Importance performance analysis for evaluating city bus service quality in Addis Ababa, Ethiopia

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ABSTRACT
Public bus transport service operators play a significant role in delivering residents’ mass transit services in cities. Thus, measuring their service performance is very important to know their strengths and weaknesses; meet residents’ rapidly growing mobility needs, and provide quality services. This study aims to assess the service quality of public buses in Addis Ababa, emphasizing on Importance-Performance Analysis model. A questionnaire consisting of thirty-one service quality attributes was used using a seven-point Likert scale. A face-to-face survey was conducted with 500 conveniently selected respondents to grasp passengers’ expectations and perceptions of public buses’ service quality in the city. Hence, based on Importance Performance Analysis, Customer Satisfaction Index, and level of Conformity analysis, 58.1% of the attributes are found under concentrate here and low priority quadrant. Therefore, the study suggests transit service operators and concerned stakeholders should provide urgent attention and allocate their resources to these attributes to improve the quality of service and enhance customer satisfaction with delivered services.

1. Introduction
The transport sector plays a significant role in the country’s overall development (Agarwal, 2016). The movement of people and goods mainly depends on transport, and it is also an expressive factor for a government to maintain a robust economy (Iles, 2005). Because of its low running and initial cost, route flexibility, and permeability into town and city centers, a conventional bus is the dominant public transport mode in most cities of developing countries (Iles, 2005; Verma & Ramanayya, 2014). Hence, adequate and proper public bus transit services are vital components for the well-being of growing and expanding urban areas (Murray et al., 1998).

However, cities in developing countries face simultaneous urban population growth, urban expansion, and growth in the level of car ownership, which are joined with resource limitations and create a challenging situation for their urban transportation...
system (Henning et al., 2011; Norouzian-Maleki et al., 2020). Notably, recently a rapid increase in private vehicles set pressure on most cities of the developing world’s urban transportation system. The growth of using personal cars also aggravated congestion, traffic noise, and air pollution in cities. Besides, it harms public transport operations and the efficiency of transit service agencies (Greene & Wegener, 1997). Hence, in such a situation, Government should encourage people to use public transportation by designing various policies (Hafezi et al., 2013; Hwe et al., 2006). Multiple Governments worldwide have used numerous approaches to promote changing private car users by public transit, such as buses or subways. Promoting public transport is also an effective option to minimize the problems associated with the urban transport system of developing countries. Besides, it significantly contributes to reducing traffic congestion, and air pollution, providing an alternative means of travel, and contributing highly to urban lives worth (Estrada et al., 2020). Therefore, policymakers in such cities should quickly design and implement an action emphasizing enhancing the performance of their urban public transport systems commensurate with the problems they faced. It entails the capacity to conduct performance assessments, learn from good practice elsewhere, and identify the areas and scale of potential improvement (Henning et al., 2011).

Similarly, due to the above reasons, the urban transport system of Addis Ababa is suffering from various problems, like traffic congestion, traffic jam, and road accidents. Studies have been conducted on the city’s public transport system (Abreha, 2007; Berhan, 2013; Berhan et al., 2013; Gebeeyahu & Takano, 2007a, 2007b; Mihretie, 2013); however, most of the studies were focused on measuring the performance of public transport in the city, emphasizing only the Anbessa city bus service in the city. In addition, IPA methodological approach is not yet employed in the above studies and other studies of the city’s public transport system. Therefore, this study is conducted to evaluate the service performance of public transport and determine the strength and weaknesses of the service in the city using the IPA model. The IPA is a strategic tool employed in this study to provide the Government and other transport stakeholders the guideline that rapidly empowers them to comprehend users’ desires and evaluate users’ satisfaction instead of only on performance attributes. Also, understanding users’ satisfaction is vital for local government and transit service enterprises in their planning effort to improve service performance to keep current customers satisfied and to attract more potential customers to the service in the city.

2. Literature review

In literature, scholars prefer to define service quality from an individual customer’s perspective, also known as user-based (Ojo, 2019). Service quality is a system to manage business processes to guarantee total satisfaction to the client at all stages (internal and external; Gržinić, 2007). It is a method that leads to increased competitiveness, effectiveness, and flexibility of the whole company (Gržinić, 2007). Service quality measures how well the service level provided matches customer expectations and delivers quality service means conforming to customer expectations consistently (Parasuraman et al., 1985). It also defines the difference between the customers’ expectations about the service performance and their perceptions about the service performed (Mercangöz et al., 2012). Thus, knowing the quality of the delivered service is essential for all businesses to guarantee survival and maintain their competitiveness in the market (Allen et al., 2020). Besides,
various benefits are obtained by investing in the quality of the service by the sectors, such as enhanced customer satisfaction, loyalty, repeat purchase, and long-run profit through positive word of mouth (Muhamad Noor & Nasirun, 2013). The quality of bus transit service also depends on numerous factors, such as regular travel time and its consistency, transit waiting time, financial costs, comfort in riding, information, and personal security (Cassetta & Carteni, 2014). There is continuing debate regarding the scientific society’s best quality definition and its measure. It is mainly acknowledged that service quality is intrinsically connected to the user (Cassetta & Carteni, 2014; Parasuraman et al., 1994).

In doing so, the quality of the services provided should be measured beforehand to identify their strengths and weaknesses. Works of literature show various approaches to measuring service quality and customer satisfaction. For instance, the Service Quality Index (SQI) was used to measure quality based on customers’ judgments rating the service’s quality attributes (Eboli & Mazzulla, 2009). The Customer Satisfaction Index (CSI) is also employed to measure customer satisfaction with the quality of services based on customers’ judgments conveyed through a numeric (Eboli & Mazzulla, 2009; Putra et al., 2014). SERVQUAL, also developed by (Parasuraman et al., 1985), is another common and widely used approach to measure the actual or perceived service quality and the customer perceptions of the service delivered (Parasuraman et al., 1985; Randheer et al., 2011; Sam et al., 2018). TRANSQUAL and SERVPREF are also used to measure service quality in public transport services related to SERVQUAL (Haron et al., 2013; Yuda Bakti & Sumaedi, 2015). IPA is also one of the marketing research techniques that investigate customers’ perception of product or service quality attributes. It is employed to examine clients’ satisfaction with a product or service by comparing expectations and performance level of service quality attributes. Several practitioners and researchers have used IPA to identify the most vital performance factors in customer satisfaction surveys (Allen et al., 2020; Grujičić et al., 2014; Haron et al., 2015; John & John, 1977).

3. Materials and method

3.1. Study area

Addis Ababa is the capital city of Ethiopia. Geographically it is located at the country’s center at the height of 2,400 m above mean sea level with rolling hilly topography. The city is spread over an area of 527 sq. km. Further, the city is divided into ten sub-cities and 116 woredas levels. Public transit service is offered by state-owned buses, such as Anbassa city bus, Sheger city bus, Public Service Employees Transport bus, and Light Rail Transport. Besides privately owned Minibus taxis, various types of small taxis, and Higher buses are also operated to provide public transport services in the city. But the focus of this study is road-based public bus transport to the city (i.e. Anbessa bus, Sheger bus, and PSETSE).

3.2. Data collection method

The study has used a multistage sampling method to reach actual respondents for the study. First, stratified sampling was employed to select terminals, and then systematic sampling was used to choose the route lines from terminals chosen for the study. Last,
using the convenience sampling method data was collected from 500 passengers while traveling on the selected bus route line. The survey was conducted from December 2019 to January 2020. A questionnaire was used to collect data from bus passengers. The first section of the questionnaire included questions about passengers’ socio-economic and travel behavior, such as gender, age, travel purpose, usage frequency, etc. The second section contains 31 attributes concerning passengers’ expectations and perceptions of public bus service quality using a seven-point Likert scale (Table 1).

| Service Quality Attributes |  |
|-----------------------------|-----------------------------|
| 1. Service coverage         | 17. Cleanliness of bus interior, seats, and windows |
| 2. Availability of bus stops and their proximity | 18. Cleanliness of bus exterior |
| 3. Service frequency        | 19. Ticket cost/fare |
| 4. Total hour of service    | 20. Availability of timetable/map on bus/bus stop |
| 5. Availability of service on weekends/holidays | 21. Provision of information |
| 6. Availability of services at night | 22. Safety and competence of drivers |
| 7. Convenient of the bus for all people | 23. Security against crime on a bus |
| 8. Punctuality of bus (runs on schedule) | 24. Security against crime at bus stops and station |
| 9. Waiting time at the bus stop | 25. Staff behavior (driver and conductors) |
| 10. Journey time (operating speed) | 26. Personnel helpfulness and friendliness |
| 11. Bus crowding level      | 27. Easiness to buy the ticket |
| 12. Comfort while riding the service | 28. Administration of complaints |
| 13. Bus stop comfort        | 29. Ease of service use |
| 14. AC – Availability on bus | 30. Accessibility of buses for people with disability |
| 15. Availability of shelter and benches at a bus stop | 31. Image of the company |

### 3.3. Data analysis method

#### 3.3.1 Level of conformity analysis (LoC)

The level of conformity is an assessment of the relationship between the rate of performance and the importance score of variables, which aids in determining which variables require immediate attention to improve service quality (Santoso et al., 2011). It is calculated by combining the attribute performance score with the importance value of each variable based on user feedback.

The conformity level indicates how well an attribute’s performance meets the user’s expectations. Thus, LoC of 1(100%) indicates that the performance level of the attributes could satisfy users’ expectations; LoC of less than 1(100%) indicates that the performance level of the attributes must meet users’ expectations. In comparison, if the LoC is more than 1 (100 percent), the attribute performance level has exceeded the users’ expectations. Therefore, this study conducts a conformity analysis between the importance and performance attributes of service quality.

#### 3.3.2 Customer satisfaction analysis

The Customer Satisfaction Index (CSI) is a method for determining customer satisfaction with a service. Supranto came up with the idea (1997). It can use the average level of expectation and performance of each service item to calculate CSI. It allows for a clear and systematic estimate of service in terms of customer satisfaction using the score provided by the customer.
Consequently, this study used CSI to compute the level of users’ satisfaction with the city’s public bus service, calculated using the satisfaction rates expressed by users, weighted based on the importance rates, using the following formula:

$$CSI = \sum_{k=1}^{N} \left[ \bar{S}_k \cdot W_k \right]$$

in which:

$\bar{S}_k$ is the mean of the satisfaction rates expressed by users on the service quality $k$ attribute

$W_k$ (Importance weight) is a weight of the $k$ attribute, calculated based on the importance rates conveyed by users. Precisely, it is the ratio between the mean of the importance rates expressed by users on the $k$ attribute and the sum of the average importance rates of all the service quality attributes (Eboli & Mazzulla, 2009). Finally, the value of CSI can be inferred from the categories proposed by (Supranto, 1997) (Table 2).

| Ranges   | Interpretation       |
|----------|----------------------|
| 0.81–1.00| Very Satisfied       |
| 0.66–0.80| Satisfied            |
| 0.51–0.65| Quite/average satisfied |
| 0.35–0.50| Less Satisfied       |
| 0.00–0.34| Not satisfied        |

3.3.3. Importance performance analysis

IPA is a method for determining the importance and performance of attributes and applying the results to management decisions, including product development and positioning. Martilla and James proposed it in a 1977 Journal of Marketing article, and it has subsequently been used in a variety of scenarios. The IPA technique’s fundamental
idea is to examine the importance of a feature and the degree to which customers are satisfied. Therefore, as a tool for evaluation, IPA visually depicts the relationship between the importance and performance of service quality attributes.

Importance and performance statistics are represented on a couple of coordinate axes, as illustrated visually, with ‘importance’ on the Y-axis and ‘performance’ on the X-axis (John & John, 1977). The information is then divided into four quadrants, as seen in Figure 1. Every quadrant depicts the importance and performance of a service component that customers have assigned to it. Finally, the graphical results aid Government authorities/agencies in identifying priority areas for service quality improvement (Table 3).

| Quadrant | Meaning | Description |
|----------|---------|-------------|
| 1. Main Priority/ concentrate here | High importance & low performance | Requires immediate attention for improvement and is a major weakness |
| 2. Maintenance Achievement/ keep up with the good work | High importance & High Performance | Indicate opportunities for achieving or maintaining competitive advantage and are major strengths |
| 3. Low priority | Low importance & Low performance | Are minor weaknesses and do not require additional effort |
| 4. Excessive/Possible overkill | Low importance & High performance | The management should recognize that the present strength in these attributes is excessive and might consider transferring the resources elsewhere |

The following is a list of the stages involved in IPA analysis:

Stage 1. Compute the average level of importance for each element i

\[ \overline{X_i} = \frac{\sum_{i=1}^{k} X_i}{n} \]

and performance for each element i

\[ \overline{Y_i} = \frac{\sum_{i=1}^{k} Y_i}{n} \]

Where n is the number of respondents

Stage 2. Compute the average level of importance for the whole items

\[ \overline{X} = \frac{\sum_{i=1}^{k} \overline{X_i}}{p} \]

and performance for the whole items

\[ \overline{Y} = \frac{\sum_{i=1}^{k} \overline{Y_i}}{p} \]

Where P is the number of items i

Table 3. The Quadrant’s Interpretation.
4. Results and discussion

4.1. Reliability test

The reliability test of Cronbach’s Alpha is used to evaluate the internal consistency of the questionnaire. Thus, the Cronbach’s Alpha for satisfaction and importance attributes are 0.859 and 0.939; receptively, both are (> 0.7), which shows that all statements are exceeding the α value of 0.7 (i.e. all attributes are reliable) (Table 4).

| Attribute Scale (1–7) | Cronbach's Alpha | N of Items |
|-----------------------|------------------|------------|
| Importance level      | 0.939            | 31         |
| Performance level     | 0.859            | 31         |

4.2. Demographic characteristics of sample

The sample group was 59.4% male and 40.6% female. A significant proportion of the participants (35.0%) were under the age category of 26 until 35 years old, and 30.6% were between 36 to 50 years old. Concerning employment status, the majority (38.8%) was work under private institutions, and 28.8% were engaged in their business activities. Summary statistics for other variables are presented in Figure 2.

Figure 2. Socio-demographic profile of the sample.
4.3. **Level of conformity analysis**

Hence, in this study, a conformity analysis between the importance and performance attributes of service quality has been conducted and shown in Table 5.

| No. | Attributes                                           | Performance Mean | Importance Mean | GAP | CR (%) |
|-----|-----------------------------------------------------|------------------|-----------------|-----|--------|
| 1   | Service coverage/network/                          | 4.52             | 5.29            | -0.77 | 85.4   |
| 2   | Availability of bus stops and their proximity       | 4.33             | 5               | -0.67 | 86.6   |
| 3   | Service frequency                                   | 3.57             | 5.18            | -1.61 | 67     |
| 4   | Total hour of service                              | 4.53             | 5.14            | -0.61 | 88.1   |
| 5   | Availability of service on weekends/holidays       | 3.6              | 5.18            | -1.58 | 69.5   |
| 6   | Availability of services at night                  | 3.1              | 5.34            | -2.24 | 58.1   |
| 7   | Convenience of the bus for all categories of people | 3.76             | 5.28            | -1.52 | 71.2   |
| 8   | Punctuality of bus/ runs on schedule               | 3.29             | 5.31            | -2.02 | 62     |
| 9   | Waiting time at the bus stop                       | 3.26             | 5.09            | -1.83 | 64     |
| 10  | Journey time (operating speed)                     | 4                | 4.47            | -0.47 | 89.5   |
| 11  | Bus crowding level                                 | 3.39             | 5.15            | -1.76 | 66     |
| 12  | Comfort while riding the service                   | 3.59             | 5.02            | -1.43 | 71.5   |
| 13  | Bus stop comfort                                   | 3.41             | 4.67            | -1.26 | 73     |
| 14  | AC – Availability on bus                           | 3.84             | 4.55            | -0.71 | 84.4   |
| 15  | Shelter and benches at the bus stop                | 4.02             | 4.65            | -0.63 | 86.5   |
| 16  | level of noise on buses                            | 3.32             | 3.94            | -0.62 | 84.3   |
| 17  | Cleanliness of bus interior, seats, and windows    | 4.34             | 5.37            | -1.03 | 81     |
| 18  | Cleanliness of bus exterior                        | 4.66             | 4.55            | 0.11  | 102.4   |
| 19  | Ticket cost/fare                                   | 4.75             | 5.08            | -0.33 | 93.5   |
| 20  | Availability of timetable/map on bus/ bus stop     | 3.58             | 5.08            | -1.5  | 70.5   |
| 21  | Provision of information using media other ways    | 3.51             | 4.82            | -1.31 | 72.8   |
| 22  | Safety and competence of drivers                   | 4.37             | 5.21            | -0.84 | 84     |
| 23  | Security against crime on a bus                    | 3.6              | 5.09            | -1.49 | 71     |
| 24  | Security against crime at bus stops and station    | 3.16             | 5.12            | -1.96 | 62     |
| 25  | Staff behavior (driver and conductors)            | 3.58             | 5.15            | -1.57 | 69.5   |
| 26  | Personnel helpfulness and friendliness             | 3.85             | 4.94            | -1.11 | 78     |
| 27  | Easiness to buy the ticket                          | 3.19             | 5.14            | -1.95 | 62.1   |
| 28  | Administration of complaints                       | 3.42             | 4.96            | -1.54 | 69     |
| 29  | Ease of service use                                | 4.14             | 5.07            | -0.93 | 82     |
| 30  | Accessibility of bus for people with disability    | 3.64             | 5.1             | -1.46 | 71.4   |
| 31  | Image of the company                               | 4.45             | 5.08            | -0.63 | 88     |
|     | **Total**                                         | **117.8**        | **155.0**       |       |        |
|     | **Mean**                                          | **3.8**          | **5.0**         |       | -1.28  |

Information:**** Highest conformity level

* Lowest conformity level

As shown above, LoC was the highest for the cleanliness of the bus exterior with 102.4% and the lowest for the availability of services at night 58.1%. Besides, out of 31 quality attributes used to assess the conformity level, 13 attributes have the highest conformity score (i.e. LoC > 80%), which means these attributes meet users’ expectations very well, and one attribute (i.e. cleanliness of buses exterior) was beyond the expectation of users. The other 17 attributes are found between LoC 60–80%, which is good; while one attribute (i.e. availability of service at night) was less than 60% which is not good enough to meet users’ expectations.

Overall, the average LoC of the service quality attributes was 76% (< 100%), which means that public transport users in the city have not been fully serviced per their expectations. Furthermore, it can be concluded that based on conformity analysis; the overall attributes are entered in the category of ‘reasonably satisfactory’ (LoC<100%).
4.4. **Customer satisfaction analysis**

Next, the study could provide the result for passengers’ satisfaction levels towards public transport service of the city from CSI analysis. Based on the analysis, the overall CSI score for public transport service in Addis Ababa is 0.542 (54.2%). Therefore, it has been concluded that passengers of public buses are quietly satisfied with the public bus transport service in the city (Table 6).

### Table 6. CSI analysis results.

| No.  | Quality Attributes                           | Performance X MIS | Importance Y MIS | Weight Factor MIS/Av.MIS | Weight Score MIS*WF | CSI  |
|------|---------------------------------------------|-------------------|------------------|--------------------------|---------------------|------|
| 1    | Service coverage/network/                   | 4.52              | 5.29             | 1.06                     | 4.79                | 0.68 |
| 2    | Availability of bus stops and their proximity| 4.33              | 5                | 1.04                     | 4.33                | 0.62 |
| 3    | Service frequency                           | 3.57              | 5.18             | 1.04                     | 3.71                | 0.53 |
| 4    | Total hour of service                       | 4.53              | 5.14             | 1.03                     | 4.67                | 0.67 |
| 5    | Availability of service on weekends/holidays| 3.6               | 5.18             | 1.04                     | 3.74                | 0.53 |
| 6    | Availability of services at night           | 3.1               | 5.34             | 1.07                     | 3.31                | 0.47 |
| 7    | Convenient of the bus for all people        | 3.76              | 5.28             | 1.06                     | 3.98                | 0.57 |
| 8    | Punctuality of bus(runs on schedule)        | 3.29              | 5.31             | 1.06                     | 3.49                | 0.50 |
| 9    | Waiting time at the bus stop               | 3.26              | 5.09             | 1.02                     | 3.33                | 0.48 |
| 10   | Journey time (operating speed)              | 4                 | 4.47             | 0.89                     | 3.56                | 0.51 |
| 11   | Bus crowding level                          | 3.39              | 5.15             | 1.03                     | 3.49                | 0.50 |
| 12   | Comfort while riding the service            | 3.59              | 5.02             | 1.00                     | 3.59                | 0.51 |
| 13   | bus stop comfort                            | 3.41              | 4.67             | 0.93                     | 3.17                | 0.45 |
| 14   | AC – Availability on bus                   | 3.84              | 4.55             | 0.91                     | 3.49                | 0.50 |
| 15   | Shelter and benches at the bus stop        | 4.02              | 4.65             | 0.93                     | 3.74                | 0.53 |
| 16   | level of noise on buses                    | 3.32              | 3.94             | 0.79                     | 2.62                | 0.37 |
| 17   | Cleanliness of bus interior                | 4.34              | 5.37             | 1.07                     | 4.64                | 0.66 |
| 18   | Cleanliness of bus exterior                | 4.66              | 4.55             | 0.91                     | 4.24                | 0.61 |
| 19   | Ticket cost/fare                           | 4.75              | 5.08             | 1.02                     | 4.84                | 0.69 |
| 20   | Availability of time table /map on bus/stations | 3.58          | 5.08             | 1.02                     | 3.65                | 0.52 |
| 21   | Provision of information using various ways | 3.51              | 4.82             | 0.96                     | 3.37                | 0.48 |
| 22   | Safety and competence of drivers           | 4.37              | 5.21             | 1.04                     | 4.54                | 0.65 |
| 23   | Security against crime on a bus            | 3.6               | 5.09             | 1.02                     | 3.67                | 0.52 |
| 24   | Security against crime at bus stops and station | 3.16            | 5.12             | 1.02                     | 3.22                | 0.46 |
| 25   | Staff behavior (driver and conductors)     | 3.58              | 5.15             | 1.03                     | 3.69                | 0.53 |
| 26   | Personnel helpfulness and friendliness     | 3.85              | 4.96             | 0.99                     | 3.81                | 0.54 |
| 27   | Easiness to buy the ticket                 | 3.19              | 5.14             | 1.03                     | 3.28                | 0.47 |
| 28   | Administration of complaints               | 3.42              | 4.96             | 0.99                     | 3.39                | 0.48 |
| 29   | Ease of service use                        | 4.14              | 5.07             | 1.01                     | 4.18                | 0.60 |
| 30   | Accessibility of bus for people with disability | 3.64            | 5.1              | 1.02                     | 3.71                | 0.53 |
| 31   | Image of the company                       | 4.45              | 5.08             | 1.02                     | 4.54                | 0.65 |

| Total | 117.8 | 155.0 | 31 | 16.81 |

Average 3.8  5  0.542

Overall CSI 54.2%

Source: Field survey, 2020

4.5. **Importance performance analysis**

Lastly, the IPA analysis was carried out by calculating each service quality attribute’s value of importance and performance level. Based on the result, the IPA matrix intersection is made available using the mean level of performance at (3.8) and the mean level of importance (5). Figure 3 shows the results of the IPA analysis.
As shown above, the first quadrant contains 14 service attributes such as:

- service frequency
- availability of service on weekends/holidays
- availability of services at night
- convenient of the bus for people including the elderly, disabled, pregnant
- punctuality of bus (runs on schedule)
- waiting time at the bus stop
- bus crowding level
- comfort while riding the service
- availability of timetable/map on bus/ bus stop
- security against crime on a bus
- security against crime at bus stops and station
- staff behavior (driver and conductors)
- easiness to buy the ticket
- accessibility of buses for people with disability in need of improvements because they have high importance but relatively low performance.

On the other hand, eight services attribute such as;

- service coverage
- availability of bus stops and their proximity
- total hour of service
- cleanliness of bus interior, seats, and windows
- ticket cost/fare
- safety and competence of drivers
- ease of service use and image of the company was found under the second quadrant.
The attributes in the second quadrant represent the service’s strength; therefore, the operators should maintain a high level of quality for these attributes for achieving a competitive advantage. Last, the other service attributes, included in the last two quadrants, can be considered service aspects with a low priority and possible overkill. So, the enterprise should not focus its efforts on these attributes. Notably, transit service providers in developing countries like Addis Ababa identified the areas where policy-based actions will likely result in the most significant improvement in such aspects linked to variables under quadrant one.

To sum up, the contribution lies in this study by comparing results for CSI with the IPA method and Conformity analysis of the attributes. Hence, CSI and IPA model uniformly identifies the primary quality attributes that need the main priority for improvement under the first quadrant and attributes the second priority in the third quadrant. Similarly, conformity analysis for the whole attributes is found between 60–80%, which shows users did not get their expectations of the city’s quality of public transport service. Therefore, the result for CSI, IPA, and CR confirmed that the following attributes (Table 7) are the significant attributes that need urgent attention by the service providers and the concerned stakeholders to improve public bus transport service in the city (Table 7).

### Table 7. Comparison of IPA and CSI results.

| No. | Attribute                        | IPA       | CSI         |
|-----|----------------------------------|-----------|-------------|
| 1   | Service frequency                | Main Priority | Quite satisfied |
| 2   | Availability of service on weekends/holidays | Main Priority | Quite satisfied |
| 3   | Availability of services at night | Main Priority | Less Satisfied |
| 4   | Convenient of the bus for all people | Main Priority | Quite satisfied |
| 5   | Punctuality of bus (runs on schedule) | Main Priority | Less Satisfied |
| 6   | Waiting time at the bus stop     | Main Priority | Less Satisfied |
| 7   | Bus crowding level               | Main Priority | Less Satisfied |
| 8   | Comfort while riding the service | Main Priority | Quite satisfied |
| 9   | Bus stop comfort                 | Low Priority | Less Satisfied |
| 10  | Level of noise on buses          | Low Priority | Less Satisfied |
| 11  | Availability of time table/map on bus/stations | Main Priority | Quite satisfied |
| 12  | Provision of information using various ways | Low Priority | Less Satisfied |
| 13  | Security against crime on a bus  | Main Priority | Quite satisfied |
| 14  | Security against crime at bus stops and station | Main Priority | Less Satisfied |
| 15  | Staff behavior (driver and conductors) | Main Priority | Quite satisfied |
| 16  | Easiness to buy the ticket       | Main Priority | Less Satisfied |
| 17  | Administration of complaints     | Low Priority | Less Satisfied |
| 18  | Accessibility of bus for people with disability | Main Priority | Quite satisfied |

### 5. Conclusion

Specifying the strength and weaknesses of the city bus service has made an essential contribution to the government authorities. Therefore, in this study, a survey was made to know travelers’ expectations and perceptions of the quality of public bus transit service in the city and strategically prioritize the area for improvement, resulting from 500 respondents.

The study used the IPA, CR, and CSI methods to analyze the data and results to provide the Government authorities the guideline that rapidly empowers them to comprehend users’ demands and evaluate user satisfaction instead of only on performance attributes. Thus, 58.1% of the attributes are found under quadrants one and three.
based on the outcomes. They need immediate attention by managers of the enterprise and concerned stakeholders to improve the quality of delivered service and enhance customer satisfaction with public transport service provision.

Moreover, IPA is the strategic tool for the Government authorities or researchers to evaluate the service quality by providing guidelines to prioritize the focus area for improvement. Even though obtaining good responses from 500 participants, it would be better for research to make it more generalized to further the entire population. Given the above, the study suggests that managers and decision-makers use the IPA findings to prioritize their resources, manage costs related to qualities in quadrants three and four, and reassess their resources.

6. Contribution of the study

It is widely acknowledged that service quality is a multi-dimensional concept; nevertheless, there is no clear agreement on the number and types of service quality dimensions (Brady & Cronin, 2001). Service quality characteristics should be determined from the perspectives of culture, service, and country, according to recent advances in the service management literature (Micuda & Crucero, 2010; Van Duong et al., 2004). As a result, this occurrence emphasizes the importance of adopting a service quality model that is well-suited to the public transportation systems of developing countries such as Ethiopia’s Addis Ababa.

Therefore, after proving the service quality model based on the context of public transportation services in Addis Ababa, i.e. linking the Customer Satisfaction Index, level of Conformity Analysis to the Importance Performance Analysis model, the findings of this study offered the theoretical and methodological contribution. Furthermore, other researchers can utilize this model to investigate the quality of service and customer satisfaction in various modes of public transportation as well as other service sectors that are relevant to the city’s setting, such as banks, hospitals, and schools.

Furthermore, this research has organizational ramifications. Public transportation companies must stress the aspects of performance and expectation data set based on the IPA model to improve service quality. Various public transportation companies can also utilize the IPA model to assess customer satisfaction and identify essential service characteristics. The outcome can also be used by the management, decision-makers, and concerned stakeholders to monitor service performance and progress upgrading programs.

7. Limitations of the study

Even though this study has confirmed the IPA model in the city’s public transportation system, the author is aware that it has some limitations. To begin, the research used cross-sectional data to determine the model’s stability, which couldn’t see at a later time. As a result, the study’s author proposed that longitudinal data be used in future studies. Another drawback of this research was that it was based on the city’s only road-based public bus system. There are, however, many types of public transportation companies. To reduce this constraint in the future, the IPA model should be evaluated on the city’s various public transportation systems, such as LRT, private, and public transportation, among others.
Disclosure statement

No potential conflict of interest was reported by the author(s).

Data availability statement

Some or all data, models, and/or codes that support the findings of this study are available from the corresponding author upon reasonable request.

Informed consent

The research involved human participants, who were informed about the purpose of the study and that their participation is voluntary.

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