TEAM ALPHA

ACCEPTANCE

8 Nov 2017

ALPHA

STAKEHOLDERS

DR. HENRY HO SUN SIEN

- Project Client
- Dr Henry Ho is a senior consultant with the Department of Urology. He was also the first doctor in SGH/SingHealth to be awarded the Singapore-Stanford Biodesign (SSB) Fellowship Award by A*STAR in 2011.

DR. RAJ VIKESH TIWARI S/O PKT

- Project Client
- Dr Raj is a doctor at the Department of Urology at Singapore General Hospital.

PROF. TAN HWEE PINK

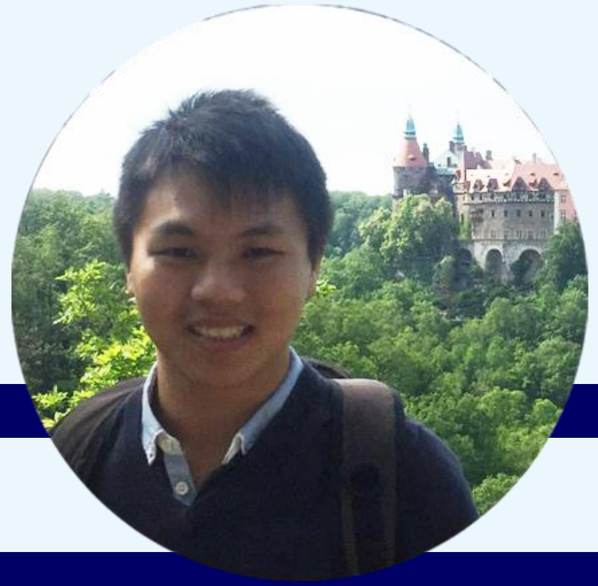
- Project Sponsor
- Professor Tan Hwee Pink is an Associate Professor of Information Systems (Practice) at Singapore Management University. He is also the Academic Director at SMU-TCS iCity Lab.

PROF. TAN HWEE-XIAN

- Project Supervisor
- Professor Tan Hwee-Xian is a Senior Research Scientist at the SMU-TCS iCity Lab. She is part of the SHINESeniors (Smart Homes and Intelligent Neighbors to Enable Seniors) project team.

ALPHA

MANAGEMENT



Tay Wee Han Jeremy
Analytics & Quality Assurance

Chai Hui Yee
Project Manager

Carine Ng
UI/UX Designer

ALPHA

DEVELOPERS

Koh Hong Ye

Back-End Developer

Aloysius Lim

Lead Developer

Tan Jun Ming

Front-End Developer

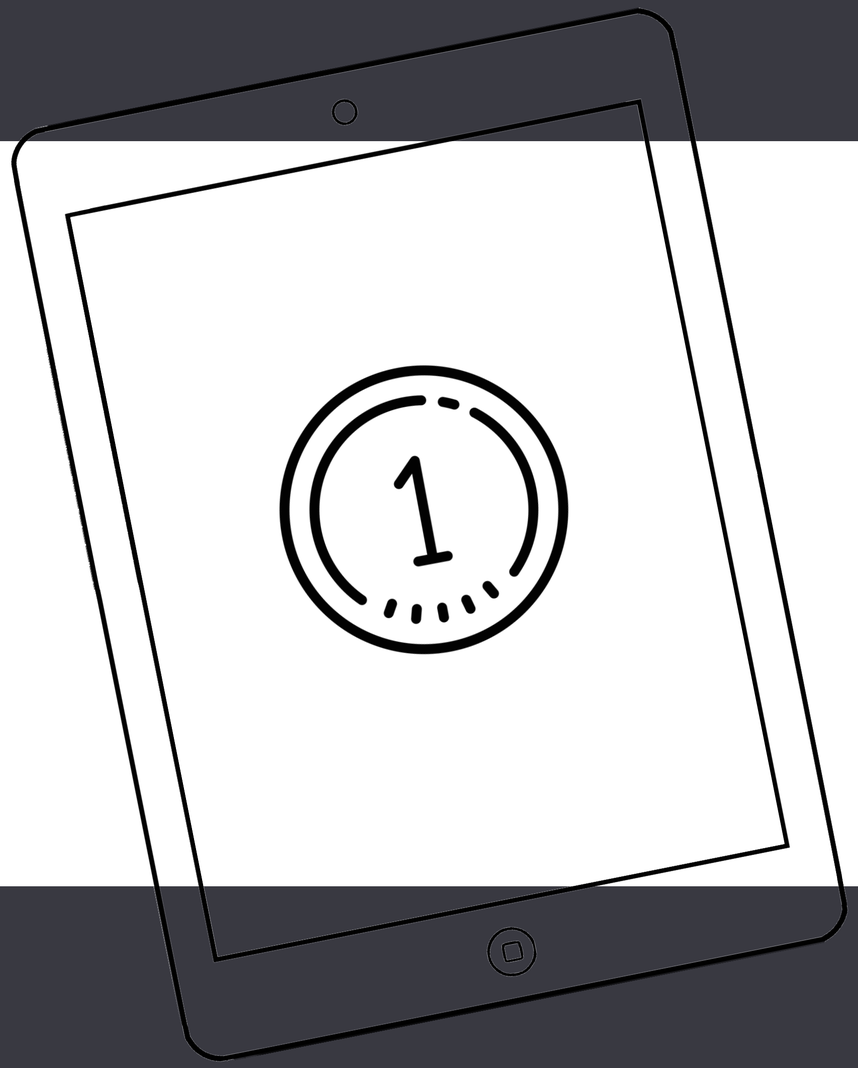
BACKGROUND

Benign Prostatic Hyperplasia (BPH) is the most common prostate problem for men older than age 50

Affects about 50% of men between the ages of 51 and 60 and up to 90% of men older than 80.

National Institute of Diabetes and Digestive and Kidney Disease (NIDDK)

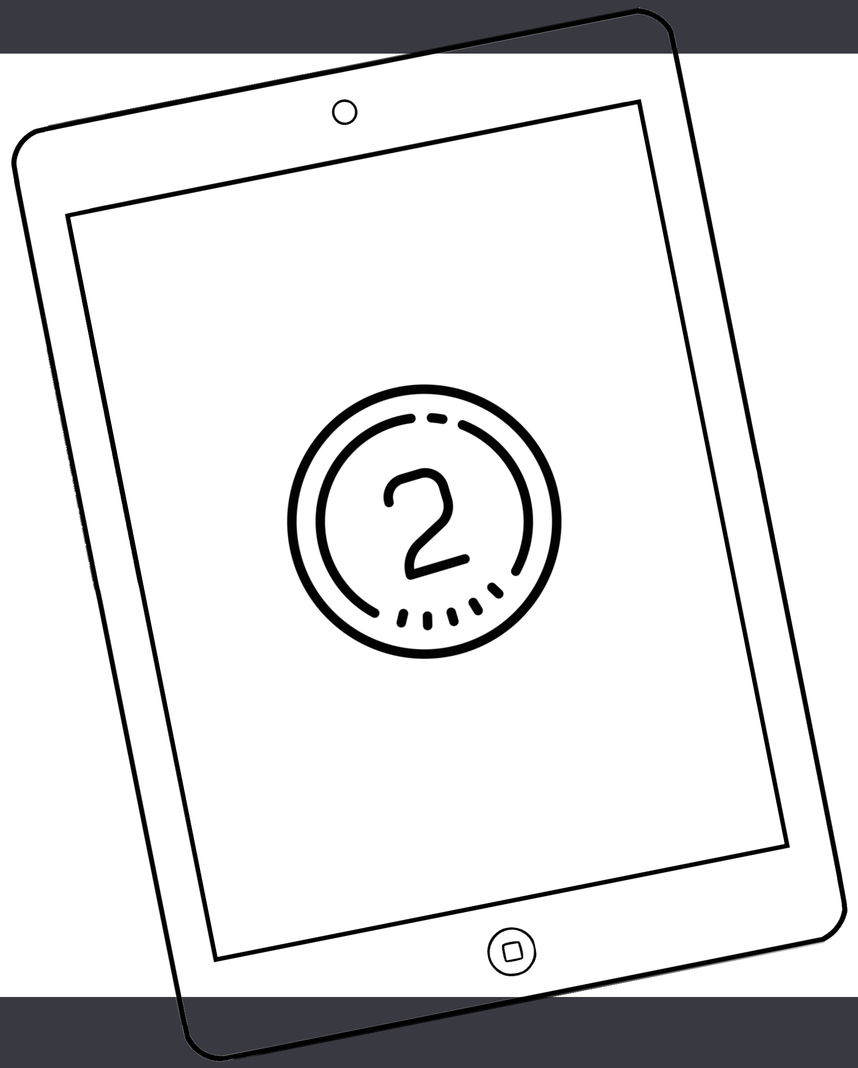
IPSS



IPSS

The International Prostate Symptom Score (IPSS) is a scoring system used to screen for and diagnose benign prostatic hyperplasia (BPH) as well as to monitor symptoms and guide decisions about how to manage the disease.

VAUS

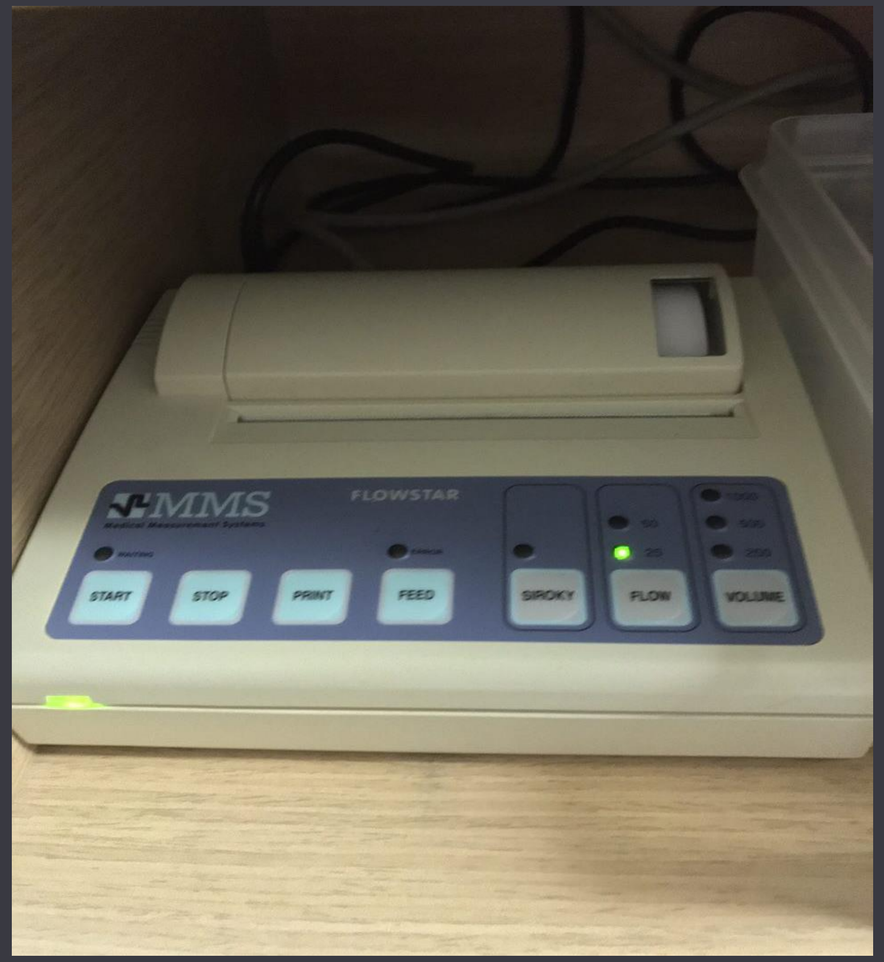


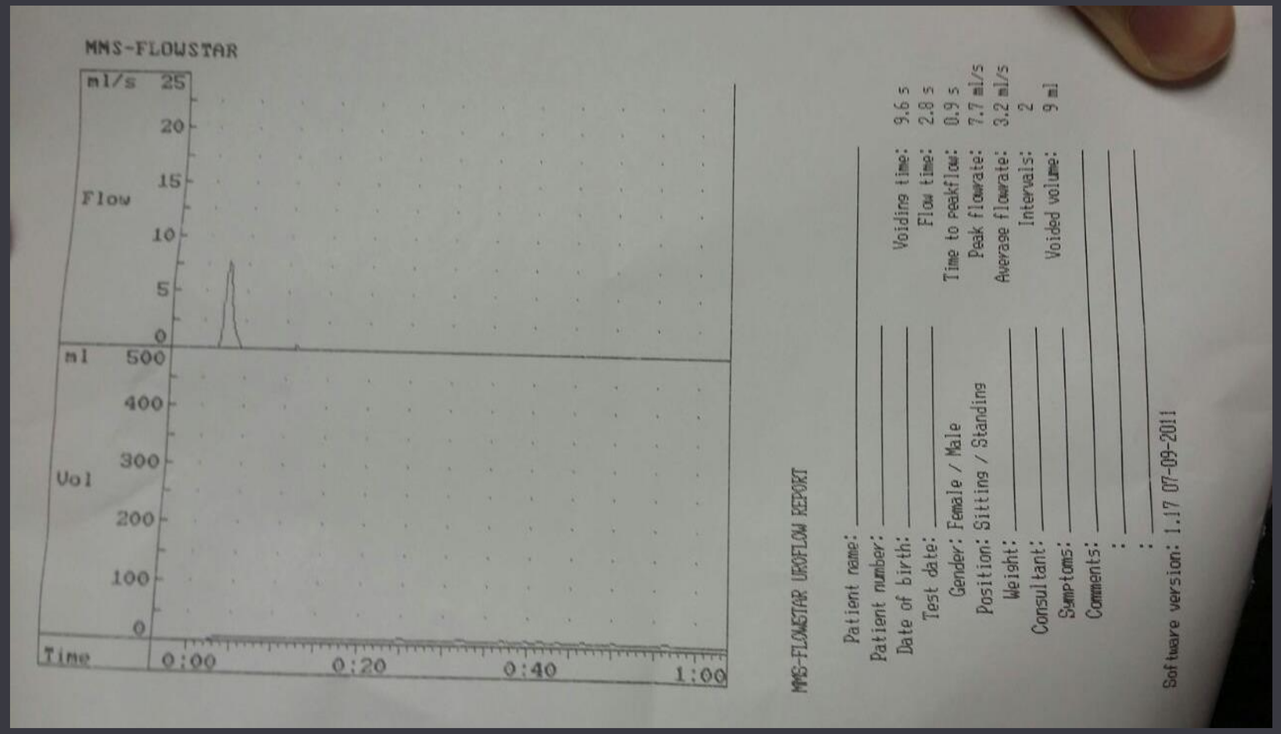
VAUS

Visual-Aided Uroflowmetry Survey (VAUS) is a scoring system to determine the severity of the symptoms faced by patients with BPH

Designed by our clients from SGH – Dr. Henry Ho Sun Sien & Dr. Raj Vikesh Tiwari S/O Pkt

UROFLOW SAMPLE





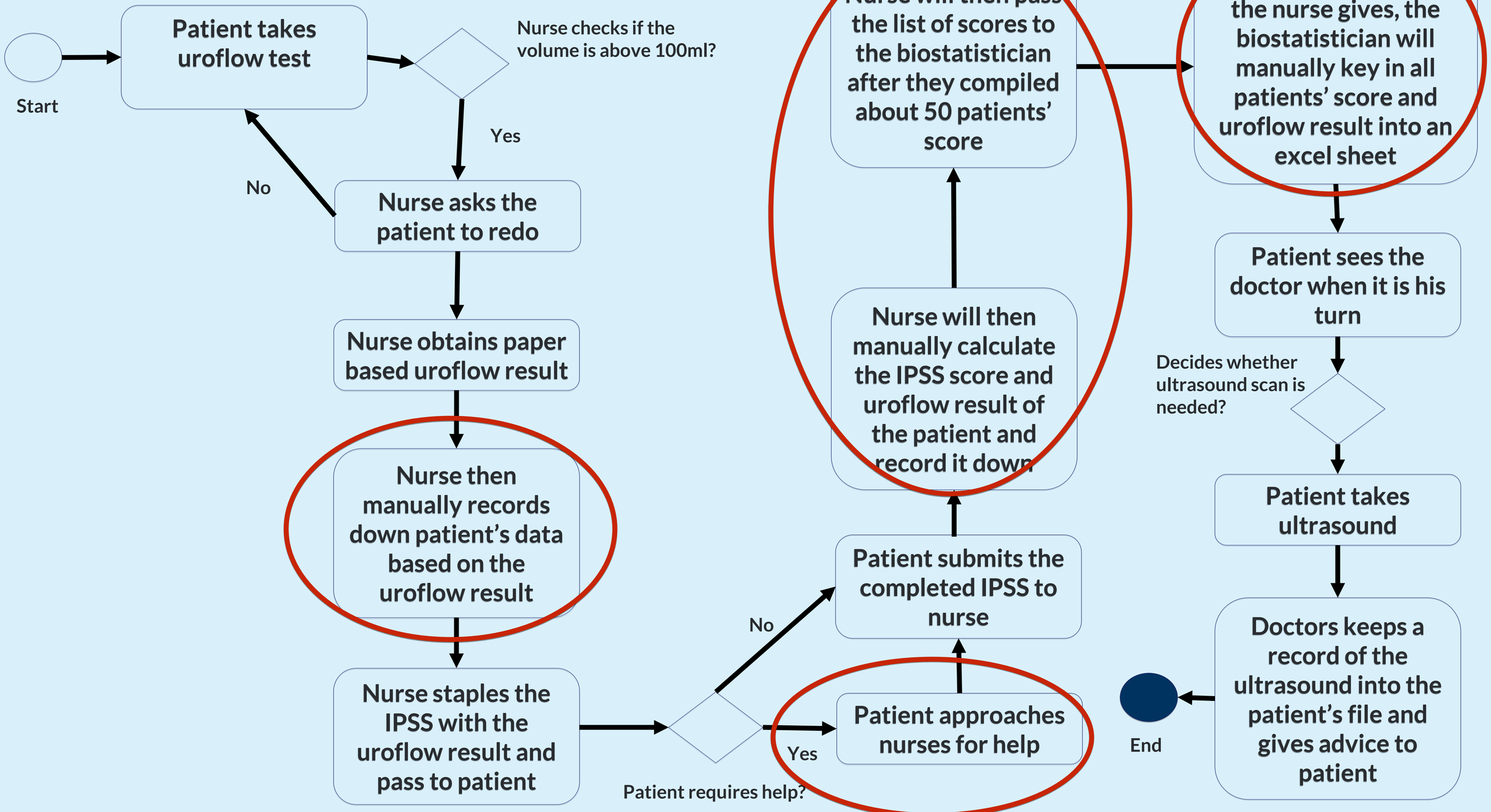
OBJECTIVE

Our project aims to deliver:

A mobile application for elderly male who are diagnosed with BPH to facilitate their filling of IPPS and VAUS

A web application to provide a platform for seamless sharing of patients' information between primary healthcare and acute hospitals

PROBLEMS


Start
Patient takes uroflow test
Nurse checks if the volume is above 100ml?
Yes
No
Nurse asks the patient to redo
Nurse obtains paper based uroflow result
Nurse then manually records down patient's data based on the uroflow result
Nurse staples the IPSS with the uroflow result and pass to patient
Patient requires help?
No
Yes
Patient approaches nurses for help
Patient submits the completed IPSS to nurse
Nurse will then manually calculate the IPSS score and uroflow result of the patient and record it down
Nurse will then pass the list of scores to the biostatistician after they compiled about 50 patients' score
Based on the list that the nurse gives, the biostatistician will manually key in all patients' score and uroflow result into an excel sheet
Patient sees the doctor when it is his turn
Decides whether ultrasound scan is needed?
Patient takes ultrasound
Doctors keeps a record of the ultrasound into the patient's file and gives advice to patient
End

PAINPOINTS

Patients

- Vision problem
- Difficulty reading the paper-based IPSS questions because of the small font size

Nurses

- Time-consuming & increases workload
- Needs to administer 3-4 patients at any one time
- Manually calculates and writes down the patient's uroflow result onto a paper

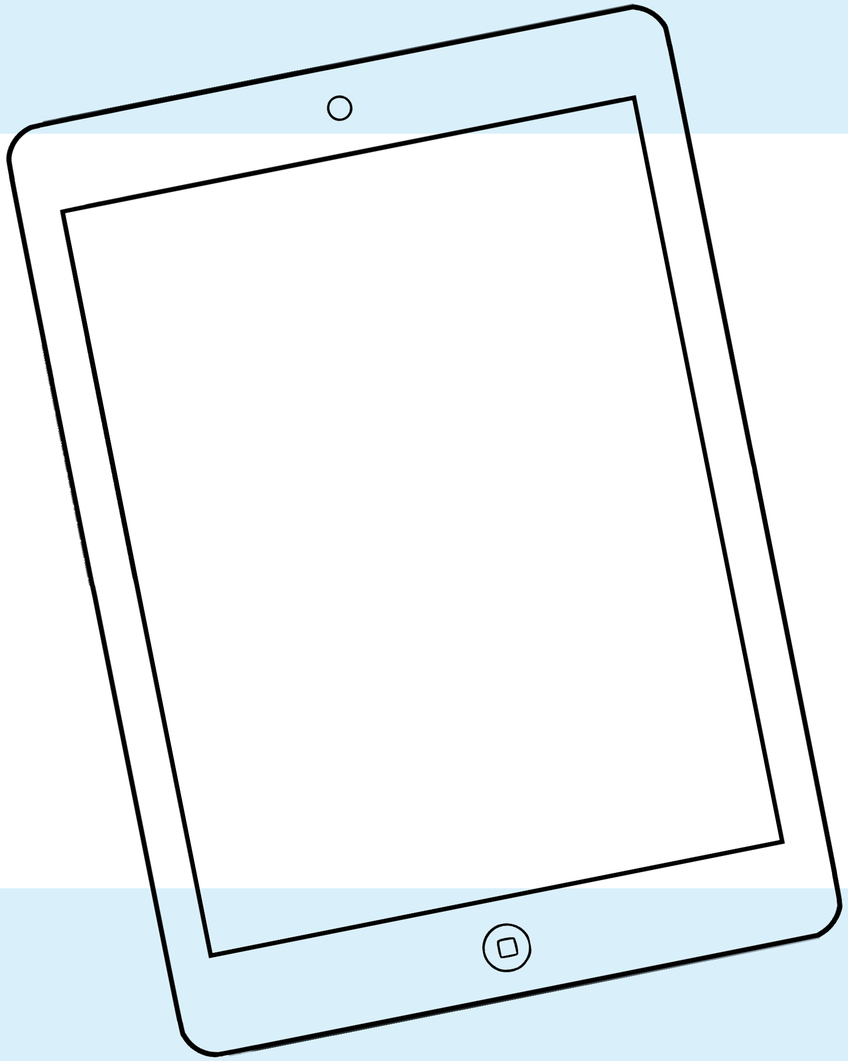
Doctors

- Lack of a integrated system for seamless sharing of patients' information between the doctors in tertiary hospitals and primary care like polyclinics

SOLUTIONS

DELIVERABLES

MOBILE APPLICATION



REMOVE THE NEED FOR NURSES TO MANUALLY CALCULATE KEY CLINICAL PARAMETERS

NO

BE MORE TIME EFFICIENT
& REDUCTION OF WORKLOAD

DELIVERABLES

WEB APPLICATION

ALLOWS DOCTORS FROM ALL HEALTHCARE PROVIDERS TO SEAMLESSLY ACCESS & VIEW PATIENTS' INFORMATION

VALUES

PATIENT-CENTRIC

Reduce the redundancy of long-distance trips to the hospital for non-severe urological cases. Instead be redirected to nearby polyclinic or general practitioner

INCREASE ACCESSIBILITY

PATIENT-CENTRIC

To allow primary care providers to assess patients' state of health and to provide optimum treatment

OPTIMIZE TREATMENT

PATIENT-CENTRIC

Enhance the usability of our application by maximizing the ease of attempting the IPSS and VAUS which are often hindered by the poorer sight of elderly male patients.

ENHANCE USABILITY

VALUES

NURSES

Increase overall efficiency by directly reducing time and workload in the manual calculation & collection of results

INCREASE EFFICIENCY

DOCTORS

To allow all doctors to have seamless access to view a patient's health status based on real-time assessment scores/data

ONE-STEP SOLUTION

RESEARCH

<table>
<tr><th colspan="2">Existing Technologies</th><th rowspan="2">Our mobile application and web application</th></tr>
<tr><th>UpToDate</th><th>QxMD</th></tr>
<tr><td colspan="2">• Both websites provide the function of automatically calculating the IPSS score of the patient after the filling up of the questions</td><td rowspan="3">A one-stop solution combining multiple medically-recognized assessment tools for doctors to assess patients assessment scores provide optimum treatment</td></tr>
<tr><th>Uro-flow</th><th>Uro-star</th></tr>
<tr><td colspan="2">• Independent systems that print hardcopies of uroflow results.</td></tr>
</table>

PERSONA

Mr Tan Wei Han

PATIENT
AGE: 76

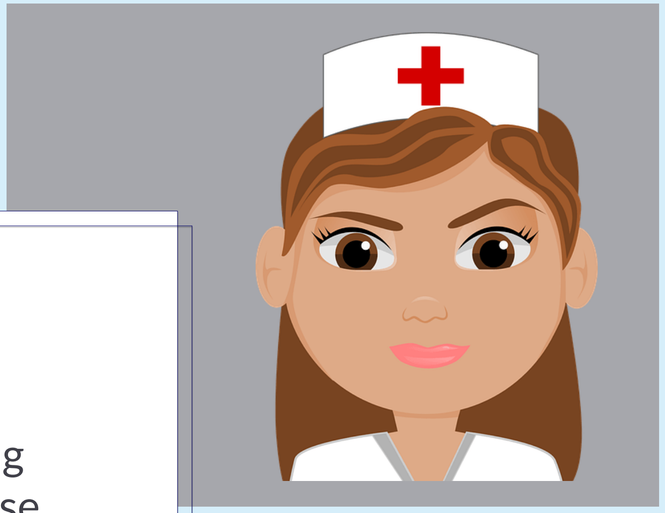
Retiree

-

Thrifty and reclusive

-

Difficulty in walking



Ms Joy

NURSE
AGE: 28

10 years of working experience as a nurse

-

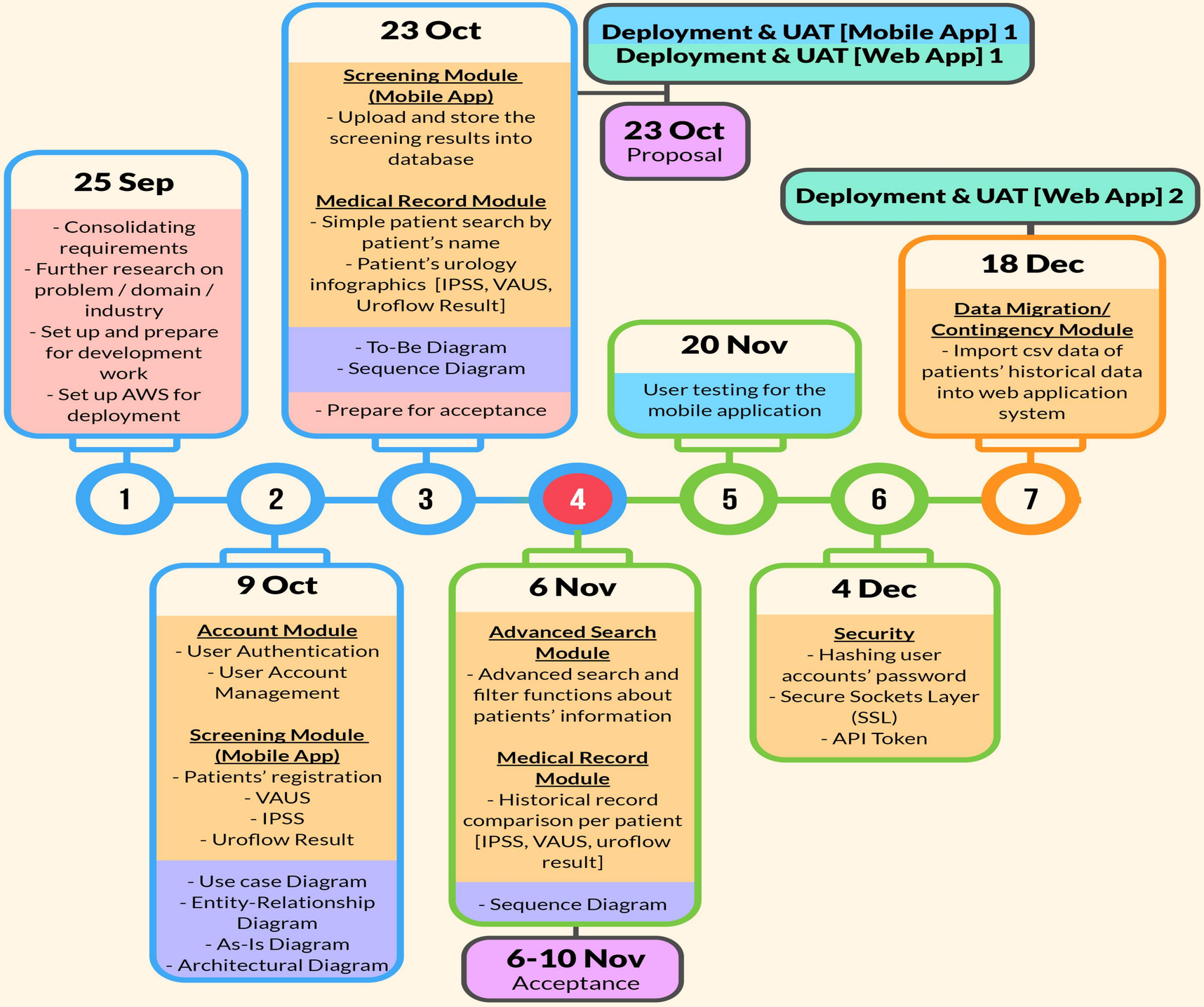
Loves interacting with people

-

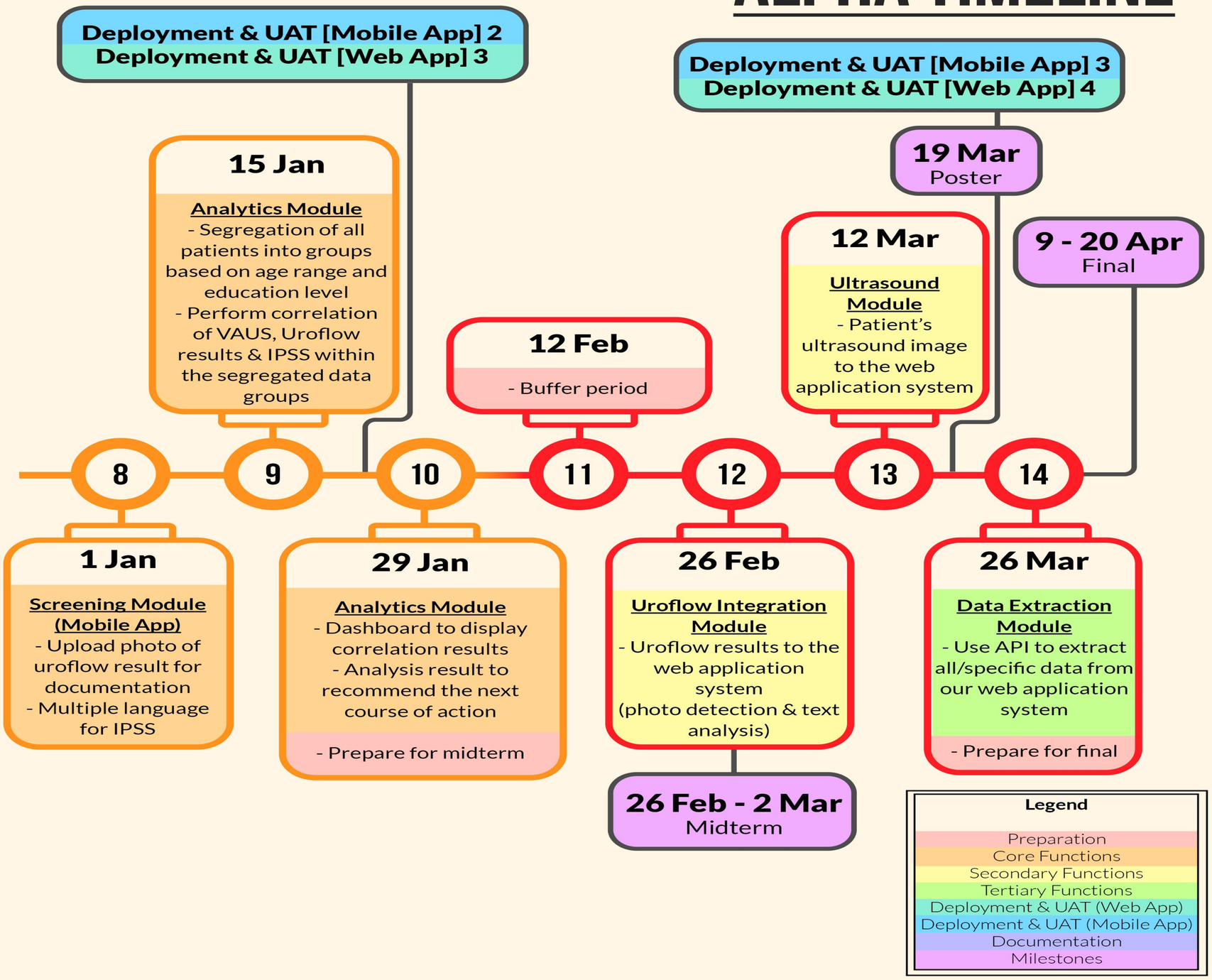
Dedicated nurse to provide good service to her patients

DEMO

SCHEDULE


25 Sep
- Consolidating requirements
- Further research on problem / domain / industry
- Set up and prepare for development work
- Set up AWS for deployment
23 Oct
Screening Module (Mobile App)
- Upload and store the screening results into database
Medical Record Module
- Simple patient search by patient's name
- Patient's urology infographics [IPSS, VAUS, Uroflow Result]
- To-Be Diagram
- Sequence Diagram
- Prepare for acceptance
Deployment & UAT [Mobile App] 1
Deployment & UAT [Web App] 1
23 Oct
Proposal
Deployment & UAT [Web App] 2
18 Dec
Data Migration/ Contingency Module
- Import csv data of patients' historical data into web application system
20 Nov
User testing for the mobile application
1
2
3
4
5
6
7
9 Oct
Account Module
- User Authentication
- User Account Management
Screening Module (Mobile App)
- Patients' registration
- VAUS
- IPSS
- Uroflow Result
- Use case Diagram
- Entity-Relationship Diagram
- As-Is Diagram
- Architectural Diagram
6 Nov
Advanced Search Module
- Advanced search and filter functions about patients' information
Medical Record Module
- Historical record comparison per patient [IPSS, VAUS, uroflow result]
- Sequence Diagram
6-10 Nov
Acceptance
4 Dec
Security
- Hashing user accounts' password
- Secure Sockets Layer (SSL)
- API Token

ALPHA TIMELINE



Tertiary Function

Core Functions

Web Application

Account Module

- User authentication
- User account Management

Security Module

- Hashing user account's password
- Secure Sockets Layer (SSL)
- Application Programming Interface (API) Token

Medical Record Module

- Simple patient search by patient's name
- Historical record comparison per patient [IPSS, VAUS, uroflow result]

Data Migration/ Contingency Module

- Import csv data of patients' historical data into web application system

Advanced Search Module

- Advance search and filter functions to retrieve patients information

Analytics Module

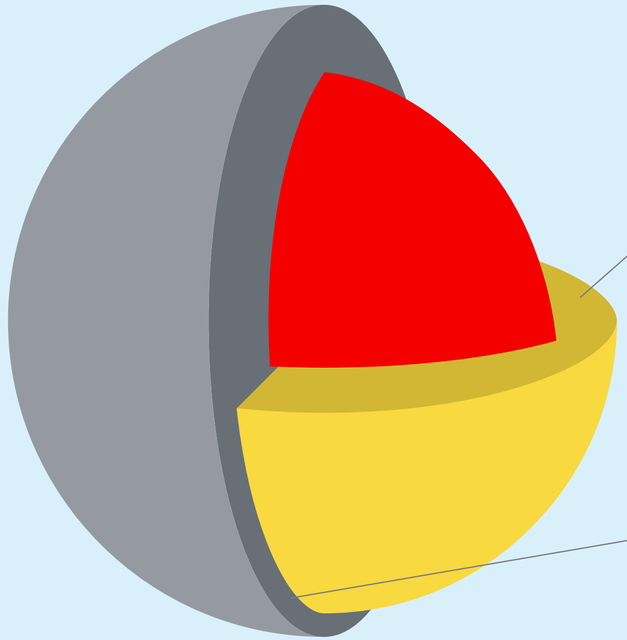
- Segregation of all patients into groups based on age range and education level
- Perform correlation of VAUS Uroflow results & IPSS within segregated data groups
- Dashboard to display correlation results
- Analysis results to recommend next course of actions

Mobile Application

Screening Module (Mobile Application)

- Patients' registration
- VAUS
- IPSS (in multiple languages)
- Uroflow results
- Upload & store the screening results into database
- Upload photos of uroflow results for documentation

SCOPE



Secondary Functions

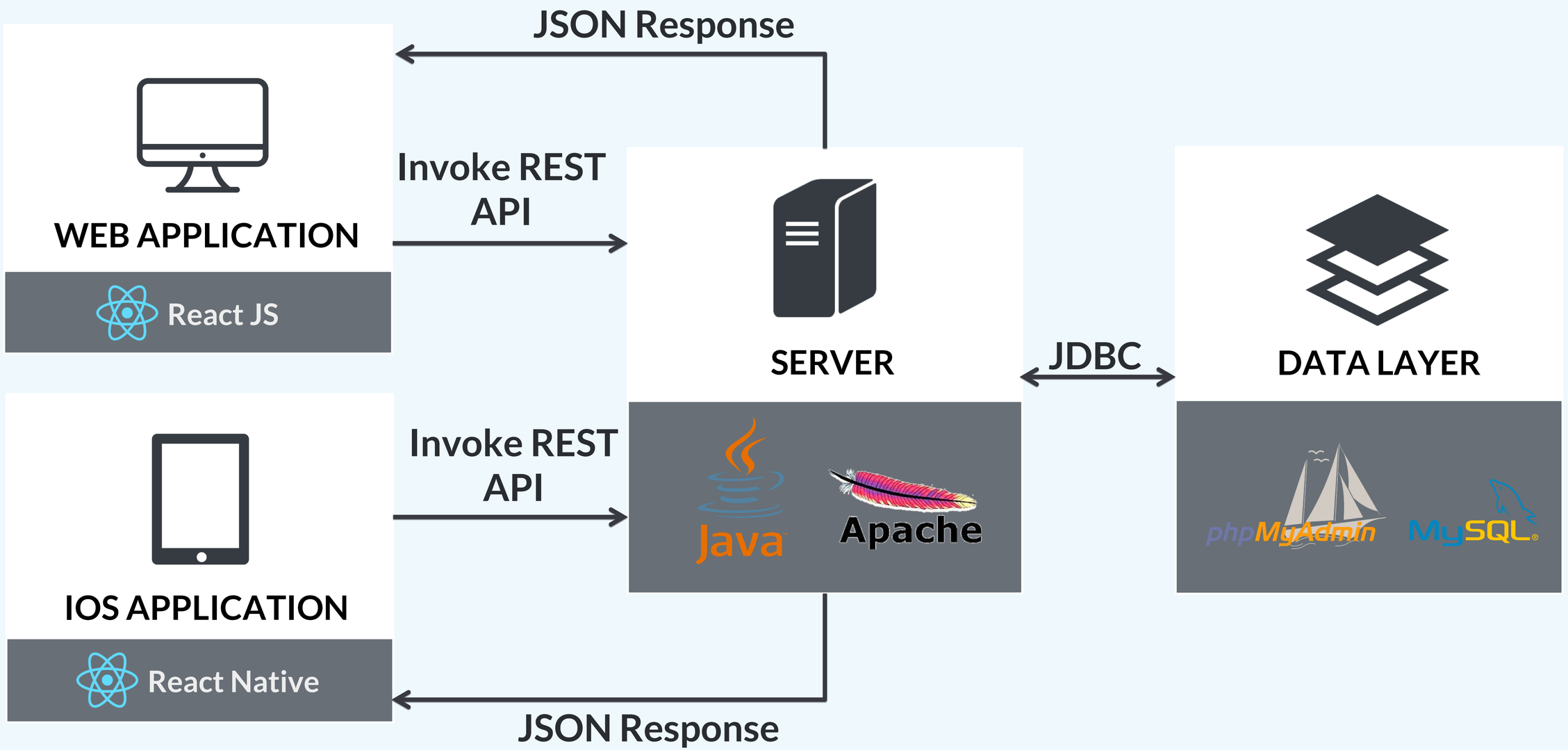
Ultrasound Module
Patient's ultrasound image uploaded onto the web application

Uroflow Integration Module
Uroflow results to the web application system (photo detection & text analysis)

Tertiary Function

Data Extraction Module
Use API to extract all/specific data from our web application system

ARCHITECTURE

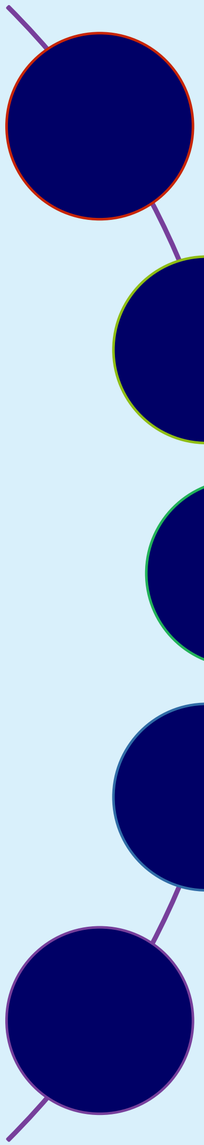


RISK & MITIGATION

Risk type	Description	Likelihood	Impact	Mitigation plans
Non-Technical (usability)	Difficulty in relating to how the elderly will feel about the mobile interface we have built	High	High	Include more user testing in our schedule to allow our target audiences (the elderly) to experiment on the mobile app interface.
Technical (framework/libraries)	Unfamiliar with technologies like react-native elements & material UI	High	Medium	Time will be set aside and allocated for the team to learn and familiarize with the various technology.
Scope (functional & non-functional)	Requirements added/changed/ removed throughout the phase of project	Medium	Medium	Project manager will regularly review the scope with the sponsor

UAT

FEEDBACK



- Reflect the score at the end of the survey
- Use buttons for VAUS interface inside of a sliding bar
- Remove Nurse ID
- Include Patient ID
- Manual Input of Qmax & voided volume

X-FACTOR

ACCEPTANCE
-Complete 1 round of user testing with the nurse and doctor
-Deploy our web application to AWS server

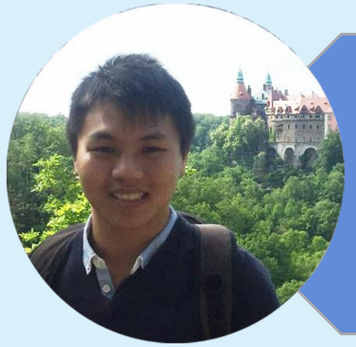
MIDTERM
-Conduct at least 3 user testing with 100 patients

FINALS
-Mobile application for at least 800 BPH patients
-Web application for 20 doctors
-Reduce the time taken for nurses to attend to individual patients to <4 mins

LEARNING OUTCOMES

Wishes to improve tacit skills such as the management of the project plan, stakeholders, and members.

Hopes that we can do our best and achieve success in the end



Hopes to apply what he has learnt, such as analytics, on this project.

Wants to ensure that the application is user friendly yet effective at its task

Aims to push the boundaries for coding abilities on the full stack layer and designing well-structured codes

Wishes to aid and facilitate seamless integration between the front and backend developer environments.

LEARNING OUTCOMES

Primary goal is to create application interfaces that will maximize users' experience

To go beyond her formal role to render her help in other functions

Intends to use this opportunity to further improve his capability as both a designer and a frontend developer

Aims to create an effective application for our clients

Hopes to learn a new language and put all that he has learnt towards helping our elders

Aims to allow the elders to have a hassle free medical experience

Thank You