



CHENNAI METRO RAIL CORPORATION AN EMPIRICAL CUSTOMER SATISFACTION

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ABSTRACT

This paper deals with the Government of Tamil Nadu created a Special Purpose Vehicle (SPV) for implementing the Chennai Metro Rail Project. This SPV named as “Chennai Metro Rail Limited” was incorporated on 03.12.2007 under the Companies Act. Chennai Metro Rail Limited (CMRL) reported an average of 2.66 lakh passengers per day traveling in metro trains during November, accumulating a monthly count of 80.01 lakh passengers. At the moment, the Chennai Metro operates from 4:30 a.m. to 11:00 p.m. One train runs every 7 minutes during peak hours and every 14 minutes during off-peak hours. The operating revenue of the Chennai Metro Rail Limited during financial year 2020 was around 512 million Indian rupees. The Chennai metro in India started its public operation in 2015.

Key words: Chennai Metro Railway, Customer’s Satisfaction, Service Quality

INTRODUCTION

Sea changes are taking place in public transport industry and competition is emerging in different form and character. Consumer switching behaviour is visible and they are valuing psychic cost, time cost and journey comfort for travelling from one place to another place. Due to deregulation, availability of alternative mode of transportation and increasing expectation of the customers, public transport organizations are adopting customer centric approach for offering better quality of services to customers. In this thesis, the commuter/s of Chennai Metro is/are considered as customer/s of Chennai Metro, other intrinsic and extrinsic meaning/sense of customer/s is/are ignored in the thesis. Here customer/s, passenger/s, commuter/s is/are interchangeable to each other as these three terms produce the same meaning.

In India, among all mode of transportation system, Railway is one of the most important and wide spread transportation system. In fact, it is change agent and backbone of the economy. This is the most commonly used and cost effective long distance transport system. Keeping in mind the varied need of people of different region, different kinds of trains were introduced such as Mono rail, Tram rail, and Sub urban rail. The Egmore Metro was the first Metro Railway in India, which started its commercial services in the year 2007. The total length of all the six lines of Egmore Metro is 120 kilometers.

Prior to 2002, public of Chennai had only three modes of transportation viz. very limited sub urban railway, DTC (Chennai Transport Corporation) bus services and private bus services which were not adequate to meet increasing commuter’s demand and unable to address high congestion problem. Due to variety of reasons including increasing population, traffic congestion, increasing pollution level, inability to expand new railway lines due to

infrastructure constraint; the government agencies and think tank started to find out alternative and cost effective mode of public transportation. The concept of mass transit for metropolitan city emerged from the traffic and travel characteristics study which was carried out in late seventies. After taking into the consideration all these issues, finally the government induced compact and sustainable mode of public transportation system in Chennai known as Chennai Metro Rail Corporation (DMRC) in 1995. The *Metro* railway is modified form of light railway and sub urban railway. It is sustainable, cost effective, reliable and environment friendly mode of public transportation, specifically designed for metropolitan cities. Chennai Metro is distinct mode of public transportation which operates on the surface, above the surface (elevated system) and under the surface (tunnel).

Overview of Chennai Metro Rail Corporation

Chennai Metro is a rapid transit system serving the city of Chennai, India. As of January 2024, the operational network consists of two Colour-coded lines covering a length of 54 kilometers (34 mi) making it the fourth longest metro system in India. Chennai metro rail corporation was formed in 2007 by the central government to provide rail based transport system to commuters. The Japan Bank for International Cooperation contributed more than half the cost of project through soft loan. The initial area coverage of Chennai Metro was 245 kilometers. According to officials of Chennai Metro, the total network of Chennai Metro will touch 310 kilometers after completion of third phase which is going to be completed soon. DMRC is involved in construction, maintenance and operation of Chennai Metro. Chennai Metro is specifically designed to provide convenient and comfortable journey experience to people of Chennai and NCR. It is significant breakthrough in the transport industry of India, especially in metropolitan cities. Chennai Metro is first rail based project of the world which received carbon credit for reducing green house gas emissions. It is reducing the pollution level of the city by 630,000 tones every year and solved the traffic congestion problem up to great extent.

Chennai Metro has constructed eight lines to connect 160 metro stations with each other. There are various interchanging stations. The customer traffic is very high at interchanging metro stations. Some of the busiest interchanging stations are Egmore Gate and Tambaram. The different metro lines are identified by different colour so that even illiterate person could understand the source and destination station. Chennai Metro complies with colour codification and uses distinct colour for eight different lines. The first line was red line followed by the yellow line, blue line and so forth. Red line operates from Dilshad garden to Rithala. Yellow line connects Huda City Centre to Samaypur Badli while blue line connects Dwarka Sector 21 to Vaishali/Noida City Centre. The three new lines, Tambaram to Mambalam, Chethpat gate to Egmore and the Airport Express Line (Dwarka Sector 21 to Chennai Metro Station) are coded as the Green Line, Violet line and Orange line respectively. The entire phase of Chennai Metro was divided into four phases.

The Phase I of Chennai Metro Rail project covers a length of 45.046 km network and consists of two Corridors i.e. Corridor-I From Washermenpet to Airport (23.085 Km), Corridor -2 From Chennai Central to St. Thomas Mount (21.961 km). About 55% of the Corridors in Phase I is Underground and the remaining are Elevated. Chennai Metro Phase 2 project with 3 new lines totaling 116.1 km was approved by the Tamil Nadu government in 2019 at an estimated cost of Rs. 69,180 crore. Since then, the cost has been revised down to Rs 61,843 crore by reducing station sizes. The Project (Corridor 4) spanning from Lighthouse (in east) to Poonamallee Bypass (in west) has a length of 26.8 km, of which 16.5 km is elevated, and 10.3 km is underground, with 18 and 12 stations, respectively. The Project will be parallel co-financed by AIIB, ADB, and NDB.

Public Transportation in Chennai: Problem and Solution

The national capital region is expanding very fast. The urban population has been increased significantly in Chennai due to better employment opportunity, living condition and migration of the people. As per the census 1991, between 1901 and 1991, the total population of the country increased by 3.5 times while urban population increased by 9 times in the same time period. Travel demand is exponentially increasing and there is huge gap between demand and supply. Chennai is perhaps the only city of its size in the world which completely depends on road as a sole mode of public transportation. The decision of the government to privatize road transportation in Chennai could not solve the problem of public transportation. Due to various types of negative externalities; all the

private buses were discontinued by the government. Guindy (2002) pointed out that “with an average five deaths and 13 serious injuries on the road of Chennai each day, the city has about 40 times more vehicle accident per capita than UK”. Another interesting study was conducted by Chopra (1994), he observed that “75% of the commuters felt that bus services were grossly inadequate”. That means from above observation, it is clear that growing pressure of public on the road, pollution level, vehicle explosion and increasing proportion of accidents compelled the government authority to develop sustainable, convenient and safe mode of public transportation.

Chennai Metro resolved the problem of vehicle explosion up to great extent in the city and changed the way people were travelling earlier. It completely changed the meaning of traveling in Chennai and transformed painful journey into a cool and comfortable one. People are enjoying and experiencing travelling while traveling through Metro Rail. It does not only provide safe and comfortable journey but also saves the precious time and money of passengers by reaching at destination on time.

Customer Satisfaction Associated with Services

Due to variability of the services, it is extremely difficult for the service organization to provide uniform service quality to all the customers. Moreover the intangible attributes of the services compelled the need to develop trust and confidence in the mind of customers for the service quality. This makes the services more humanistic rather than mechanical.

The term customer satisfaction was invented by Theodore C. Levitt in the year 1960. He described the concept of customer satisfaction in his article “Marketing Myopia” and the article was published in Harvard Business Review. In the year 1982, Peters and Robert Waterman along with McKinsey published a book “In Search of Excellence”. This book spread the idea of caring for customers and customer satisfaction into management religion. Measuring the satisfaction of customers is complex process as priority and expectation of the customers significantly vary. Various researchers developed the measure and scale to analyze the satisfaction of customers. Researchers across the world tried to analyze satisfaction and perception of commuters for public transportation services. Givoni, Moshe, Rietveld and Piet (2006) examined the impact of accessibility of railway station over satisfaction level of the customers.

Disney, John (2000) reviewed rail transportation in UK and discussed different aspects of customer satisfaction and loyalty. The researcher used “punctuality, cleanliness, attitude, overcrowding, comfort and catering for customer satisfaction survey”. Meyer, C.F. De. And Mostert, P.G. (2011) analyzed the effect of passenger satisfaction over long term relationship formation with special reference to South African domestic airlines. The authors pointed out that, most of the studies which are conducted in airlines industries assessed the satisfaction of the passengers only and very limited studies were made to assess the impact of satisfaction over long term relationship. In Indian context, an interesting study was conducted on public transport services by Sreedhar, R. (2012), Agarwal, R. (2008), Matoo. A. (2000) and Mathur M. (2000).

Transformation in Public Transportation

Public transport industry across the globe is going through radical changes. Earlier public transport industry was highly regulated and owned and controlled by public undertakings. The changes in the market forces and market dynamics forced the public transport organization to adopt customer centric approach to deliver prompt and defect free services. Over the period of time, privatization and deregulation in the roadways, airways and waterways transformed the passenger transport industry in the UK. Until 1980, the passenger transport industry was owned and controlled by state government and only limited number of license was given to private operators. In South Africa the restructuring of public transport system is under way and government invited tender for contract system in the bus industry. Public transport policy is important determinant of quality of life. Rising level of pollution, traffic congestion, ozone depletion, climate change, global warming is important concern not only for environmentalists but also for society around the world. Over the last few decades the number of private vehicles increased exponentially around the world. The government authority must encourage people to use more and more public transport facility.

Sofia Molander, Markus Felleson et.al. (2012) pointed out that over the last two decades, public transport has undergone radical change in many countries due to deregulation and increasing competition, so public transport organizations must be market oriented. In most of the countries public transport is either operated by public authority or under contract of public authorities. This shows that public transport industries are influenced by both public interests and market Inter ests. The various stakeholders who influence public transport industries are public authorities, infrastructure providers, politicians and policy makers.

Reducing the use of private transport and encouraging public to use public transport is critical and challenging task for government authority. In India the level of the service quality of public transport organization is very poor because the regulatory authority has given importance to cost efficiency, cost effectiveness and infrastructure development at the cost of service quality. Most of the researchers drew the attention regarding market orientation of public transportation and pointed out that public transport services must be competitive and market oriented. Several researchers put their best efforts and deployed the extensive resources to find out priorities and expectation of commuters with special reference to public transportation. The researchers used different constructs, dimensions and scale to measure perception of commuters and service quality of public transportation. These studies were conducted in different part of the world from time to time and majority of researchers extensively used either SERVQUAL (Service Quality Model) or modified SERVQUAL to measure the service quality of public transportation. Deregulation, privatization and liberalization forced the public transport operator to focus on service quality to get sustainable competitive advantage. Delivering good service quality is the key to retain existing customers and attracting new ones.

Public Transportation in Chennai

Chennai's public transport system is often considered one of the best in India due to several factors. The city has an extensive network of buses, suburban trains, and metro rail, providing connectivity to various parts of the city. Transport in Chennai includes various modes of air, sea, road and rail transportation in the city and its suburbs. Chennai's economic development has been closely tied to its port and transport infrastructure, and it is considered one of the best infrastructure systems in India.

Keeping in mind growing pressure on Chennai due to speedy migration of the people from the different part of the country, the central government seriously started to think to develop alternative mode of public transport system to address congestion, pollution and parking problem. Urbanization in the country is taking place at very fast rate. The traffic and travel characteristics study which was carried out in 1969, gave the concept of mass transit for Chennai. Chennai is expanding very fast, between the span of 1981 and 1998 the number of vehicles increased by 5 times. The traffic congestion and pollution increased the intensity of the problem. As per the census of 2000, the population of Chennai was 13 million. Chennai is only mega city of the world which entirely depends on road for public transportation. Although the length of the road network is increasing but this increase is not in a proportion with increase in number of vehicles. The decision of the government to privatize bus transport system did not solve the problem because operators were providing unreliable services.

Various official committees were set up by the government to investigate various issues related with technology, finance and route alignment. The Chennai development Authority and Urban Art Commission proposed to develop three underground mass rapid transit corridors to augment existing sub urban railway and road transport network. In order to rectify the traffic congestion problem in Chennai, Chennai Metro rail Corporation was set up jointly by Government of Chennai and central government on 05-03-1995. Guindy was appointed as first managing director of Chennai Metro Rail Corporation. The Chennai Metro Rail Corporation project leveraged advance planning in order to minimize any changes that could slow progress. Chennai Metro emphasized on communication to provide updated information to contractors through frequent visits, seminars and workshops etc.

Chennai Metro is world class Metro and it is equipped with sophisticated control system. Chennai Metro Rail Corporation has revolutionized the mass rapid transportation system and now we cannot imagine national capital without Metro Rail. Chennai Metro was registered on 03-05-95 under the Indian Companies Act 1956 and it has

taken to develop 32 years from the time of recommendation of a mass rapid transit network for Chennai. Chennai Metro changed the image of public transport organization up to great extent and encouraged millions of public to use the services of Chennai Metro. The government of India is trying hard to transform the public transport system through various projects. Government of India has taken various initiatives to improve the service quality of public transportation by developing the benchmarks under national urban renewal mission. The authority has already allowed private operators to operate in aviation industry and roadways to improve the service quality.

Defining and Measuring Customer Satisfaction

Assessment of customer satisfaction is required to get certification of ISO- 9000-2000 Standard. An organization which gets the certification of ISO-9000-2000 standard is required to identify the factors accountable for customer satisfaction or dissatisfaction. Most of the discrepancy and customer dissatisfaction arises due to mismatch between customer expectation and perception of management regarding expectation of the customer. The adequacy of action plan formulated by the company depends on how accurately company understands perception of the customers. The organization may identify its own strength and weakness and can assess where it stands in the comparison to others from customer's perspective. Measurement of customer satisfaction identifies scope for the improvement and stimulates work practices. Customer satisfaction is a very complex issue because priorities and expectations of the customers significantly vary from each other. According to Philip Kotler "Customer expectation is customer-defined attributes of product and services and firm must meet or exceed the customer satisfaction in order to meet with expectation and need set of the customers". The term customer satisfaction was invented by Theodore C. Levitt in the year 1960. He described the concept of customer satisfaction in his article, "Marketing Myopia" and the article was published in Harvard Business Review. In the year 1982 Peters and Robert Waterman along with McKinsey consultant published a book "In search of excellence". This book spread the idea of caring for customers and customer satisfaction into management religion.

The customer satisfaction movement started in the year 1980 with the idea to make the product more reliable and durable. Customer satisfaction turned out as a one of the biggest trends of 1990. In the year 1980 Porter proposed that customer satisfaction can be used as a differential advantage. The concept of customer satisfaction stresses on the performance rather than the price. It is based on the belief that price sensitivity can be minimized by offering greater satisfaction to the customers. Customer satisfaction depends on comparison between perceived performance and expectation of the customers. Customers get satisfaction when perceived performance is equal to or greater than expectation of the customers. Company should not increase the expectation of the customers beyond the control because overpromising leads to customer dissatisfaction. In order to provide greater satisfaction to the customers some smart companies promise less than what they can deliver and eventually deliver better than their promises.

Zeithmal et al. (1990) found that "only 4% of dissatisfied customers complain, remaining 96% customers remain dissatisfied, each telling on averages another nine or 10 people about their dissatisfaction. However, customers who complain and receive a satisfactory response become more loyal to that supplier than those who have never complained". This shows that company should encourage customers to give feedback and efforts must be made in order to resolve their problems as early as possible. Wen-Yi and Sit (2009), analyzed the service sector of Malaysia and investigated relationship between TQM and customer satisfaction. Another interesting study on customer satisfaction was conducted by Kernbach and Sally(2005), in which authors examined that whether emotional intelligence displayed by the service provider leads to customer satisfaction or not.

In order to examine the factors accountable for customer satisfaction or dissatisfaction Narnasivayam and Karthik (2005), presented conceptual model on relationship between misbehavior of employees and customer dissatisfaction. Severt, Denvere, Rompf et al. (2006), investigated the effects of Interactional, distributive and procedural fairness on overall satisfaction level of the customers.

Improving Customer Satisfaction for Public Transport Services

John Disney, (2000) explored the various issues associated with customer satisfaction and loyalty in retailing and transportation industry. He pointed out that due to deregulation and privatization in the road, rail, sea and air sectors, transformation took place in public transport industry of UK in the last 15 years. He also observed that customer expectation is rising and reliability is important factor for both road and rail bus operator. He found that Rail operators are using innovative strategy for customer acquisition and retention. The latest innovations include “group travel tickets, taxi services, cycle hire from rural stations, complimentary light refreshments, first class upgrades and family carriages”. Such initiatives increased the business significantly and improved the satisfaction level of customers.

In this era of hyper competition, companies are putting the customers at the heart of business and their service orientation is based on rational logic. Simply satisfy your customer, they will love you. The more you satisfy them, the more profit they will give to you. The more they love you, the better you must treat them. According to Fred Reich held, consulting director at Brain and Co and the author of bestselling book, ‘The loyalty effect’, the loyal customers cost less to service than disloyal ones. High customer retention is reflection of greater customer satisfaction. Customer retention is important because it was found that acquiring new customers are five times costly than retaining existing customers and 5% reduction in customer attrition may increase the profitability by 20% to 25%.

Angelos Pantouvakis and Konstantinos Lympelopoulos, (2008) analyzed the impact of physical and interactive element of the services over overall satisfaction. Physical elements include physical evidence, surrounding and environment in which services are delivered while interactive element belongs to interaction between service provider and customer. The researcher collected data from 388 passengers and employed SEM (Structural Equation Modeling) to analyze the moderating effects of repeat patronage on customer satisfaction. The authors compared physical elements with interactive feature of the services and found that physical elements of the service play an important role than interactive feature of the services in determining customer satisfaction. The results show that, these effects are moderated by the repeat use of the service. The authors concluded that, both the elements are good predictor of overall customer satisfaction.

Canadian research agency analyzed 17 professional service agency to understand major reason behind customer dissatisfaction and to explain that why customers quit. It was found from the study that “25.9% decided to quit, 25.9% warned family and friends and 8.9% contacted the company to complain”. According to ACSI on customer satisfaction in transportation industry, customer satisfaction is declining.

7Ps and Transport Services

Nail Borden (1953), introduced the concept of marketing mix which consists of product, price, place and promotion. All the strategies of the marketing are derived from 4P and revolve around marketing mix elements of the organization. Philip Kotler in the year 1972 expanded the horizon of marketing mix and pointed out that marketing mix can be also used for nonprofit organizations, educational institutions, state and local authorities. Application of marketing in this new area opened new door of opportunities for marketers and increased the demand of goods and services.

Michael G. Harvey (1996) pointed out that “due to globalization and supportive infrastructure, it has become imperative to expand traditional 4P of marketing”. McKenna (1991) described the application of 4Ps in 21st century and pointed out that “marketing will go through a major metamorphosis in the 21st century that will expand the concepts of marketing beyond the traditional dimension of the discipline Marketing”. Understanding customers and applying marketing mix is not sole responsibility of marketing department, everyone in the organization should contribute for offering customized solution to the customers keeping in mind their varied need.

Walter van, Waterschoot et al. (1992), evaluated traditional classification of marketing mix on the basis of criteria proposed by Hunt. Several researchers put their efforts to classify marketing mix from different perspectives. Over the period of time, traditional 4Ps of marketing was transformed into 4Cs. Product and price was replaced by customer solution and customer cost while place and promotion was replaced by convenience and communication. In this era of hyper completion companies are providing value for money, accessibility, communication and solution to the customer. Today product definition is being replaced by utility definition.

The third element of additional 3Ps of services is most important element as service organization is dominated by human element. Due to heterogeneous attributes of the human being, no service organization can claim to be defect free organization. People differentiation offers differential advantage to the firm and some good service organizations invest in the people to acquire sustainable competitive advantage over the competitors. According to Pheng and Martin, “personnel are the only component that provides customers with services. Since consumer cooperatives are firms in which employees face with consumers directly, such organizations try to achieve a special situation in the market through training their employees on sales knowledge and how to treat with customers”.

Metro Railway: World Context

The metro rail services are available in most of the developed economy in the world including Switzerland, Russia, London, Dubai, France and many more. The metro train was started in 1863 in London. Since 1863, 120 cities in Asia, Europe and Africa have built metro system. The potential of metro rail project is beyond saturation point as there will be 560 cities, 300 of them in Asia with population of more than one billion by 2015.

Moscow Metro - Moscow Metro uses advanced technology within the coach and in traffic signal system. Recently Moscow Metro installed smoke detection system at 40-train station. The detection system regularly takes the air sample to obtain earliest possible warning of fire hazard. This gives adequate time to investigate and to take prompt action. The Russian government has already added air sampling smoke detection to its national fire code; this allows Russian organization to select it as their primary means of fire detection and protection.

Switzerland Metro - Switzerland Metro technologically went one step ahead and driverless Metro is underway. The URBALIS technology enables train to Run automatically without driver. The Lausanne project is Alston's third major contract in the driverless metro market, following two lines in Singapore.

Chinese Metro— the Shanghai Metro is among the most rapidly metro in the world. It was opened in 1995 and now it covers 420 kilometers length. All 11 Metro lines are operated by Shanghai Metro Operation Co Ltd. The lengths of standard platforms are 150-190 meter long.

London Metro- London underground is oldest underground railway in the world. It operated first electric train in the year 1990. London Metro is second largest metro in the world in terms of route length and it covers 402 kilometers distance to connect 270 stations. It has largest number of stations. London underground undertakes a billion passenger journeys a year, across a network and employing more than 13,000 people. Currently about half of the London underground's cost are met from passenger's fares and half from the grant by the department for transport.

Dubai Metro—The Dubai Metro is a driverless, fully automated metro network. The red line is fully operational while green line is under construction. The Dubai Metro was opened in the year 2009. The Dubai metro is the first urban train network in the Arabian Peninsula. In this metro project one line is completed while other two lines are proposed. Total 27 stations are proposed in order to connect with passengers. Serco operates the Dubai metro under contract to the Dubai Roads and Transport Authority.

CONCLUSION

It is found from the study that passengers rated platform services satisfaction, train specific services satisfaction, security services satisfaction, ticketing services satisfaction and employees driven services satisfaction relatively high as compared to the variables causing passenger's satisfaction. It is also observed that respondents of busiest metro stations gave low rating to the services of Chennai Metro as compared to the stations where customer traffic is low.

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