



MID-TERM PRESENTATION

HU Qunqun (Carina), Amabel LAU Si Ting, Leon LIM Junyang, Sherman YONG Chin Wei

AGENDA

1. Introduction
 2. X Factor
 3. Demo
 4. Technical Implementation & Complexity
 5. User Testing
 6. Project Management
 7. Learning Outcomes
-



INTRODUCTION

TEAM 4SIGHT



AMABEL LAU

PROJECT MANAGER



CARINA HU

UI/UX & QUALITY
ASSURANCE
ANALYST



LEON LIM

SYSTEM INTEGRATOR
& DEPUTY PROJECT
MANAGER



**SHERMAN
YONG**

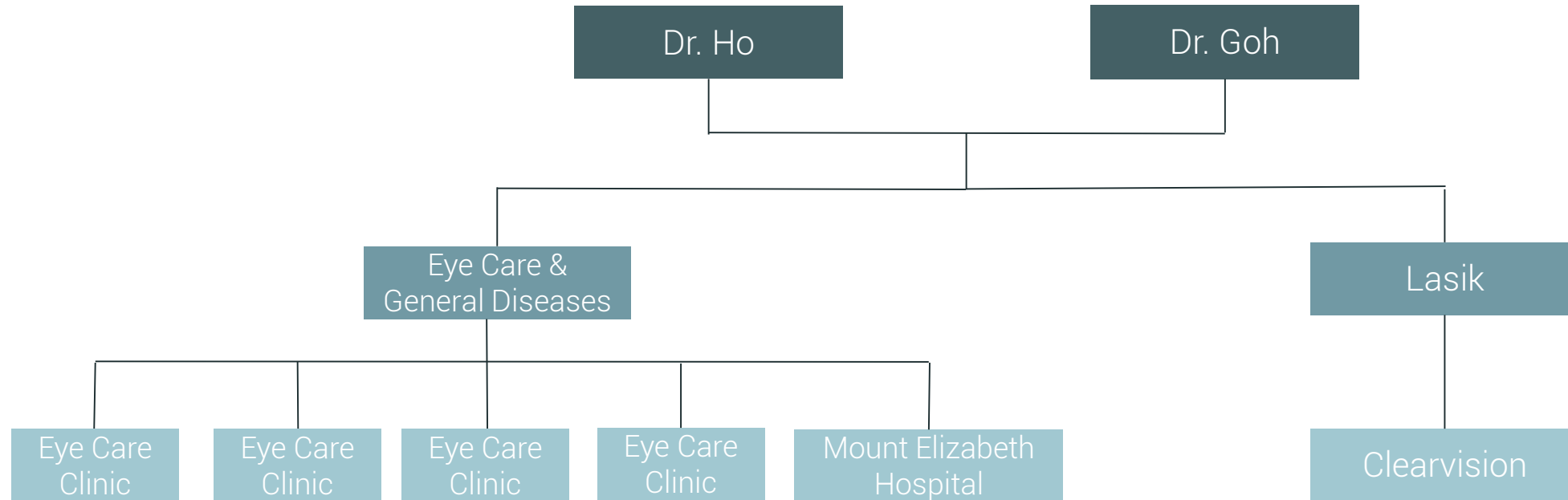
LEAD DEVELOPER

OUR CLIENT

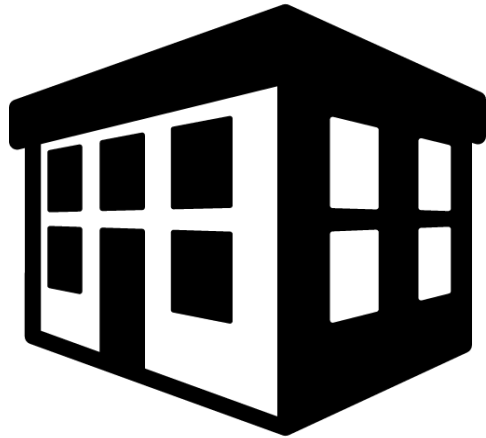


- Established in 2001 by ophthalmologist Dr. Tony Ho
- First dedicated Lasik center in Singapore
- Services include Lasik surgery and eye consultation
- Approximately 15-20 employees

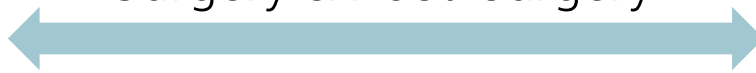
OUR CLIENT



OUR CLIENT



Surgery & Post-surgery



PROBLEMS



PROBLEMS



CHECK

- Patient came for the appointment
- Appointment timings based on doctor and appointment type
- Existing appointment details



COUNT

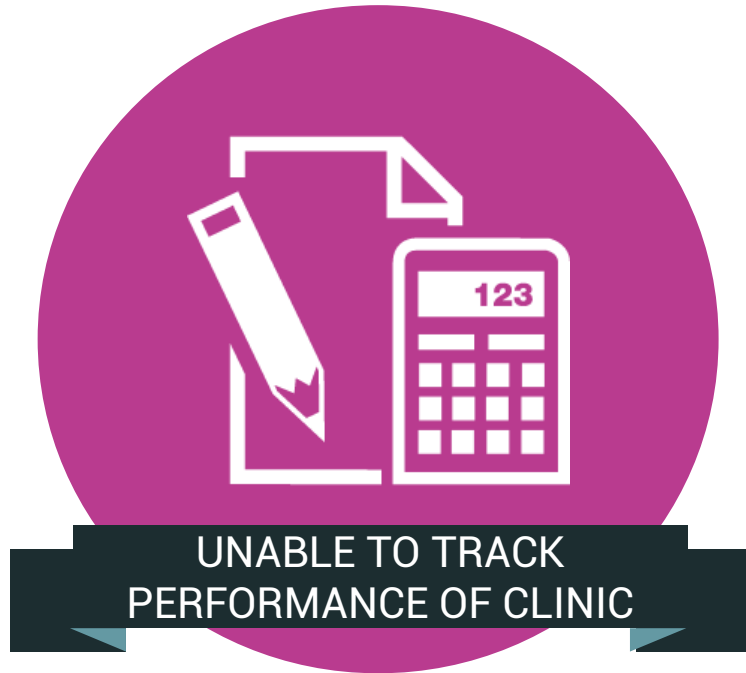
- Number of patients for particular time slot, doctor and appointment type



CALL

- Appointment reminder
- Sync appointment book across clinics
- Inform of swap appointment

PROBLEMS



- Conversion rates of different marketing channels are difficult to trace
- Return of investment on marketing campaigns is difficult to calculate

OUR SOLUTION

A smart appointment scheduling application that aims to improve the traditional ways of how appointments are made in Clearvision

OUR SOLUTION

1

Eradicate Manual Activities

Increase efficiency and reduce human error

2

Customizable and Scalable






Able to customize calendar to suit clinic's needs and scales with ease

3

Collect data for Analytics

Data should not exist in silos and should be used for analysis

MARKET RESEARCH

	 Setmore	 SimplyBook .me	 Acuity SCHEDULING	Genbook	 SuperSaaS	 SIGHT
SMS/ Email Configurations	✓	✓		✓	✓	✓
Analytics Dashboard		✓		✓	✓	✓
Notification	✓					✓
Scheduling	✓	✓	✓	✓	✓	✓
Google Calendar Sync	✓	✓	✓	✓	✓	✓
Mobile Ready	✓	✓	✓	✓	✓	✓
Customization	✓	✓	✓	✓	✓	✓
Search / Filter			✓	✓		✓
Heat Map						✓
Suggest Time Slots						✓
Waiting List						✓



X FACTOR

X FACTORS



Self Proposed one-of-a-kind **intelligent scheduling** aimed at reducing the time taken for creating, editing and deleting an appointment booking by at least **50%**



Early Deployment to track and collect at least **100 schedule records** before mid-term presentation, so as to generate an assessment analysis used to improve the productiveness of our application

X FACTORS

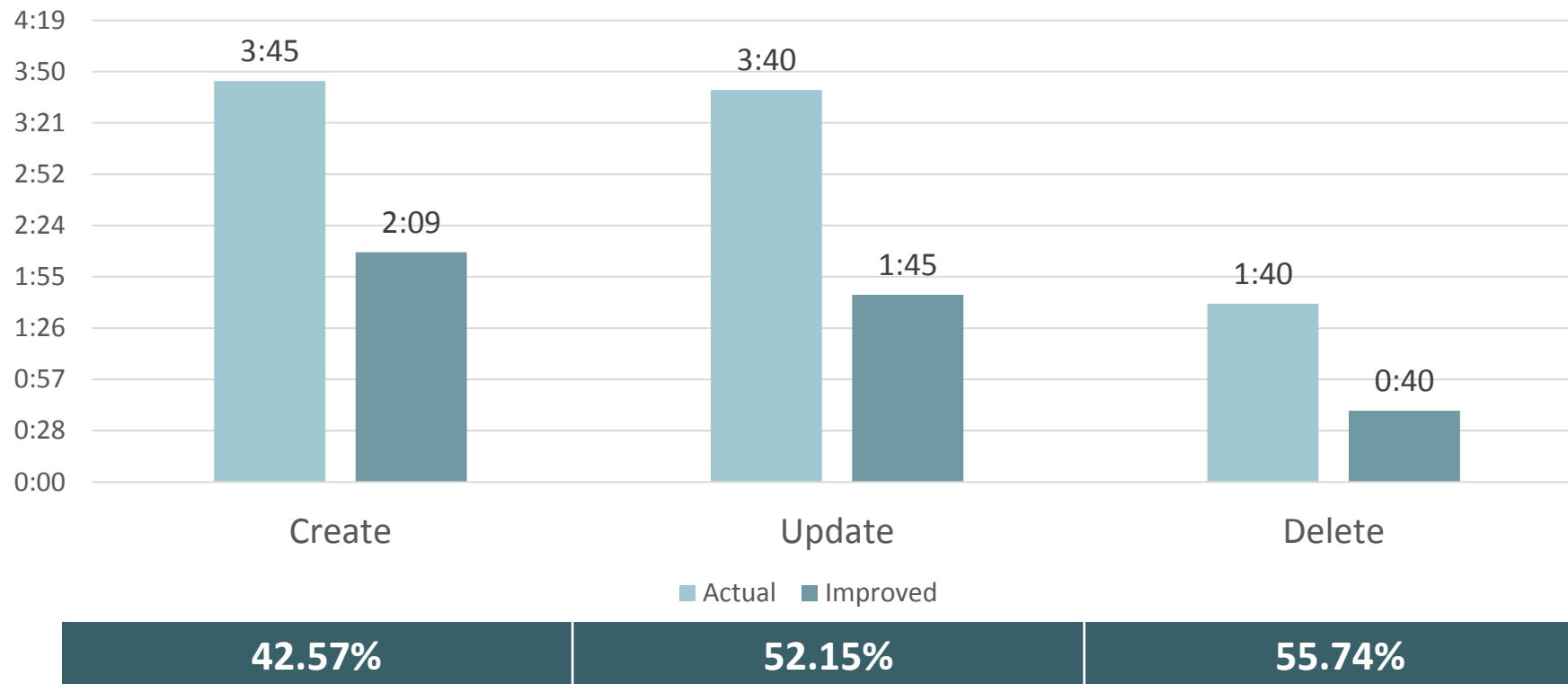
Total Number of Appointments

Create: 87

Update: 60

Delete: 27

Comparison Between Actual & Improved Timings





DEMO



Block Doctor's
Calendar

SCENARIO 1
Appointment



Blocked Time Slot
Notification Prompt



Heatmap



Real-time



Add to Waiting
List



Check for Existing
Patient

SCENARIO 2

Create Appointment



Search



Swap List
Notification
Prompt

Introduction

X factor

Demo

Technical Implementation & Complexity

User Testing

Project Management

Learning Outcome



2-way SMS



SMS
Notification
Inbox

Introduction

X factor

Demo

Technical Implementation & Complexity

User Testing

Project Management

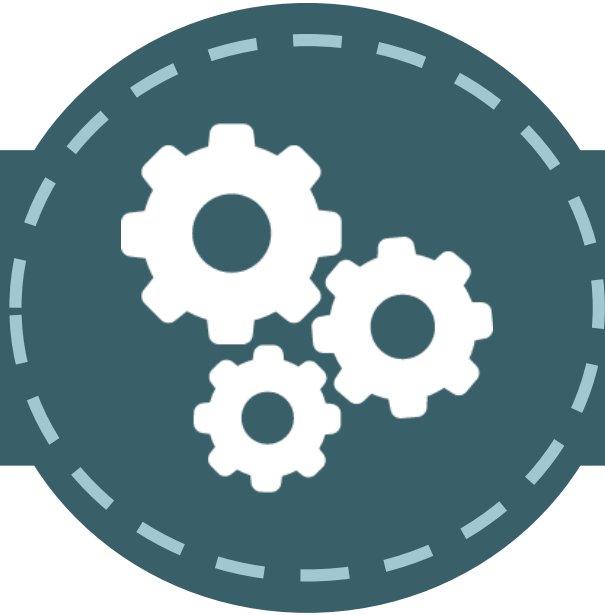
Learning Outcome



Manage Patient Queue

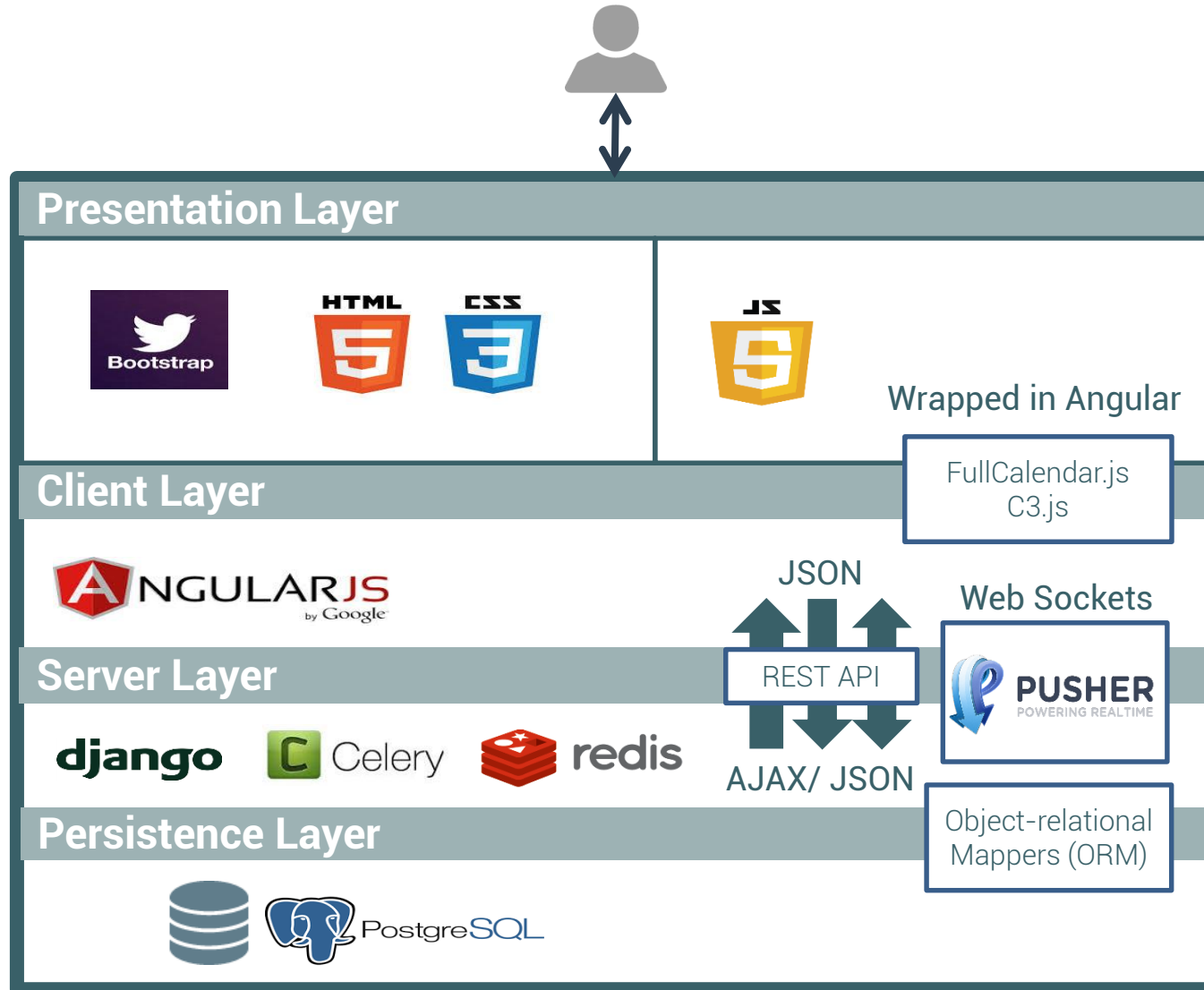


Manage No
Show List

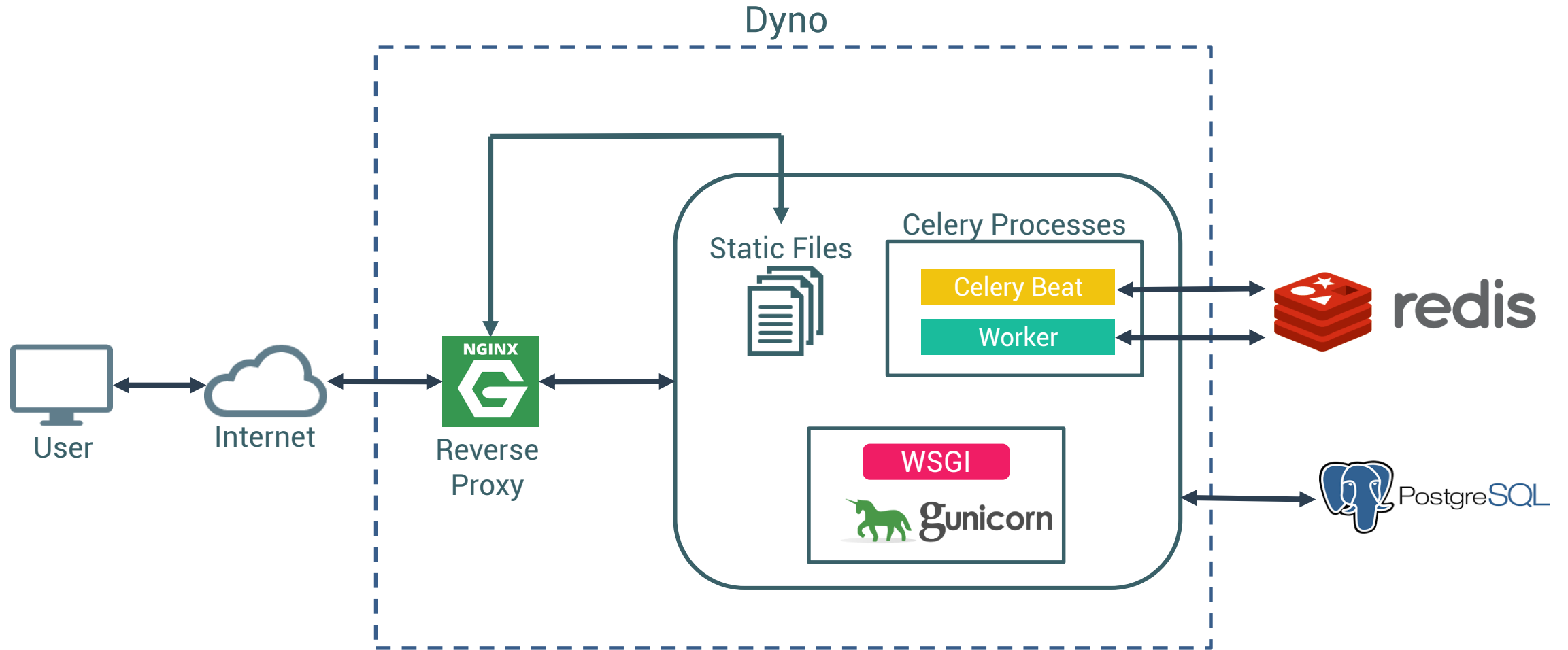


TECHNICAL IMPLEMENTATION & COMPLEXITY

TECHNICAL DIAGRAM



ARCHITECTURE DIAGRAM



PATIENT VOLUME VISUALIZATION

Issue



- Tedious manual process – look through black book, counting patients on each time slots etc.
- Admin Clerk schedule appointment based on their gut feelings / discretion
- Scheduled appointments not well spread out, leaving the clinic too busy – or *too empty*.

PATIENT VOLUME VISUALIZATION

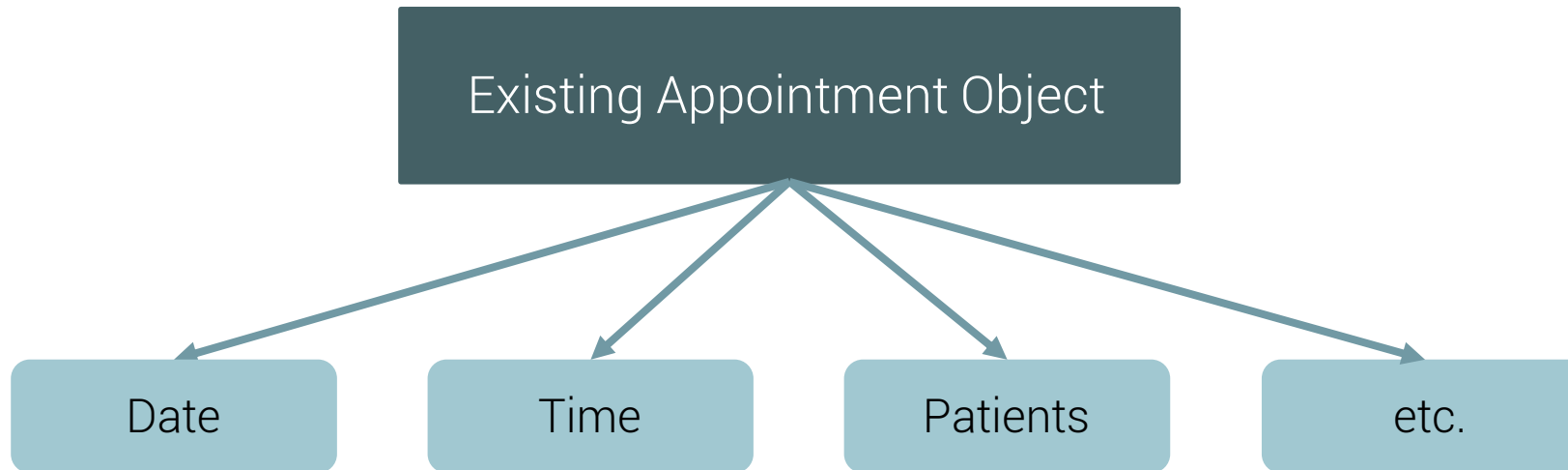
Solution



- Consolidated view of appointment time slot capacities integrated with main calendar
- At a glance, have a clear view on time slots that are relatively empty – *or full*
- Time slots are color coded to reflect how full(or empty) they are, in the "Add Appointment" form

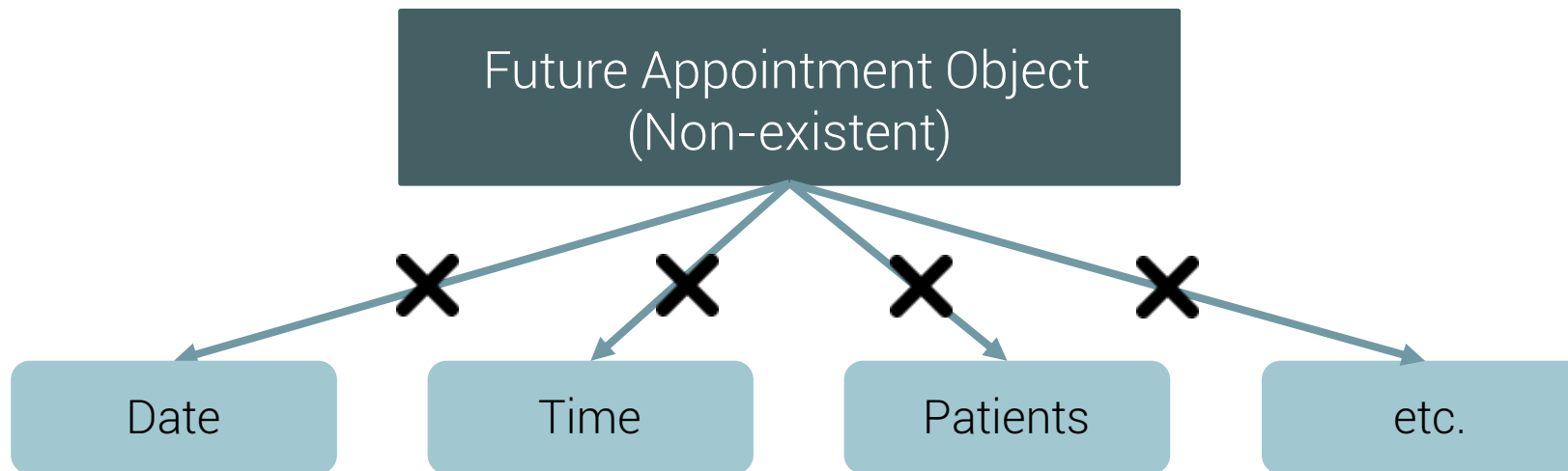
PATIENT VOLUME VISUALIZATION

Implementation Challenges



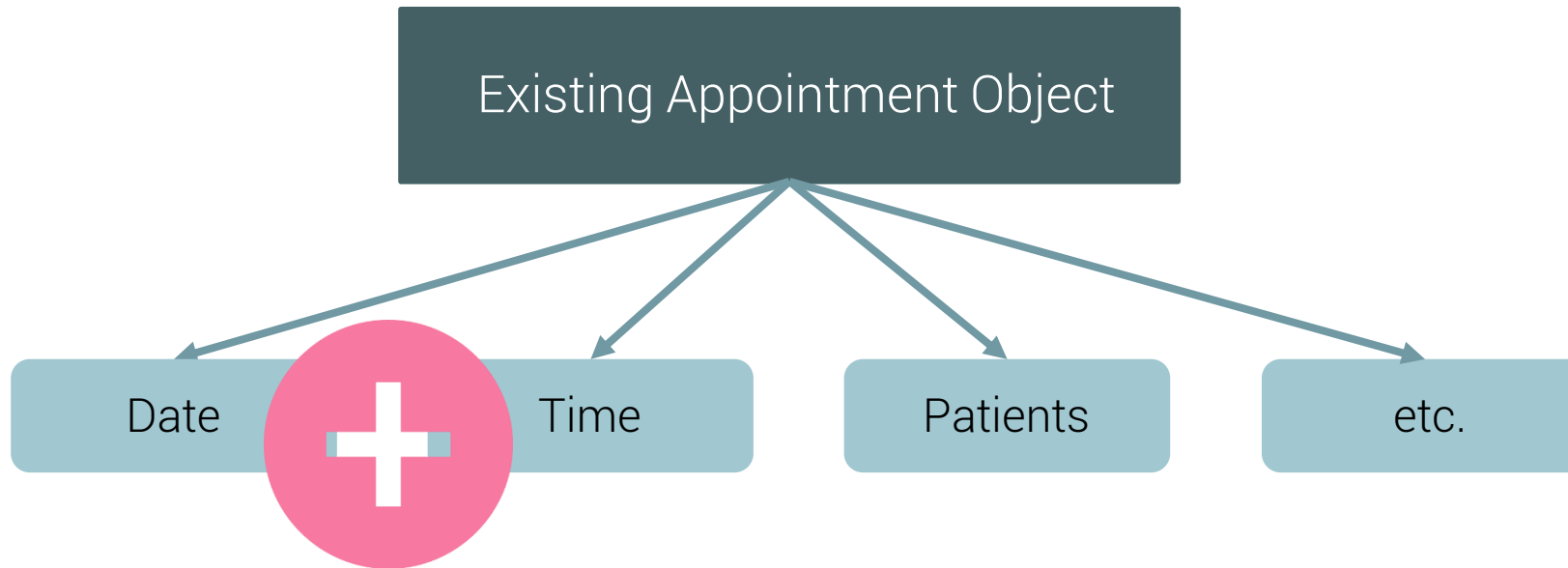
PATIENT VOLUME VISUALIZATION

Implementation Challenges



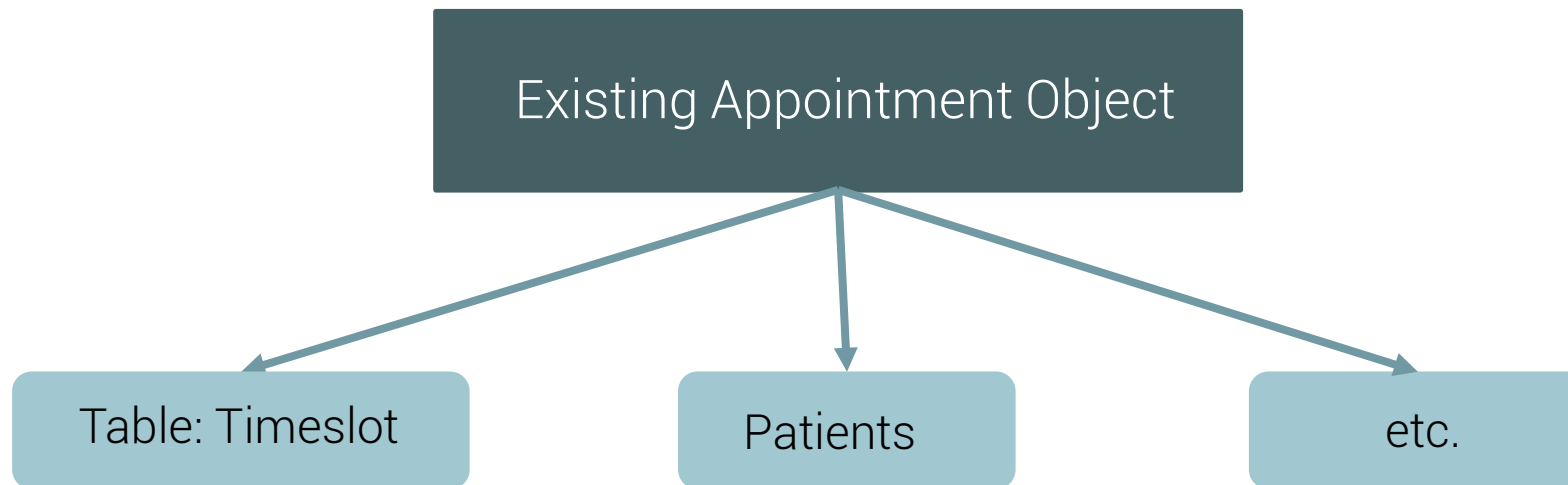
PATIENT VOLUME VISUALIZATION

Implementation



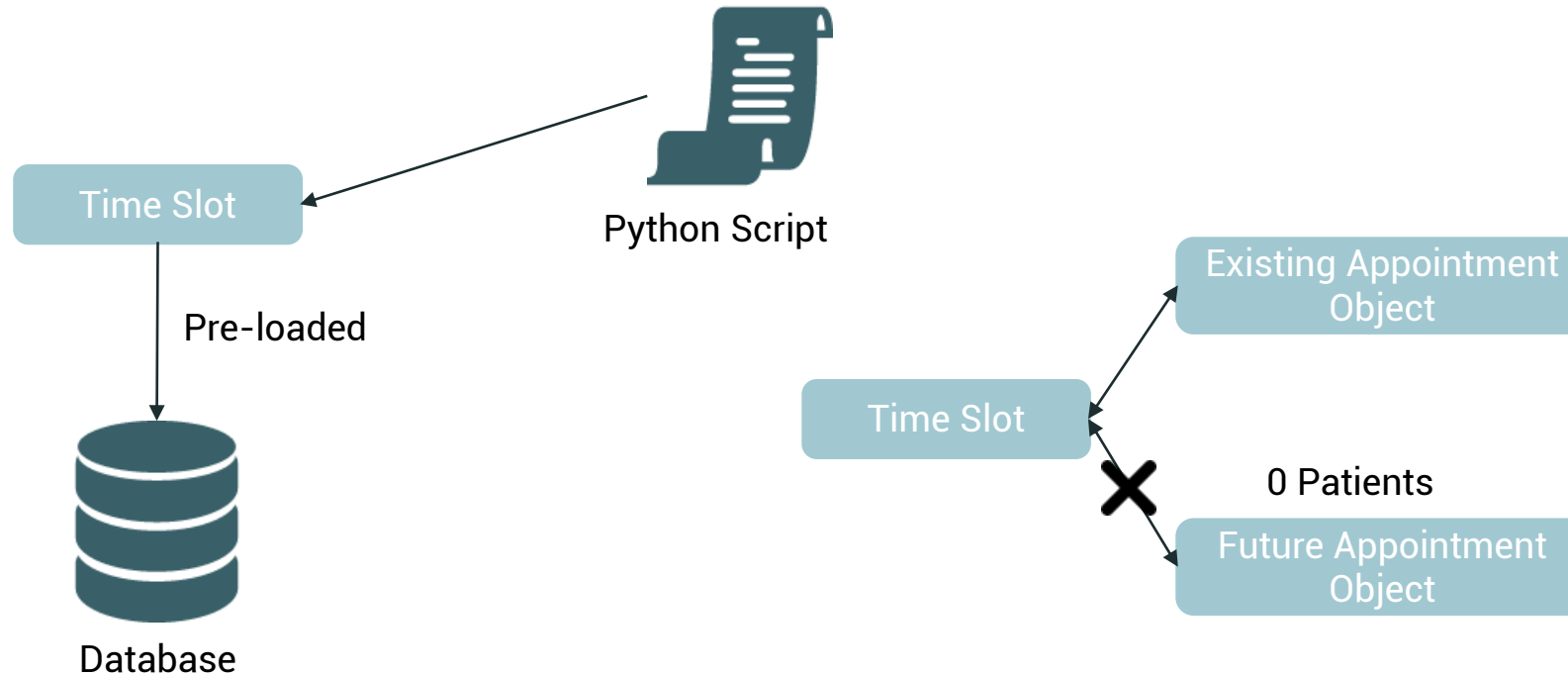
PATIENT VOLUME VISUALIZATION

Implementation



PATIENT VOLUME VISUALIZATION

Implementation



WEB SOCKETS

Issues



- Users might not strategically make new appointments if calendar does not show updated view of appointments
- Force refresh of the web page to get latest updates
- Calendar not updated real time

WEB SOCKETS

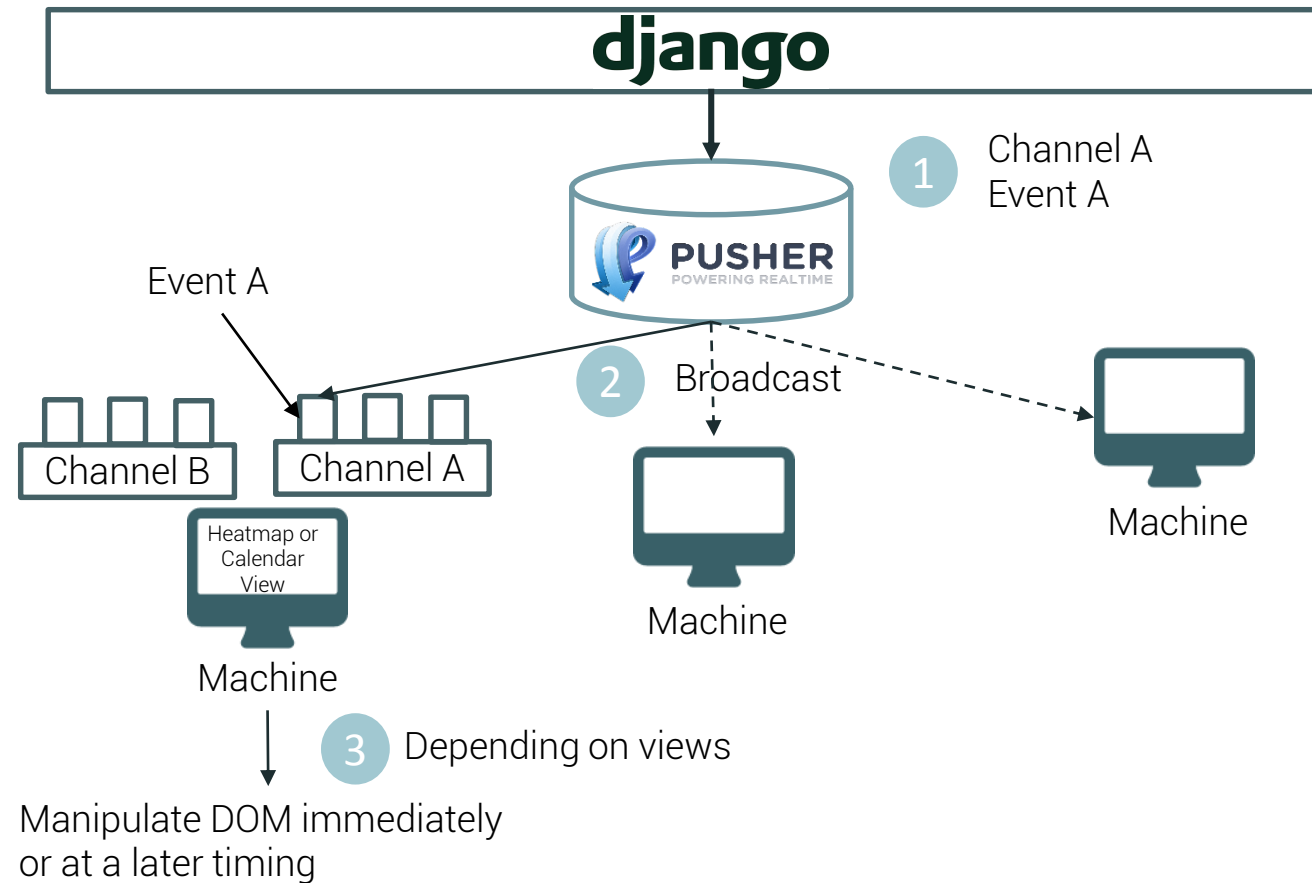
Solution



- To deliver a greater user experience, application has to be self-aware and updates pages real-time
- Each crucial action that needs to be real time is tagged
- One client updates, the other is updated without a forced refresh

WEB SOCKETS

Implementation





USER TESTING

USER TESTING 1

Objectives

1

Verify that functionalities built are in line with user requirements

2

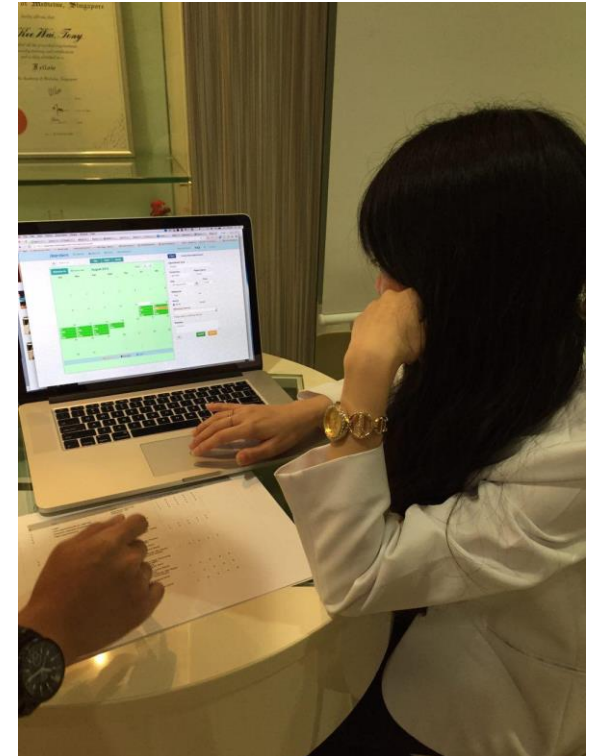
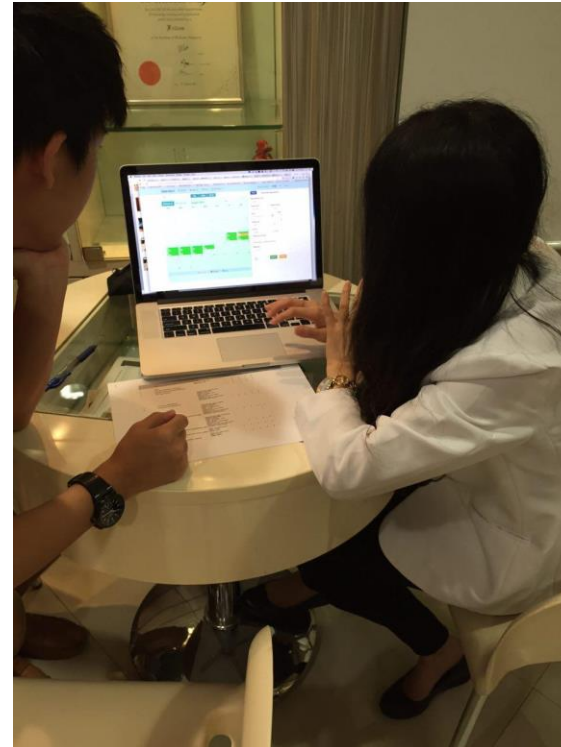
Determine if user interface is intuitive

3

Identify usability problems

USER TESTING 1

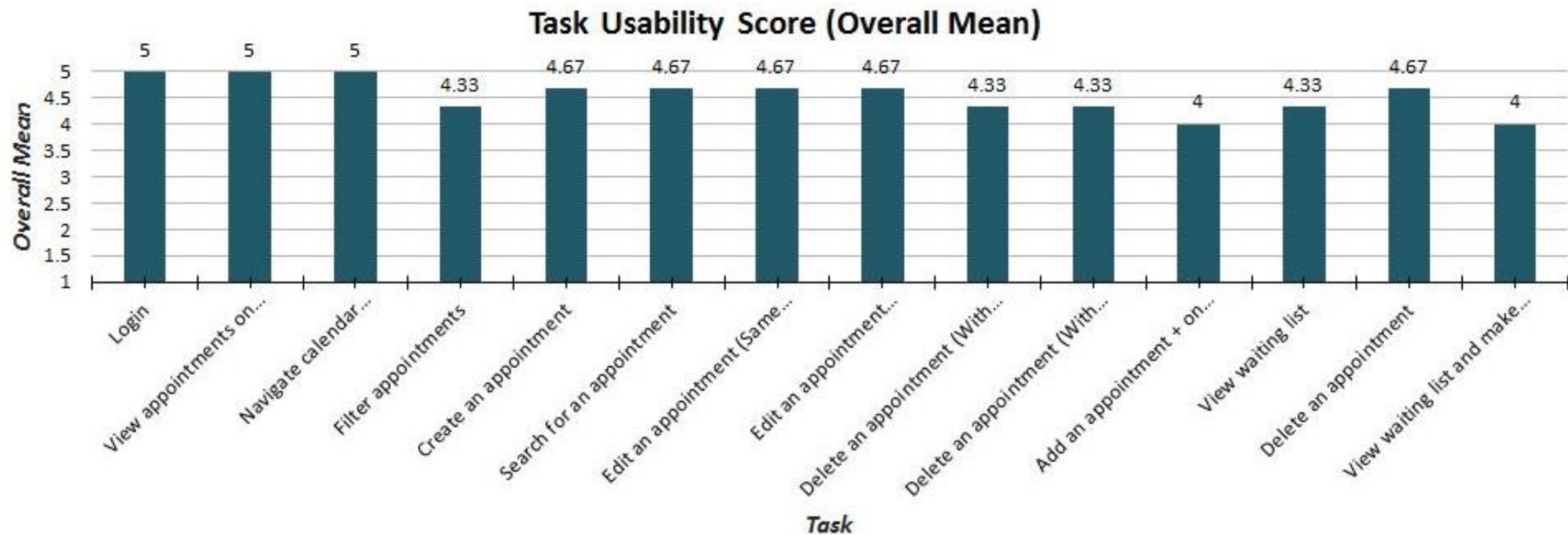
Participants



USER TESTING 1

Usability

Easy to perform task? (1: Difficult - 5: Very Easy)



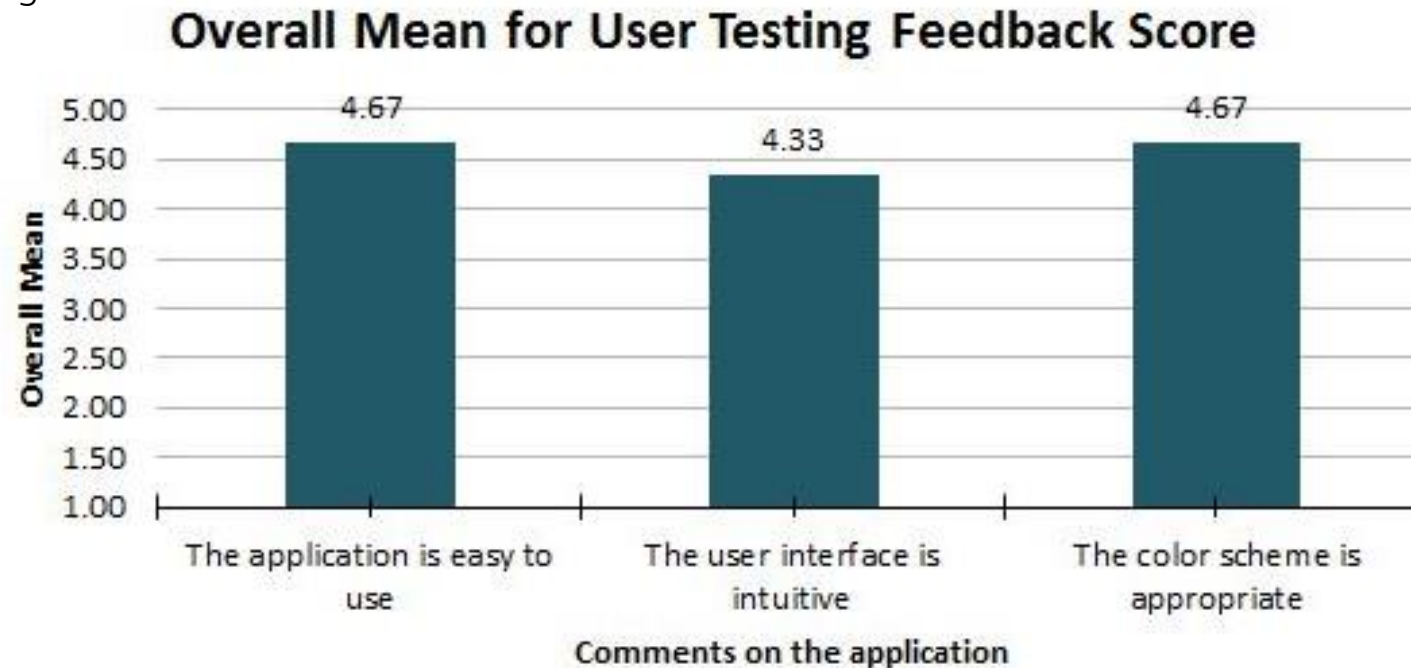
USER TESTING 1

Feedback

On a scale of 1 to 5, please rate the following:

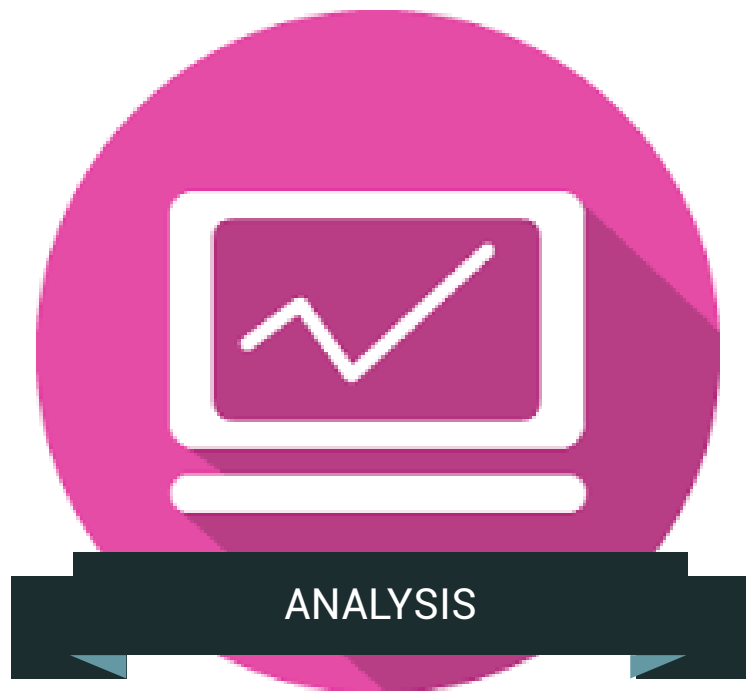
1 - Strongly Disagree

5 - Strongly Agree



USER TESTING 1

Analysis



- No drastic variation in the usability scores between users of different roles
- Simple UI that allows user to perform fundamental tasks easily
- Confirmed the value of proposed features such as swap list
- Discover potential improvement eg: Block off doctor's time slots on calendar

USER TESTING 2

Claims

1

Participants find it easy to navigate the calendar and manage patients' appointments (CUD) effectively
(average rating: 4/5)

2

Participants find the patient queue useful in helping them track patient's attendance
(average rating: 3.5/5)

3

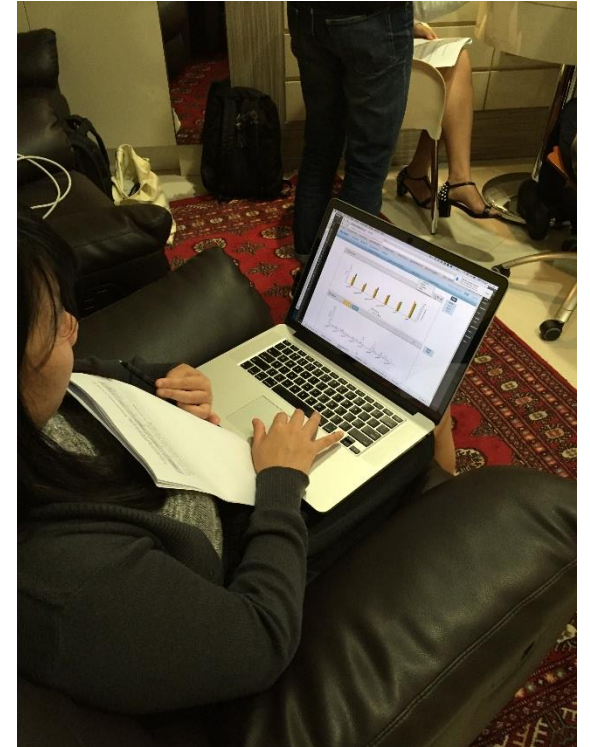
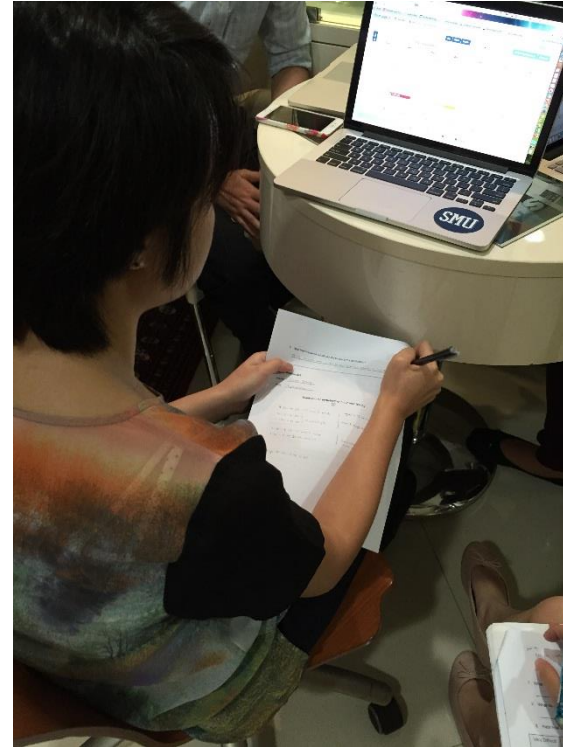
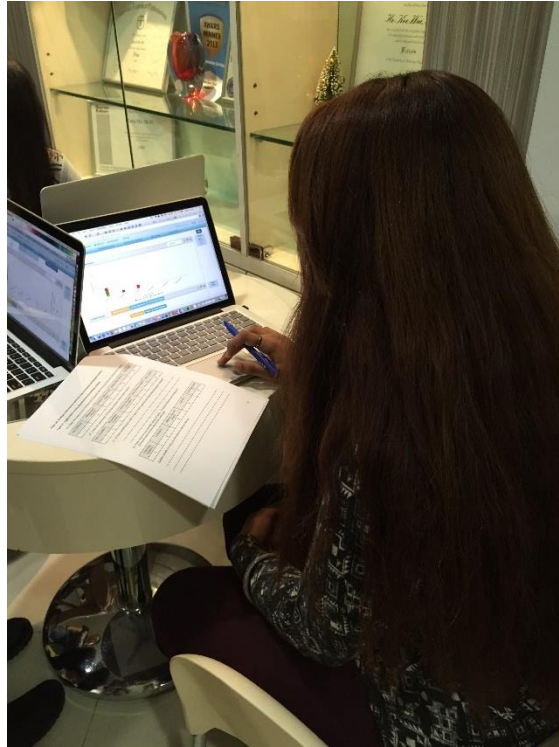
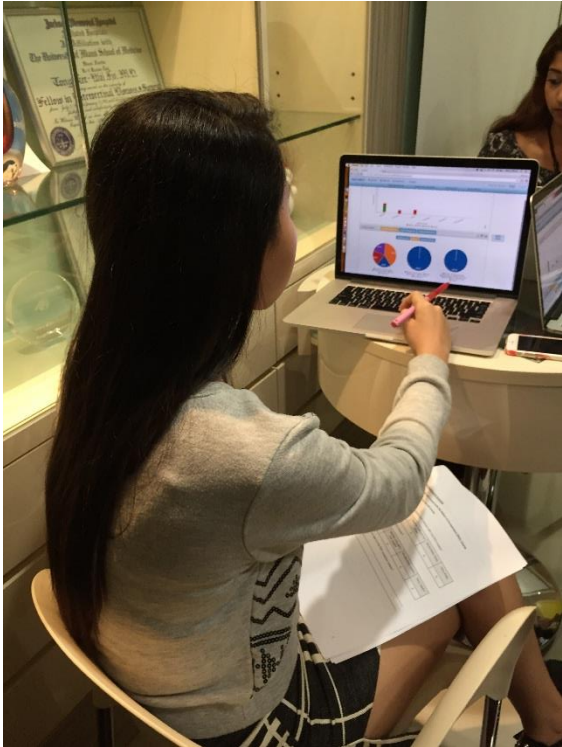
Participants find the marketing conversion and appointment scheduling dashboard beneficial in their performance analysis
(average rating: 4/5)

4

Participants like and have positive comments about our user interface
(average rating: 4/5)

USER TESTING 2

Participants



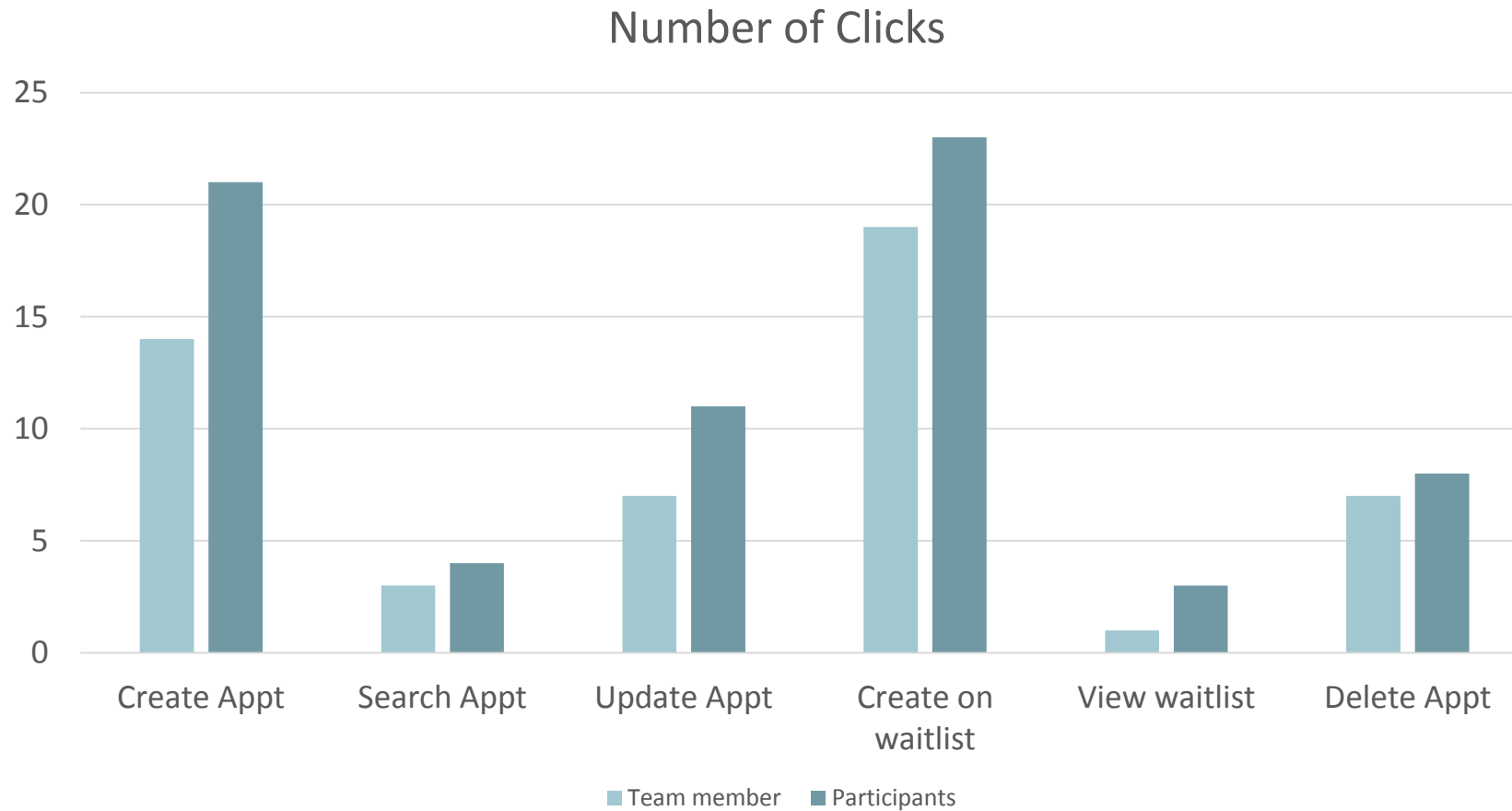
USER TESTING 2

Claim 1

Participants find it easy to navigate the calendar and manage patients' appointments (CUD) effectively (average rating: 4/5)

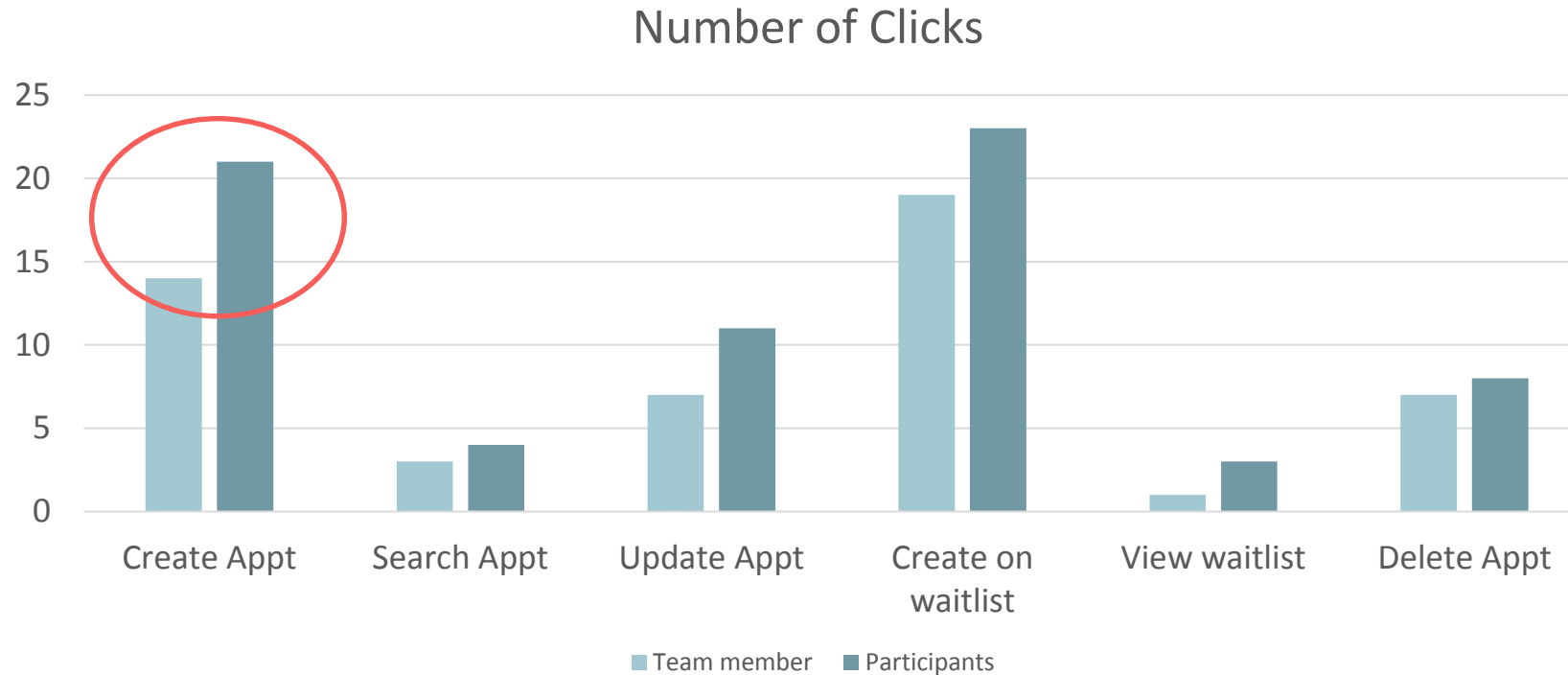
USER TESTING 2

Claim 1



USER TESTING 2

Claim 1



Activation of heat map does not navigate the calendar to the current date

USER TESTING 2

Claim 1

Before

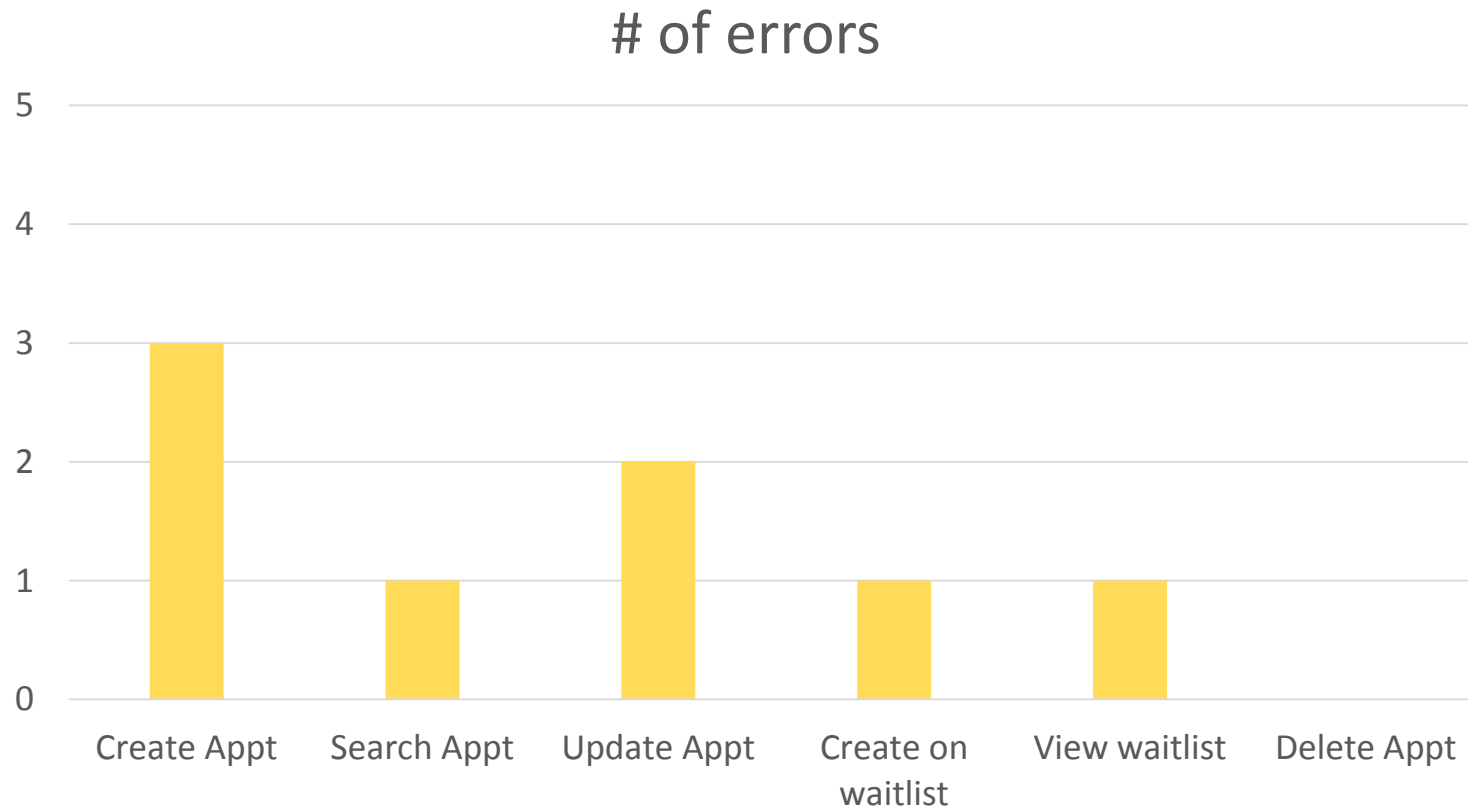
After

The 'Before' screenshot shows a web application interface for 'clearvision'. The top navigation bar includes links for 'Calendar', 'Swap List', 'Dashboard', and 'Manage Q', along with a user greeting 'Welcome, admin'. The main content area is titled 'Jun 7 — 13, 2015' and features a calendar grid for Dr. Ho. The grid shows slots from 9am to 5pm for each day of the week. To the right of the calendar is a form for creating a new appointment. The form includes fields for 'Appointment Type' (Pre Evaluation), 'Doctor' (Dr Ho), 'Contact No.', 'Patient Name', 'Date', 'Time', 'Waiting list' (Yes/No), 'Marketing Channels', and 'Remarks' (Optional). At the bottom of the form are 'Submit' and 'Cancel' buttons.

The 'After' screenshot shows the same web application interface, but with a different calendar view. The calendar is now titled 'Oct 4 — 10, 2015' and shows a week view. The appointment slots are color-coded: green for 9:00-11:00 on Wed 10/7, orange for 9:00-11:00 on Thu 10/8, and red for 2:00-3:00 on Fri 10/9. The form on the right is identical to the 'Before' version, with fields for 'Appointment Type', 'Doctor', 'Contact No.', 'Patient Name', 'Date', 'Time', 'Waiting list', 'Marketing Channels', and 'Remarks', and 'Submit' and 'Cancel' buttons.

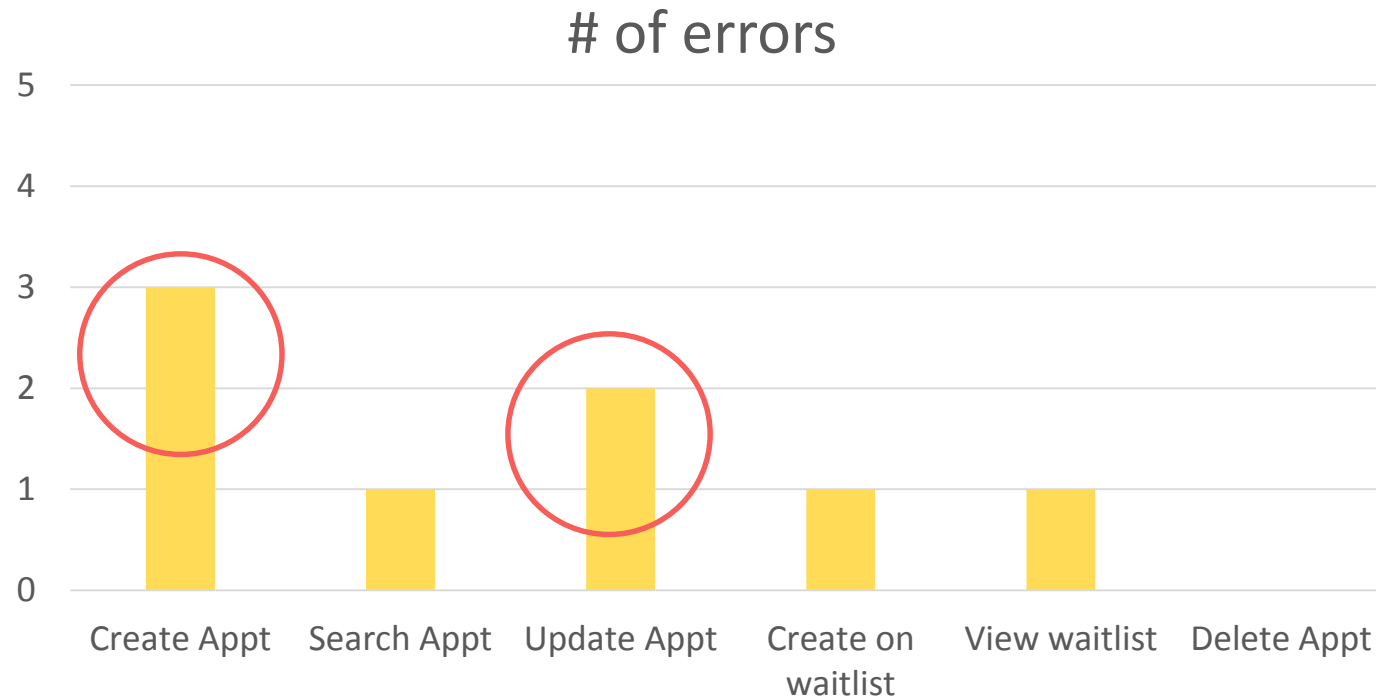
USER TESTING 2

Claim 1



USER TESTING 2

Claim 1



Participants change dropdown selections before heat map finishes loading

USER TESTING 2

Claim 1

Before

The screenshot shows the 'Create New Appointment' form in the clearvision system. The form is divided into a calendar view on the left and a form area on the right. The calendar view shows a week from Sunday, October 4 to Saturday, October 10, 2015. The form area on the right contains the following fields:

- Appointment Type:** A dropdown menu with 'Pre Evaluation' selected. This field is highlighted with a red box.
- Doctor:** A dropdown menu with 'Dr Ho' selected.
- Contact No.:** A text input field.
- Patient Name:** A text input field.
- Date:** A date picker showing '07-October-2015'.
- Time:** A dropdown menu.
- Waiting list:** Radio buttons for 'Yes' and 'No'.
- Marketing Channels:** A dropdown menu.
- Remarks:** A text area with 'Optional' entered.

After

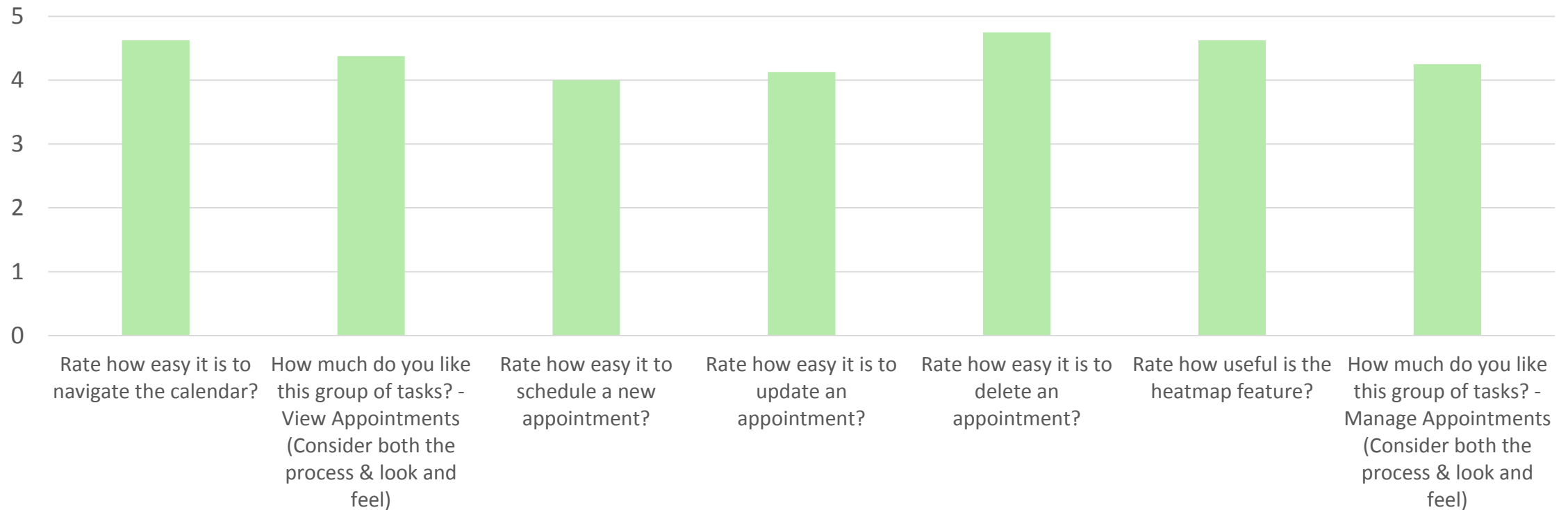
The screenshot shows the 'Edit Appointment' form in the clearvision system. The form is divided into a calendar view on the left and a form area on the right. The calendar view shows a week from Sunday, October 4 to Saturday, October 10, 2015. The form area on the right contains the following fields:

- Patient List:** A dropdown menu with 'Edison' selected.
- Appointment Type:** A dropdown menu with 'Post Surgery' selected. This field is highlighted with a red box.
- Doctor:** A dropdown menu with 'Dr Ho' selected.
- Contact No.:** A text input field with '89421563' entered.
- Patient Name:** A text input field with 'Edison' entered.
- Date:** A date picker showing '07-October-2015'.
- Time:** A dropdown menu.
- Waiting list:** Radio buttons for 'Yes' and 'No'.
- Marketing Channels:** A dropdown menu with 'Word of Mouth' selected.
- Remarks:** A text area with 'Optional' entered.

USER TESTING 2

Claim 1

Mean



Average Score of 4.39 > 4 (support our claim)

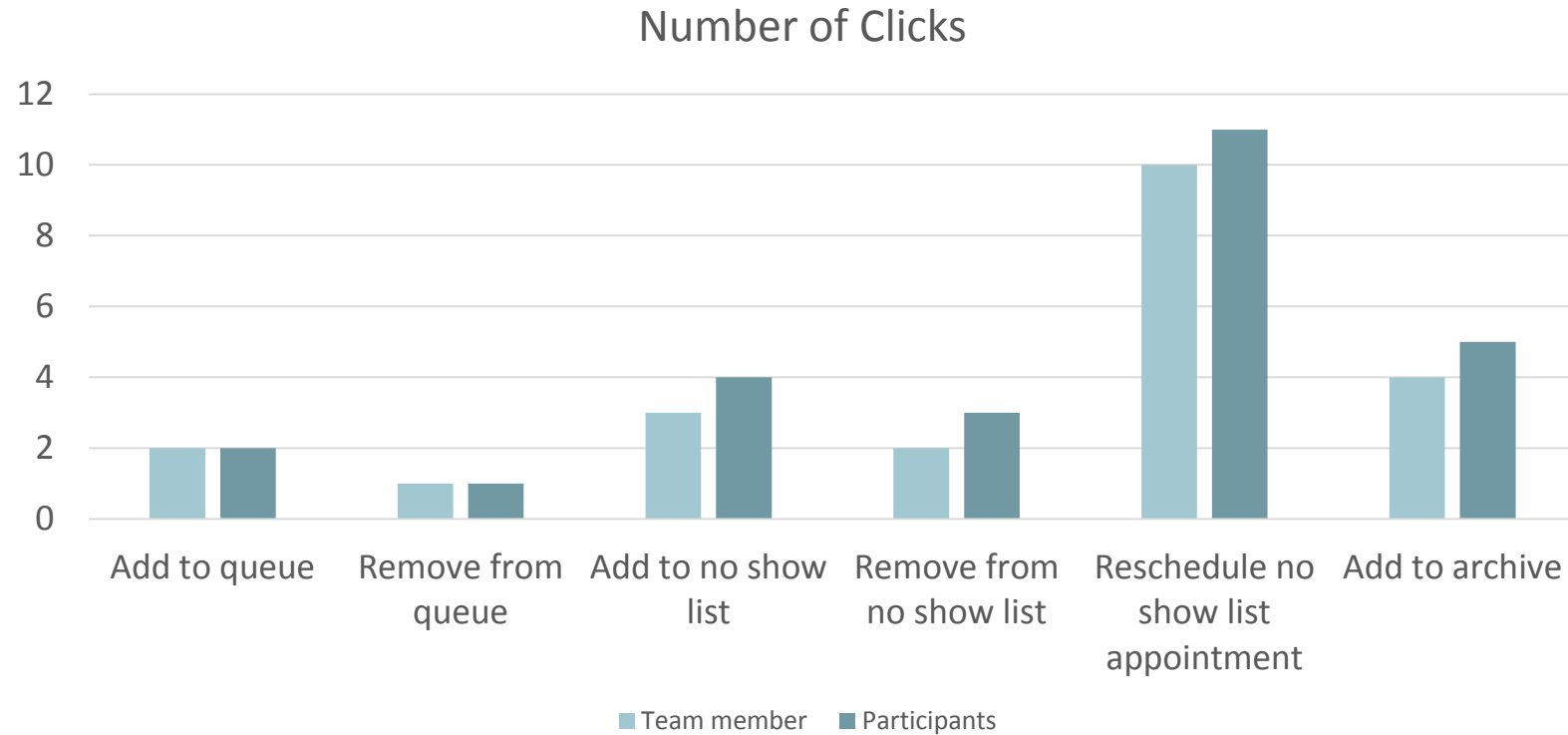
USER TESTING 2

Claim 2

Participants find the patient queue useful in helping them to track patients' attendance (average rating: 3.5/5)

USER TESTING 2

Claim 2

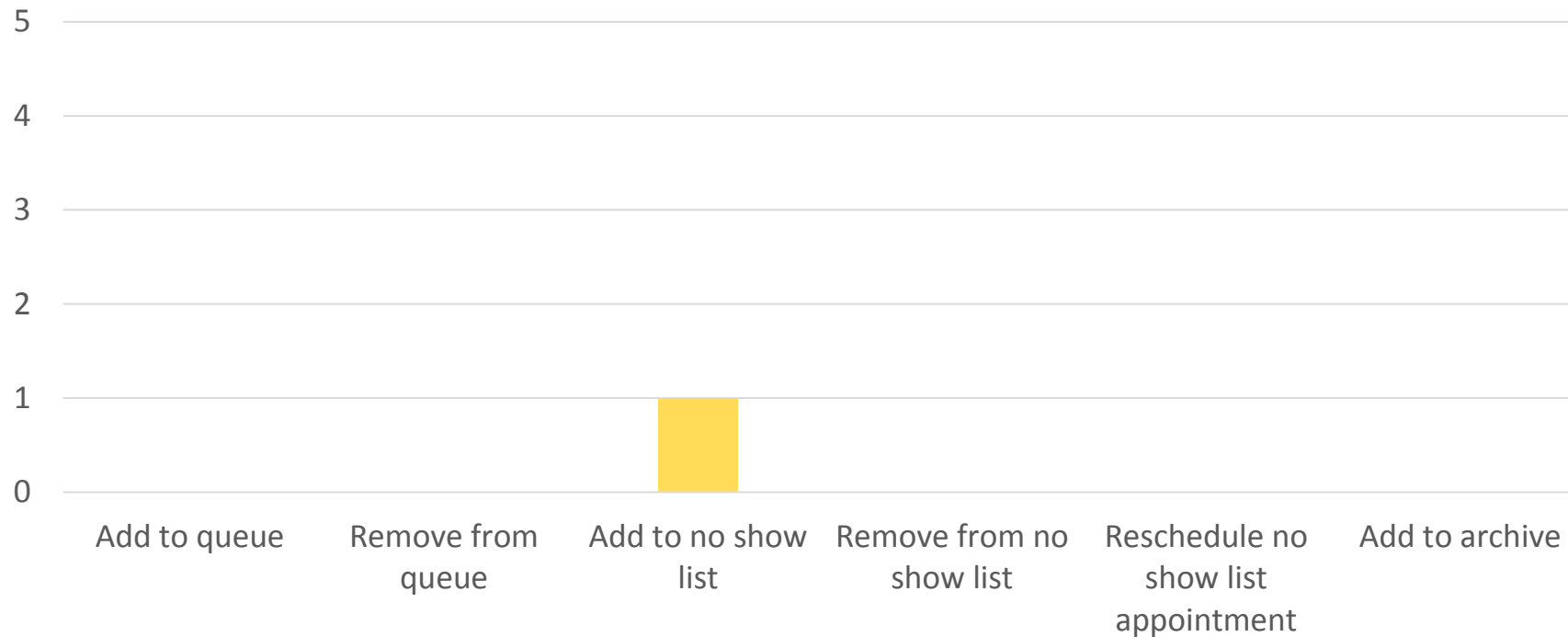


Participants found the tasks intuitive and easy to use

USER TESTING 2

Claim 2

of errors

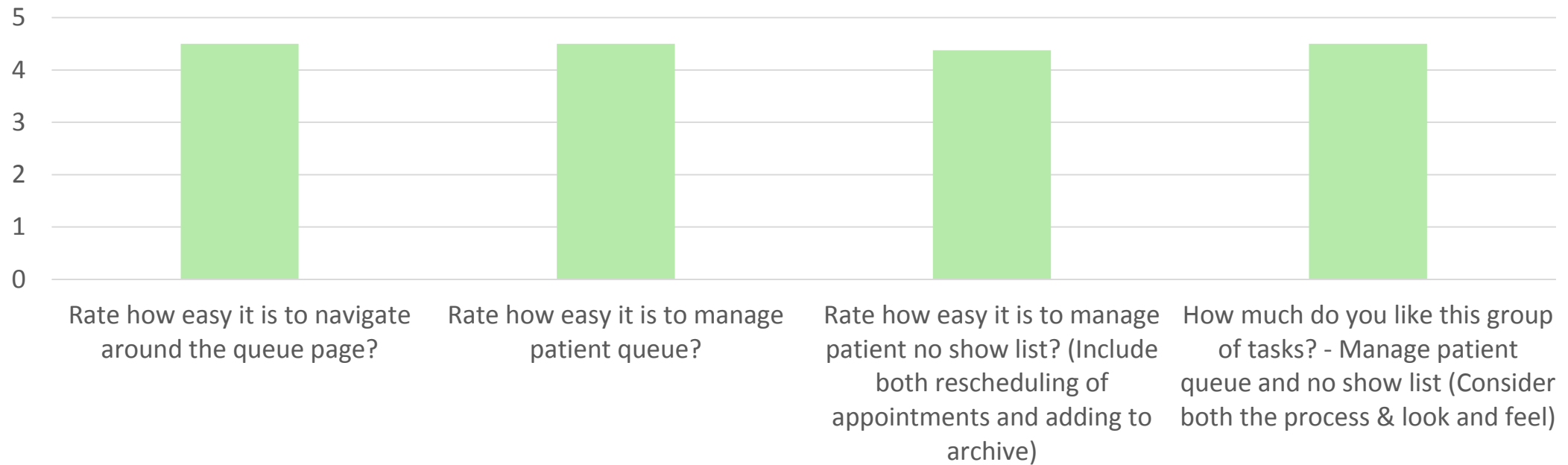


A small number of participants could not associate the cross button to add to the no show list initially

USER TESTING 2

Claim 2

Mean



Average Score of 4.47 > 4 (support our claim)

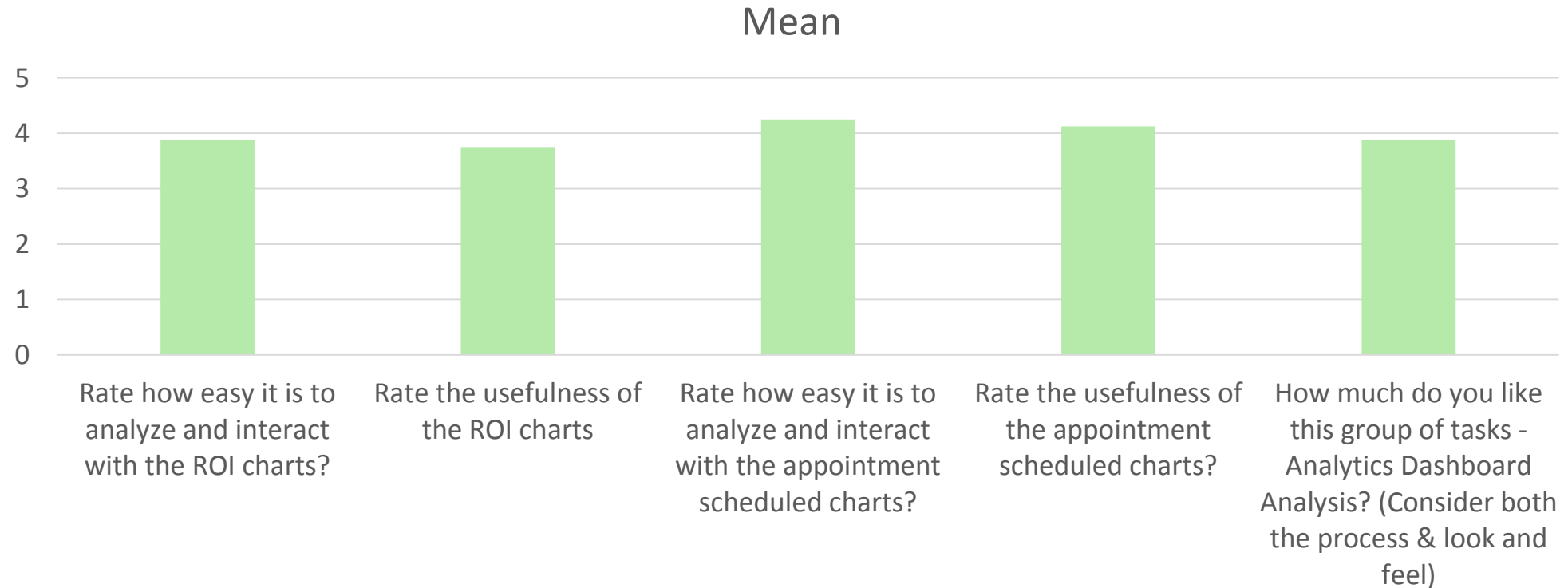
USER TESTING 2

Claim 3

Participants find the marketing conversion and appointment scheduling dashboard beneficial in their performance analysis

USER TESTING 2

Claim 3



Average Score of 3.975/5
ROI chart to be separated analyzed from marketing conversion

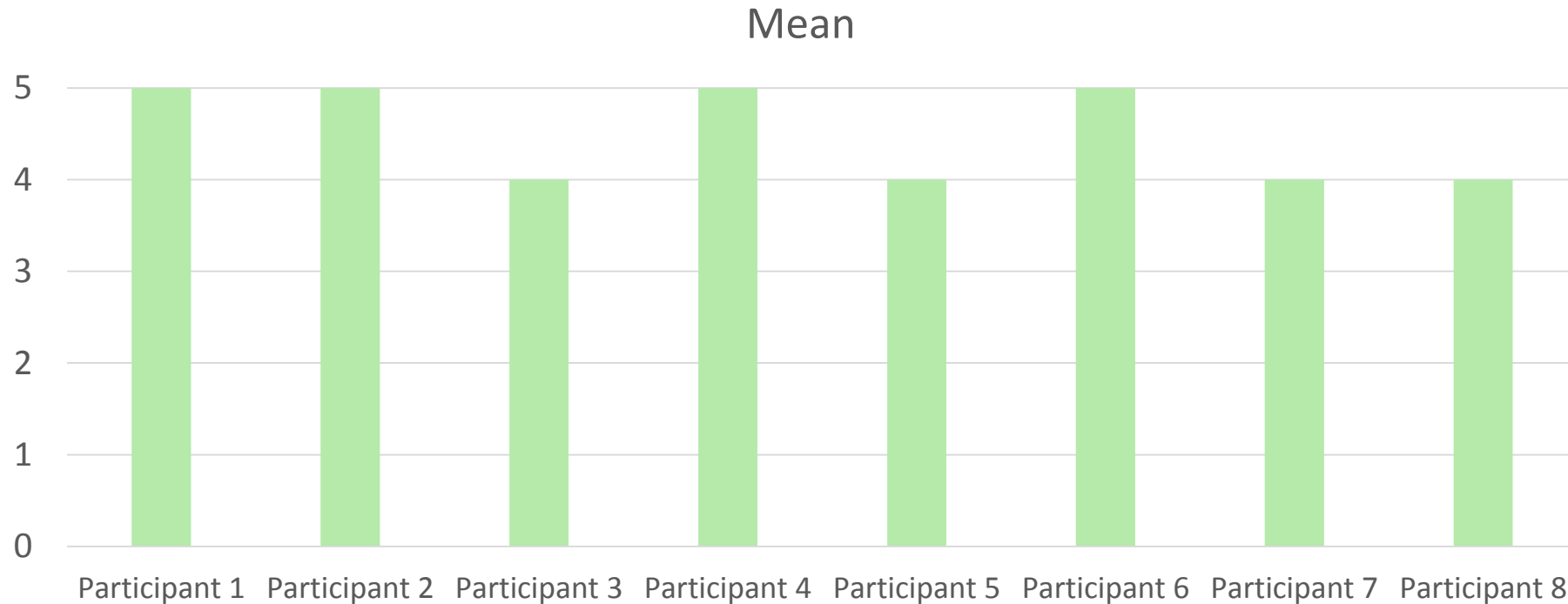
USER TESTING 2

Claim 4

Participants like and have positive comments about our user interface (average rating: 4/5)

USER TESTING 2

Claim 4



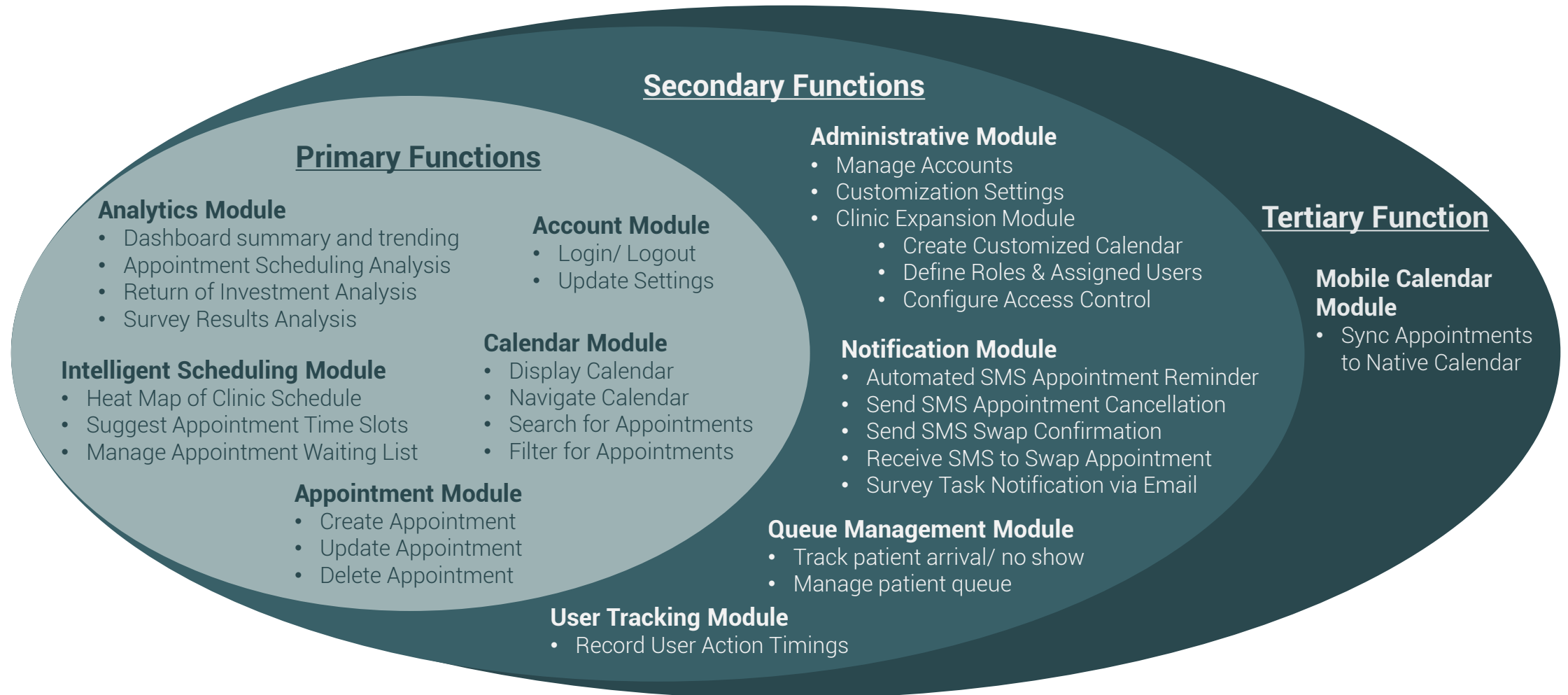
Average Score of 4/5 (supports our claim)
Participants like the convenient navigation of the application
Theme of the UI is soothing



PROJECT MANAGEMENT

SCOPE

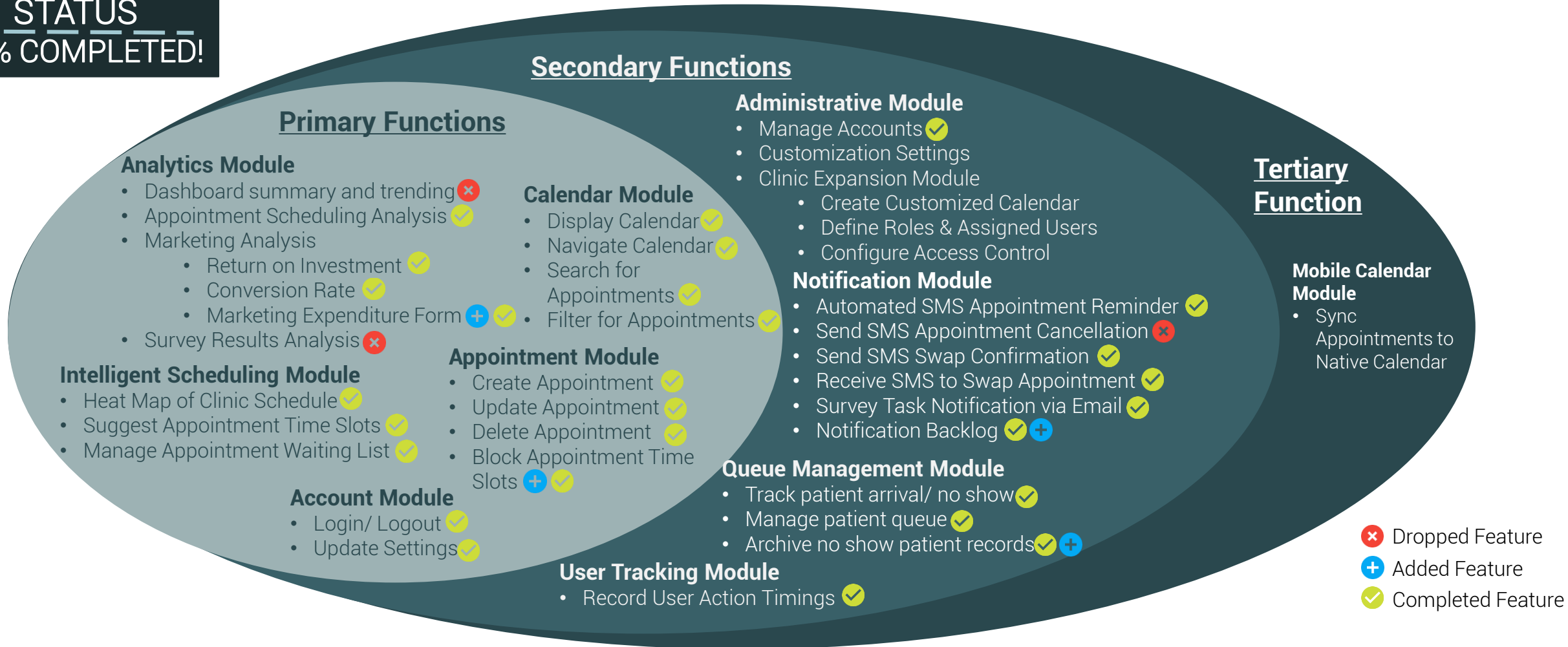
Planned



SCOPE

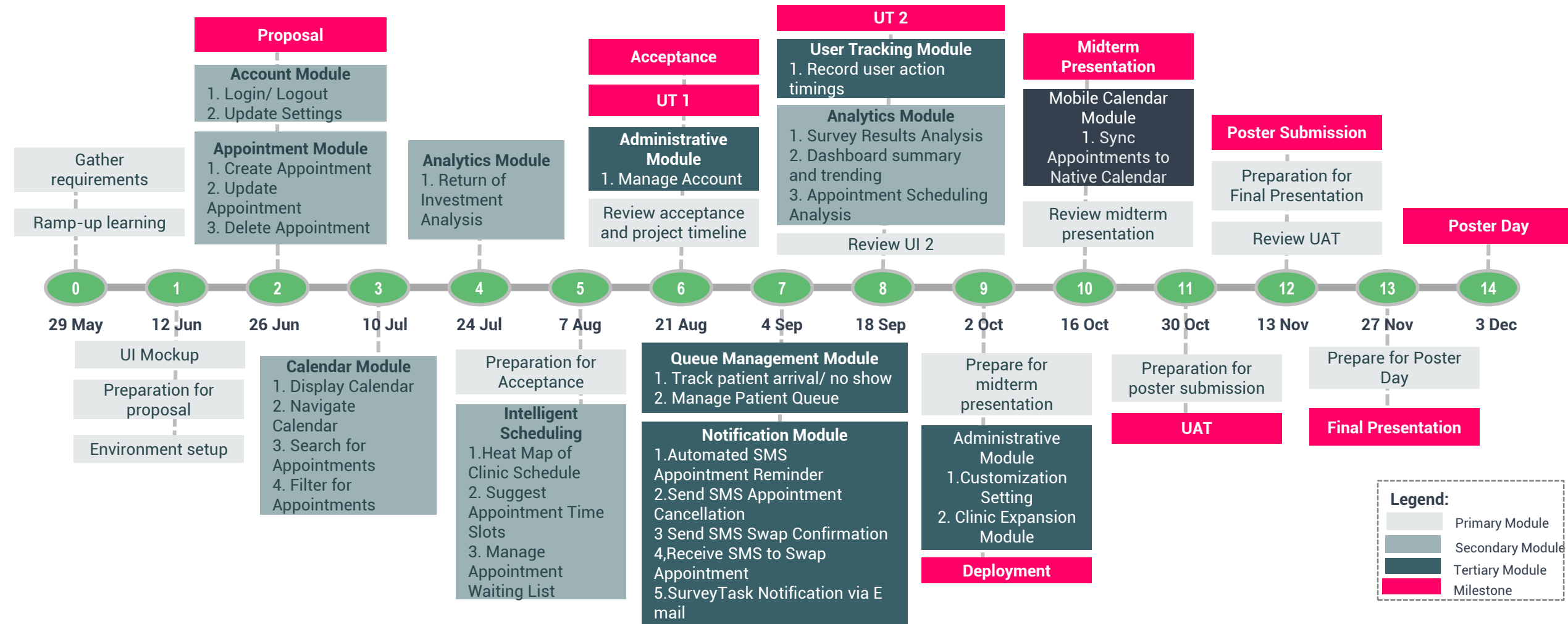
Actual

STATUS
90% COMPLETED!



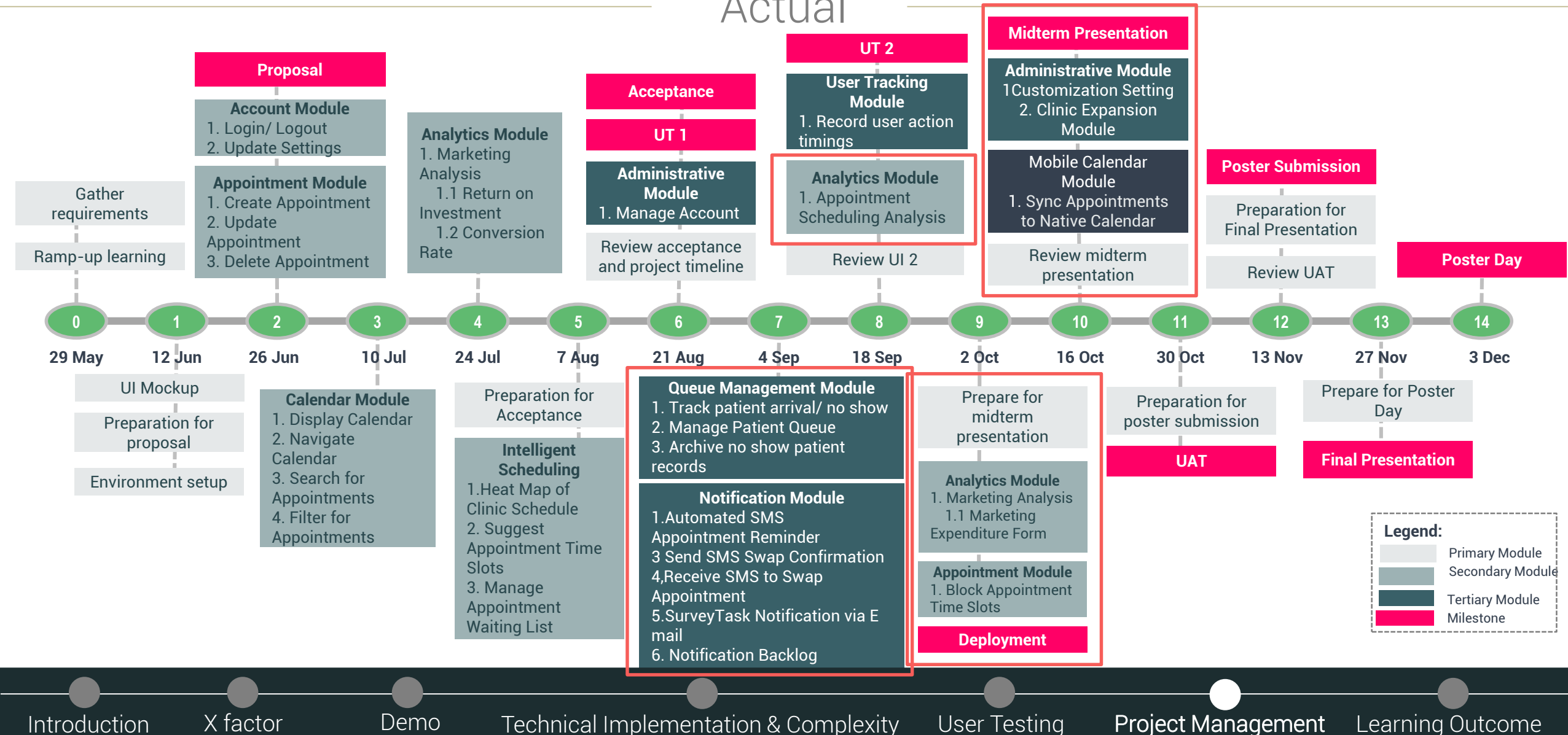
SCHEDULE

Planned



SCHEDULE

Actual



CHANGE MANAGEMENT



CHANGE MANAGEMENT

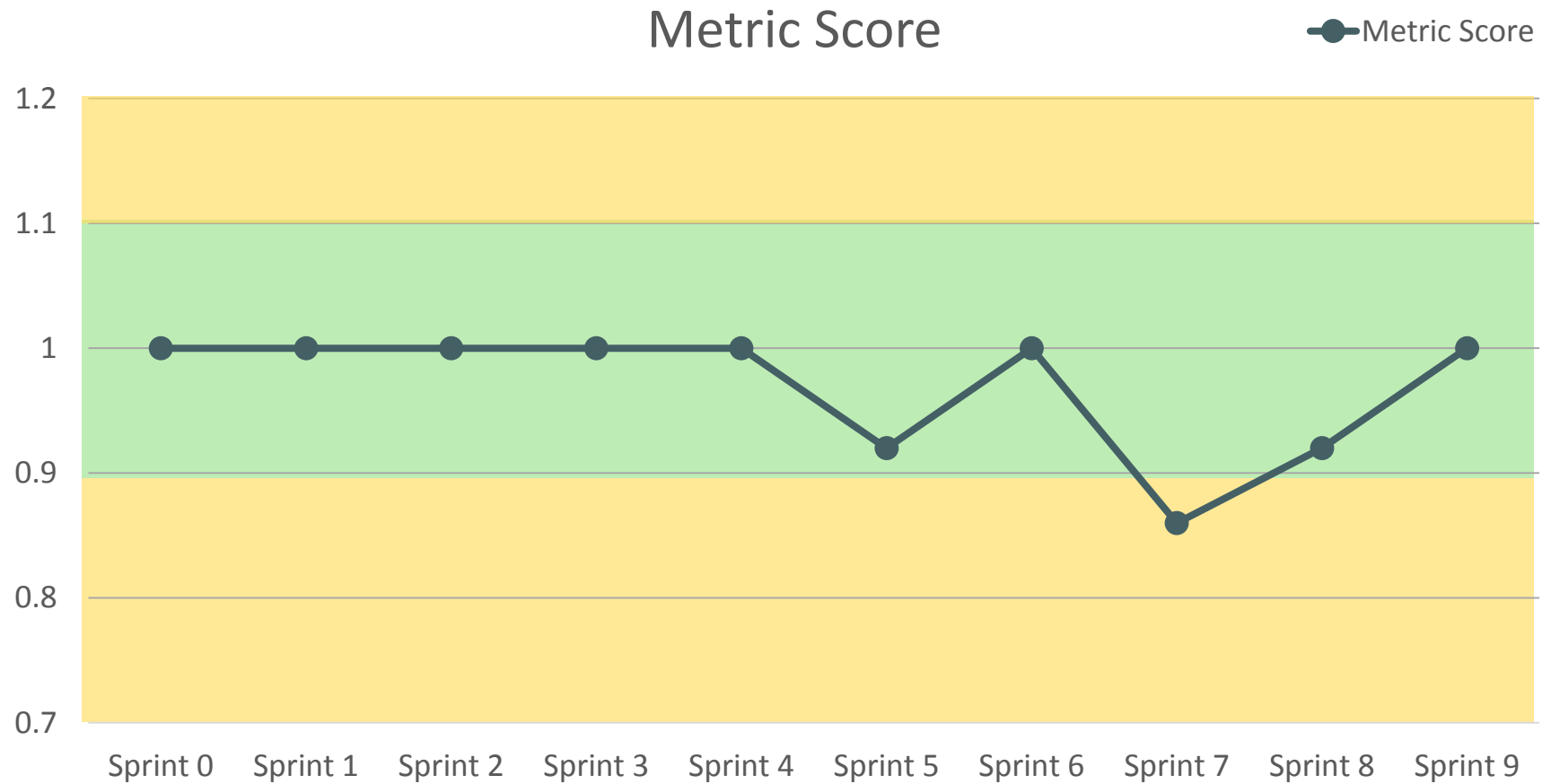
Co	Date	Description	Reason for Change	Feasibility	Priority	Accept/Reject	Reason	Action	Status
8	16/9/2015	Expenditure input form for marketing team	Marketing team requested for a form that allows her to input their marketing expenditures at the end of every month. This will enable her to track the ROI on every marketing dollar spent	Create a form to input marketing expenditure	2	Accept	Accepting this request would not affect the project schedule. Proceed as planned.	Add a new user story and relevant tasks in subsequent sprint. This new change request is part of the marketing analysis dashboard in analytics module. Hence no change is required for project scope and timeline	Completed
8	16/9/2015	Remove dashboard summary	Marketing team does not need a summary dashboard page as the current dashboards (Appointment scheduling, survey results, ROI and conversion) are sufficient. They are more interested in doing in-depth analysis than having an overview of all dashboards. Doctor will not be viewing the summary dashboard as marketing team will prepare a detailed report at the end of every month	N.A	3	Accept	As this feature does not provide much value to Clearvision's current business process, our team felt that the development cost is too high since Clearvision might not use it often. Hence, our team have accepted the change request to remove this feature and re-scope project.	Removed summary dashboard of Analytics Module from project scope and timeline.	Completed

SCHEDULE METRICS

Schedule Metric (Total Estimated Days/Total Actual Days)	
Score	Action
Metric < 0.5	<ol style="list-style-type: none"> 1. Inform supervisor and sponsor about the slip 2. Investigate causes of deviation 3. Consider shifting tasks to later sprint or dropping some of the tasks 4. Evaluate product backlog and task breakdown for subsequent sprints. Re-estimate the time for certain tasks if needed
0.5 < Metric <= 0.9	<ol style="list-style-type: none"> 1. Schedule incomplete tasks into buffer time 2. Investigate causes of deviation 3. Consider shifting back tasks to later sprint or dropping some of the tasks 4. Evaluate product backlog and task breakdown for subsequent sprints. Re-estimate the time for certain tasks if needed
0.9 < Metric <= 1.1	Our estimates are fairly accurate, and we are roughly on track
1.1 < Metric <= 1.5	<ol style="list-style-type: none"> 1. Allocate more time for sprint retrospective/ review meeting and testing 2. Investigate causes of deviation 3. Evaluate product backlog and task breakdown for subsequent sprints. Re-estimate the time for certain tasks if needed
Metric > 1.5	<ol style="list-style-type: none"> 1. Inform supervisor and sponsor about the slip 2. Allocate more time for sprint retrospective/ review meeting and testing 3. Investigate causes of deviation 4. Evaluate product backlog and task breakdown for subsequent sprints. Re-estimate the time for certain tasks if needed

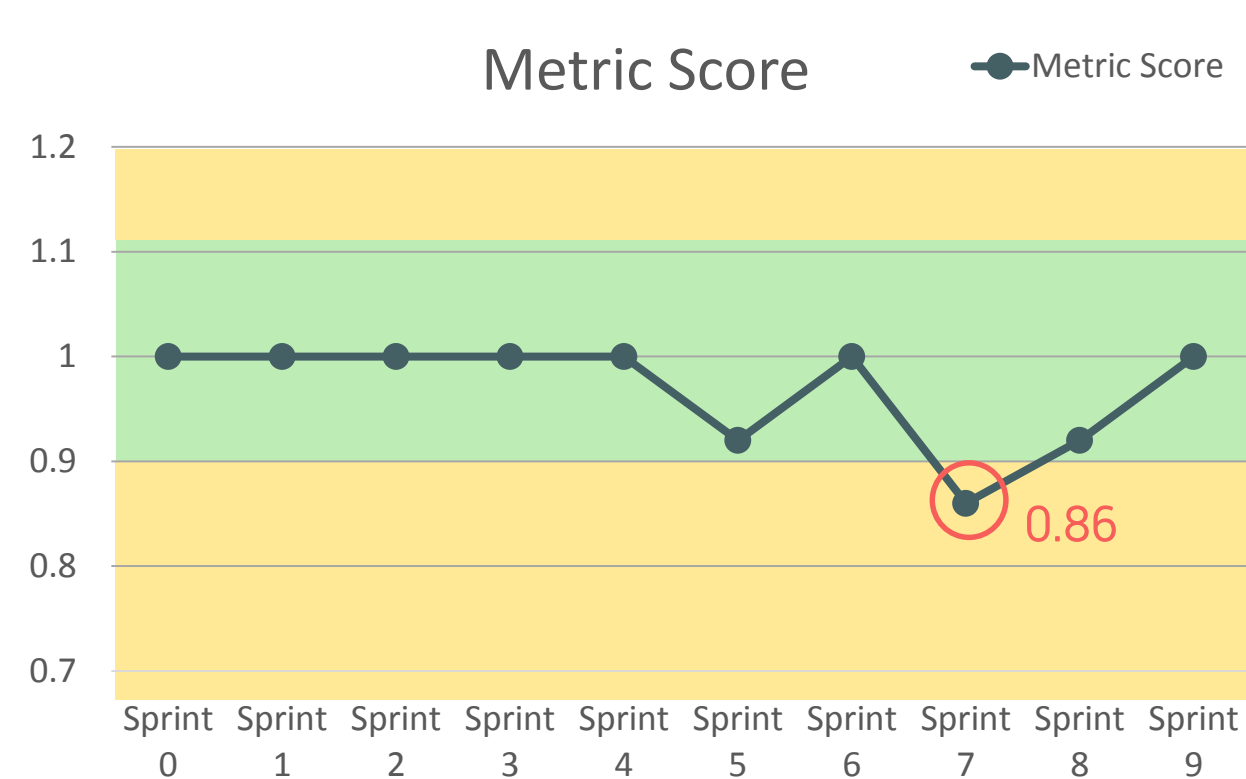
SCHEDULE METRICS

Schedule Metric Score



SCHEDULE METRICS

Schedule Metric Score



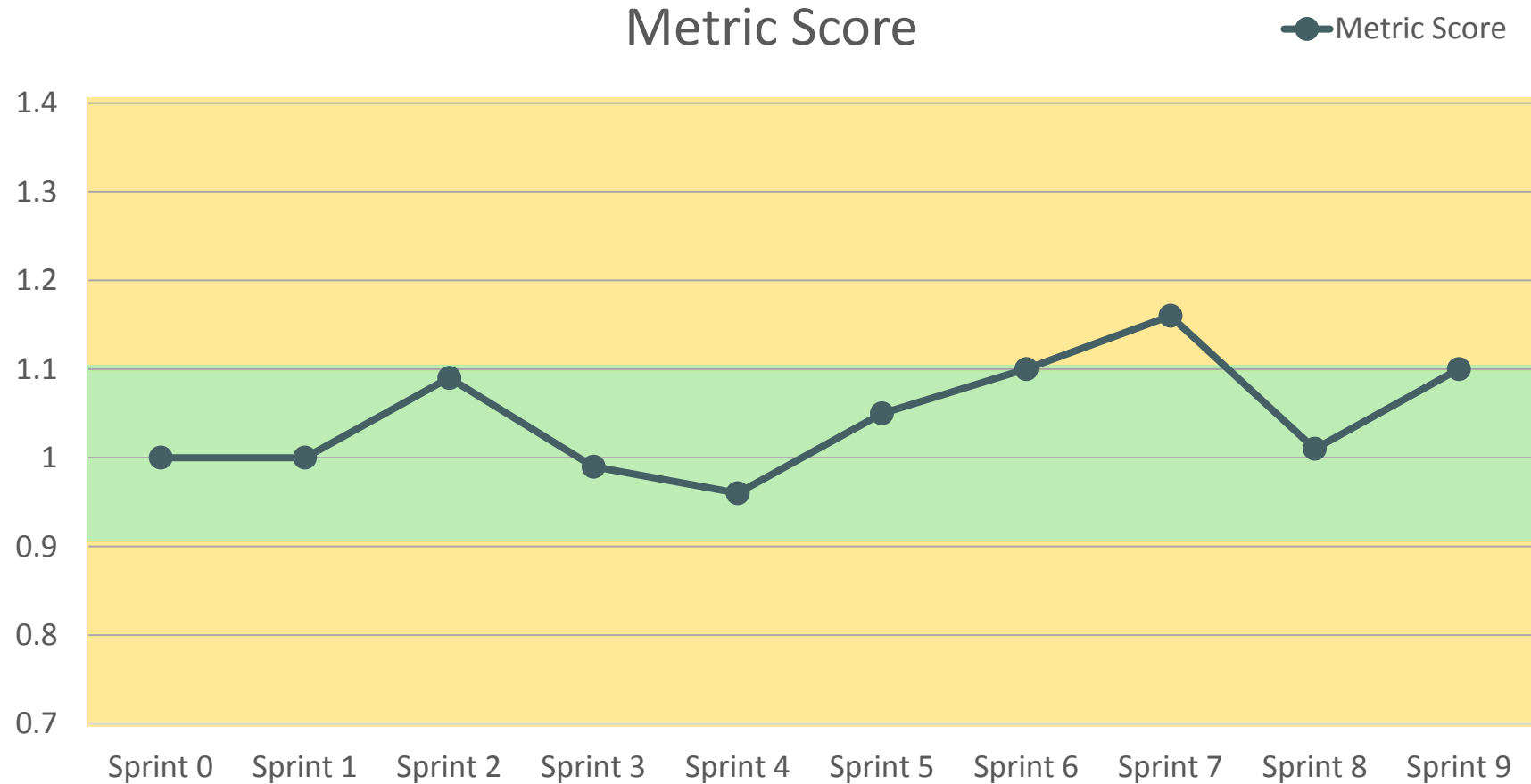
- Estimated / Actual days – 12 / 14 days
- Delay was caused by tasks in the notification module
- Tasks dependent on SMS providers
- Difficulties faced in finding a service provider for 2 way SMS

TASK METRICS

Task Metric (Total Estimated Hours/Total Spent Hours)	
Score	Action
Metric < 0.5	<ol style="list-style-type: none"> 1. Inform supervisor and sponsor about the slip 2. Investigate causes of deviation 3. Consider shifting tasks to later sprint or dropping some of the tasks 4. Evaluate product backlog and task breakdown for subsequent sprints. Re-estimate the time for certain tasks if needed
0.5 < Metric <= 0.9	<ol style="list-style-type: none"> 1. Schedule incomplete tasks into buffer time 2. Investigate causes of deviation 3. Consider shifting back tasks to later sprint or dropping some of the tasks 4. Evaluate product backlog and task breakdown for subsequent sprints. Re-estimate the time for certain tasks if needed
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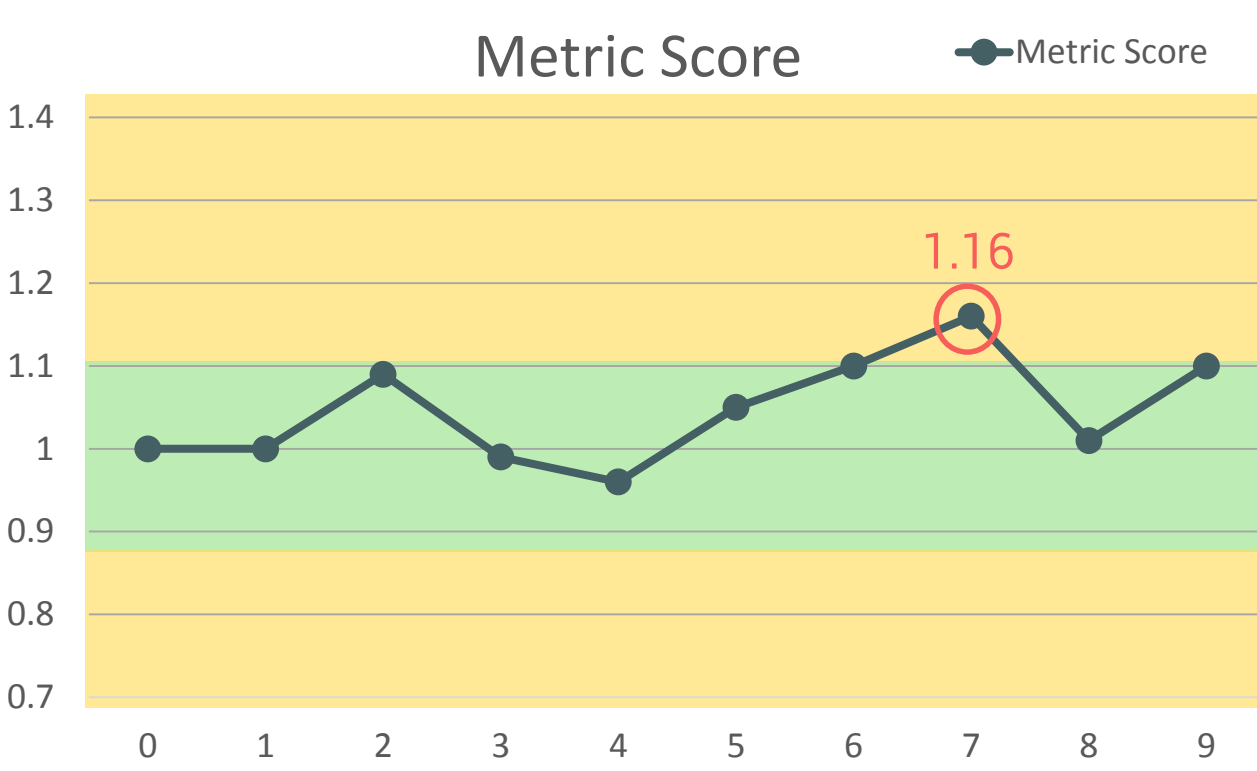
TASK METRICS

Task Metric Score



TASK METRICS

Task Metric Score



- Estimated / Actual Hours – 69.5 / 60 hours
- Overestimation of hours in tasks for the survey feature in the notification module
- Some of the tasks planned were removed due to some changes requested from sponsor
- Action taken: Checked if the upcoming sprint's tasks will be affected by these changes

BUG METRICS

Bug Severity

Bug Severity Metric	
Severity	Action
Low (1)	No real impact on functionality Usually aesthetic error, enhancement or a result of non-conformance to a standard
Medium (2)	Do not result in failure but cause system to show incorrect, incomplete, or inconsistent results Usability issues for non-critical functionalities (Tertiary functions)
High (3)	Failure that prevents the application from meeting requirements or carrying out a feature Usability issues for critical functionalities (Primary and Secondary functions)
Critical (4)	Failure that prevents the application from functioning, unable to carry out further testing Causes data loss, incomplete or inconsistent data stored on the database

BUG METRICS

Bug Priority

Bug Priority Metric	
Priority	Action
Low (1)	Fixing can be deferred until all other priority defects are fixed, either after release or in next release
Medium (2)	Fixing has to be done after all major bugs have been repaired
High (3)	Fixing should be done as soon as possible during the development process, before a sprint release
Critical (4)	Fixing should be done immediately while other development should be halted

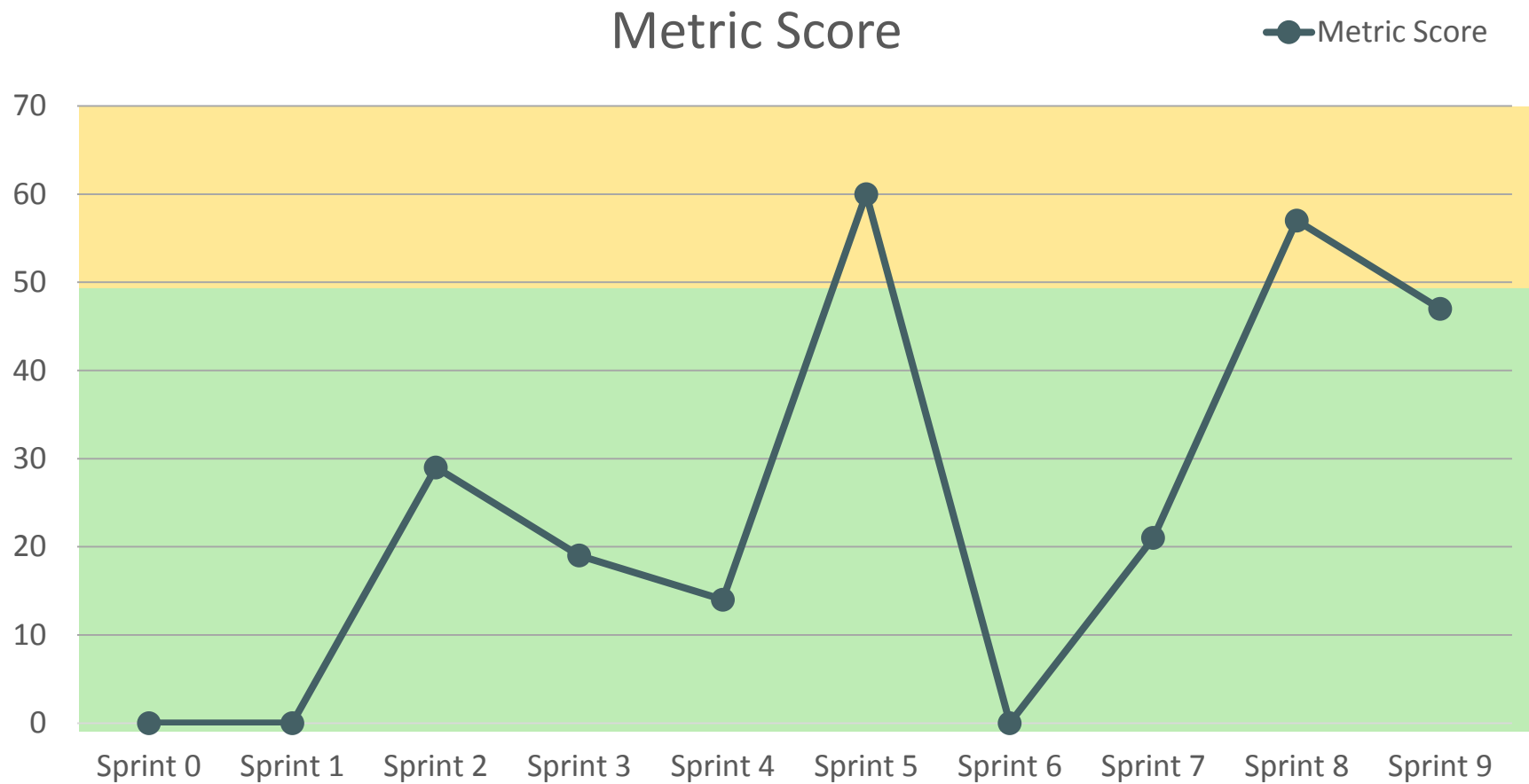
BUG METRICS

Bug Metric Score = Severity x Priority

Score	Action
Metric <= 2	The system does not need immediate fixing. Bugs can be fixed during the planned debugging time at the end of the sprint
3 < Metric <= 8	<ol style="list-style-type: none">1. Bugs can be fixed during coding session2. Use the planned debugging time at the end of the sprint
Metric >= 9	Team has to stop all current development and resolve the bug immediately

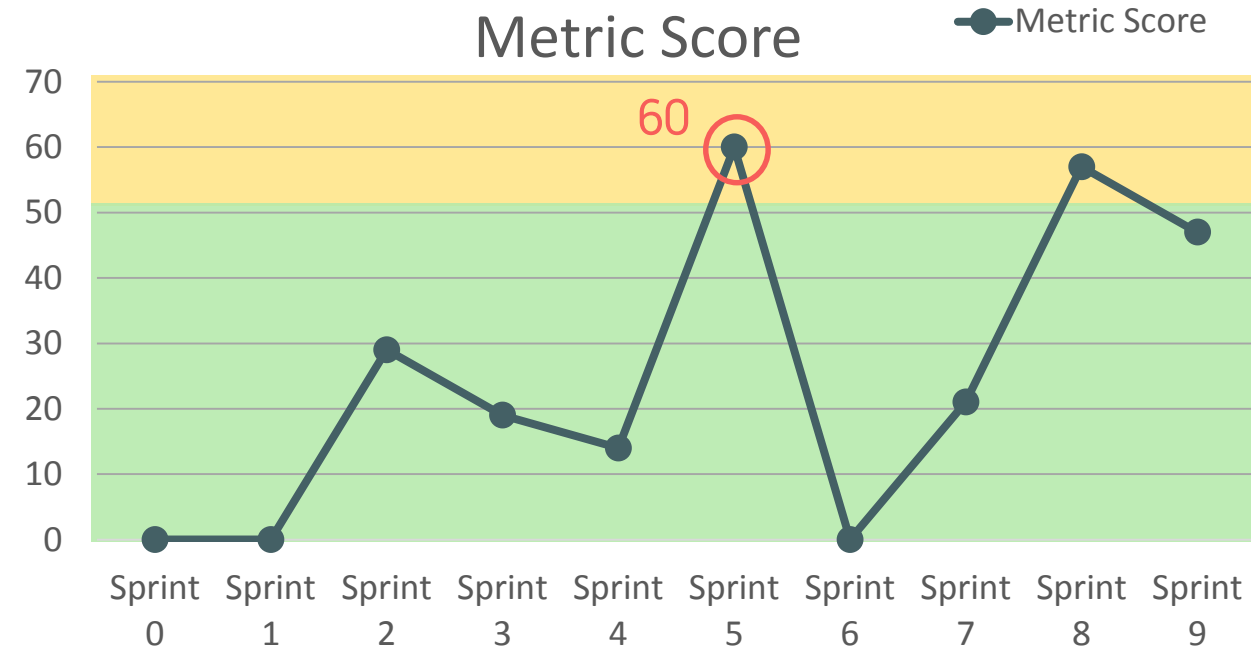
BUG METRICS

Bug Metric Score



BUG METRICS

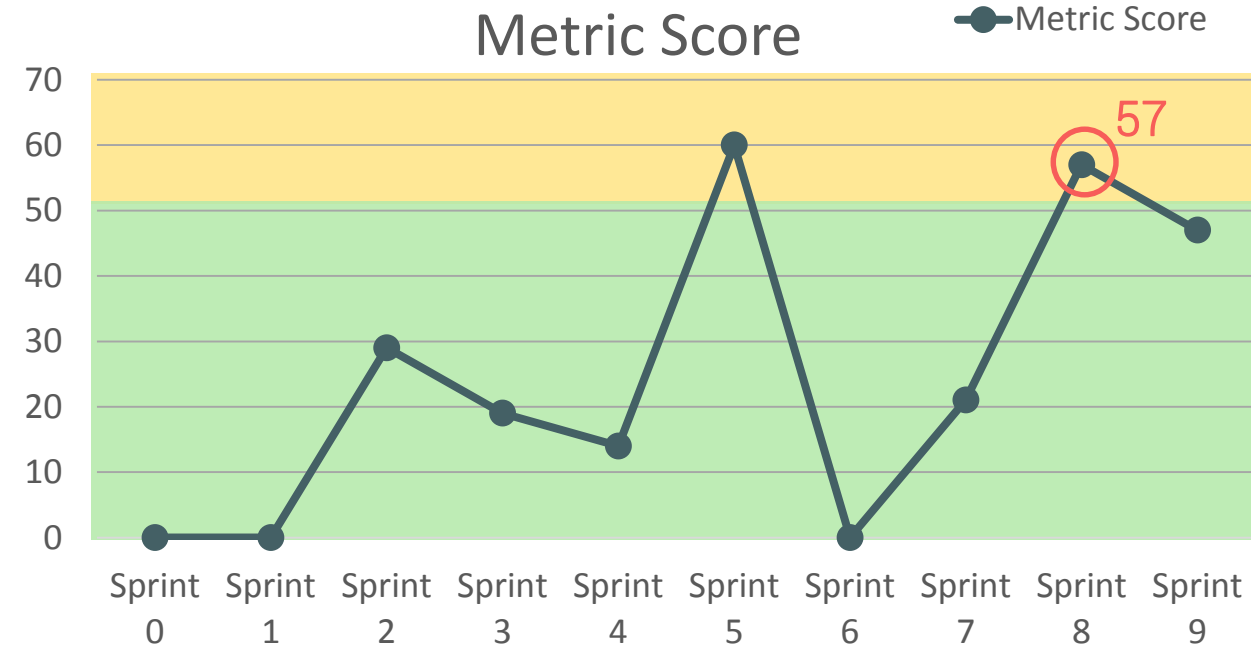
Bug Metric Score



- Deployment to heroku for acceptance
- Static files served by Django server failed to be deployed onto heroku
- Action taken: Stopped current development and resolved the bugs immediately
- All bugs fixed within the scheduled time

BUG METRICS

Bug Metric Score



- Implementation of the analytics modules
- Complexity in the combination of charts we could have. Corner cases not addressed.
- Action taken: Stopped current development and resolved the bugs immediately
- All bugs fixed within the scheduled time

RISK MANAGEMENT

Risk Scale

Impact	High	None	Medium	High	High
	Medium	None	Low	Medium	High
	Low	None	Low	Low	Medium
	None	None	None	None	None
		None	Low	Medium	High
Likelihood					

RISK MANAGEMENT

Risk Type	Risk Statement	Consequence	Likelihood	Impact	Mitigation Strategy
Project Management Risk	Unable to get actual users to conduct testing due to busy schedule	Unable to get genuine feedback from actual users and hence affecting usability of system	High	High	Coordinate in advance with Clearvision stakeholders so that they have ample time to gather relevant users for our User Testing, such as involving nurses and optometrists from other Clearvision clinics.
Technical Risk	2 way SMS might not work for all mobile device platforms (iPhone, Android etc.). Current provider, infobip might not work for iPhone.	Team has to source for other providers that provide 2 way SMS service suitable for all mobile device platforms. This might cause a delay in project schedule	Medium	High	Lead Developer to work closely with provider and check if 2 way SMS service is possible for iPhone. Meanwhile team has to look for alternative providers and ensure that it works well with all mobile device platforms.



LEARNING OUTCOMES

LEARNING OUTCOME

Team

What have we done well so far?

- Focused a lot on providing business value to our client when we design and build the app
- As a result, both our client and the actual application users like the product and gave us positive feedbacks

What can be improved?

- Do more in-depth research before going ahead with a technical implementation

How will we do better?

- Consistently gathering and collating feedbacks from the users as they use the application on a day-to-day basis
- For any technical implementations that we are unfamiliar with, must come up with a proof of concept

LEARNING OUTCOME

Individual



UI/UX & QUALITY ASSURANCE ANALYST

As an UI developer, it requires me to dive deep into the various front end technologies, such as angular js, javascript and css. Through this learning journey, I hope to be well versed in front end development using these technologies.

SYSTEM INTEGRATOR & DEPUTY PROJECT MANAGER

I have learnt the importance of consistently updating our client on our progress and gathering their feedback throughout the project. The time invested to do so paid off as we developed an application that is very much in line with solving the key issues faced by the business. As a result, our team did not encounter any major requirement change in our project and avoided incurring any unnecessary development cost.



PROJECT MANAGER

As a Project Manager, I have learnt to strike a balance between team's workload and meeting the expectations of our client. I have also learnt to effectively manage and embrace changes through proper implementation of the change management and scrum methodology.

LEAD DEVELOPER

I have learnt to prioritise my time. Given the scale of the project and the various tools utilized, I had to prioritize some of the deliverables, sometimes at the expense of others, due to dependencies. However, I'm glad we managed to pull through.





QUESTION & ANSWER