Course: Internet of Things - 521043S
Exercise 3: Added Value of Smart Lightning

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1 Question I

Following the first question "what we can obtain from all measures", the main purpose is about motion detection in specific areas. It is clear that with the changes in one of luminaire, illumination, movement measures, the motion can be detected. For example, the changes of luminaire or illumination or motion measure can lead to a modification of somethings in light areas. In addition, these measures can show the period of time in modification, which means the change in a period of time can be captured and analyzed.

The motion detection of people also can be detected by temperature measure. To be successful, the heat map from temperature measure can be illustrated. Another thing which can achieve from temperature measure is fire detection or change of heat weather. In more detail, with the suddenly rising temperature measure, the fire can be considered as a reason.

Last but not least, the energy measure can be utilized to manage electronic power on the campus. In particular, this measure points out the electronic leak on the campus due to the irregular changes.

2 Question II

The most interesting advantages in smart light systems are about efficient cost and effective use in order to improve comfort and attraction. In more detail, lights can be automatically turned on when there is someone entering a room or a specific place. Then, those lights can turn off if they leave the room or that area. To implement this idea, a set of sensors can be installed such as motion, temperature, illumination sensor. These sensors' result can be sent to local servers or centralized cluster servers to handle decisions (turn on or off). As a consequence, the light system on the campus can be optimized in order to reduce electronic consumption and improve comfort.

Another idea for the smart light is the change of light color depending on the different situations. For example, the yellow light can be utilized in restaurants

and sleeping or relaxing room, which can make comfort for the students and staffs; however, in the case of lecture rooms, the blue light can be utilized. This idea can be set up based on smart light devices which can be set based on different aims of rooms or areas in the campus. Moreover, to successfully implement this idea, a study on different light colors for different purposes can be considered.

The adjustment of light level is also an idea to build the smart light system. In details, the idea is to adjust the light level in the campus based on the sunlight level in different rooms. Furthermore, with lecture rooms using the projectors for presentation, the light level should be automatically reduced to enhance the comfort for the audiences or students. The installation for this idea is based on illumination sensors which can capture the sunlight level before estimating a suitable light level for the room. Another kind of sensor being luminaire sensor can be used to adjust different light levels shining to different materials such as projection screen.

The smart light system should consider other dangerous situation such as fire or earthquake. For instance, if there is a fire in the campus, the electronic power should be automatically turned off, but the smart light system has to open specific lights as crucial signs in order to show the ways the students and staffs leaving safely the campus. Hence, due to turning off electronic power in dangerous cases, the smart light should consider a way for specific lights without electronic power. Moreover, the smart light can be trained to decide to automatically switch on special modes including fire, earthquake and etc. Therefore, the design to set up specific lights (without electronic consumption) for dangerous cases needs to be considered with special signs.

For entertainment, the smart light can be built with several applications. One of the most interesting ideas is music light, which means the changes in colors and shapes depending on the music or sound in relaxing rooms as an example. To set up this idea, the relaxing room should have several sounds or music sensors and light color. These sensors take sounds from the room and transmit to computing servers (local or cluster servers). Then, the change of colors and shapes can be projected in that room.