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The effect of service quality on customer satisfaction in railway transport service in Ethio-Djibouti

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Abstract

Service quality (SQ) plays an important role as a driver of customer satisfaction (CS). This paper attempts to assess the effects of SQ on CS in the Ethio-Djibouti railway transport service. A questionnaire was constructed with 42 SQ items covering 8 SQ dimensions using the ServQual model with additional dimensions added by the researchers. A total of 251 respondents were taken using the convenience sampling technique to collect the required data. Minitab software has been used to perform the data analysis and interpretation. As the finding shows, there is a gap between customers' perceptions and expectations of SQ in the transport service. As a result, reliability, assurance, service delivery, empathy and tangibility contributed a higher value to CS, and comfort and social responsibility a higher value contribution to CS. Therefore, the provider has to focus on improving the SQ to bring CS.

Keywords: Customer satisfaction, railway, service quality, ServQual;

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1. Introduction

The relationship between service quality (SQ) and customer satisfaction (CS) has received researchers' attention over the last few years. In a highly competitive service sector market, establishing good relationships with customers and satisfying them plus gaining loyal customers is a vital and most significant issue for service providers for the reason that affecting their stability as well their competitiveness and profitability (Hassan et al., 2015; Hussain et al., 2015). On account of this, service providers are paying attention to CS and working doggedly to provide quality service to their customers. Among the service providers, the transportation sector has performed very crucial roles in the GDP of countries around the globe by facilitating the mobility of mass population passengers as well as fright service from one place to another (Lingaitis & Sinkevičius, 2014; Mauro Azeredo, 2018). The railway is one mode of transport for both freight and passengers. According to the report of the international railway research board, rail transportation is important to any settlement, it enhances productivity, provides time and space utility; as well, it serves as a backbone for local and foreign public transport in many countries (Schut & Wisniewski, 2015). Modern railway transportation in Africa is on the development path and there is a lot left as compared to other developed countries in the western and Asia continent.

In this regard, the Ethiopian government strives for poverty reduction and country development along the different dimensions of national's activities. Among those activities, railway transportation can be mentioned. In the country, the railway history has begun with the meter gauge type and was first introduced in 1917 which once connected Addis-Ababa to the port city of Djibouti. Nowadays, the railway has been completely superseded by an electrified standard gauge railway that was completed in 2017. According to the annual report of the Ethiopian railway corporation (ERC); in January 2018, the railway was operational and transported some 150,000 passengers until the end of the year with a cargo capacity of 6–7 million tons of freight per year in its first year of operation. The railway has 19 stations and only 5 stations (Lebu, Adama, Dire Dawa, Ali Sabieh and Nagad) are opened for passengers currently to provide service, the other stations will be opened step by step to provide service to passengers.

As a starter and closer, the handling of customer-related issues in the Ethiopian railway service is just getting started. Providing a high standard of SQ can result in a high level of CS (Butkus et al., 2023; Deneş & Grecu, 2020; Hussain et al., 2015). Therefore, it has to compete with private-public transportation lower-cost buses, and freight logistics providers.

To attract more passenger and freight customers and consistently satisfy their requirements, railway management is required to identify cost-effective ways and employ a better system to increase punctuality, safety-security and capacity, and improves performance at a system level (Elfarmawi, 2019). In the global competitive environment, delivering quality service is considered an essential strategy for success and survival. However, the service of ERC particularly Ethio-Djibouti railway transport service complaints arising from customers on various issues in the service since the train began its operation in January 2018; such as delays in departure and arrival time, lack of food and beverage service on the train, the absence of a ticket office nearby, affordable transportation costs in terms of other private transportation providers, and long time travelling due to the lower speed of the train. So far, the train officials have not focused on CS, other than service delivery. In addition, they simply collect money with no progress in SQ and with no applicable practical ServQual model or use a system of measuring SQ to get CS (Javed et al., 2021). As a result of the day-to-day observation of the above problems, the researchers were motivated to conduct this study.

Hence, this research intends to assess the effect of SQ on CS on Ethio-Djibouti railway transport service by developing the following hypothesis in terms of five SQ dimensions: reliability, responsiveness, assurance, empathy and tangibles based on the ServQual model to get the gap between

the passenger expectations and actual services received by passengers and to examine factors that affect the passenger's satisfaction; finally, to suggest the way to improve the SQ offered by the transport service provider. This paper helps the service provider to identify their strengths and weaknesses in service delivery right now and it shows the direction where they really should focus in terms of their SQ in the future.

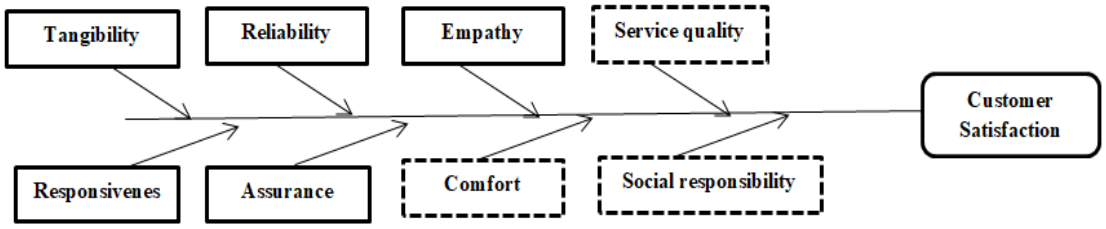
1.1. Literature review

1.1.1. Service quality

Recently in the hospitality industry, numerous scholars have discussed CS and SQ using different models. In the present paper; the researchers defined that, SQ in a business is the way to manage all processes to ensure CS at all levels. As numerous scholars and researchers discussed (Hussain et al., 2015; Parasuraman et al., 1988), the term SQ is defined as customer perception of how well a service meets or exceeds their expectations. Nowadays, one of the major problems facing by service providers is controlling the level of quality service and offering the service consistently. Following that, considerable research started showing their interest in this regard and they conducted broadly on the periphery of providing quality service, as these concepts have been recognised as playing a significant role in the hospitality industry's success in the competitive market. The ServQual framework model partially adopted by Parasuraman et al. (1988) is displayed in Figure 1.

Figure 1

ServQual Framework Model Partially Adopted From Parasuraman et al. (1988)



1.1.2. Measuring SQ

For the last three decades, various scales and indexes are developed and introduced to measure SQ. Measuring SQ for a service provider is where they test the service they provided as well as measure and demonstrate their eligibility. In addition, it is a better way to dictate whether the services are good or bad and whether the customers will be or are satisfied with them (Kumar & Zymbler, 2019). To this effect, various scholars have considered and followed different measurement dimensions of SQ, a little more than many: the technical and functional quality (TFQ) model developed by Gronroos (1984). Gronroos was amongst the first researcher who called for conceptual models of SQ to understand the concept better.

Gap model/ServQual (Parasuraman et al., 1988, 1985), a synthesised model of SQ (Brogowicz et al., 1990), SERVPERF (Cronin & Taylor, 1992) and Antecedents and mediator model (Dabholkar et al., 2000) have been developed and extensively used by academics and practitioners. However, as Faizen et al. (2017), the instrument most often discussed for measuring SQ in the marketing literature are, namely, TFQ model and gap model/ServQual. As Faizan continued his clarification, ServQual grabbed a lot of attention as compared to TFQ and other models. The new ServQual model (Parasuraman et al., 1988) is an improvised version (revised) of the old ServQual model (Parasuraman et al., 1985) because of defining the reduced five SQ dimensions as reliability, responsiveness, assurance, empathy and tangibles.

1.1.3. Customer satisfaction

CS has been a central concept in marketing literature and is an important goal of all business activities. As Kim et al. (2015) defined, CS refers to the extent to which customers are happy and delighted with the products or services provided by a business. The hospitality industries have focused on their performance to deliver good service, due to the fact that general CS could be a source of extra earnings for organisations and marketplace share growth. As a result, CS with rail transport services is determined by several factors.

1.1.4. Relationship between SQ and CS

For the past three decades, researchers have discussed the relationship between SQ and CS. As Jun and Cai (2010) have studied, SQ has a positive relationship with CS, or SQ influences CS and vice versa. Mekonnen (2010) has discussed the relationship between SQ and CS public bus transportation service delivered by Anbassa city bus service enterprise in Addis-Ababa using some factors (reliability, safety, accessibility, security, excessive waiting time and overcrowding) as SQ dimension. In a highly competitive business market, establishing good relationships with customers helps service providers to attain a different advantage over their competitors (Anderson et al., 2008; Tsafarakis et al., 2019). Once the service providers can satisfy their customers, there will be a willingness to recommend someone else to use the service.

1.2. Purpose of study

The study aims to assess the effect of SQ on the level of CS by identifying the gap between customers' expectations (CEs) and perceptions while customers using the Ethio-Djibouti railway transport service; a ServQual model is a basic tool used to find this gap by incorporating the dimensions those were mentioned above, which are directly affecting SQ of a business. In the following section, the researchers have discussed the sampling method and sampling techniques used in this paper.

2. Materials and method

2.1. Research design and approach

In this study, the researchers used a quantitative research approach to collect, measure and analyse relevant statistical data from different sources and concerned service providers, and qualitative research followed to explore the observations about the transport system conditions by the Ethio-Djibouti railway transport service (Wu et al., 2020). Moreover, the descriptive and correlational type of research design was applied to determine the frequency with which something occurs or the relationship between variables (tangibility, reliability, responsiveness, assurance, empathy, comfort, SQ and social responsibility) (Tiikkaja et al., 2020).

2.2. Participants and sample

The research has been conducted among the Addis-Ababa-Djibouti railway customers (passengers) from Addis-Ababa to the port city of Djibouti and vice versa which are randomly picked from stations at Djibouti, Dire Dawa, Adama and Lebu stations with a time frame of study from August until November 2019. According to ERC reports, 150,000 customers are transported in 2018; moreover, 39,000 customers are transported within 9 months from January up to August 2019, and the total number of customers is a result of the summation of the number of passengers in both directions. The number of customers in 2019 is very less compared to the total number of customers in 2018; for this, an accident on the railway line and consequences of the non-function of the rail service for many days, and human-made problems on the railway line were the reason for fewer number customers transported in 2019 (Oliver, 2020).

Currently, the daily average total number of passengers who are using the rail-transport service is 673 passengers per trip from Addis-Ababa to the port city of Djibouti or vice versa. The daily number of passengers in both directions fluctuates on every travelling day. Moreover, a report implies that the daily average number of passengers transported to Djibouti is less than the daily average number of passengers transported to Addis-Ababa. In this paper, the researchers developed survey questionnaires based on the variables which were mentioned previously and distributed them to selected respondents according to the sampling technique (non-probability sampling technique, convenient sampling basis) used in this paper. To eradicate systematic bias and due to the large population of passengers, the present paper has taken a survey approach.

In this study, the respondents were passengers who waited for the train at the stations which were mentioned previously; hence, the researchers then observed the exact daily number of passengers at the stations by tracing the sold tickets for the passengers at the station mentioned previously from August until November 2019. Then, the number of passengers is adjusted to the average daily number of passengers at the station as mentioned in Table 1 for both directions of the train line.

Table 1

The Average Number of Passengers Per Day in the Stations

Station at	**The** Daily Average Passengers **on the** Stations **to Djibouti**	**The** Daily Average Passengers **on the** Station **to Lebu**	**Adjusted** Total Average Daily Number **of** Passengers
Lebu	278	-	-
Adama	220	-	-
Dire-Dawa	152	438	-
Djibouti	-	258	-
Total	650	696	673

Source: ERC Operation Supervision Office (2019).

Before determining the sample size for the numbers mentioned above in the table, the researchers should decide in which train line direction the survey approach will be applied. So, the researchers decided to proceed with his surveying approach process techniques only on Djibouti to Lebu train line direction due to the total number of daily passengers (673) mentioned in Table 1. To get the sample size for the determined number of passengers, the researchers used the statistical formula that was developed (Yamane, 1967).

$$n = \frac{N}{1 + N(e)2} \text{..... (1)}$$

where:

n = number of sample size;

N = number of the total targeted population under the study; and

e = error (at 95% confidence interval).

$$n = \frac{673}{1 + 673(0.0025)}$$

n = 250.88 ~ 251

Therefore, based on the sample size 251 questionnaires have been distributed to the passengers (randomly picked from stations at Djibouti, Dire Dawa, Adama and Lebu stations) for 90 working days from August until November 2019 before the rail arrived waiting for the terminal or check-in place. The questionnaire prepared in both English and Amharic language, which the population is currently using as a national working language, consists of 42 statements that could directly represent the SQ dimensions in the ServQual model, to collect the responses of the passengers to understand the satisfaction with each service level.

All selected random respondents (passengers) give their opinion positively based on a scale/score provided on the questionnaire paper as shown in Table 4, which is categorised into five measurements: Strongly Dissatisfied (1), Dissatisfied (2), Somewhat Satisfied, (3) Satisfied (4) and Strongly Satisfied (5). As the researchers mentioned in the Introduction section, the main intent of this study is to assess the effect of SQ on CS in the case of Ethio-Djibouti railway transportation using the ServQual model. The model uses quality dimensions or variables, namely, tangibility, reliability, responsiveness, assurance, empathy, comfort, SQ and social responsibility. A total of 251 out of 251 questionnaires (100% of the response rate) were collected back and used for data analysis purposes. The questionnaire distribution period was from August until November 2019. The researchers used Minitab V20.0 software to analyse the collected data from the respondents.

2.3. Ethics

The respondents' consent was sought prior to them answering the questionnaire. Participation in this study was voluntary.

3. Results

Of the total respondents, 119 (47.4%) are females and the remaining 132 (52.6%) are males. The sample data indicate that the majority of respondent groups (35.1%) were middle-aged adult passengers with the range of age between 31 and 40 years; 17.1% were of young age between 20 and 30 years, the rest of the respondents (21.5%) were old-aged adults above 40 years old and 26.3% were under 20 years (Table 2).

Table 2

Demographic Characteristics of Respondents (N = 251)

Demographic	Category	*F*	*p*	VP	*p*
Sex	Male	132	52.6	52.6	52.6
	Female	119	47.4	47.4	100
Religion	Christian	105	41.8	41.8	41.8
	Muslim	146	58.2	58.2	100
	≤20	66	26.3	26.3	26.3
Age	20–30	43	17.1	17.1	43.4
	31–40	88	35.1	35.1	78.5
	≥41	54	21.5	21.5	100
	Uneducated	12	4.8	4.8	4.8
	Primary	51	20.3	20.3	25.1
Education status	Secondary	92	36.7	36.7	61.8
	Diploma	38	15.1	15.1	76.9
	≥degree	58	23.1	23.1	100
	Government	85	33.9	33.9	33.9
	Private	58	23.1	23.1	57.0
Occupation status	Self employed	42	16.7	16.7	73.7
	Unemployed	35	14.0	14.0	87.7

	Student	31	12.3	12.3	100
	≤2,000	41	16.3	16.3	16.3
	2,000–3,000	52	20.7	20.7	37
Family monthly income	3,001–4,000	44	17.5	17.5	54.5
	4,001–5,000	50	20.0	20.0	74.5
	5,001–6,000	37	14.7	14.7	89.2
	≥6,000	27	10.8	10.8	100
	Alone	59	23.5	23.5	23.5
	With family	97	38.7	38.7	62.2
With whom do you	With friends	56	22.3	22.3	84.5
travel?	With partners	39	15.5	15.5	100

F = Frequency, *p* = Present, VP = Valid percent, CP = Cumulative present.

Source: Researcher's survey data (2019).

Table 3

Travel Frequency of Respondents

	Travel Frequency	***F***	***p***	**VP**	**CP**
	First time	68	27.1	27.1	27.1
Valid	Two times	84	33.4	33.4	60.5
	Three times	43	17.1	17.1	77.6
	Four times	21	8.4	8.4	86
	More than five times	35	14	14	100
	Total	251	100	100	

F = Frequency, *p* = Present, VP = Valid percent, CP = Cumulative present.

Source: Researcher's survey data (2019).

As Table 3 shows that among 251 passengers, 84 (33.4%) passengers used the train two times, 43 (17%) passengers used the train three times, 21 (8.4%) passengers used the train four times, 35 (14%) passengers used the train more than five times and 68 (27.1%) passengers used for the first time. This implies that 72.9% of passengers used the train as transport more than once time within 90 working days from August until November 2019. So, the passengers have enough information to judge or evaluate the level of SQ provided by the train.

Table 4

Overall CS Towards Service Provided by ERC Service

Level		***F***	***p***	**VP**	**CP**
	Strongly dissatisfied	93	37.05	37.05	37.05
	Dissatisfied	26	10.36	10.36	47.41
	Somewhat	52	20.72	20.72	68.13
Valid	Satisfied	56	22.31	22.31	90.44
	Strongly satisfied	24	9.56	9.56	100.0
	Total 251		100	100	

F = Frequency, *p* = Present, VP = Valid percent, CP = Cumulative present.

Source: Researcher's survey data (2019).

In Table 4, the descriptive statistics analysis of CS is shown; accordingly, only 9.56% of passengers are highly satisfied with the service provided by the Ethio-Djibouti railway transport service followed by 22.31% satisfied and 20.72% somewhat satisfied passengers; Moreover, the other measuring scale value represents 10.36% of passengers are dissatisfied and 37.05% of passengers are strongly dissatisfied in the transport service. The SQ dimensions with their basic concepts and Cronbach's alpha are shown in Table 5.

Table 5

SQ Measurement Dimensions

No	**Dimensions and** Their Concept	**Number of** Sub Variables	**Cronbach's** Alpha
1	Tangibility: Physical facilities, equipment and appearance of personnel	5	0.811
2	Reliability: Ability to perform the promised service dependently and accurately	6	0.821
3	Responsiveness: Willingness to help customers and provide prompt service	6	0.835
4	Assurance: Knowledge and courtesy of employees and their ability to inspire trust and confidence	5	0.844
5	Empathy: Caring and individualised attention that the firm provides to its customers	6	0.851
6	Comfort: A state of physical ease and freedom from pain or constraint, the easing or alleviation of a person's feelings of grief or distress	5	0.838
7	Service delivery: It refers to how the service is rendered to the customer	4	0.809
8	Social responsibility: Developing a business with a positive relationship with the society in which they operate ultimately can create benefit/satisfaction	5	0.775
	Total number of sub-variables	42	0.971

Source: Researcher's survey data (2019).

Table 6

CE and Perception Towards Tangibility Dimension (C1)

Items	Level of Perception (*P*)			Level of Expectation (*E*)		CS Level
	N	Mean	SD (σ)	Mean	SD (σ)	*P–E*
1. Cleanliness of the station	251	4.56	0.5348	4.86	0.3686	−0.3
2. Cleanliness of the train	251	4.18	0.6170	4.69	0.5332	−0.51
3. A neat professional staff	251	4.46	0.6067	4.78	0.5230	−0.32
4. Availability of ICT both in the train and the station	251	1.08	0.5758	1.75	1.1219	−0.67
5. Clarity of information given in timetables	251	3.79	0.7339	4.19	0.8020	−0.4
6. The overall appearance of the train	251	3.3	0.9133	3.99	0.8801	−0.69

Tangibility total	21.97	24.26	−2.89
Tangibility mean	3.56	4.04	−0.481666667 (Dissatisfied)

Table 7

CE and Perception Towards Reliability Dimension (C2)

Items		Level of Perception (*P*)		Level of Expectation (*E*)		CS Level
	N	Mean	SD (*σ*)	Mean	SD (*σ*)	*P-E*
1. Maintaining the frequency of trains as scheduled	251	3.01	0.8349	4.66	0.5223	−1.65
2. Providing on-time train services	251	3.3	0.9133	4.61	0.5710	−1.31
3. Updated information about the status of the train during travel	251	4.46	0.6386	4.86	0.4200	−-0.4
4. Complaint handling system	251	3.04	0.9541	4.51	0.5465	−1.47
5. Dependability in handling your service problems'	251	4.22	0.7971	4.36	0.6000	−0.14
Reliability total		18.03		23		−4.97
Reliability mean		3.60		4.6		−0.994 (Dissatisfied)

Table 8

CE and Perception Towards Responsiveness Dimension (C3)

Items	*N*	Level of Perception (*P*)		Level of Expectation (*E*)		CS Level
		Mean	SD (*σ*)	Mean	SD (*σ*)	*P–E*
1. Informing customers when the service exactly be offered	251	3.81	0.7366	4.51	0.5402	−0.7
2. Availability of staff in handling requests	251	4.12	0.7913	4.58	0.5969	−0.46
3. Prompt service	251	3.67	0.9238	4.38	0.5840	−0.71
4. Willingness to help you	251	4.68	0.4909	4.88	0.4020	−0.2
Responsiveness total		16.28		18.35		−2.07
Responsiveness mean		4.07		4.58		−0.5175 (Dissatisfied)

Table 9

CE and Perception Towards Assurance Dimension (C4)

Items		Level of Perception (*P*)		Level of Expectation (*E*)		CS Level
	N	Mean	SD (*σ*)	Mean	SD (*σ*)	*P–E*
1. Courtesy(politeness) of staff on the train	251	4.16	0.7634	4.59	0.5939	−0.43
2. Being informed if there are delays	251	3.18	0.8458	4.24	0.7954	−1.06
3. The staff knows to answer your questions.	251	3.26	0.8576	4.56	0.5993	−1.3

4. Providing you with information about any changes in the itinerary	251	3.35	0.8900	4.48	0.6408	−1.13
Assurance total		13.95		17.87		−3.92
Assurance mean		3.92		4.46		−0.98 (Dissatisfied)

Table 10

CE and Perception Towards Empathy Dimension (C5)

Items		Level of Perception (*P*)		Level of Expectation (*E*)		CS LEVEL
	N	Mean	SD (*σ*)	Mean	SD (*σ*)	*P–E*
1. Operation of trains at convenient times for most customers	251	2.69	0.8593	4.66	0.5521	−1.97
2. Understanding your needs when you make inquiries	251	3.99	0.8836	4.29	0.6550	−0.3
3. Having your best interest at heart	251	2.92	0.9242	4.51	0.2986	−1.59
4. Availability of coach attendant/helper on the train	251	4.41	0.6877	4.4	0.4734	−0.01
Empathy total		14.01		17.86		−3.85
Empathy mean		3.50		4.46		−0.9625 (Dissatisfied)

Table 11

CE and Perception Towards Comfort Dimension (C6)

Items		Level of Perception (*P*)		Level of Expectation (*E*)		CS Level
	N	Mean	SD (*σ*)	Mean	SD (*σ*)	*P–E*
1. Availability of enough seating on the train	251	4.96	0.2830	4.99	0.0890	−0.05
2. Comfortable seats in the train station	251	4.78	0.5241	4.91	0.2833	−0.13
3. Availability of waiting for space at the station	251	4.26	0.5942	4.66	0.3048	−0.04
4. The smoothness of ride on the train	251	4.21	0.6305	4.77	0.5293	−0.56
Comfort total		18.19		19.33		−1.14
Comfort mean		4.54		4.83		−0.285 (Dissatisfied)

Table 12

CE and Perception Towards Service Delivery Dimension (C7)

Items		Level of Perception (*P*)		Level of Expectation (*E*)		CS Level
	N	Mean	SD (*σ*)	Mean	SD (*σ*)	*P–E*
1. Traveling time of the train	251	2.57	0.8263	4.29	0.6442	−1.72
2. Punctuality of trains	251	2.59	0.8574	4.41	0.6891	−1.82
3. The smoothness of the rail journey	251	4.52	0.5379	4.81	0.4390	−0.29
4. There is a sufficient ticketing process	251	4.89	0.3895	4.94	0.2835	−0.05

Service delivery total	14.57	18.45	−3.88
Service delivery mean	3.64	4.61	−0.97 (Dissatisfied)

Table 13

CE and Perception Towards Social Responsibility Dimension (C8)

Items	Level of Perception (*P*)			Level of Expectation (*E*)		CS on Level
	N	Mean	SD (*σ*)	Mean	SD (*σ*)	*P–E*
1. Availability of safety signs on the train and at the stations, safety equipment and signs should be clearly labelled	251	4.66	0.5058	4.96	0.1959	−0.3
2. Accessibility of the infrastructure to disables	251	4.73	0.4685	4.98	0.1400	−0.25
3. Adequate security on the train and at the station	251	4.56	0.5495	4.65	0.5544	−0.09
4. Provision of affordable travel to the society	251	3.38	0.9431	4.38	0.5840	−1
Social responsibility total		17.33		18.97		−1.64
Social responsibility mean		4.33		4.74		−0.41 (Dissatisfied)

In Tables 6–13, most of the parameters under dimensions, tangibility, reliability, responsiveness, assurance, empathy, comfort, SQ and social responsibility CE values, are above four points which means the expectation is very high. However, the situation from the perception side values where the means of customer perception is lower than the means of CE and the values are less than four points mostly. Moreover, it is also seen that all mean quality gap scores are negatives which reveals the inefficiency of transport service providing towards all dimensions.

Table 14

The Overall Descriptive Statistics Result

SQ dimensions	***p***	***E***	**SQ gap**	**CS level**	**Rank**
	Mean	Mean	*P–E*	*P–E*	
Overall tangibility (C1)	3.56	4.04	−0.48	Dissatisfied	Sixth
Overall reliability (C2)	3.60	4.60	−0.99	Dissatisfied	First
Overall responsiveness (C3)	4.07	4.58	−0.51	Dissatisfied	Fifth
Overall assurance (C4)	3.48	4.46	−0.98	Dissatisfied	Second
Overall empathy (C5)	3.50	4.46	−0.96	Dissatisfied	Fourth
Overall comfort (C6)	4.54	4.83	−0.28	Dissatisfied	Eighth
Overall service delivery (C7)	3.64	4.61	−0.97	Dissatisfied	Third
Overall social responsibility (C8)	4.33	4.74	−0.41	Dissatisfied	Seventh

N = 251, valid = 251, missing = 0, *E* = Expectation, *P* = Perception, SQ = Service quality.

Source: Researcher's survey data (2019).

As it is shown in Table 14, the reliability dimension has the highest score with a gap score value of (−0.99), and overall assurance takes the second rank with a gap score value of −0.98 followed by overall service delivery (−0.97), overall empathy (−0.96), overall responsiveness (−0.51), overall tangibility (−0.48), overall social responsibility (−0.41) and overall comfort (−0.28) in descending orders.

4. Discussion

As Dancey and Reidy (2017) categorised, a correlation coefficient is a very useful means to summarise the relationship between two variables with a single number that falls between −1 and +1. A single number called a correlation coefficient (*r*) provides information about the direction of the relationship (either positive or negative) and the intensity of the relationship (−1.0 to +1.0). The correlation coefficient ranged from −1.0 to +1.0. Correlation analysis with Pearson's coefficient (*r*) was conducted on all variables in this study to analyse the relationship between variables. Correlation about the variables are they related or not? About this direction of a correlation, if two variables tend to move in the same direction, they would be considered to have a positive or direct relationship. Alternatively, if two variables move in opposite directions, they are considered to have a negative or inverse relationship. When a correlation result is zero, it indicates zero correlation, 0.1 and 0.3 indicates a weak correlation among variables, 0.4 and 0.6 shows a moderate correlation, 0.7 and 0.9 indicates a strong correlation among variables and 1 indicates a perfect correlation.

Correlation analysis was conducted to investigate the relationship between ServQual dimensions with CS. The relevance of various dimensions of SQ, which have been measured in the present study, was determined by calculating the correlation coefficient '*r*' values. The values for correlation coefficient '*r*' of all the dimensions of SQ, namely, tangibility, reliability, responsiveness, assurance, empathy, comfort, service delivery and social responsibility precisely indicate the relationship between the SERVQUAL dimensions and CS as mentioned in Table 14, respectively.

Table 15

Pearson Correlation Matrix of the SQ Dimensions of the ServQual Scale

Method

Correlation type	Pearson
Rows used (*N*)	251

p: Pair-wise Pearson correlation, **. *Correlation is significant at the 0.01 level (2-tailed), p < 0.01*

Correlations

	C1	C2	C3	C4	C5	C6	C7	C8
C1	1							
C2	0.255	1						
C3	0.315	0.621	1					
C4	0.332	0.711	0.698	1				
C5	0.238	0.539	0.201	0.421	1			
C6	0.701	0.257	0.239	0.418	0.725	1		
C7	0.430	0.753	0.731	0.722	0.701	0.645	1	
C8	0.307	0.370	0.249	0.353	0.552	0.496	0.307	1

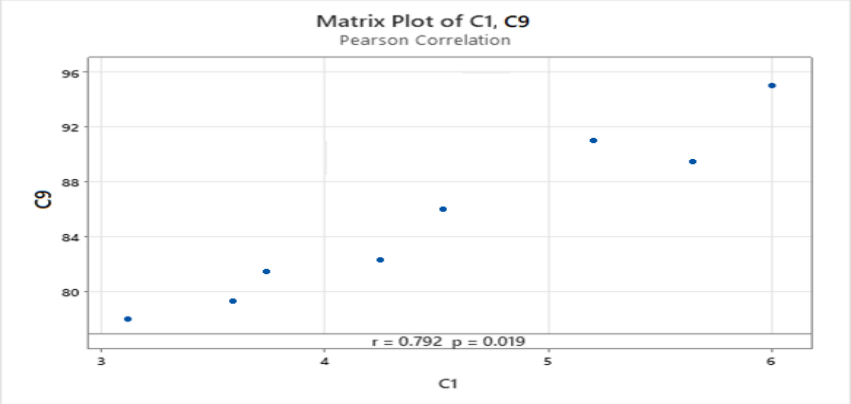
Correlations

	C9
C1	0.621
C2	0.425

C3	0.273
C4	0.342
C5	0.514
C6	0.601
C7	0.531
C8	0.447
C9	1

Figure 2

Correlation Matrix Result of Service Quality and Customer Satisfaction



p: Pairwise Pearson correlation.

** Correlation is significant at the 0.01 level (2-tailed), $p < 0.01$.

The result in Table 15 and Figure 2 exhibits the Pearson's correlation analysis; accordingly, there is a positive relationship between tangibility and CS with a value of $r = 0.621$, $p < 0.01$. Reliability and CS ($r = 0.425$, $p < 0.01$), responsiveness and CS ($r = 0.273$, $p < 0.01$), assurance and CS ($r = 0.342$, $p < 0.01$), empathy and CS ($r = 0.514$, <0.01), comfort and CS ($r = 0.601$, $p < 0.01$), service delivery and CS ($r = 0.531$, $p < 0.01$), social responsibility and CS ($r = 0.447$, <0.01). When summarised, these values indicate that the overall reliability, tangibility, empathy, comfort, service delivery and social responsibility of the passenger maintains a moderate correlation relationship with the passenger's satisfaction; furthermore, the overall responsiveness and assurance of the passenger maintain a weak correlation relationship with the passenger's satisfaction in the case of Ethio-Djibouti railway transportation service. Second, we observe from the scatter plot that the values of CS do not vary more from this linear model as values of the SQ variable change. This means that most of the points lie within an ellipse or cigar shape orientated in the direction of the linear model.

5. Conclusion

This study adopted the 'ServQual model approach' to measure perceived SQ and its impact on CS in the Ethio-Djibouti railway transportation service. A survey questionnaire has been used with 42 SQ items covering 8 SQ variables or dimensions. CE represents the expected service by customers and customer perception (*P*) signifies the received service by customers or passengers in this case.

Therefore, the data (in Table 14) imply that the overall customer perception's SQ dimension values are less than the overall CEs SQ dimension values. In other words, there is a gap between customer's perception and expectation of SQ in the Ethio-Djibouti railway transportation service; due to the gap score values: reliability (−0.99), overall assurance (−0.98), overall service delivery (−0.97), overall empathy (−0.96), overall responsiveness (−0.51), overall tangibility (−0.48), overall social responsibility (−0.41) and overall comfort (−0.28) in descending orders.

This result implies that the levels of SQ that the passengers receive are lower than their expectations or the service provided by ERC. Hence, there is a certain degree of dissatisfaction regarding the service provided now. According to the analysed data, ERC service should emphasise reliability, assurance, service delivery, empathy, responsiveness and tangibility, as they contribute higher value to customer dissatisfaction (37.05% strongly dissatisfied. 10.36% dissatisfied). Moreover, the other quality dimension such as comfort and social responsibility contributed higher value to CS with a significant gap score value: overall social responsibility (−0.41), overall comfort (−0.285), and the company should focus on their continuity. Generally, the overall level of the service is not so bad, but still, it has lots of things to improve on for the strongly dissatisfied, the dissatisfied and the indifference levels of the SQ passengers.

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