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User group evaluation based on survey data

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Abstract

In order to understand passenger needs regarding multimodal journey planners a framework of aspects was created. The passengers were divided into user groups, so that all the different expectations could be represented. To recognize realistic needs of the user groups a survey was composed about the importance of the aspects. Having the results of the survey a statistical analysis was performed. Although, big differences were expected among the user groups, according to the survey's results no significant differences could be detected concerning the main aspects. But considering single aspects many differences turned out, which are discussed briefly. The obtained values for the single aspects were weighted according to the general preferences of the users and were compared to the original values. As a result the most important main aspects are route planning (33%) and handled data (31%), while booking and payment (16%), comfort service information (10%), supplementary information (10%) have lower relevance. Finally the ranking of different multimodal journey planners were performed. The evaluation provides information for the journey planner operators about possible directions of development based on real user needs.

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Keywords: user groups; evaluation; survey; journey planners

1. Introduction

The topic covers a highly up-to-date issue, which also appears in the EU transport strategy in White Paper 2011. It contains that the enhancement of public transport's quality can be realized through actions on physical (Tettamanti et. al., 2008) and on information level (Csiszar et. al., 2011). In this article the information level actions were analyzed in the form of an evaluation and a survey.

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The European Union recognized the importance of trip planning issues, which was handled in the Easyway (2010) project that has a pillar concerning the development of travel information services, specially emphasizing the need of creating a comprehensive and fully multimodal journey planner. The "smart multimodal journey planner" competition was announced already in 2011, where many applications were evaluated and some of them were awarded. However a detailed quantitative evaluation was not yet performed.

In the field of travel benefit analysis many papers presented interesting results. In the broader context Lupo (2013) pointed out that the quality level of services has to be constantly controlled and evaluations should reflect the viewpoints of the users. Hüging et. al. (2014) dealt with the benefits of sustainable mobility measures, and provided a comprehensive review of assessment methods. Shang et. al. (2004) described a comprehensive and flexible evaluation method for selection of transportation projects. Brown and Ryan (2011) compared different evaluation methods, while Beira et. al. (2012) tried to combine two evaluation methods (MCA, MultiCriteria Analysis and CBA, Cost Benefit Analysis) in order to assess sustainable mobility.

In the paper of Wang et. al. (2009) different weighting approaches are described for MCA method to reach rational results. However, using evaluation methods some problems with user groups has to be considered. According to Garmendia and Gamboa (2012) weighting processes are criticized for aggregating various stakeholders' priorities into an average weight. Moreover, based on the research of Rogers and Seager (2009) participants might be reluctant to reveal their preferences.

Longo et. al. (2015) analyzed the main problems of mobility in order to understand the preference structure of the users. They created a survey, which pointed out features and preferences of different user groups. The work aimed to define the most suitable transportation mode for the users.

Some general evaluation aspects are present in the paper of Campos et. al. (2010). They proposed a procedure to evaluate sustainable mobility in urban areas. A set of indicators according were defined, as environmental, economical, and social aspects. The evaluation is based on an index calculated through a weighted multi-criteria combination procedure.

Although, several papers dealt with the topic of service quality and passenger information, it was rarely used directly for multimodal journey planners. The current paper should fill this gap, and therefore it proposes an evaluation method with a survey to provide valuable information about user group preferences.

2. Method

2.1. Aspects, user groups and evaluation

In order to evaluate multimodal journey planners different aspects were defined, which are potentially important for passengers, were taken into account. They were classified (Table 1) into 5 main aspects, as route-planning services, booking and payment, handled data and operational features, comfort service information, supplementary information. To each main aspect several single aspects was assigned.

Table 1 Aspects of journey planners

Route-planning services	Booking and payment	Handled data, operational features	Comfort service information	Supplementary information
data input	tariff information	static data	services at the stations	environmental impacts
planning aspects	method of booking	semi-dynamic data	services on board	foreign language information
displayed data	payment options	dynamic and estimated data	additional services	customer service
visualization		personal data		equal opportunity information