AuRa – Autonomes Rad

Flexibler Einsatz autonomer Fahrradsysteme für Logistik- und Beförderungsaufgaben

Simulation Testbed for AuRa System

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Objective and Methodology

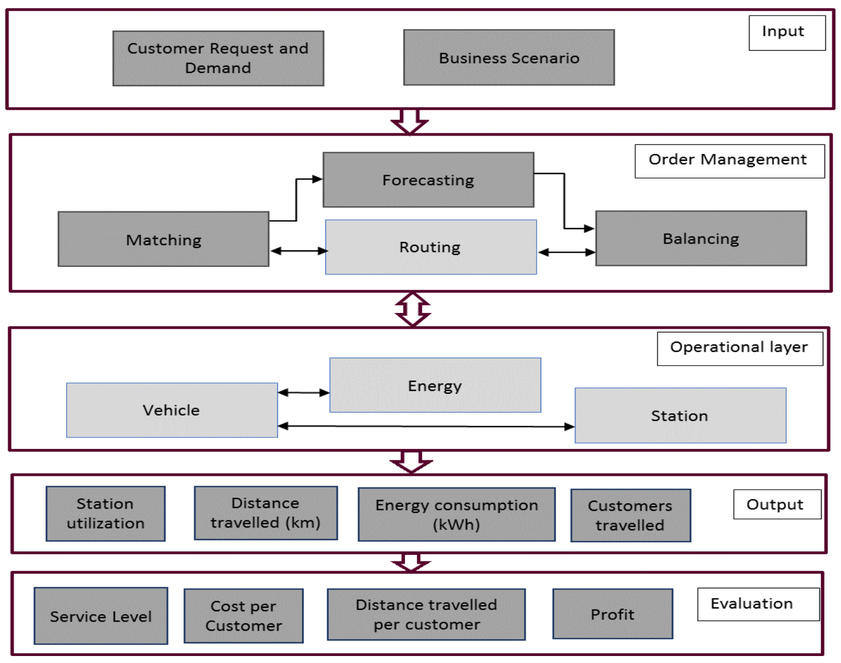

Fig. 1 – Bird view of Conceptual Model.

The objectives of the simulation testbed are:

- Represent the behaviour of various components of the AuRa system
- Evaluation of order-management algorithms, station distribution strategies, energy supply technologies, business models and demand scenarios
- Determine the economic viability of the AuRa system

The layered architecture represents the conceptual model for the simulation model of the AuRa system. Each layer contains the components and their interactions with each other to realize the entire AuRa system (Fig. 1).

Simulation Model

- To implement the simulation testbed an agent-based paradigm was used.
- Anylogic simulation tool was used to develop the simulation model.
- A customized input interface was developed to test the different demand scenarios, station distribution strategies, energy supply technologies and order management algorithms.
- The customer and AuRa bike behaviour was realized using state charts.

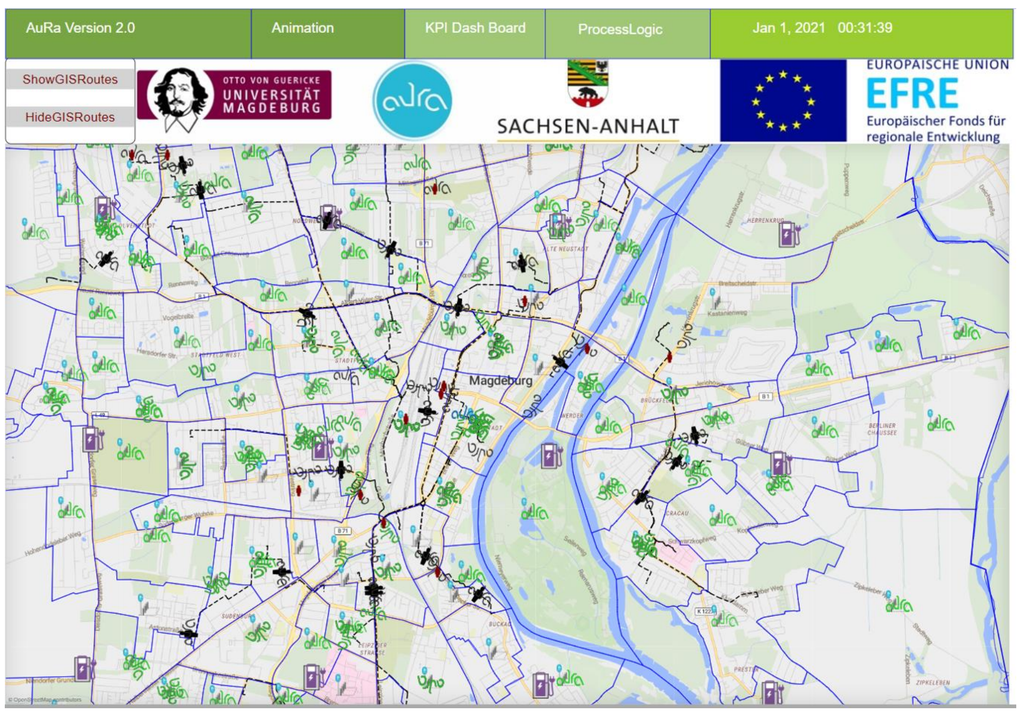

Fig. 2 – Simulation Animation Window.

Fig. 3 – KPI Dashboard.

- Simulation animation window represents the AuRa bike agents moving on the operational area. waiting stations and charging stations (Fig. 2).
- The Key Performance Indicators (KPI) dashboard to visualize the outcome of the system such as service level, energy consumed by the AuRa bike, distance travelled, cost analysis (Fig. 3).
- Please refer to “Economic viability of AuRa system” poster for more details.

Das Projekt AuRa (Kennziffer 19-15003/004) wird gefördert aus Mitteln des Europäischen Fonds für regionale Entwicklung (EFRE) gemäß der „Grundsätze über die Gewährung von Zuweisungen zur Förderung der Forschung, Einführung und Nutzung intelligenter Verkehrssysteme” des Landes Sachsen-Anhalt. Fördervolumen: 4,4 Mio. Euro. Projektzeitraum: 01.07.2019 bis 30.09.2022.

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