

Abstract (English)

The Internet of Things (IoT) is a network of addressable, physical objects that contain embedded sensing, communication and actuating technologies to sense and interact with their environment (Geschickter 2015). Like every novel paradigm, the IoT sparks interest throughout all domains both in theory and practice, resulting in the development of systems pushing technology to its limits. These limits become apparent when having to manage an increasing number of *Things* across various contexts. A plethora of IoT architecture proposals have been developed and prototype products, such as IoT platforms, been introduced. However, each of these architectures and products apply their very own interpretations of an IoT architecture and its individual components so that IoT is currently more an Intranet of Things than an Internet of Things (Zorzi et al. 2010). Thus, this thesis aims to develop a common understanding of the elements forming an IoT architecture and provide high-level specifications in the form of a *Holistic IoT Architecture Framework*.

Design Science Research (DSR) is used in this thesis to develop the architecture framework based on the pertinent literature. The development of the *Holistic IoT Architecture Framework* includes the identification of two new *IoT Architecture Perspectives* that became apparent during the analysis of the IoT architecture proposals identified in the extant literature. While applying these novel perspectives, the need for a new component for the architecture framework, which was merely implicitly mentioned in the literature, became obvious as well. The components of various IoT architecture proposals as well as the novel component, the *Thing Management System*, were combined, consolidated and related to each other to develop the *Holistic IoT Architecture Framework*. Subsequently, it was shown that the specifications of the architecture framework are suitable to guide the implementation of a prototype.

This contribution provides a common understanding of the basic building blocks, actors and relations of an IoT architecture.