Assignment 6 – Technology Architecture

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| Design an adequate technology architecture that supports your transformation initiative. Chose an adequate viewpoint from ArchiMate. Discuss possible alternative designs.  Make sure that your technology architecture is aligned with the business architecture and the information systems architecture and that all relevant relations are mapped.  Before you begin the with the modelling task, define and discuss a suitable viewpoint for the task at hand. |

After successful definition of the application architecture in the previous assignment, the next step is identification of the technologies supporting it. The viewpoint of the technology architecture, shown in Figure 1, consists of the required elements such as Equipment, Communication Network, Device and System Software.

The element “Equipment” is used to depict the machines that create, use, store, move or transform materials. Lift systems, turnstiles, ticket machines and most importantly sensors for tracking guests belong to this category. The element “Device” is used to depict devices such as smartphones, smart companions or any physical IT resources upon which a system software may be stored or deployed for execution (e.g. servers). Together, they provide technology services such as provision of tracking data that is used by the application components.

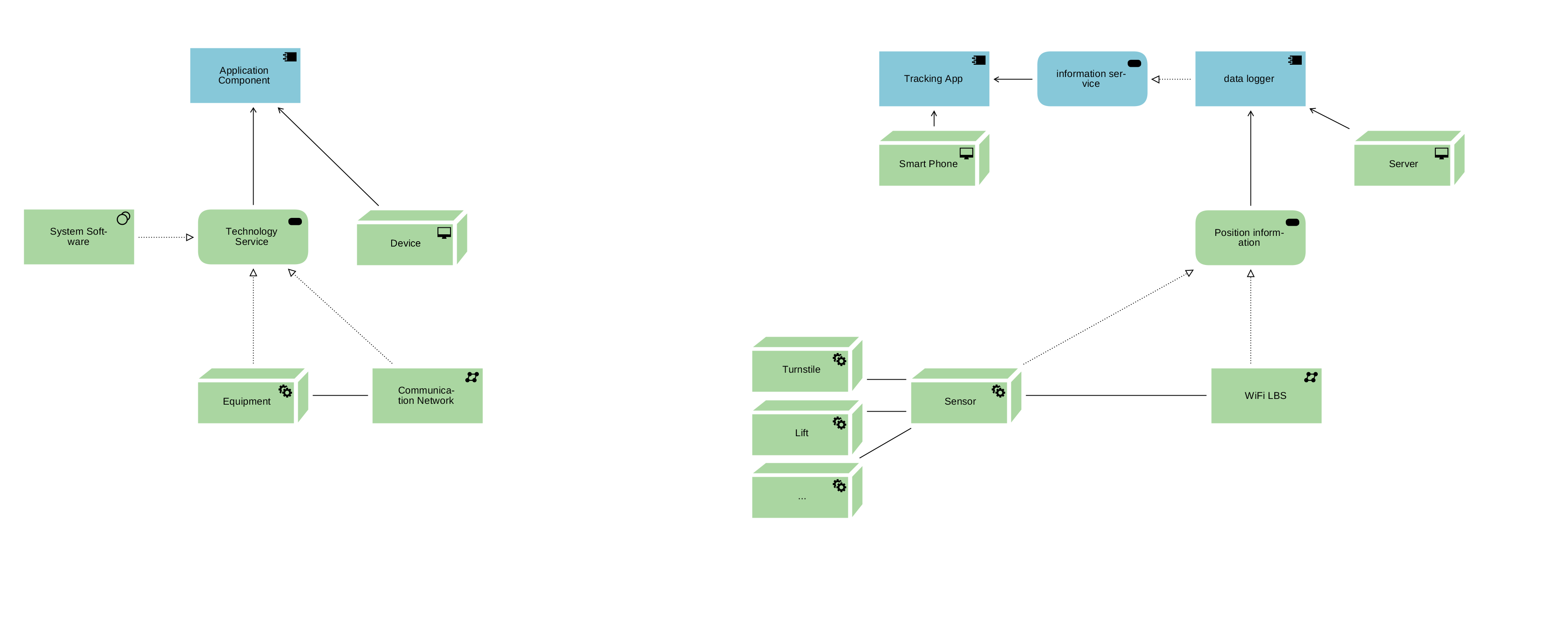


Figure 1 Viewpoint for the technology architecture

In the next sections, possible technical solutions for the tracking service are discussed.

# Communication network: Network technologies

Communication network can be implemented based on various network technologies. Some of them are discussed in the following paragraph.

Beacons are the first technology option the IT department of the ski resort takes into consideration. Beacons are Bluetooth Low Energy (BLE)-based indoor transmitters that sense the nearness of user communication and provide very accurate information of the user location. Their recommended use is for micro-location services. Due to the low power and short range, it is required to use many overlapping beacons to cover an area. As a result, tracking people in the entire ski resort is not possible and utilization of beacons is dismissed.

Another network technology that is taken into consideration is the Near Field Communication (NFC). It provides secure communication to all users within the network and promotes the transfer of data through safe channels as well as the encryption of sensitive information. Again, the proximity needed for NFC to function is a problem. The only way it will work is if sensors are positioned at the lift gates and at other prominent places. However, if the goal is to track people throughout the entire ski resort including the slopes, then this is not a suitable solution.

The last option is usage of WiFi powered location-based services (WIFI LBS). As the name suggests, WiFi-powered location-based services use the existing WiFi infrastructure to detect the devices whose WiFi is turned on. For example, if a guest enters a zone on a slope or a lift, the push notifications with relevant information can be sent.

To identify the guest, WiFi-based methods use MAC addresses and SSID. It’s widely accessible as most mobile devices and establishments already have WiFi to use WiFi LBSs for engagement.

# Device: Smart companion vs Smartphone

Two types of devices are required. One of them is a device that is used to locate (track) a person (e.g. child) within the ski resort and on the slopes, while the other shows the tracking information (e.g. parent).

The ski resort is considering whether to use a smart phone or a smart companion as a device. One of the advantages of using a smart phone, according to the maxim “Bring your own device”, is that the ski resort does not have to invest into devices that might get lost or be outdated in the future. A disadvantage is that guests, especially young ones, might not possess a smartphone and can thus not be tracked. The permanent usage of NFC or WIFI will drain the battery very fast. As a consequence, people might not be trackable in case of an emergency if battery is low.

Smart companion, e.g. digital bracelet, can be a substitute for the ski card and the NFC feature can be used for accessing the ski lift gates. An important advantage over a smartphone is the long-lasting battery power. The device is also quite robust and there is no danger of breaking it in case it falls.

However, the main disadvantage that comes with the smart companion, is that it supports only NFC and not WIFI – based communication protocols. As opposed to the smartphone, usage of the smart companion comes with additional costs related to the device. Some additional efforts are required since the ski resort must maintain the devices, rent them and take refundable deposits to ensure that smart companions are returned. Another major disadvantage is the lack of the display and it is therefore required to use a smartphone besides it.

# Target architecture for the technology layer

As Figure 2 shows, based on the above-discussed pros and cons, the ski resort has decided to use smartphones as a tracking device, since there are no investment costs involved.

The WIFI LBS network technology for communication and locating will be used, since it provides a long-range coverage, including the ski slopes.

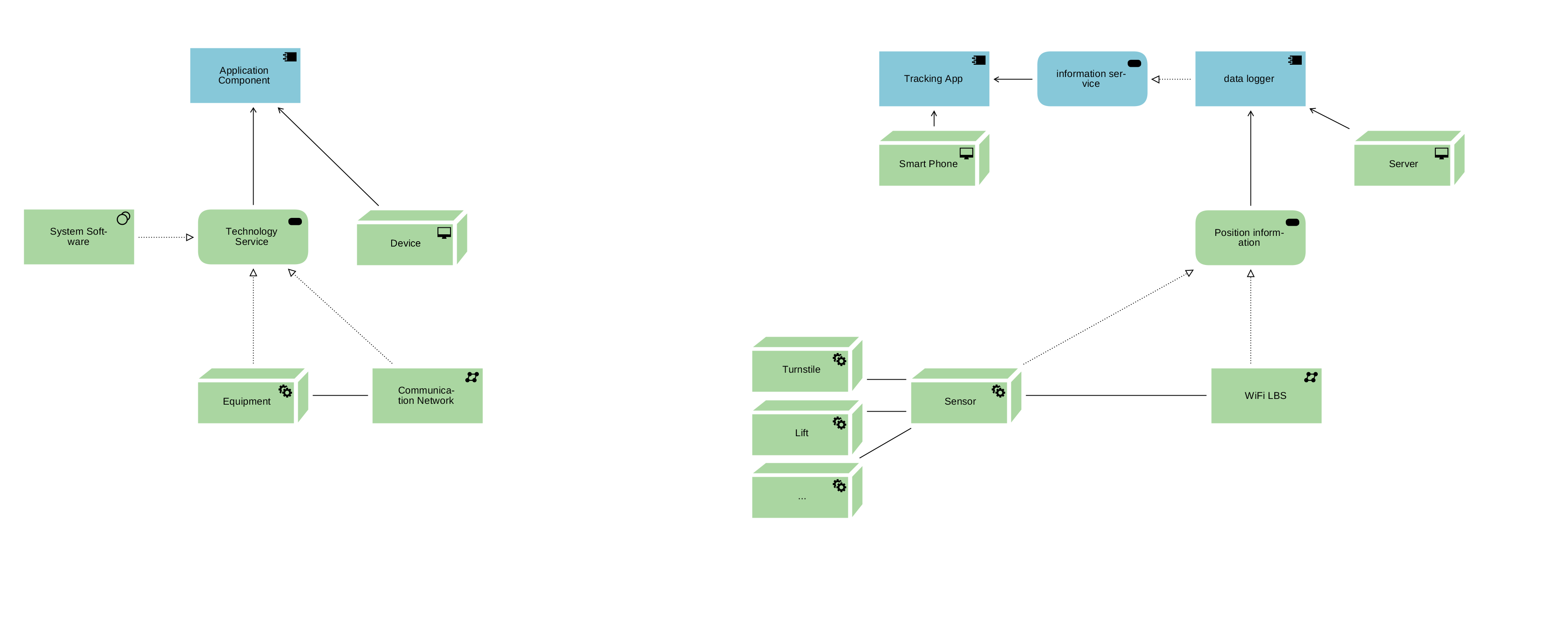


Figure 2 Technology Architecture for the tracking app incl. docking to application layer