

California State University Long Beach
Department of Computer Engineering and Computer Science



Course # CECS 542

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Semester: Spring 2017

Lab 11 – Usage Model

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Lab 11 Write-up

To ensure that our models and diagrams reflected the most accurate and concise information, we decided to fill out the Cockburn template first, then use it to construct our sequence diagram; then go back to the template and update anything we might have missed. First, we listed the core use cases of the system and created the overview diagram. This helped us grasp an overall understanding of the system. Second, we wrote our use cases in the Cockburn template which gave us a greater understanding of each core use case and the way they worked. This was really helpful for our last step, creating the message sequence diagrams. Having done the overview diagram and use cases allowed us to do the message sequence diagrams with ease after we figured out the classes and database tables. After having done this for the core use cases, we repeated the same process for adding the use cases that are not implemented yet.

Taking a step back and creating the overview diagram was probably the easiest part for us. We were able to quickly recognize the core use cases after entering the OpenMRS admin account. We explored the all entry and search forms and wrote down our core use cases. Adding our list of use cases to the Cockburn diagram was also pretty simple. The template, although intimidating at first glance, was actually pretty straightforward.

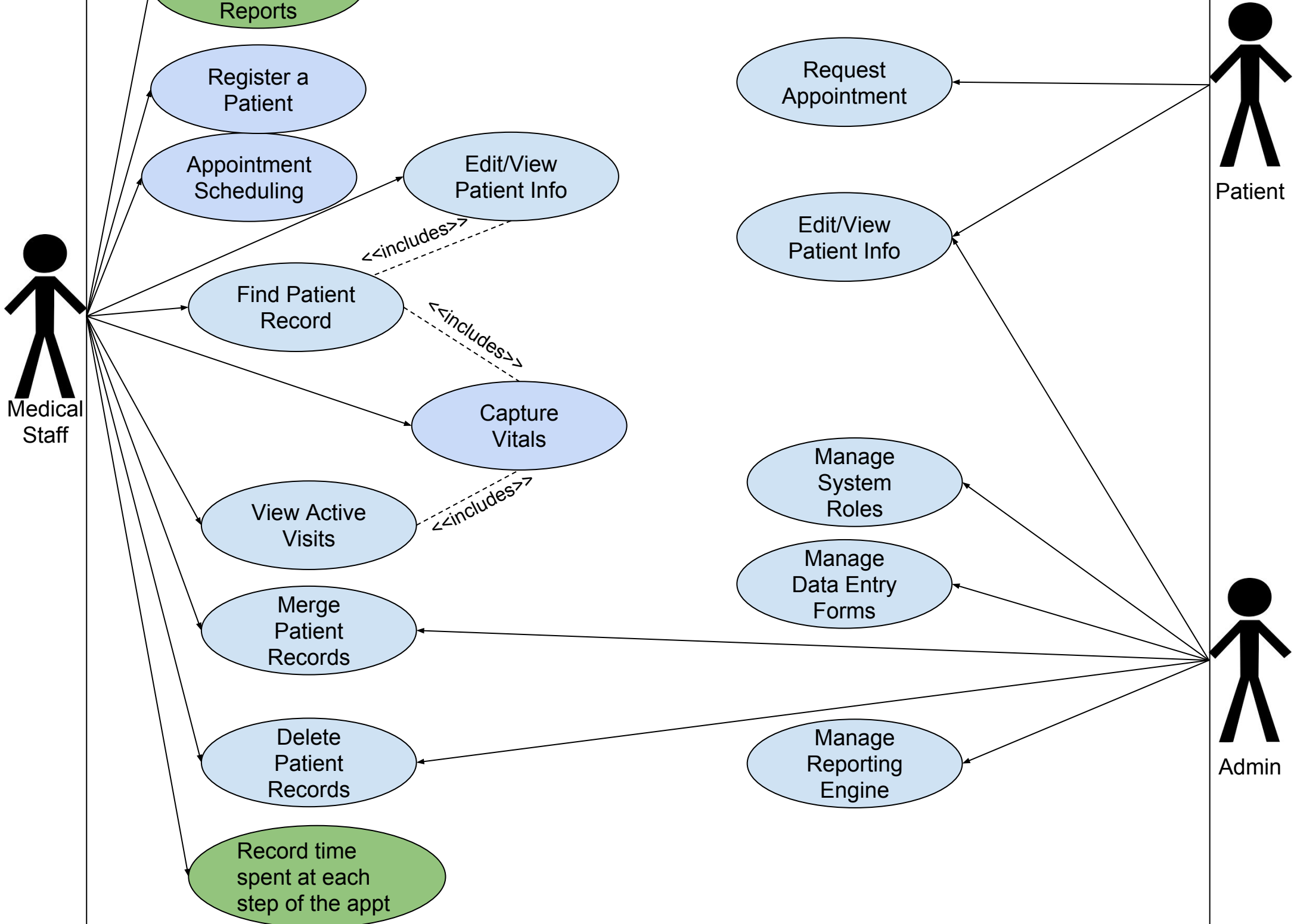
The most difficult aspect of this Lab was the message sequence diagram. We looked at the source code to help us understand the classes and tables involved for each of our use cases, where applicable. This proved to be the most difficult part. We wanted to ensure that we provided as accurate information as we could in our sequence diagrams. After we finally figured out the classes, we were able to swiftly create the rest of the diagram by following our Cockburn use cases.

For the first use case that is not yet implemented, we noticed that OpenMRS does not have any out of the box reports built in for the medical staff to use; someone with technical knowledge would have to create the reports at each location. Therefore, the first not yet implemented use

case shows how built in reports would work. Having visibility to information such as all patients seen, demographic breakdown, visit types, and diagnoses would allow facilities to make staffing and medical decisions to help as many patients as possible. Each facility would be able to run the reports as they need, whether it is weekly, monthly, quarterly, or yearly.

The second use case we created is a time tracking feature. This module would allow a patient's visit time to be tracked from when they check in until when they leave. We feel this module would closely tie in to the reporting module. The data is not critical in a day to day operation sense, but it can be used to give insight into where there are bottlenecks in their processes. The facilities aim to help as many patients as possible, using time stamp data will allow management to determine which processes are slowing down each patient's visit , therefore reducing the number of patients that can be seen. This data can be viewed through reports, and be used to help develop processes that utilize the facilities resources as efficiently as possible.

OpenMRS System



Use Case 1

| | | |
|---------------------------|---|---|
| USE CASE # | 1 Register Patient | |
| Goal in Context | Medical staff registers a patient | |
| Scope & Level | Scope: OpenMRS web interface Level: Primary task | |
| Preconditions | <ol style="list-style-type: none"> 1. Patient must be available to provide information. 2. The medical staff must be logged in to the system and have the correct role 3. The patient must not currently exist in the system | |
| Success End Condition | The new patient is successfully added to the system | |
| Failed End Condition | The new patient is not successfully added to the system | |
| Primary, Secondary Actors | Primary actor: medical staff, patient | |
| Trigger | Medical staff requests name and birthdate to verify that the patient is new. | |
| DESCRIPTION | Step | Action |
| | 1 | Medical staff clicks on <i>Register a Patient</i> icon |
| | 2 | The system loads the form requesting the patient information |
| | 3 | Medical staff enters information, including additional information: gender, address, and phone number |
| | 4 | Medical staff clicks confirm to register patient into the system |
| EXTENSIONS | Step | Branching Action |

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| | 3a | Condition: System identifies existing record based on entered attributes Action: View existing record, if it is the same patient, view record. If not, continue to step 6 |
| SUB-VARIATIONS | | Branching Action |
| | 3a | Condition: Patient does not know their address or birthdate: Action: Patient provides only one field for address and/or estimates their age |
| | 4a | Condition: System fails to save record upon clicking Confirm Action: Medical staff refreshes their page and re-enters the information again |

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| RELATED INFORMATION | 1 Register Patient |
| Priority: | Critical |
| Performance | 5 minutes |
| Frequency | Multiple times daily |
| Channels to actors | Interactive |
| OPEN ISSUES | - |
| Due Date | April 3, 2017 |
| Superordinates | - |
| Subordinates | - |

Use Case 2

| USE CASE # | 2 Scheduling an Appointment | |
|---------------------------|--|--|
| Goal in Context | Schedule appointments for existing patients | |
| Scope & Level | Scope: OpenMRS web interface Level: Primary task | |
| Preconditions | <ol style="list-style-type: none"> 1. The medical staff must be logged in to the system and have the correct role 2. Patient must be available to confirm if date/time is acceptable | |
| Success End Condition | An appointment is scheduled for the patient on a date/time that they are available | |
| Failed End Condition | An appointment is not scheduled | |
| Primary, Secondary Actors | Primary actor: the medical staff Secondary actor: patient | |
| Trigger | The patient requests an appointment (checkup/follow up visit) and provides their name | |
| DESCRIPTION | Step | Action |
| | 1 | The medical staff finds the patient's record by clicking the <i>Find Patient Record</i> button and entering the patient's name |
| | 2 | The system loads a list of all matching patient names |
| | 3 | The medical staff will click on the corresponding patient row |
| | 4 | The system loads the patient's record |
| | 5 | The medical staff proceeds to the <i>Schedule</i> |

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| | | <i>Appointment</i> hyperlink |
| | 6 | The system loads a form to search for dates and services |
| | 7 | The medical staff searches for available dates based on the appointment type |
| | 8 | The system return a list of all available appointments |
| | 9 | The medical staff selects an available date and time and clicks <i>Next</i> |
| | 10 | The system loads a confirm appointment form |
| | 11 | The medical staff clicks <i>Save</i> |
| EXTENSIONS | Step | Branching Action |
| | 2a | Condition: Medical staff pulls up patient's info and sees an already scheduled appointment Action: Adds additional appointment or reschedules current appointment |
| SUB-VARIATIONS | | Branching Action |
| | 3a | Condition : The specific clinic does not offer appointments of that type Action: Medical staff refers patients to another clinic |

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| RELATED INFORMATION | 2 Scheduling an Appointment |
| Priority: | Critical |
| Performance | 2 minutes |
| Frequency | Multiple times daily |

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| Channels to actors | Interactive |
| OPEN ISSUES | - |
| Due Date | April 3, 2017 |
| Superordinates | - |
| Subordinates | - |

Use Case 3

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| USE CASE # | 3 Capturing Vitals | |
| Goal in Context | Record a patient's vitals during their visit | |
| Scope & Level | Scope: OpenMRS web interface Level: Primary task | |
| Preconditions | <ol style="list-style-type: none"> 1. The medical staff must be logged in to the system and have the correct role 2. The patient must be checked in and be an active visit | |
| Success End Condition | The medical staff captures the patient's vitals | |
| Failed End Condition | The medical staff is unable to capture the patient's vitals | |
| Primary, Secondary Actors | Primary actor: Medical staff Secondary actor: patient | |
| Trigger | The patient being called from the waiting room into the exam room | |
| DESCRIPTION | Step | Action |
| | 1 | The medical staff clicks on <i>Capture Vitals</i> |
| | 2 | The system loads a form requesting patient name |
| | 3 | The medical staff enters the patient name |
| | 4 | The system loads all matching patient names |
| | 5 | The medical staff selects the correct patient row |
| | 6 | The system loads the confirmation screen |
| | 7 | The medical staff clicks on <i>Yes, Record Vitals</i> |

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| | 8 | The system loads a form requesting patient's vitals information |
| | 9 | The medical staff log a series of tests into the system (height, weight, temperature, pulse, respiratory rate, blood pressure, and blood oxygen saturation) |
| | 10 | The system loads a confirmation page with vitals entered |
| | 11 | The medical staff clicks <i>Save</i> |
| EXTENSIONS | Step | Branching Action |
| | 5a | Condition: Patient information has changed Action: Update patient information by clicking the <i>Edit</i> hyperlink in the <i>Capture Vitals</i> screen |
| SUB-VARIATIONS | | Branching Action |
| | 11a | Condition: Vitals have been entered onto screen and <i>Save</i> button clicked Action: System displays error message; vitals not saved |

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| RELATED INFORMATION | 3 Capturing Vitals |
| Priority: | Critical |
| Performance | 1 minute |
| Frequency | Multiple times daily |
| Channels to actors | Interactive |
| OPEN ISSUES | - |

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| Due Date | April 3, 2017 |
| Superordinates | - |
| Subordinates | Find Patients Use Case |

Use Case 4

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| USE CASE # | 4 Running Metrics Reports | |
| Goal in Context | Be able to run out of the box reports that give insight into the services performed: all patients seen, demographic breakdown, visit types, diagnoses | |
| Scope & Level | Scope: OpenMRS web interface Level: Summary | |
| Preconditions | OpenMRS has been used correctly and has sufficient records that can be used for reports | |
| Success End Condition | The reports are generated successfully | |
| Failed End Condition | The reports are not completed correctly or are incomplete | |
| Primary, Secondary Actors | Primary Actor: Medical Staff Secondary Actor: Admin | |
| Trigger | The medical staff needs to run a report | |
| DESCRIPTION | Step | Action |
| | 1 | The medical staff clicks on <i>System Administration</i> |
| | 2 | The system loads all System Administration options |
| | 3 | The medical staff clicks on <i>Advanced Administration</i> |
| | 4 | The system loads all Advanced Administration options |
| | 5 | The medical staff click on <i>Run Reports</i> |
| | 6 | The system responds with a list of available reports |
| | 7 | The medical staff selects the desired report and clicks |

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| | | <i>Next</i> |
| | 8 | The system loads a form requesting parameters |
| | 9 | The medical staff fills out form with parameters and clicks <i>Submit</i> |
| | 10 | The system generates and exports report |
| EXTENSIONS | Step | Branching Action |
| | 6a | Condition: Out of the box report does not suit management's needs Action: Admin can customize out of the box reports or create new reports to ensure management has access to the desired data |
| SUB-VARIATIONS | | Branching Action |
| | 8a | Condition: Medical staff not correctly entering data into OpenMRS Action: Additional reports or manual effort will be needed to use data for metrics |
| | 8b | Condition: No data entered between the selected date range Action: Expand date range to ensure there is enough data for the report |

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| RELATED INFORMATION | 4 Running Metrics Reports |
| Priority: | Medium |
| Performance | 10 Minutes |
| Frequency | As needed (weekly, monthly, quarterly, yearly) |

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| Channels to actors | Interactive and databases |
| OPEN ISSUES | Reports vary from clinic to clinic, would be hard to create a core set of reports that can be used by all clinics Each clinic's medical staff can enter the information slightly different which could make the reports useless |
| Due Date | April 3, 2017 |
| Superordinates | - |
| Subordinates | - |

Use Case 5

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| USE CASE # | 5 Record patient time spent in facility | |
| Goal in Context | Medical staff records the time the patient spends at each workstation in the facility. This data allows efficiency to be measured and ultimately will allow the facility to serve more patients daily | |
| Scope & Level | Scope: OpenMRS web interface Level: Summary | |
| Preconditions | The patient has an existing record | |
| Success End Condition | Be able to determine how much time the patient spent at each “station” until their visit is finished | |
| Failed End Condition | Medical staff is unable to determine how long each patient’s visit lasted | |
| Primary, Secondary Actors | Primary: Medical staff Secondary: Patient | |
| Trigger | The medical staff checks in the patient and load the patient’s record opened | |
| DESCRIPTION | Step | Action |
| | 1 | The medical staff click the <i>In Waiting Room</i> checkbox |
| | 2 | The system’s only response is the checkbox showing as clicked on the screen |
| | 3 | The medical staff click the <i>Capturing Vitals</i> checkbox |
| | 4 | The system’s only response is the checkbox showing as clicked on the screen |
| | 5 | The medical staff click the <i>Waiting for Doctor</i> |

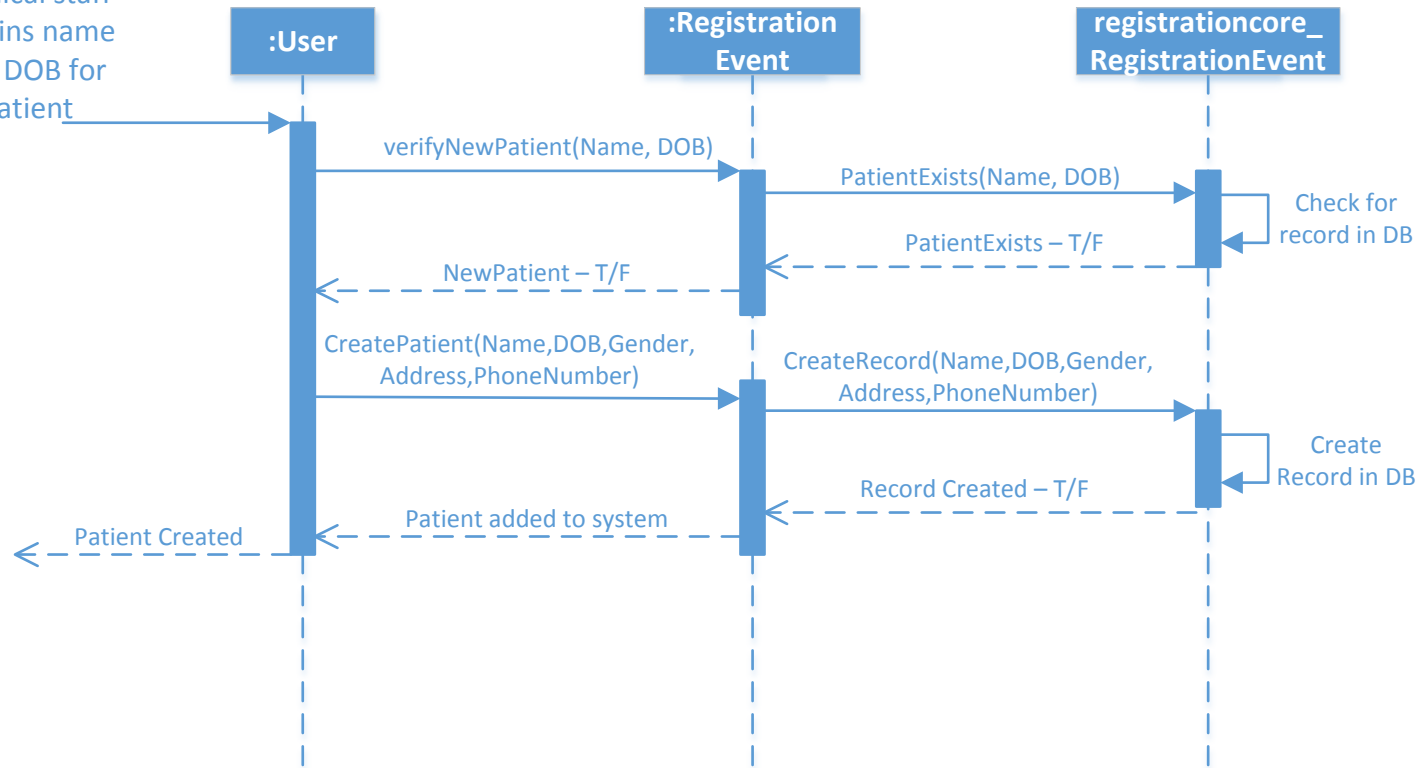
| | | |
|----------------|-------------------------------------|--|
| | | checkbox |
| | 6 | The system's only response is the checkbox showing as clicked on the screen |
| | 7 | The medical staff click the <i>Check Out</i> checkbox |
| | 8 | The system's only response is the checkbox showing as clicked on the screen |
| EXTENSIONS | Step | Branching Action |
| | 6a | Condition: Medical staff requires lab work while waiting for the doctor Action: Medical staff records time taken for patient to get lab work performed |
| SUB-VARIATIONS | | Branching Action |
| | 2a (or at any time) | Condition: Patient gets tired of waiting and leaves without notifying the medical staff Action: System would autocheck out patients at the end of each day to avoid skewing metrics |
| | 2b (or at any time) | Condition: Medical staff is busy and does click all the required checkboxes Action: System would autocheck out patients at the end of each day to avoid skewing metrics |

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| RELATED INFORMATION | 5 Record patient time spent in facility |
| Priority: | Low |

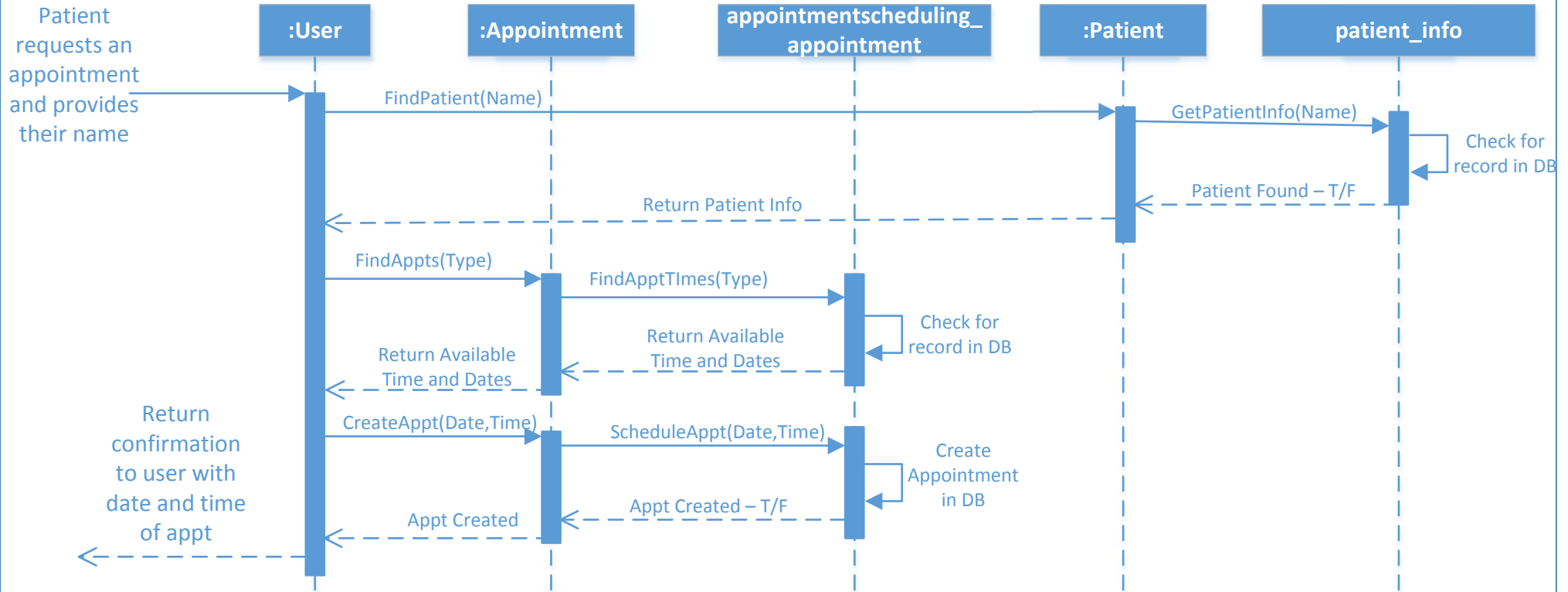
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| Performance | 30 seconds |
| Frequency | Multiple times daily |
| Channels to actors | Interactive |
| OPEN ISSUES | Finding a quick unobtrusive way for medical staff to log time at each station |
| Due Date | April 3, 2017 |
| Superordinates | - |
| Subordinates | Find Patients Use Case |

Register Patient

Medical staff obtains name and DOB for patient

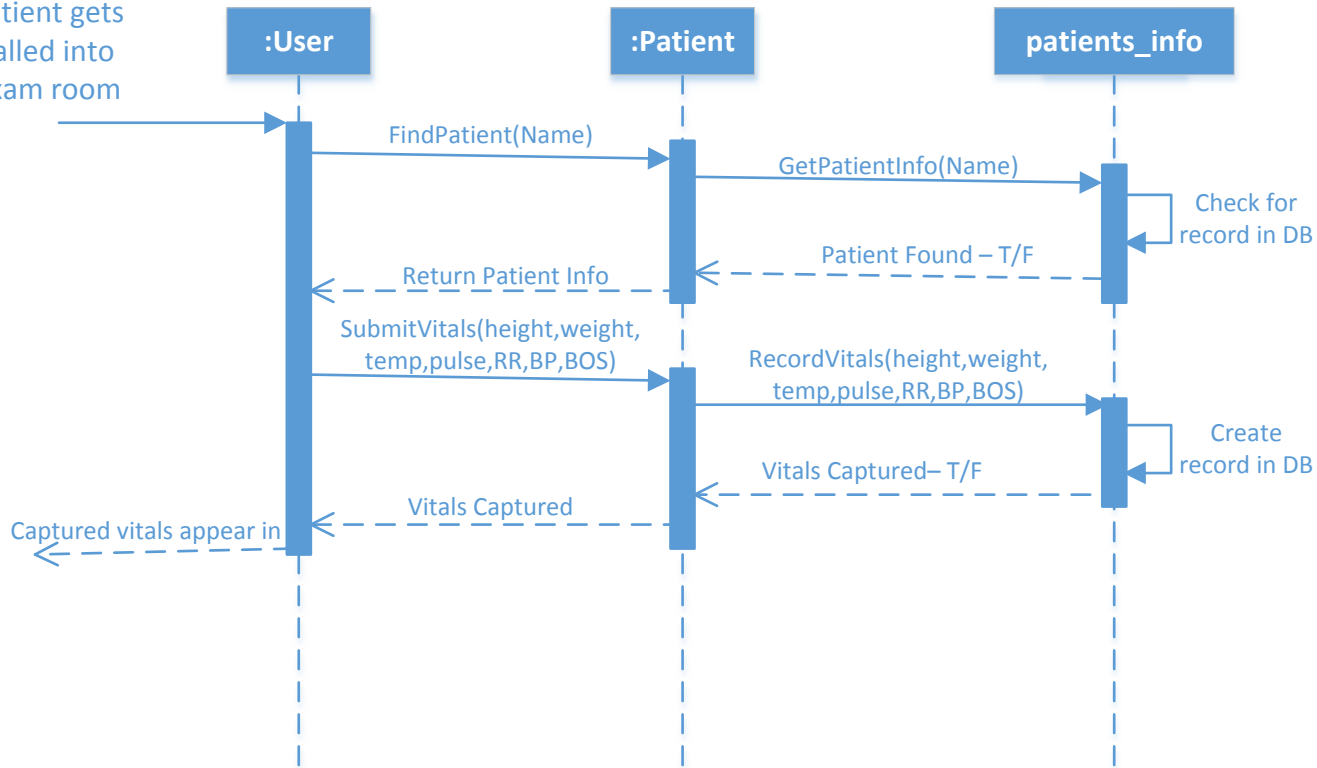


Schedule an Appt



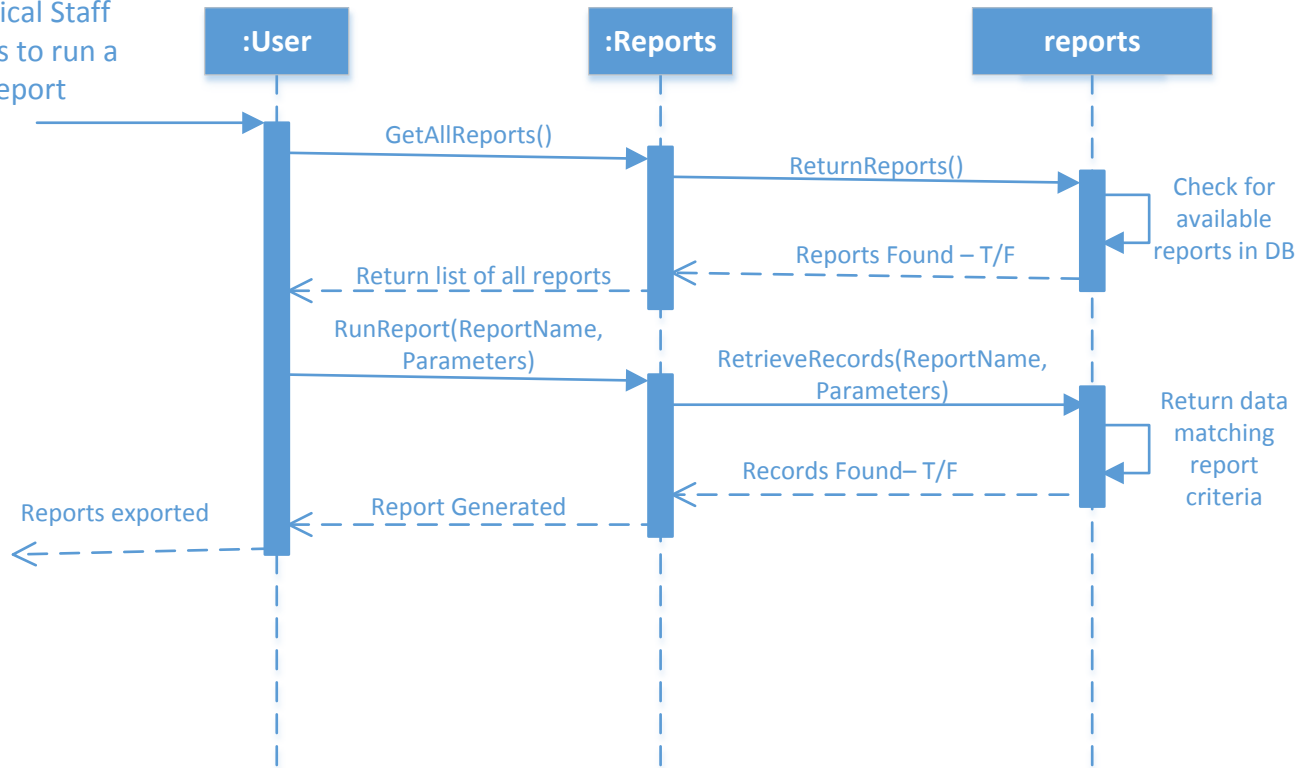
Capture Vitals

Patient gets called into exam room



Run Reports

Medical Staff
needs to run a
report



Time Tracking

Medical Staff records time for each activity

