COMP 396

OPAL Patients' Committee Web Portal

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COMP 396 Final Report

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Abstract: The OPAL oncology application is a mobile app developed by Health Informatics Group (HIG) for patients at the MUHC Glen hostpital. This paper outlines the implementation of a web portal for the MUHC Cancer Care Mission Patients' Committee to add announcements and resources and access suggestions submitted via the OPAL application.

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Abbreviations

MUHC: McGill University Health Centre

HIG: Health Informatics Group

CCM: Cancer Care Mission

1   Introduction

In order to add a module to an app, there needs to be some way to populate the module with information. When the people in charge of providing such information are not well-versed in SQL, there needs to be an easy way to populate a database. The CCM Patients' Committee at MUHC can use an interface like the one prototyped at `https://patients-committee-web-app.firebaseapp.com` in order to push and pull information from the OPAL oncology app.

This report discusses the development of the web portal for the Patients Committee Module of the OPAL oncology application, entitled Patients for Patients (see Section 3.1). CCM members wanted to modernize the way that they interact with patients - this paper outlines their integration into the OPAL app from the initial planning phase (Section 3) to the development (Section 4).

2   Background and Related Work

In Quebec, Patients' Committees are mandated by the Quebec Ministry of Health. [1] As such, there are numerous committees across the province that aim to educate patients about their rights and responsibilities. The channels which these committees use to communicate with the patients vary in robustness; the Comité des usagers du CSSS de Laval has a comprehensive website which was a useful resource for determining potential sub-menus and features to develop MUHC Cancer Care Mission Patients' Committee's interface. [3]

HIG has been working on developing OPAL, a mobile application that allows cancer patients at MUHC to and access their medical information outside of the hospital, interact with their doctors, and manage their appointments. A Patients' Committee module is an

effective way to improve and modernize communication between the Patients' Committee and the patients.

3   Plan for the Module - Meeting with Committee

At the CCM meeting on October 17th, 2016, members discussed their priorities for the module, and a high-level plan for development was carved out.

3.1   Feature Name

CCM members were concerned that the term "Patients Committee" was too ambiguous and that people using OPAL would not know what sort of information would be found under the "Patients Committee" tab, and consequently, their information would be overlooked. They selected the name "Patients for Patients" as a feature name, which they thought better described their role as a group of patients providing resources, assistance, and advice to their fellow patients.

3.2   Suggestions

Currently, the suggestion box is a literal cardboard box in the waiting room, in which patients write out their suggestions for the Patients Committee to empty and look through. A major priority for the Patients Committee was to digitize this process through OPAL - patients could enter suggestions (with the option of anonymity) on their apps and the submissions would be accessible only to CCM members.

3.3   Resources

Committee Members remembered how overwhelmed they felt when they first heard of their diagnoses, and they wanted to provide a list of resources for patients so that they had easy access to reliable information. "Resources" also encompasses contact information, most importantly, the information of the Ombudsman, who acts as a liason between the patients and the hospital, handling areas of dissatisfaction.

3.4   Accessibility and User-Friendliness

The ability to remotely access the web portal for Patients for Patients was a priority to CCM members; many of them were at the hospital infrequently and did not bring their computers to the hospital. Furthermore, not all committee members have smartphones, so it would not make sense to create an alternate view especially for Patients Committee members within the existing mobile app. It was decided, then, that the best way to allow

CCM members to push and pull Patients for Patients data to and from the app would be via a web portal.
Guidelines for the portal:

- Remotely accessible

- Authentication system independent of OPAL authentication

- Functional for all browsers: Safari, Google Chrome, Firefox, and Internet Explorer

- Basic user interface - intuitive for people who are not technologically adept

3.5 Future Plans

Section 3.1 through Section 3.4 outline the most important parts for the first round of development, but future additions to the module were discussed, including a Q&A for local knowledge sharing, and a "tips and tricks" section to aid patients in navigating the different stages of treatment as well as general tips (like the best times of the week to book appointments, parking tips, and the best type of clothing to wear for specific types of appointments).

4 Development

As of December 2016, the web application is not connected to the mobile application, but such a connection is easily achievable if the data is read from the existing firebase database, or the code is augmented to route to OPAL's SQL database. This project was developed in JavaScript and hosted on Firebase.

4.1 User Interface

The interface is very basic, so that users of varying levels of technical expertise should be able to comfortably navigate it. For consistency, the colour scheme is similar to that of the OPAL mobile app: light green and white are the main colours, and the font is also the same (Helvetica Neue font family). Navigation is at the top of the page. The UI was built using bootstrap. To see how data in Sec. 4.1.2, Sec. 4.1.3, and Sec. 4.1.4 are stored at the database level, refer to Section 4.2.

4.1.1 Authentication

When first arriving to the portal, users are to either sign in or sign up. Without signing in, they will not be able to see any of the subsequent sections. The authentication screen can be seen in Figure A1.

4.1.2   Announcement Management

The Announcement Management screen is set up in the following way.
The option to add a new announcement is at the top of the screen. When selecting a "start date" for a new announcement, a calendar pops up (See Figure A2).
As soon as "Submit Announcement" is pressed, the announcement is written to the database. A table of existing announcements is at the bottom of the screen (Figure A3). If you add an announcement, it will be reflected in the table immediately.

4.1.3   Resource Management

The Resource Management section is set up very similarly to the Announcement Management section, with a table of current resources occupying the bottom portion of the screen. There is a button at the top of the screen reading "Add New Resource" that toggles a form in which a user can enter a resource title, description, and URL. The URL must match a regular expression or else the entry will not be written to the database. If fields are valid, then submitting a resource (see Figure A4) will add the new resource to the table immediately (see Figure A5).

4.1.4   Suggestion Management

Unlike the announcement and resource management screens, the suggestion management screen does not contain a form to add suggestions. While the other modules are for the Patients' Committee to communicate with the patients, this particular section is for the patients to communicate their concerns to the committee. This view is just a table, with the content of the suggestion, the date it was submitted, and contact information if the user supplied it (See Figure A6).

4.2   Firebase Realtime Database

The web portal was developed using Firebase. Firebase's database structure is a noSQL cloud database in which data is stored in a tree-like structure. Only authenticated users can read and write to a firebase database by default, and further restrictions can be placed on authenticated users [2].

4.2.1   Database Structure

For the Patients Committee web app, there are three high-level categories: announcements, resources, and suggestions. (See Figure 1) Each node (each announcement, re-

```
patients-committee-web-app
    ├── announcements
    ├── resources
    └── suggestions
```
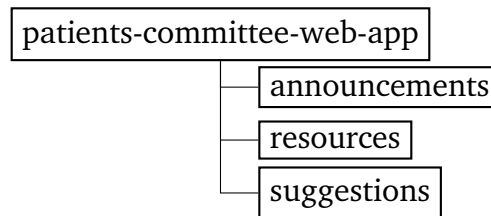
Figure 1. High-level database structure

source, suggestion) has a randomly generated key, and relevant information to the entry. For example, an announcement node has: a start date, submitted date, text, and user, as can be seen in Figure 2.
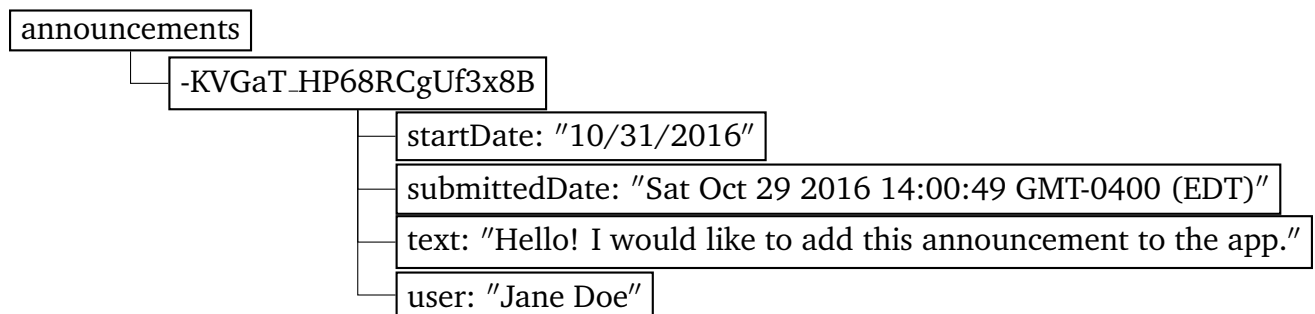
```
announcements
    └── -KVGaT_HP68RCgUf3x8B
            ├── startDate: "10/31/2016"
            ├── submittedDate: "Sat Oct 29 2016 14:00:49 GMT-0400 (EDT)"
            ├── text: "Hello! I would like to add this announcement to the app."
            └── user: "Jane Doe"
```

Figure 2. How announcement entry is stored in Firebase's noSQL database

4.2.2 Reading and Writing to the database

Reading and writing to the database are done in JavaScript; the Announcement Management reading/writing functions are at public/MUHC_scripts/announcements.js and the ResourceManagement functions are at public/MUHC_scripts/resource.js. Tables are set to populate when the window loads, and in the event that a new announcement or resource is added.

4.3 Testing and Deploying

After installing Firebase, web apps can be easily tested on local servers or deployed to a site provided by Firebase. The code that goes to the web app must be in the "public" directory. Running the command

```
firebase serve
```

results in the web app hosted on a local machine (localhost:5000 by default) and running

```
firebase deploy
```

deploys the web application to a predetermined site - in the case of this project, this site is `https://patients-committee-web-app.firebaseapp.com`, but it can be customized to any domain.

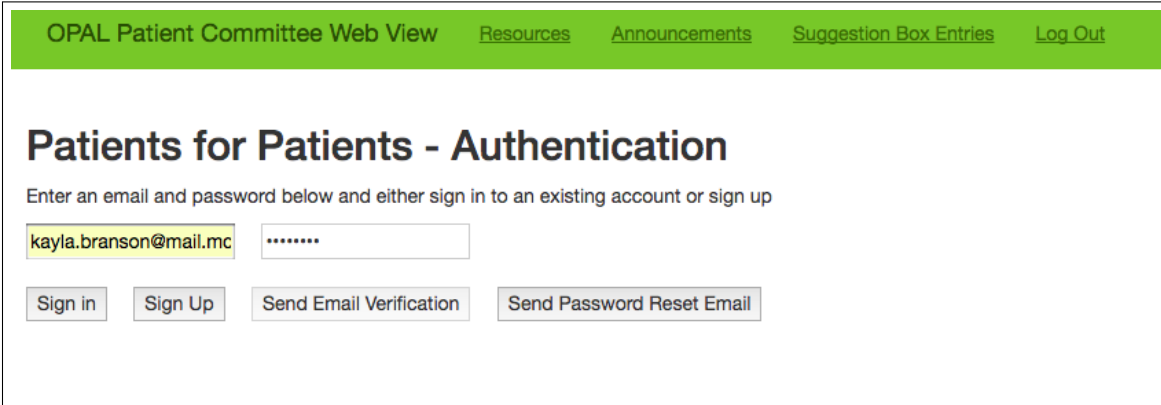# 5   Opportunities for Future Development

These are the next steps for the Patients for Patients web app:

- Connect the information provided on the web portal to the mobile application (and vice versa)

- Make the authentication system more robust - include an admin level user so that an invite is required to join the site, and so that announcements/resources must be approved before being pushed to the app

- Have the ability to toggle language so it is accessible in French as well as English

- Add support for questionnaires, and the features outlined in Sec. 3.5

- Move the portal from `https://patients-committee-web-app.firebaseapp.com` to some other custom domain

References

[1] McGill University Health Centre. The patients' committee, 2016. `https://muhc.ca/homepage/page/patients-committee`.

[2] Comité des usagers du CSSS de Laval. Users' committee, 2016. `http://www.cucssslaval.ca/users-committee`.

[3] Google Developers. Firebase realtime database, 2016. `https://firebase.google.com/docs/database/`.

Appendix A: Screenshots

Figure A1. Authentication screen

Announcement Management

New Announcement:

Start Date:

January 2017

Su	Mo	Tu	We	Th	Fr	Sa
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Submit Announcement

Curre...

Start Date		Date Submitted	Submitted By
10/31/201	announcement to the app.	10/29/2016	Jane Doe
11/01/201		10/29/2016	Committee Member
11/04/201		10/30/2016	Kayla Branson
11/07/2016	hi	11/4/2016	Kayla Branson

Figure A2. Calendar for selecting start date

OPAL Patient Committee Web View   Resources   Announcements   Suggestion Box Entries   Log Out

Announcement Management

New Announcement:

Start Date:

Submit Announcement

Current Announcements

Start Date	Announcement Text	Date Submitted	Submitted By
10/31/2016	Hello! I would like to add this announcement to the app.	10/29/2016	Jane Doe
11/01/2016	Announcing!!!	10/29/2016	Committee Member
11/04/2016	Hello World	10/30/2016	Kayla Branson
11/07/2016	hi	11/4/2016	Kayla Branson
11/26/2016	New announcement!	11/25/2016	Kayla Branson
11/30/2016	This is a a new announcement	11/25/2016	Kayla Branson
12/02/2016	Test	12/22/2016	Kayla Branson

Figure A3. Announcements screen

Resource Management

Add New Resource

Title:

Ombudsman - Glen site

Description:

Michael Bury, 514-934-1934 ext 35655

Link:

https://muhc.ca/homepage/page/ombudsman-complaints-commissioners-webpage

Submit Resource

Figure A4. Form to add resource

OPAL Patient Committee Web View   Resources   Announcements   Suggestion Box Entries   Log Out

Resource Management

Add New Resource

Current Resources

Link	Description	Date Added	Added By
Mcgill My Tool Box Program	Chronic disease self-management, for patients who have chronic pain and or a chronic illness, and also for caregivers.	10/29/2016	Kayla Branson
Lung Cancer Navigation Centre	Created for patients with suspected or diagnosed lung cancer, the navigation centre includes a complete team of general practitioners and specialists, nurses and administrators who are responsible for managing treatment plans and helping patients and their families navigate the process of accessing care and services.	10/29/2016	Kayla Branson
Children's Cancer Care	While the fight against cancer continues, there have been significant victories thanks to the vision, the motivation, and the commitment that drive our team.	11/4/2016	Kayla Branson
Division of Supportive and Palliative Care	Our supportive care model ensures that these services meet the physical, psychological, informational and spiritual needs of our patients.	11/25/2016	Kayla Branson
Stem Cell Transplantation	A leader in the discipline, performing autologous as well as unrelated and related donor allogeneic transplants	11/25/2016	Kayla Branson
Ombudsman - Glen site	Michael Bury, 514-934-1934 ext 35655	12/22/2016	Kayla Branson

Figure A5. Resource management screen

OPAL Patient Committee Web View   Resources   Announcements   Suggestion Box Entries   Log Out

Suggestion Management

Current Suggestions

Entry	Date Submitted	Contact Info
Anonymous suggestion	11/25/2016	Anonymous
The hospital is hard to navigate - I wish there was some sort of app I could use to navigate the Glen.	11/20/2016	concernedPatient@gmail.com

Figure A6. Suggestion box screen