

COOPERATIVE STRATEGIES AND OPERATING CONDITIONS FOR PLATFORM BASED LIVING LABS ON THE MARKETS OF TRANSPORTATION SERVICES

Dr. Jani-Pekka Jokinen
Aalto University

AUTHORS

Jani-Pekka Jokinen^{1*}, Marko Nieminen¹, Elina Hildén², Kaisa Väänänen², Simo Syrman³, Juho Kostiaainen⁴

1. Department of Computer Science, Aalto University
2. Pervasive Computing, Tampere University of Technology
3. Department of Built Environment, Aalto University
4. VTT Technical Research Centre of Finland Ltd.

BACKGROUND

- On the markets of transport services a multitude of new technological possibilities and simultaneously limited resources for developing and testing have created a need for service platforms enabling fast development and efficient service provision.
- **Living Lab Bus -Open platform for technology and service providers in operating electric buses**



Passenger Engagement Tools



Environment Perception for Automated Driving



Enhanced Weather Predictions



Road Slipperiness Detection



Driving Optimization
Via CAN bus data



Intelligent eMobility
Emission free buses



Road Data Collection



PASSENGER EXPERIENCE



ENERGY EFFICIENCY



SMART SERVICES

RESEARCH OBJECTIVES

- The study identifies and analyses the key decisions related to cooperation and operating conditions of transportation service platforms.
- The analysis is based both on the empirical case study of the LLB platform in Finland and literature review.

THE MAIN CAPABILITIES OF THE LLB PLATFORM

1. *Test Environment*
2. *Service Platform*
3. *Source of Real-Time Data*
4. *Facilitator of Improved Visibility for Digital Services*

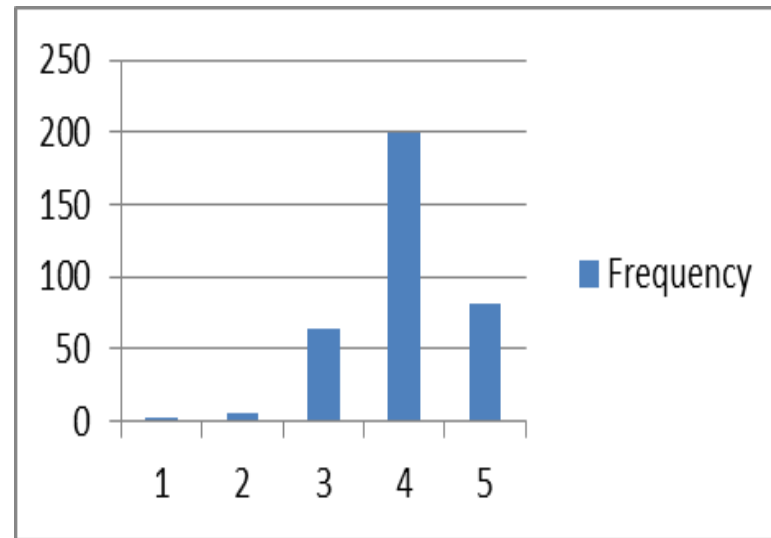
EMPIRICAL RESEARCH ILLUSTRATING THE CAPABILITIES OF THE PLATFORM, 1/2

- Several qualitative studies for collecting insights on passengers' travel experiences and the needs for future traveling services.
- Project developed tools and methods that communicate some of the main study findings in a concrete visual form.
- The tools – bus passenger personas, passenger journey map, and Context Cards, are available at the LLB Development Portal as a UX design support.

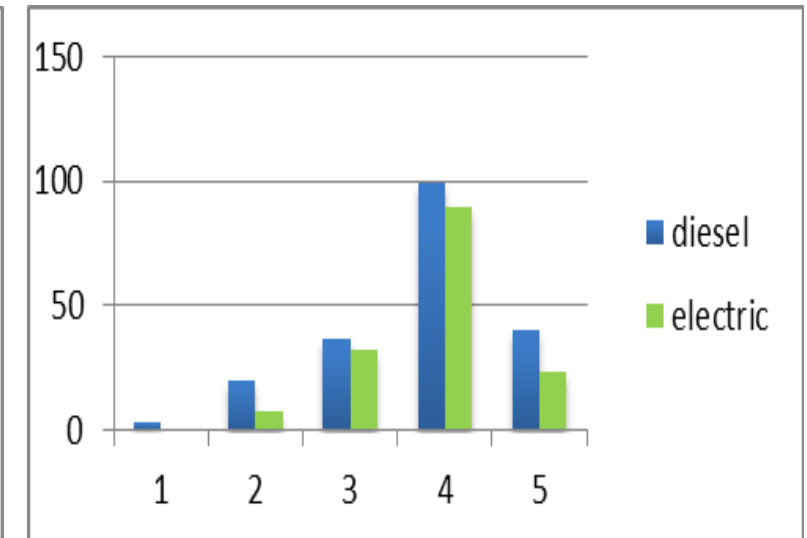
EMPIRICAL RESEARCH ILLUSTRATING THE CAPABILITIES OF THE PLATFORM, 2/2

Table 1 Descriptive sample statistics

Variables	Frequency	Freq. diesel bus	Freq. electric bus
Total sample size	356	200	153
Male	120		
Female	228		
		Mean	Median
Age		38	33
Income (€ month before taxes)		2563	2450



Passenger evaluations of travel experiences in buses
(1 = very unsatisfied, 5 = very satisfied)



Passenger evaluations of smoothness of driving
(1 = very uneven driving, 5 = very smooth driving)

IMPACTS ON OPERATING CONDITIONS

- The research activities were implemented in close cooperation with the local transport authority (Helsinki Region Transport) and the bus companies.
- This type of research would have been much more difficult to carry out without these research collaborators in the LLB platform.
- **Cooperation in the LLB platform with relevant participants is crucial for fast and efficient data collection and for related R&D activities.**
- Well-known and established research organizations can provide reliable testing and verified references for service developers and vehicle manufacturers.

MARKET STRUCTURE OF PUBLIC TRANSPORTATION AND COOPERATIVE STRATEGIES

- Public transport operators
 - Easy access to versatile transport data
 - Subsidized public transport operators are often the only notable provider of public transport on the local market
- Optimal usage of own and partners' superior resources
- Coopetition

PUBLIC AUTHORITIES AND TRANSPORT OPERATORS

- Public transport operators
 - Similar objectives and resource constraints as private companies
 - Also politically defined social objectives
- Analysis of platform capabilities and social objectives:
 - Different optimal allocation of capability resources
 - Different preferences for local and global markets

COOPERATION BETWEEN COMPANIES IN THE PLATFORM

- Effective practices for the platform leaders (Gaver & Cusumano, 2013)
 1. Design an element with **essential function with easy connection**, and identify third-party firms as **complementors** for the platform
 2. Build a **rich technical architecture and interfaces** enabling to develop services on the platform and facilitate complementary innovation
 3. Build a coalition around the platform for **co-creating a vibrant ecosystem**
 4. Evolve the platform while maintaining a central position by keeping **innovating on the core** for ensuring that it continues to provide essential function to the overall system, and make long-term **investments in industry coordination activities**

CRITICAL CAPABILITIES AND FACTORS NEEDED FROM THE OTHER PARTICIPANTS IN COOPERATION

	Public transport operator	Bus manufacturers	Technology and service providers	Digital platform provider	Research organizations
Public transport operator		-Collaboration for bus testing -Responses to passenger feedback	-Collaboration for utilizing platform capabilities to support social objectives of PT operator	-Compliance of policies for content and services displayed -real-time data for transport operations and management	-Research collaboration for supporting public transport development
Bus manufacturers	-Access to passenger feedback		-Value adding complementary technologies and services for vehicles	-Testing capabilities	-Collaboration for R&D
Technology and service providers	-Access to passengers as customers	-Physical premises for devices		-Capabilities for testing, visibility, data utilization in service provision	-Collaboration for R&D
Digital platform provider	-Operating bus fleet as physical base for digital platform	-Physical premises for hardware and sensors			-Collaboration for platform R&D
Research organizations	-Access to passengers as research objects -Collaboration in data collection	-Insights on information and knowledge needs for research planning	-Insights on information and knowledge needs for research planning	-Capabilities for versatile data collection and innovative research experiments	

CONCLUSION

- 4 key capabilities of the LLB platform
- Potential benefits of cooperation in the LLB platform
- Essential role of public transport operators
- Effective practices for platform leaders
- Identification of superior resources in the platform ecosystem