Department of Electrical and Computer Engineering,

University of Ottawa.

ELG 6131 : Advance Software Engineering in Biomedical

(E-health, m-health, Telemedicine)

Project Deliverable:

Verification and Validation Testing

Project Title: *"Meditech – E-health Platform"*

Submitted by:

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*This **Verification and Validation** is Submitted to Professor Ali Hassan Abbas in partial fulfillment of the requirements for ELG 6131: Advance software in Biomedical course.*

Verification and Validation Testing

Verification:

Verification is the process of evaluating the intermediary work products of a software development lifecycle to check if we are in the right track of creating the final product. Verification can be quoted as "*Am I building the product right!*". These includes verifying project related sub-tasks such as:

1. Architecture Diagram
2. Use-case diagram
3. Database table design
4. ER diagrams
5. Test cases
6. Coding conventions & business logic

The most important part of verification is to check whether the products satisfy the requirements specified in the goal during the beginning of the project life cycle.

According to requirements specified for Meditech Platform, the software can perform task such as:

1. Patient can access his own personal record and medical history.
2. Patient can book an appointment via portal easily.
3. Patient can have E-Consultant with the doctor available at the clinic.
4. Patient can use the feature called AI diagnosis to predict the disease and generate a doctor authorized prescription.

The Meditech Doctors portal,

1. Doctors can view and edit the medical record of every patient at the clinic.
2. Doctors can see the upcoming and the past appointments records.
3. Doctors can use to the E-consultant feature to contact the patient in case of emergency.
4. Doctor can edit and review the AI predictions and prescriptions made for a better diagnosis.

Making sure all the features of Meditech requirement is fulfilled by the software is called as verification process.

Verification Strategies:

Verification should be performed in every stage of project development by the project team members such as,

1. Team Review Meetings
2. Design Review
3. Test plan
4. Peer Review
5. QA meetings.

Validation:

Validation is a process that ensures the system operates according to a plan by executing the system functions through a series of tests that can be observed and evaluated. Validation can be quoted as "*Am I building the right product*?" . There are two main types of validation testing namely: black-box testing, white box testing.

For Meditech E-health platform we are doing black-box testing.

Blackbox Test case & strategies:

1. Only registered user is authorized to access the Meditech portal. The Authentication of user can be evaluated if the patient is registered in the login database of the clinic.
   We here tested the Meditech portal by passing 1 invalid and 1 valid input. The test results can be seen in the screenshot attached below.

This figure requests user to fill the blank details. [Test-case: Pass]
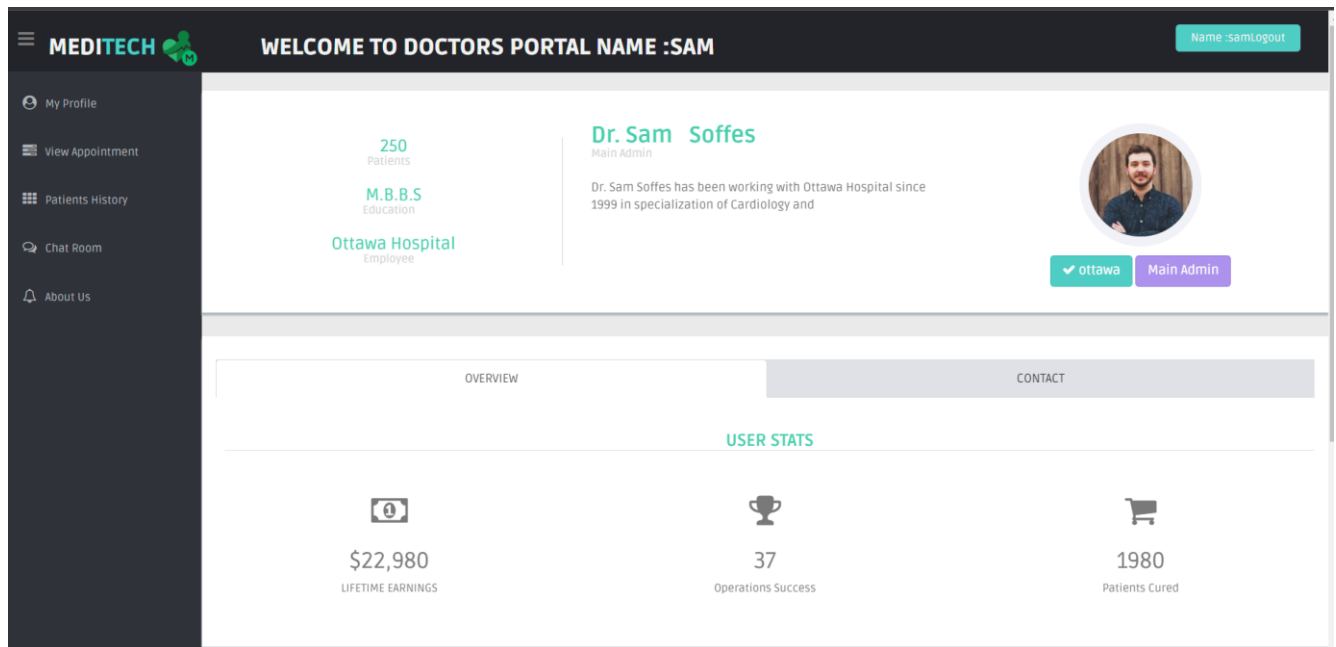
This figure states any valid user should be able to access the Meditech portal [Test-case: Pass]

2. In Book my appointment feature, when patient tries to Reserve a appointment slot, the data entry should be reflected in database and also should be visible in doctors Meditech portal.

To Test the capabilities of "Book my appointment" we tried booking a slot and check the database page and doctors page, as seen in screenshot below.

This figure states the situation where a patient tries to book an appointment using patients portal.[Test-case for front end: pass]

This page shows the changes occurred in the database when the book appointment was click.
*[Test-case for database: pass]*

This doctors portal reflects the change in appointments table as its updated.
[Test-case for doctors portal:pass]

3. Check that user is able to navigate through all the pages across Meditech portal such as AI diagnosis, E-consultancy, Logout to homepage etc.

   To test this case, we tried rigorously clicking on various buttons to check the capability and responsiveness of the MediTech Portal which should handle multiple users connected simultaneously.

4. Check the efficiency of the feature "E-Consultancy" as a priority service for communication between the doctor & patients.

   To test this case, we tried opening two different browser portals for E-consultant and check the responsiveness.
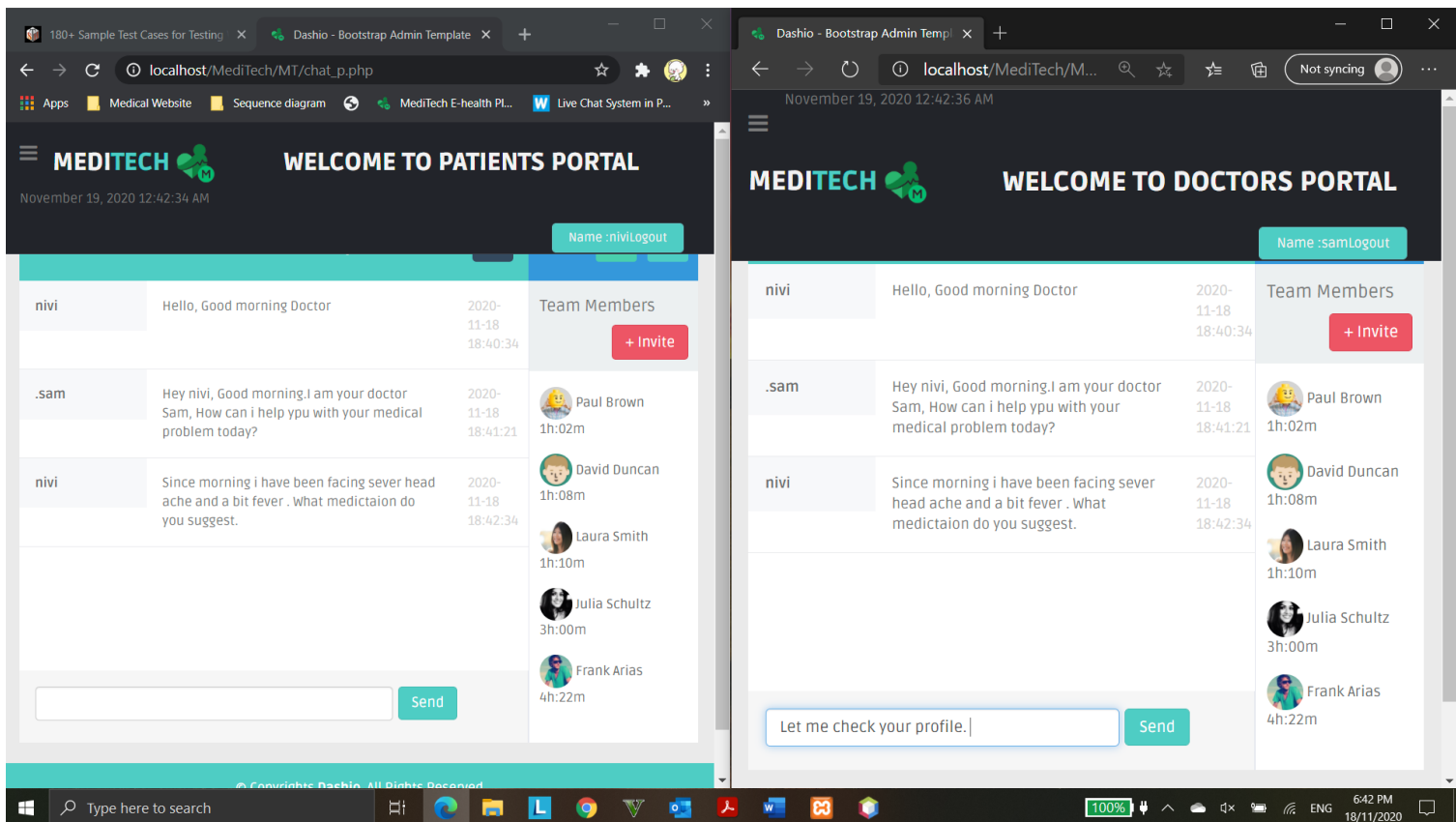
This image depicts an E-Chat scenario between doctor and patient's portal using 2 different browsers.

Disclaimer: This are some of basic test-cases created on basis of current development of Meditech Portal. As project progress, we intend to have many other test cases before our final release of Meditech Portal.