 2014-15. According to Rokkas, T., et. al. (2009), the OPEX costs for an integrated operator can be divided in to five general categories. The first is related to expenditure on network elements comprising operation and maintenance of the network, network operation support, software licences, rental for space and hired network resources, and electricity. The second is about marketing and sales expenditure on customer acquisition and subsidisation. The next category is associated to customer service incorporating costs incurred for customer care and billing, etc. The fourth is regarding management and development of services including IT support. The last category includes interconnection and roaming costs. Idea Cellular Limited in its annual report for 2014-15 organizes the total operating expenses in seven major heads such as Network Expenses and IT Outsourcing Cost, Roaming and Access Charges, License Fees and Spectrum Usage Charges, Subscriber Acquisition and Servicing Expenditure, Personnel Expenditure, Advertisement and Business Promotion Expenditure, and Other Expenses. The total cost of telecommunication service as described in Cost Accounting Records (Telecommunication Industry) Rules 2011 consists of direct costs (such as employee cost, sales and marketing cost, administration cost, etc.), network element operating cost and support function or department cost. Network element operating cost is further divided into network direct cost and support function cost. For the analysis of costs, this study refers value chain for service organisations introduced by Segal-Horn, S. (2003) as a sequence of distribution followed by simultaneous production and consumption of services. Value chain is predominantly concerned with the business process from

inputs to customers, and the activities underlying business model to which assets and costs can be mapped (McGee, J. 2015a). The first activity of 'distribution' can broadly be mapped with the first cost driver as 'Marketing, Sales and Distribution Costs (MAREX)'. The subsequent activities of production and consumption are characterised by the next two broad categories of cost drivers i.e. CAPEX and OPEX. The CAPEX is the 'Capital expenditure towards deploying the network infrastructure' while OPEX is 'Operating expenditure towards operations and maintenance of the network infrastructure'. Slater, M., 2003 explained two costs, one is costs incurred in using market for performing a particular activity or transaction and the other is cost incurred in using authority when the activity is performed in-house. Accordingly, the fourth cost driver as 'Employee Cost (EMPEX)' can be mapped on entire value chain as human resources are required for operating and organising the complete business process from inputs to customers. Thus, the cost drivers of telecommunications services firm can be categorized as,

- i) Operating expenditure towards operations and maintenance of the network infrastructure (OPEX)
- ii) Marketing, Sales and Distribution Costs (MAREX)
- iii) Employee Cost (EMPEX) and
- iv) Capital expenditure towards network infrastructure (CAPEX)

Factors affecting cost drivers of telecommunications services firm

The transformation in many of the services industries led by macro-environmental factors and technology advances have impacted range of services on offer, including the way services are delivered (Segal-Horn, S., 2003). The key in analyzing a firm's strategic environment is to identify the factors affecting the profitability of the firm that are affected by the firm's immediate environment (Pitkethly, R., 2003). The immediate environment, that telecommunication services firms are facing, in telecommunications industry in India is characterised by increasing competition, increasing customers' expectations, and technology advances. Indian telecommunications industry is highly competitive with telecommunications companies competing for market share and profitability. Telecommunications companies are striving for economic efficiency to remain competitive. Technology advances helped reduce capital expenditure per customer. Customers are benefitting from introduction of new service in addition to falling tariffs on continued basis. These variables concerning market condition, viz. competition, increased customer expectations, and advances in technology influences the cost categories or cost drivers of telecommunication services firm. Albeit, transformation in service industries made many of them concentrated, capital-intensive, and international, service firms on the other hand are defined in terms of characteristics of services. In service industries, output is an intangible 'experience' which can be shared unlike a physical product that can be demonstrated. In service firms, major activity occurs while the customer is present, and major proportion of resources is allotted at the interface between the firm and its customers, while in manufacturing organisations major activity occurs away from the customers. Services are different from products and make a difference to the

strategists of the service firms (Segal-Horn, S., 2003). Services are different from products in terms of characteristics of services viz. intangibility, inseparability, heterogeneity, and perishability. The first characteristic, intangibility, implies to lack of physical evidence. Instead of physical product to demonstrate, services have only intangible experience to share. This makes services difficult to describe or communicate as a product, define their quality, and measure value addition to the consumer. The second characteristic, inseparability, refers to simultaneous production and use of services. Unlike product making firms, that can carry inventory of finished or semi-finished products, services are consumed instantly as and when produced. The next characteristic, heterogeneity, refers to different perceptions about the same service by different customers. Quality of service experience perceived by customers is dependent on interaction of individual customer with service personnel in addition to customers' expectations about the service. The last characteristic, perishability, refers to production and delivery of services while customer is present. Services cannot be stored or returned due to perishability aspect of services. These four major service characteristics also affect cost drivers of telecommunication services firm.

RESEARCH METHODOLOGY

This study aims to analyse the element of cost, or cost drivers, of telecommunications services firm. A grounded theory research comprising literature review, interviews and survey questionnaire is used to identify potential concepts and variables. Literature in the area of cost management in general, and telecom cost management in particular is reviewed. The few semi-structured interviews with key telecom professionals are also conducted. Four cost drivers in telecommunications service provisioning are identified as executional cost drivers. The first is operating expenditure towards operations and maintenance of the network infrastructure and facilities (OPEX). The second is expenditure towards customer acquisition activities including marketing, sales and distribution (MAREX). The next is expenditure on employee (EMPEX). And the last is capital expenditure incurred in acquiring network infrastructure and facilities (CAPEX). The variables that have impact on these executional cost drivers are identified. The variables considered include four major service characteristics that are intangibility, inseparability, heterogeneity, and perishability. In addition, variables concerning market condition, termed as service drivers, viz. competition, increased customer expectations, and technology advances are also considered. A survey questionnaire to access the impact of identified variables on identified cost drivers is developed and administered. The population considered is telecom professionals working in executive capacity at BSNL. Total 196 telecom professionals from lower, middle and higher management responded to the questionnaire. A response on five point Likert scale regarding impact of each of the above identified variable (e.g. intangibility, perishability, competition, etc.) on each of cost driver (viz. OPEX, MAREX, EMPEX, CAPEX) is collected. Responses to questionnaire are analysed using factor analysis. The analysis resulted in five factors, identified as structural cost drivers, viz. service drivers,

service types, service positioning, customer service, and service capacity. The structural cost drivers are then analyzed using structural equation modelling.

DATA CHARACTERISTICS

A survey questionnaire to access the impact of each of the above identified variable (e.g. intangibility, perishability, competition, etc.) on each of cost driver (e.g. OPEX, EMPEX, CAPEX, etc.) is developed and administered. For example, a question statement that measures impact of intangibility on OPEX is framed as 'Intangibility aspect of services increases the operating expenditure (OPEX)'. A response to such questions on five point Likert scale (strongly disagree, disagree, neutral, agree, and strongly agree) is collected. The 29 responses received online, and 167 responses collected through personal visits are combined. There were 15 responses of missing values in at least one of the questions and the same were removed from the database leaving 181 cases for analysis. There are 70 responses from operations/lower level management, while 97 and 14 are from middle and senior level management respectively. The functional area representation is of 6 number of responses from marketing including sales and distribution, 133 from operations, 25 from human resources, and 17 responses from finance. Majority of respondents are having work experience of 11 to 20 years (85 Nos.) followed by 21 to 30 years (40 Nos.) and 3 to 10 years (33 Nos.). Very few are from less than 3 years (8 Nos.) and more than 30 years (15 Nos.) of experience.

IDENTIFICATION OF STRUCTURAL COST DRIVERS

The variable wise responses on five point Likert scale are analyzed using exploratory factor analysis (EFA) in R. Initially, there were 28 variables that measures impact of four service characteristics – (viz. intangibility, inseparability, perishability, and heterogeneity) and three service drivers (viz. competition, customer expectations, and technology advances) on each of the four executional cost drivers viz. OPEX, MAREX, EMPEX and CAPEX. However, impact of advances in technology on any of the executional cost drivers did not reflect in factors loadings ≥ 0.45 for any of the latent variable and hence is excluded from further analysis. For final analysis, there are total of 24 observed variables that measures impact of four service characteristics – (viz. intangibility, inseparability, perishability and heterogeneity) and two service drivers (viz. competition and customer expectations) on each of the four executional cost drivers viz. OPEX, MAREX, EMPEX and CAPEX. The analysis yielded a five-factor solution for factor loadings ≥ 0.45 , $p = 1.09e-21$, and chi-square statistic is 402.62 on 166 degrees of freedom. The five factors are service drivers (ServDrv), service design (ServDsgn), service positioning (ServPostng), customer service (CustServ), and service capacity (ServCpcty). The first factor, i.e. 'service drivers (ServDrv)' representing the extend of competition and customer expectations, has loadings from all four cost elements (OPEX, MAREX, EMPEX and CAPEX) that are reported to increase due to increased competition and customer expectations in the market. The second factor, i.e. 'service design (ServDsgn)', comprises loadings from

increase in OPEX, and CAPEX as a result of both intangibility and inseparability characteristics of services. Increase in MAREX due to intangible nature of services also loads the factor of ServDsgn. There are 4 items that loads the third factor, 'service positioning (ServPostng)'. All the cost elements viz. OPEX, MAREX, EMPEX and CAPEX that increases as a result of heterogeneity of services load this factor. The fourth factor is termed as 'customer service (CustServ)'. The elements that load this factor are increase in EMPEX with both intangibility and inseparability characteristics of telecom services. In addition, increase in MAREX due to inseparability loads this factor. The fifth factor represents 'service capacity (ServCpcty)' as one of the structural cost driver with the loading on increase in three cost drivers viz. OPEX, MAREX, and CAPEX due to perishability aspect of telecom services. Increase in EMPEX due to perishability did not reflect in factors loadings ≥ 0.45 for any of the latent variable and hence is excluded from further analysis.

Structural model

Structural cost drivers are always considered in the context of strategic choices about economic structure of the firm that drives costs (Shank, J.K., 1989) and, thus, contribute to design of business model and strategy. The five identified structural cost drivers, viz, service drivers (ServDrv), service design (ServDsgn), service positioning (ServPostng), customer service (CustServ), and service capacity (ServCpcty), can be leveraged as value drivers or

drivers of competitive behaviour in design of business and competitive strategy. Value drivers, such as service design, service scope, degree of customisation, and brand, etc., according to Hoopes, D.G., Madsen, T.L. and Walker, G., (2003) influences the buyer value. Daellenbach, U. (2015) proposes three levels of drivers of competitive behaviour the firm needs to consider for analysis. The first is at corporation as a whole, second is at business level, and the third is at function level such as marketing, operations, finance, etc. The interrelations among these identified structural cost drivers, i.e. latent variables, are explored and analyzed using structural equation modelling (SEM) using 'lavaan' package in R. In spite of implausible fit of overall model (Chi-square/degrees of freedom = 2.38; Comparative fit index - CFI = 0.780; Root mean square Error or approximation, RMSEA = 0.087; Standardized root mean Square residual, SRMR = 0.075), there are important relationships that can be observed through the results of SEM. A statistically significant association for $p < 0.05$ of ServDrv with two of the other structural drivers is observed. The first is with ServDsgn ($p=0.018$) while second is with ServPostng ($p=0.000$). Again a significant affect of both ServDsgn ($p=0.000$) and ServPostng ($p=0.034$) on CustServ is observed. A significant association is also observed between ServDsgn and ServCpcty ($p=0.001$). The model displaying these interrelations that are statistically significant, for $p < 0.05$, is shown in figure 1 below followed by model testing results.

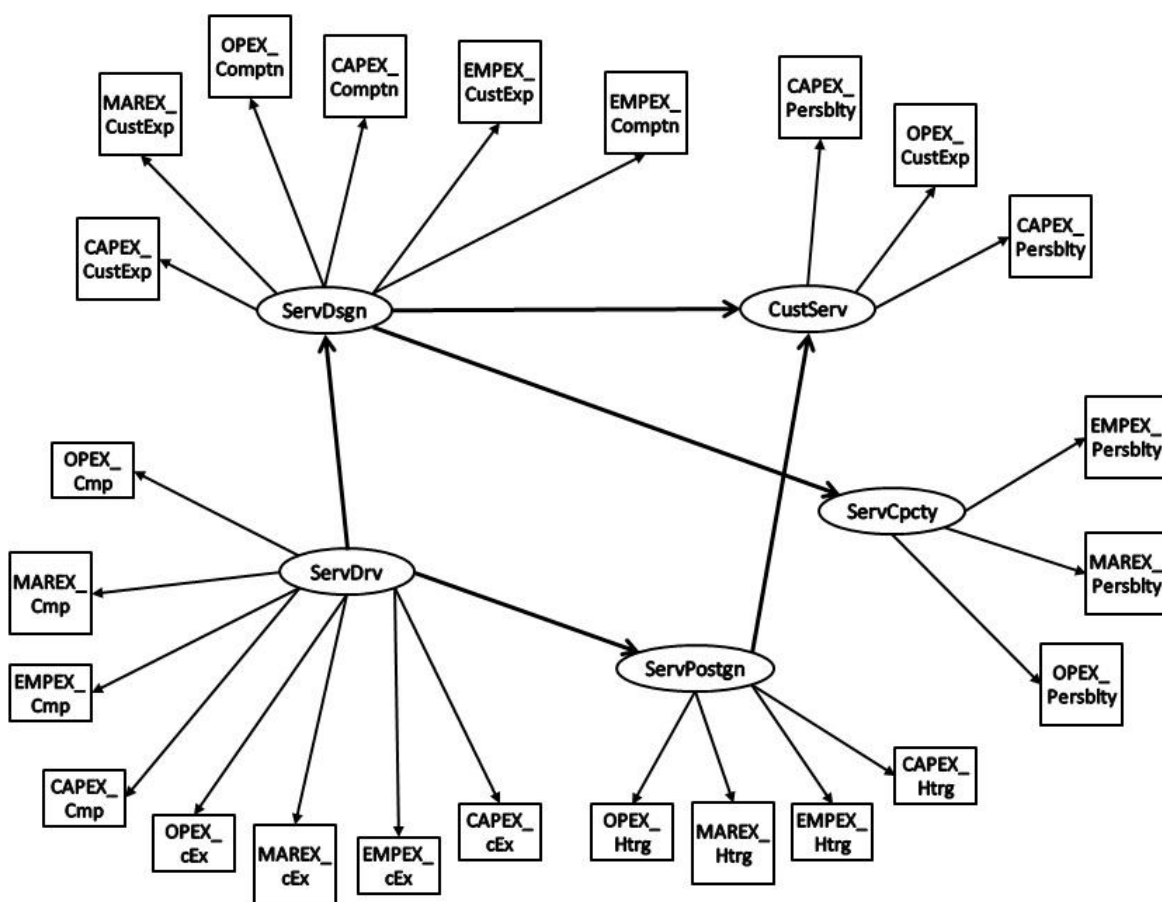


Figure 1 : Structural Model

Figure 1: Structural model of interrelations among structural cost drivers

ServDrv = service drivers, ServDsgn = service design, ServPostng = service positioning, CustServ = customer service, and ServCpcty = service capacity

OPEX = operating expenditure, MAREX = marketing costs, EMPEX = employee cost, and CAPEX = capital expenditure

Intg = intangibility, Insp = inseparability, Htrg = heterogeneity, Prsh = perishability, Cmp = competition, and cEx = customer expectations.

OPEX_Intg = Increase in OPEX due to intangibility. Similar convention is followed for all variables e.g. MAREX_Insp, EMPEX_Htrg, and CAPEX_Prsh denotes increase in MAREX due to inseparability, increase in EMPEX due to heterogeneity and increase in CAPEX due to perishability respectively.

OBSERVATIONS AND FINDINGS

Johnston, R. (2015) highlights critical issues for service firms to deliberate while developing a strategic plan. These includes the development of objectives rooted in drivers of strategy at corporate level; understanding of the market, the environment, the size and the nature of competition; identification of the potential target market; and assessment of the perceived needs and the expectations of target customers. The first factor, or structural cost driver in this study, identified as 'service drivers' (ServDrv) embodies these concerns. ServDrv, construed from the extend of competition and customer expectations, has loadings from all four cost elements (OPEX, MAREX, EMPEX and CAPEX) that are reported to increase due to increased competition and increased customer expectations in the market. ServDrv influences the service concept and focus adopted by a service firm. The service concept and degree of focus is the another critical area identified by Johnston, R. (2015) in designing service strategy. A service concept identifies type of the service that firm wishes to provide, and the nature of business to create and provide value to the customers; while focus identifies with how firm differentiates its service offerings than that from competitors. The service concept and the focus dimensions together determine the range of services and the scope of identified market (Johnston, R. 2015). The two latent variables viz. ServDsgn and ServPostng are concerned with the service concept and focus respectively. The influence of ServDrv is clearly visible with a statistically significant association of ServDrv with the two structural cost drivers, viz. ServDsgn ($p=0.018$), and ServPostng ($p=0.000$). This influence of ServDrv on ServDsgn and ServPostng also represents the influence of market and competitive analysis on design of the organisation and development of the value proposition. In the long-term, the cost structure of the firm to a large extend is determined by the decisions concerning these two areas of organisation design and value proposition (Anderson, S.W., 2006). The next critical areas for a service firm, according to Johnston, R. (2015), are about identifying performance objectives in managing resources and activities, and differentiating service offerings, in addition to decisions involving service package, its environment and delivery processes. ServDrv influencing ServDsgn and ServPostng which in turn affecting CustServ and ServCpcty is also observed. 'Service capacity' (ServCpcty), the latent variable identified as one of the structural cost driver, has loading from 3 items, and addresses perishability aspect of the telecommunications services. Unlike product making firms, that can carry inventory of finished or semi-finished products, services are consumed instantly as and when produced. In the absence of concept of stock or inventory, the unsold capacity is lost in services business, and as a result utilization of capacity is crucial for service firms

(Segal-Horn, S., 2003). These concerns are visible with the loading on increase in OPEX, MAREX, and CAPEX due to perishability of telecom services. Increase in EMPEX due to perishability did not reflect in factors loadings ≥ 0.45 , for any of the latent variable. Capacity decisions impact costs and profitability. Strategic issue addressing perishability is about service firms designing their operations and processes for optimal capacity utilization (Segal-Horn, S., 2003). There are basic compromises between creating additional capacity to better serve customers and increasing costs (Weitz, B.A. and Wensley, R. eds., 2002). These strategic concerns are clearly visible with ServDsgn significantly affecting ServCpcty ($p=0.001$). It is also critical that an organisation structure bring about effective coordination among firms' internal operations and processes. In addition, the firm's structural arrangements are linked to the environment in which it operates (Miller S., 2011). Thus, an indirect association can also be noticed between ServDrv and ServCpcty through ServDsgn. 'Service Design' (ServDsgn), the next structural cost driver, is concerned with design of service offering including service processes with the long-term commitment of resources. The two most widely recognised characteristics of a service are intangibility and inseparability (Segal-Horn, S., 2003) and the same is reflected in loadings on ServDsgn from increase in OPEX, and CAPEX as a result of both intangibility and inseparability characteristics of services. In service industries output is an intangible experience that may be produced, transferred and consumed at the same time (Segal-Horn, S., 2003) causing problem of coordinating marketing and operations to most of the firms (Weitz, B.A. and Wensley, R. eds., 2002). Increase in MAREX due to intangible nature of services also loads this factor. The service design is blueprint/ flowchart of the service processes that describes all the process activities involved, the sequence in which these activities are performed, and coordination among the elements of processes and activities (Lewis, B. R., 2015), and accordingly ServDsgn significantly affecting CustServ ($p=0.000$) and ServCpcty ($p=0.001$) is also observed. Service design, in addition to developing a 'service product', is related the elements of marketing mix (Lewis, B. R., 2015). Competitive advantage may be attained and improved through two major approaches. The first focuses upon threats and opportunities that are presented by the macro-economic environment, in which the firm operates, and this lies at the heart of Michel Porters' 'positioning' approach in determining different value propositions. The second approach, the resource-based view (RBV), is about leveraging firm's capabilities and internal resources to attain and improve the competitive advantage (O'Regan, Philip, 2016). However, insignificant association is observed between ServDsgn and ServPostng ($p = 0.112$). 'Service Positioning' (ServPostng), the next latent

variable identified as structural cost driver, is concerned with positioning of service offering in the market place. A positioning approach to strategy is concerned with achieving sustained competitive advantage by leveraging firm's internal strengths to ensure the fit to the external environment in which firm operates (Miller S., 2011). The ServDrv with loadings from increased competition and customer expectations significantly influencing the structural cost driver of ServPostng ($p=0.000$) is observed. There are 4 items that loads ServPostng. All the cost elements viz. OPEX, MAREX, EMPEX and CAPEX that increases as a result of heterogeneity of services load this structural cost driver. Managing the corporate brand and making core service relevant and valuable is crucial especially for companies that have had a background of technical legacy and now facing a new commercial environment which is becoming more and more market-oriented or customer-oriented (Young, L. and Burgess, B. eds., 2010). This is visible from loading of ServPostng with increase in OPEX, MAREX, EMPEX and CAPEX due to heterogeneity. Service encounters are heterogeneous in a sense that quality of the service delivered, to a certain extent, depends on the personality of individual involved in delivering the service. Thus, making it difficult to guarantee or standardize the services in all kinds of service businesses, whether a capital-intensive, a labour-intensive, or both (Segal-Horn, S., 2003). ServPostng significantly affecting CustServ ($p=0.034$) is also observed. For strategies in service industries, the critical element in strategy implementation is about the control of the service offerings at the point of transaction with the client. The service characteristic of heterogeneity occurs at this point of service encounter and makes its impact (Segal-Horn, S., 2003). Quality of service experience perceived by customers is dependent on interaction of individual customer with service personnel in addition to customers' expectations about the service, thus, standardising and guarantying service experience is difficult (Segal-Horn, S., 2003). This can be traced to the next factor termed as 'customer service (CustServ)'. The elements that load this structural cost driver are increase in EMPEX with both intangibility and inseparability characteristics of telecom services. In addition, increase in MAREX due to inseparability loads this factor. Services are intangible and hence significant amount of resources are being consumed in order to tangibilize the service offerings by improving service delivery through personal service in an environment intended to project the brand value (Miller S., 2011). Service brand is an important way of guaranteeing the standards of service delivery and thus representing reduced risk that arises out of inseparability i.e. simultaneity of production and consumption of service. In the absence of 'test drive' or 'samples' in many services, buying a service involves a higher risk than buying a product that can be tested before buying or can even be returned or exchanged if dissatisfied. In case of services, once availed, it is difficult to return a service on dissatisfaction. Service strategies, which are based on quality of analysis that goes into designing the strategy, for the most part are dependent on its implementation by frontline staff directly dealing with the customer (Segal-Horn, S., 2003). A significant affect of both ServDsgn ($p=0.000$) and ServPostng ($p=0.034$) on the fourth factor,

CustServ, is also observed. A very intangible nature of services of being an 'experience' or 'outcome' results in a specific individual relationship of the customer with the service provider which, the strategy of service provider should encompass (Segal-Horn, S., 2003) while designing and positioning the service offerings, thus, signifying this influence of both ServDsgn and ServPostng on CustServ. Thus, establishing indirect relationship of ServDsgn with ServPostng ($p = 0.112$). Together, these three drivers, viz. ServDsgn, ServPostng, and CustServ, indicate the importance of word-of-mouth recommendations in selling of services. In sum, firms adopt a variety of strategies resulting in some creating better value than others to any particular set of market conditions, ServDrv in this study. The 'value' here means anything tangible e.g. scale/scope economies or intangible e.g. brand value, which could be attributed to a particular strategic action e.g. incurring CAPEX to achieve scale/scope economies or leveraging MAREX to promote brand image, respectively. Those best suited would lead the firm to perform better and grow. The value chain of service organisations follows a sequence wherein distribution occurs first followed by simultaneous production and consumption of services (Segal-Horn, S., 2003). A distribution capability, which implies marketing, sales and distribution taken together, is about creating competitive heterogeneity, ServPostng in this study. Competitive heterogeneity is at the source of performance differences among firms competing with relatively similar resource configurations (Hoopes, D.G., Madsen, T.L. and Walker, G., 2003). And thus, heterogeneity, being an inherent characteristic of services, can be leveraged to ensure better returns, and requires firm to incur CAPEX, OPEX, MAREX and EMPEX in achieving the ServPostng consistent with the overall strategy of the firm. The next stage in the value chain of service firms is simultaneous production and consumption of services. The two most widely recognised characteristics of a service are intangibility and inseparability (Segal-Horn, S., 2003) and the same can be leveraged in both the areas of ServDsgn and CustServ. Resources being input in producing a service, competitive strategy originate with resources (Daellenbach, U., 2015). Additionally, significant amount of resources are also consumed in order to tangibilize the service offerings by improving service delivery through personal service in an environment intended to project the brand value (Miller S., 2011). This resource consumption manifests in increased OPEX and CAPEX in tangibilizing the service offering i.e. ServDsgn, and increased EMPEX in improving service delivery i.e. CustServ, while increased MAREX is required to be incurred in projecting intended brand value. Perishability, being another inherent characteristic, adds to CAPEX in designing optimum capacity, and adds to OPEX and MAREX for this capacity to be fully utilized. However, what it takes to succeed currently might change in the future with the change in ServDrv. In order to cope with, firm need to deploy dynamic capabilities that facilitate developing sources of competitive advantage, each time it faces the changed environment (Boulton, J.G., Allen, P.M. and Bowman, C., 2015), through a strategic intervention for novel reconfiguration of 'economic logic'. 'Economic logic' is about how the firm creates value (Miller S., 2011), for example, by exploiting scale economies to achieve lowest

possible cost or by commanding premium prices for differentiated services. The value, that is tangible, can be achieved by reconfiguration of ServDsgn and CustServ by leveraging intangibility and inseparability characteristics of services, while the intangible value can be achieved by reconfiguration in ServPostgn together with CustServ by leveraging heterogeneity and inseparability characteristics of services. Thus, service characteristics can be leveraged for this dynamic and continuous strategic intervention in the structural cost drivers, value drivers, or drivers of competition behaviour in response to change in external environment.

CONCLUSION

There are continual developments in technology advances, competition, and customer preferences over the last two decades, in Indian telecommunications industry. Each of these factors has its own impact on telecommunications service firms in India, impacting the business model the firm takes up and service market strategy it adopts. Historically, cost advantage has been the primary for competitive advantage. The understanding of cost behaviour requires understanding the complex interplay of the set of cost drivers at work in any given situation. The aim of this study has been to explore different issues relevant in assessing and answering what drives cost of telecommunications services firm. Drawing from strategic cost management literature two kinds of cost drivers, the structural cost driver and the executional cost driver are identified. Four cost drivers of telecommunications services firms are identified, as executional cost drivers, viz. operating expenditure (OPEX), marketing, sales and distribution costs (MAREX), employee cost (EMPEX), and capital expenditure (CAPEX). The impact of service characteristics, viz. intangibility, inseparability, heterogeneity, and perishability, on cost drivers of telecom firms operating in an environment of increasing competition and customer expectations is assessed using factor analysis in R. Five latent variables, termed as structural cost drivers, viz. 'service drivers (ServDrv)', 'service design (ServDsgn)', 'service positioning (ServPostgn)', 'customer service (CustServ)', and 'service capacity (ServCpcty)', are identified. Finally, interrelation among identified structural cost drivers of telecommunications services firm is assessed using structural equation modelling. A statistically significant association of ServDrv with ServDsgn (or service processes, in other words) and ServPostgn is observed, symbolizing impact of increasing competition, and customer preferences in telecommunications industry. Again a significant affect of both ServDsgn and ServPostgn on CustServ is observed, signifying importance of service processes and positioning on customer satisfaction. A significant association is also observed between ServDsgn and ServCpcty, suggesting efficient service processes as a prerequisite for capacity utilization.

REFERENCES

- [1] Anderson, S. W. (2006). Managing costs and cost structure throughout the value chain: research on strategic cost management. *Handbooks of Management Accounting Research*, 2, 481-506.
- [2] Annual Report 2014-15, Bharti Airtel Ltd.
- [3] Annual Report 2014-15, BSNL.
- [4] Annual Report 2014-15, Ideal Cellular Ltd.
- [5] Atkinson, A.A., Balakrishnan, R., Booth, P. and Cote, J.M., (1997). New directions in management accounting research. *Journal of management accounting research*, 9, p.79-108.
- [6] Banker, R. D., & Johnston, H. H. (2006). Cost and profit driver research. *Handbooks of Management Accounting Research*, 2, 531-556.
- [7] Barkus, E., Yavorsky, C., & Foster, J. (2006). *Understanding and Using Advanced Statistics*. Sage Publications.
- [8] Blocher, E. J., Stout, D. E., & Cokins, G. (2010). *Cost management: A strategic emphasis*. Includes index. McGraw-Hill/Irwin, 5th edition.
- [9] Casadesus-Masanell, R., & Ricart, J. E. (2010). From strategy to business models and onto tactics. *Long range planning*, 43(2-3), 195-215.
- [10] Chea, A. C. (2011). Activity-based costing system in the service sector: A strategic approach for enhancing managerial decision making and competitiveness. *International Journal of Business and Management*, 6(11), 3-10.
- [11] Cokins, G., & Căpușeanu, S. (2010). Cost drivers. Evolution and benefits. *Theoretical and Applied Economics*, 8(8), 7.
- [12] Colin, D. (2001). *Management Accounting for Business Decisions*. Thompson Learning, 2nd edition, London.
- [13] *Cost Accounting Records (Telecommunication Industry) Rules*, 2011.
- [14] Ittner, C. D., Larcker, D. F., & Randall, T. (2003). Performance implications of strategic performance measurement in financial services firms. *Accounting, organizations and society*, 28(7-8), 715-741.
- [15] Labro, E. (2006). 10 Analytics of costing system design. *Contemporary issues in management accounting*, 217.
- [16] Faulkner, D. O., & Campbell, A. (Eds.). (2006). *The Oxford handbook of strategy: A strategy overview and competitive strategy*. Oxford University Press.
- [17] Avlonitis, G. J., & Indounas, K. A. (2005). Pricing objectives and pricing methods in the services sector. *Journal of services marketing*, 19(1), 47-57.
- [18] Govindarajan, V., & Govindarajan, S. (1993). *Strategic cost management: The new tool for competitive advantage*. Simon and Schuster.
- [19] Grant, R.M. (2008). *Contemporary Strategy Analysis*, 6th Edition, Blackwell Publishing Limited, pp. 223-239.
- [20] Gruber, H. (2005). *The economics of mobile telecommunications*. Cambridge University Press.
- [21] Coombs, H., Jenkins, E., & Hobbs, D. (2005). *Management accounting: principles and applications*. Sage.
- [22] Johnston, R. 2015. Service Strategy. *Wiley Encyclopedia of Management*. 10:1-3.

- [23] Johnston, R. (2015). Service Strategy. In Wiley Encyclopedia of Management (eds C. L. Cooper, S. Roden, M. Lewis and N. Slack).
- [24] McGee, J. (2015a). Business Model. In Wiley Encyclopedia of Management (eds C. L. Cooper, J. McGee and T. Sammut-Bonnici).
- [25] McGee, J. (2015b). Cost Strategies. In Wiley Encyclopedia of Management (eds C. L. Cooper, J. McGee and T. Sammut-Bonnici).
- [26] Lewis, B. R. (2015). Service Design. In Wiley Encyclopedia of Management (eds C. L. Cooper, N. Lee and A. M. Farrell)
- [27] Kajüter, P., & Kulmala, H. I. (2005). Open-book accounting in networks: Potential achievements and reasons for failures. *Management Accounting Research*, 16(2), 179-204.
- [28] (2003). Campbell, A., & Faulkner, D. (Eds.), *The Oxford Handbook of Strategy: A Strategy Overview and Competitive Strategy*. : Oxford University Press,
- [29] Kaplan, R. S., & Norton, D. P. (2001). Transforming the balanced scorecard from performance measurement to strategic management: Part I. *Accounting horizons*, 15(1), 87-104.