OSU COVID Info Hub

Team SKRE

Table of Contents

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1. The Ohio State University: Business and Enterprise Analysis

We will begin by describing the enterprise in which the OSU COVID Info Hub is going to exist. Complete with a review of it's industry segments, potential products and services it can provide, the market in which it could complete it, and the overall business and organizational structure. Then we will describe the value chain of OSU along with its stated areas of differentiation. Finally, we will explain the five force analysis of OSU in its stated industry, then explain OSU's stated strategy.

1.1. Targeted Industry Segment

Online media platform, specializing in public health policies.

1.2. Products and Services

Updated news regarding COVID and what new guidelines businesses have to follow. Searches for updated policies for specific businesses.

1.3. Market

All universities.

1.4. Business and Organizational Structure

The Ohio State University's administration including: President Kristina M. Johnson, Board of Trustees, University Senate, Council of Deans. There are many offices led by an individual with supporting staff that manage each area of OSU.

1.5. Value Chain

Primary activities in the value chain:

Primary Activity	Description
Inbound Logistics	● Partnered with The Lantern for newspapers related to COVID
Operations	● Keeping track of the data about the users of the product ● Researching all possible news related to new policies or updates on how to prevent the spread of COVID ● Testing and adjusting the strategies used to display news so that the platform appeals to a larger audience ● Utilizing resources of the university to make application available to be read in multiple languages for international students
Outbound Logistics	● N/A no sales to be made from our product

Marketing and Sales	● Utilizing giveaways to users that fill out surveys to help company improve in areas described by the users ● Focuses on digital media and print advertising through the university ● Sales profit comes from companies using the app to market and give updates of their policies
Services	● Services are all free to students and faculty of the university ● Customer service for issues with applications features ● Displaying updates regarding businesses new policies regarding COVID

Secondary activities in the value chain:

Secondary Activity	Description
Firm Infrastructure	● Management of each department (Publishing, Developing, Consumer Analysis, Accounting, and Marketing/Advertising) ● Employees fluent in multiple languages to provide different

	versions so the app can be run in multiple languages ● Daily meetings revolving around going over surveys of how the app could be better based on users inputs ● Inventory Management
HR Management	● Having a talent management department that solely specializes in hiring individuals with specializations in current needs of the company ● Weekly performance report to ensure employees are being efficient (firing those that are not meeting requirements consistently) ● Full benefits to all full-time employees ● Access to OSU's many facilities ● Discounts to sporting events
Technology	● Use of microsoft office to communicate through email ● Use of zoom to have meetings (since we are all remote during COVID)

	● Making adjustments to the application based on surveys provided by the users ● Providing employees with computers/laptops to perform the work needed to be done
Procurement	● Allow for advertising on platform to receive more profits ● Expenses for the company would be paying the employees and supplying them with the necessities for their position ● Partnered with multiple companies to handle shipping & handling and marketing of policies for certain businesses

1.6. Stated Areas of Differentiation

Large, public, coed, midwestern, successful football team, graduate and undergraduate programs, alumni network, many options for majors, strong business and medical programs.

1.7. Five Force Analysis

1. Threat of new entrants:

The threat of new entrants is the probability a new competitor in an industry will surface. The threat level can be determined by how costly it is to start a business in the

industry and how competitive and/or entrenched other companies are. In terms of research and education, the probability of a new university becoming competitive is very low.

Pre-existing universities have the benefit of deep connections for professors, graduate students, and fresh graduated students to use. Some universities go as far back as when their state or country first began, such as those in the ivy league in the US. Others come about from influential philanthropists with money to spare, such as most private universities. These connections take time to develop and require a good history of research and development to nurture.

The upfront cost for a university is steep. In order to be competitive in education, a new university might need appealing programs for majors. A new university could also appeal to students that can't afford or cannot pass screening tests for larger universities. To appeal to researchers, universities might want state of the art equipment. All of these features would only add to the enormous overhead cost of starting a university.

The small exception is online universities, but they are only universities in name and they are closer to a substitute product.

2. Bargaining power of suppliers:

The bargaining power of suppliers is the pressure suppliers can put on an industry. Suppliers have more bargaining power if they can determine their prices, choose their buyers, and ultimately have low threats in their five force analysis. Suppliers also have more power if the industry relies heavily on them to survive. The supplier of a university is a group of donors and sometimes a government body.

Without any buyers, the bargaining power of suppliers is very large. This is because they supply money to keep the university running. However, since the university only needs money to survive, suppliers lose bargaining power as universities profit more from buyers. It's a balance: universities will try to appeal to donors with state of the art equipment, good programs for students, and other campus facilities. At the same time, universities will attempt to profit from research and education to cover their costs. Universities can also rake in large profits from extracurricular activities such as college sports. If universities become less appealing to students and faculty, they

become less appealing to donors. Then the bargaining power of suppliers is only as big as the gap in funds from insufficient profit from buyers.

3. Threat of substitute products:

The threat of substitute products is the probability buyers will choose a different industry over this one. Substitute industries will provide a similar product or service with a catch. The catch is some trade in appeal, like a cheaper product with lower quality. Substitutes for universities mostly come in the form of substitutes for education, such as online universities, trade schools, or community colleges. Substitutes for research come from companies.

Online universities pose a very low threat as a substitute product. They offer education with easier access and lower tuitions, but often at the cost of quality. Online universities also have a stigma with employers as “less prestigious” than offline universities. Trade schools and community colleges also have a very low threat to universities. These substitutes offer lower tuitions and specialized programs, but do not have nearly as many opportunities for education.

Company research does pose a significant threat to universities. However, companies often keep research internal and rarely present their findings to the public. They also provide research products as a service at a higher price. Universities will use their appeal of public research and state of the art technology to bring in donors and graduate students.

University researchers have much more freedom and often resources at the cost of less pay. Researchers who do not work for profit but for the love of their field will stick to universities, while for profit researchers will lean towards working at a company. This creates a nice separation of interests to keep university labs filled.

4. Bargaining power of customers:

The bargaining power of customers is the pressure buyers can put on an industry. Buyers have more bargaining power if they have many choices for an industry’s product or services. Customers also get increased bargaining power if the

product is not essential and won't necessarily sell itself. For a university, customers are students, professors, and larger entities offering grants to research labs.

Students have all the bargaining power. Students can choose from a wide variety of universities that each provide a variety of different experiences. Universities have to appeal to students and convince them to join their program. Most universities have a screening process to filter out students who they believe to be an ill fit for their program. In the end, most people can survive without a college degree.

Professors have less bargaining power than students. Professors are hired by universities to fill a role, often involving both research and lecturing. Professors can choose which university to work at, but the screening process is much stricter.

Research grants are only offered to projects that the grant program elects. This means professors and labs must submit their ideas to a grant and hope their idea gets picked. This gives the program offering the grant power over the university.

In summary, students have the most power, research grants still have significant power, and professors have much less power.

5. Competitive rivalry within an industry:

Competitive rivalry within an industry is a measure for how fierce pre-existing companies compete against each other. This usually means how heavy their advertising is, but could also involve how strong their connections are and sometimes force low profit margins. Competitions among universities usually revolve around getting students to enroll.

Competitive rivalry is high when universities bid for new students. They advertise features like campus housing, rec centers, libraries, and restaurants. They will also try to specialize in programs. Then they will advertise that they're the best music college, or the best art college, which will appeal to students interested in those programs.

1.8. OSU's Stated Strategy

OSU's main strategy is to differentiate themselves from other universities with their large selection of competitive departments. Their vision is to be a massive, highly-accessible,

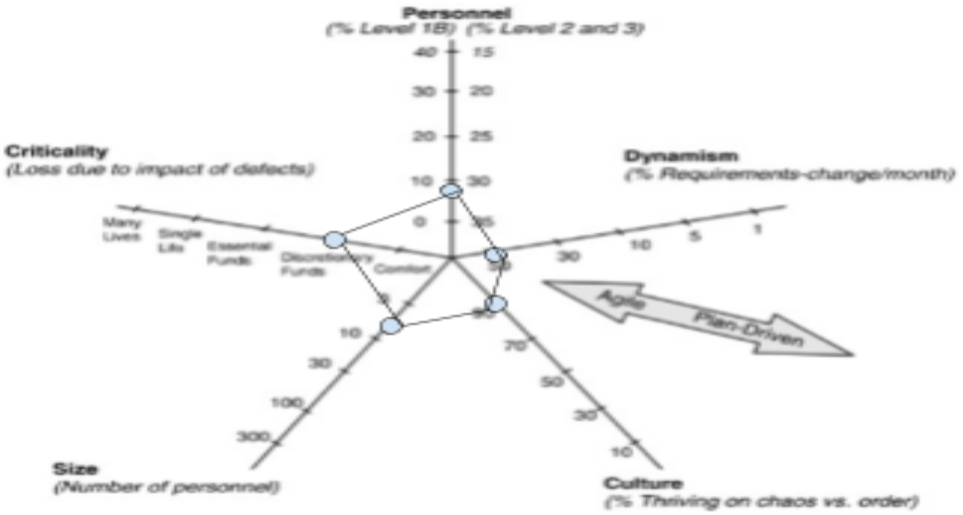
technical, and research oriented state university. OSU's mission is to get people to enroll for a sense of community and belonging, while also getting an excellent education.

2. OSU COVID Info Hub: Software Engineering Process

In this section, we will explain why we have decided on an Agile process for this project.
In addition we will describe multiple works products that have been created to support the project through the SDLC.

2.1. Spider Diagram

The project will be entirely Agile. We have described the reasoning for this decision using the below spider diagram. The axes we have used to rate the project is: criticality, dynamism, size, personnel, and culture. With further explanation detailed below.



2.1.1. Criticality

The current risk this addition to the app poses to the entire system is very low. Since the base for the app is already there and completely functional, this addition for spreading information

about covid is completely separate. If implemented correctly, the functionality of this new addition should not affect the rest of the app.

2.1.2. Dynamism

Due to this being a somewhat new problem, there is not much groundwork to use for requirements. Things like what businesses need to display, how often messages should be updated, and so on. This means dynamism will be high and features will be hammered out as the project goes along.

2.1.3. Size

The number of people that would be on a team from OSU to work on an OSU app addition would be small. Most likely, it would be five or six graduate students with one experienced developer, who is hopefully familiar with the OSU app.

2.1.4. Personnel

The level of experience in the team assigned to this project will most likely be low. The graduate students will have low experience with developing software in the field, but the team leader will have more experience.

2.1.5. Culture

Due to the majority of the team members being graduated students, they are not very familiar with the flow of a project. Then the project will lean more towards chaos than order.

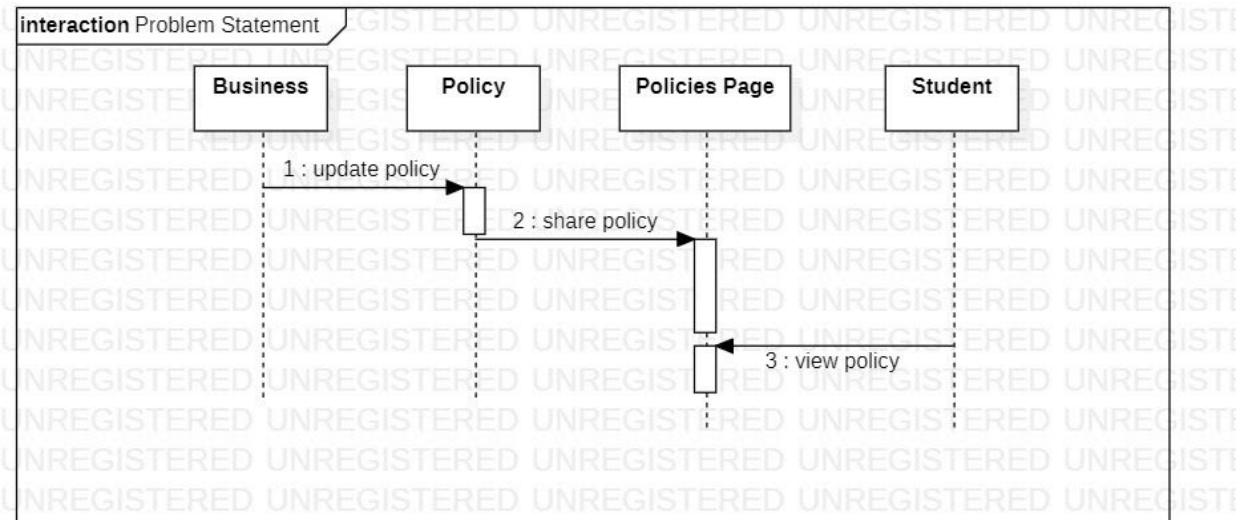
3. Requirements

Problem Statement	A problem statement will be created that addresses what the desired outcome will entail and needs to be done in order to obtain it.
Storyboards	A storyboard will be created to illustrate how actors will interact with the app.

Business Case	A business case will be created to determine whether or not the project is financially achievable. This will include a breakdown of cost and expected profits from the project.
Use Cases	Several use cases will be created to demonstrate functional requirements based on specific interactions with the project.
User Stories	Several user stories will be created to demonstrate functional requirements based on full experiences with the project.
Scenarios	Scenarios will be created that clarify edge cases.
Non functional requirements	How well the project will do its requirements will be defined.
Acceptance Plan	An outline for what specifically the project needs to be able to do in order to be completed will be created with assistance from the customer.
System tests	A series of tests will be created so that they can be used to see if the project is meeting the acceptance requirements.

3.1 Problem Statement

Businesses on campus want to share their COVID-19 policies with people in a fast and reliable way such that students know how to act or prepare when they visit. However, current solutions rely on either business websites or signs in front of their shops. Navigating to individual business websites for their policies is not a valid solution in most cases. Businesses would like to reach students where they know their COVID-19 policies will be seen.



From the problem statement, There are three main classes: Students, Businesses, and Policies. Since Businesses cannot feasibly interact with students directly, they must use a platform to share their policies where students will see them.

- Businesses want to update their policy regularly as needs evolve.
- Businesses want to share their policies on a platform students use.
- Students should be able to see the most up to date COVID-19 policies for campus businesses.

3.2. Business Case

The main costs for the project will be the labor to create the app. With 6 grad students and 1 experienced developer, $25 an hour for grad students, and $55 for an experienced developer. If we give the team 4 weeks to complete the project, that is (55 + (25 * 6)) * 40 * 4 = $32,800. This is a reasonable time frame because the team is creating an addition to an up and running app. To reduce the cost further, the university could give the grad students grants or other benefits to replace some of the payment. For maintenance, the app is already being maintained, the extra work needed to maintain one more part of it will be trivial. The benefits of the project are that The Ohio State Community will be able to function more cohesively during the pandemic, possibly saving lives.

3.3. User Stories

We have broken down the user stories into two categories: functional user stories, and non-functional user stories.

3.3.1. Functional User Stories

User Story ID	As a <type of user>	I want to <perform some task>	So that I can <achieve some goal>
1	business	update my COVID policies	show customers my most recent COVID policy changes
2	business	post my COVID policies	show customers my COVID policies
3	business	delete my COVID policies	show customers that we do not have any COVID policies
4	business	view my COVID policies	be sure that my posted COVID policies are correct
5	student	view business' COVID policies	be aware of any new business-specific COVID policies

3.3.2. Non-Functional User Stories

User Story ID (NFR)	As a <type of user>	I want to <perform some task>	So that I can <achieve some goal>
6 (Availability)	business	post my policies anytime between 5am-12am	show customers my COVID policies
7 (Availability)	business	be able to view my COVID policies 98% of the time	be sure that my posted COVID policies are correct
8 (Availability)	business	update my policies anytime between 5am-12am	show customers the most recent COVID policy changes
9 (Availability)	business	delete my policies anytime between 5am-12am	show customers that we do not have COVID policies

10 (Availability)	student	be able to view COVID business policies 98% of the time	be aware of any changing COVID policies
11 (Security)	business	be the only one who can update my policies	be sure that no incorrect/false COVID policies have been updated
12 (Security)	business	be the only one who can post my policies	be sure that no incorrect/false COVID policies have been posted

3.4. Acceptance Plan

A clear acceptance plan is needed to ensure that the features implemented in the application are working as intended. In particular, we have detailed out an acceptance plan for the user stories that we have shown above.

- AC for User Story ID 1
    - Given I am a business
    - And I am on the OSU mobile application
    - And I have posted my COVID policies
    - And I am on the ‘Edit Policies’ page
    - When I click the ‘Save My Changes’ button
    - Then my policy changes are saved
    - And I can see the changes on the business web page
- AC for User Story ID 2
    - Given I am a business
    - And I am on the OSU mobile application
    - And I am on the ‘COVID Policy’ page
    - When I click ‘Create COVID Policies’ button
    - Then my policy is posted
- AC for User Story ID 3
    - Given I am a business
    - And I am on the OSU mobile application
    - And I am on the ‘COVID Policy’ page
    - When I click ‘Delete COVID Policies’ button
    - Then my policy is deleted
- AC for User Story ID 4
    - Given I am a business
    - And I am on the OSU mobile application

    - And I am on the ‘COVID Policy’ page
    - When I click on the ‘COVID Policy’ page
    - Then my posted policy is visible
- AC for User Story ID 5
    - Given I am a student
    - And I am on the OSU mobile application
    - When I click on the ‘COVID Policy’ page
    - Then I can see policies that business have posted
- AC for User Story ID 6
    - A business can post their policies anytime between 5am-12am
- AC for User Story ID 7
    - A business can view their policies 98% of the time
- AC for User Story ID 8
    - A business can update their policies anytime between 5am-12am
- AC for User Story ID 9
    - A business can delete their policies anytime between 5am-12am
- AC for User Story ID 10
    - A student can view COVID business policies 98% of the time
- AC for User Story ID 11
    - A business can only edit their policies
- AC for User Story ID 12
    - A business can only post policies for their business

4. Analysis and Architecture

- Domain, Problem and Solution Analysis using class and object models, sequence and collaboration diagrams

Architecture

- Quality Scenarios:

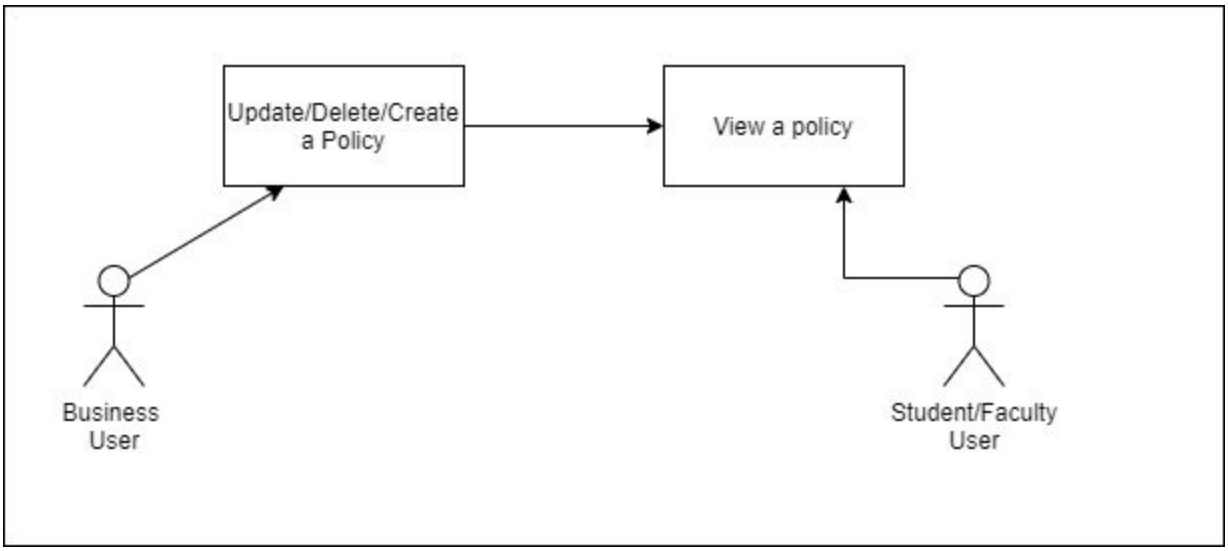
Name	Policy View
Description	This happens when a user (student/faculty/business) wants to view a policy for a company. Allows the user to view policies dependent on the

	business that has been chosen
Meet FR	4,5
Meet NFRs	7) Allows for businesses to constantly check that policies displayed are correct by having a steady connection 10) Policies displayed will continuously be up to date so there is no chance of missing a policy for a business
Quality Scenario	The user (business, student, or faculty) navigates to the policies section of the application and can select the business they wish to check the policies for. Will not display policies for any other businesses other than the one selected. The user will also be able to choose a back option to be able to go back and select another business to view.

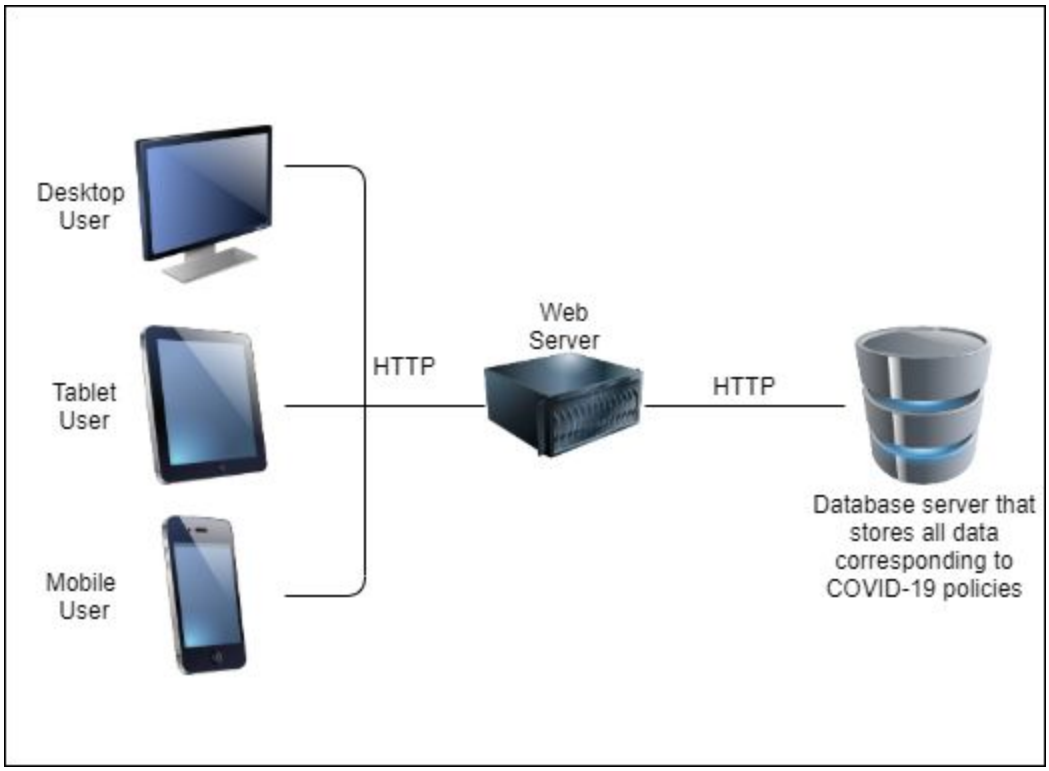
Name	Edit a Policy
Description	This happens when a business that is registered with the app wants to add/delete/edit a policy.
Meet FR	1,2,3
Meet NFRs	6) The system allows for new policies to be posted between 5am - 12am because these are the hours that the registered businesses operate and support can help from the application 8) The system allows for current policies to be updated between 5am - 12am

	because these are the hours that the registered businesses operate and support can help from the application 9) The system allows for current policies to be deleted between 5am - 12am because these are the hours that the registered businesses operate and support can help from the application 11) Heavy encryption of policies stored in the database is used so that only businesses can update their own policies 12) Heavy encryption of policies stored in the database is used so that only businesses can post their own policies
Quality Scenario	The business navigates to the update policies page to either add/delete/update a policy for their business. It will not allow for them to do one of these actions if they are not the registered business for their policies. Page will not update until all fields are correctly filled out.

- Subsystem Model:



- Target Environment:



5. Project Management

In this section we will explain how we structured our project management plans: release plan, iteration plan, and the risk plan. Further, we explain how we estimated task sizes and difficulty, along with our general project schedule.

5.1. Release Plan

We have structured the releases for the COVID Info Hub project into three sections. The first release being the creation and testing of the initial COVID Info Hub tab and page in the existing OSU mobile application. The second release being the added implementation of adding business specific pages to the Info Hub, complete with their COVID-releated policies. The third and final release will be adding increased functionality to allow business owners and employees to edit and create their own COVID policies.

5.1.1. Release 1 (release on August 24, 2020)

This release contains the basic functionality of the COVID Info Hub tab in the OSU mobile application. Detailed below is the breakdown of features being provided in this release:

- New “COVID Info Hub” tab on the OSU mobile application
- Landing page for COVID-releated policies for OSU
- List of all business with COVID-releated policies

5.1.2. Release 2 (release on October 5, 2020)

This release contains the functionality for adding business specific information and views to the application. Detailed below is the breakdown of features being provided in this release:

- New business specific page populated with static COVID-releated policies
- Form for creating and storing COVID-releated policies for a business user
- Create COVID-releated policies for a business user
- Contact information on the “COVID Info Hub” for business to be able to add their business to the application

5.1.3. Release 3 (release on December 1, 2020)

This release contains advanced functionality to the COVID Info Hub COVID pages in the OSU mobile application. Detailed below are the breakdown of features being provided in this release:

- Delete COVID-releated policies for a business user
- Update COVID-releated policies for a business user
- Allow business to sync their store capacity to the application
    - Business user can update the store capacity as a business-day progresses

5.2. Iteration Plan for First Release

Creating and testing of the initial COVID Info Hub tab and page

- Alter the current OSU app so that it includes the COVID tab and interface
- Test app for use cases

Implementation of adding business specific pages to the Info Hub

- Create UI for user to see businesses pages
- Have database populate tab with businesses and their policies

Increased functionality to allow business owners and employees to edit/create their own policies

- Create UI for businesses to create/edit their pages/policies
- Set up database for businesses and their policies
- Edits made by businesses update the database

5.3. Risk Plan

Given the ever changing landscape of COVID, there are many inherent risks in this project. Below we have described multiple risks and potential mitigation tactics in how to avoid them.

Risk Plan		
Risk	**Avoid**	**Mitigate**
Project is over budget/Project receives budget cuts	Re-estimate the cost of the project at every major step so that the team knows ahead of time if the project is or will be over budget.	Request a larger budget or remove features that are not crucial to the project.
Businesses dislike the service	Work with local businesses as clients to the project. Refer to these clients for feedback and fix anything that would be a major barricade to businesses using the application.	Advertise the application to different businesses to add more policies and increase traffic. If these businesses dislike the service, consider modifying it with their issues in mind.
Students dislike the service	Make the application user friendly to students. Invite students to test the application's user interface before the first release.	Consider adding more benefits to students for using the application. Consider modifying the application such that students find the service easier to use.
Policies become outdated	Write out guidelines for when, why, and how often policies should be updated.	Create rules such that if a policy becomes too old or is no longer valid, it can and should be removed by the page admin.

Policies are off topic, racist, or otherwise unfit	Write out a number of guidelines to explain what policies should look like.	Create rules such that if a policy breaks a rule that would make it unfit for the policy page, it can and should be removed by the page admin.

- Linear and parametric estimation
- Project schedule:
  Link to gantt chart

Sources

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