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Bailey Forbes Cheyenne Pierpont Brandon Maurer

Feasibility Report

You should provide a feasibility report in the following format:

1. **Product:** A general statement about the product; give a brief description of what the proposed system will do, highlighting where the proposed system meets the specified business requirements of the organization.

   Our project will be designed to help Cave Country Canoes improve the management of emergency distress situations and the handling of map-based data on their operations, among the critical tasks that are currently being done by them. With the emergence of such a modern system, the management of processes will be made more efficient, integrating the following:

   a. Emergency incident tracking

   b. Customer feedback management

   c. Route and trip condition logging

   d. Resource allocation for emergency response teams

   The system will be a web-based platform made with the help of Python's Flask framework, and the back-end data will be managed through a MySQL database. Primary features of the system are trip management functionalities, including logging customer trips, recording points of interest (POI) and geofences and sending emergency alerts. Also, to ease the management of the resources and response teams, sending processing of the same will occur, thus ensuring quick encapsulation and response during times of emergency.

   Data security and continuous updates are improved by the automatic triggers for logging changes within the accounts, customers, turns, and emergency incidents. This layout is designing a trustworthy, responsive system from both customer and in-house side.

   By using the services of Heroku, the application will be online and accessible to both the staff and users. This solution is a scalable one, which means it can be used to manage both day-to-day and emergency operations.

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2. **Technical Feasibility:** Will the proposed system perform to the required specification? Outline the technical systems options you propose to use, which will give a technical solution satisfying the requirements and constraints of the system, as outlined in the terms of reference.

    - As of now yes, the product will perform to the required specification. The technical systems we have right now proposed for the application is we will be having our database through MySQL which if needed to be downloaded and moved to a new system can be dumped into a file and transferred using this command line.
        - mysqldump -u [username] -p [database_name] > [backup_file.sql]
    - The system host server we will be using will be on Heroku, we will be using flask as our application server as well. We are going to be using PyCharm as our way to code in Python.
    - We should ensure this project development and utility for Cave Country Canoes (and others who use it) adheres to:
        - Data Privacy and Collection Requirements
        - Cookie Requirements
        - Data Security Requirements
        - Accessibility Requirements
        - E-commerce Security
        - Copyright and Plagiarism Requirements
        - Content Licensing and Attribution
        - Anti-Spam Laws
        - Disclaimers

      Additionally, the system should adhere to technology policies, such as those enforced by the FCC, FTC, and IEEE.

3. **Social Feasibility:** Consideration of whether the proposed system would prove acceptable to the people who would be affected by its introduction. Describe the effect on users of the introduction of the new system; consider whether there will be a need to retrain the workforce. Will there be a need for relocation of some of the workforce? Will some jobs become deskilled? Will the current workforce be able to perform effectively any new tasks introduced by the proposed system? Describe how you propose to ensure user cooperation before changes are introduced.

Our project should not affect the workforce in a major way. It will require some training for workers to learn how to use the application, but our current hope is that it will not prove difficult

to use. It may have an impact on CCC's customers due to them needing to download the application on their phones to use it, however, considering most phones have a large storage and the application can be removed after the customer's trip should hopefully not be a problem. We are going to work towards making the application as small as possible to avoid causing issues.

4. **Economic Feasibility:** Consider the cost/benefits of the proposed system. Detail the costs that will be incurred by the organization adopting the new system; consider development costs and running costs. Detailed benefits that the new system will bring, direct economic benefits such as reduced costs, and indirect benefits, such as improved management information and better customer service. Illustrate the cost/benefit of the new system by applying a suitable cost/benefit analysis method such as the payback method.

The only costs we foresee now are the costs of publishing the application to the Apple App Store and the Google Play Store. From our research, it will cost us $99 a year to have the app on Apple, and a one-time $25 payment to get the app on Google Play Store. We are currently under the impression that if we are to run the system off the machines at CCC they will be able to handle it. We are going to work towards that being the case, but there may be costs if they must upgrade their machines. As an alternative, we have also discussed using Heroku to make it cloud-based, but we will wait and see as things progress. On benefits, our system is designed to aid them in case of emergencies, ideally saving them time.

5. **Market Research:** Comprehensive market research finding a need for the product. Detail all the market research you carried out, listing sources of information. Justify any conclusions you have drawn from your research. Find the potential customer base for your product, together with evidence of customer need for the product. Describe how you propose to compete with equivalent products on the market.
   - The first thing we did to see if there was competition in the field for these apps was, we looked it up to see if there were any apps that did this for canoeing and kayaking. There were numerous apps but there are 5 top apps that were recommended by professionals.
   - Here is the website link to those thirteen apps.
     - https://www.angleoar.com/post/best-kayak-tracking-apps?srsltid=AfmBOoqoAHaIrq0n3lxKAkCg8lauVD1aGEA4I1rVAP4DauwLVaMCjyJU

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- One thing that right away grabbed my attention when looking into these apps was it wasn't just used for kayaking. There was one specific app for kayaking that is in the top 5. A lot of the other apps are geared around hiking, biking, running, and walking. So having an app inclusively just for kayakers on the blue river would have a lot of potential and interest.
- A potential customer base would be canoes and kayakers on the blue river. This could change if the project gets expanded to out to different rivers in different areas. The customer wants these apps to track how far they have gone, how far they have left on the river. For the other customers, as they say, the businesses who run these trips also have the need for the SOS system when they get these alerts with a location, they can cut down the time on finding out where the people are. They can send the information to the correct emergency services and get to them faster. They also can send automated messages to the customers like “Please stop your boat where you are and stay put emergency services have your location and are headed your way.”
    - How we are going to be different than other apps is that we have a map that was designed by this specifical rental company of the blue river. We are going to use this app to make to where They have access to a digital map instead of carrying a paper map and it gets wet and disintegrating. They have access to the map all the time and if they get in an emergency situation, they will have a pop-up button where they can send their information to Cave Country Canoes. Which will get them help faster, which will secure their confidence and make them less frightened out on the water.

a. This project will be a blend of several general widely used software and concepts which already exist and should be acknowledged; some of these solutions are:
    i. Life 360
    ii. Find My Friend or Device (Apple)
    iii. Google Family Link (Android)
    iv. Find My Device (Android)
    v. Emergency distress pings
b. While this will not currently be used in our solution, another technology which is available is sending data (like texts) over satellite. OSs such as iOS and Android commonly use this technology when emergency distress personnel are needed in an SOS situation.
c. **How will we integrate these technologies**: As noted above we will have a blend of software for this project which aims to provide our clients (Cave Country Canoes) with specialized versions of this technology for their needs. This includes:
    i. Retrieval tools in a SOS situation for emergency personal
    ii. instructions to help in retrieval
    iii. Cave Country Canoe map information for the public
    iv. Tools to improve event and trip information for public
    v. Tools to help show general topographic information that the public may discover.
    vi. Means of logging activity as service is used.

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These individual concepts will work together to help aid safety and improve overall performance of the company. As addressed in other sections, these will help prevent emergency distress situations by better map tools, but in the event also improve how emergency situations are handled.

6. **Alternative Solution:** Consideration of alternative solutions should be documented. At least two alternative business or technical systems options should be considered. Detail the differences between these options and the proposed system. Justify your choice of the proposed system and the reasons for rejecting the alternative options

    a. One solution that is possible is building a combination of mobile applications through both C++ and either Objective C or Swift; this would be for the Apple Ecosystem side. On the Android side, the system would be built on either Kotlin or simply Java.

    Alternatively, one could use Dart with Flutter to create an all-in-one package. Some of the supported Operating Systems which Dart with Flutter applications can be published and run include:

        i. Android
        ii. iOS and iPadOS
        iii. MacOS
        iv. Windows
        v. Linux

    Why we are not using this possibility: The main reason we are not using these options is due to the lack of familiarity of these coding languages. Another reason is due to the economic cost of being a developer (see section 4).

    b. Another option for Cave Country Canoe's system is using a physical computer to act as a server for the system. For example, they could have a mini-PC to host the database and the overall app. The computer acts as a server hosting on private employee frequency and customers would access the system on the public frequency (same network).

    Depending on the network approach, concepts such as port forwarding would be used. If used, the system would run on port 3306 (one of the ports reserved for MySQL) and feed traffic to the computer (server) on the network.

    Why we are not using this choice: This option is less practical due to the potential cost and maintenance of the computer acting as the computer. All

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electronic devices require power, if there is something like a blackout, the entire computer-based server network would shut down and could not be recovered in the present state (pre-blackout). Cloud-based hosting would reduce costs and reduce data loss.

If port forwarding were used in this model for pushing data onto from the MySQL database, this could have several security implications. For one, using port forwarding opens the port on the network and can be accessed externally from other networks; as such, bad actors can exploit the open port. Additionally, internet traffic to the server could be extremely leading to a model neck and reduced transmission speeds.

c. **General Differences between approaches**: In section A, an all-around round application was noted for the system via Dart with Flutter to do both mobile and desktop or focus on C++ with Objective-C for iOS and Kolten or Java for Android. In Section A, these could have the local physical server (noted in Section B), or a hosted server. If separate applet environments (no Dart with Flutter) were used, a standard language like Java would be used for the desktop environment.

7. **Project Risks:** To have success in managing a software project, the project manager needs to understand the nature of software risks, which can be defined as uncertain events or conditions that, if they occur, can hurt a project outcome. List and discuss some of the risks associated with this project.
   - One project risk is that right now currently the DOD is in control of the cell towers. It is free right now to ping cellphone locations and find out where the location is. This could change now that social network sites like Facebook, Instagram, Snapchat, etc. Are benefiting from these cell towers. The DOD could start charging an annual fee to get to these locations.
   - Another risk is if a canoer/kayaker is out on the water, and they do not have cell service. They will not be able to send their exact location because they will not be pinged from their last known location from the cell tower.
   - The last risk is that the canoer/kayaker does not take their phone on the river trip. They will not have access to the map or anything because they do not have a device on them. Which means they also will not have a location on the river.

At this point, all the planning (personnel and period) for the project has been done and if the feasibility study has shown that the project is likely to succeed within its constraints, then it only is still for us to start the requirements analysis and thus continue with the project.