Module Code & Module Title

CS6P05NI Final Year Project

Assessment Weightage & Type

5% FYP Proposal

Semester

2023 Autumn

PROJECT TITLE: MyTutor Nepal

Student Name: Prasanna Bahadur Chand

London Met ID: 22015727

College ID: np01cp4s220183

Internal Supervisor: Prithivi Maharjan

External Supervisor: Prajil Shrestha

Assignment Due Date: 29th November 2023

Assignment Submission Date: 29th November 2023

Word Count (Where Required): 1803

Prasanna Bahadur Chand

Table of Contents

Prasanna Bahadur Chand

Prasanna Bahadur Chand

Table of figures

Prasanna Bahadur Chand

MyTutor Nepal

1 Introduction

This project focuses on delivering a learning platform through a web application in which people can hire tutors for a month. Tutors can register through a form where they can select their field of expertise, location and other necessary information in a form. After submitting necessary documents, the admin registers the tutor into the system. The user of the application selects necessary flairs which if matched with the tutor's expertise, recommends relevant tutors. The system displays the tutors to the user along with their information such as availability, initial pricing and rating. The user books a tutor and can send additional information relevant to their needs and the tutor gets a request along with the location of the requester. The tutor can adjust their final price based on this detail and the reply is sent back to the user. After both parties come to an agreement, tutoring lessons can now begin with a three-day trial phase. During this period, if payment is done, lessons will continue for a month otherwise if tutoring service is unsatisfactory users can cancel the tutoring service. The application additionally will include a feature where teachers can assign homework to the students and grade them. Parents can monitor their children's progress through the parent panel.

1.1 Problem Scenario

- Lack of personnel whose experience doesn't meet student's study needs and criteria.
- Difficulty locating a tutor in close proximity which could delay tutoring sessions.
- Lack of well managed platform for students to find tutors.
- Tutoring services can be expensive with some tutors charging more than others.

Prasanna Bahadur Chand

1.2 Project as a solution

- This application displays all the qualifications of a tutor in their profile. Tutor's rating and review is also made public. Users can view them before booking. An AI review is also done using sentiment analysis.

- The application will allow both parties to view each other's location. Users are free to choose nearby tutors if that is their preference.

- Although there are platforms like MeroTutor for booking tutors, they have tutors who are inactive or have stopped using the platform. To solve this problem, tutors can select their activity status in which case they do not get recommended.

- This application makes it easy to hire tutors by recommending tutors each with their own initial pricing. Students can pick from a wide range of choices to make it affordable for them.

2 Aims and Objectives

2.1 Aim

The aim of this project is to create a reliable web application which provides a platform for students to find and connect with qualified tutors based on their specific needs.

2.2 Objectives

The objectives of this project are:

- To build a user-friendly interface which allows users the perform operations with simplicity.

- To include parental involvement in the student's academic activities.

- To assist tutors in finding and teaching students.

- To help users find the right tutors through AI assisted rating system.

- To help tutors and users decide on a non-negotiable price.

Prasanna Bahadur Chand

3 Expected Outcomes and Deliverables

After the completion of the project, the web application is expected to allow users to book tutors with ease. The payment system and location finding process will be made convenient with the use of this application. The complete feature sets of the application after completion are listed below:

- Authentication model consisting of login, register, signup, forgot password and password change.
- Users can become tutors using the application.
- Find a tutor with the help of filters and flairs and provide a location. Tutor can adjust price when they get a request which overrides their initial price.
- Payment feature once booking is complete. Payment will be accepted for up to three days.
- Google maps API to help visualize location.
- Rating system with sentiment analysis.
- Tutors can update their profile to showcase their experience and achievements.
- Notification for tutors, parents and students.
- Tutors can provide assignments and grade them once completed. Assignments will have difficulty level.
- Parents panel where they can view students' completed or pending assignments as well as the grades. They can also provide feedbacks.
- Teacher panel where they can view active students, pending orders and provide and grade assignments.
- Admin panel to register teachers to the database, ability to deactivate or suspend users and view financial records

Prasanna Bahadur Chand

4 Project risks, threats and contingency plans

4.1 Project risks and threats

- **Technical issues** – Technical issues such as bugs, server failure or other issues may result in downtime and affect the availability of the platform.
- **Tutor credibility** – There is a risk of tutor not being credible or qualified to teach the student and there may arise a concern for security with a risk of fraudulence in payment.
- **Data security and vulnerability** – Risk of sensitive information of users such as password or payment details can be breached by malicious attackers.
- **Time constraint** – There may be insufficient time to complete the project within the given deadline.
- **Hardware failure while building the application** – There is a risk of failure of hardware on which the application is being developed.

4.2 Contingency plans

- **Technical issues –**
    i. **Bugs –** Proper testing will be conducted before deployment.
    ii. **Server failure –** Using a strong and powerful computer that can act as the server when deploying the application.
- **Tutor credibility -** Tutors will provide necessary documents and qualifications before registering as a tutor which will have to be approved by admins. These documents are made available on the tutor's profile. Payment will only be done upon completion of the first session.
- **Data security and vulnerability –** I will implement robust security measures such as encryption and secure authentication approach using JWT.
- **Time constraint** – I will reach milestones specified in the Gantt chart on time and follow a well-defined plan to prioritize and develop core features specified by the requirements.

- **Hardware failure while building the application** – I will regularly upload my code in GitHub to avoid any loss of progress and use a backup computer in case of failure in the primary hardware device.

5 Methodology

5.1 Considered methodologies

5.1.1 Prototype methodology

In this methodology, first the requirements are gathered and the client writes down what is expected from the system. Then, a prototype is built, showcasing the interface and functionalities of the product and shown to the client. The client evaluates the strengths and weaknesses of the design and provide necessary feedback. The prototype will be improved as per the feedback and suggestions of the client. This process may be repeated until the prototype is approved. After the prototype is approved, the system is engineered and tested.
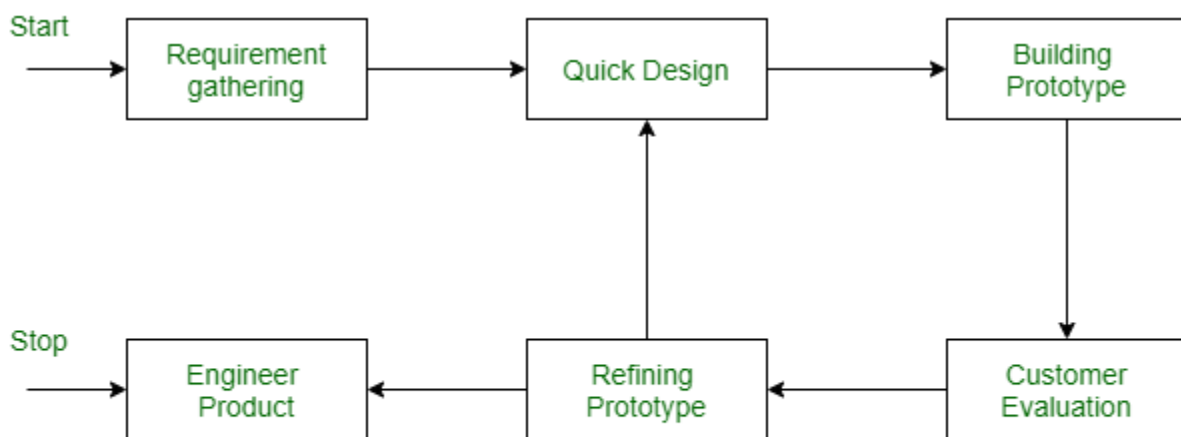
Figure - Prototype Model

Figure 1: Prototype Model (Upadhyay, 2022)

Prasanna Bahadur Chand

5.1.2 Spiral methodology

The spiral model is an iterative model consisting of four stages where objectives are first determined and requirements are gathered and alternate solutions are proposed. After significant risk analysis and resolving, the actual features are implemented and tested. Although good for large scale projects with high possibility of risks, this model is not picked for the following reasons:

- The risk analysis in each phase is time consuming.
- More documentation is required than other projects.
- Project deadlines can be missed since number of phases in not known early.

(Rana, 2021)
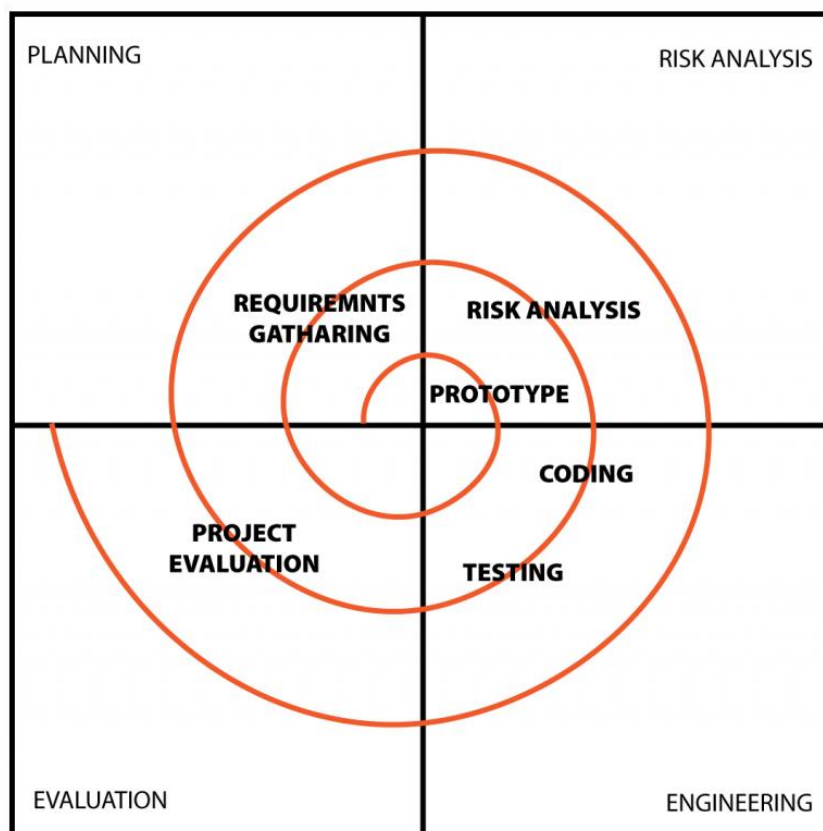
Figure 2: Spiral model (What's Spiral Model? Advantages and Disadvantages, 2019)

Prasanna Bahadur Chand

5.2 Selected methodology

5.2.1 Evolutionary Prototype Model

In this model, an initial prototype of the final product is developed and shown to the client for feedback. The client tests the prototype and provides feedback. The prototype is refined based on the feedback. This process goes on and on until a final prototype is developed. When the client finds the prototype satisfactory, this process can stop. The development process begins after completion of the final prototype. Then, the system is tested and deployed. This approach is beneficial in projects where requirements are not fully understood or can be changed during designing. The reasons for choosing this model are:

- **Flexibility** – This model is very flexible so I can refine the design in each prototype to meet the client's need.

- **Easy to detect errors** – Errors can be detected early in prototype phase rather than during development which will save me a lot of time early on.

- **Client Interaction -** Client interaction is present every prototype stage which leads to a better development of the application.

- **Easy to build the system** – Development of the application is easier once the design is outlined before development.

- **Customer Satisfaction** – Customers are satisfied as they know what to expect.

(Upadhyay, 2022)

Prasanna Bahadur Chand

6 Resource and Requirements

The tools and technologies to be used are as follows:

6.1 Design

- **Figma** – Figma is a powerful designing tool that is widely used for designing an interface for web applications. It will be used for designing the wireframes and develop prototypes for the application.

6.2 Programming language

- **JavaScript** - JavaScript is a programming language widely used to make web pages interactive. It will be used primarily throughout the development of the application.
- **Python** – Python is a programming language used for general purpose programming. It will be used for AI integration.

6.3 Framework and libraries

- **ReactJS** - Main library for frontend. It will be used for developing UI in a well-managed manner by breaking down elements of the UI into reusable components.
- **Chakra UI –** Chakra is a component library built into React that provides pre-defined and styled but customizable HTML elements. It will be used to design the UI for the application.
- **NodeJS –** NodeJS is a JavaScript runtime environment which will serve as the foundation for backend development in the application. It will be used to handle requests, manage databases and executing server-side logics.
- **ExpressJS –** ExpressJS is a framework of NodeJS which will be used in my application for routing, running middleware, handling HTTP requests, etc.

6.4 Database

- **MongoDB** – MongoDB is a non-relational database that uses JSON-like format to store data and develop scalable applications.

6.5 IDE

- **Visual Studio Code** – Visual Studio Code is a text editor that will be used to write code throughout the development of the application.

Prasanna Bahadur Chand

7 Work Breakdown Structure

Figure 3: Work Breakdown Structure

Prasanna Bahadur Chand

8 Milestones

Project Kickoff — 26th Nov 2023
Second prototype completion — 10th Dec 2023
First prototype completion — 10th Dec 2023
18th Dec 2023
Final prototype completion — 31st Dec 2023
Development begins — 1st Jan 2024
Frontend completion — 25th Feb 2024
Database integration completion — 11th Mar 2024
Backend completion — 26th Mar 2024
AI integration completion — 30th Mar 2024
Testing and optimization completion — 6th Apr 2024
Report completion — 16th Apr 2024
Deployment — 20th Apr 2024

Figure 4: Milestone

Prasanna Bahadur Chand

9 Gantt Chart

MyTutor Nepal
Read-only view, generated on 28 Nov 2023

	ACTIVITIES	START	DUE
	Initiation and Research:	**18/Oct**	**25/Nov**
1	Finallize topic	18/Oct	18/Oct
2	Research and strategy planning	19/Oct	06/Nov
3	Requirement Gathering	07/Nov	25/Nov
	Prototype 1:	**26/Nov**	**10/Dec**
5	Design Prototype	26/Nov	08/Dec
6	Testing protptype	09/Dec	09/Dec
7	Client review	10/Dec	10/Dec
	Prototype 2:	**11/Dec**	**20/Dec**
9	Refine previous prototype	11/Dec	18/Dec
10	Testing prototype	19/Dec	19/Dec
11	Client review	20/Dec	20/Dec
	Prototype 3:	**21/Dec**	**01/Jan**
13	Final prototype after refinement	21/Dec	29/Dec
14	Testing prototype	30/Dec	30/Dec
15	Client review	31/Dec	31/Dec
16	Implementation of prototype	01/Jan	01/Jan
	Development phase:	**01/Jan**	**30/Mar**
18	UI Design for user	01/Jan	31/Jan
19	UI Design for tutor panel	01/Feb	10/Feb
20	UI Design for admin panel	11/Feb	17/Feb
21	UI Design for parent panel	18/Feb	25/Feb
22	Database Intergration	26/Feb	11/Mar
23	Backend Integration	12/Mar	26/Mar
24	AI Integration	27/Mar	30/Mar
	Optimization:	**31/Mar**	**06/Apr**
26	Code cleaning	31/Mar	02/Apr
27	Unit testing	03/Apr	05/Apr
28	Compatibility testing	06/Apr	06/Apr
29	Performance testing	06/Apr	06/Apr
	Project Finallization:	**07/Apr**	**20/Apr**
31	Report writing	07/Apr	16/Apr
32	Deployment	20/Apr	20/Apr

Figure 5: Gantt Chart

Prasanna Bahadur Chand
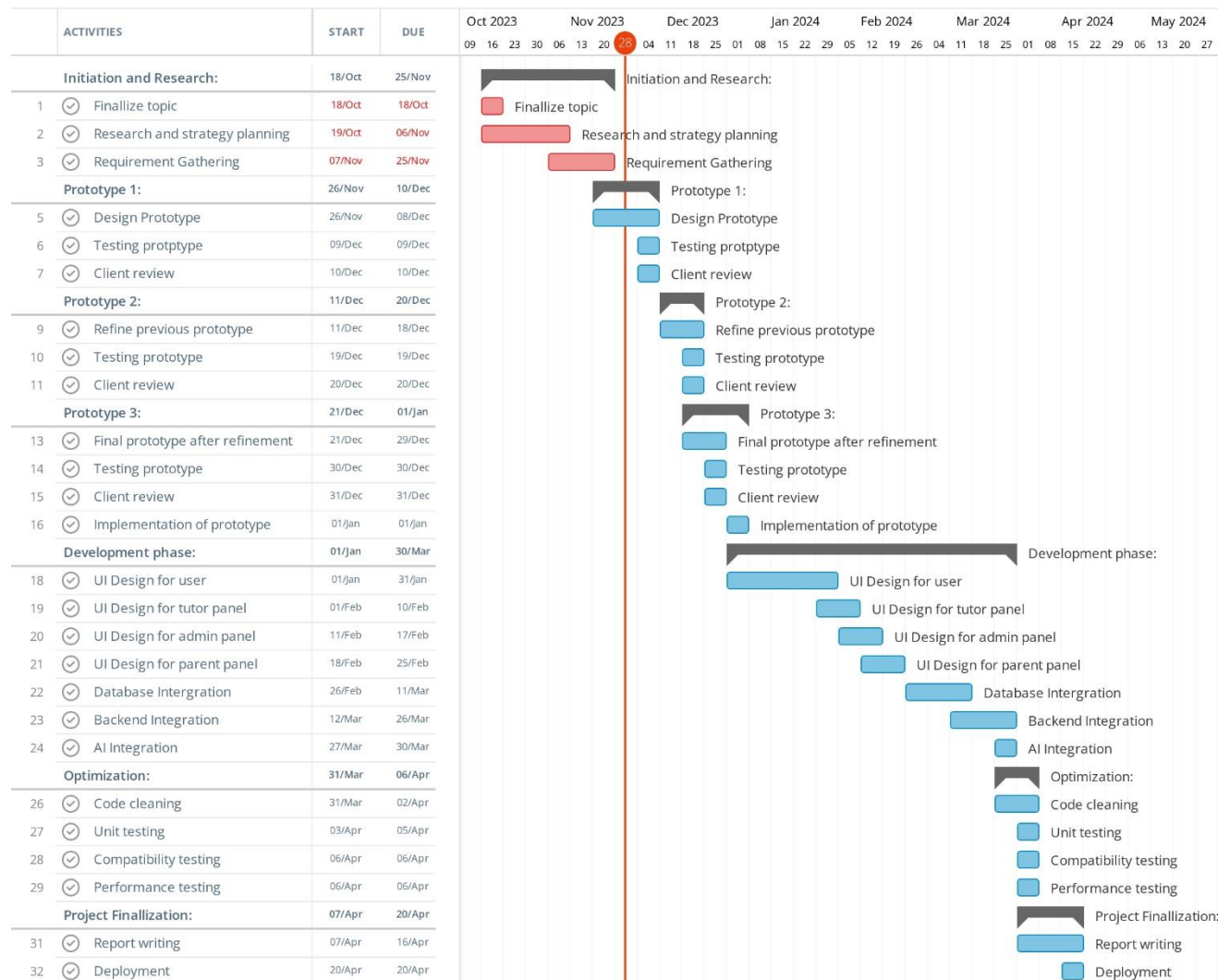
10 Conclusion

In conclusion, this project addresses the challenges faced within Nepal's education system by developing a web application that facilitates easy access to qualified tutors. The application will provide a user-friendly interface to simplify booking a tutor by providing locations, simplifying payment procedure, an AI assisted rating system to help find the right tutor. The app will take proper measures will be taken to prevent any chances of fraudulence. With the implementation of a three-day trial phase users can not only prevent monetary loss in case of unsatisfactory service but also be safe from fraudulence. The project will be implemented using the evolutionary prototype model enabling iterative improvements through client feedback. Through its user-centric approach, emphasis on security, and commitment to quality, the project aims to significantly improve the accessibility and effectiveness of education in Nepal.

Prasanna Bahadur Chand

11 Bibliography

Rana, K. (2021, April 28). *Spiral Model - Definition, Phases, Advantages and Disadvantages*. Retrieved from ArtOfTesting: https://artoftesting.com/spiral-model

Rauniyar, R. (2022). By the time they reach Grade 12, as much as 66.9 percent students drop out. *myRepublica*.

SDLC - Waterfall Model. (n.d.). Retrieved from TuorialsPoint: https://www.tutorialspoint.com/sdlc/sdlc_waterfall_model.htm

Software Engineering | Prototyping Model - GeeksforGeeks. (2023, November 1). Retrieved from GeeksforGeeks: https://www.geeksforgeeks.org/software-engineering-prototyping-model/

Talib, Y. Y. (2018, July). *Waterfall Methodology*. Retrieved from ResearchGate: https://www.researchgate.net/figure/Waterfall-Methodology_fig1_326412659

Upadhyay, R. (2022, December 2). *Advantages and Disadvantages of Prototype model - Geeksforgeeks*. Retrieved from Geeksforgeeks: https://www.geeksforgeeks.org/advantages-and-disadvantages-of-prototype-model/

Wagle, P. (2022). Issues with Higher Education Sector in Nepal. *NiPoRe*.

What's Spiral Model? Advantages and Disadvantages. (2019, May 20). Retrieved from testbytes: https://www.testbytes.net/blog/spiral-model-advantages-and-disadvantages/

Prasanna Bahadur Chand

12 Appendix

12.1 Problem Scenario

The quality of education remains a major concern and is considered poor by many. For students that graduate high school from a remote district, there is a need to move to a bigger city. Among those who enroll into higher education, graduation rate is low. Tribhuvan University, with more than 75 percent of students within the country, had a pass rate of 26.6 percent in 2015/16 and 26.1 percent in 2019/20. (Wagle, 2022) Although there may be several reasons for this, the quality of education is also responsible to some extent. The challenging course design is also a reason for many students to drop out of schools. As of 2022, 85 percent of the budget allocated for education is spent on the teachers' salaries and allowances, so the amount is insufficient to increase the quality of education. (Rauniyar, 2022)

12.2 Considered methodologies

12.2.1 Waterfall methodology

Waterfall methodology is a linear model in which each phase needs to be completed before the next phase can begin. Though it is a simple model, it is mostly suitable for small scale projects. Waterfall was not picked due to the following reasons:

- It is risky because it has limited flexibility for changes. Alterations in requirements is difficult once project is underway.
- Working software is not produced until later in the life cycle which means there is no room for user input and feedbacks.
- It is a poor model for complex and long going medium and large scale projects.
- Testing and validation is done during the end of the project which means bugs and other issues are not detected until later in the project.
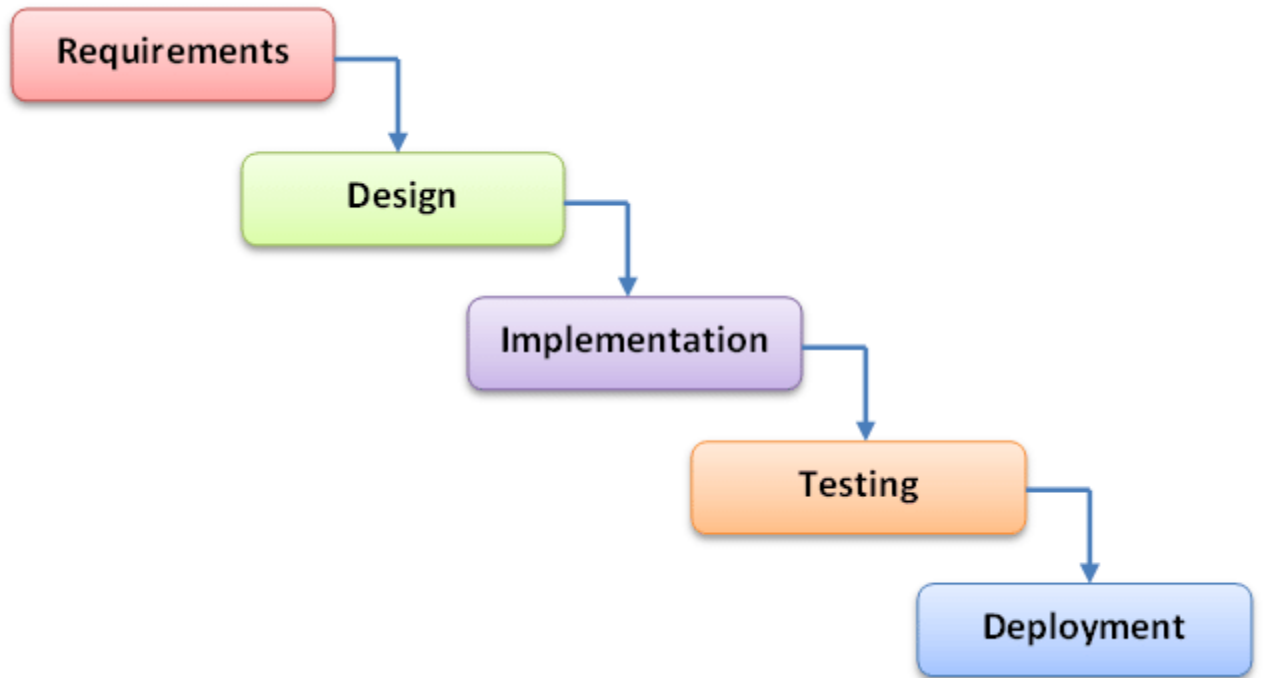 (SDLC - Waterfall Model, n.d.)

Prasanna Bahadur Chand

Figure 6: Waterfall methodology (Talib, 2018)

Prasanna Bahadur Chand