I. Candidate Information

First Name: Frank
Last Name: Pizzuta

II. Capstone track Selection and tentative title

Web Development

Tentative Title: Employee Communication System

III. Design Questions, Technology, References, and Schedule

Employee engagement and communication is a $74 billion dollar market.[1] As the email generation ages out of the workforce companies are struggling with how to communicate with digital natives. These new employees use their mobile devices for most of their communication outside of work. Further, they tend to communicate in bite size chunks instead of long form communication.

Many companies cannot afford to develop their own mobile app or are restricted by regulatory concerns from using larger two-way systems such as Slack and Microsoft Team. My project will create a customizable mobile application and a backend communication system to allow any company to push information via mobile notifications to their employees.

Today, most employee communications go out via email. At my current job, these emails have a very low open rate. With this in mind, measurable outcomes can include open rates of the notification messages, click through rates to any links included, and possibly sharing of information with partners.

Technology #1: NodeJS
Reason: Node is used for back end infrastructure builds it allows me to use JavaScript (which I am very comfortable with) to build all server-side communications. Being open source, it has a large library of modules for me to choose from when adding functionality.

Technology #2: Flutter or PhoneGap
Reason: Flutter and PhoneGap allow developers to build an app once and deploy it to both Android and iPhone devices. Newer versions are starting to approach native app speeds but more importantly development can be done using the standard web languages html, CSS, and JavaScript.

Technology #3: MongoDB
Reason: Mongo is a document-based database. Normally used with Node for quick development and testing it will allow me to more easily change the data

[1] (Smith, 2016)

model as the project evolves. Also, as one of the tools I learned in my program at Harvard, I am interested in trying it out in a more robust manner.

Technology #4: Urban Airship or other notification service
Reason: I require a way of sending the messages to the mobile devices. Building my own push service would require more time than is allotted for this project. Further, the cost of using such a system is so small that it makes sense from a project perspective to try and use a prebuilt system.

IV. Tentative Schedule

Milestone #1:

Date: End of August

Description: Infrastructure built and running on Digital Ocean

Milestone #2:

Date: End of September

Description: Server-side service working and rendering messages as web pages

Milestone #3:

Date: Mid November

Description: Mobile apps working

Milestone #4:

Date: Early December

Description: Mobile apps receiving notifications

Milestone #5:

Date: End of class

Description: All testing complete

V. Project Description

Today, most internal communications from teams such as HR, payroll, and marketing are distributed via email or placed on internal intranet sites. At my current job, we find that these emails have a very low open rate. On top of that most employees complain that they don't receive the right communications about employee benefits and offerings and that it is also hard to share this information with significant others. Younger employees ask for more mobile access to information.

This project consists of three components (see figure 1). A server-based system for entering in messages, a method of pushing these messages to a mobile device and/or desktop browser, and the app to receive and view the messages. Unlike most team-based communication tools this product is not intended to support two-way communication. Instead, we are looking to see if we can improve employee access and use of enterprise level communications.

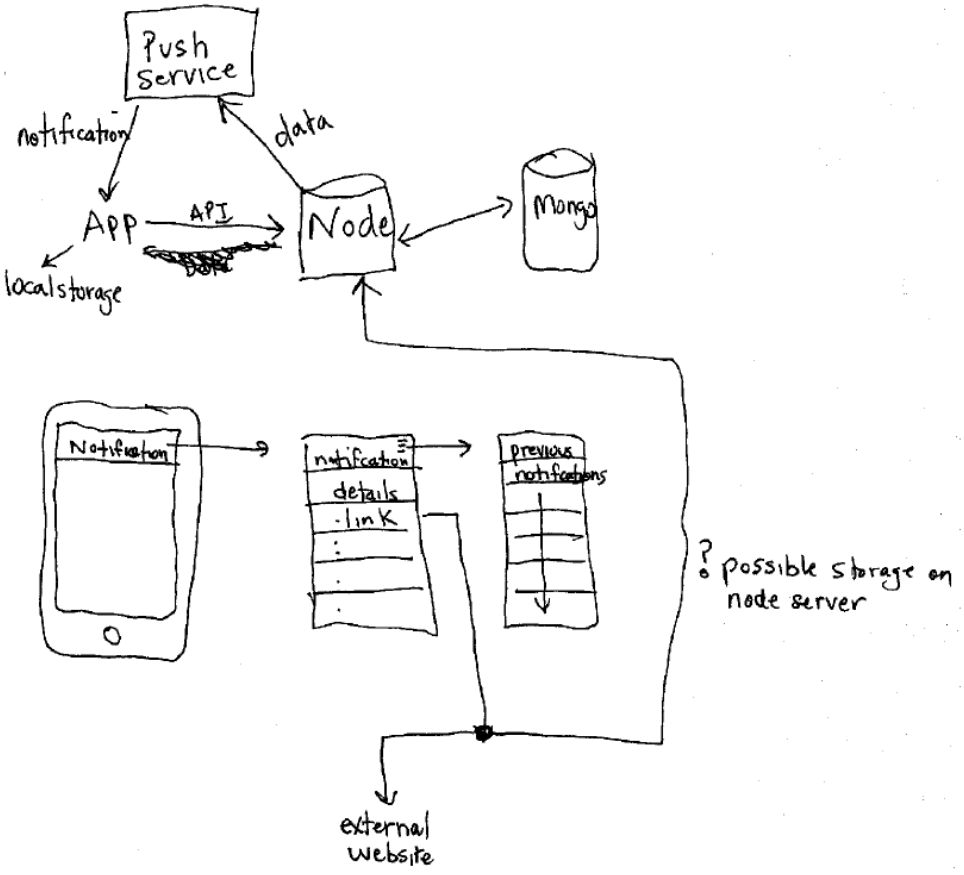

Figure 1 Data Flow

The server component will have an admin interface for creating and send the push notifications. The admin will be able to segment the employees by unit and team as well as pick individuals with which to communicate. There will also be an API created to expose these notifications to the mobile app. If time allows, the server will also do browser notifications so that people can receive updates on their desktops as well. The desktop notification is a possible side benefit to allow for emergency communication in the event of a business that does not allow the use of cell phones in the workplace.

The push service is a third party offering that has a set of APIs. The server component will need to register with this service, set up users, and properly format

and send the messages. When done correctly the push service will then send notifications to all of the appropriate cellphones.

The mobile app needs to receive push notifications and allow access to the history of messages that have been sent. Performance testing needs to be done to determine if this list can always be pulled from the main server or if caching on the phone is required.

User testing will be performed with my current employer. A mix of marketing and HR personnel will test the app as well as both users and admin. This feedback will be used to find bugs as well as iterate through functionality enhancements for future versions.

From a project management perspective, I will use a Lean methodology approach. I am looking at the capstone as my minimal viable product (MVP). I need to test the core concepts of my idea and then be ready to change my approach if it doesn't test well. Most importantly, I need to get something into the hands of my users as opposed to building the whole system without any feedback.

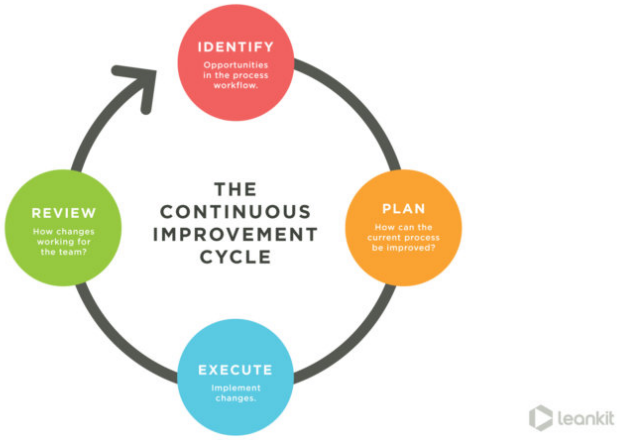

Figure 2 Lean Continuous Improvement (from leankit.com) (leankit.com, 2019)

References

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Smith, S. (2016, June 9). *employee-engagement-and-market-share-the-74-billion-question*. Retrieved from blog.thestarrconspiracy.com: https://blog.thestarrconspiracy.com/employee-engagement-and-market-share-the-74-billion-question