Measuring Staff Availability in Public Transport: The Case Study of Tyne and Wear Metro

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Abstract. Despite its importance, the definition of staff availability and the components affecting staff availability are still unclear for public transport users. This paper investigates how public transport users define staff availability and the elements related to it. The case study for this paper is Tyne and Wear Metro. The method chosen in this paper was the focus group discussion to give more in-depth explanations from users. The focus group discussions generated keywords, which then are analyzed by its recurrence and emphasis. Based on the findings, this paper has found the definition of staff availability as the combined attributes of staff presence and quality. This paper also has identified the components of staff availability, and the most significant element is staff presence.

1. Introduction
Public transport has many impacts on urban life in the cities. Thus, it requires to provide a good quality of service to the public. To maintain proper services, public transport operators need to consider several aspects, including staff aspects. Most public transport users wanted significant staff aspects from the operators, such as the gentleness of staff[1]. Although the kindness of staff may not be the most influential factor in the quality of services, users in some categories feel the importance of it. Hence, public transport operators may assess their quality of services, including staff aspects.

To understand their quality of service from the users, public transport operators use periodic customer satisfaction surveys. One of the public transport operators that use regular customer satisfaction surveys is Tyne and Wear Metro operator in Newcastle upon Tyne, United Kingdom. The study includes questions on one of the staff aspects, such as staff availability. Unfortunately, on average, staff availability has become the worst scoring aspect in the survey since November 2013. Compared to other elements, Tyne and Wear Metro users scored poorly on staff availability in the customer satisfaction survey in consecutive periods averaging 5.5 out of 10.

This phenomenon attracts questions about how public transport users perceive staff availability. It may come from the lack of a basic understanding of staff availability itself. This inadequate awareness may also reflect on how limited past studies mentioning staff availability in transport are. One study observed staff availability as part of facilities in transport operators[2]. Staff availability is among the qualitative factors influencing the reliability of transportation. Although the study revealed the influence of staff availability on dependability, it only explained staff availability as part of transport operator facilities. The study did not have any method or process to explore the basic understanding of staff availability.

Another past study stated that staff availability is a part of principles relating to treatment provided to transport users. Staff availability also has several indicators, including information from staff and staff behavior [3]. However, the study did not present a clear definition of staff availability regarding its relation to the indicators as well. There was no method in the study to confirm the elements of staff
availability based on users’ perspective either. Furthermore, there is no information on which one of these components has a more significant impact on staff availability. The study did not explore the possibility of other components influencing staff availability beyond those two components as well.

![Score of Aspects in Tyne and Wear Metro Survey](image)

**Figure 1.** The Score of Aspects in Tyne and Metro Survey

Therefore, this paper evaluated the general understanding of staff availability from public transport users using focus group discussion. The essential knowledge included how users grasp about staff availability in the basic sense, such as the definition. Knowing the fundamental idea of staff availability may improve the actual performance of operators. This paper also explored the components affecting staff availability in transport. It studied what kind of aspects or elements relating to staff availability based on users’ perspectives. The importance of each factor of staff availability is also significant to understand. It may help operators prioritize improvement in certain aspects of staff availability.

This paper has a research purpose of determining the definition of staff availability among public transport users in the case study. This paper also aims to find the components relating to staff availability, including the most critical element. The arrangement of this paper consists of four main sections. The introduction section sets the background and the purpose of the research. The second segment elaborates on the case study and the research methods used in this paper. The third section follows to explain the data collected and discuss the result from the data. The last part concludes the research with answers to the research purposes.

2. **Case Study and Methods**

2.1. **Case Study**

Tyne and Wear Metro or the Metro is one of the public transport services in the Tyne and Wear area. Most structures of the Metro have remained for more than 30 years, and some other old buildings dated back to the Victorian era. The Metro was one of the first light rail transit in the UK that were initially from the major rail network[4]. More than 30 million passengers use the Metro annually in the population of more than 1 million in the North East of the UK.

The network of the Metro has stretched for more than 70 km long around Tyne and Wear Area. It comprises several regions, such as Sunderland, North Tyneside, South Tyneside, and Gateshead. The operation of the Metro uses Grade of Automation Level 1 (GoA 1) with train drivers assisted by the Automatic Train Protection (ATP)[5]. The train driver manages all systems on the train, including driving trains, stopping trains, and opening-closing doors. ATP is fitted in the scheme to prevent accidents by using the automatic braking application.

In more than 50 stations, Nexus, as the operator, has recruited the Metro staff to provide adequate services for passengers. There are several types of employees in the Metro services, such as train drivers
and station cleaners. However, no permanent staff is available on most of the Metro stations[6]. The Metro has implemented automatic services in some of its systems, including the self-service ticketing machine and automated turnstiles. Thus, there is no need to put more staff in their existing structure.

Furthermore, there is a plan to upgrade the operating system of the Metro into more sophisticated technology that may bring more automated systems in the future. This system may involve even less operational staff to manage the services; hence, this has attracted negative responses and refusals from people[7]. People still have some concerns relating to safety regarding automated systems implemented in future operations.

2.2. Methods and Data Collection

Qualitative method is one of the most suitable research methods since it explores underlying meaning or definition also insights from experiences of people[8]. To explore more in-depth opinions and experiences from people, focus group discussion is one of the best qualitative research tools. Focus group discussion is an economical, valid, quick, and convenient method to do compared to other qualitative methods. Data from the qualitative approach may be in the form of explanations, observations, and words.

After deciding the right technique, it is also crucial to set the research plan[9]. The research plan starts with the purpose of research, which is finding the definition of staff availability and the components related to it. The sample population is then decided based on the case study, and Newcastle University’s students using the Metro can be the sample population. Three groups can be accepted as the minimum number of focus group sessions as it can be comparable to each session.

Table 1. Question Route of The Research

| Type of Question          | Question Samples                                                                 |
|---------------------------|----------------------------------------------------------------------------------|
| Opening Question          | “Please tell me your name, your occupation, and your favorite mode of transport.” |
| Introductory Question     | “What is the first thing coming to your mind when you hear about public transport staff?” |
| Transition Question       | “Please share your experiences communicating or interacting with public transport staff.” |
| Key Question              | “What can you define regarding staff availability?”                               |
|                           | “What is the most important component of staff availability?”                     |
| Ending Question           | “What would you suggest to improve staff availability?”                           |

Another step to prepare is the question route as the focus group needs to achieve the purpose of the research through it. The question route comprises four different types of questions, such as the opening, initial, transition, essential, and ending questions [10]. Opening, introductory, transition, and ending questions are the bridging questions to get the idea from the key issues. There are two critical questions in this paper. The first key question or KQ1 discussed the definition of staff availability, and the second key question or KQ2 explored the components of staff availability also the most critical components.

Preparation and organization of focus group discussion are vital to do in this research. A focus group generally requires six to ten persons for each session[11]. The preparation starts by setting the initial schedules for the focus group, then the invitation process of potential participants can start. The invitation covered the aim of the research and the proposed schedule time for the focus group. As a result, there were three separate sessions of focus groups consisting of 24 persons in total. Audio recording devices recorded the whole conversation during focus group sessions.
2.3. Data Analysis

The findings from the data collection process become the basis of the data analysis. The transcription-based review is one of the data analysis methods for the focus group discussion. This method using transcripts from the focus group is one of the most accurate methods for the focus group analysis. The transcripts can become vital data for data analysis[12]. Compared to other approaches, the transcription-based analysis has become one of the most thorough methods for data analysis since it uses audiotapes rather than notes or memories. The memory-based study only recalls the events of the focus group, which is prone to errors.

One of the most appropriate approaches after the transcription process is the classic analysis strategy. It is one of the most common methods to find the theme and to categorize the results[13]. It is also known as the long table approach since it usually needs a long table to carry out the analysis. The benefit of this method is its straightforwardness since this method does not require sophisticated technologies involved. It is also a great technique as it delivers the analysis without much hassle.

The long table approach requires simple preparations, including two copies of transcripts, scissors, tapes, colored marking pens, and used newsprint papers. The plan then commences with cutting the transcripts into individual quotes and group it based on its relevance. The process then continues to arrange the quotes into separate focus groups. The quality and significance of each group may vary for some reason. Some unrelated comments that do not accurately answer the questions may stay in the piles for future references.

The first step of the process is to read the quotes regarding the queries. After that, the process continues by checking whether the quotes may answer the questions. If the quotes answer the exact questions, the quotes then can be checked whether it gives an essential answer or not. Lastly, the last step is to examine whether the quotes are already mentioned previously or not. This step should process all fundamental questions, and it will conclude the process of a long table approach.

After closing the process, determining the frequency and the emphasis of each comment is the next step. Firstly, the occurrence is one of the most common factors deciding which phrases or quotes are more critical than the other. Although the frequency may not be the sole factor in qualitative research, the occurrence of some phrases may suggest how important these matters for the participants. How specific participants describe their opinions may also play a significant role in deciding the importance of words. The emphasis that people gave may indicate how people relate their experiences with the phrases used. These two factors are the factors determining which factors are more important than the other one.

3. Result and Discussion

3.1. Result

Two critical questions defined in the question route are the basis of the overall research results. These fundamental questions discussed the definition of staff availability and the most significant components of staff availability. The critical phrases generated from the quote of participants would be the main results of this paper. In the KQ1, the focus group asked the participants about what they can define regarding staff availability. Most participants gave at least a phrase, while several participants elaborated longer with their opinion and personal experience about staff availability. Nevertheless, few participants stated that they never heard about the staff availability before this focus group discussion, and they mainly had no opinion on this matter.

Based on the conversation of KQ1, the presence of staff was one of the most frequently mentioned phrases in KQ1. One participant stated as follows: “I think it is a bit more reassuring if there is human presence somewhere. Like a visible human being.” Another participant believed that the presence of staff is personally essential for them. Other participants pointed out that the presence of staff is related to the right timing. He added that there is no point in employing operation staff without knowing when to deploy them.

Another phrase frequently stated in the KQ1 is the quality of staff. Even though it is also often mentioned, fewer participants got the idea regarding the excellence of employees compared to the
presence of staff. One participant said that the users need qualified personnel that has excellent communication, skills, and knowledge. He believed that those characteristics are strongly related to the quality of the staff. Another participant added as follows: “I would rather choose the quality because too many staff do not help us about many things.”

Several participants mentioned the number of staff during the discussion of KQ1. They felt the number of staff might be related to staff availability. However, some participants disagreed and stated that they are content as far as they can find the employees. Another participant also believed that the number of staff is not directly related to staff availability. He stated that it depends on the size of the station, even the timing. A few participants also said several different phrases in the discussion of KQ1, such as information from staff and on-train staff. One participant noted that the knowledge from personnel influences how people ask questions in the station; hence, it is related to staff availability. Another participant said regarding the on-train staff as follows: “I feel comfortable at night in the Metro if there is a security in the train.” Several participants in the focus group briefly discussed these two phrases.

After the discussion of KQ1, the focus group questioned the participants about KQ2 regarding the most significant component of staff availability. Key phrases stated by the participants again are the main talking points in the KQ2. Several key phrases mentioned in the KQ1 were expressed once more in the KQ1 while there were new phrases discussed in the KQ2. However, participants also seemed not to recall phrases in the KQ1, such as information from staff and on-train staff.

Many participants in various focus groups stated that the presence of staff might be the most significant component of staff availability. The presence of staff became the most mentioned phrase regarded as the most crucial component in the KQ2. One participant stated as follows: “The staff attendant is the most important. They must know how to help.” Another participant added that if the staff are there to help, the users can easily ask anything. Safety concern was also one of the main talking points for one participant why the presence of staff is the most critical component.

At the same time, the quality of the personnel was also the most significant component of staff availability for some separate participants. One participant believed that quality matters the most when it comes to the interaction between staff and users. Another participant emphasized the importance of quality of staff as follows: “The quality means they (staff) should be friendly, very informative, and eager to help passengers.” However, one participant could not decide whether the quality or the presence is the most important since both are interrelated.

Some participants mentioned the number of staff, although fewer participants took part in the discussion. When asked whether the number of staff is the most significant component, one participant claimed as follows: “Yes, because I will not like to queue up for information.” Nevertheless, most of the participants declined to confirm this claim. One participant compared the number of staff to the presence of staff and still felt the presence of personnel is way more important. Other participants stated that there is no point in adding more staff since there is no benefit in having two employees working the same thing. He said as follows: “My personal view is that it is better if there is a human (staff) presence there.”

Several new phrases were never stated in the KQ1 as well, such as the purpose of staff, helpfulness, and knowledge of the personnel. While several participants newly mentioned these phrases, only a few participants believed that these phrases are the most significant components of staff availability. One participant thought that the purpose of the staff is related to the responsibility of personnel influencing how the employees would work. A minor number of participants also stated they might consider the helpfulness and the knowledge of staff as the most significant components without much reasoning.

3.2. Discussions

The discussion of results focuses on the results of the two key questions. The phrases mentioned in the response from participants during KQ1 and KQ2 may become the components of staff availability. In the KQ1, the participants discussed the definition of staff availability. When asked about the definition of staff availability, no participant seemed to have the exact meaning. It may imply that staff availability is still unknown for most participants. Although some participants gave words and phrases related to staff availability, there is no visible evidence that participants have a clear definition of it.
Table 2. Summary of Key Phrases Mentioned in Each Key Question

| Key Phrase          | Key Question 1 (KQ1) | Key Question 2 (KQ2) |
|---------------------|----------------------|----------------------|
| Presence of Staff   | √                    | √                    |
| Quality of Staff    | √                    | √                    |
| Number of Staff     | √                    | √                    |
| Information from Staff | √              | ×                    |
| On-train Staff      | √                    | ×                    |
| Helpfulness of Staff | ×                  | √                    |
| Knowledge of Staff  | ×                    | √                    |
| Working Hours of Staff | ×              | √                    |

From the discussion of KQ1, most participants put much attention to the presence of staff. Some participants would mention it a few times in the focus group, and the others seem to add more information to it. Hence, it may suggest that the presence of staff is strongly related to staff availability. Many participants mentioning the presence of staff would give explanations and reasons for staff availability. Based on the emphasis, it may indicate that the presence of staff may have a stable relationship with staff availability.

The quality of staff also caught some attention for several participants in the KQ1. Some participants frequently stated it about staff availability. It may indicate that the quality of staff may be related to staff availability. Compared to the presence of staff, fewer participants mentioned the quality of staff regarding staff availability. However, these participants seemed to give more explanations based on their experiences. It may suggest that the quality of staff is closer to the personal experience rather than a deep relation.

While the number of staff was also frequently mentioned by the participants, there were a significant number of participants with conflicting views from the participants discussing it. It may infer that the number of staff may be strongly related the staff availability. Some other participants also discussed other phrases like information from staff and on-train staff, yet there were only a small number of participants discussed it. It may suggest that staff availability has a relatively weak relation to these phrases.

To conclude the KQ1, the definition of staff availability is found based on the results. The presence of staff and the quality of staff may be the two strongly related components compared to other phrases. Other phrases, like the number of staff, information from staff, and on-train staff, were also considered. Nevertheless, these phrases may not be strongly related to staff availability, and it may be sensible not to put these phrases in the definition of staff availability. Finally, the definition of staff availability is the combined attributes of the presence of staff and the quality of staff.

The most significant component of staff availability was the main discussion in the KQ2. All phrases in the KQ1 and the KQ2 may become the component of staff availability. Previously mentioned phrases, like the presence of staff and quality of staff, were stated again in the KQ2. It may indicate that these phrases have an essential relation to staff availability due to its frequent mentions. Other phrases not mentioned again in the KQ2 were still components of staff availability, but it may not be crucial to staff availability. This interpretation may also apply to phrases only mentioned in the KQ2.

A significant number of participants felt that the presence of staff is the most significant component of staff availability. The fact that the presence of staff is the most frequently mentioned during the KQ2 may suggest it is the most significant component. Furthermore, more participants gave a longer explanation of why they prefer the presence of staff to others. Various reasons, including safety concerns behind this stance, also reinforce the significance of the presence of staff. Thus, it may infer that the presence of staff has the most solid importance regarding staff availability.

The quality of the staff was also deemed as the most significant component of staff availability, even though the quality of staff may not be as substantial as the presence of staff. Compared to the presence
of staff, the quality of staff has only attracted fewer participants to discuss it. It may suggest that the quality of staff may not be as important as the presence of staff about staff availability. However, participants seemed to share more personal experiences regarding the quality of the staff. It may also suggest that the quality of staff may still have a strong relationship with staff availability, although it is not the strongest one.

A few participants also mentioned other phrases, such as the number of staff, the helpfulness, the knowledge of staff, and the working hours. However, the frequency and the emphasis from the response were relatively low. It may infer that these phrases are not strongly related to staff availability. Lack of reasoning behind these phrases also supported its weak relation to staff availability.

All results in both the KQ1 and the KQ1 have successfully discovered the components of staff availability. Regardless of its importance, all components of staff availability may include all key phrases stated in the discussion since these components are related to staff availability to some extent. Therefore, the components of staff availability are the presence of staff, the quality of staff, the number of staff, the information from staff, the on-train staff, the helpfulness, the knowledge of staff, and the working hours.

Among all these components, there is only one component that has a significant impact on staff availability. Based on the frequency and the emphasis, the presence of staff has dominated the discussion about the most significant components of staff availability. The fact that the presence of staff was discussed deeply in both KQ1 and KQ2 was a strong point supporting its importance. Participants also addressed other phrases, yet there is no phrase attracting more profound comments and personal views other than the presence of staff. Hence, the presence of staff is the most significant component of staff availability.

4. Conclusion
Staff availability is one of the essential aspects of public transport, yet it is still widely unclear for public transport users. While there is yet no definition of staff availability, several public transport companies have already used the term of staff availability in their customer satisfaction surveys. Moreover, staff availability may have several components affecting it. This paper has successfully found the definition of staff availability based on the findings. The staff availability is the combined attributes of the presence of staff and the quality of staff. The components of staff availability also have been discovered in the paper. Among these components, the presence of staff has become the most significant component of staff availability since it has the most substantial impact on staff availability.

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