

Chapter 5

Application Case Studies

ABSTRACT

The previous chapters showed theoretical foundations and development techniques for the Smart Spaces concept. This chapter presents appraisal of the M3-based smart spaces for Internet of Thing application development. Six topical application domains has been chosen: collaborative work environments, social networking, transport logistics, mobile e-Tourism services, mobile health, and industrial Internet. Existing pilot implementations of applications for these domains show that M3 space is useful for smart services collaboration since it provides possibilities of semantic-based information sharing between services using the publish/subscribe mechanism.

INTRODUCTION

Internet of Things becomes more and more popular last years it is a paradigm, which supports internetworking of different devices and sensors in the Internet that shown by Gubbi et al. (2013) and Manyika et al. (2015). In according with Atzori et al. (2010) and Wang et al. (2013) the most common view of IoT refers to the connection of physical objects, while the core of technology is in information interconnection and convergence. Producers of home appliances supply devices with Internet access and provides for the market useful smart home-based applications. Internet of Things provides a lot of possibilities for use cases development since a lot of devices and services in the Internet can participate in these scenarios.

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Recall from the previous chapters that the smart spaces concept, according with Cook et al. (2007), Oliver and Boldyrev (2009), and Gilman et al. (2013), aims at application development for advanced computing environments, when participating objects acquire and apply knowledge for service construction in order to enhance user experience, quality and reliability of the provided information. Each participating object is represented with a software agent—an autonomous information processing unit, which is not necessarily attached to a fixed device say Kortuem et al. (2010). Services are constructed by agents interacting on shared information, i.e., the interaction is indirect and based on publish / subscribe mechanism, in contrast to the communication level provided by the IoT technology. Agents act as knowledge processors to create proper service construction chains. At the end of the chain a meaningful information value is shaped to deliver it as a service to the users.

In this chapter, six topical application domains are considered: collaborative work environments, social networking, transport logistics, mobile e-Tourism services, mobile health, and industrial Internet. Existing pilot implementations of applications for these domains show that M3 space is useful for smart services collaboration since it provides possibilities of semantic-based information sharing between services using the publish / subscribe mechanism.

BACKGROUND

The main idea of the chapter is showing the applicability of smart space approach for Internet of Things-based applications. The section describes six hot application domains that have been chosen and developed on top of the Smart-M3 platform: collaborative work environments, social networking, transport logistics, mobile e-Tourism services, mobile health, and industrial Internet. The use cases have been developed in the scope of KA179 and KA322 projects of Karelia ENPI programme, which is co-funded by the European Union, the Russian Federation, and the Republic of Finland. For each domain reference model and research prototype system have been developed. They provide substantial evaluation of the smart spaces approach presented in previous chapters.

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