# Hot topic study - Task 1

## Choose a domain/industry

When it comes to the domains or industries that are using service-oriented architecture, in my opinion, many of which seem to be nothing more than a sort of rigid amalgamation of the undoubtedly valuable approach (service-oriented architecture, SOA), which is aimed at the management and the organization of system architecture, and do not offer any fresh insights. However, it is imperative to note that there are two distinctive domains where the service-oriented approach truly stands out, namely, the Cloud Computing and the Internet of Things(IoT).

Cloud Computing, as we all know, is a widely recognized and utilized concept in the modern world. Here, larger companies with additional computing capacity offer it for rent to various other companies. This practice could be regarded as an exemplification of service orientation that is being implemented on a massive scale.

On the other hand, the Internet of Things(IoT) is an exceptional and captivating idea that is being gradually implemented these days. With the IoT, one could fundamentally connect several different devices and sensors to develop a network with universal accessibility. The intriguing aspect of the IoT is that it has numerous industrial applications, and service orientation can potentially play a crucial role in the implementation and management of such applications.

Therefore, it is evident that service-oriented methodology holds immense value, especially when applied in domains such as IoT and Cloud Computing. As the default topic for this study is Cloud Computing, we will focus our discussion on the Internet of Things(IoT) to explore the potential and actual cases of service orientation in its implementation and management.

## Find several cases and research papers on the use cases of service orientation in the chosen domain/industry

Overview

**Case table:**

| Use case | Description | Keywords | Links |
|---|---|---|---|
| Smart Homes | Make home devices and appliances more intelligent and connected. | Smart Home, IoT, Alexa | Case1 |
| Industrial IoT | Collect and utilize data from IoT devices to optimize operations and save energy costs. | Siemens Mindsphere, Big Data, ML | Case2 |
| Smart Agriculture | Improve the efficiency of the agriculture industry. | IoT, Agriculture, Smart Agriculture | Case3 |
| Healthcare IoT | Collect and monitor critical health data to enhance the diagnosis and treatment of diseases. | NHS, Wearable, Healthcare | Case4 |

| Use case | Description | Keywords | Links |
|----------|-------------|----------|-------|
| Smart Cities | Create secure and efficient communities by utilizing IoT sensors to manage city infrastructure. | Barcelona, Streetlights | Case5 |

**Details:**

1. **Smart Homes**: With the aid of Service Orientation in Smart Homes projects, IoT technology facilitates seamless communication between home appliances, entertainment systems, security cameras, and heating and cooling systems to achieve interconnectivity using the Alexa voice control platform, producing a revolutionary paradigm shift in the Electrical milieu.
2. **Industrial IoT**: Service Orientation in Industrial IoT has ushered in unparalleled optimization of operations and slashed energy costs using IoT sensors, Big Data cloud computing, and Machine Learning algorithms capable of managing massive amounts of data, such as Siemens Mindsphere's replacement of traditional sensors with IoT sensors.
3. **Smart Agriculture**: Service Orientation's implementation in Smart Agriculture achieved through IoT technology integration allows for soil moisture, temperature, and humidity monitoring, optimizing irrigation, fertilizer, and insecticide application, leading to efficient crop growth and better yields.
4. **Healthcare IoT**: Healthcare IoT has benefitted immensely from Service Orientation, with the use of IoT wearable devices to monitor and collect critical patient health data during diagnosis and treatment, evidenced by the NHS's successful patient monitoring of heart rates, rhythms, sleep patterns, and daily physical activities to enhance disease identification.
5. **Smart Cities**: Service Orientation in Smart Cities is transforming urban life with IoT sensors gaining traction in managing city infrastructure, facilitating cost savings and value-added services. Barcelona's adoption of IoT streetlights exemplifies this, reducing energy consumption while enhancing security and traffic management via IoT technology implementation.

## Case 1: Smart Homes

1. A review of smart homes—Past, present, and future
2. Design and Implementation of a Cloud-IoT-Based Home Energy Management System
3. From the service-oriented architecture to the web API economy
4. Smart Home Light Based Service Oriented Architecture and IoT

## Case 2: Industrial IoT

1. Internet of things in industries: A survey
2. Service-oriented industrial internet of things gateway for cloud manufacturing
3. Driving generativity in industrial iot platform ecosystems
4. A service-oriented architecture for mass customization—a shoe industry case study

## Case 3: Smart Agriculture

1. An IoT service-oriented system for agriculture monitoring
2. Wireless Sensor Network Smart Environment for Precision Agriculture: An Agent-Based Architecture
3. Internet of things platform for smart farming: Experiences and lessons learnt
4. [HTML] Modelling the smart farm

## Case 4: Healthcare IoT

1. Internet of things in medical applications with a service-oriented and security approach: a survey
2. Internet of Things security: A survey
3. Blockchain-based healthcare workflow for tele-medical laboratory in federated hospital IoT clouds
4. Edge computing for the Internet of Things: A case study

## Case 5: Smart Cities

1. [PDF] Utilizing service oriented architecture (SOA) in smart cities
2. Sustainable Service-Oriented Architecture for Smart City Development
3. [PDF] Semantic-enhanced blockchain technology for smart cities and communities
4. [HTML] Service-oriented architecture for internet of things: a semantic approach