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Cooperative Services: Managing Evaluation challenges in the Austrian FOT "Testfeld Telematik"

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Abstract
Planning and conducting a large scale field test is a challenging undertaking when it comes to facing project realities and respecting partner's interests. Developing the evaluation methodology in a large-scale field test is a similarly challenging undertaking. Theory and practice in implementing an evaluation methodology can easily evolve into two different things. Within the project "Testfeld Telematik" a large-scale field tests is performed in the eastern part of Austria from summer 2012 onwards to evaluate these "user acceptance" and "usability" of cooperative services provided by ASFiNAG. The paper discusses challenges within these assessment design process and presents the methodological approach of this large scale field test with foreseen 3.000 test drivers and addresses strategies to overcome evaluation challenges.

Keywords:
Testfeld Telematik, evaluation challenges, cooperative services, field test, user acceptance, usability.

Introduction

Both European road operators and the automotive industry regard cooperative systems as the future information channel to the vehicle, due to the possibility to pass on real-time information accurately and direction-based to the respective transport user. The Austrian road operator ASFiNAG considers cooperative services and systems as a future key technology and initiated the project Testfeld Telematik with 13 industrial and scientific partners. The aim of the project is to provide Austrian drivers with safety and efficiency relevant real time information to optimize traffic capacity and facilitate a multi modal shift. The 4.5 Mio. project is funded by KliEN - the Austrian Klima and Energiefond - and started in March 2011 with a duration of 27 months.

Project realities: Challenges in FOT evaluation

Setting-up theoretically and practically implementing an evaluation methodology is a

challenging undertaking when it comes to project realities and respecting different partner interests. Experience shows that various developing steps are necessary - involving project internal and external partners - to create a final evaluation methodology for assessing cooperative services. Following challenges needs to be addressed.

Time frame

Time plays an important role when it comes to evaluation methodologies. As technical development can be tricky, time delays are not uncommon. Often too less time is available to test a system as it should be tested. Experience show that this circumstance can lead to: 1) the number of test participants needs to be limited 2) project partners involve their employees as test persons, which leads to a non-representative evaluation result. 3) FOT results cannot be analysed in the end, because no time or budget is left. To avoid that data cannot be analysed in the end it is planned to continuously analyse data in Testfeld Telematik. Last but not least to avoid measuring and focusing wrong data.

Financial frame

Budget limits are reality in every research and development project. Budget often is too small to have 1) enough test drivers, 2) offer incentives for test drivers to enhance their willing to be questioned several times, 3) to have all the preconditions/functionalities to collect user data through technical equipment. In Testfeld Telematik the methodological approach to collect user data foresees a mixture of 1) automated logging of GPS user data, 2) driver surveys collecting data via questionnaires (online), 3) pop-ups to collect direct user feedback at the end of the trip (shown on end user devices), 4) interviews by telephone after events (triggered by specific events) and 5) focus groups. All these evaluation instruments together guarantee that relevant data is collected. Instead of one user device collecting all data Testfeld Telematik decided for various reasons for an evaluation mixture that keeps small financial risks and dependencies from one technical evaluation instrument. Automated tracking can also be used as plan B if drivers are not willing to answer to pop-ups, questionnaires or participate in interviews and focus groups. To ensure that relevant data is gathered this methodological mixture will be pre-tested in early summer 2012.

Project partners

Different companies have different interests. Scientific and industrial interests also diverge. A project comprising a lot of different partners is confronted with the challenge of respecting all of them. Interaction between project partners can be challenging, but is absolutely necessary.
In Testfeld Telematik this challenge was addressed by an early integration of project partners in the methodological design. Key success performance indicators were collected from

industrial and scientific partners. These indicators representing what makes the services/system successful from our partner's point of view were the basis for research questions and hypotheses.

Test users

Another uncertainty is the test user itself. It is not clear at the beginning of a test how many users will participate in test drives and if they are willing to participate in the evaluation process (answering questionnaires, interviews). To minimize possible risks Testfeld Telematik has different test environments/ test driver groups: 1) 3.000 app-users, 2) 100 in-car navigation device users and 3) fleet in-car device users. Due to the limited number of in-car navigation device drivers it is useful to distribute the devices to members of user groups that are of high interest. Testfeld Telematik focuses on risk driver groups, ASFINAG core user groups and innovative drivers that are relevant from a market entry perspective.

Safety risks

Safety plays an important role in testing cooperative services. Driver distraction can have serious consequences. This has to be considered when having a direct interaction while a driver is conducting a vehicle. On the one hand a prompt questioning after receiving services leads to relevant results, because drivers still have in their mind what they experienced. On the other hand it can be dangerous to ask the driver while driving. For this reason Testfeld Telematik decided to leave out a questioning by pop-ups on the device while driving and to ask questions only at the end of a trip.

Limitations

The list of evaluation challenges and methodological design option does not claim to be complete. It shows how challenges are addressed in Testfeld Telematik.

Conclusio

Finding the middle between the idea of delivering a plenty of relevant and valid results and reacting on challenging project realities is a step by step focusing process involving all project partners. Experience in FOTs showed that time frame, financial frame, safety risks, user- and project partner-uncertainties can be challenges that need to be addressed in a methodological approach conforming scientific requirements. An intelligent user sample, independence from one single technical evaluation instrument, pre-tests of the evaluation mixture and continuous data analysis, as well as a close partner cooperation seem to be risk limiting factors at the moment. The following steps in Testfeld Telematik will prove these ideas.