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1. Introduction

On the Current situation economic growth has led to increasing deforestation and loss of biodiversity, accelerated urbanization, intensive animal farming, global travel - all factors known to increase the risk of zoonotic viruses jumping to human hosts and spreading with alarming ease.

Scientists and public health experts around the world have been warning us for many years that a pandemic caused by an unknown virus was not a matter of "if" but of "when", and that we needed to prepare. But, as German virologist Christian Dorsten pointed out, "there is no glory in prevention", and pandemic preparedness has not received the necessary resources or attention. Hopefully, this will change. Ultimately, the best way to reduce the risk of future pandemics is by avoiding a return to "business as usual". With the same aim to reduce the future risk I have come up with this project named "Guardian".

1.1. Problem Statement

On 23rd January 2020, the Nepalese government first identified covid-19 case on Nepal. With the raise of covid 19 and an unconditional lockdown was made by the governments against it. Coming out from home for any means of purposes was difficult for the peoples. This created more difficulties for the patients (aka customers) and pharmacies to sell their products. Likewise, being in a home whole day and spending time on digital gadgets had made children's, youths, and adults mental health ill.

The covid was the main key to remove the cotton covering this problem, the other problem is that not all persons are able to buy their medicines physically and attend their therapy session physically. For example, a disabled person or an aged person must be reliable to their caretaker or their family to buy them their medicines and drop them for their therapy session.

Similarly, whenever we visit hospitals where doctors prescribe us different shots of medicines. The prescription provided by the doctor aren't able to read by us(patients) most of the time which creates a lot of difficulties for patients to research and buy (if not heavy drugs) medicines without prescription.

1.2. Project as a solution

Being on the cart of health and wealth the solution for the above problem statement is a web application named "Guardian"

The Guardian acts as an online hub for pharmacies, counsellors, and its customers where pharmacies and counsellors can broaden their business by providing medicines and health related advise to their customers. Likewise for customers, the app works as an online medical store where they can order, research on their medicines prescribed by the doctors by uploading the perception sheet or by manually ordering the medicine and can take online therapy. Moreover, it connects customers with pharmacies and counsellors that offer medicines and therapy in their area and lets them choose, order, and pay online/offline.

Similarly, this also reduce the dependency of aged or disable people to their caretaker or family members. And lets patients(customers) know what types of drugs they are using.

2. Aims and Objectives

2.1. Aims and Objective

The main aim of this project is to provides physical and mental health services in all the areas of Nepal. The physical health services are provided by creating and online store where customers can place their orders and the mental health service is provided by the counselling therapy.

2.2. Objective

i.   Identifying and evaluating existing customers' needs and requirements.

ii.   Confirming the methodology for development.

iii.   Requirements gathering and confirming technical specification.

iv.   Design the website, use case diagram, database design, wireframes, sequence diagram, User Interface Design etc.

v.   Development of the website.

vi.   Creating AI model to read prescription.

vii.   Testing and Client review.

viii. Creating the documentation for the website.

3. Expected Outcomes and Deliverables

The application is supposed to be an open-source application. It is a web-based system. The System provides interaction between the customers, counsellors, and pharmacists.

Customer

- The customer shall be able to view different medicines and learn about their uses, side effects and so on.
- The customer shall be able to select their nearby pharmacy and can place their order.
- The customer shall be able to upload prescription.
- The customer shall be able to search medicines with different filters.
- The customer shall be able to share their location.
- The customer shall be able to view their invoice.
- The customer shall be able to view different counsellor
- The customer shall be able to book therapy session.
- The customer shall be able to view their paper prescription on pdf.
- The customer shall be able to search their medicine and know more about its uses, side-effects and so on.
- The Customers will be able to get weekly newsletters.

Pharmacist

- The pharmacist shall create their own pharmacy details.
- The pharmacist shall be able to upload images and add different medicines into their medicine.
- The pharmacist shall be able to view customers prescription and send them digital document of the prescription.
- The pharmacist shall be able to view customers feedbacks and requests
- The pharmacist shall be able to view customers requested location.

Counsellor

- The counsellor shall be able to create counselling portal.

- The counsellor shall be able to upload their documents.

- The counsellor shall be able to view customers' requests.

- The counsellor shall be able to upload their visiting time.

- The counsellor shall be able to conform customers sessions.

The pharmacist and Counsellors will be able to use the customers features as well. Similarly, the features will be added with time if needed.

4. Project risks, threats, and contingency plans

S/N	Risk and threat	Probability	Contingency plan
1	Exceeding timeframes	High	Using Agile model to track the time and giving regular updates of project.
2	Data migration	Medium	identifying and specifying all the data before importing it into the website and doing some research.
3	Cross-browser compatibility	High	By following the Cross-browser issue solutions and constantly checking the compatibility in different browsers.
4	Untracked changes in code	Medium	Using Git Hub and constantly pushing and pulling the changes.
5	Coding Error during development phase	High	Research on the topic and implement the TDD method.
6	Testing and debugging	Medium	Research and seek guidance.

Table 1: Projects risks and threat with its probability and contingency plan.

5. Methodology

The Project methodology offers a clear project roadmap that lists all the steps required to deliver a project successfully. These project methodologies provide a defined governance structure, process guidelines, test activities, processes, and deliverables. They take a well-detailed, rigid, and repeatable approach towards project management.

5.1. Considered Methodologies

For this project, I opted for two frameworks of agile software development methodology. They are:

i.   Extreme Programming Framework
ii.   Scrum for One Framework

5.1.1. Extreme Programming Framework

Extreme programming (XP) is an agile software development methodology used to implement software projects. XP is designed to use face to face human communication in place of written documentation wherever possible. Effective conversation is faster and more effective than written documentation. When you bring people together, they need less paperwork.

The core of Extreme Programming (XP) is the interconnected set of software development practices.

- The Planning Game
- Small Releases
- Metaphor
- Simple Design
- Testing
- Refactoring
- Pair Programming
- Collective Ownership
- Continuous Integration
- 40-hour week
- On-site Customer

- Coding Standard

Even though with time Extreme Programming (XP) Practices have changed a bit since they were initially introduced.

While it is possible to do these practices in isolation, many teams have found some practices reinforce the others and should be done in conjunction to fully eliminate the risks you often face in software development. (Wells, 2013)
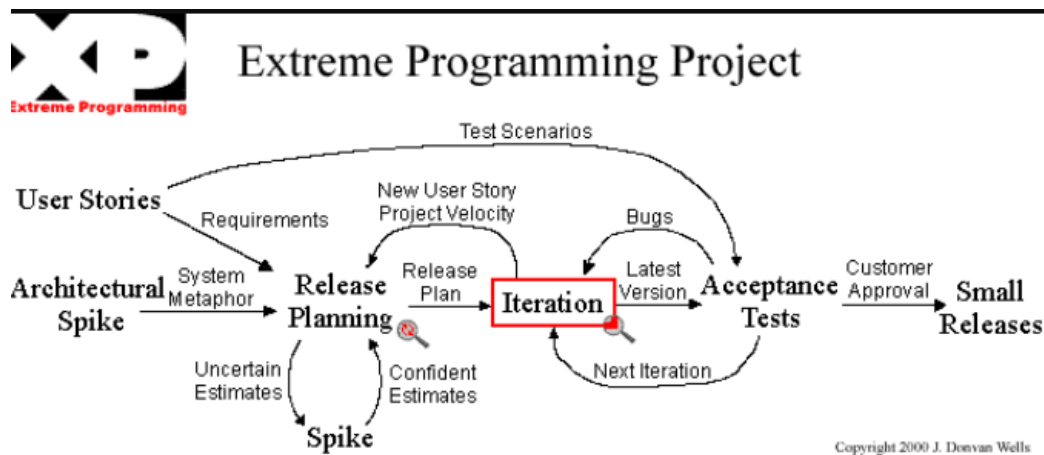

Figure 1: XP Project cycle

5.2. Selected Methodologies

5.2.1. Scrum for One Framework

Scrum is one of the dominant Agile frameworks which has a set of guidelines that manage the development of product. Methodology is iterative, measurable, and incremental, since it focuses on really tightening up development cycles, which are based on scope that is divided into smaller tasks amounts of effort called sprints, rather than extensive planning, building, testing or deployment.

Scrum Characteristics

- Small self-organization team: Responsibilities are discussed among all the members of the team.
- Less documentation: To the point, user stories are used.
- Regular and frequent customer feedback: Customer closely works with the team.
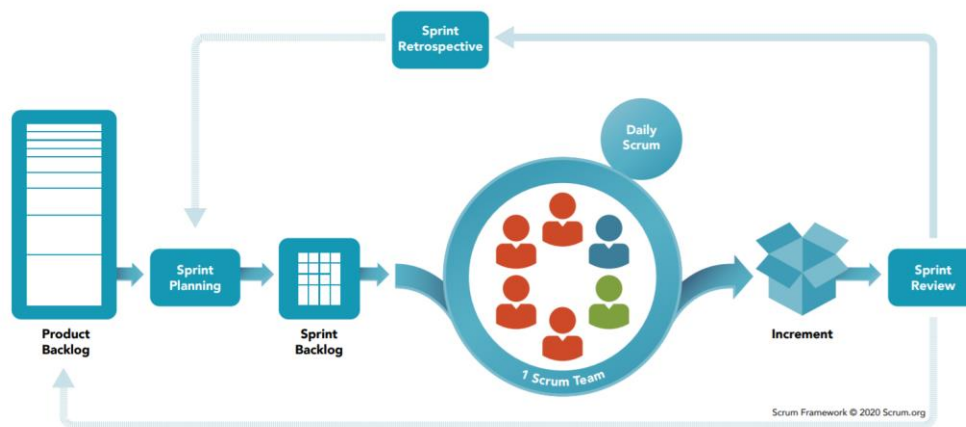- Decentralization: Decision making is easy.

Figure 2: Scrum Project Cycle

In Scrum, Sprint is the heart of the Scrum activity. In every sprint, the time frame of one weeks or one month is given to deliver the increment. The times allotted for each activity need to be consistent throughout the project. The next sprint can be executed as soon as the previous sprints have been completed. The Sprint includes:

- Sprint Planning
- Daily Scrums
- Sprint Review
- Sprint Retrospective

  In Sprint Planning the scrum team collaboratively makes plan to execute it in the sprint. The duration of the sprint is also planned. The two thing that are discussed in this planning is:

  What needs to be delivered?

  How to execute the work

The daily scrum is a short standing meeting held to synchronize the activities. Each person describes what has done already and what is going to be done for the project.

The sprint is reviewed at the end of every sprint. The scrum team and other stakeholders review the sprint that has been released, so then changes are reviewed, creating value to the project. The objective of the sprint review is to adjust the feedback and move towards progress in a collaborative manner.

The sprint retrospective occurs after the sprint review but before planning begins for the next sprint. It is an hour-long meeting. Its purpose is to combine what has been learned from the recent sprints and identify significant items which could be developed to improve the project.

Scrum Artefacts

Product Backlog

In Scrum, the product backlog is a single document that outlines every requirement of the project to be implemented. Product backlog can also be thought of as a to-do list which produces deliverables, has business value and is maintained by the product owner on the basis of business value.

Sprint Backlog

These are the specific items that need to be implemented in the sprint and which come from the product backlog.

Increment

A sum of all product backlog items that have already been completed is known as the increment. However, it is the up to the product owner as to when an increment has to be released, and it is a team responsibility to make sure that the increment release process is smooth.

(Scrum.org, 2021)

Why Scrum?

The scrum provides the framework for the continual feedback and exposure to make sure that the quality is as high as possible. The scrum helps ensure quality by defining and elaborating the requirements so that the knowledge of product features is as relevant as possible, conducting sprint retrospectives, allowing the scrum team to continuously improve such team-specific factors as processes, tools, relationships, and work environments. It also increases customer satisfaction, improves progress visibility and exposure, reduce project risk and much more.

Thus, the scrum is selected.

6. Resources Requirement

Every project needs resources for its completion. Similarly, for this web application the required hardware and software resources are listed below:

- A pc with OS windows 8 or higher else mac9
- Programming language: JavaScript, Python
- Framework: Django
- HTML, CSS and bootstrap for frontend
- Postgres as database
- Visual Studio Code as code editor
- Microsoft Word for documentation
- Draw.io for drawing various diagrams and
- Dummy data of customers, pharmacy and counselor.
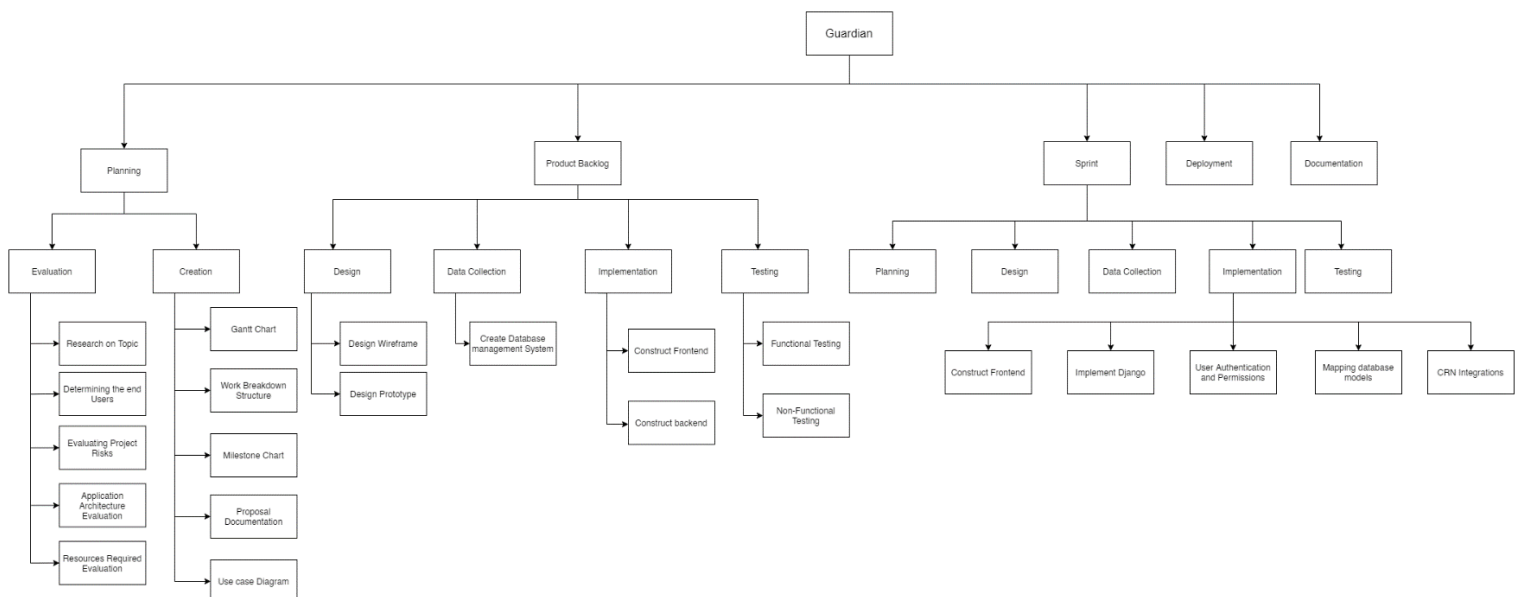
7. Work Breakdown Structure

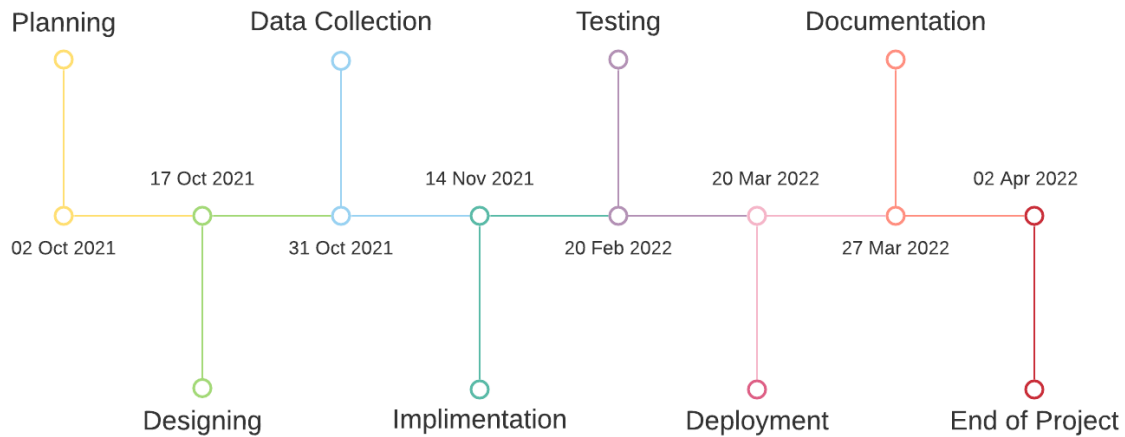
Figure 3: Work breakdown Structure

8. Milestone

Figure 4: Project Milestone

9. Project Gantt Chart

Figure 5: Project Gantt Chat

10. Conclusion

As we know business doesn't remain as usual. With time it keeps changing, so to adapt with current business on health issues this web application will be able to serve its customers as it aimed.

Mentioned in the project outcomes and deliveries the project doesn't remain within the points written, the projects keep adapting the changes. The current outcomes focus on the present difficulties faced by the peoples, pharmacists, and counsellors. Out of the mentioned problems in problem statement some of the traditional problems are also solved like it creates flexibility for customers, pharmacists and counsellors, Faster buying process, learning about medicines and its side-effect's, uses and much more similarly the blog creates awareness regarding the specific topics.

Agile methodology is the best suit for this project since it is an iterative development cycle, where requirements are refined regularly by breaking down the work, have highly collaborative working style of the team and the Agile Software allows delivering working software quickly and more frequently, allowing teams to break the lengthy requirements, build, and test phases down into smaller segments. Out of different framework of agile methodology I choose scrum for one as its features supports the project. The scrum has a capability of adapting itself to changing market conditions and incorporates those changes in the product development cycle even late during the development process. The Scrum process focuses on responding quickly and efficiently to changing environments and assimilating those changes in the product design. (Scrum.org, 2021)

With proper execution and effort, the project can be completed according to the time mentioned in the Gantt chat and can be used to deliver the aimed results.

11. References

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