WAIT TIME MANAGEMENT

https://youtu.be/5sodrfYVRHg

A mobile system whereby patients and families can see what is occurring in anticipation and during procedures.

Further Research

Broader Problem Space
- Wait lists used as an instrument to ration health care
- Health care providers work to preserve health care rationing, without jeopardizing the benefit of the procedure or causing undue stress and anxiety on the patient

Goals of Current Efforts
- In addition to reducing patient anxiety, existing studies attempt to address increasing patient times with capacity planning and patient flow modeling to identify bottlenecks

Role of Wait Time Management Project
- Our project provides a first step towards this ultimate solution by capturing data points to develop a framework for operational modeling
- The proposed solution allows the client health care provider understand the steady-state throughput of their system

Blake, John; VanBerkel, Peter. *A comprehensive simulation for wait time reduction and capacity planning applied in general surgery.* Retrieved from https://link.springer.com/article/10.1007/s10729-007-9035-6

Team & Roles

TRACY HU
Project Manager

Epic EHR, Population Health, SQL, Python

ALAIN BROWN
Developer

Java, C++, Python, Cloud Services

JAMES FRY
Developer

Javascript, Node.js, Python, PHP, SQL, React, JQuery

RAJAN CHAUDHARI
Developer

Python, SQL/Hive/Pig, Data Science/Stat/ML

HEIDI BRAUNSTEIN
Developer / QA

HCI, Java, Python, Frontend - Angular, Backend - Java, SQL, Data Science, ML

Application Overview

Patient Procedure ID:

B26

Radioactive XRay Procedure

Agenda:

- Check In
- Procedure
- Recovery
- Check Out

		CURRENT TIME	1:05 PM
	STATUS	TIME	LOCATION
	Checked In	12:15 pm	H1
I55	In Procedure	11:00 am	O2
D42	Recovery	12:22 pm	R23
K71	In Procedure	11:33 pm	O1
P12	In Triage	12:52 pm	T1
Y12	Checked In	12:50 pm	H1

LOGO				CURRENT TIME	1:05 PM

RADIOLOGY CLINIC ADMINISTRATIVE OVERVIEW

PATIENTS		ROOMS		
ID	**PATIENT NAME**	**STATUS**	**TIME**	**LOCATION**	
B26	Tina Buchanan	Checked In	12:15 pm	H1	EDIT
I55	Magnus A. Knudsen	In Procedure	11:00 am	O2	EDIT
D42	Philip Andrejew	Recovery	12:22 pm	R23	EDIT
K71	Eva Cambage	In Procedure	11:33 pm	O1	EDIT
P12	Pershant Kumar	In Triage	12:52 pm	T1	EDIT
Y12	Leopolda Puga Sando	Select ▼	12:50 pm	Select / R23 / R24	CANCEL

LOGO				CURRENT TIME	1:05 PM

RADIOLOGY CLINIC ADMINISTRATIVE OVERVIEW

PATIENTS		ROOMS		
ROOM		**STATUS**	**TIME**	**LOCATION**	
H1		Ready	12:15 pm	H1	EDIT
T1		Full	11:00 am	O2	EDIT
O1		Cleaning	12:22 pm	R23	EDIT
O2		Turned Over	11:33 pm	O1	EDIT
O3		Occupied	12:52 pm	T1	EDIT
R10		Select ▼	12:50 pm	Select / R23	CANCEL

Visual Mockups - Patient Card

Patient Procedure ID:

B26

Radioactive XRay Procedure

Agenda:

- Check In
- Procedure
- Recovery
- Check Out

Visual Mockups - Public Overview

| LOGO | | CURRENT TIME | 1:05 PM |

RADIOLOGY CLINIC PROCEDURE STATUS

Patient ID	STATUS	TIME	LOCATION
B26	Checked In	12:15 pm	H1
I55	In Procedure	11:00 am	O2
D42	Recovery	12:22 pm	R23
K71	In Procedure	11:33 pm	O1
P12	In Triage	12;52 pm	T1

Visual Mockups - Admin Patient Overview

LOGO				CURRENT TIME	1:05 PM

RADIOLOGY CLINIC ADMINISTRATIVE OVERVIEW

PATIENTS	ROOMS

ID	PATIENT NAME	STATUS	TIME	LOCATION	
B26	Tina Buchanan	Checked In	12:15 pm	H1	EDIT
I55	Magnus A. Knudsen	In Procedure	11:00 am	O2	EDIT
D42	Philip Andrejew	Recovery	12:22 pm	R23	EDIT
K71	Eva Cambage	In Procedure	11:33 pm	O1	EDIT

Visual Mockups - Admin Room Overview

CURRENT TIME 1:05 PM

RADIOLOGY CLINIC ADMINISTRATIVE OVERVIEW

PATIENTS	ROOMS		

| ROOM	STATUS	TIME	LOCATION	
H1	Ready	12:15 pm	H1	EDIT
T1	Full	11:00 am	O2	EDIT
O1	Cleaning	12:22 pm	R23	EDIT
O2	Turned Over	11:33 pm	O1	EDIT
O3	Occupied	12;52 pm	T1	EDIT

Architecture Diagram
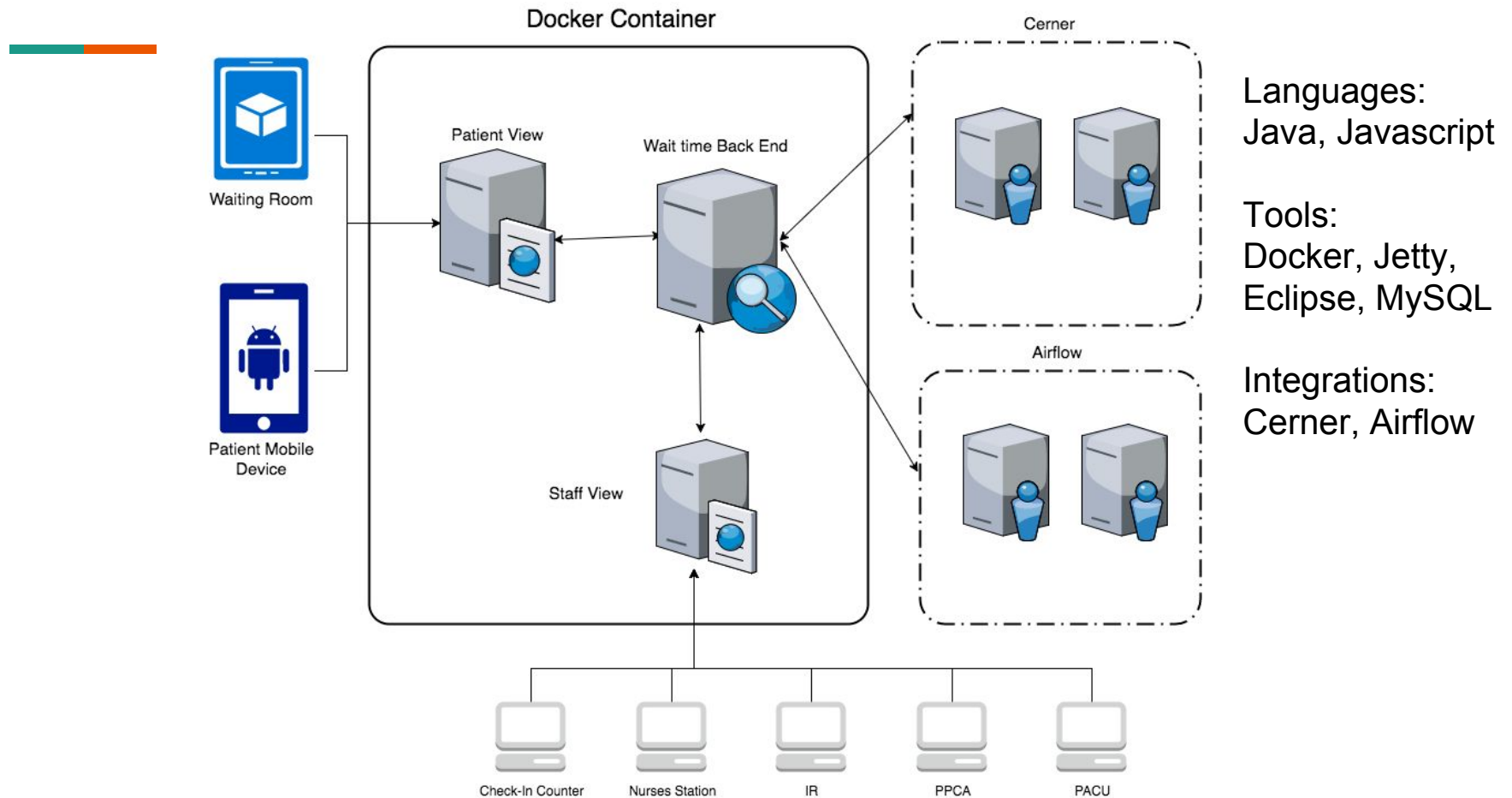
Database Schema
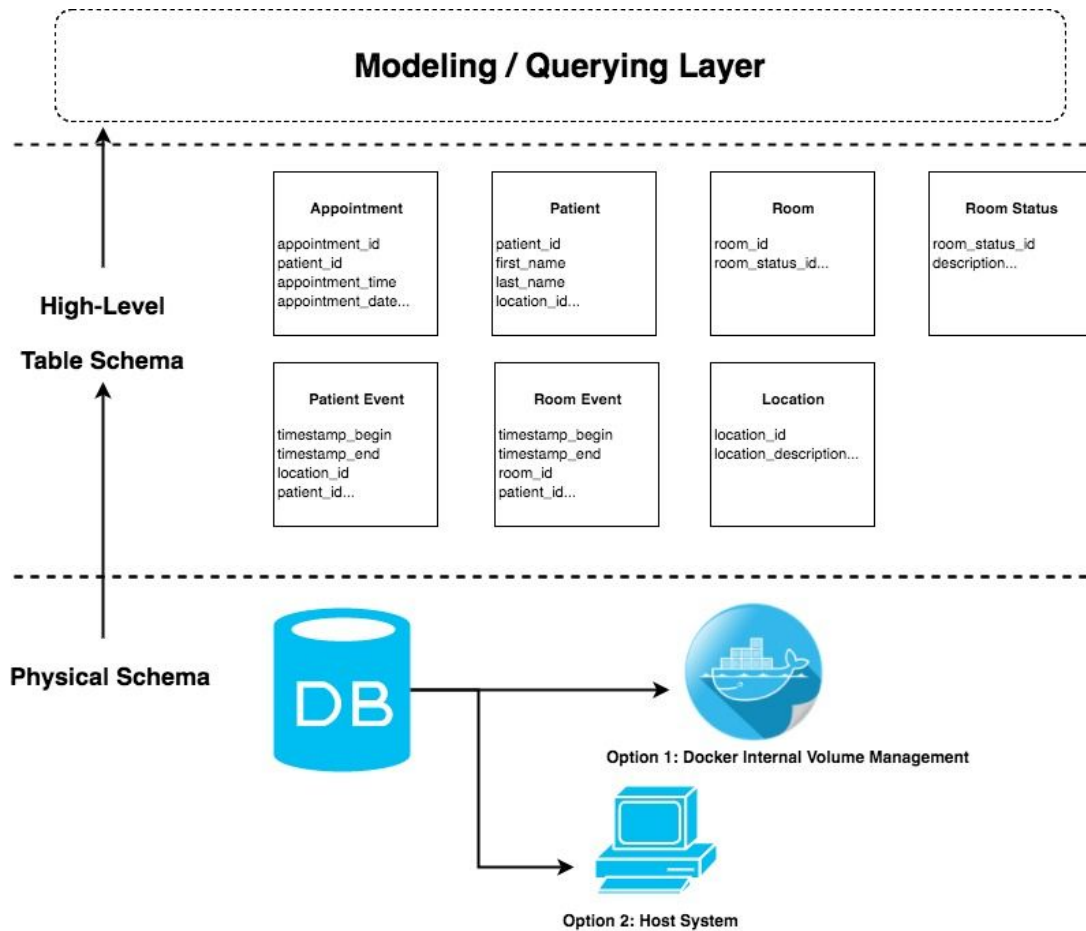
Concerns

- Mentor Availability
  - We have been able to gather their cell phone contact information and have weekly standing meetings
- Cerner and Airflow integration
  - Tool will be built to be service oriented to be flexible with different data sources

Plan of Action

Image from: [Wait Time Management Project Gantt Chart](#)
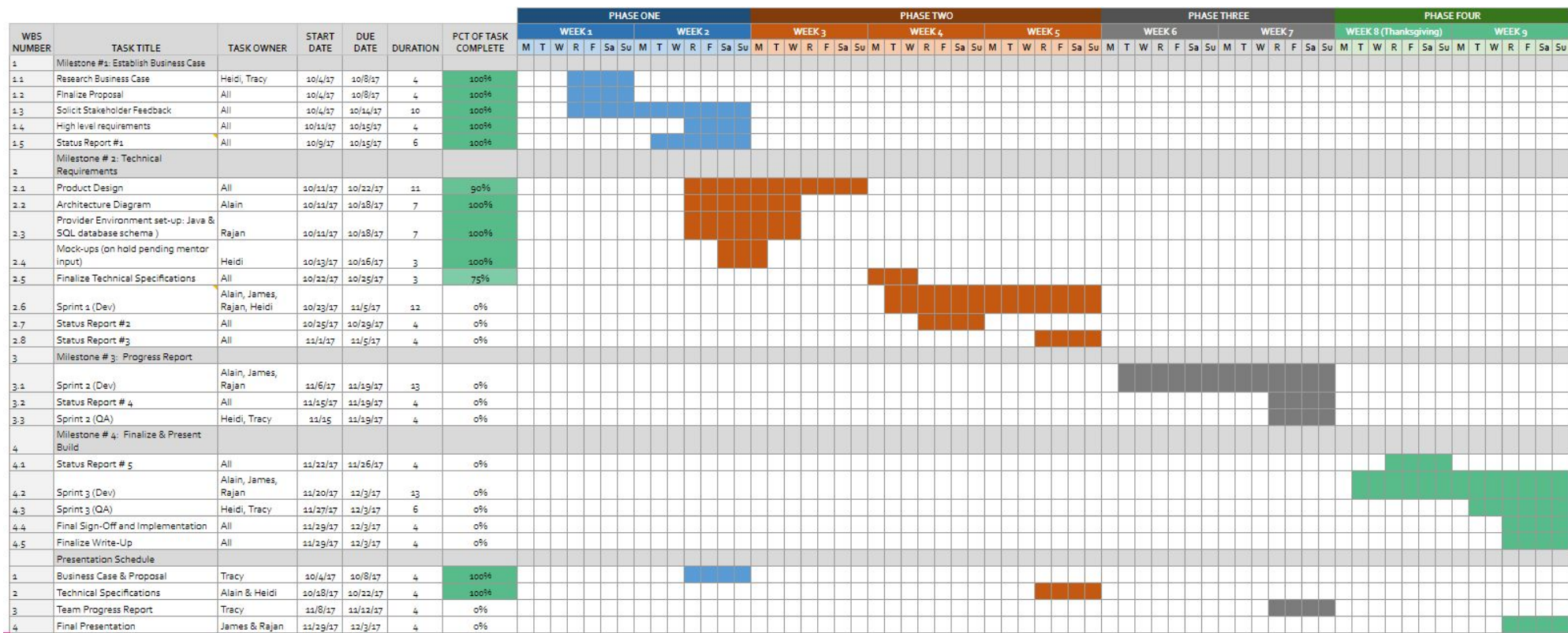
Phase I Details

WBS NUMBER	TASK TITLE	TASK OWNER	START DATE	DUE DATE	DURATION	PCT OF TASK COMPLETE
1	Milestone #1: Establish Business Case					
1.1	Research Business Case	Heidi, Tracy	10/4/17	10/8/17	4	100%
1.2	FInalize Proposal	All	10/4/17	10/8/17	4	100%
1.3	Solicit Stakeholder Feedback	All	10/4/17	10/14/17	10	100%
1.4	High level requirements	All	10/11/17	10/15/17	4	100%
1.5	Status Report #1	All	10/9/17	10/15/17	6	100%
	Presentation Schedule					
1	Business Case & Proposal	Tracy	10/4/17	10/8/17	4	100%
2	Technical Specifications	Alain & Heidi	10/18/17	10/22/17	4	100%
3	Team Progress Report	Tracy	11/8/17	11/12/17	4	0%
4	Final Presentation	James & Rajan	11/29/17	12/3/17	4	0%

Phase II Details

WBS NUMBER	TASK TITLE	TASK OWNER	START DATE	DUE DATE	DURATION	PCT OF TASK COMPLETE
2	Milestone # 2: Technical Requirements					
2.1	Product Design	All	10/11/17	10/22/17	11	100%
2.2	Architecture Diagram	Alain	10/11/17	10/18/17	7	100%
2.3	Provider Environment set-up: Java & SQL database schema)	Rajan	10/11/17	10/18/17	7	100%
2.4	Mock-ups (on hold pending mentor input)	Heidi	10/13/17	10/16/17	3	100%
2.5	Finalize Technical Specifications	All	10/22/17	10/25/17	3	100%
2.6	Sprint 1 (Dev)	Alain, James, Rajan, Heidi	10/23/17	11/5/17	12	0%
2.7	Status Report #2	All	10/25/17	10/29/17	4	0%
2.8	Status Report #3	All	11/1/17	11/5/17	4	0%

Phase III Details

WBS NUMBER	TASK TITLE	TASK OWNER	START DATE	DUE DATE	DURATION	PCT OF TASK COMPLETE
3	Milestone # 3: Progress Report					
3.1	Sprint 2 (Dev)	Alain, James, Rajan	11/6/17	11/19/17	13	0%
3.2	Status Report # 4	All	11/15/17	11/19/17	4	0%
3.3	Sprint 2 (QA)	Heidi, Tracy	11/15	11/19/17	4	0%

Phase IV Details

WBS NUMBER	TASK TITLE	TASK OWNER	START DATE	DUE DATE	DURATION	PCT OF TASK COMPLETE
4	Milestone # 4: Finalize & Present Build					
4.1	Status Report # 5	All	11/22/17	11/26/17	4	0%
4.2	Sprint 3 (Dev)	Alain, James, Rajan	11/20/17	12/3/17	13	0%
4.3	Sprint 3 (QA)	Heidi, Tracy	11/27/17	12/3/17	6	0%
4.4	Final Sign-Off and Implementation	All	11/29/17	12/3/17	4	0%
4.5	Finalize Write-Up	All	11/29/17	12/3/17	4	0%