

ENABLING OFFLINE ACCESS CONTROL IN MACE

Mark Swanenberg
Bachelor Industrial Design
University of Twente
The Netherlands

People identification plays an important role in modern enterprises. Hospitals, airports, parking facilities and industrial estates are equipped with access control systems to authorize people to move in or out of specified zones. Nedap Identification Systems (NIS), focuses on the identification of vehicles and people. They believe convenience and security go hand in hand resulting in hands-free access control systems, due to smartphone credentials and smartcards.

Access control has progressed to increase security through the years. From a key, dating back over 6,000 years, to modern electronic versions controlled remotely by computers, offering a higher level of security and convenience. Nowadays, access control systems can monitor who accesses when and respond in unexpected circumstances.

The rise of smartphones and its embedded technologies bring new opportunities in the field of access control. Therefore, NIS developed a platform that can be integrated with third parties called "MACE": Mobile Access Control Entities. MACE enables access control with smartphones.

Currently, the MACE platform is only used to identify people with online access control systems. This means that someone presents a physical card or smartphone to a system. This system validates the access rights in an online database and checks if the door should be opened. Therefore, a server connection is mandatory to validate the user. Nedap has the idea to store access rights in the smartphone's application. The reader autonomously reads these access rights, and determines to open the door or not. A server connection on the controller side is not needed, making the installation of MACE easier and cheaper. Such an access control system is often characterized as an offline access control system.

The aim of the research is to identify what should be added or changed to enable offline access control in MACE (offMACE). Therefore, a company and technology analysis has been performed. The result is a set of requirements for the system design. These requirements were considered during the further exploration and design of a new system architecture.

Finally, multiple system architectures are presented and compared to show an overview of the possibilities. The final designs distinguish in a standalone platform and a platform to be integratable with third parties, whether or not to use with smartcards. With these new system configurations, new challenges with considerations arose.

Most often, these considerations had a strong contradiction between convenience and security in which a balance should be found. Moreover, these considerations are strongly influenced by the key drivers, namely costs and integration possibilities with third parties.

Furthermore, the changed configuration within and between subsystem led to new opportunities of functions and user interactions with the software. Therefore, the user application is picked to be further elaborated, resulting in an improved user interface for the offMACE App.