

Team Ruby's QuestNest

CS410W - Lab #1: Version #1

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Version #1

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1.0 Introduction

Household chores are typically performed by one guardian but will commonly be assigned to their children as well (Lam, 2016). However, this system is not always perfectly executed and leads to children resisting the chores they are given, which results in tension building between the guardian and child (Lam, 2016). In modern times, this trend has become increasingly apparent. A survey conducted by Braun Research concluded out of 1,001 U.S. adults, 28% of these parents assigned chores to their children (Society for the Psychology of Women, 2017). This may cause concern, considering that research has shown an increase in school engagement, positive mental health in adulthood, and family cohesion, when children are tasked with completing chores around the household (Rende, 2015).

Families can be busy, and with that, parents will not make it their utmost priority to assign children chores. It is situationally dependent, but the fact is that it takes time out of their days to sit down in the morning, write a “traditional” chore-list for their children, stick it on the fridge, and hope their kids remember to look at it, let alone do it. Families need a process that consumes less time and gives the children a reason to remember.

QuestNest will be a gamified mobile application that seeks to minimize the stress of assigning and tracking chores for parents, while also creating a more enjoyable experience for their children.

2.0 Product Description

QuestNest is a cross-platform mobile application designed to help families manage chores through a fun and structured reward system. By turning daily responsibilities into interactive quests, the app motivates children to complete tasks while giving caregivers tools to assign, monitor, and customize chores with ease. Children earn experience points (XP) for completing tasks, level up through consistent participation, and unlock real-world rewards like extra screen time or special privileges. QuestNest includes features such as caregiver-managed verification, tiered incentives, reminders, and a shared family calendar to encourage consistency, accountability, and communication. The application promotes lifelong habits of responsibility while reducing household stress and improving family collaboration.

2.1 Key Product Features and Capabilities

QuestNest provides an engaging experience to users, for doing activities that are challenging. The application has a plethora of systems and features, which can all be accessed for free. The descriptions of what is provided can be found below, in Sections 2.1.x.

2.1.1 Gamified Chore Tracking and Experience Points System

Chores assigned by the parents will appear as quests to children. These quests will grant experience points (XP) as they are completed by the children as their reward.

2.1.2 Tiered Leveling System

As the child collects XP, they will level-up in the tiered leveling system. Rewards that were previously inaccessible, can then be accessed by the child to redeem upon reaching their most-recent level. The goal of this system is to allow the child to have long-term interest in completing their chores, in hopes of collecting their new rewards.

2.1.3 Collaborative Family Rewards

As previously noted in Section 1.1, when the chores fall on one person, typically the parent, there are tensions arisen between themselves and the others in the household that do not contribute. The collaborative family rewards can be reached by quests assigned to the whole family to contribute towards. Upon completion of the quests, the experience will fill the contributor's progress bar, as well as the family's progress bar to reach their shared reward.

2.1.4 Customization

The guardians will have administrative access to customize and give the quests and rewards to the assigned individuals, or group. This would include details such as the task type, task objective, XP rewarded, reward XP costs, and the rewards themselves.

2.1.5 Validation and Verification

The validation and verification of completed chores will be enforced by photo/video proof taken by the children. This evidence will be submitted in the app and reviewed by the guardian. Once reviewed, the parent can either approve the child's work which will grant them their XP, or reject the work which will notify the child to redo their assigned quest and resubmit upon completion.

2.1.6 Shared Family Calendar and Notifications

QuestNest will provide a familial calendar, which everyone can upload their daily chores, events, and important dates. The goal is to reinforce family organization and individual responsibility.

2.2 Major Components (Hardware/Software)

QuestNest will be developed as a cross-platform mobile application using Python 3.13.5. The application will adopt the Model-View-Controller (MVC) architectural pattern to ensure an organized codebase and assert strict responsibilities to each technology/class. The project's workflow and organization can be seen with the major functional components below (Figure 1).

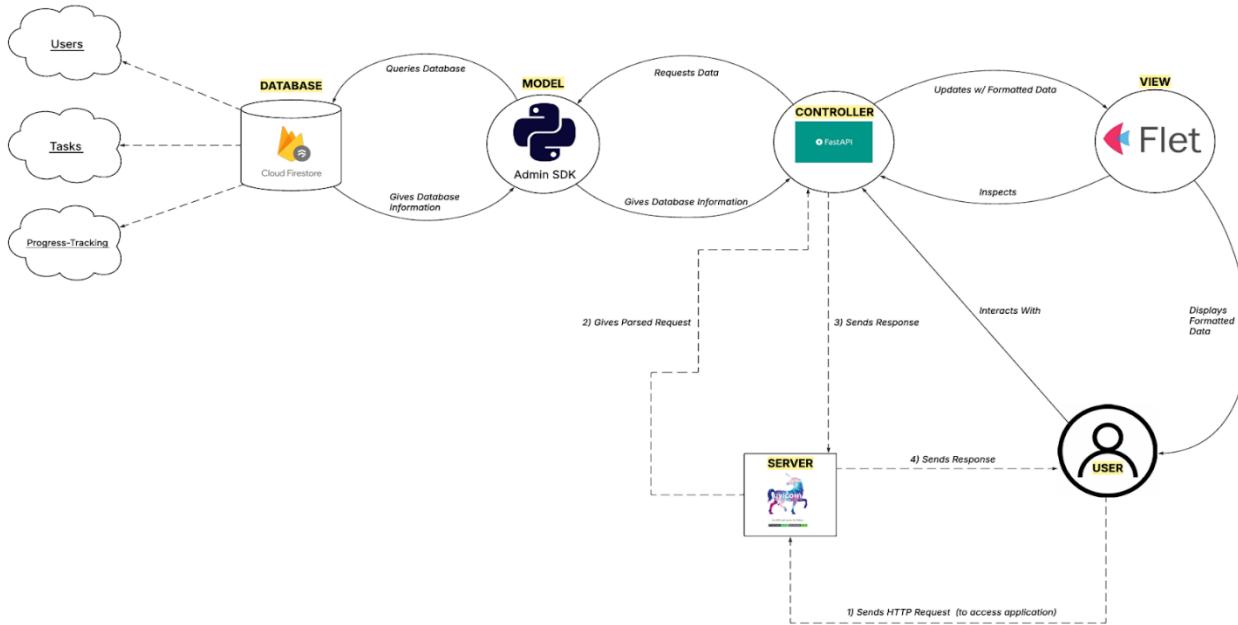


Figure 1: Major Functional Components Diagram

2.2.1 Model

The *Model* layer is responsible for handling the application's business logic and database interactions. QuestNest will use Google Firestore, a cloud-based NoSQL database, capable of multi-platform hosting and quick real-time updates. The model will use the Python Admin SDK to query and interact with the Firestore database directly.

2.2.2 View

The *View* will manage the visual presentation of the application. It formats and displays data from the database. The app will utilize Flet, a Python framework built on Flutter. Flet

supports multi-platform development and enables the creation of an appealing UI for users of all ages.

2.2.3 Controller

The *Controller* serves as the central coordinator of the application. The model and view will not have any interaction with one another and are handled solely by the controller. It serves as a middleman for communication between the two, and the device is to be interacted with by the user. It will "ask" the model for information pertaining to the database, then allow the view to receive that data in a defined fashion.

The controller will also need to carry the load of work to be done for the back end, but this cannot be done easily with Python alone. FastAPI is a framework that will connect all the components. It will follow the protocols and procedures of RESTful API, allowing the establishment of endpoints for user's navigation needs, and interacting with the web server while also providing quick performance.

2.2.4 Web Server

Uvicorn will serve as the web server, which will receive the user's request, parse through its data, give that data to FastAPI, then receive the response and deliver it to the user for access. It is a tightly integrated dependency of FastAPI and works seamlessly with Flet.

3.0 Identification of Case Study

QuestNest is designed to create a fulfilling game out of doing chores, while still maintaining the notion of consistency and accountability for all users. These users would include all members of the family, such as the guardians/parents who want to build good habits for their children, and the children who are having fun taking tasks off of the plate of their parents and reaping the rewards for it. This environment will help to alleviate the stress of busy families struggling to maintain the upkeep of their household.

In the future, QuestNest may be suitable for use in settings where positive behaviors and habit building can be rewarding and rewarded for their efforts, such as a classroom.

4.0 Glossary

Experience Points (XP) - points awarded as a progression indicator.

Collaborative Family Reward - collaborative custom chores awarded if all members of the family complete their assigned tasks.

Push Notification - an alert received from an application to notify when there is a new event or message to view.

5.0 References

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