Introduction to Opal

Stacey Beard

based on slides by David Herrera

The HIG Group

- **Health Informatics Group:** Initiative started in 2014 by Laurie Hendren, John Kildea, and Tarek Hijal.
- **Goal**: Patient empowerment through information readily available and relevant to patients.

" No one cares about you as much as you do"

Opal's Guiding Principles

Opal is a mobile application that serves as a hub between the patient and their health.

❖ Material is **personalized** according to each individual patient.

❖ Data is **contextualized** by attaching educational material. The patient should be able to understand everything they are given.

❖ Content is provided **at the right time** it is needed to accompany treatment.

What does Opal offer?

- ❖ Announcements
- ❖ Appointments
- ❖ Checking in
- ❖ Clinical Documents
- ❖ Diagnoses
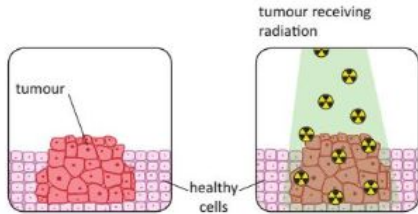- ❖ Doctor contact info
- ❖ Patients for Patients
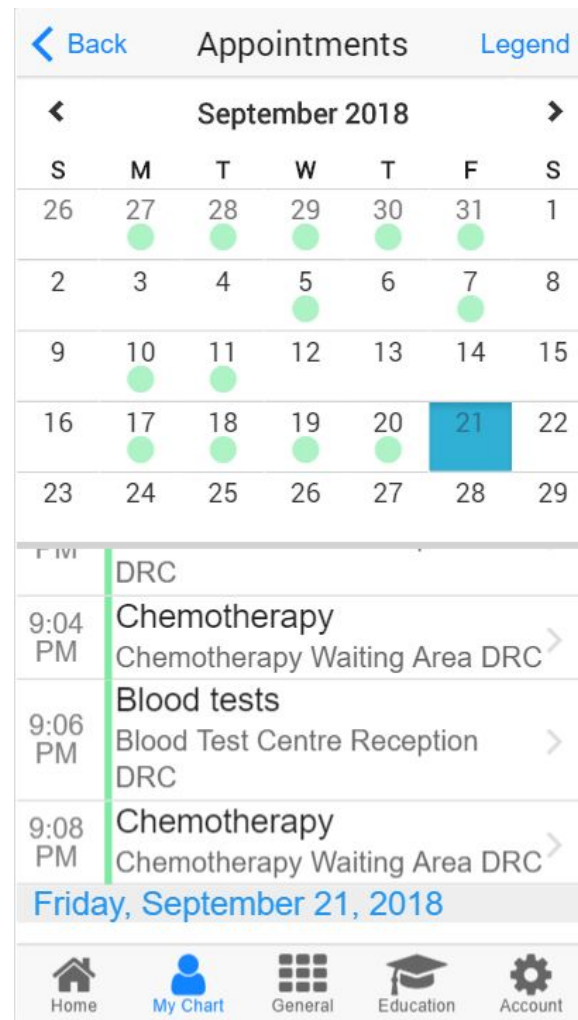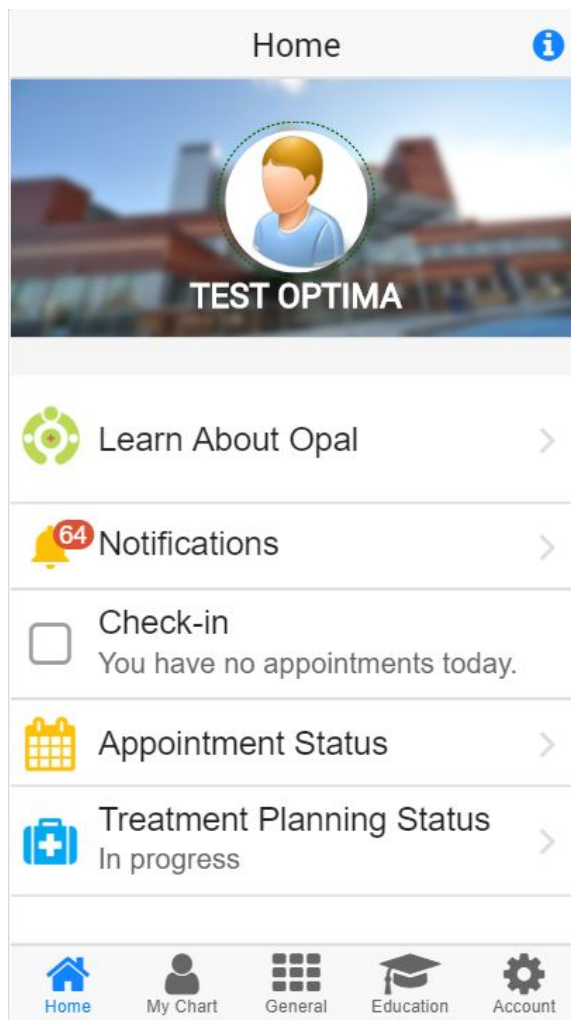
What does Opal offer?

- ❖ Educational Material
- ❖ Notifications
- ❖ Questionnaires
- ❖ Test Results
- ❖ Treatment Planning Status
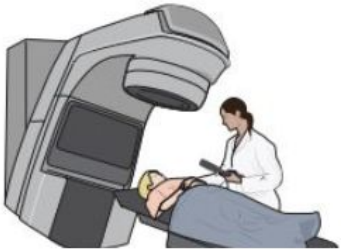- ❖ Treatment Team Messages
- ❖ And more...

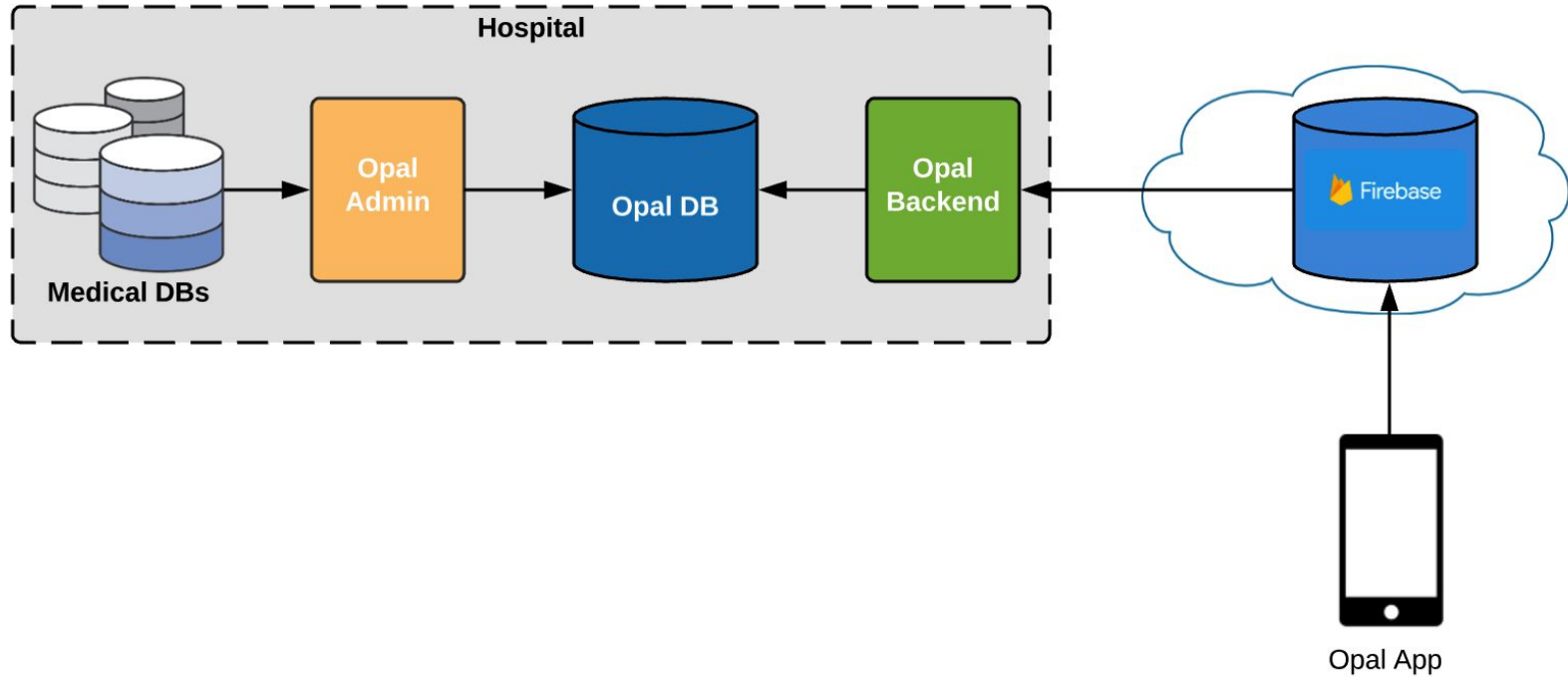# Opal Demo

High-Level Architecture
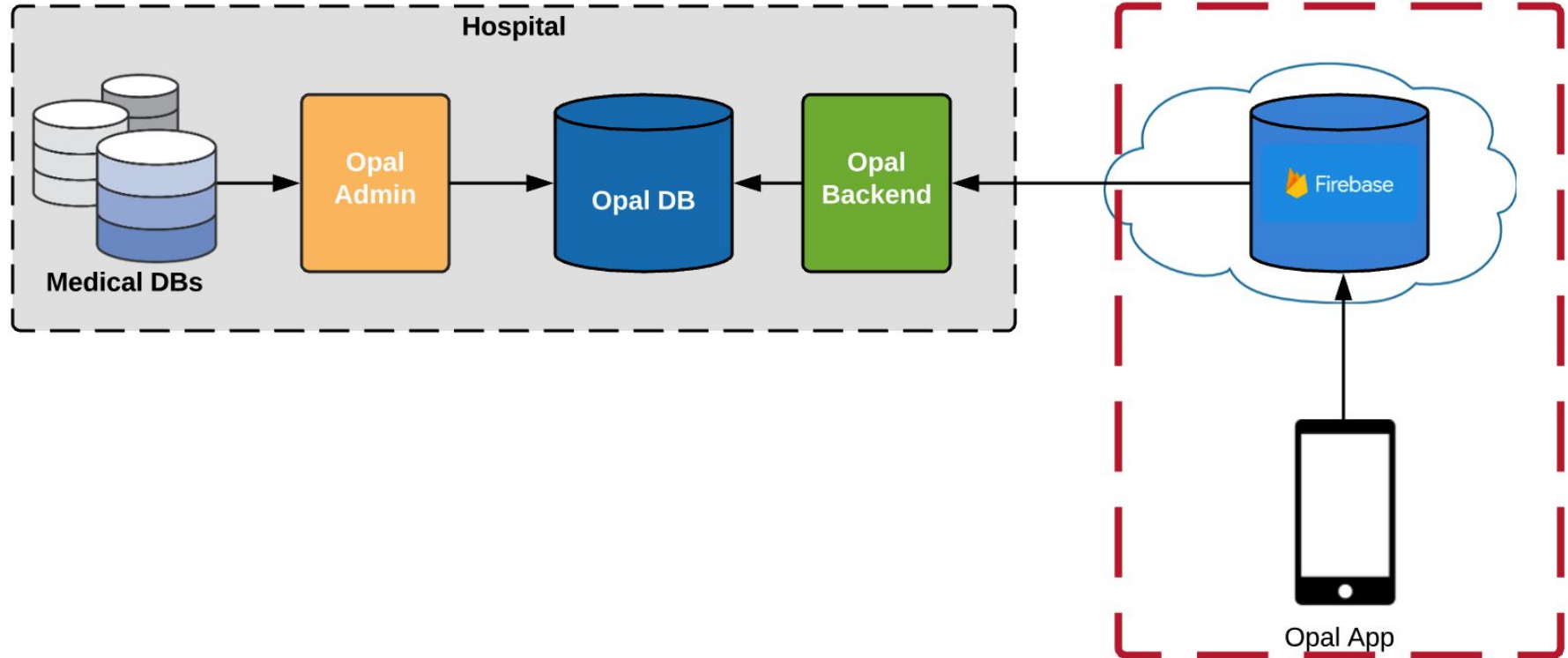
Architecture High-Level

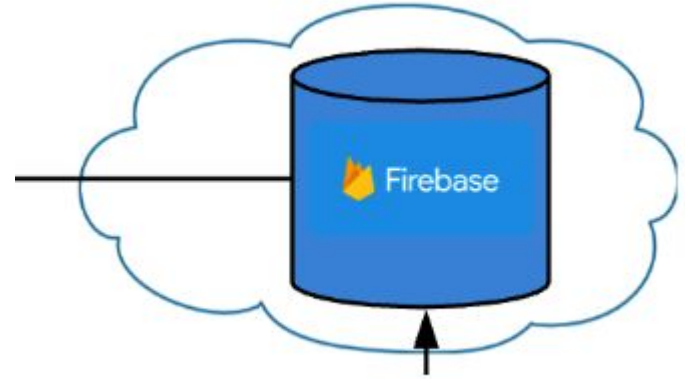# Architecture - Firebase and Opal App

Architecture - Firebase

❖ Real-time Cloud Database owned by Google.
❖ Use for patient authentication.
❖ Provides a secure bridge between the hospital and the app.
❖ All data that goes into Firebase is encrypted.
❖ Acts as an end-point for both the app and Opal back-end.

Architecture - Opal App

❖ Connects with the hospital through Firebase.

❖ Sends request to Firebase and waits for response.

❖ Sends information to the hospital from patient: i.e. feedback, questionnaire responses, etc.

❖ Updates patient of any event such as a new appointment, clinical document, message, etc.
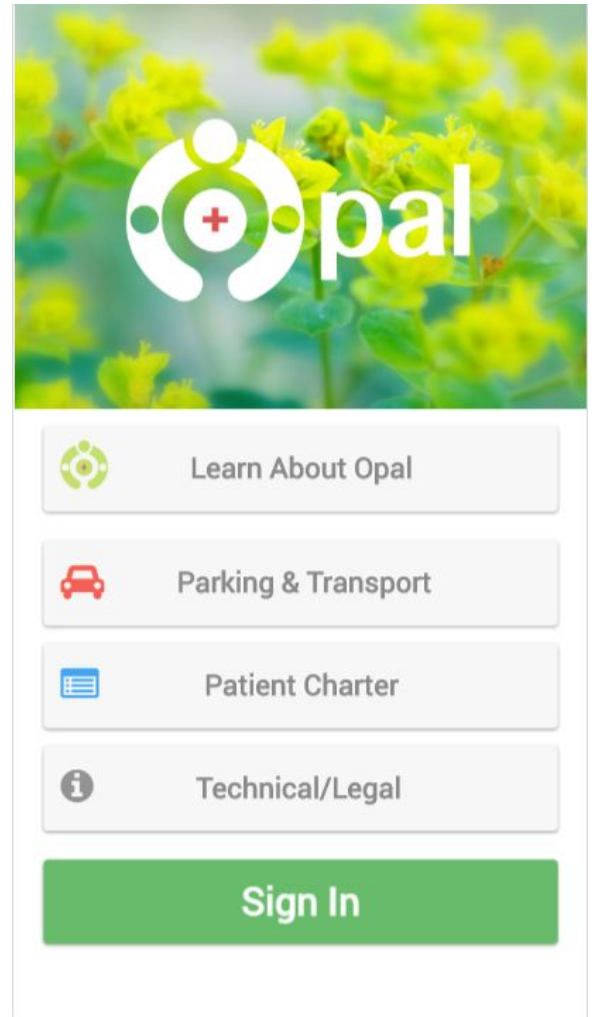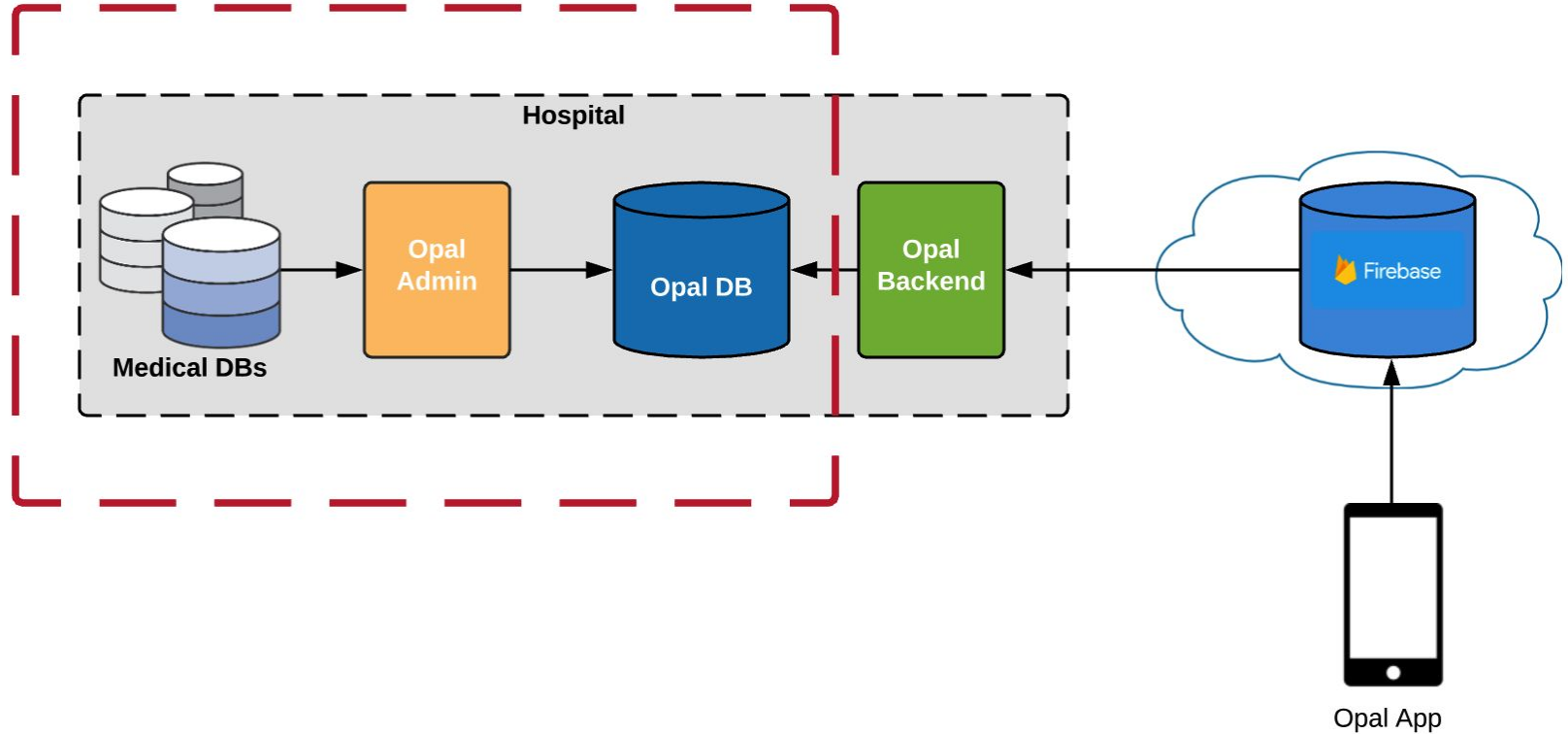
Architecture - Opal Back-End
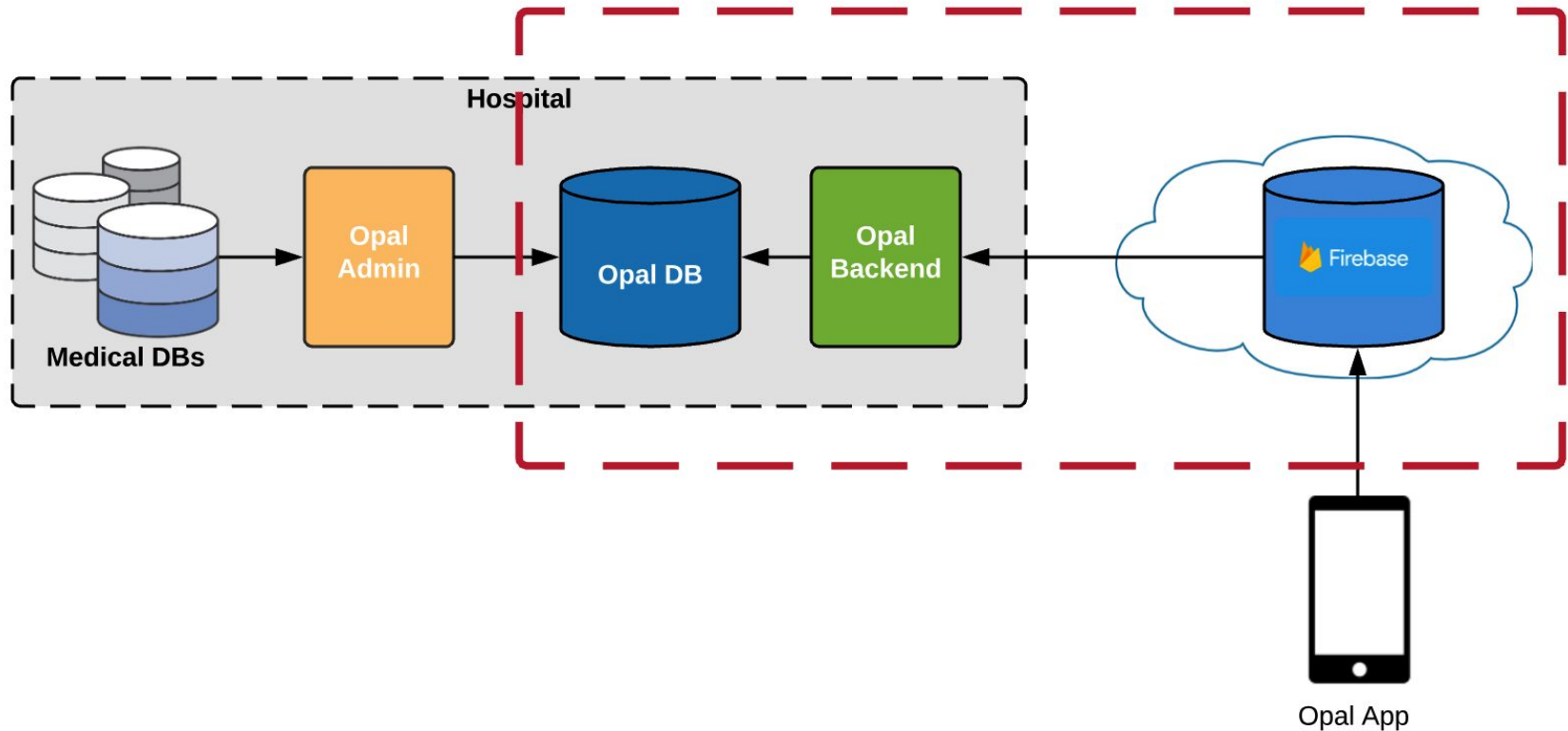
Architecture - Opal Back-End
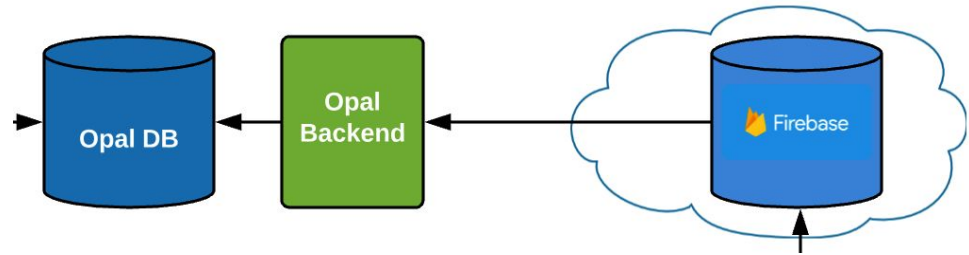
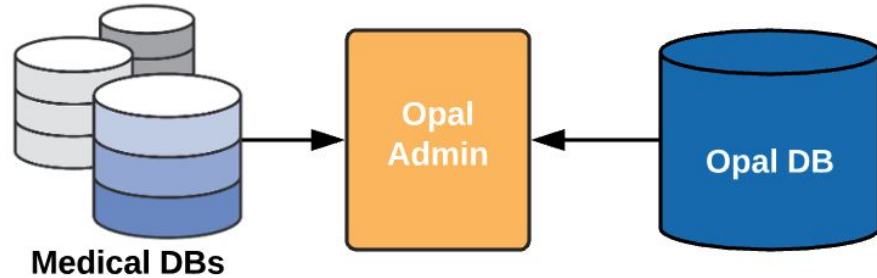❖ Called "the **listener**".
❖ Listens to Firebase for patient requests and serves as a back-end for the app.
❖ Queries OpalDB to send data to the patient.
❖ Updates OpalDB with patient-provided information from the app.
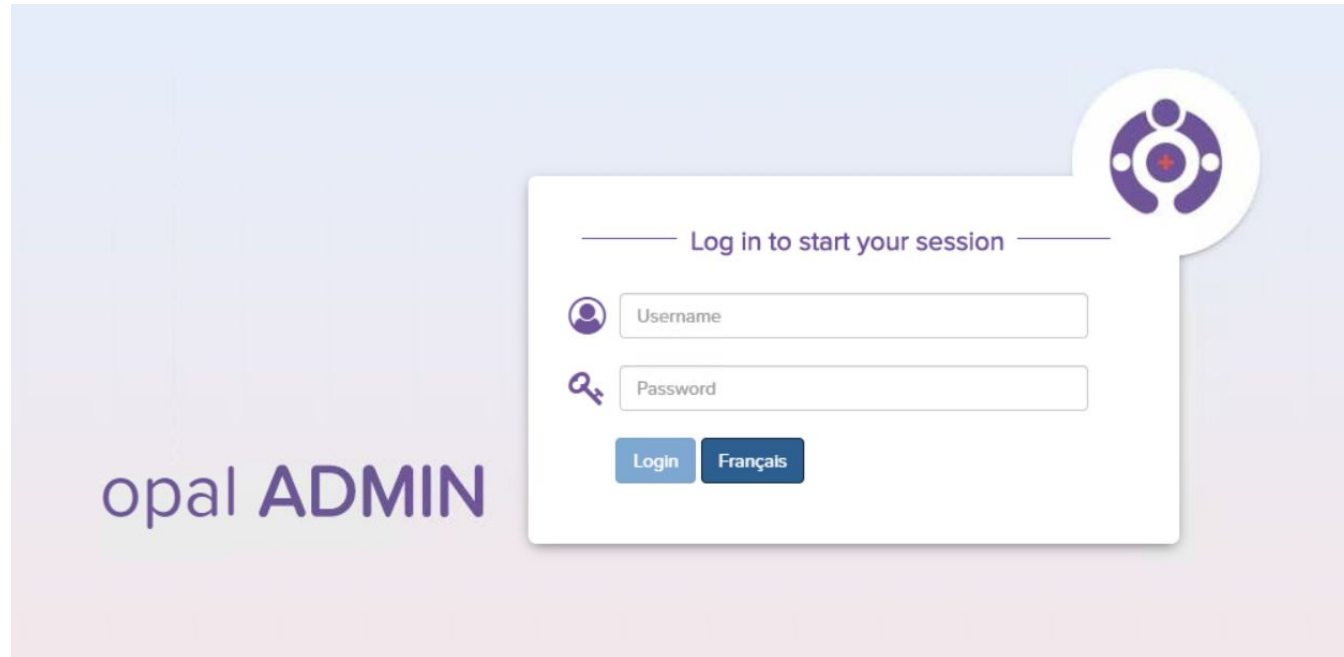
Architecture - OpalAdmin

Architecture - OpalAdmin

Medical DBs → Opal Admin ← Opal DB

- ❖ Queries the hospital DBs to obtain most up-to-date information.
- ❖ Provides an interface to prepare personalized documents for the patients.
- ❖ Updates OpalDB periodically through a publishing interface (the "cron job").
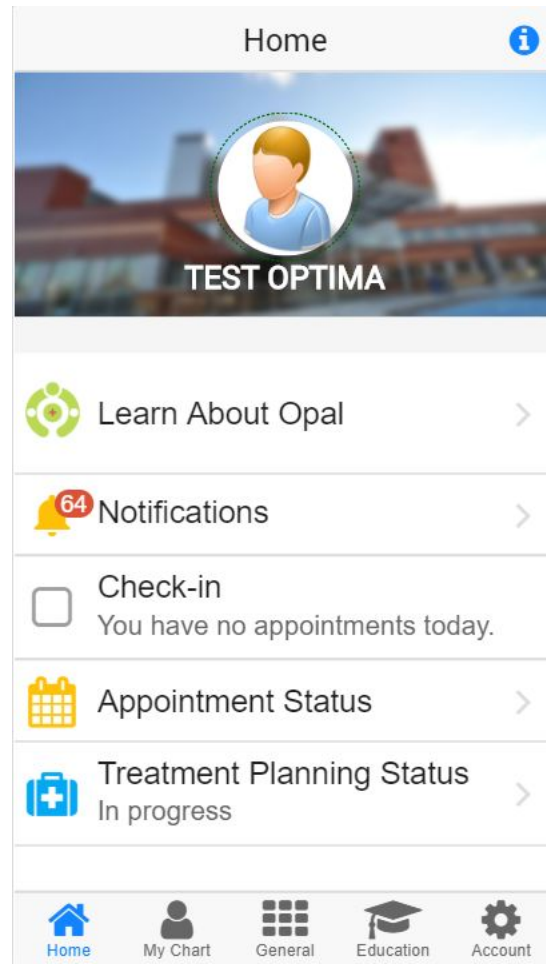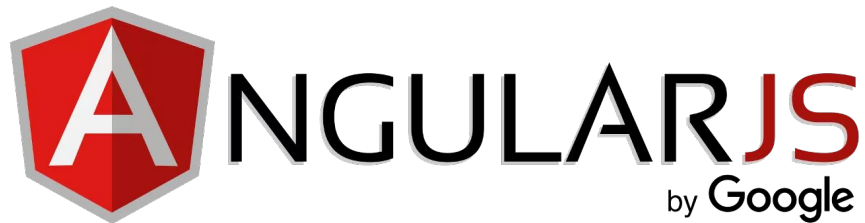
OpalAdmin Demo

Technology Stack

Technology Stack - Opal Frontend

Technology Stack - Opal Frontend - AngularJS

❖ **AngularJS,** JavaScript framework by Google developed in 2009.
❖ Revolutionized the way web apps were written via two-way binding.
❖ Introduced one-page applications.
❖ Built on top of the **MVC** design pattern.
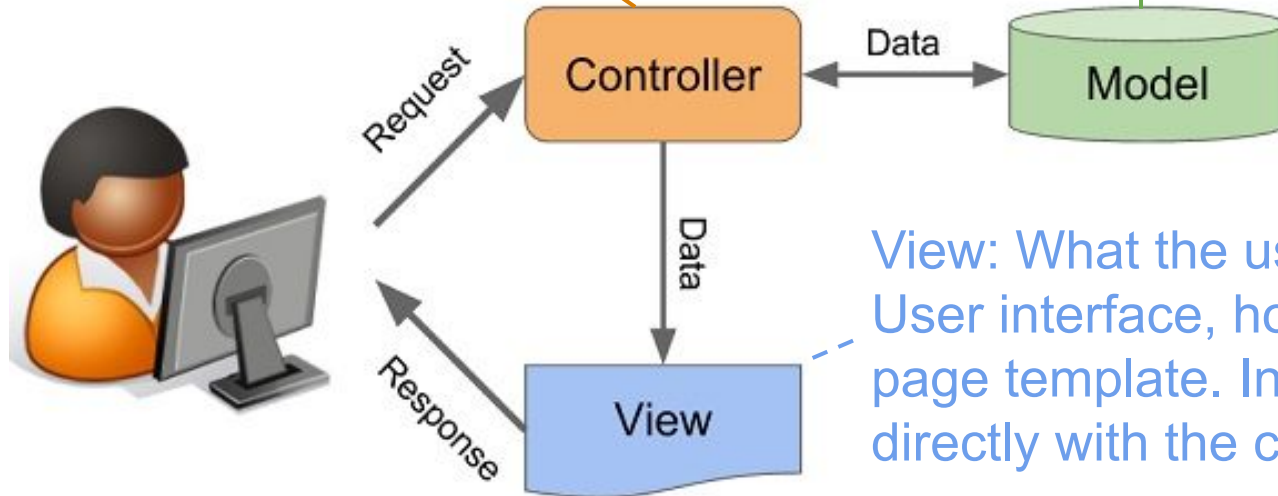❖ Current version of Angular is v9. AngularJS (v1) is still quite popular today.

Technology Stack - Opal Frontend - AngularJS

MVC: Model, View, Controller

Controller: Gets data through the model. Provides the view with data and listens to the view to react to changes.

Model: Source of truth, maintains state and abstractions. Queries data from the DB.

View: What the user sees. User interface, holds the page template. Interacts directly with the controller.

To be continued...