Evaluation of Dispatcher Requirements on Automated Customer Feedback in Public Transport

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Abstract. This paper presents a study to analyze fundamental requirements for dispatching systems in public transport, integrating the new technical possibilities of automated customer feedback. Dispatchers in German transport companies are surveyed on their acceptance and expectations, regarding the integration of automated customer feedback in their dispatching decisions. The results serve as a basis for the user-oriented development of dispatching and mobile information systems in public transport with bi-directional communication.

Keywords. Dispatching systems · public transport · user requirements

1 Introduction

Public transport is a widespread mobility service for the society, which is based on a network of defined stations and routes, that operate at defined times. In order to guarantee an optimal execution of the mobility services, dispatchers monitor and manage the actual situation within the mobility system and take measures to react on short-term interruptions. New possibilities of automated customer feedback, for instance via the "Travellers' Realtime Information and Advisory Standard" (TRIAS) [1], provide more precise real-time data about actual traveler flows and needs. By having timely access to feedback from travelers, the dispatchers are able to assess the actual situation more precisely and reach better decisions. Exemplarily, the information about actual and future traveler flows can support dispatchers in minimizing the total traveler delay in case of service interruptions or demand peaks [2].

By contrast, the increasing data volume might lead to a growing complexity of the dispatching systems and an information overload of the dispatchers. For this reason, the introduction of automated customer feedback has to be adapted to the dispatchers' workflow [3] and the dialogue principles [4]. However, there is a lack of research, regarding the dispatchers' requirements on real-time customer data for dispatching systems. Thus, the aim of this study is to analyze these requirements, considering the dispatchers' expectations and the relevance of different data for dispatching decisions.

2 Method

A survey among dispatchers was conducted anonymously in November 2014 based on an online questionnaire. 34 dispatchers, who took the survey voluntarily, were acquired from nationwide and regional transport companies. These surveyed dispatchers represent the typical range of duties and roles in German transport companies. The majority of the dispatchers perform tasks for operational dispatching decisions or dispatching management. Additionally, some dispatchers also maintain the customer information service or conduct further activities, such as operational command. The standardized questionnaire included questions in regard to the individual assessment of influencing factors on operational decisions, the supply with actual data about customers, attitudes towards using automated customer feedback, and the relevance of customer feedback contents. While the influencing factors, attitudes, and relevance of contents were surveyed in single items on a five-point Likert scale, the participants had to quantify their demand of actual data by multiple selection.

3 Results

3.1 Supply with Actual Data about Customers

According to the statements of the dispatchers, dispatching decisions in transport companies are mainly influenced by the operational procedures. 97 percent of the dispatchers assess the operational procedures as very relevant or relevant for their decisions. Nevertheless, other influencing factors, such as customer needs, personal experiences, and external situational factors, are also rated as very relevant or relevant by 77 to 85 percent of the dispatchers. Furthermore, the dispatching decisions of regional companies are more oriented on the management of external situational influences than on customer needs. This might be caused by the higher frequency of vehicles per route and the resulting higher variety of route alternatives for customers in cities, in comparison to long-distance traffic. In contrast to these results, which indicate that customer needs are at least relevant factors for dispatching decisions, the answers about the actual data supply reveal that 83 percent of dispatchers in regional transport companies do not have any actual data about customers available. Most customer data is available in nationwide transport companies, for instance regarding the number of travelers (73 percent), who are affected by an interchange, and their destinations (36 percent). This information is mainly provided by messages from the staff in the vehicles [3].

3.2 Attitudes towards Using Automated Customer Feedback

The analysis of the attitudes towards the integration of automated customer feedback considers the need and the possible realization of such dispatching systems. While the assessment of the needs includes the improvement, support, and appraisal of decisions, the realization considers the workload, integration, and automation of the data

[2]. The results reveal that half of the dispatchers confirm the need and realization of automated customer feedback for operational dispatching decisions with quite positive attitudes (cf. fig. 1). However, nearly 24 percent of the surveyed dispatchers associate quite negative opinions with the usage of automated customer feedback for dispatching decisions. The answers of the single items of the negative attitudes show that these opinions refer to an expected higher workload, in contrast to a suspected low added value.

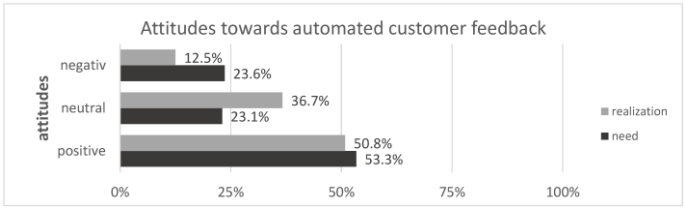

Fig. 1. Attitudes towards the need and realization of automated customer feedback

3.3 Relevance of Different Contents of Automated Customer Feedback

The assessments of the relevance of customer information for dispatching decisions show considerable differences according to the type and content of information. For instance, the survey reveals that the real-time information about travelers is most relevant as an aggregation of the number of interchangers per connection (cf. fig. 2). Furthermore, additional information, such as destinations and itineraries of travelers, can provide valuable information about travel alternatives and allow conclusions about the prioritization and the characteristics of the required decisions. Direct customer feedback can not only comprise the success of interchanges, but also the reasons and consequences of failures from the travelers' point of view. Due to the fact, that this customer feedback could provide valuable data for the evaluation of the dispatching quality in retrospect, the relevance of this information is mainly rated moderately. In contrast to the previous customer information and feedback, the relevance of damage reports by customers is rated high and very high, especially by the dispatchers of regional transport companies. Due to the fact, that the regional dispatchers also often supervise the according infrastructure, such as tram wires and station facilities, these results indicate the highest acceptance and need of automated customer information.

Fig. 2. Appraisals of the relevance of the content of automated customer feedback

4 Discussion

The evaluation reveals fundamental user requirements of dispatchers on the content, the processing, and the design of automated customer feedback. Due to the chosen methods, these results enable a representative overview of the situation within transport companies in Germany. In the following step, the results have to be linked to the individual tasks and working environments of different kinds of dispatchers. Therefore, additional methods are required, such as contextual inquiries, which include the individual context and extend the results to the context of use [4] of the dispatching interactions.

Some dispatchers are concerned about a suspected higher workload due to the higher system complexity with integrated automated customer feedback. In order to allay these concerns, the introduction of user-friendly and workflow-oriented dispatching systems is required to support the dispatching decisions and compensate for the higher amount of information.

In addition, the development of information systems for automated customer feedback is related to the functions of mobile applications for travelers and also requires the integration of the customers' point of view, for instance in usability tests.

5 Conclusion

The fundamental user requirements of dispatchers are an essential input for the further development of dispatching systems, and consequently for the further development of mobile information systems for travelers.

In general, dispatchers are open-minded about automated customer feedback, if the content actually has a direct reference to their tasks and is expected to improve the dispatchers' decisions. The results of this survey reveal differences in the requirements of dispatchers for different contents of automated customer feedback, regarding real-time customer information, interchange customer feedback, and damage reports. In summary, the results indicate that the user-oriented integration of automated customer feedback is an essential condition for the further development of dispatching systems.

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