Chapter 1

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ABSTRACT

Quality connotes excellence in relation to the product or service that a customer gets. Hence, quality should be in sync with the expectations and needs of the customers. The philosophy of Total Quality Management also engage persistent efforts to meliorate quality and attain customer satisfaction and the fundamentals of TQM are at par significant to the service industry. Service quality is eminently articulated as service the difference between the customer perception and expectation of service which is often evaluated by the SERVQUAL model. A handful of studies have analyzed customer perceptions of service quality in passenger transportation services in the Indian context, This study therefore contemplates on analyzing the service quality of the Metro Rail Transit system of Delhi, Namely, Delhi Metro Rail Corporation by applying the five dimensions of service quality model namely, SERVQUAL. The research is also focused to study the impact of demographic variables namely: Age and Gender and the impact of service quality on customer satisfaction. For this purpose a sample of 1200 respondents was selected by dividing NCR into routes of Delhi Metro.
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BACKGROUND OF THE THESIS

1.1. INTRODUCTION TO THE THESIS CONCEPTS

1.1.1. Quality at its Core

Quality\(^1\) is considered as the prime parameters for measuring the performance of the products or services. Earlier quality was restricted only to the manufacturing sector but for last couple of decades there has been incredible growth in service sector with respect to quality issues. The organizations are always cautious about ascertaining that products conform to their specifications and deliver highest customer satisfaction and value for money. Providing consistent quality engenders consumer’s faith in a product and its producers.

Quality is frequently articulated as to be in the eyes of the beholder, customarily, quality was connected with the product or service that a customer gets in which it is broadly defined as the ability of a product or service to constantly meet or exceed customers’ expectations. Juran defined quality as “Fitness for use” he emphasized a balance between product features and products free from defects. As used by Juran, the word “product” refers to the output of any process, and that includes goods as well as services (Juran & Gryna, 1988).

According to Crosby, quality\(^2\) refers to “conformance to requirements” (Crosby, 1979). Quality is defined in measurable and clearly stated terms to help the organization take

\(^{1}\) Tattersley, P. (1999). The quality approach, United Kingdom, 6: 21-56.

action based on tangible targets, rather than on bunch, experience, or opinions. Deming asserts that the quality of any product or service can only be defined by the customer. Quality is a relative term that will change in implication depending on the customer’s needs. To meet or exceed the customer’s needs, managers must recognize the significance of consumer research.

Quality has been acknowledged as one of the chief outcomes that management must accomplish to attain profitable growth and excellence in its work endeavors. The importance of quality has been appreciated by both manufacturing and service organizations. Organizations that pursue the TQM\(^3\) path view quality as being defined by their customers and use all means to investigate their customers’ needs.

1.1.2. The Bond Between Quality and Total Quality Management

Since 1970’s, Total Quality Management (TQM) has been a crucial philosophy all across the globe. Quality should be coordinated with the expectations and requirements of customers. Quality is something the customer wants and not what the organization decides for the customers. Without customers organizations do not have any existence. A customer focus is, although, not a sufficient condition on its own for ensuring total quality. Organizations following TQM practices apply well framed strategies for meeting their customers’ requirements. According to Dotchin and Oakland (1994), Although Total Quality Management is more associated with manufacturing companies; it is believed that the concepts and principles underlying it are similarly significant to service industry. As a result it is applied to manufacturing companies as

well as service organizations given that both manufacturing and service organizations intend to satisfy customer needs and wants.

TQM establishes an organization-wide focus on quality to achieve customer satisfaction and improved business performance. It involves persistent efforts to meliorate quality and attain customer satisfaction (Stevenson, 2002). The word “total” implies to everything in which it aims to satisfy all customers, both internal and external. The prime task of TQM is to meet these needs and wants of its customers. Brilliant organizations, both public and private, always stay ‘close to the customer’. TQM is all about providing customers with what they want, when they want it and how they want it. It includes analyzing varying customer expectations and designing products and services that meet and exceed their expectations. Once the customers are delighted, they spread a good word of mouth about the product or service in the market. The perceptions and expectations of customers are understood as being short term, therefore organizations experiment varied options for keeping close to their customers and respond to their changing tastes, needs and wants.

1.1.3. Service Quality as an Ingredient of Total Quality Management

TQM has always benefited the organizations in different ways. One of them is superb service quality, which is crucial for service organizations in satisfying customers’ needs and wants. The concept of service quality has evolved from the concept of Total Quality Management and it is considered as an crucial criterion for ensuring effective implementation of Total Quality Management philosophies.

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Parasuraman et al. (1985) expressed service quality as the global evaluation or attitude of overall excellence of services. So, service quality is the difference between customer expectation and perception of services delivered by service firm.

Nitecki et al. (200) defined service quality in terms of “Meeting or exceeding customer expectations or as the difference between the customer perception and expectation of service”

Service sector has realized that service quality is the main source of gaining competitiveness and remain successful in the market “Service quality is a measure of how well the service level that is delivered matches customer expectations, while a firm delivering quality service means conforming to customer expectations on a consistent basis (Joewono and Kubota, 2007; Transportation Research Board, 1999, 2004)” (Lai and Chen, 2010).

Customers sight services as an assortment of attributes that may, in diverse ways, play a vital role in to their purchase intentions and also perceptions of service quality. Even though researchers have zeroed on varied facets of service quality, all of them give their consent to the fact that the importance should be on customers. The most widespread definitions of the Concept is attitude, which is a consequence of comparison between customers’ expectations with perceptions of performance.

The precise nature of services makes it complex to provide measure and maintain their quality. Though, Parasuraman, Zeithaml and Berry (1985, 1988) presented the SERVQUAL scale, which became one of the eminent instrument for measuring quality

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of services. The model has been proved useful in a variety of service industries, namely, tourism and hospitality. In majority of the researches the instrument was modified to fit the features of a specific service.

The service quality has been recognized as a vital strategic component for service firms aiming to be successful and survive in today’s highly competitive atmosphere. Over period of time, the public transport industry in many countries has undergone a phase of deep transformation. At present, the utility of private vehicles is more in contrast to public transport. This scenario has many repercussions like traffic congestion, air and noise pollution, energy consumption and therefore serious consequences on the environment.

As a result transit agencies are becoming more competitive and are relating themselves with service quality.

Service quality measurement is one of the chief practical themes for service providers and regulatory agencies, though, transit agencies have a keen interest in attaining a high service quality level, considering all priorities and requirements of the commuters. As a result, the requirement of using techniques to recognize the magnitude of service quality attributes on global satisfaction and to assess service quality increases and has become important.

1.1.4. SERVQUAL: The Key Instrument of Service Quality

The SERVQUAL model contemplates on the intricacies involved in ensuring a high quality of service for all customers in all sort of situations. It is an analytical approach for

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evaluating the difference between customers’ expectations and perceptions of quality. The desired quality is different from the perceived quality as it does not symbolize the day to day experiences of the users, but to some extent what they crave from their public transport system. This is why it is vital to study the desired quality, the knowledge of which gives local authorities the background information for framing tailored marketing policies based on the user’s requirements rather than their daily perceptions.

The SERVQUAL model is based on upon the customer belief in defining service quality and they enable identification of disparity in quality at different levels. The GAP model stresses on five gaps that result in failure of services. The five gaps are:

1. The gap between a customer’s expectation and perceptions of a company’s management of the customer expectations.
2. The gap between the perceptions of the company’s management and the service quality specifications.
3. The gap between service quality specifications and the ways of providing services,
4. The gap between the delivered service and services that were promised to the customer via external communication – Customer expectations are affected by the statements of a company’s representative and its advertising.
5. The gap between a perceived service and an expected service – a gap exists when a customer misunderstands the service quality.

On the bases of the five gaps the five dimensions of service quality have been identified: Tangibility (appearance of premises, equipment, personnel and communication materials), Reliability (ability to provide the promised services), Responsibility (willingness of employees to provide a service without delay), Assurance (knowledge,
courtesy of employees and their ability to provide clients with a sense of trust and confidence), and empathy (expressions of care and attention to each client) (Parasuraman et al., 1994, p. 207; Kotler, Keller, 2008, p. 413).

The SERVQUAL model has been fruitfully applied in different sectors of service industry, because of feasible modification and adaptation to the specific requirements. SERVQUAL model can be used for complex analysis, as it provides the basis for control for variable like customer satisfaction, monitoring service quality, recognition of a service components that are vital or non vital, and the measurement of the overall customer satisfaction with particular service.\(^\text{8}\)

The quality of a public transport system is covered by many factors, like considerations relative to comfort and safety within the vehicle, the time taken to cover the routes and the convenience and so on. Transport system plays chief role in the economic development of the country.

**1.1.5. Customer Satisfaction: A Consequence of Service Quality**

Customer satisfaction\(^\text{9}\) is counted as the foremost important factor for any product or service. Service quality is a significant determinant of customer satisfaction. As Customer satisfaction is something that includes apparent assessment of all the services and products (Leem and Yoon, 2004) Service companies need to focus their efforts on developing and improving service quality in order to satisfy the customers they can serve best. The connection between service quality and customer satisfaction

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depends on the particular customer (individual) and his good or bad experience of consuming the service. The analysis of satisfaction must consist of customer expectations and experience in the use of the services in a precise period of time. Customer expectations are shaped on the basis of personal experience and information from other sources. The customer expectations vary with a given period of time, even while using the service.

### 1.1.6. Service Quality and Transportation Sector with Special Reference to Delhi Metro Rail Corporation

The services sector in India is mounting speedily in sync with the global scenario. Services are progressively attracting interest from academicians and practitioners. The creation of services generates business opportunities, at the same go, also poses elevated levels of competitive threats to service providers. Many researchers and marketers have contemplated on customer evaluations of services to discover ways to meliorate service quality (Fisk et al., 1993).

Despite the enormous quantity of researches under the ambit of service quality that have been accumulated, a handful of studies have analyzed customer perceptions of service quality in passenger transportation services in an international setting and all the more less in the Indian context. This scenario calls for a grave consideration to service providers as the perceived service quality frequently reveals customers’ satisfaction and intention to repatronize the services.

Escalating travel\(^{10}\) demands surpass the constrained availability of transport infrastructure and services. Public transport, specifically, has been completely overstrained. Most bus

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and train services are congested, unreliable, slow, inconvenient, clumsy, and risky. All the more, the public ownership and operation of most public transport services has immensely reduced productivity and magnified costs.

India’s cities urgently require enhanced and extended public transport service. Weak government financial assistance and devoid of any favorable policies, such as traffic priority for buses, place public transport\textsuperscript{11} in an almost impossible situation are adding to the miseries of the commuters. A good physical connectivity in the urban and rural areas is crucial for economic growth of the country. Since 1990s, India’s growing economy has witnessed an increase in demand for transport infrastructure and services. But still, the sector has been proved incompetent to keep pace with rising demand. Significant improvements in this sector are required to support the country’s continued economic growth.

The variety of public transport services available across the most developed cities in the country also differs noticeably. Only Mumbai, Kolkata, and Chennai have widespread suburban rail services. Delhi has inadequate suburban rail services. Until recently, Kolkata had India’s only underground metro system, but Delhi is currently constructing a far more extensive metro. One result of deficient service quantity and horrible service quality is that public transport has been losing market share in many cities. Dissatisfied public transport\textsuperscript{12} commuters are gradually resorting to the private cars, and even more noticeably, to the relatively low-cost motorized two-wheelers, which have experienced a boom in ownership and use in the past 10 years. Delhi has been pioneering on the

\textsuperscript{11} BPI. (2011). Modes of transport & communication (1\textsuperscript{st} Edition), India, 121-137.

\textsuperscript{12} Margaret, H. (2003). Transportation (Around the World Series), United Kingdom, 43-60.
front that, it has been constructing new metro system with three lines, but only a small section is currently in service.

1.1.7. Significance of the Study

A lot of study has been undertaken measuring the service quality on various service sectors. Major research has been done on measuring the service quality of hotel industry and restaurants. One can find SEVRQUAL model being used to measuring banking industry. There have been resent trends where in some of research even in India have also been done on measuring the service quality of cellular industry. Furthermore, there had been few studies conducted abroad for measuring the service quality in public transportation. But there is paucity of studies conducted on the measuring the service quality in metro trains. So, the focus of this study was to measure the service quality in Delhi Metro Rail Corporation.

The ever increasing influx of population and increasing demand for better quality public transportation system in Delhi and NCR reinforces need to scrutinize the current commuting system in light of service quality standards.

To accomplish this purpose the following objectives have been framed

- To measure the service quality of DMRC with the help of SERVQUAL developed by (Parasuraman et al., 1988)
- To find out the expectations of commuters from services of DMRC
- To highlight the implications of the research to the DMRC
1.2. RESEARCH METHODOLOGY

1.2.1. Scope of the Study

Though the topic of the study is related to Total Quality Management, the study aimed at measuring the service quality of DMRC as service quality is an inherent concept of TQM. So the scope of the study was to measure the service quality on the model developed by Parasuraman et al. (1988) and it was confined to the five-dimensional model developed by them.

1.2.2. Research Design

The Research Design followed in the initial stages of the study was exploratory research design wherein the problem was identified and the questionnaire was developed, from henceforth descriptive research design was followed to measure the Service Quality of Delhi Metro.

1.2.3. Research Gap

The SERVQUAL model focuses on the difficulty in ensuring a high quality of service for all customers in all situations. The desired quality of service is different from the perceived quality because it does not represent the daily experiences of the users, but rather what they desire, hope for or expect from their public transport system. This is why it is important to study the difference between the perceptions and expectations of commuters of DMRC, further.

Though a lot of work has been done on the SERVQUAL model but no work has been done on measuring the service quality on Delhi Metro.

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1.2.4. Objectives of the Study

The primary objective of this study is to measure the service quality of Delhi Metro DMRC in NCR India:

- To measure the service quality of DMRC with the help of SERVQUAL developed by (Parasuraman et al., 1988).
- To find out the expectations of commuters from services of DMRC.
- To highlight the implications of the research to the DMRC.

1.2.5. Hypothesis Formulated

For the fulfillment of the study following hypothesis had been formulated:

$H_1$: In terms of service quality the rating given by the respondents are significantly different from each other.

$H_2$: There is significant association between DMRC service usage and demography of the respondent i.e. Age and Gender.

$H_3$: The generic dimensions of service quality is Reliability

$H_4$: The generic dimensions of service quality is Assurance

$H_5$: The generic dimensions of service quality is Tangibility

$H_6$: The generic dimensions of service quality is Empathy

$H_7$: The generic dimensions of service quality is Responsiveness

$H_8$: There are five generic dimensions of service quality: Reliability, Assurance, Tangibles, Empathy, and Responsiveness.

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1.2.6. Conceptual Framework

The conceptual framework model aims to examine the impact of the five dimensions of SERVICE QUALITY model developed by (Parasuraman et al., 1988). All constructs were conceptualized to fit better into the current scenario of the study. The study is also focused to study the impact of demographic variables namely: Age and Gender and the impact of service quality on customer satisfaction.

![Conceptual Framework Diagram]

**Figure 1.1:** Conceptual Framework

1.2.7. Population

A sample of 1200 (1080 actual responses) respondents was taken into consideration. These respondents were interviewed through a well drafted pre-tested questionnaire. The respondents were very forthcoming and cooperated for most part. That was reason why, the response rate was 90%, which is good, so we could get 1080 completely filled questionnaires.
1.2.8. Sample Framework

Research was carried out in National Capital region of India (Delhi, Ghaziabad, Faridabad, Noida and Gurgaon). Sincere attempt has been made by the researcher to cover as wide as possible, so as to achieve the objective of the study. In this study two demographic variables namely, Gender and Age have been studied. The Age of the respondents ranged between 18-40 years. Both males and females were considered for the purpose of conducting the study.

1.2.9. Sampling Design

The sampling design can be Probabilistic Sampling and Non Probabilistic Sampling. The study aimed at measuring the service quality of DMRC. For this purpose a sample of 1200 respondents was selected by dividing NCR into routes of Delhi Metro. Further, within these routes non-probabilistic sampling was followed, as it is appropriate for exploratory studies. Further with in Non Probabilistic sampling\(^ {15} \), Convenience sampling method was used for two reasons firstly respondents are selected because they happen to be in right place at the right time and secondly, convenience sampling technique is not recommended for descriptive or casual research but they can be in exploratory research for generating ideas (Malhotra, 2005).

1.2.10. Questionnaire Development

Though a lot of work has been done on the SERVQUAL model but no work has been done on measuring the service quality on Delhi Metro. Though, literature has been reviewed for measuring the service quality in public transport in order to develop a

\(^{15}\) Juliet, C. and Anselm, S. (2007), Basics of qualitative research: Techniques and procedures for developing grounded theory, United States, 45-71.
construct for measuring the service quality of Delhi Metro. The SERVQUAL developed by (Parasuraman et al., 1988) was adopted to prepare the initial instrument.

Initial instrument was developed by generating 21-28 items after a thorough understanding of conceptualization and operationalization of the service quality construct in DMRC of NCR India. The first part of the questionnaire\textsuperscript{16} was left with four items relating to tangibility factor, second part with five items relating to reliability factor, third part with four items relating to responsiveness factor, fourth part with four items relating to assurance factor, fifth part with five items relating to empathy factor and sixth, the last factor with six items relating to demographic factor. All the closed-ended questions were designed to generate responses on a five point Likert scale to measure the perception of service quality indicated as -1 strongly disagree, -2 disagree, 0 neither or nor, +1 agree and +2 strongly agree. Cui, Lewis, and Park, (2003) in a study measuring service quality using SERVQUAL with five dimensions have achieved successful results using Likert Scale with seven point scale.

Though many researchers have agreed that for the transportation and other services, SERVPREF is the scale for measuring service quality. Parasuraman et al., (1988) being the original scale in this research, the scale\textsuperscript{17} was culturally modified and the variables were drafted according to metro train. Further the questionnaire was pretested on 200 respondents which clearly indicated the questionnaire was reliable.

\textsuperscript{16} Ian, B. (2008). Questionnaire design: How to plan, structure and write survey material for effective market research, United Kingdom, 7-29.

The questionnaire\(^{18}\) was divided into three parts. The first part of the questionnaire consisted of two demographic questions (Gender and Age). The second part was designed to measure the respondents’ expectations regarding service quality in the DMRC in NCR India. The third part of the questionnaire was designed to examine the respondents’ perceptions of service quality actually provided by DMRC.

By comparing each value difference between all 21-28 expectations and perceptions, the level of quality can be concluded. For example, if the perception value is higher than the expectation value, it can be concluded that the service is satisfactory or ideal. However, if the expectation value is lower than the perception value, the service quality level can be regarded as unsatisfactory or even unacceptable.

1.2.11. Data Collection

Data can be defined as the quantitative or qualitative values of a variable. Data is plural of Datum which literally means to give or something given. Data is thought to be the lowest unit of information from which other measurements and analysis can be done. It can be numbers, images, words, figures, facts or ideas. Data sources are broadly classified into primary and secondary data.

➢ Types of Data

Primary Data

Data that has been collected from first-hand-experience is known as primary data. Primary data has not been published yet and is more reliable, authentic and objective. It cannot be changed or altered, therefore its validity is greater than secondary data.

Importance of Primary Data

Importance of Primary data cannot be neglected. A research can be conducted without secondary data but a research based on only secondary data is least reliable and may have biases because secondary data has already been manipulated. In statistical surveys it is necessary to get information from primary sources and work on primary data.

**Validity:** Validity is one of the major concerns in a research. Validity is the quality of a research that makes it trustworthy and scientific. Validity is the use of scientific methods in research to make it logical and acceptable. Using primary data in research can improves the validity of research. First hand information obtained from a sample that is representative of the target population will yield data that will be valid for the entire target population.

**Authenticity:** Authenticity is the genuineness of the research. Authenticity can be at stake if the researcher invests personal biases or uses misleading information in the research. Primary research tools and data can become more authentic if the methods chosen to analyze and interpret data are valid and reasonably suitable for the data type. Primary sources are more authentic because the facts have not been overdone. Primary source can be less authentic if the source hides information or alters facts due to some personal reasons. There are methods that can be employed to ensure factual yielding of data from the source.

**Reliability:** Reliability is the certainty that the research is good enough true to be trusted on. It improves when primary data is used. If the researcher uses experimental method and questionnaires the results will be highly reliable. On the other hand, if he relies on the data available in books and on internet he will collect information that does not represent the real facts.
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Sources of Primary Data

Sources for primary data are limited and at times it becomes difficult to obtain data from primary source because of either scarcity of population or lack of cooperation. Regardless of any difficulty one can face in collecting primary data; it is the most authentic and reliable data source. Following are some of the sources of primary data.

Experiments: Experiments require an artificial or natural setting in which to perform logical study to collect data. They are more suitable for medicine, psychological studies, nutrition and for other scientific studies. In experiments the experimenter has to keep control over the influence of any extraneous variable on the results.

Survey: Survey is most commonly used method in social sciences, management, marketing and psychology to some extent. Surveys can be conducted through different methods.

Questionnaire: is the most commonly used method in survey. Questionnaires are a list of questions either open-ended or close-ended for which the respondent give answers. Questionnaire can be conducted via telephone, mail, live in a public area, or in an institute, through electronic mail or through fax and other methods.

Interview: Interview is a face-to-face conversation with the respondent. In interview the main problem arises when the respondent deliberately hides information otherwise it is an in depth source of information. The interviewer can not only record the statements the interviewee speaks but he can observe the body language, expressions and other reactions to the questions too. This enables the interviewer to draw conclusions easily.
Observations: Observation can be done while letting the observing person know that he is being observed or without letting him know. Observations can also be made in natural settings as well as in artificially created environment.

- Secondary Data

Data collected from a source that has already been published in any form is called as secondary data. The review of literature in any research is based on secondary data. Mostly from books, journals and periodicals.

Importance of Secondary Data

Secondary data can be less valid but its importance is still there. Sometimes it is difficult to obtain primary data; in these cases getting information from secondary sources is easier and possible. Sometimes primary data does not exist in such situation one has to confine the research on secondary data. Sometimes primary data is present but the respondents are not willing to reveal it in such case too secondary data can suffice.

Sources of Secondary Data

Secondary data is often readily available through:

Published Printed Sources: There are variety of published printed sources. Their credibility depends on many factors. For example, on the writer, publishing company and time and date when published. New sources are preferred and old sources should be avoided as new technology and researches bring new facts into light.

Books: The use of books start before even you have selected the topic. After selection of topics books provide insight on how much work has already been done.
**Journals/Periodicals:** Journals and periodicals have become more important as far as data collection is concerned as they provide up-to-date information which at times books cannot.

**Magazines/Newspapers:** Magazines are also effective but not very reliable. Newspaper on the other hand are more reliable and in some cases the information can only be obtained from newspapers as in the case of some political studies.

**Published Electronic Sources:** As internet is becoming more advance, fast and reachable to the masses; it has been seen that much information that is not available in printed form is available on it. In the past the credibility of internet was questionable but today it is not.

**e-journals:** e-journals are more commonly available than printed journals.

**General Websites:** Generally websites do not contain very reliable information so their content should be checked for the reliability before quoting from them.

**Unpublished Personal Records:** Some unpublished data may also be useful in some cases.

1.2.12. **Limitation of the Study**

Despite the fact that no study can be perfect there are some or the other limitation which are always there in a study. Following are the limitations of the study:

1. The study was only confined to NCR India.
2. The study was confined to only the commuters of Delhi Metro.
3. Other modes of transports were not taken into consideration for the study
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4. The researcher has taken PZB’s SERVQUAL model for measuring the service quality other models are taken into consideration.

5. Comparative study between Delhi Metro and other metro like Kolkata metro will not be considered.

6. Again total quality management is understood as measuring the service quality measurement but other dimensions of total quality management were not considered.

For the present study the method of data collection included primary and secondary sources. For the primary data collection questionnaire has been used. Further the questionnaire was pretested on 200 respondents which clearly indicated the questionnaire was reliable. 1200 Copies of questionnaire were photocopied for the final administration. I was helped by my friends for getting the questionnaire filled from the commuters at various metro stations. For the secondary source\textsuperscript{19}, website of Delhi Metro Rail Corporation, books on DMRC, Research papers, newspapers etc have been referred.

\textsuperscript{19} Uwe, F. (2011). Introducing research methodology: A beginner’s guide to doing a research project.