

# Rika Project

## « System for Distributed Information Dissemination »

### Envisioned Scenario

Users carry a mobile device which allows them to locate themselves inside buildings. The position information can be used for other services like navigation or other location based services. Until an indoor positioning standard has emerged, different technologies have to be supported. By abstracting from different hardware solutions, location based services can be implemented without having the software worry about the underlying hardware.

A proposed infrastructure consists of three parts:

1. Several different hardware enables the positioning estimation. For example: Bluetooth, 802.15.4a, or other.
2. One or more of these hardware devices are driven by a small computer (base station) which abstracts from the hardware, is responsible for the communication with the user device in the local perimeter and for the data transport to the server.
3. A central server accepts the data from the different base stations and estimates the positions of the user. Additionally it provides additional features on top of the positioning data and enables and hosts location based services.

### Project Goal

The goal of this work is the design and implementation of the proposed system and underlying infrastructure, allowing position estimation, sending messages to the user devices and having the users acknowledge these messages. The infrastructure has to keep track of which base stations are in communication range of a users' mobile device and use only those for communication. The system allows to dynamically add and remove software components (for positioning hardware or other services) while the system is still running. Also, failures of single devices need to be tolerated in the position estimation as well as communication.

A basic firmware for a mobile device based on the Crossbow Iris node will be implemented, too. It allows displaying messages from the central server and a user to acknowledge these messages.

The central server as well as the base stations will be implemented in **Java**. The user device software will be implemented in **Tiny OS 2.x**, which uses the C like **NesC** programming language. Additional frameworks for the servers, for example OSGi, should also be considered.

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