

Extended Abstract: AGIT Poster

Business Development based on Indoor Navigation Products for Industrial Buildings

by

Christian Robin, BSc.

Carinthia University of Applied Sciences

School of Engineering & IT

Department of Geoinformation and Environmental Technologies

Supervisors:

Dipl.-Ing. Dr. Erich Hartlieb

Dipl.-Ing. Dr.techn. Victor Manuel Garcia-Barrios

The architectural complexity in combination with the complexity of industrial manufacturing equipment of industrial buildings often leads to intense maintenance intervals, which further increase if the number of machines is very high. Thus, maintenance costs may explode. To reduce these costs, the utilization of indoor navigation systems is a possible solution. Currently, there are no software solutions on the market that completely fulfill the needs of industrial customers in terms of indoor navigation. Based on specific and general customer needs of industries, this thesis provides a concept of an indoor navigation system solution for complex buildings. General customer needs were defined together with project cooperation partners of Carinthia University of Applied Sciences. Specific needs were derived from the refinery sector in order to give the work a specific application area.

The main research challenges in this context are to observe suitable technologies for an industrial indoor navigation system and to find a rentable business concept for a successful company launch. The available technologies, like user interface technologies, positioning systems, path calculation technologies, spatial data modeling, and augmented reality techniques are analyzed in this thesis based on a technology research process and on technology management methods.

Further, indoor navigation solutions with mobile devices includes technical challenges and constraints, such as the exact positioning of the persons in the building, efficient routing software and an accurate spatial database with a local coordinate system based on the building schemes.

The navigation is based on augmented reality. The use of augmented reality technologies for the navigation purpose enables to display the route information directly at the requested position. For the user is no complex mental processing of the route information required. In Figure 1 an example of the augmented reality navigation mode is shown.

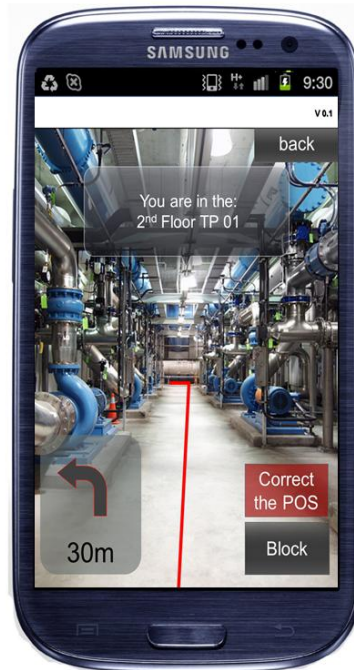


Figure 1: Indoor navigation based on augmented reality for industrial plants.

Thus, implementing an innovative solution is not trivial, as it implies the consideration of predefined requirements. In addition, existing innovative solution alternatives, such as the detection of markers for capturing a person's current position, must be taken into account in order to offer a competitive product in the market.

A well-defined and successfully tested product is the base for the business model. The business model elaborated in this thesis was based on a concrete industrial customer. It is highly relevant to develop business models and observe them based on external and internal influences, like respectively competitive forces and customer demands.

The overall solution proposed in this thesis goes beyond the requirements of indoor navigation systems, as some purposes of navigating imply to fetch and apply contextual knowledge about the navigation target, e.g. a specific part of a complex machine that needs to be repaired. Thus, the solution is able to detect the target object through augmented reality tags as well as to provide online information about the object. This solution may also have a positive influence on the safety of the plant, e.g. because it can avoid that persons navigate through dangerous or permission-restricted areas.