Cared4

Zachary Almas

CST-452 Capstone Project Proposal

Grand Canyon University

Instructor: Professor Mark Reha

Revision: 2.0

Date: 04/25/2023

ABSTRACT

Cared4 is the next best self-diagnosing personal care tool. Users can utilize Cared4 to search for their symptoms and get a diagnosis instantly without doctoral consultation. The application will be optimized to be incredibly user-friendly, making care accessible to everyone. Simply inputting a user's symptoms into the search bar will start their diagnosis as the Cared4 algorithm will quickly provide results illustrating to the user what they most likely have. Whereas other self-diagnosing software displays every result no matter how terrifying, Cared4 will keep the user calm by placing rare conditions separate from what they most likely have.

Cared4 will also have the capability to be personalized. Users will be given the option to add personal information such as pre-existing conditions, age, and gender to their profile, which can give them more accurate results when searching for their symptoms. Personalization will also help Cared4's algorithm determine how severe an illness is. For example, if a user has undergone chemotherapy, a sickness like pneumonia is much more severe than usual.

The goal of this application is to bring reliable healthcare to everybody. Sometimes visiting a doctor can be a daunting task. Whether it's too expensive or too time-consuming, it can be a hassle. Cared4 brings the doctor to your phone, so you can get results whenever is most convenient for free. Providing help wherever possible is how Cared4 brings healthcare into the 21st century.

History and Signoff Sheet

Change Record

Date	Author	Revision Notes
9/16/22	Zachary Almas	The initial draft for review/discussion
9/21/22	Zachary Almas	Additions to the initial draft
9/25/22	Zachary Almas	Finalized Proposal
04/25/22	Zachary Almas	Updated proposal to reflect application updates

Overall Instructor Feedback/Comments

Overall Instructor Feedback/Comments

Integrated Instructor Feedback into Project Documentation

✓ Yes ☐ No

Project Approval

✓ Professor Mark Reha

TABLE OF CONTENTS

Project Overview and Project Objectives

State the Problem and Background

In this day and age, going to the hospital can be extremely expensive and time-consuming. Because of this, sick users tend to search for their symptoms online. There are various services online where a user can search for their symptoms; however, they aren't personalized to the user, meaning the user is given a wide range of possible illnesses and has no way to narrow them down. Cared4 will solve this problem by allowing the user to personalize their experience. Users can input personal medical information like their age, gender, and previous conditions to get the most accurate results. If the user chooses not to input information, the application will default to the most common illnesses instead of scaring users with rare and severe medical conditions.

Christian Worldview

Galatians 6:10 says, "So then, as we have opportunity, let us do good to everyone, and especially to those who are of the household of faith."(New International Version, 1973). Cared4 is a way of providing easily accessible care to everyone. It is an opportunity to do good to everyone, which fuels the development of the software.

Project Objectives

Everyone should have access to some form of medical care. The objective of Cared4 is to provide a simple healthcare option to everyone. Users will never again have to worry about scheduling an appointment or facing a hefty bill for simple questions about their symptoms. This not only gives the user extra free time but also takes some of the work off of doctors' plates by answering questions for them. If everyone is able to diagnose themselves from the comfort of their homes effortlessly, Cared4 will be considered a success.

Challenges

- Publishing on all platforms.

One of the goals of this project is to publish Cared4 on all platforms. Since the developers have never published applications to the various app stores or hosted a web application online, this may pose a challenge. Each technology must be learned to ensure users can access Cared4 from any device.

- Keeping the most accurate information.

Since the application will use a custom database, ensuring Cared4 has the most accurate information may require extra attention. The developers must research multiple data lists to ensure Cared4 starts with the most updated data. It may pose a challenge to find this data list and keep the information updated as new discoveries are made. It may also be a challenge for the developers to always know of every update to current medical information as it's presented. Keeping up with the newest information is essential for Cared4's success and needs to always be accounted for.

Benefits and Opportunities

Providing users with another healthcare application that allows them to diagnose their illnesses effortlessly gives them extra free time and doctors less work. Users will have peace of mind having an accurate estimate of what they might have and know how to treat it. While users are getting their questions answered, doctors have more time in their busy schedules to treat patients with more severe conditions. Cared4 benefits users and doctors by giving them extra time in their days to focus on more important issues while also having peace of mind.

Project Scope

In-Scope features that will be completed at project deployment:

● Register user.
● Log in user.
● Customize account.
● Connect to an illness database.
● Search symptoms.
● Estimate an illness.
● Provide treatment options.
● Be a web application.

Out-of-Scope features that are lower priority:

● Be a mobile application.
● Find hospitals nearby.
● Find hospitals in your area that take your insurance.
● Live chat with a Doctor.

ID	Task	Dependencies	Status	Effort Hours	Start Date	Planned Completion	Estimate to Completion	Actual Completion	Resource
1	Project Proposal form		Complete	4	9/10/22	9/24/22			
2	Project Requirements Documentation		Complete	4	9/26/22	10/16/22			
3	Write User Stories		Complete	1	9/10/22	10/16/22			
4	Final Architectural Plan		Complete	6	10/17/22	11/20/22			
5	Learn React Native		Complete	4	9/10/22	11/20/22			React Native Course
6	Research Bulma's capabilities		Complete	2	9/10/22	11/20/22			
7	Create Databases		Complete	1	9/10/22	11/20/22			MySQL Workbench
8	Research Data lists to populate illness database.		Complete	2	9/10/22	11/20/22			
9	Develop API		Complete	30	11/21/22	1/23			Nodejs
11	Develop Cared4 Front-End		Complete	20	11/21/22	3/23			React, Bulma
13	Develop Severity Algorithm		Complete	6	11/21/22	3/23			Nodejs
14	Host Database on AWS		Complete	1	4/20/23	4/23			AWS
15	Host API on Render		Complete	1	4/20/23	4/23			
16	Host front end on Vercel		Complete	1	4/20/23	4/23			

Table title: Work Breakdown Structure

Project Success Measures

Cared4 is designed to provide every user with the most accurate results, so success can be calculated by how many users can receive accurate results. With this in mind, calculating project success can be done by examining the accessibility of Cared4 on each platform. If Cared4 is hosted on every platform when it is launched, allowing everyone to get accurate results searching their symptoms, it will be considered a success.

Project Completion Criteria
1 - Web Application hosted online.
2 - Mobile Application published to the AppStore, Google Play Store, and Amazon Appstore.
3 - A user can successfully search for their symptoms and get realistic results.

Assumptions and Constraints					
ID	Description	Comments	Type	Status	Date Entered
1	The developers are still learning React Native	The development team needs to complete their React Native course to learn the framework.	Constraint	Developers still learning the framework	9/25/22
2	The developers will be finished learning React Native by the time development starts	It is assumed that the developers will have learned React Native by the time development starts.	Assumption	Developers still learning the framework	9/25/22
3	Lack of funding	The development team has a shortage of money, so funding will need to be acquired for the hosting services.	Constraint	Team still acquiring funds	9/25/22

Project High-Level Solution

Introduction

According to the Centers for Disease Control and Prevention, 31.6 million United States citizens don't have health insurance. Knowing this statistic, we can determine that a minimum of 10% of Americans rely on other healthcare information when they fall ill instead of their doctor. This is a significant problem as the CDC also states that the average adult gets sick 2-3 times per year. Additionally, some people prefer to reserve the doctor for severe illnesses or other emergencies, whether they're insured or not. In fact, 25% of Americans don't see a doctor at all annually. Overall, both groups tend to search for their symptoms online using healthcare software to diagnose themselves from their homes. Unfortunately, most of the developed healthcare software is not user-friendly and does a better job of scaring the users rather than helping them diagnose their illnesses.
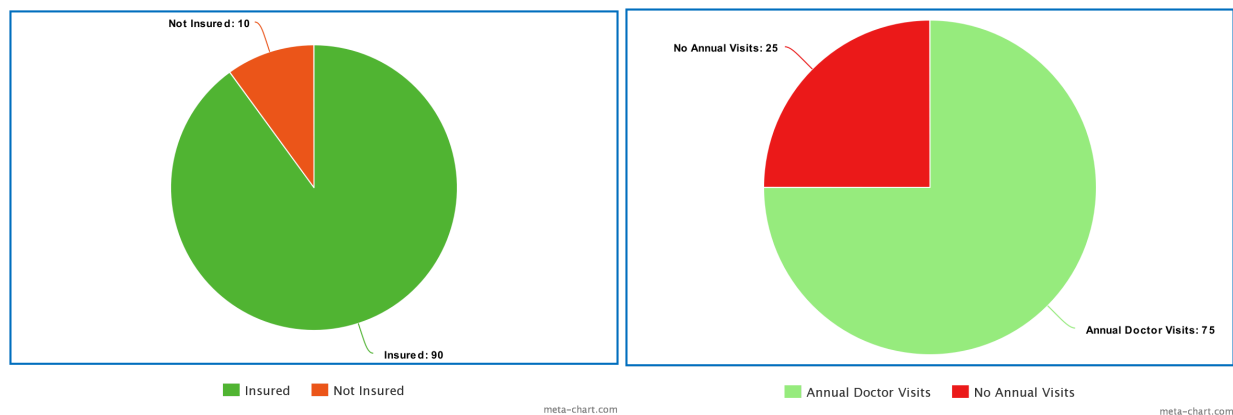

A user-friendly self-diagnosing healthcare tool users can utilize to search for their symptoms and receive an accurate estimate of what they have needs to be developed to provide a healthcare option to people who may not have access to a doctor. Cared4 will be that tool. The objective of Cared4 is to provide answers to basic healthcare questions to as many users as possible. With advertisement support, this service won't cost the user extra, making it available to the maximum amount of people. It's time for healthcare applications to become updated for the 21st century.

Solution

When users enter Cared4, the application will prompt them to enter their symptoms immediately. This way, users don't have to search around the application to find their diagnosis. Cared4 will also allow the user to register an account and input some information about themselves. With this information, Cared4 can provide more accurate results concerning illness severity and possibility. Cared4 will use various tools and frameworks to provide users with accurate results based on the symptoms they enter. When users enter their symptoms into Cared4, an API will query the database returning the results that match the symptoms. The database will be populated using a data list researched by the development team. The API passes these results to an algorithm that determines the illness' severity based on user information associated with their account. Cared4 will display the most common results and their seriousness to the user. Underneath these results, a separate section for more severe results will also be provided. Since these results tend to be rarer than less severe illnesses, there's no need to worry the user by presenting them first.

Block Diagram Displaying how the Technologies Work Together:
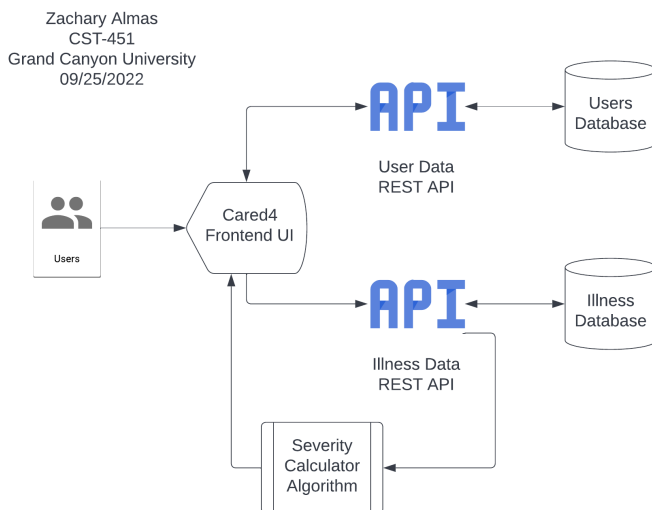
Front-End

        Cared4 will be built using the React framework. React allows the developers to build Cared4 for all platforms seamlessly. Its cross-platform capabilities make it the perfect choice for developing a web application that can be viewed on all platforms capable of accessing the Internet. Cared4 will also utilize the Bulma CSS framework for styling. Bulma was built with Flexbox, which is incredibly responsive to screen size changes. This makes it the perfect framework for Cared4 since the developers only need to style the application once for all screen sizes.

Back-End

        The back end of Cared4 will be developed using Nodejs and Express. Express and Nodejs are powerful tools that will aid the development of Cared4 by giving the developers complete control. Both Express and Nodejs have very active communities and extensive support, giving the developers plenty of debugging assistance. Nodejs also has a non-blocking I/O system that allows the application to process several requests simultaneously, thus improving performance.
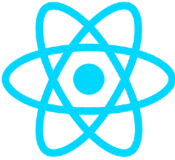
Database

        Cared4 will utilize a SQL database to hold all user data and sickness information. Since the developers know what information will be added to the database, SQLs structure is the most ideal. This structure allows the team to write specific queries that access the desired data quickly. Additionally, the developers have years of experience with SQL databases, making the development smooth. The team knows precisely what queries need to be written to access the data in each database.

Hosting

        One goal of Cared4 is to give its services to as many users as possible. Because of this, the developers plan on hosting Cared4 on as many platforms available. The Cared4 web application will be hosted using Amazon Web Services, Vercel, and Render. AWS has SQL server support, making it a perfect host for Cared4, as SQL is the database of choice. Vercel and Render provide exceptional deployment capabilities for React and Express applications, making them the best choice.

Diagram Displaying the Technologies used for Each Part of the Application:

Front-End	Back-End	Database	Hosting

Project Controls

Risk Management				
Event Risk	**Risk Probability** **(high, medium, low)**	**Risk Impact**	**Risk Mitigation**	**Contingency Plan**
Someone hacks into the database.	Medium.	Important user medical information will get leaked.	Ensure the project is protected against common cyber attacks such as SQL injections. Additionally, encrypting the content of the database will ensure that if data leaks then, the hacker won't be able to read it.	Getting ahead of the problem by not requiring users to input sensitive information, just what they think is required, can give the user peace of mind if there is a data leak.
The lead developer doesn't have the necessary understanding of React.	Low.	Cared4 would not get completed.	The lead developer must complete all extracurricular learning to ensure they have the knowledge to complete the project.	In the event the lead developer cannot create Cared4 with React, they will instead develop the application with Spring Boot since they already have an understanding of that framework.
The database isn't complete by deployment	Medium.	Cared4 wouldn't have a solid database to connect to, rendering it useless.	The lead developer must commit to adding information to the database daily until it is complete or sufficient for demonstration.	In the event the database is incomplete, the developers can shift from using the custom database to using a third-party database.

Issues Log									
ID	**Description**	**Project Impact**	**Action Plan/Resolution**	**Owner**	**Importance**	**Date Entered**	**Date to Review**	**Date Resolved**	
1	No issues at this time.								
2									
3									

				Change Control Log						
ID	**Change Description**	**Priority**	**Originator**	**Date Entered**	**Date Assigned**	**Evaluator**	**Status**	**Date of Decision**	**Included in Rev. #**
1	No Changes have been made at this time.								
2									

1. Use the template to describe how the end user is involved in the software development, if applicable. Include relevant information about meetings, reviews, presentations, etc.

		Roles and Responsibilities	
Name	Team	Project Role	Responsibility
Zachary Almas	Development	Lead Developer	In charge of building Cared4 by using the necessary frameworks, languages, and tools.
Olivia Perrego	Design	Designer Consultant	In charge of designing aspects of the application, such as the logo and UI design.

Project Cost and Schedule

1. Create a spreadsheet of costs related to the scope of the project, with all necessary materials and elements required to accomplish it effectively and the allocated resources. Note: If the project being designed will not require any cost calculations, please state that here.

Name	Price	Billing	Reason
AWS Hosting	$9.50	Free for the first year, then $9.50 monthly.	Service to host the web application and database.
Vercel SSL Certificate	$20	Per Year.	SSL certification for the web application makes it more secure and gives users peace of mind.

Appendix A – References

Center for Disease Control and Prevention. (2022). Retrieved from: https://www.cdc.gov/

New International Version. (1973). *Biblica.* Retrieved from: https://www.bible.com/

Appendix B – Copyright Compliance

To my knowledge I have not violated any copyrights as all of the software is free to use for use.