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Measuring customer satisfaction with the Gautrain during the COVID-19 pandemic using the service quality model

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Background: The Gautrain was created with the sole purpose of availing efficient transportation between the three metropolitan municipalities, namely the City of Tshwane, the City of Johannesburg and the City of Ekurhuleni. The Gautrain has been transporting more than five million passengers annually. However, ridership decreased drastically because of COVID-19. Poor ridership has resulted in less revenue income and the halting of expansion. In prior years, the Gautrain Management Agency (GMA) measured customer satisfaction levels; however, it has not undertaken such a study since the start of COVID-19 pandemic.

Objectives: The study measured service quality experienced by Gautrain users amidst the COVID-19 pandemic through the service quality (SERVQUAL) model. Unknown customer satisfaction levels with the Gautrain services during the COVID-19 pandemic posed a problem for the agency.

Method: This study followed a descriptive and quantitative path. A cross-sectional survey via online platforms was used to collect the data. The study had a sample size of 84 Gautrain commuters.

Results: The findings revealed that users experienced a negative service quality in terms of SERVQUAL dimensions, namely assurance, tangibles, empathy and responsiveness.

Conclusion: The study concluded that COVID-19 had a negative impact on some of the Gautrain service factors; however, users were still satisfied with some of the service factors. It is recommended that the Gautrain can improve services by understanding what customers expect in terms of service factors during the pandemic.

Keywords: pandemic; COVID-19; Gautrain; public transport; customer satisfaction; customer service; SERVQUAL model; rail transport.

Introduction

The movement of people for better work, education and leisure opportunities has led to South Africa's Gauteng province being densely populated, with the highest number of work-related trips annually compared to other provinces (Passenger Transport 2013). The increased population size and movement led to congestion of road transportation, particularly on the Pretoria-Johannesburg highway (Thomas 2013). The movement of people could not be shifted to rail because of the inefficiency and unreliability of the passenger rail network operated by the Passenger Rail Agency of South Africa (PRASA). The demand for an efficient transport network between Pretoria and Johannesburg resulted in the construction of the Gautrain network. The Gautrain is a high-speed rail network owned by Mbombela, together with the Gauteng provincial government. It operates between Pretoria and Johannesburg, as well as Sandton and OR Tambo International Airport.

Various factors influence the ridership levels of the Gautrain; however, it was found that the coronavirus disease 2019 (COVID-19) pandemic is an increasing latent variable that has heavily influenced public transportation (Gautrain 2020:29). Despite the abundance of academic research on customer satisfaction and public transport, there is a lack of research conducted on customer satisfaction during this pandemic (Dong et al. 2021). It is important to understand what customers require in order to provide a service that meets their needs. Measuring customer satisfaction affords an organisation the ability to identify problem areas and devise strategic schemes that will improve service quality (Mongay 2014).

The study explores the underlying theory of customer satisfaction using the service quality (SERVQUAL) model. Understanding customer service is vital for all transport organisations and their ability to be successful. To understand customer satisfaction, an organisation needs to measure how customers choose, sort and analyse data as well as stimuli related to a specific brand (Mongay 2014).

Literature review
The Gautrain and the movement of people

The South African population mostly travels for work, and most people either walk to work or use minibus taxis. According to a survey by Council for Scientific and Industrial Research (CSIR) (2020), 17.4 million South Africans walked to their destinations, followed by 10.7 million people who travelled using taxis and 6.2 million people who used private transport. This study focused on Gauteng province, which accounts for the largest number of people who travel in a week, accounting for 28.2% of the national travel. The modal split shows that travel by train was minimal, accounting for 1.5% of travel in Gauteng (CSIR 2020). With these low numbers of travel by train, it is therefore important to measure customer satisfaction levels to determine the possible areas of improvement to attract more travel by rail.

The corridor between Johannesburg and Pretoria is serviced by various forms of public transport, including the Gautrain speed rail, Metrorail, e-hailing services like Uber and Bolt, minibus taxi services and private car transport. This study is focused on the Gautrain speed rail, which plays a key role in the mobility of South Africa's most densely populated province. The Gautrain contributes to the economic activities of the province through social investment opportunities; it has created more than 30 000 jobs during the planning, construction and operation phases (Gautrain Management Agency 2019). The Gautrain service has been positioned as a convenient transport alternative between Johannesburg and Pretoria, as well as servicing areas in between.

For most of its history, the Gautrain played an important role in shaping the Gauteng City Region. It unites the region's dispersed urban centres of Johannesburg, Pretoria and Ekurhuleni into a highly accessible network. Pretoria Station (Tshwane) to Sandton Station (Johannesburg) takes 43 min, Rhodesfield Station (Ekurhuleni) to Sandton Station (Johannesburg) takes 44 min and Pretoria Station (Tshwane) to Rhodesfield Station takes 31 min (Ekurhuleni) (Gautrain Management Agency 2019). The Gautrain is known for influencing transport and has changed the negative opinions and consumer decisions related to public transport by providing a reliable service, therefore reducing pressure on the road network (Gautrain Management Agency 2019). The Gautrain's competitive advantage is that it provides a reliable and speedy service without disruption, as it is not affected by traffic congestion and has a fixed schedule (Schrenk et al. 2017). The Gautrain relatively has advanced technology which includes self-service stations, a mobile application, short message service (SMS) services and voice announcements (Schrenk et al. 2017).

In the context of this study, it is important to note that the COVID-19 pandemic government regulations permitted rail operators to carry at most 70% of their licenced passenger capacity (South African Government 2021). This resulted in approximately 460 550 fewer passenger trips taken in March 2020, in comparison to March 2019 (Gautrain Management Agency 2020). Owing to COVID-19, Gautrain had 28% fewer passengers in 2020 than in 2019 (Gautrain Management Agency 2020). According to the Gautrain Management Agency (2021), approximately 30 000 passengers commuted daily in 2020.

Customer service and customer satisfaction

Customer service contributes to customer satisfaction and therefore is a critical part of sustainable profitability. Improved customer service leads to increased perceived product quality, increased competitive advantage and ultimately increasing sales and income (Jahanshahi et al. 2011:254). Various industries have different factors of what constitutes a customer service, and their performance of these factors determines if they provide a good or bad service. It is therefore argued that good customer service ensures customer satisfaction and results in a positive customer experience. Therefore, customer service is an important factor in customer satisfaction (Marquardt, Olaru & Ceausu 2016).

Organisations measure service performance for various reasons, for example, management reasons; information gathered in the internal measure of service quality informs managers of areas in need of improvement and can be used to guide their decision-making (Marquardt et al. 2016:98). The measurement of service quality also enables businesses to perform benchmarking to develop a means of differentiation and creating competitive advantage. Quality of services is considered a powerful competitive tool in service-based organisations (Pantouvakis 2010:366). In the context of the quality model applied in this study, according to Parasuraman, Zeithaml and Berry (1985), service quality is described as the variance of consumers' perceptions of services provided by an organisation and their expectations about the organisation's service provided. Because of this potential power of service in differentiation, good service quality is considered a necessary step towards gaining the competitive advantage over other organisations (Boshoff & Gray 2004; Getty & Getty 2003).

Measuring customer service also benefits businesses by revealing their customers' views and perceptions about the meaning of 'good service quality'. Service quality measurement is an important tool for firms in understanding consumer needs and wants, by analysing the customers' perceptions of their experience of the services provided (Getty & Getty 2003). Understanding customer needs will enable a business to anticipate and provide services designed to meet specific needs during and after the service encounter (Pantouvakis 2010:366).
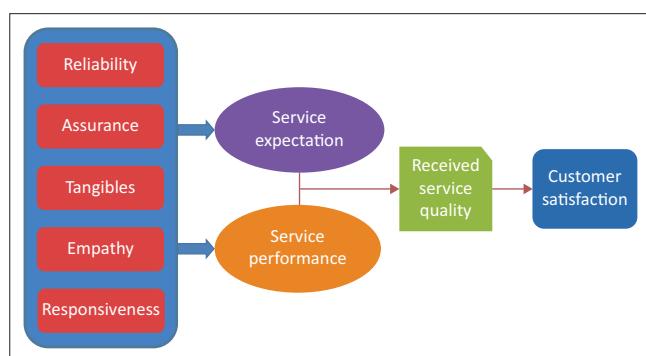
The SERVQUAL model

The use of conceptual models in service quality measure and evaluation enables management to identify quality problems and helps in the development of quality improvement programmes (Seth, Deshmukh & Vrat 2005:913). Various models have been developed to enable companies to measure and evaluate their service performance. The variations in the models developed can be explained by the subjective nature and definition of service quality. Some notable models are the service performance (SERVPERF) and evaluated performance models. Cronin and Taylor's (1992) SERVPERF model is based on performance, a technique that assesses service quality based on the total impression of the customer towards the service. The SERVPERF model is useful for assessing service quality; however, it does not give information on how customers wish service to be delivered in order to determine customer satisfaction. Teas (1993) created the evaluated performance model, which assesses the difference between perceived performance and the optimal level of a service quality attribute, rather than the customer's expectation. This model is useful to address company performance based on a given benchmark or desired performance level.

This study used a classical model termed the SERVQUAL model, developed by Parasuraman et al. (1988). To understand customer satisfaction, Parasuraman et al. (1988) developed a method of measuring service quality; this model uses five dimensions to assess the aperture between service expected and service perception by an organisation, as shown in Figure 1. Customers use the magnitude of the gap to evaluate the quality of an organisation's services. When the gap is small, customers perceive an organisation's services to be of high quality. When the gap is large, an organisation needs to take measures to improve customer satisfaction levels (Mongay 2014).

The impact of COVID-19 pandemic on the Gautrain's customer service

Like all other transport modes, the Gautrain was affected by the COVID-19 pandemic and the resulting regulations. According to Cokayne (2020), the Gautrain Management Agency (GMA) and investors have suffered great economic loss because of reduced usership caused by COVID-19

Source: Parasuraman, A., Zeithaml, V.A. & Berry, L.L., 1988, 'SERVQUAL: A multiple-item scale for measuring consumer perc', *Journal of Retailing* 64(1), 12

FIGURE 1: The SERVQUAL model.

regulations. COVID-19 is a severe acute respiratory syndrome (SARS) caused by the SARS-CoV-2 virus (Marivate & Combrink 2020). To reduce the spread, South Africa went into lockdown and COVID-19 regulations were implemented. To adhere to COVID-19 regulations, the rail system was suspended until level 4 lockdown (Venter & Ndlazi 2020). When the suspension ended, the Gautrain Management Agency (2020:81) stated that only 70% of the train's available carrying capacity was utilised. The decline in commuters has resulted in financial losses incurred by the rail system. As a result, the Gautrain's expansion plans of adding 19 more stations by 2024 were postponed (Venter & Ndlazi 2020).

The Gautrain Management Agency (2020:29) reported that because of COVID-19, the number of passengers in general passenger service (GPS) decreased by 28%, airport service (APS) decreased by 49% and the bus services (BS) followed the same trajectory. This decrease in commuter activity portrays an issue faced because of the pandemic. Tirachini and Cats (2020) highlighted the impact of COVID-19 on public transportation; however, they did not address how COVID-19 has affected customer satisfaction of public transport.

The levels of customer satisfaction with the Gautrain services during the COVID-19 pandemic have not been investigated and are unknown. This study aims to resolve this problem by measuring the gap between customer expectations and customer perceptions regarding the Gautrain service performance during the COVID-19 pandemic. Customer satisfaction is measured using SERVQUAL dimensions, namely tangibility, reliability, responsiveness, assurance and empathy. The study sought to determine the satisfaction levels of Gautrain users during the COVID-19 pandemic.

Research methods and design

This study was a descriptive study aimed to gain an accurate profile of events, persons or situations (Saunders, Lewis & Thomhil 2016:175). A descriptive study was suitable for this research as the objective was to determine the influence of the COVID-19 pandemic on the Gautrain service's user satisfaction. The positivist research philosophy was followed to obtain information about how customers perceive the Gautrain during the COVID-19 pandemic. Positivism is suitable because the study is based on obtaining factual data on the satisfaction levels of Gautrain users during COVID-19. Furthermore, positivism exposes the law of human behaviour while maintaining an objective mindset (Saunders et al. 2016). This descriptive study followed a quantitative methodology and survey design. It was conducted using a quantitative method to allow for greater objectivity and accuracy of results to offer summaries of data that support generalisations about the phenomenon under study (Schrenk et al. 2017).

Data collection

The method used for data collection was a single-method quantitative study, defined as a systematic investigation of

phenomena by gathering quantifiable data and performing statistical or computational techniques (QuestionPro 2021). A survey questionnaire was administered with the aim of measuring customer satisfaction levels of Gautrain users during COVID-19. A descriptive quantitative research was adopted in this study to gain an accurate profile of events, persons or situations (Saunders et al. 2016) Survey distribution included the use of e-mails as well as social media distribution to ensure the widest reach at minimal cost. This method was selected based on the benefits realised, such as reduced time and cost and the ability to collect a large number of responses from many respondents.

This study made use of past studies to obtain reliable literature and empirical findings to aid in understanding service quality and how the SERVQUAL model can be used to measure it (Saunders et al. 2016). The data collection instrument was a questionnaire. The questionnaire consisted of 22 SERVQUAL model questions modified to suit the Gautrain services. The questions were closed-ended to promote easy comprehension and aid in the collection of quantitative data. Respondents completed the questionnaire online, and this allowed conformity with the COVID-19 regulations and allowed for a wider reach. With a confidence level of 95%, a margin of error of 5% and the population proportion being 50%, the sample size for this study was 84 respondents.

Study population and sampling strategy

The COVID-19 regulations permitted rail operators to carry at most 70% of their licenced passenger capacity (South African Government 2021). This resulted in approximately 460 550 fewer passenger trips taken in March 2020 in comparison to March 2019 (Gautrain Management Agency 2020). The low ridership amidst COVID-19 contributed to the sample size of this study. This study had a sample size of 84 Gautrain commuters. A snowballing non-probability sampling method was employed in this study. This framework was selected, firstly, because of a lack of public information such as the list of Gautrain users and because the technique allows screening and filtering of participants to suit the study (Glen 2020). Secondly, respondents volunteer to participate in the study rather than being chosen (Saunders et al. 2016).

Data analysis

Data were analysed using descriptive and inferential statistics. Descriptive statistics are used to aid in explaining and inferring the phenomenon studied, as well as to describe basic features of the data in this study (Schrenk et al. 2017). The purpose is to describe a population accurately and systematically and allow for unassuming interpretation of the data collected, because data were collected from a large population. Inferential statistics are used to aid in reaching generalisations that are beyond the immediate data by making inferences from the sample data as to what the

population might assume or think (Moyo & Musakwa 2016). The null hypothesis is that customer expectations of the Gautrain users will not be higher than perception, owing to COVID-19, and the alternative hypothesis is that customer expectations of Gautrain users will be higher than perception owing to COVID-19. *T*-testing will be used as it is compatible with nonprobability. *T*-test is suitable because it aids in the calculation of the mean and standard deviation (Saunders et al. 2016). Once the quality gap has been established by subtracting the mean score of customer expectations of service quality from the mean score of customers' perceptions, standard deviation can be calculated.

Validity and reliability

To establish reliability, a Cronbach's alpha, or coefficient alpha test, was used. This test is mostly used for testing data reliability (Laerd Statistics 2018), and it ensures that the data collected are usable and conclusions can be drawn from the data. The study's internal validity is structured, and respondents are screened. This study has a Cronbach's alpha value of 0.92, which suggests that the data collected are reliable and can be used to draw a conclusion.

Ethical considerations

The study met all the ethical requirements and ethical clearance was obtained from the Department of Transport and Supply Chain Management at the University of Johannesburg (ref. no. 2021TSCM-0017HON).

Results

The reported results relate to descriptive analysis of questionnaire responses about the satisfaction level of Gautrain users during COVID-19. The inferential results show the levels of satisfaction based on the analyses of each variable and the relationship between these service variables.

Demographics

This study was conducted via an online survey in the province of Gauteng, where the Gautrain rail network operates. The modal age of this survey was 18–25 years (56%) mainly because the survey was shared on social media platforms and used an online form, which made it more accessible to individuals in that age segment (Table 1). Many respondents had been using the rail network for 1 year (16%), followed by 6 years and then by 2 years, at the same frequency (14%). The survey comprised 65% respondents who use it 0–10 times monthly, followed by 13% who use it 11–20 times and lastly by 6% who use it 21 or more times, since COVID-19 started.

Service quality gap

This section presents the results concerning the gap between service expectation and service performance of the Gautrain during the COVID-19 pandemic. With

TABLE 1: Age group frequency of respondents.

Age	Frequency	Percent	Valid percent	Cumulative percent
18–25 years	47	56.0	56.0	56.0
26–35 years	20	23.8	23.8	79.8
36–45 years	12	14.3	14.3	94.0
46–55 years	3	3.6	3.6	97.6
56 years and above	2	2.4	2.4	100.0
Total	**84**	**100.0**	**100.0**	-
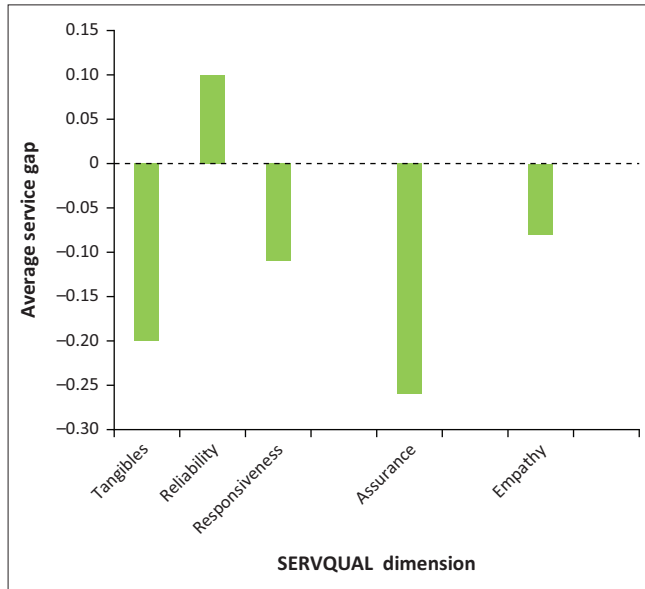
FIGURE 2: Average service quality gap of the SERVQUAL dimensions experienced by Gautrain users ($n = 84$).

Gautrain operations changing because of COVID-19, many respondents' expectations were not met where SERVQUAL dimensions were concerned: tangibles (4.29), reliability (4.20), responsiveness (4.11), assurance (4.11) and empathy (3.99). Based on data from Figure 2, users experienced a negative service quality in terms of tangibles (−0.2), responsiveness (−11), assurance (−0.26) and empathy (−0.08) by the Gautrain. There was, however, a positive service quality dimension that was experienced by users in terms of reliability (0.1).

Dimensions for service quality

This section presents results pertaining to the service quality dimensions that will result in satisfaction among Gautrain users. The results show that assurance (4.37), tangibles (4.31) and responsiveness (4.22) were ranked high as dimensions expected to be offered by the rail service. The high ranking of these dimensions depicts the needs and expectations of users from the rail service. According to the study, Gautrain offered better tangibles (4.29) and reliability (4.20), whereas users expected the rail network to offer better assurance, tangibles and responsiveness. According to Figure 3, customers had higher expectations than perceptions, and the gap seen displays low customer satisfaction levels. The dimensions that Gautrain users found more important for customer satisfaction were assurance and tangibles, which had high scores on the expectations results.
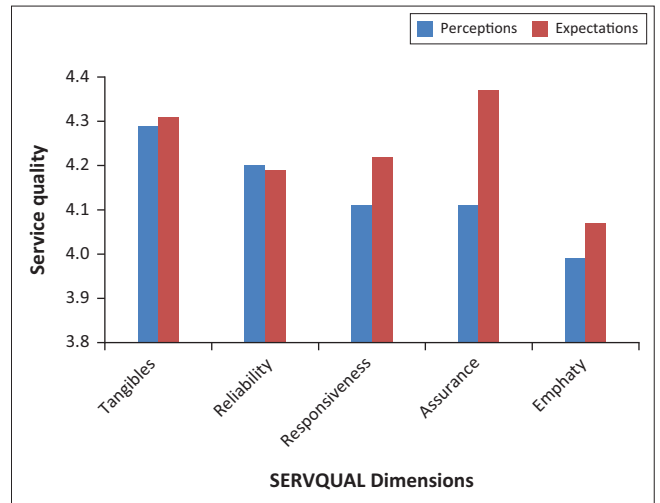
FIGURE 3: Average perceptions and expectations of Gautrain users during COVID-19.

TABLE 2: Pearson correlation.

Variable	Total customer expectation	Total customer perception
Total customer expectation		
Pearson correlation	1	0.858
Sig. (2-tailed)	-	0.000
Total customer perception		
Pearson correlation	0.858	1
Sig. (2-tailed)	0.000	-

$n = 84$.

Correlation of service dimensions

A Pearson correlation, shown in Table 2, was conducted to test the relationship between customer expectations and perceptions owing to COVID-19. Table 2 shows that there is a significantly positive correlation between customer expectations and perceptions: Pearson correlation = 0.858, $n = 84$, $p = 0.000$ ($p < 0.01$). The null hypothesis can be rejected; thus, customer expectations of Gautrain users will be higher than their perceptions owing to COVID-19, which has affected Gautrain's ability to render quality services.

Discussion

This section discusses the results mentioned in the previous section. Firstly, the results of the questionnaire provided extensive insight into customer service levels experienced by Gautrain users amidst the COVID-19 pandemic. In agreement with Balachandran (2018), SERVQUAL is a suitable method of establishing customer satisfaction, and the use of this method aided in understanding customer satisfaction of Gautrain users amidst COVID-19 by measuring expectations against perceptions. The model was easily adapted to this study about Gautrain customer satisfaction.

Gautrain's survey in 2019 showed that its users found the rail network both reliable and assuring as a mode of choice (Gautrain Management Agency 2019). Users aligned with the brand's high customer service (Gautrain Management Agency 2019). However, Figure 2 indicates a distinct perspective shift owing to COVID-19. Service quality of

dimensions such as tangibles, responsiveness, assurance and empathy has been lower since COVID-19 began. Many respondents expected the rail service to offer reassuring services in terms of the SERVQUAL dimension: tangibles (4.31), reliability (4.19), responsiveness (4.22), assurance (4.37) and empathy (4.07). The Gautrain has always been known as a world-class train service (Gautrain Management Agency 2019), and this is backed by faster journey times and reduced waiting times. It was created for people on the move (Gautrain Management Agency 2019); hence, most respondents had high expectations which arose from past experiences and the Gautrain's brand alignment.

During a study by Veloso and Monte (2019), it was established that in the passenger rail sector, reliability was highly valued by users; however, the results of this study show that assurance and tangibles are highly valued by users. During this pandemic, users needed information about the train schedule displayed clearly and communicated effectively. Furthermore, users required information about how the Gautrain is adapting its services owing to the COVID-19 pandemic. The study by Veloso and Monte (2019) did not consider rail users' needs during a pandemic. These results indicate that rail users regard different dimensions as important depending on the situation at hand. The GMA schedule performance shows that service availability has declined with train availability at 90% and punctuality at 94% (Gautrain 2020). The Gautrain records late arrivals of their trains to be 1528 within the year and scheduled trips to be 84 388.

Thomas (2013) reported that the Gautrain was created to offer users high-quality services. Many users experienced a negative service quality in terms of assurance, tangibles, empathy and responsiveness. Users ranked the rail network low in terms of consistency, knowledge to answer queries and confidence during this pandemic. The more unassured users are, the more likely they are to use a different mode of transport or their own cars to move between Pretoria and Johannesburg. Overall, it can be stated that the current customer perception of the Gautrain can be seen as negative by customers, and this can be attributed to the relatively high standard and performance record of this service prior to the COVID-19 pandemic. Overall, the perception of the service was lower than the expectation in four out of the five dimensions. A study by Khorshidi, Nikfalazar and Gunawan (2016) concluded that reliability was the dimension customers viewed as important for quality service. However, this study indicates that assurance is the highest dimension valued by customers for quality service. The contrast in the studies could be because of the current times. Users need assurance from the Gautrain amidst COVID-19. The results of this study indicate that a service provider that offers assurance, tangibles and responsiveness is highly regarded by users.

A survey by the Gautrain Management Agency (2019) indicated that users associated the rail network with being reliable and responsive. Furthermore, it was voted the mode of choice when moving between Pretoria and Johannesburg

(Gautrain Management Agency 2019). This study indicates that users experienced service gaps, which depicts dissatisfaction. The decrease in commuter numbers was because of people driving their own vehicles to work because of the fear of contracting COVID-19 on public transportation (Digvijay et al. 2020). Regulations of COVID-19 on capacity and curfew also caused a decrease in the Gautrain's ability to maintain high levels of responsiveness and assurance. To improve customer satisfaction, the organisation must reduce the evident service gap. The study indicates that passengers expect convenient operating hours, safe transactions, neatly dressed employees, information on service schedules and services performed as promised. The results of this study indicate that Gautrain operators need to improve services in all dimensions, especially assurance and responsiveness, by properly planning, prioritising services and reviewing processes with customer expectations in mind.

Theoretical and managerial implications

To boost service levels, Gautrain should focus on providing services when and as promised. This will improve satisfaction among users. The GMA experienced lockdowns during the year and uncertainty during the COVID-19 pandemic. The uncertainty of COVID-19 reduced the assurance of passengers on service quality and therefore affected their customer satisfaction. The Gautrain App should be adapted with real-time information each day. Having health care professionals at their stations and videos on the app will offer better assurance to users. These health care workers can talk about COVID-19 and how to minimise contamination. The app can be used for inquiries and any other queries 24 h a day, 7 days a week. Improving communication will improve the confidence of users about the rail network.

Conclusion

The Gautrain rail service plays a significant role in people's lives by relieving the pressures of traffic as well as allowing for faster and more efficient travel between Pretoria and Johannesburg. The study has identified a gap that exists as a direct result of the impact of the COVID-19 pandemic on the rail industry. It was found that expectations of the users of this service were higher than their perceptions – indicating that customers are experiencing a low service quality. This also highlights that there has indeed been a negative impact on the rail industry by COVID-19 and that operations have been disrupted to some extent. Appropriate measures must be put in place to turn this around, considering the importance of this service to users.

Limitations

This study was focused on customer service perceptions, which required inputs from individuals who used the Gautrain as a transportation service, and this was limited by the lockdown restrictions put in place by government. The research sample size ($n = 84$) is of quality and proved informative; however, such a limited number of respondents may not

provide full representation of all users of the Gautrain. An extended time horizon may have allowed for further analysis and the potential for a larger group of respondents, thereby improving the results and providing a wider representation of perceived service quality. Furthermore, conducting this study only online was a limitation. Only Gautrain users with social media presence were able to partake in it. The study was based on high-speed rail and the results of the study might not apply to a different type of rail system. Lastly, the questions were closed-ended, and this limited their depth. Therefore, Gautrain users could not express their views in detail.

It is worth noting that the adaptability of the SERVQUAL model allowed for specific extraction of information from users, which enhanced the feasibility of this study. The model served the purpose of meeting the requirements of this research and allowed for greater flexibility in structure, which led to the ability to make solid and supported conclusions.

Recommendations for future studies

Future studies could focus on measuring the customer satisfaction levels for the Gautrain after the COVID-19 pandemic. A study of this nature would allow a comparison of satisfaction levels during the COVID-19 pandemic and after the pandemic, as such a comparison would verify the true impact of the COVID-19 pandemic over customer satisfaction levels of the Gautrain. Further studies can also focus on measuring the customer satisfaction levels for other transport forms, such as the bus rapid transport (BRT), minibus taxis or bus transport during the pandemic. This would strengthen the external validity of findings.

Disclaimer

The views and opinions expressed in this article are those of the author and do not necessarily reflect the official policy or position of any affiliated agency of the author.

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