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GitHub Repo: https://github.com/InTheYearOf39/Software-Project-Management/

Question One

I. **Define a statement of work and outline the work products of your course project.**

A statement of work, also known as "scope of work" is a contractual document that outlines what goes into the project in as much detail as possible. It can also be termed as a legally binding document that captures and defines all the work management aspects of your project.

Work Product means the tangible and intangible results of the Work, whether finished or unfinished, including drafts. The work products of my course project are Design, Level of effort, Performance based.

Design/Detail: This phase includes designing a prototype and coming up with the front end and backend for the application.

Time and Materials: This involves the different frameworks used to come up with the system such as Flutter to make the app, Firebase to handle the data. This also involves the time spent in involving the project derived from a work breakdown structure.

Performance Based: This is comes into play in delivering the intended system, it involves texting and implementing the system.

II. **Elaborate 5 potential risks likely to threaten your project and how to they can be mitigated.**

1. **Scope creep**: This occurs when the project objectives are not clearly defined. To mitigate this the parameters of the project, have to be clearly defined before the start of the project.
2. **High costs:** This happens when the cost of running the project go well above the budget and render it unobtainable. This can occur when the project is under budgeted for. To mitigate this, each element of your project must be estimated accurately and stick closely to the budget by using a project plan template.
3. **Low performance:** This occurs when the project doesn't perform as well as initially expected in the future for example through miscommunication. This can be mitigated by identifying project risks that may lead to low performance and look for ways to prevent those risks by using a project management software.
4. **Stretched resources:** This occurs when there aren't enough resources to complete the project these resources may include time, skills, money, and tools. To mitigate this is to create a resource allocation plan.

5. **Operational changes:** This involves changes in company or team processes, like an unexpected shift in team roles, changes in management, or new processes that my team must adjust to but since I am doing this project solely on my own the only viable example is change to the design process. This can be mitigated by is by having a clear schedule for the tasks.

III. Explain the five stages of your project.

1. **Software Requirements Document**. Here I created a document that describes what the software will do and how it will be expected to perform including functional and non-functional requirements.
2. **Technical Document and Work breakdown Structure.** During this phase I created another piece of writing that describes the application, purpose, creation or architecture of a product along with a step by step approach to the project.
3. **Prototyping.** Here I developed a prototype of the project I intended to design along using Figma to generate a user interface and experience. (UX/UI).
4. **Front End.** Here I implemented the UI/UX designs in flutter and added a few functionalities for the presentation logic which are the interactions for the end user.
5. **Backend**. Here I implemented the business logic like the code that will handle the exchange of information between a database and user interface. I choose to use Firebase database for a real time database.

IV. Is your project objective driven or product driven, elaborate on the difference?

My Project is Object driven. That is to say its main objective is find a solution to the end-user's problem for example since it's a mental health application the client has an issue and needs help from a professional. While Product driven the details of the product is provided by the client.

Question Two

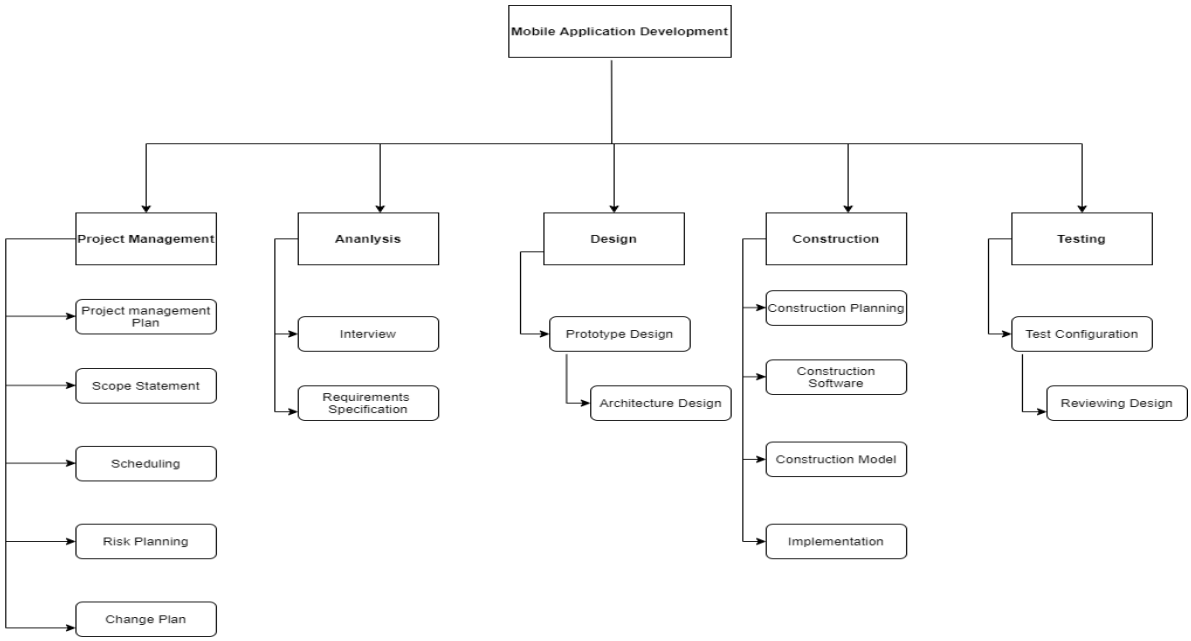
I. Explain the Agile Methods.

Agile is an iterative approach to project management and software development that helps teams deliver value to their customers faster and with fewer headaches.

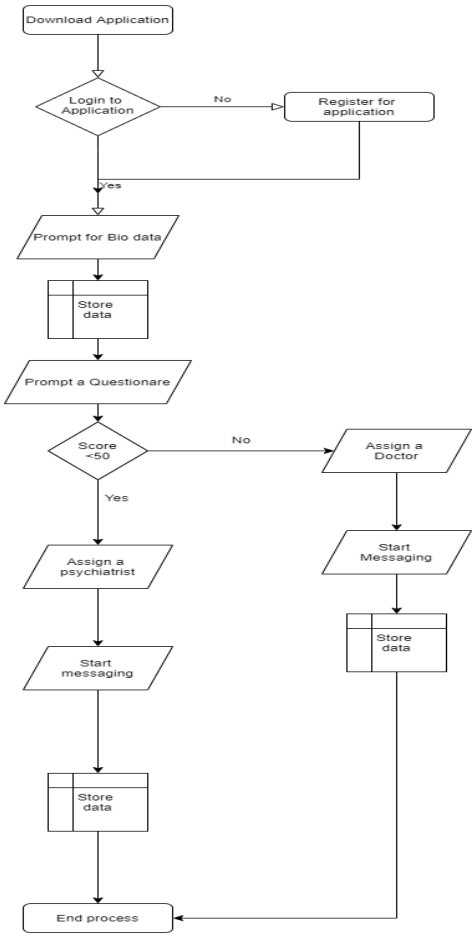
The agile methods include Scrum, Kanban, Extreme Programming, Lean Development and Crystal.

1. **Scrum.** This is an agile method is characterized by cycles or stages of development, known as sprints, and by the maximization of development time for a software product towards a goal, the Product Goal.
2. **Kanban.** This is a method organized on a board or table known as a Kanban board, divided into columns, showing every flow within the software production project. As the development evolves, the information contained in the table changes, and whenever a new task comes into play, a new card is created.
3. **Extreme Programming.** This is a methodology based around the idea of discovering "the simplest thing that will work" without putting too much weight on the long-term product view.
4. **Lean Development.** This methodology that comes directly from Lean Manufacturing, created by Toyota, and applied to software development. This method offers a conceptual framework and follows values, principles and good development practices that can be applied to an Agile development approach.
5. **Crystal.** This method is one of the most flexible frameworks, giving tremendous freedom to the team to develop their own processes. It focuses way more on individuals and how they interact rather than on the process or the tools so communication is an essential key aspect.

II. Draw a product break down structure for your project



III. Draw the product flow diagram and the derived activity network.



Question Three

Define the different types of contracts in software projects.

Fixed Price Contract (FP). This type requires fully detailed specifications, project scope statements, and checklists from the seller side. Both sides agree on a fixed price. It means that when the project is delayed as well as there are cost overruns, the seller will absorb all the extra expenses.

It is divided into several subtypes.

- Firm Fixed Price (FFP) is the most common one. The price is set from the outset and cannot change unless there is a change in scope;
- Fixed Price Incentive Fee (FPIF) model is usually chosen to offer the seller a performance-based incentive. It can be dependent upon certain project metrics, including development cost, time, and performance;
- Fixed Price Award Fee (FPAF) is used when the expectations from the seller can be exceeded. If the product is finished earlier than expected, an extra payment will be received;
- Fixed Price Economic Price Adjustment (FPEPA) option gives you an opportunity to readjust the fixed price according to the fluctuations in the market. Usually, it is chosen in the case when a project is going to last for multiple years.

Cost Reimbursable Contract (CR). This type is used when the requirements are uncertain from one side and the development process is not clear from the other. It is used for new research and development and requires immense innovation without a guarantee of predicted outcome. The key idea of this contract is that the seller provides work for a fixed time period and then increases the bill to get profit after finishing the product.

Time and Material Contract (T&M). This is the second popular option after FP, and it is a hybrid of both Fixed Price and Cost Reimbursable. One of the parties agrees to pay the other the time and materials that are used for the project within a reasonable limit. It can be cost reimbursable when the customer agrees to pay the cost for all the genuine and legitimate expenses. Or, it can be more like a FP type when the customer sets the limit.

Unit Price Contract. This type is less popular than the other three options and is also known as an hourly rate contract. It combines the elements of the FP and CR models, just like T&M. However, this option differs on setting the price per item or unit not per hour rate along with the receipts for all the resources used in the overall process.

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