SOFTWARE ENGINEERING

ASSIGNMENT 1

**Group 4**

09/2019

Assignment 1’s requirements:

Each student has to submit the following contents by only 01 pdf file:

- Functional requirements:

  + Use-case diagram for the whole system (group work)

**+ Use-case detail/scenario for use-case the student is in-charged**

**+ Other non-interactive functional requirement (bonus)**

- Non-functional requirements:

**+ General non-functional requirements for the whole system (group work)**

**+ Other non-functional requirements the student is in-charged**

Deadline

September 30th 2019

First group work deadline: 9:00pm Sunday, 22nd Sept 2019

Group work task role distribution

|  |  |  |
| --- | --- | --- |
| No. | Name | Description |
| 1 | Diep | We have to provide a web application and a mobile application for everyone in the university, including lecturers, students, staffs, and guesses. The user can easily search for the schedule of any room and the direction to that room. Moreover, the system will allow the lecturers to book a room if it is free directly on the web application or mobile application. |
| 2 | Huy | The system has be make sure that the doors of a room will be opened and its electrical devices such as lights, sound system, fans, projectors will be turned on automatically 15 minutes before the beginning of the lecture, if they are off. The electrical devices will be off and the doors will be closed after the end of the lecture and after the last person left the room if there is no next lecture in the same room. A sound will be alarmed at if there is still some person in the room after the closed hour of the university (around 9:00 PM). |
| 3 | Khoa | The security staffs can still access to any room using their key cards and turn any light on or off through the mobile app or (control) pannel attachted to each room, corridor and building. |
| 4 | Nhan | To detect human, the camera signals and the human detector signals will be sent to an external AI service provided by the ABC company. The AI service is as follows. To reduce the used energy, at the night, the lights in corridors will be turned on only for human or when the rooms in that area are in used. |
| 5 | Thanh | Reports about the usage of the electrical devices (working hours, etc.) of a room, a level of a building, a building and the whole campus within a period (day, week, month, year, date to date) can be seen at any time. A monthly report will be generated and sent automatically to the Admin and the Board of Rectors via email. |

What to do

The followings are to do tasks for each member, submit before the deadline on Sunday 22nd.

1. Find out at least 5 functional requirements
2. Use-case detail/scenario for use-case
3. Find out at least 5 non-functional requirements, they can be based on functional requirements

Actors

1. Lectures
2. Students
3. Security Staffs
4. Office Staff (including the Head)
5. Guests

References

1. Slides
2. Let me google that for you

*Scroll down for our member’s work*

Khoa’s

|  |  |  |  |
| --- | --- | --- | --- |
| Requirement | F | NF | No. |
| We have to provide a web application and a mobile application for everyone in the university, including lecturers,  students, staffs, and guesses. |  | X | 1 |
| The user can easily search for the schedule of any room and the direction to that room. | X |  | 2 |
| Moreover, the system will allow the lecturers to book a room if it is free directly on the web application or  mobile application. | X |  | 3 |
| The system has be make sure that the doors of a room will be opened and its electrical devices such as lights,  sound system, fans, projectors will be turned on automatically 15 minutes before the beginning of the lecture, if  they are off. |  | X | 4 |
| The electrical devices will be off and the doors will be closed after the end of the lecture and after  the last person left the room if there is no next lecture in the same room. | X |  | 5 |
| A sound will be alarmed at if there is  still some person in the room after the closed hour of the university (around 9:00 PM). | X |  | 6 |
| The security staffs can still access to any room using their key cards and turn any light on or off through the  mobile app or (control) pannel attachted to each room, corridor and building. | X |  | 7 |
| To reduce the used energy, at the night, the lights in corridors will be turned on only for human or when the rooms  in that area are in used. | X |  | 8 |
| Reports about the usage of the electrical devices (working hours, etc.) of a room, a level of a building, a building  and the whole campus within a period (day, week, month, year, date to date) can be seen at any time. | X |  | 9 |
| A monthly  report will be generated and sent automatically to the Admin and the Board of Rectors via email. | X |  | 10 |

Huy’s

|  |  |  |  |
| --- | --- | --- | --- |
| Requirement | F | NF | No. |
| The doors of a room and its electrical (lights, fans) will be turned on automatically 15 minutes before the beginning of the lecture, if they are off | x |  | 1 |
| The electrical devices will be turned off and the doors will be closed after the end of the lecture and after the last person left the room if there is no next lecture in the same room | x |  | 2 |
| If the doors of a room or its electrical (lights, fans) don’t turned on before the beginning of the lecture, the lecturer can send messages to security to announce by app(Requirement of the NF(5)) | x |  | 3 |
| A sound will be alarmed at if there is still some person in the room after the closed hour of the university (around 9:00 PM). | x |  | 4 |
| The lecturer must log in by account if he/she want to send messages to security |  | x | 5 |
| Information of the scheduled room will be automatically sent to students and lecturer before a day | x |  | 6 |
| The security can sort rooms in the campus which will not be closed and turned off the electrical devices after 9:00 PM |  | x | 7 |
| Information of scheduled rooms will be saved in a month in the system |  | x | 8 |
| Information of scheduled rooms (name of rooms, user, time-use, purpose of using, …) can be searched |  | x | 9 |
| If lecture was cancelled before 15 minutes, the information will be sent to students and the security (only lecturer) | x |  | 10 |

Diep’s

|  |  |  |  |
| --- | --- | --- | --- |
| Requirement | F | NF | No. |
| User (lecturers) can search for room schedule using date, time, building, room number, room capacity, room facility. The system returns the room schedule and direction to the room. | x |  | 1 |
| User (lecturers) can book a room. | x |  | 2 |
| User (lecturers) can book a room if it is free. |  | x | 3 |
| User (lecturers) can cancel his/her booked room | x |  | 4 |
| User (lecturers) can modify his/her booked room as long as it’s free | x |  | 5 |
| User can login the application using ID and password | x |  | 6 |
| User (lecturers) will receive a reminder about his/her booked rooms’ information of the next day | x |  | 7 |
| User (lecturers) will receive a reminder about his/her booked rooms’ information of the next day before 5pm the day before |  | x | 8 |
| User (security staff) can monitor rooms, corridor and building using camera, check if electrical devices are on or off | x |  | 9 |
| A warning will be sent to the user (security staff) if electrical devices do not function properly (on or off as schedule) | x |  | 10 |
| A warning will be sent to the user (security staff) if electrical devices do not function properly (on or off as schedule) immediately |  | x | 11 |
| Electrical devices can be control remotely by user (security staff) | x |  | 12 |
| Add new user, delete user, add guest user, validate user | x |  | 13 |

Nhan’s

|  |  |  |  |
| --- | --- | --- | --- |
| Requirement | F | NF | No. |
| Everyone in the university can search for the schedule of rooms | x |  | 1 |
| Everyone in the university can search for direction to rooms | x |  | 2 |
| The lecturers can book a room | x |  | 3 |
| The lectures can book  a room DIRECTLY ON THE WEB OR MOBILE APPLICATION |  | x | 4 |
| The doors of a room and its devices (lights, sound system, fans, projectors…) will be AUTOMATICALLY opened 15 minutes before the beginning of the lectures |  | x | 5 |
| The electrical devices will be off and the doors will be closed after the end of the lecture and after the last person left the room if there is no next lecture in the same room |  | x | 6 |
| The system can alarm at if there is still some person in the room after the closed hour of the university (around 9:00 PM). |  | x | 7 |
| The security staffs can access to any room using their key cards and turn any light on or off | x |  | 8 |
| The system can recommend available rooms for the lecturers | x |  | 9 |
| Report about the usage of the electrical devices MONTHLY for particular section (a room, a building, whole campus …) |  | x | 10 |
| The system can send report to the Admin and the Board of Rectors via email | x |  | 11 |
| The system can send report to the Admin and the Board of Rectors via email MONTHLY |  | x | 12 |
| The lecturers can book a room IF IT IS AVAILABLE |  | x | 13 |
| The system can send an alert to security staffs and lectures (in case of detect abnormal activity) | x |  | 14 |
| The security staffs, lectures can look up for room usage history | x |  | 15 |

Thanh’s

|  |  |  |  |
| --- | --- | --- | --- |
| Requirement | F | NF | No. |
| User đăng nhâp bằng ID và password | X |  | 1 |
| User (học sinh –sinh viên) có thể xem khu vực tự học đang hoạt động hoặc không hoạt động tại thời điểm hiên tại | X |  | 2 |
| User ( giảng viên, cán bộ-công viên chức) có thể xem khu vực tự học và các phòng học đang hoạt động hoặc không hoạt động tại thời điểm hiện tại | X |  | 3 |
| User (bảo vệ) có thể xem khu vực tự học,các phòng học, tòa nhà và toàn bộ khuôn viên trường đang hoạt động hoặc không hoạt động tại thời điểm hiện tại | X |  | 4 |
| User (Quản trị, Ban giám hiệu) ngoài các tính năng của user (học sinh-sinh viên, giảng viên, cán bộ công viên chức, bảo vệ) còn có thể xem  báo cáo về sử dụng các thiết bị điện bất cứ lúc nào | X |  | 5 |
| Bất kỳ User nào cũng có thể tin cung cấp thông tin  hoặc đóng góp ý kiến về việc sử dụng các thiết bị điện về ban quản trị | X |  | 6 |
| Báo cáo định kỳ sẽ được tạo và gửi tự động tới Quản trị và Ban Giám hiệu qua email |  | X | 7 |
| User (Quản trị) có thể thiết lập email người nhận và thời gian báo cáo định kỳ theo lựa chọn hoặc thông số hoặc biểu dồ hoặc cả hai | X |  | 8 |
| User (Quản trị và Ban giám hiệu) có thể xem báo cáo được thống kê (phòng học, tòa nhà, khuôn viên,..) theo dạng biểu đồ trong khoản thời gian | X |  | 9 |
| User (Quản trị và Ban giám hiệu) có thể xem báo cáo được thống kê theo thiết bị điên (đèn, quạt, âm thanh, máy chiếu,…) theo dạng biểu đồ trong khoản thời gian | X |  | 10 |
| User (Quản trị và Ban giám hiệu) có thể xem báo cáo được thống kê thiết bị điện các hãng sản xuất theo dạng biểu đồ trong khoản thời gian | X |  | 11 |
| Thiết bị cảm biến điện năng tiêu thụ được gắn trên mổi thiết bị điện |  | X | 12 |
| Mỗi khu vực ( phòng học, tòa nhà, khuôn viên,…) được gắn thiết bị cảm biến tổng |  | X | 13 |

Assignment 1

1. Introduction

1.1. Purposes

1.2. Scope

1.3. Definitions

1.4. Technologies will be used (?)

1.5. Overview

1. Overall Description

2.1. Product Functions

|  |  |
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| Diep |  |
| Huy |  |
| Khoa |  |
| Nhan |  |
| Thanh |  |

|  |  |  |
| --- | --- | --- |
| # | Use Case Name | Descriptions of Use Case |
| 1 | Search for room schedule and its location | User (lecturers) can search for room schedule using date, time, building, room number, room capacity, room facility. The system returns the room schedule and direction to the room. |
| 2 | Book a room | User (lecturers) can book a room. |
| 3 | Cancel room | User (lecturers) can cancel his/her booked room |
| 4 | Modify room | User (lecturers) can modify his/her booked room as long as it’s free |
| 5 | Login the app | User can login the application using ID and password |
| 6 | Reminder | User (lecturers) will receive a reminder about his/her booked rooms’ information of the next day |
| 7 | Monitoring | User (security staff) can monitor rooms, corridor and building using camera, check if electrical devices are on or off |
| 8 | Error warning | A warning will be sent to the user (security staff) if electrical devices do not function properly (on or off as schedule) |
| 9 | Remote control | Electrical devices can be control remotely by user (security staff) |
| 10 | User control | Add new user, delete user, add guest user, validate user |
| 11 | Email notification | An email will be sent to the user when he/she finishes booking/modifying/canceling room |
| 12 | Schedule retrieving | User can find his/her booked rooms list on the application |
| 13 | Infrastructure and Facilities management | User (admin) manage the infrastructure and facilities of the university by adding, deleting, modifying rooms, building, rooms’ facilities. |
| 1 | Search information scheduled room | User can search information room (name of rooms, user, time-use, purpose of using, …) |
| 2 | Cancel room | User (Lecturer) can cancel a room if he/she is busy and the information will be sent to students and the security |
| 3 | Sort information of the scheduled rooms | The security can sort rooms in the campus which will not be closed and turned off the electrical devices after 9:00 PM |
| 4 | Log in | Although the lecture will start, the doors of a room and its electrical didn’t turned on. Therefore, the lecturer want to send a message to the security for an announcement, he/she will log in in the system by his account |
| 5 | Alarm | A sound will be alarmed at if there is still some person in the room after the closed hour of the university (around 9:00 PM). |
| 6 | Saving information rooms | Information rooms will be saved in a month to user can search old information. |
| 7 | Check | User will be received information room before a day |
| 1 | Room usage history checking | The security or the lectures can look up for room usage history (date, time, user…) |
| 2 | Human detecting | The system is able to detect human (is there any people?  if any, then identify quantity...) based on video footage |
| 3 | Abnormal activity warning |  |
| 4 | Attendance checking |  |
| 5 | Room recommendation |  |
| 6 |  |  |

    2.2. System Process Model

    2.3. System Context Model

2.4. User Classes and Characteristic

    2.5. Operating Environment

    2.6. Design and Implementation Constraints

1. Functional Requirement Specifications

**For each use case, please follow the below template, main functional requirements first and arrange them in the right category. If the category is not available, create one.**

|  |  |
| --- | --- |
| Diep |  |
| Huy |  |
| Khoa |  |
| Nhan |  |
| Thanh |  |

3.1. Campus Monitoring

        3.1.1. Camera Monitoring

* Context Model
* Use case diagram:
* Use case scenario tabular

|  |  |
| --- | --- |
| Use case name | Camera Monitoring |
| Actor | Security Staff (SS) |
| Description | The SS monitors the whole campus by watching camera |
| Preconditions | The SS logged in into SCAMS application |
| Triggers | None |
| Normal Flow | 1. SS selects Campus Monitor 2. SS selects Camera Monitor 3. The cameras list will be shown up 4. SS selects a specific camera and watch video 5. SS quit the current view and select another camera 6. SS choose to quit |
| Exception | Exception at step 4. Camera is not working |
| Alternative Flows | 4a. SS reports Camera is not working, move to step 5. |

        3.1.2. Sensor Monitoring

* Context Model
* Use case diagram:
* Use case scenario tabular

|  |  |
| --- | --- |
| Use case name | Sensor Monitoring |
| Actor | Security Staff (SS) |
| Description | The SS monitors the whole campus by reviewing sensor’s information |
| Preconditions | The SS logged in into SCAMS application |
| Triggers | None |
| Normal Flow | 1. SS selects Campus Monitor 2. SS selects Sensor Monitor 3. The sensors list will be shown up 4. SS selects a specific sensor and view information 5. SS quit the current view and select another sensor 6. SS choose to quit |
| Exception | Exception at step 4. Camera is not working (Alternative 4a) |
| Alternative Flows | 4a. SS reports Camera is not working, move to step 5. |

    3.2. Remote Control

    3.3. Room and Schedule

    3.3.1. Search Room Information

* Context Model
* Use case diagram:
* Use case scenario tabular

|  |  |
| --- | --- |
| Use case name | Search Room Information |
| Actor | User (Security Staff, Lecturer, Student, Guest) |
| Description | User can search for room information |
| Preconditions | User logged in into SCAMS application |
| Triggers | None |
| Normal Flow | 1. User selects “Search” on SCAMS home page 2. System represents a search panel with multiple filters (date) and (building, room number). Date and building must be filled 3. User selects date, building and room number filters 4. System represents a page with the room’s usage timetable and capacity 5. User chooses each lecture/event 6. System represent a pop up box giving the lecture/event’s information: lecturer/speaker, subject/event’s name 7. User choose to quit the view 8. User choose to quit |
| Exception | Exception at step 4. Cannot find the room number  4a. The system represents a pop up box saying that user should use other search criteria (Alternative 3a) |
| Alternative Flows | *Alternative 1: at step 3*  3a. User selects date and building  3b. System represent a list of room in that building and it’s usage timetable, capacity  3c. User select on a particular room to see its usage timetable, move to step 4  *Alternative 2: at step 5*  5a. User chooses “Room information”  5b. System represents the room’s capacity, facilities and direction to that room |

    3.3.2. Book Room

* Context Model
* Use case diagram:
* Use case scenario tabular

|  |  |
| --- | --- |
| Use case name | Book room |
| Actor | Lecturer |
| Description | Lecturer can book room |
| Preconditions | Lecturer logged in into SCAMS application |
| Triggers | None |
| Normal Flow | 1. Lecture selects “Search” on SCAMS home page 2. System represents a search panel with multiple filters (date) and (building, room number). Date and building must be filled 3. Lecturer selects date, building and room number filters 4. System represents a page with the room’s usage timetable and capacity 5. User chooses the time he/she willing to book 6. System represent a pop up box announcing that the room is booked successful. 7. System automatically send an confirmation email to the lecturer, including the room information 8. Lecturer choose to quit the view 9. User choose to quit |
| Exception | Exception at step 4. Room is full at that date (Alternative 3a)  Exception at step 4. Cannot find the room |
| Alternative Flows | *Alternative 1: at step 3*  3a. User chooses another room, same date and building |

1. Other Non-Functional Requirements

4.1. Performance Requirements

4.2. Safety Requirements

4.3. Security Requirements

4.4. Software Quality Attributes

4.5. Business Rules

1. External Interface Requirements

    5.1. User Interface

    5.2. Hardware Interface

    5.3. Software Interface

    5.4. Communications Interface