

An Investigation of Information Communication and Dissemination Needs: Case of Gautrain Operations

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1 ABSTRACT

Public transport plays an important part in the way people move around their communities. Information dissemination concerns the process of conveying information through Intelligent Transport Systems from transport operators to commuters. Correct and timely dissemination is essential to maximize operational efficiency and reduce the effects of disruptions. Public transport operators often concentrate on the technical aspect of services while commuter needs are neglected. The Gauteng province has been making efforts in the pursuit to improve mobility; a case in point is the Gautrain. The Gautrain is the first mass rapid rail transit system in South Africa and the first in Africa. Although much effort has been made there has not been much effort in understanding the information dissemination needs of commuters. The study aimed to identify information communication and dissemination (ICD) strategies of the Gautrain and evaluate the effectiveness of those strategies. It then described the impact of information dissemination needs also analysing the level of smartness in those aspects. Questionnaires and key informative interviews were conducted in order to obtain the user's perspectives and understand their information needs. The results reveal the various dissemination tools used by the Gautrain Management Agency are the Gautrain App, Social Media and Interactive Public Information Displays among others are utilised as tools to communicate with their commuters. Indicators were selected in order to measure the level of smartness on the Gautrain ICD strategies, which indicated that Gautrain was partly smart. The research highlighted how ICD strategies can enhance the overall improvement in public transport and influence user satisfaction. Lastly, the study also highlights some challenges public transport agencies face in providing adequate information to commuters such as policy disputes and demand.

Keywords: Smart mobility, Public Transport, Intelligent Transport System (ITS), Information Communication Dissemination (ICD), Public Information Displays (PIDs), commuters, Gautrain

2 INTRODUCTION

The South African public transport system over the years has seen immense changes from the Apartheid era up till the present day. Many residents were forced into areas that were far away from job opportunities and essential facilities needed for their livelihood. Transport, in particular rail was seen as integrating these areas with the city and most importantly transporting individuals to their places of work (Walters, 2013). Rail offered a more effective means of moving large numbers of people as compared to other modes of transport and was able to connect the spatially fragmented apartheid city. The South African transport system has since progressed and in times progress is evident in terms of the type and quality of public transport that is available. The introduction of bus rapid transport (BRT) and high-speed rail in the form of the Gautrain in cities such as Johannesburg and Tshwane has shown that there is progress. The Gautrain in particular was seen as "the key to future transport" as this was Africa's first. Rail transit added a new dynamic to the South African transport system and has since changed the face of public transport in the country. However, challenges continue to cripple the growth of the South African transport sector like the lack of a holistic approach towards public transport, lack of sustainable funding to achieve desired policy objectives and lack of skills to effectively monitor policy initiatives. The immense public pressure to radically advance public transport accessibility, reliability, efficiency and safety was a challenge especially because of the introduction of e-tolls on the freeways (Walters, 2013).

The advancement of urban areas brought numerous issues and challenges, such as trying to find means of reducing pollution and planning for sufficient transportation systems that would meet the consistent population movements, and should focus on improving the performance of public transport services (Bubeck, Tomaschek, & Fahl, 2014; Musakwa & Gumbo, 2017)). As a result there was a need to plan cities

in a new way through smart city concepts. Smart cities are a representation of a multidisciplinary field constantly shaped by the developments in technology and urban developments. The smart city buzzword is attracting city leaders around the world often being associated with Information Communication Technology (ICT). The smart city concept drives the user satisfaction narrative. The word smart city is a self-sufficient city that is resilient and uses Information Technology as a force to transform cities to be savvy for the people who live in it (March, 2017). The smart city is from the idea of intelligent city including the connection between urban space and development relating to issues such as e-government, social learning and provision of ICT structures Castells and Hall, 1994; Komninos, 2002, Hollands, 2008). What is definite is that smart city is a diverse field that is shaped by the progression in technology and the influence it has on the urban development. The smart city narrative has various concepts to it such as smart governance, economy, mobility and environment. Smart mobility also stems from the smart city concept with more focus on transportation. It is seen as a way to reduce pollution due to traffic congestion by creating a reliable transport efficient and reliable public transport systems in order to increase safety and overall commuter satisfaction. Smart mobility involves the use of ICT in the form of mobile applications, social media, public information displays (PIDs) in order to support effective transport routes and for commuters to be able to engage effectively with transport operators or agencies more effectively (Longo et al., 2013).

Smartphones allow users to access travel information about their travel, view where others might be in their social network and share information (Dickinson et al., 2015). Application developers have recognised this potential and as result there has been great developments in a range of apps that determine, track users, share travel information and provide real time public transport information as they enable access to data resources that were once perhaps difficult to access (Dickinson et al., 2015). Smartphones are the ideal travel instruments as they can be used on the move and to share, access information on travelling (Dickinson et al., 2014). The trend of applications has been focused more on travel information and route planning. However, more recently transport companies have developed apps to facilitate a more collaborative use where commuters may purchase tickets in advance through these mobile apps and use their smartphones as tickets.

Similarly, in the 21st social media has transformed the way people interact and share information in essence the way individuals communicate (Musakwa, 2014). Social media platforms are web-based services that enable people to disseminate and receive information in real time. Social media may be used for various functions such as promoting businesses, for customer relations and for real time information notices (Cottrill et al., 2017; Rashidi, Abbasi, Maghrebi, Hasan, & Waller, 2017). For this reason the use of social media grows day by day and various sectors have begun to take social media marketing seriously as they are able to reach a wider audience through this medium (Gal-Tzura et al., 2014). The core purpose of social media use across organisations is information sharing and updates, advising the public on travel disruption, handling travel queries, and responding to queries and messages. Giving information and updates and generally informing users on issues and processes of transportation system. Updating the public on delays and disruptions are essential aspect that many organisations particularly those involved with the scheduling, ticket sales and timetables. Real time Public Information Displays (PIDs) are prominent features for traveling. These systems show real-time information by providing features such as next departure of trains and buses at stations and stops. Research has shown that commuters appreciate this kind of information and the installation of PIDs is significantly to improve traveller information and the quality of service.

Understanding Information Dissemination (ID) is a requirement for customer satisfaction. Information Dissemination can be defined as a process of conveying information either through Information Technology Systems (ITS) applications from operator to partner (regulator or agency) to commuters. ID is an important aspect where people make decisions by accessing real-time information, in awareness of upcoming problems because it modifies people's behaviours. ID can essentially be utilised in 3 ways, disseminating for awareness, action and understanding. Correct and timely dissemination is essential to maximize operational efficiency and reduce the effects of disruptions. Public transport operators often concentrate on the technical aspect of services while commuter needs are neglected. It is essential to understand information communication and dissemination needs to help improve user satisfaction not only to increase ridership but also provide a smart public system that is reliable, convenient and accessible that will also encourage people to use public transport. The study aim was to identify ICD strategies of the Gautrain and evaluate the effectiveness or smartness of those strategies.

3 STUDY AREA

The study area is Gauteng Province, South Africa, which is the economic hub of the country and the fastest growing province in terms of the economy, development and population. The Gautrain operates in three metropolitan cities in Gauteng namely the City of Tshwane, the City of Johannesburg, and the City of Ekurhuleni. These and are the only cities in the country which have a rapid transit train (see figure 1 below).

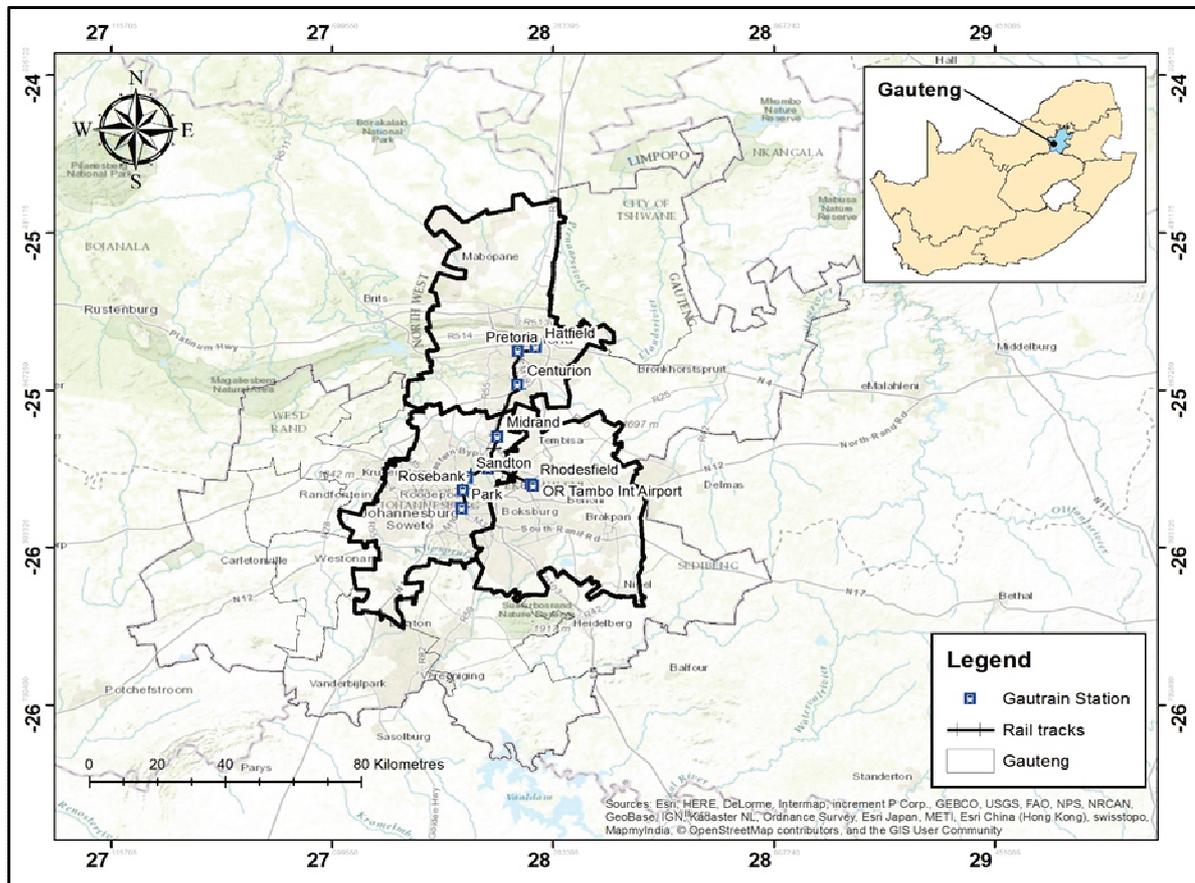


Fig.1: Location of the study area

3.1 The Gautrain Rapid Transit

Gautrain is Africa’s first rapid rail system and is located in the Gauteng province of South Africa (GMA, 2014).



Fig. 2: Gautrain transit. Source (GMA 2013)

The Gautrain project was initiated in 1997/1998, but was formally announced in the year 2000 by the premier of Gauteng. The project was created as a government initiative for strategic economic infrastructure. It officially started operating on the 8th of June 2010. The Gautrain project serves as an integrated network between 3 metropolitan cities in Gauteng namely, City of Tshwane, Johannesburg and Ekurhuleni. The purpose of the Gautrain project was to ease the traffic congestion between Pretoria and Johannesburg but also to offer a more reliable transportation system to the general public (GMA, 2010a).

4 STUDY METHODS

The research study is a survey and utilises both quantitative and qualitative methods. The study seeks to investigate user experiences and understand their information and dissemination needs. A questionnaire consisting of both open and closed questions was developed through Google forms and was administered through Gautrain social media pages (Facebook and twitter). One key informant interview was conducted with key personnel from the GMA to identify various strategies that the GMA utilises to communicate with their users. Secondary data in the form of reports from Jan 2015- Dec 2016 was also gathered. Data collected from questionnaires was analysed using Google forms and converted into statistical representations (graphs and charts). Other various analysis techniques utilised was content, narrative, statistical and time series. Echo-echo was also another essential analysis tool used to analyse Facebook and twitter feeds from the Gautrain. The study also utilised observation and the study period was from 2010-2016.

4.1 Indicators

In this study a number of indicators were chosen in order to make comparisons on smart mobility and determining the level of smartness of the Gautrain namely; Public Mobility Systems (PMS) and Public Transport Support System (PTSS). PMS consisted of SMS service; mobile app, PIDs and social media and PTSS consisted of electronic bus stop sign, electronic ticket payment system. Various studies have used indicators to measure and evaluate the performance of various sectors, including mobility (Garau et al., 2016). The two variables that were identified were utilized to analyse and make comparisons on smart mobility regarding Gautrain. Indicators were selected in order to identify and examine the current state of ICD in Gautrain and also assist in identifying strategies utilised for information dissemination.

5 RESULTS AND DISCUSSION

5.1 Public mobility systems

These are systems in place that are there to assist commuters in their travelling. They consist of a number of the SMS and voice announcement, Public information Displays and mobile apps.

5.1.1 SMS service and voice announcements

The SMS's service has become a widely used tool to disseminate important information to commuters and is utilised by the Gautrain as a means of informing their users should any issue arise regarding any operational issues. The Gautrain utilises voice announcement as a means of communicating with their users. These give information on the arrival and departure times of the train, notice of any delays or any other issues that might hamper the commuter's safety and also caters for people with impaired or blind vision as they can hear the announcements being made. Voice announcement is a reliable means of disseminating information, as it is real-time and common worldwide in various modes of public transport. Nevertheless the voice and sms service is a one-way form of communication, which does not, allows commuter feedback.

5.1.2 Mobile app

The study revealed that 51,6% of commuters was using the app to plan their trips and 48,4% did not utilise the app. This meant that they don't use the app at all. The official Gautrain mobile App was developed by AfriGIS, which provides commuters with what they need to know about Gautrain and with the live bus route information. Some of the features included in the app are the user-friendly interface, finding the nearest Gautrain station and bus stop, bus tracking system, map view displaying all the Gautrain stations, bus stops and routes, trip planner to and from all different Gautrain stations, calculate estimated trip fares including parking and bus fares. The Gautrain is currently running on all major Smartphone and tablet devices including Android, Blackberry, iOS and Windows phone 7. Significant utilization of smart mobile

applications can be potentially very beneficial, particularly in car travel mode to reduce travel time, cost, and vehicle emissions. This is due to the fact that car travel is the dominant mode of transportation in most urban cities around the world. However the mobile app struggles with providing real-time information thus it can be regarded as being largely static

5.1.3 Public Information Displays (PIDs)

The survey revealed that 73,3% was aware of PIDs while 26,7% was not. It indicates that most respondents are aware that there are Public information Displays. Public Information Displays (PIDs) provide new possibilities for transportation companies to provide information at different stages of the journey. Public displays with interactive functionality provide the opportunity to support different users in their interaction, through specific support functions by providing information on schedule, calculate fares and train and bus routes. Gautrain has public information kiosk that offer users with the type of information they would need for their trip (see fig. 3). These kiosks are more engaging than the traditional PIDs on the train station. There needs to be more of these PIDS put at various stations to increase usage.



Fig 3: PIDs kiosk

5.2 Public Transport Support System

The concept of public transport support systems is a well-defined and professional field and can be defined as (geo) information technology-based instruments that are dedicated to support public transport systems (Geertman, et al., 2015).

5.2.1 Electronic bus stop system

The Gautrain busses do not possess any electronic bus stops, which can provide commuters with specific information about their journey. In order to avoid confusion about the location and incoming bus services, electronic bus stops signs may be seen as an essential element for public transport. In order for Public transit system in Johannesburg to reach smart city status there is an urgent need to invest in these smart and informative electronic bus stop signs. As a result commuters can wait indefinitely without knowing when the next bus comes.

5.2.2 Electronic Ticket Payment

The Gautrain electronic ticketing system is a cash-free ticketing system that uses reloadable smart cards. The smart cards are obtained at the self-help ticket vending machines or a manned ticket office in each station in order to pay for the train and/ or bus trips (see fig 4). Gautrain offers an average of four automated machines

per station where commuters can load money on the smart card. This system is smart as it reduces paperwork and ensures that if the smart card is lost the card cannot be reused if the commuter had registered and can even recover the money in the card (Gautrain, 2010b).



Fig 4: Gautrain ticket system

6 CHALLENGES

Public Transport systems, notably bus and rail, are undoubtedly important parts of the transport operation. Continuing challenges of public transport are identified in various sectors such as safety and security, population growth and the inability of cities and transport systems to cater for that demand (Miller, 2013). The role of ITS today has transformed an entire generation in the way public transport companies can share important information with users. However, the reluctance of transport agencies to invest in such concepts can be seen as a setback for public transport and hampers the potential growth of the transport sector. Gautrain has made various efforts in ensuring their information strategies are set in place to encourage commuter engagements, but do not have suitable plans in place that will be able to cater for information communication needs in future. This is a challenge in many public transport systems today, the inability to have proper strategies in place for future developments and in that regard there is a need for re-learning as public transport agencies need to be forward-thinking and constantly investing in measures that will improve their systems so as to have a more flexible, efficient and smart public transport system.

7 CONCLUSION

Public transport is a key feature in sustainable growth thus, it should be properly designed to be flexible and meet the continuously changing demands in cities. Understanding the needs of passengers is an important factor in the level of satisfaction of users. The findings from this research highlight the various information communication and dissemination strategies of the Gautrain that are categorised in terms of Public Mobility Systems and Public Transport Support Systems. These consist of information dissemination strategies that are utilised as tools of communication from operator to user and support systems that aid the user in travelling. Although Gautrain has since implemented these mechanisms they are still faced with challenges in planning for future ICD needs of commuters, and as a result there is a need for re-learning. Proper evaluation and planning of ICD needs can assist transport companies in understanding their customers, expanding their brand and potentially attracting more people into using public transport. Moreover, in order to reach an efficient and smart public transport system, effective collaboration from various organisations should be shared. It is important to note that collaboration involves values such as understanding the motives and roles of each party, mutual respect and engagement. Creating real value in collaboration or co-action is an important theoretical task, which requires action and active learning. Users are an important feature in public transport. Innovative solutions are needed to find forms in which passengers' experience can be used.

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