

# WHITE PINNACLE

ACCEPTANCE PRESENTATION

Gladys Khong Zhi Xuan, Khoo Hui Ping (Grace), Jocelyn Ng, Ngow Wei Yi, Tan Shi Qi

# CLIENT & SPONSOR



Michelle Koh Geok Mui



Andrew Tan Teck Jin



# FACILITIES IN NP HS

- Patient Simulation Centre
- Intensive care units
- Operating theatres



Introduction



Project Overview



Scope



Demonstration



Project Management



User Testing



Learning outcome

# PROJECT OVERVIEW

# VIDEO



# PROBLEM STATEMENT

Lack of system to provide a realistic hands-on experience



# MARKET RESEARCH

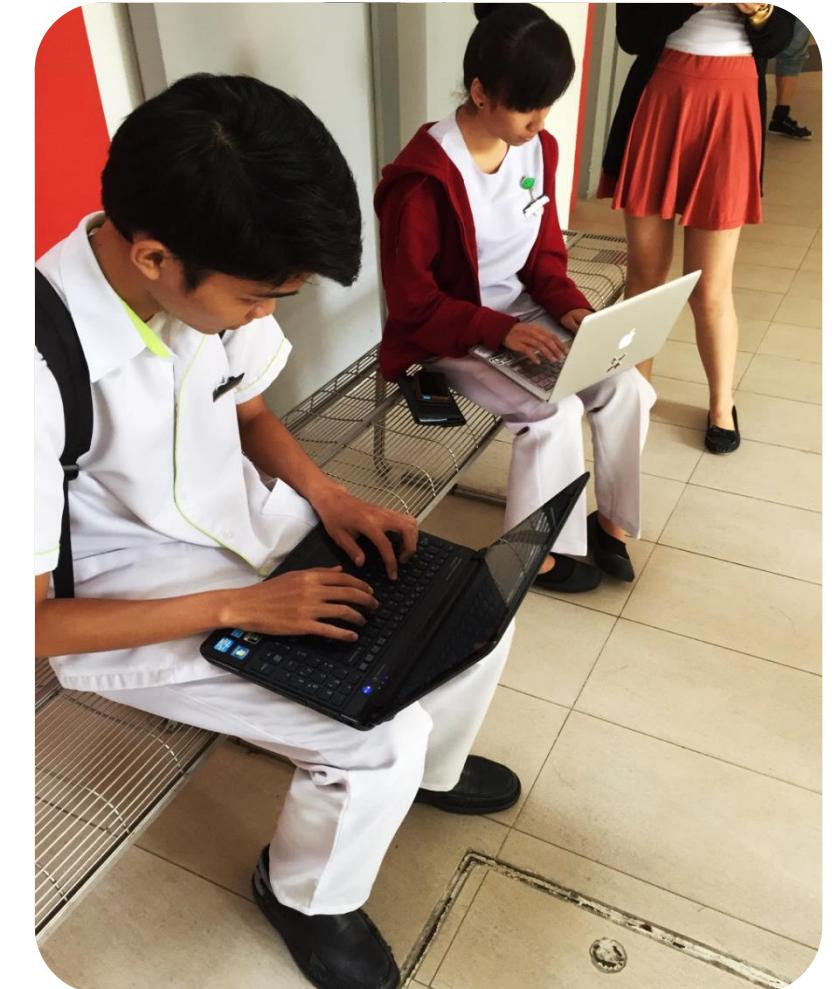
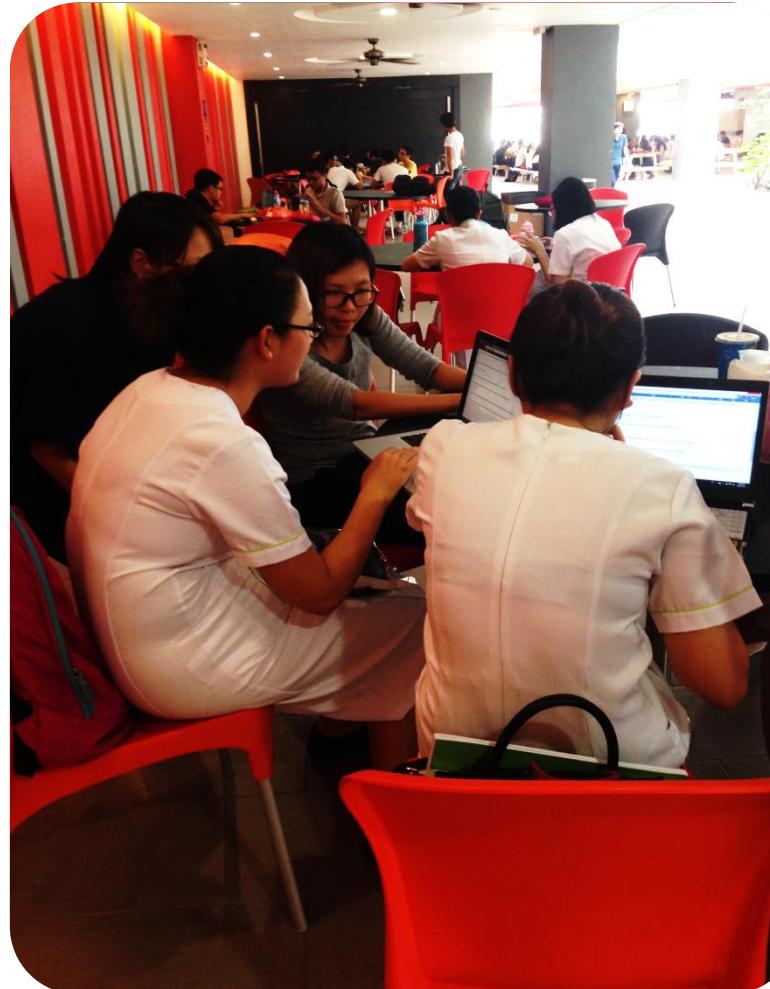
# NUMBER OF RESPONDENTS

Freshmen  
(Year 1s)

15

Juniors/Seniors  
(Year 2s and 3s)

37



Introduction



Project Overview



Scope



Demonstration



Project Management



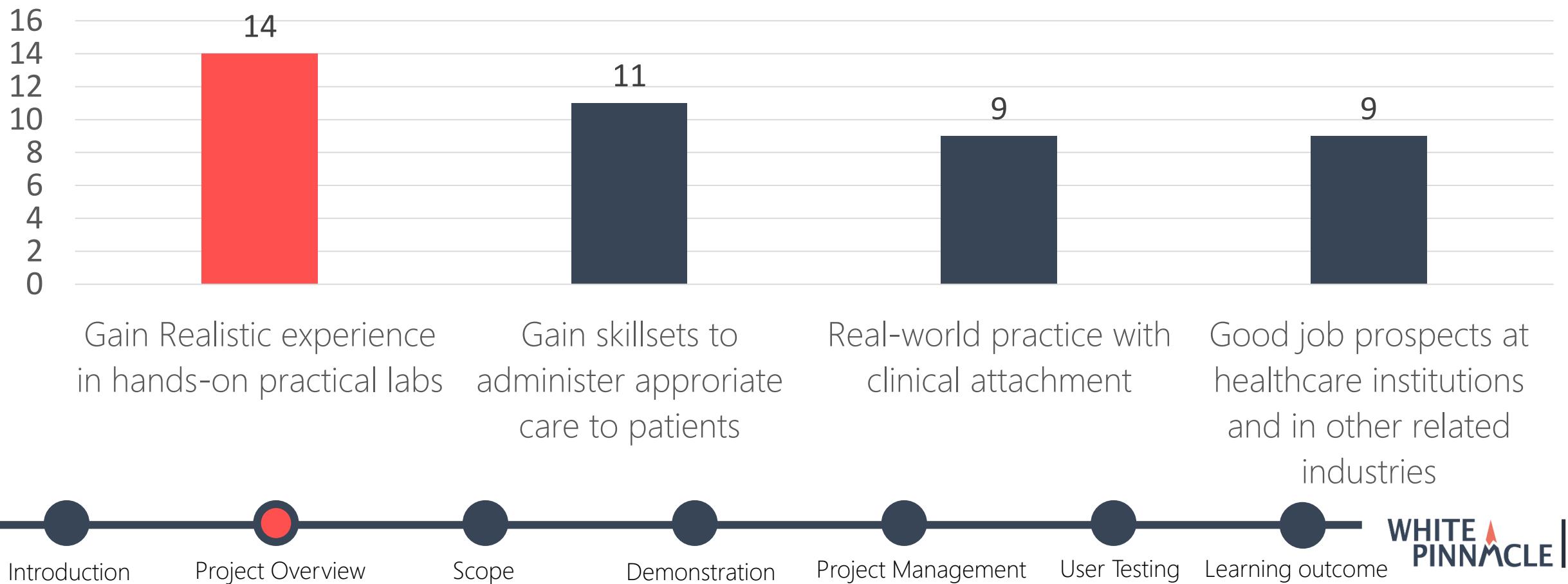
User Testing



Learning outcome

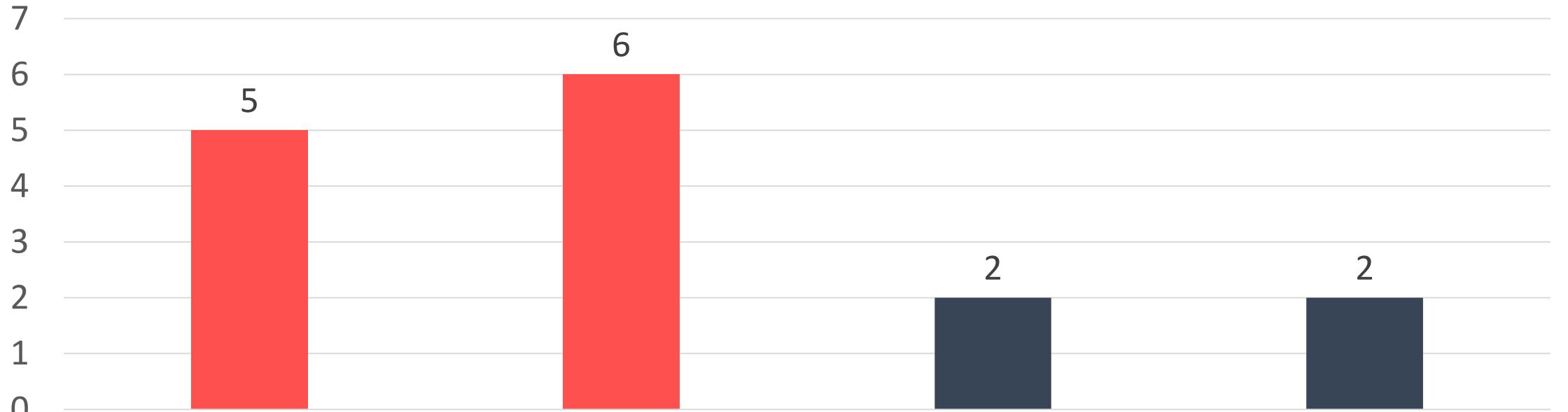
# FRESHMEN

What do you wish to **learn/experience** from NP HS as a certified nurse?



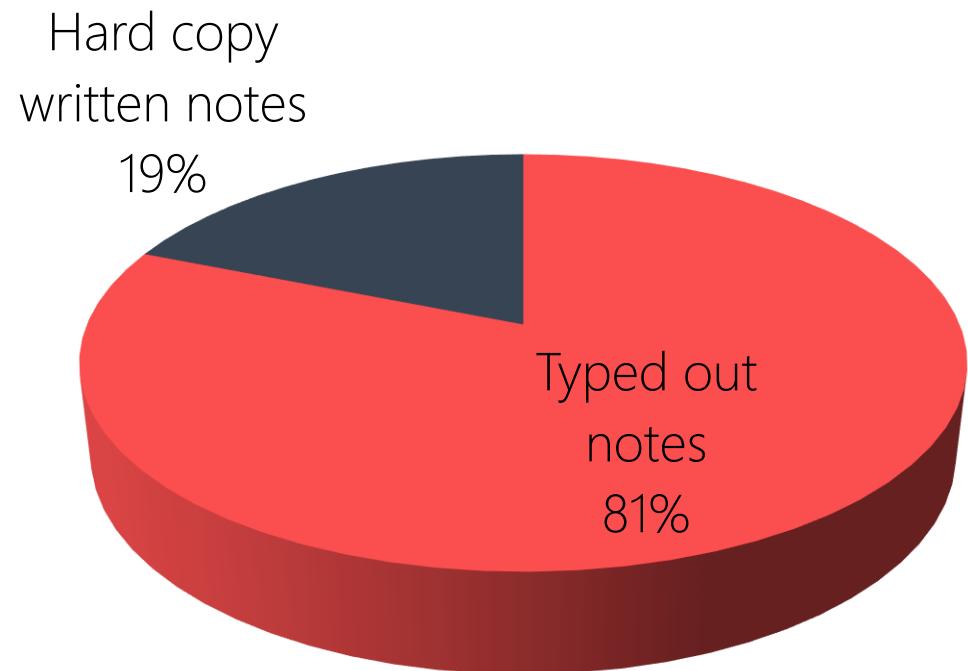
# FRESHMEN

What is your **preferred way** of taking down notes during lesson?



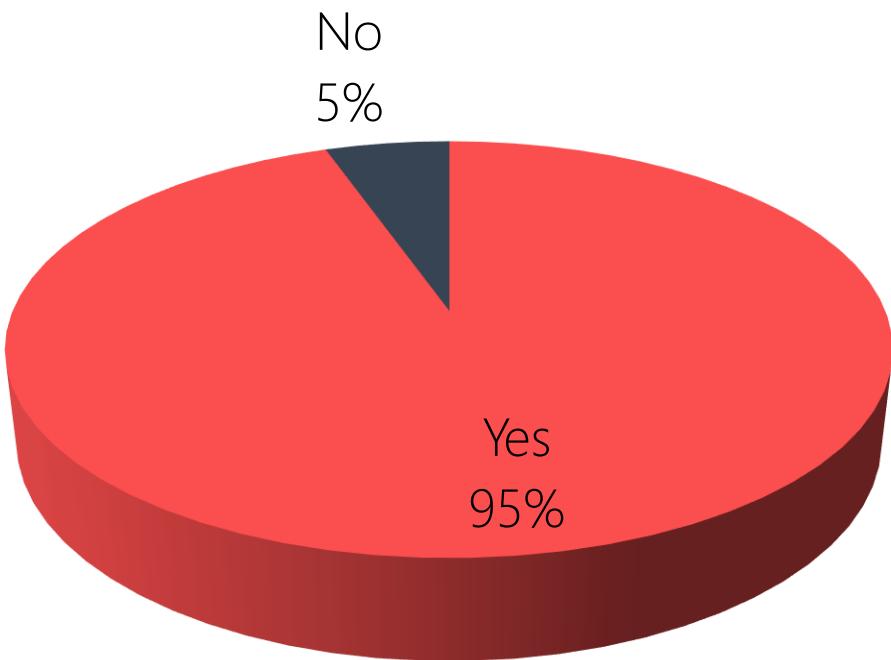
# JUNIORS/SENIORS

Do you prefer to read hard copy written notes or **typed out the notes** on laptop/desktop/MS Word, etc?



# JUNIORS/SENIORS

Are systems like **Electronic Medical Records (EMR)** used during your attachments?



# JUNIORS/SENIORS

What do you **like or dislike** about the handwritten multidisciplinary notes used in your Nursing Simulation Laboratory 2.1?

Showing 37 responses

some of the handwriting may be illegible

10/29/2014 12:43 PM [View respondent's answers](#)

Doctors handwriting can ~~eucle~~ so much sometimes

10/29/2014 12:42 PM [View respondent's answers](#)

some of the handwriting may be illegible

10/29/2014 12:42 PM [View respondent's answers](#)

nil

10/29/2014 12:42 PM [View respondent's answers](#)

hard writting

10/29/2014 12:35 PM [View respondent's answers](#)

difficult to understand the handwritting

10/29/2014 12:35 PM [View respondent's answers](#)

unable to read clearly due to unreadable handwriting

10/29/2014 12:33 PM [View respondent's answers](#)



# JUNIORS/SENIORS

How do you think NP HS can **improve** on the current Nursing Simulation Lab lessons to match up with the industry standard?

allow us to type out multidisciplinary notes instead

10/24/2014 6:57 PM [View respondent's answers](#)

have computers to check for information rather than hard copy case file

10/22/2014 3:13 PM [View respondent's answers](#)

a more realistic experience, maybe use more electronics rather than paper based

10/21/2014 4:09 PM [View respondent's answers](#)

# NO EMR

"The abbreviation used is similar"

"No EMR in HS, but there's EMRX in Attachments"

"Lessons still use lesson order with paper presentation"

"There isn't a system that is similar to the hospital"

"Lessons still use medication order with paper documentation"

"No EMR in school"

"Mostly similar except in the real world computers are not used, more high tech"  
"a lot of attachments"

"School uses paper IMR"

"No EMR in school"  
"We don't have EMR in labs"  
"There's no EMR in school"

"Capital we use clinic imr but in school hand written imr"

# AS-IS PROCESS

# Lecturer



Allocates students into groups & Distribute hardcopy Case Scenario

## 2. Not realistic



Announces state change to give doctor's order



Hands over relevant report



Collects & Reviews hardcopy multi-disciplinary notes

## Group 1

### 1. Tedious & Manual



Analyse hardcopy Case Scenario in group



Flip through & View Case Files



Proceed to drawer to get documents



Administer Physical Care



Write down vital signs by plotting on graph charts



Despatch reports by requesting from lecturer



Analyse report

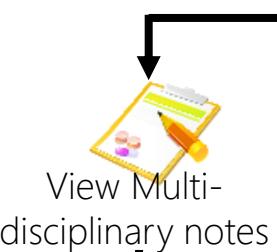


Fill in Multi-disciplinary notes

## Group 2



Analyse hardcopy Case Scenario in group



View Multi-disciplinary notes



YES

NO



Proceed to take medication



Check with nurse in charge before administering



Correct medication?

YES

NO



Administer medication



Fill in multi-disciplinary notes

Consult previous group

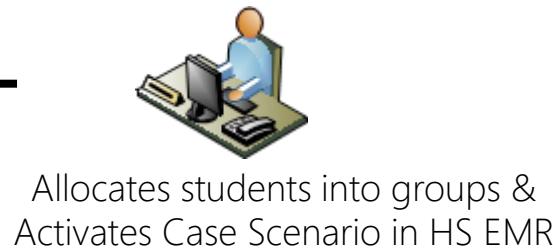
## 3. Time consuming

## 4. Not realistic

## 5. Paper based

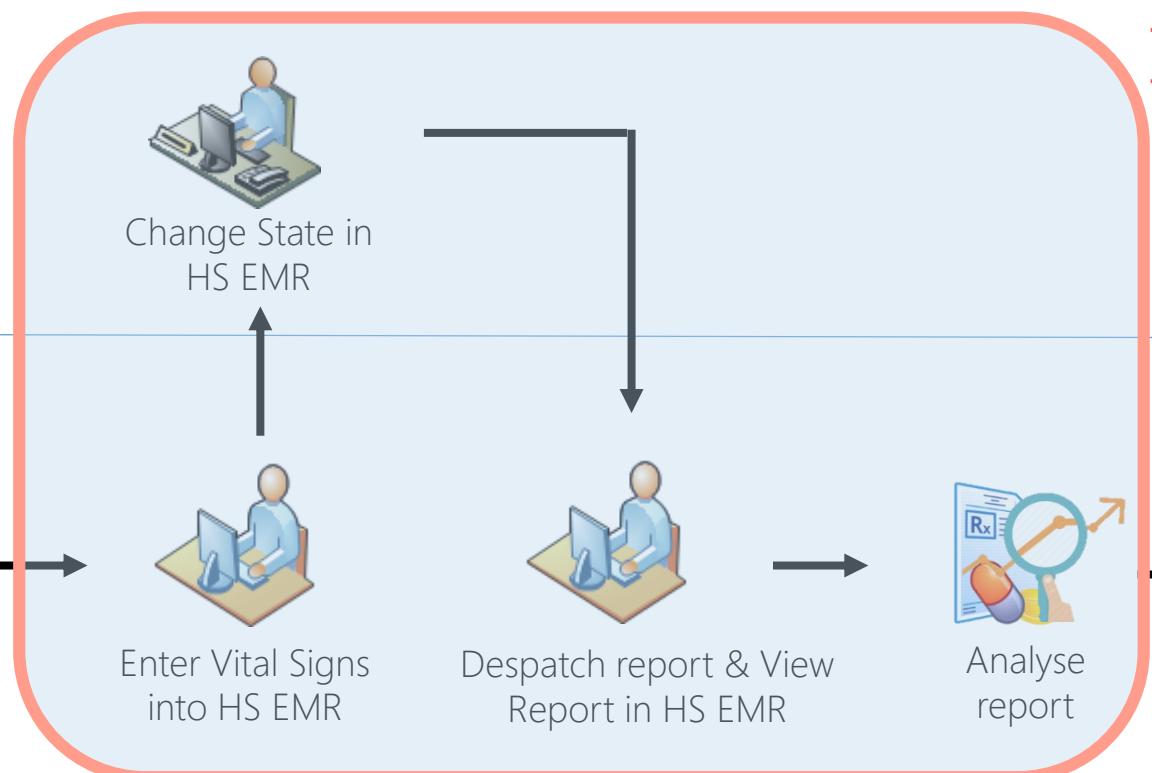
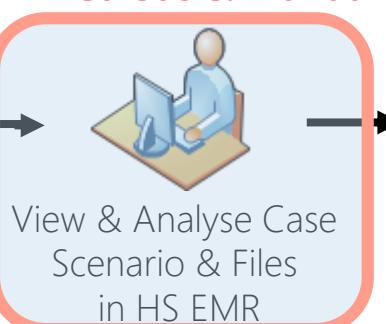
# TO-BE PROCESS

# Lecturer



## Group 1

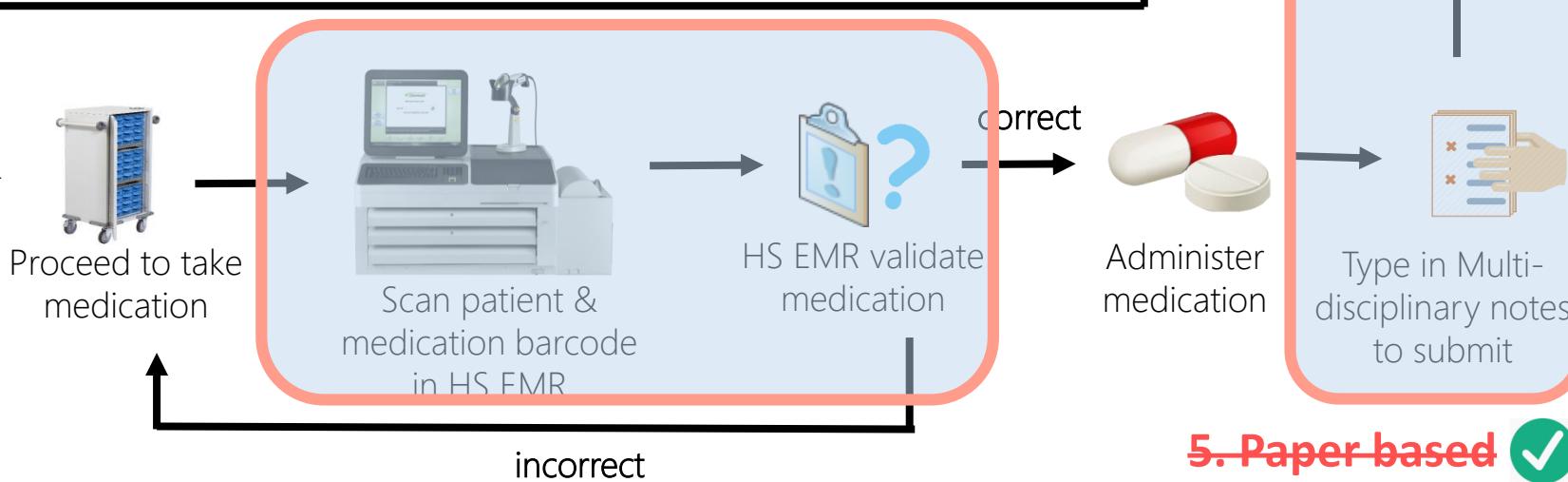
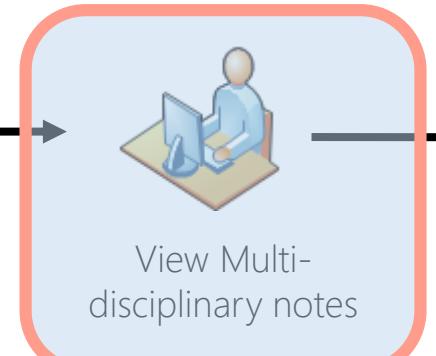
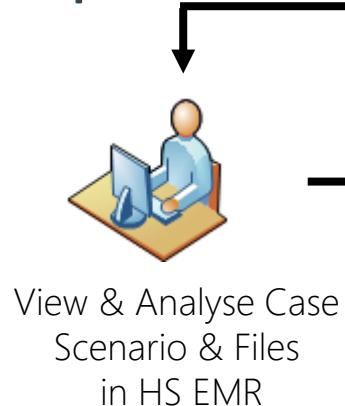
**1. Tedious & Manual**



**2. Not realistic**



## Group 2



**4. Not realistic**

incorrect

**5. Paper based**

# X-FACTOR

# X-FACTOR HS EMR

Release  
in  
**2015**

Benefit  
**520**  
Students

**LIVE**  
Deployment



# ROLES AND RESPONSIBILITIES

# ROLES & RESPONSIBILITY



**Tan Shi Qi**  
Project Manager

- ▶ Ensure team's progress is on track according to project schedule



**Ngow Wei Yi**  
Lead Developer

- ▶ Breakdown tasks and understand the dependencies of each task



**Khoo Hui Ping**  
System Analyst

- ▶ Prepare all technical documentation and blueprints



**Gladys Khong**  
Quality Assurance

- ▶ Ensure that the application is free of bugs or other defects



**Jocelyn Ng**  
Visual Interface Developer

- ▶ Develop overall strategic plan for building the web application

# PROJECT SCOPE

# MODULES



User  
Management



Medical  
Administration



Case  
Management



Student's  
Assessment



Ward  
Management



Patient  
Management



Mobile  
Application



Introduction



Project Overview



Scope



Demonstration



Project Management



User Testing



Learning outcome

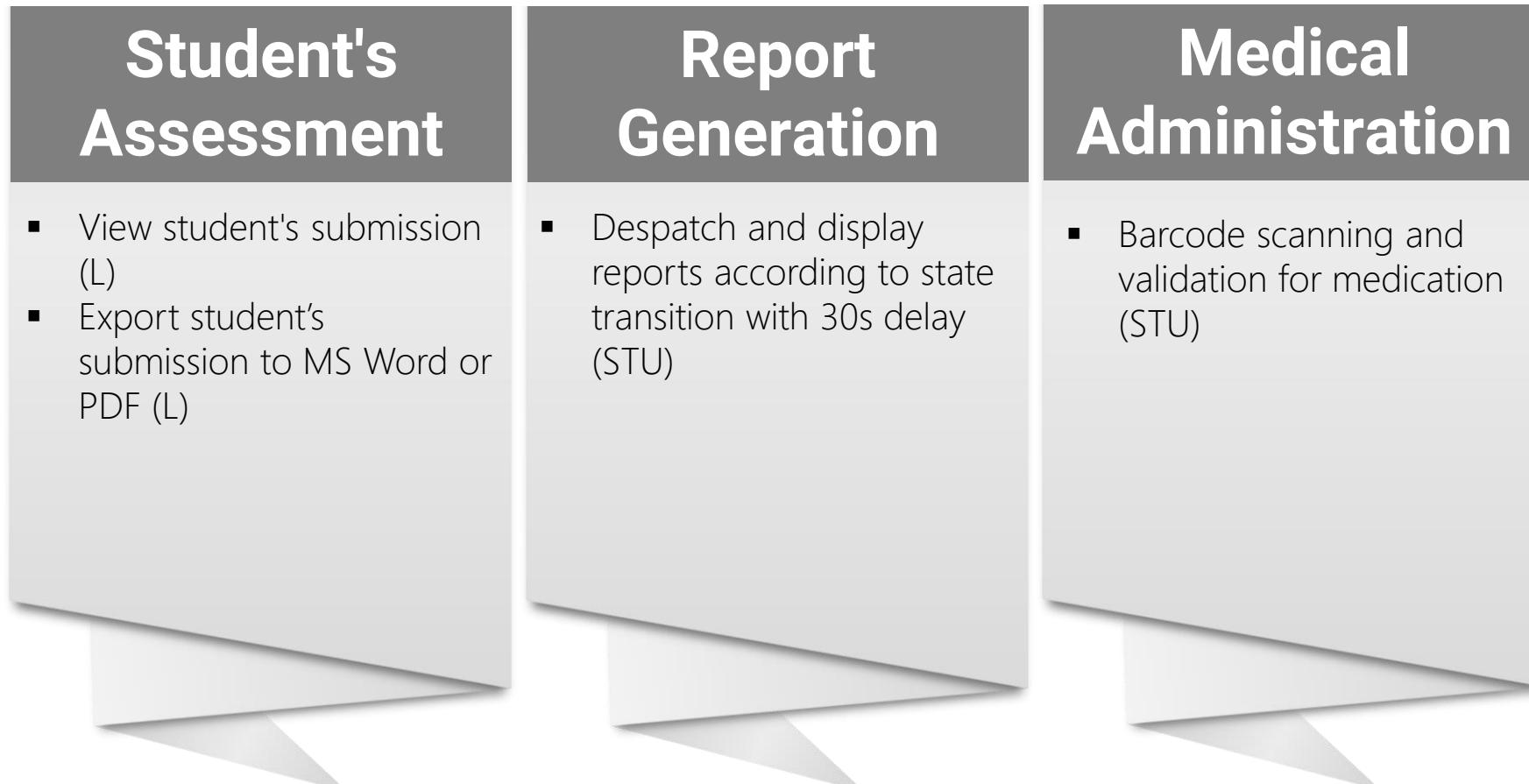
# SCOPE - PRIMARY FUNCTIONS

User Management	Student's Assessment	Patient Management	Case Management
<ul style="list-style-type: none"><li>▪ CRUD Accounts (A) </li></ul>	<ul style="list-style-type: none"><li>▪ Submission of multidisciplinary notes (STU) </li></ul>	<ul style="list-style-type: none"><li>▪ Edit vital signs (STU) </li><li>▪ View investigation reports, patient's information (STU) </li><li>▪ Create multidisciplinary notes (STU) </li><li>▪ View previous multidisciplinary notes (STU) </li></ul>	<ul style="list-style-type: none"><li>▪ View, activate cases (L, A) </li><li>▪ View activated case information (STU)</li></ul>

## User Role Abbreviation

Student – STU, Lecturer – L, Administrator – A

# SCOPE – SECONDARY FUNCTIONS



## User Role Abbreviation

Student – STU, Lecturer – L, Administrator – A

# SCOPE – SECONDARY FUNCTIONS

## Case Management

- CRUD cases (A)
- Upload reports (A)
- Reset case information to default values (A)
- State Transition (L)

## Ward Management

- View beds in ward (STU)

## Patient Management

- Historical charts for vital signs (STU)

### User Role Abbreviation

Student – STU, Lecturer – L, Administrator – A

# SCOPE - TERTIARY FUNCTIONS

## iOS Mobile Application

- Core functions from HS EMR, such as viewing of patient's information and case information

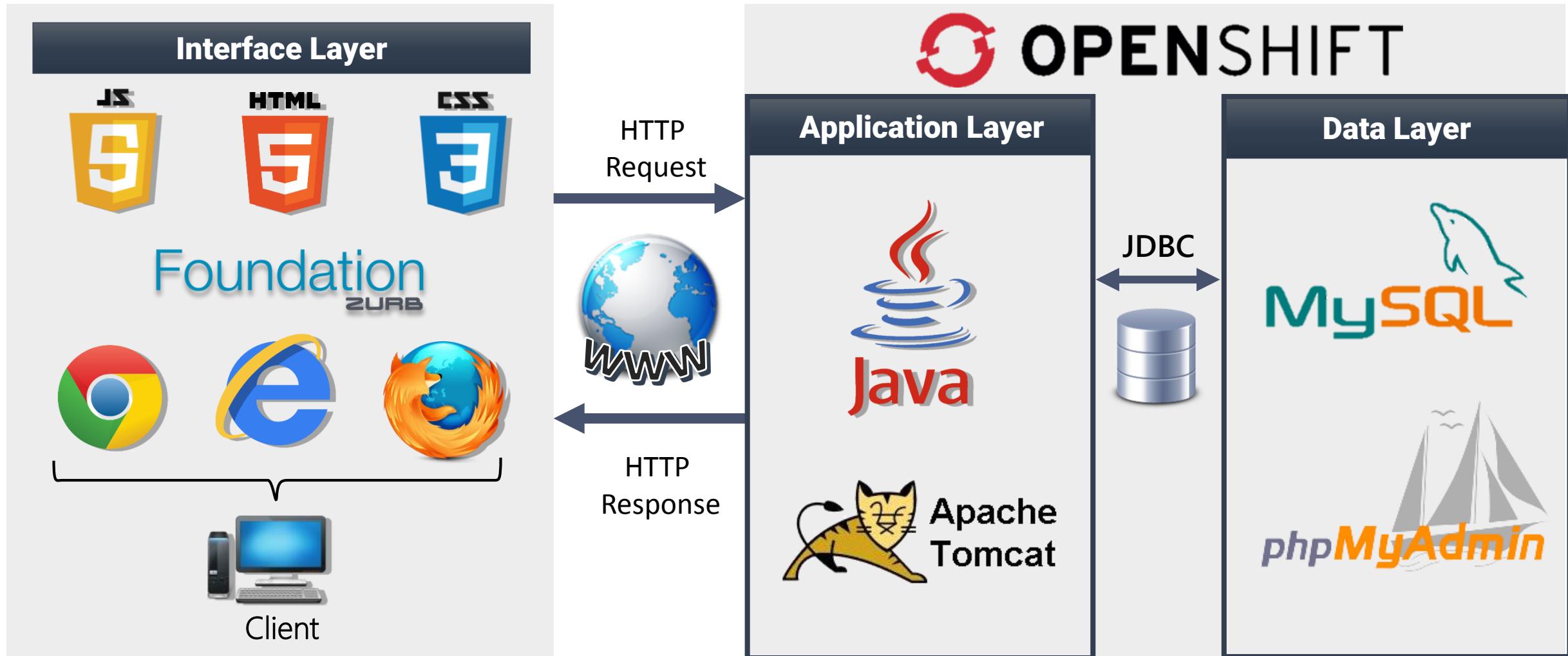
### User Role Abbreviation

Student – STU, Lecturer – L, Administrator – A

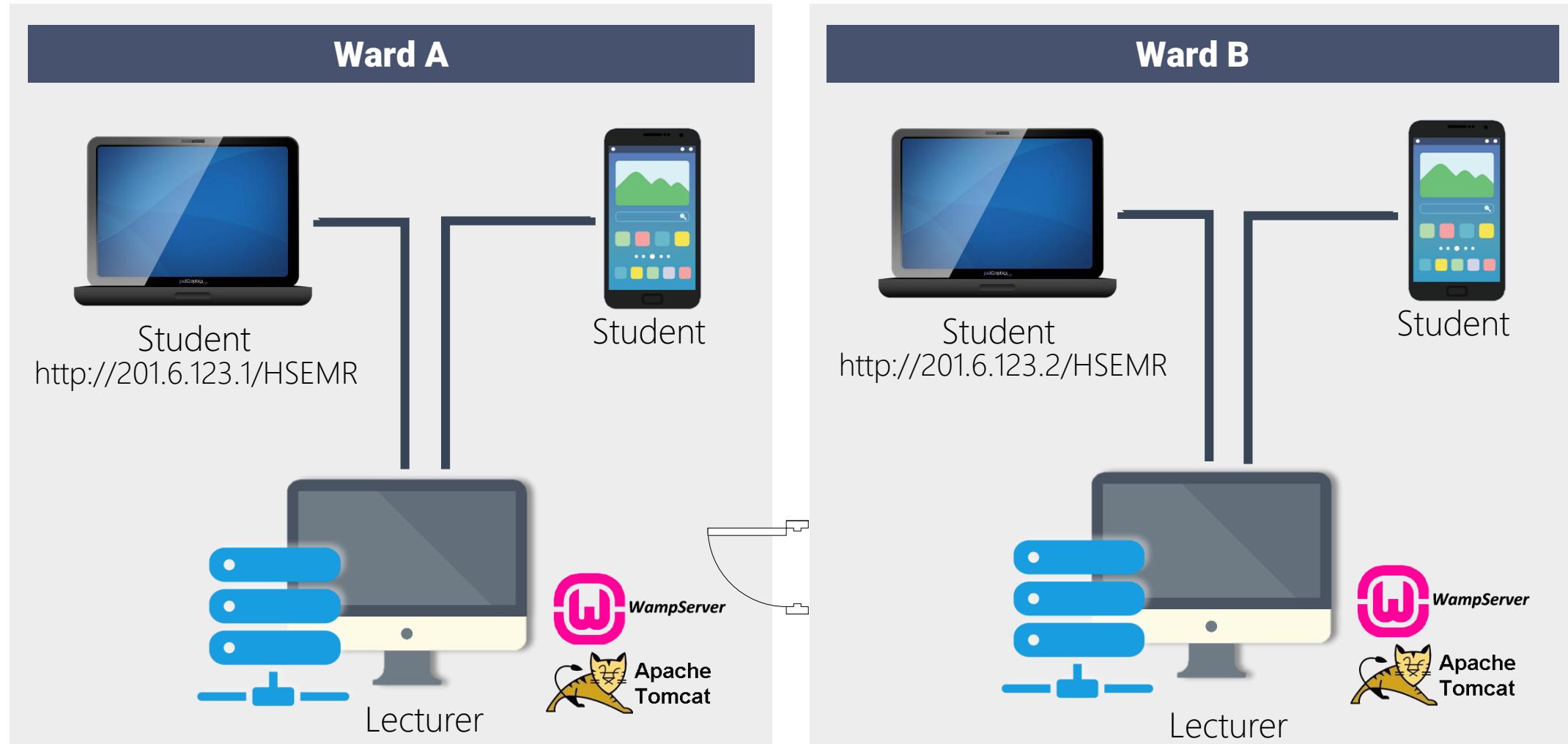


# ARCHITECTURE DIAGRAM

# DEVELOPMENT PHASE



# LIVE DEPLOYMENT



# DEMONSTRATION

<http://hsemr-wpinapp.rhcloud.com/hsemr/>

# PROTOTYPE

# PROTOTYPE – CASE SETUP

## Low-Fi

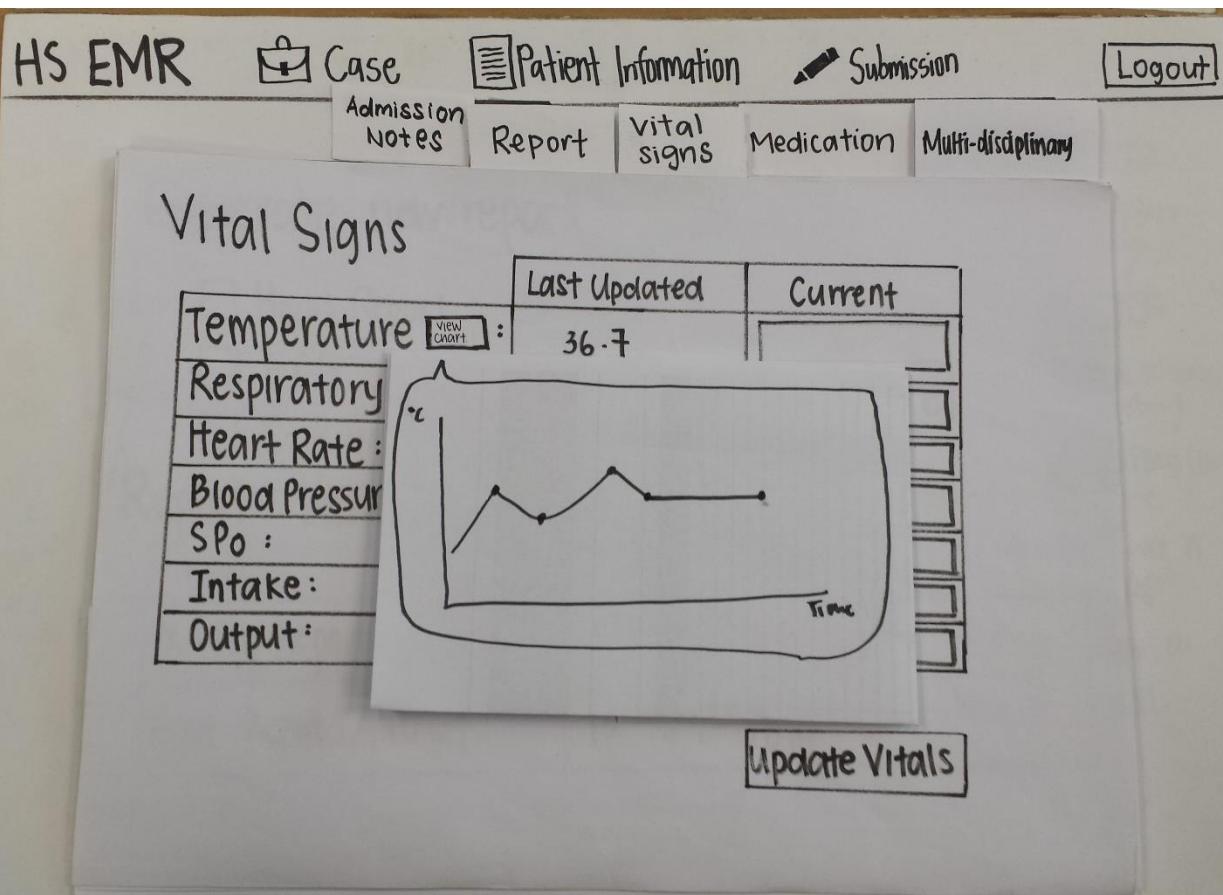
A hand-drawn prototype of a web application interface. At the top, there is a navigation bar with the HS EMR logo, a briefcase icon labeled "Case", a patient information icon labeled "Patient Information", a pen icon labeled "Submission", and a "Logout" button. Below the navigation bar, the title "Case Setup" is written above a field labeled "Case Scenario Name" with a text input box. A vertical sidebar on the left contains links for "Case Information", "Patient Information", "Default Vital Signs", and "Define State(s)". The main area has a large text input box labeled "State Description". Below it, there are six smaller text input boxes arranged in two rows of three: "Respiratory Rate", "Blood Pressure", "Heart Rate" in the top row; and "SPO", "Intake", "Output" in the bottom row. At the bottom, there is a text input box labeled "Temperature".

## Med-Fi

The Med-Fi version of the Case Set Up interface. The page title is "HS EMR Admin Portal - Create Scenario". The header includes a back/forward button, a search bar with the URL "/createScenario.jsp", and navigation links for "HSEMR", "Case Management", "User Management", and "Logout". The main content area is titled "Case Set Up" and features a "Case Name" input field. Below this, there are sections for "Case Information", "Patient Information", and "Default Vital Signs". The "Define State(s)" section is highlighted with a blue background. It contains fields for "State Description" (with a large text input box), "Respiratory Rate", "Blood Pressure", and "Heart Rate" (each with a text input box). Below these are fields for "SPO", "Intake", and "Output" (each with a text input box). At the bottom right of the form is a "Add New Scenario" button.

# PROTOTYPE – CLINICAL CHARTS

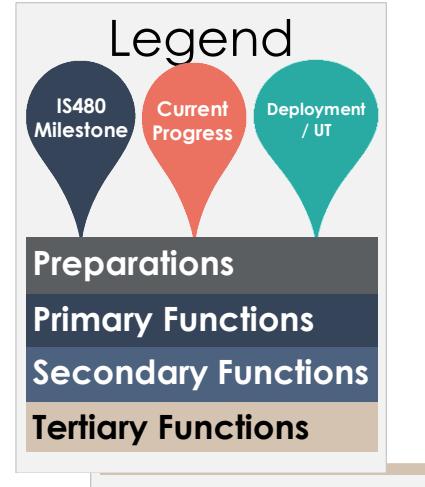
## Low-Fi



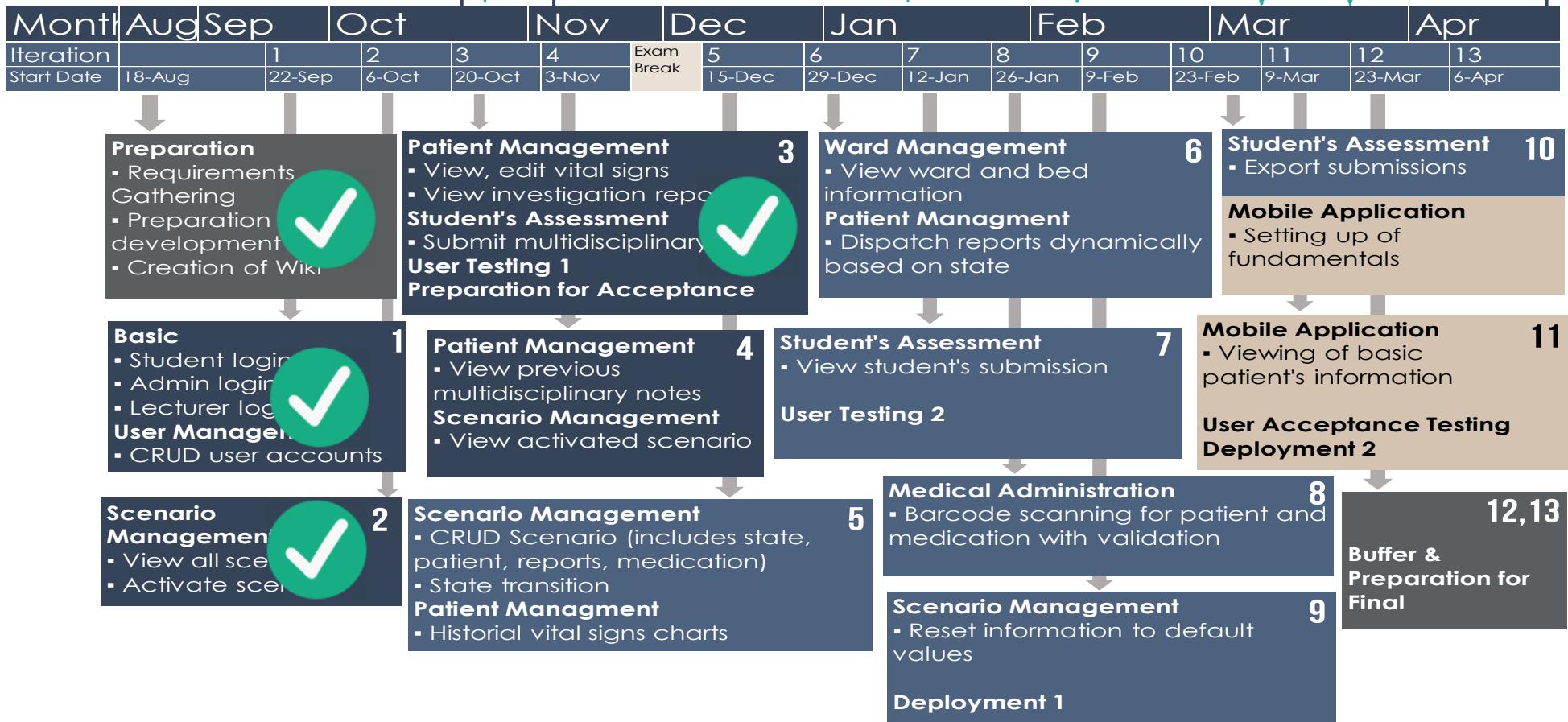
## Med-Fi

A digital high-fidelity prototype of a clinical chart interface. The top bar includes 'HS EMR Student Portal - Patient Information', a search bar ('/viewPatientInformation.jsp'), and navigation tabs: 'HSEMR' (selected), 'Patient Management', 'Ward Management', and 'Logout'. Below this is a 'Patient's Information' box with details: Name: James Tan NRIC: S1231231A DOB: 10/10/1998 Gender: Male Allergy: Seafood. A horizontal menu bar below the information box includes 'Admission Notes', 'Investigations', 'Clinical Charts', 'Medication', and 'Multidisciplinary Notes'. The main area features a 'Vitals' section with a table for 'Temperature' (Current as of 18-10-2014 3p) and a 'Historical Temperature Chart' graph. Other vital signs listed are Respiratory, Blood, Heart, SPO, Intak, and Outpu. A 'View Chart' button is next to the temperature table, and a 'Update Vitals' button is at the bottom right.

# PROJECT MANAGEMENT



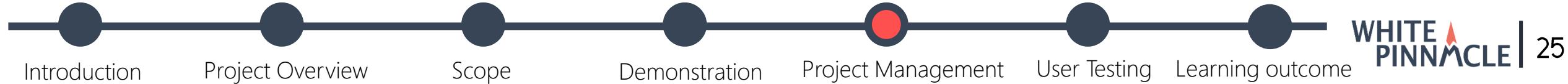
# PROJECT SCHEDULE



# PROJECT SCHEDULE



Month	Aug	Sep	Oct		Nov	Dec	Jan	Feb	Mar	Apr					
Iteration		1	2	3	4	Exam Break	5	6	7	8	9	10	11	12	13
Start Date	18-Aug	22-Sep	6-Oct	20-Oct	3-Nov		15-Dec	29-Dec	12-Jan	26-Jan	9-Feb	23-Feb	9-Mar	23-Mar	6-Apr



# METRICS

# SCHEDULE METRICS

Score (%)	Action
<b>SM &lt;= 90</b>	<p>The team is behind the schedule Under-estimated the effort required Re-estimate tasks for future iterations Deduct the number of days behind schedule from buffer days If there is no more buffer days left, decide to drop any functionalities</p>
<b>90 &lt; SM &lt;= 110</b>	<p>Estimates are generally accurate and on track.</p>
<b>&gt; 110</b>	<p>The team is ahead of schedule Over-estimated the effort required Re-estimate tasks for future iterations Add the number of days gained back to the buffer days</p>

# SCHEDULE METRICS

Formula: Estimated Days / Actual Days

Iteration 1

Actual: 14

Planned: 14

Login  
User  
Management

Iteration 2

Actual: 14

Planned: 14

View all scenario  
Activate scenario

Iteration 3

Actual: 14

Planned: 14

View, edit vital signs  
View investigation reports  
Submit multidisciplinary notes  
User Testing 1



# BUG METRICS

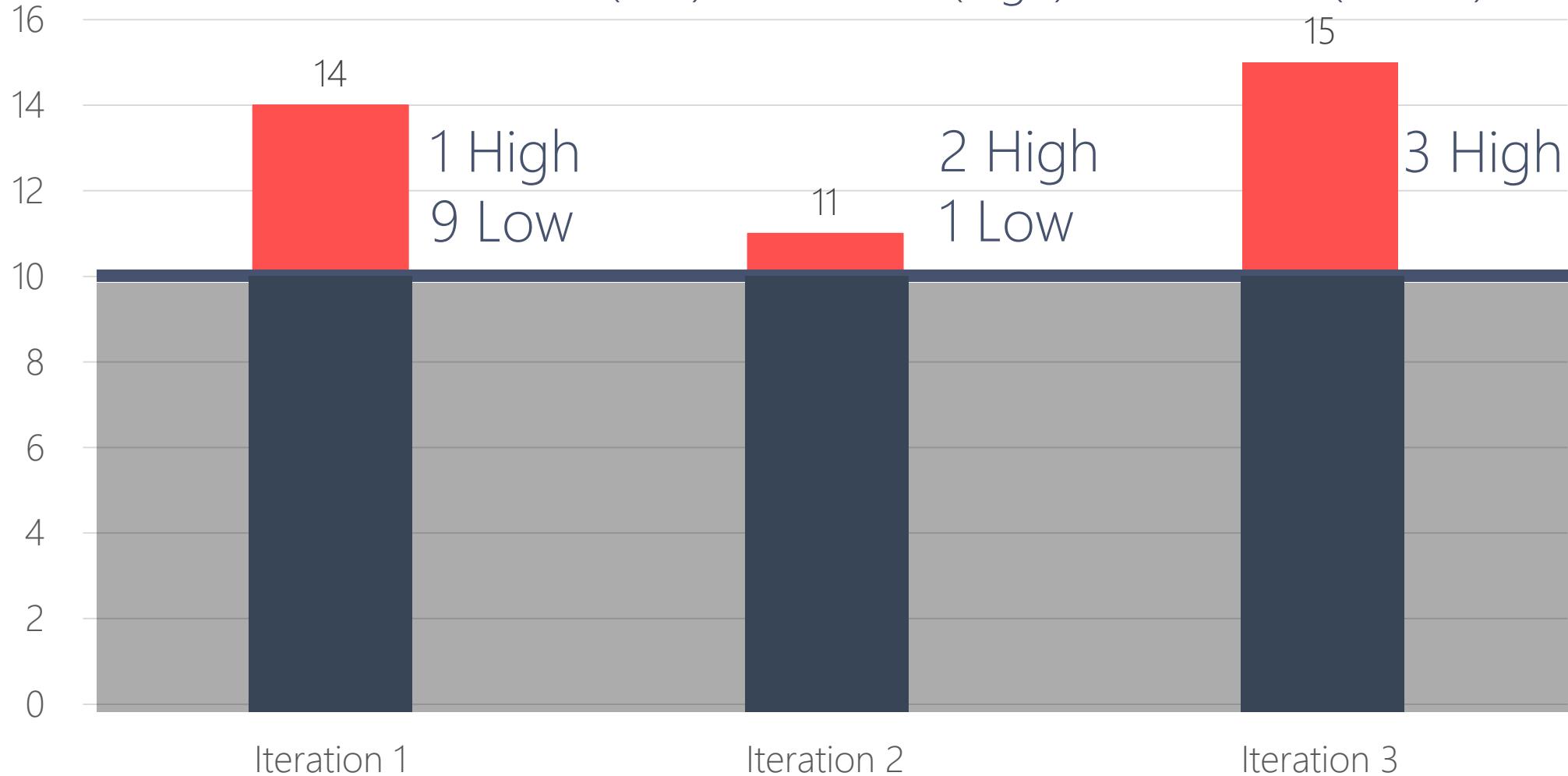
Severity	Point(s)	Description
Low Impact	1	User interface display errors, such as out of alignment, color used is not according to theme. It does not affect the functionality of the system.
High Impact	5	The system is functional with some non-critical functionalities are not working.
Critical Impact	10	The system is not functional. Bugs have to be fixed before proceeding.

# BUG METRICS

Point(s)	Action
<= 5	The system does not need immediate fixing, could be fixed during buffer time or during coding sessions
5 < points < 10	Coders to use planned debugging time in the iteration to solve the bug
>= 10	The team has to stop all current development and resolve the bug immediately

# BUG METRICS

Formula: 1 x num (low) + 5 x num (high) + 10 x num (critical)



# RISK MANAGEMENT

# RISK MATRIX

		Likelihood		
		Low	Medium	High
Impact	High	B	A	A
	Medium	C	B	A
	Low	C	C	B

Category	Description	
A	High Risk	Needs the most attention and a developed mitigation strategy
B	Moderate Risk	Needs lesser attention than high risk
C	Low Risk	Risk can occur but deserves least amount of planning

# RISK MANAGEMENT – PAST

Technical Risks					
Risk Description	Impact/Consequences	Likelihood	Impact	Category	Mitigation Plan
Team is unfamiliar with technology used (barcode scanning, charting)	Project will be potentially delayed due to incorrect estimates. The quality of the system might not be as satisfactory as there might be more bugs.	High	High	A	Lead developer will research and discuss with the team. Project Manager to allocate more time to this task.
Project Management Risks					
Risk Description	Impact/Consequences	Likelihood	Impact	Category	Mitigation Plan
Client changes requirements on an ad hoc basis	Project schedule will be affected	Medium	Medium	B	Team to ensure that client requirements are properly documented in a Business Requirements Document before implementation.



# RISK MANAGEMENT – POTENTIAL

Project Management Risks					
Risk Description	Impact/Consequences	Likelihood	Impact	Category	Mitigation Plan
Delay in getting necessary data or information (such as cases used in class, multidisciplinary notes, etc.) from the client due to client's busy schedule	Project schedule will be affected	High	High	A	Team to use mock data to test the system instead.  PM to keep steady communication with our client. Also, could call the client as we realised that the client prefers calls, face to face communication rather than emails.

# USER TESTING 1

# USER TESTING 1

## Focus group:

- NP HS Nursing students
- NP HS Lecturers

## Objectives:

- Determine if user interface is intuitive
- Discover usability problem



# USER TESTING 1

## Study Task:

- Users are given a set of task to complete

## Survey:

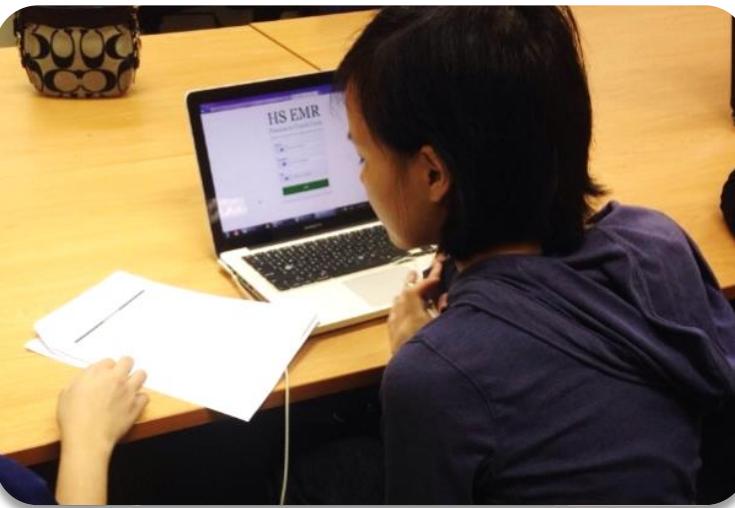
- Given out to collect feedback and suggestions

# USER TESTING 1 PARTICIPANTS

Student 1



Student 3



Student 2



Lecturer



Introduction

Project Overview

Scope

Demonstration

Project Management

User Testing

Learning outcome

# FEEDBACK

## User Interface

CURRENT	TO BE IMPROVED
<ul style="list-style-type: none"><li>• Easy to navigate</li><li>• Good for learning purposes</li><li>• Font is easy to read</li><li>• Color matches School of Health Sciences</li></ul>	<ul style="list-style-type: none"><li>• Notifications should be more prominent</li><li>• Important information should be highlighted (e.g. Allergy)</li></ul>

# FEEDBACK

## Others

CURRENT	TO BE IMPROVED
<ul style="list-style-type: none"><li>• Reports are easily retrieved</li><li>• More convenient as compared to manual task</li><li>• Similar to what they use during clinical attachments</li></ul>	<ul style="list-style-type: none"><li>• Pop up message to prompt user when report results are retrieved</li></ul>

# LEARNING OUTCOMES

# TEAM LEARNING OUTCOME

Importance of requirement gathering  
Working with a real-world client



# WHAT WE EXPECT TO LEARN ?



Working with a client requires us to think promptly and adapt to changes. Hence, I wish to be able to better manage the aspect of a project such as time and quality. I believe that exposing myself to a full project life cycle allows me to better manage the expectations from various stakeholders and also sharpen my communication skills

I hope to achieve better time management and to be adaptable to changes to make the necessary improvements. In addition, I hope to deliver the technical aspect such as data base, technical diagram and system functionalities that serves the end purpose of our client



It is a good opportunity to gain exposure on how a real-life project works especially on the types of problems and challenges that my team may face. Hence, it allows me to enhance my capability to resolve any issues encountered in the project. Finally, I hope to further improve my technical skills in developing a website.



# WHAT WE EXPECT TO LEARN ?



At the end of the course, I hope to improve on my collaboration skills and be able to deliver a quality web application that is in line with our client and sponsor's expectations. On top of that , I hope to gain and improve on my personal designing skills and technical competencies.

I hope to gain a deeper understanding of visual organization and the ability to develop visual designs using tools and technologies learnt to far. With the basic management practices, I hope to improve my work productivity as a member of teams and better manage expectations.



# THANK YOU !