# Introduction

Webapps have revolutionized the way we use the internet. Initially web browsers could only render simple HTML contents. However, nowadays browsers are powerful enough to run even heavy 3D RPG games, thanks to the JavaScript engines built into browsers. People use the internet very frequently, making it the perfect platform for reaching a huge mass of people. Several businesses in Nepal have already moved or have been moving to the internet for that reason. The beauty of webapp is that it runs on any platform so long as you have an internet connection and a browser, be it IOS, Windows, Android, Linux, or any other OS. Using a webapp, both the tenants and landlords can find one another more easily and communicate before having an on-site meeting. This helps both the tenants and landlords in screening the available options.

The pandemic made people more aware and enthusiastic for cashless payment options. While managing rents looks trivial, it can get out of hand very quickly if you own multiple properties to rent. Besides, traditionally, people either do not keep a record of the rents they push or pay; or record it on paper. Keeping a record of rents is extremely useful as it can provide statistical benefit. Comparing the rents paid for different houses can give one an idea on what the market is offering them which can be used in decision making while searching for rents. On the flip side, keeping tabs of bills pushed or rent collected can be valuable to landlords to gauge what people are willing to pay and what their property’s worth should be to tenants. By keeping record of rents paid/collected, the users can make educated guesses about what properties are worth and what amount they should be paying.

This is where Rent Management WebApp (Tarif) comes to play. The webapp makes it easier to find rentable houses/flats and tenants by displaying all the rents available in the user’s vicinity in google map. It provides multiple options to both tenants and landlords along with reviews and ratings to help in screening from among the options. The webapp helps the landlords to push bills to tenants. It does so by allowing the landlords to make a bill template by selecting from available billing criteria such as monthly rental, water fees, electricity fees, waste disposal service fees, etc. which can then be used to push bills to the tenants. The webapp helps not only the landlords, but also helps the tenants to pay it via cashless methods if they so desire. The webapp also visualizes the rental data of landlord or tenant to them through graph so that they can make educated decisions on their rental journey.

# Problem Scenario

The problems that the webapp intends to solve are as follows:

1. Finding a rent or finding a tenant is very difficult given the limited means of reaching out to one another in Nepal.
2. People are opting to spend money via cashless means due to the pandemic. However, house rents are paid mostly via cash when the landlord visits the tenant door to door.
3. Pushing consistent bills to tenants takes quite a bit of time as landlords mostly need to do all the calculations themselves, write it all down on a piece of paper, sign it, and manually send it to tenants.
4. While pushing a bill or paying a bill, most of the parties involved in house rents, do not keep track of the transactions being made. That is ignorance of data which could serve as a valuable asset in decision making.
5. Often there is no reliable way for screening available options of landlords and tenants. Thus, after a contract is signed, either party could end up stuck with a bad or unwanted company.

# Project as solution:

The project solves the aforementioned issues by the following means:

1. The app displays a google map-based view which helps users locate houses ready to be rented. Similarly, since the houses are now viewable in map, the landlords can find tenants more frequently.
2. The app provides a cashless means to pay rent if the user desires to do so.
3. The app supports development of a bill template which the landlords can then use to push consistent bills to all tenants.
4. The app keeps track of all rent related transactions and visualizes the data in form of graph so that the user can make educated decisions.
5. The app supports ratings and reviews which help in screening both tenants and landlords.

# Aims and Objectives

The major aims and objectives of this webapp are:

* To learn about web development and its required paradigms
* To learn about database designing in a real-world scenario
* To learn how restful APIs work
* To understand and customize google map component
* To better understand frameworks like react and Django
* To help tenants find reliable rent and help landlords find reliable tenants
* To help tenants and landlords make educated guesses based on previous data
* To provide tenants and landlords a reliable way to pay and push bills respectively

# Expected Outcomes and Deliverables

The expected outcomes and deliverables of the webapp are:

* Google Maps for navigation
  + Points out house available for rent
* Make and push bills as landlord
* Receive bills and Make payments as tenant
* Leave ratings on either party
* Keep track of payment amounts and dates
* Communication portal for connecting landlords to tenants
* Data visualization in graph for both landlords and tenants

# Risks and Contingency Plan

Some risks of the project are:

1. Backend server failure 1 3 (Impact Probability)
2. Security risks (Several attacks such as SQL injection, Cross site scripting, etc.) 1 2
3. Client requirement variance 3 2
4. Difficulty in gaining client approval after project completion 1 3
5. Natural Disaster 2 5
6. Technological complication 3 4
7. Insufficient resources 2 4
8. Insufficient technical skills 3 4
9. Infeasible deadline 2 2
10. Unexpected delay in bug-fixing 3 2

The impact and probability are determined on a scale of 1-5 where lower the value, higher the impact/probability.

# Methodology

To add:

SCRUM

Incremental Waterfall

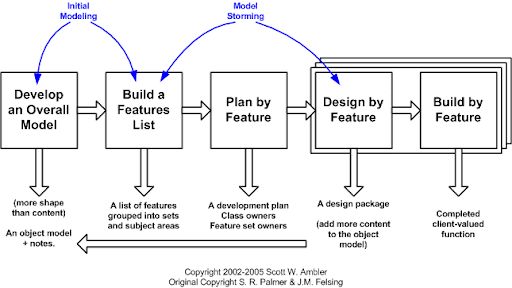
Prototype

DSDM

An Agile methodology for developing software, Feature-Driven Development (FDD) is customer-centric, iterative, and incremental, with the goal of delivering tangible software results often and efficiently (PlanView, 2021). As the name suggests, this methodology focuses more on features. In FDD, a feature is expected to be delivered every 2-10 days. The methodology is followed using the below steps:

* Develop overall model
* Build feature list
* Plan by feature
* Design by feature
* Build by feature

Instead of project milestones, FDD uses features to organize their activities. The first three steps are completed initially and the rest of the steps are repeated for every feature.



# Resource and Requirement

Some requirements of the project are:

1. A working Internet connection
2. A working computer capable of running a web browser, IDE, and other tools.
3. An IDE: “VS Code”
4. Tools

# WBS

1. Tarif
   1. Pre-Development
      1. Requirement Gathering
         1. User Requirement
         2. Technical Requirement
         3. Reporting Requirement
      2. Risk Analysis/Minimization
      3. Project planning and Documentation
         1. Project Proposal
            1. Gantt Chart
            2. Work Breakdown Structure
         2. Project Interim Report
   2. Develop Overall Project
      1. Design Basic App Wrapper
      2. Design Overall App Database
      3. Build App Wrapper
      4. Build Overall App Database
      5. Build functional API endpoints for App Database
   3. Develop Feature List
      1. Breakdown requirements into features
      2. Gauge feature development feasibility and further breakdown features
   4. Plan by Feature
      1. Group Features into feature sets and plan execution
   5. Design by Feature
      1. Design a feature
      2. Design Review
   6. Build by Feature
      1. Code the feature
      2. Code review
   7. Design by Feature
      1. Design a feature
      2. Design Review
   8. Build by Feature
      1. Code the feature
      2. Code review