

QuestNest

Prototype Design Presentation

Complete Tasks. Level Up. Earn Rewards.

Teach responsibility with a system kids love and you control



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Meet the Team



Caitlyn Heath



Uzziel Vea-Linares



Natalie Avila



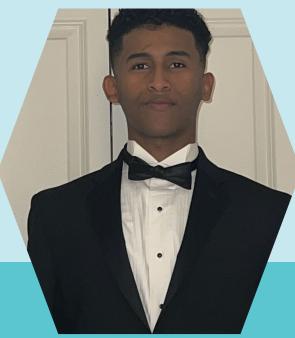
Ejara Dinku



Colin McGowan



Kanaan Graham



Mohumed Shemson



Junsen Huang

Problem Statement

Parents struggle to assign and follow up on chores effectively, especially in busy families. Traditional chore charts often fail to provide the necessary structure or engagement to promote consistency and accountability.



What is Needed?

Families need a positive and structured system to balance responsibilities and build better habits in an engaging way.

Problem Characteristics

Chores usually fall on one parent or caregiver, often leading to parent-child conflict when children resist taking on tasks or when there is no shared agreement on how chores should be distributed (Lam, 2016).

Braun Research found that out of 1,001 U.S. adults, only 28% assigned chores to their children (Society for the Psychology of Women, 2017).

Benefits of Household Chores

Research by Rende (2015) displays an increase of school engagement, positive mental health in adulthood, and family cohesion when children are assigned chores.

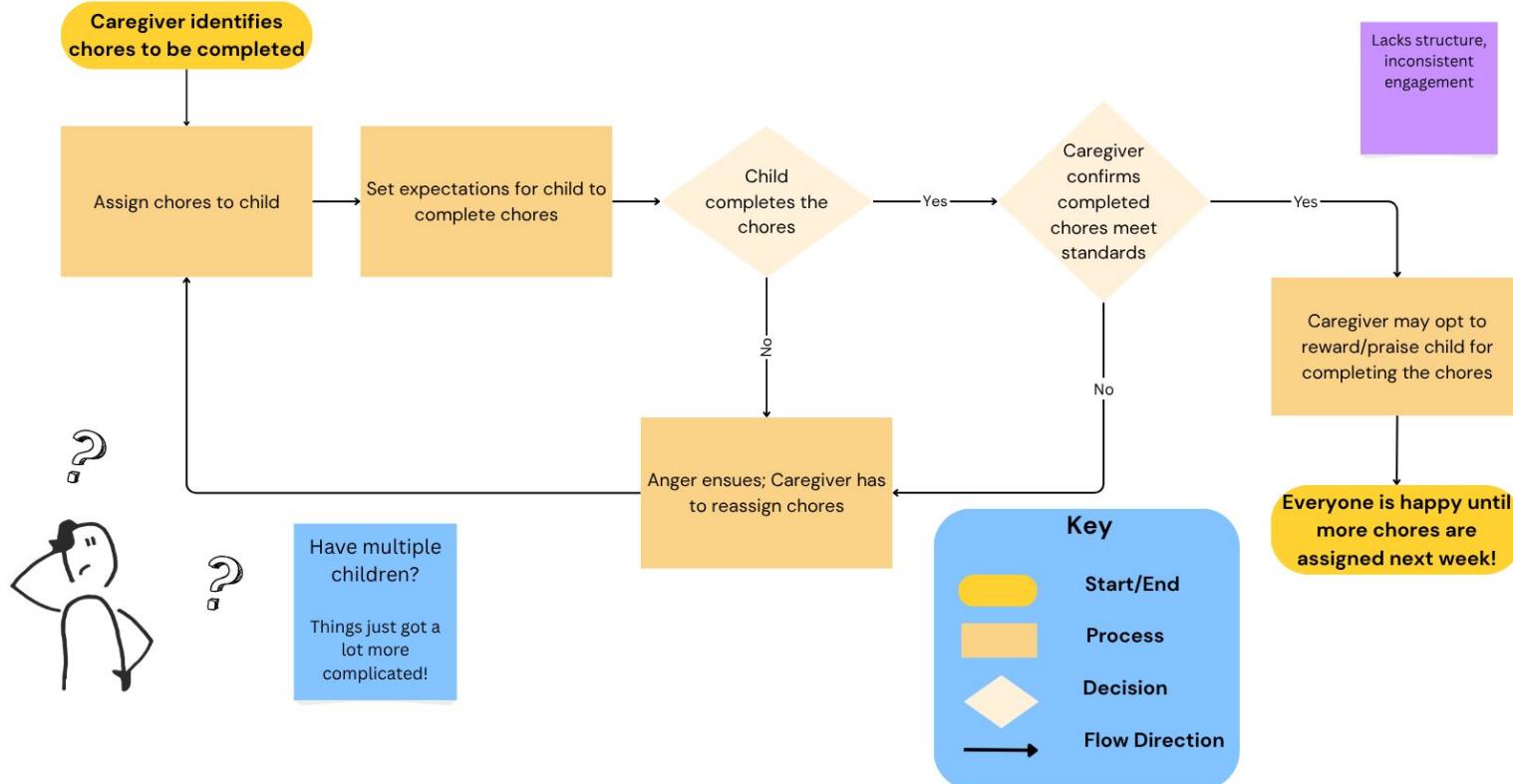


Elevator Pitch

QuestNest is a mobile app that turns household chores into a fun, rewarding system for kids, and a stress reliever for caregivers. Designed for families with children of all ages, the app uses a progression system powered by experience points (XP): kids complete chores assigned by their guardians, earn XP, and level up to unlock custom rewards like game currency, special outings, or screen time.

QuestNest helps children build responsibility and feel accomplished, while giving parents a much-needed break and peace of mind.

Current Process Flow

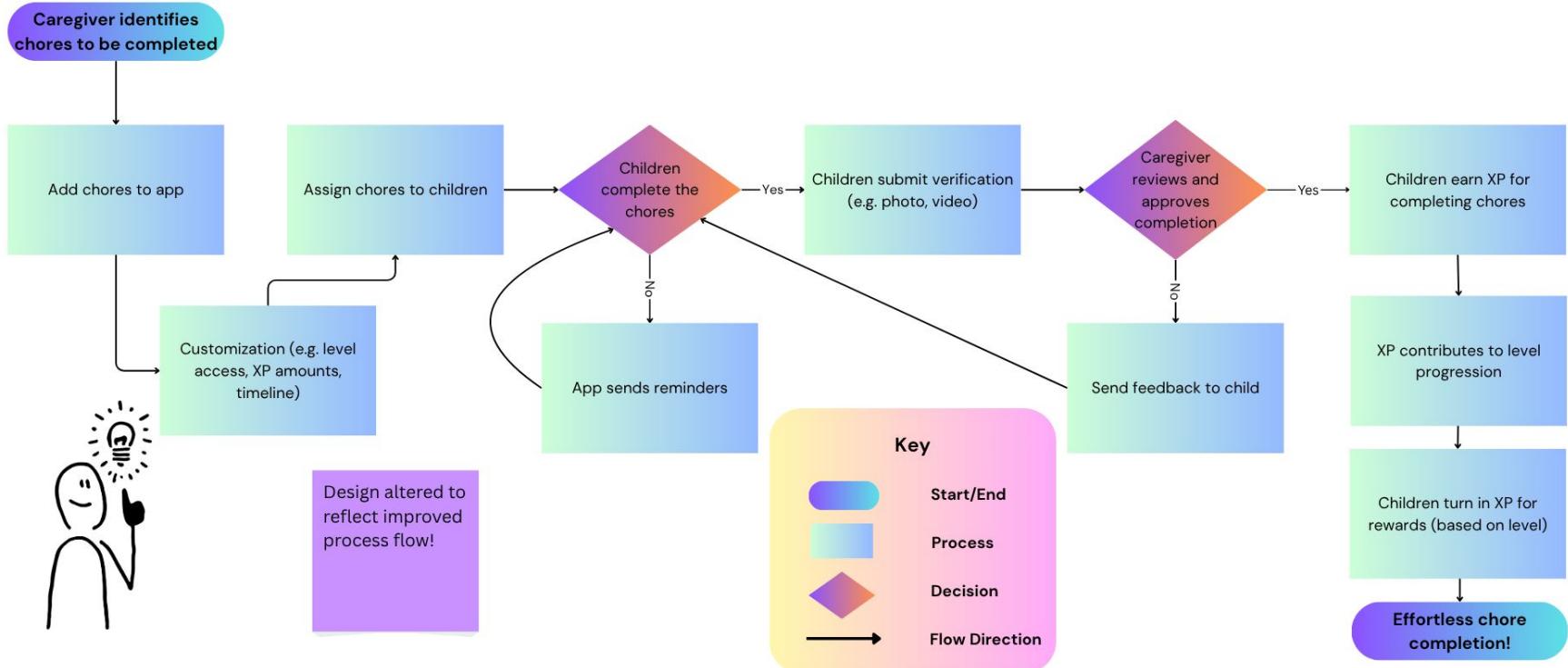


Solution Statement

QuestNest is a gamified mobile application that makes chore tracking engaging and fun through a reward management system. The goal is to transform routine household chores into a rewarding quest, teaching responsibility and healthy habits through positive reinforcement.



Solution Process Flow



Features and Functionality

(What it will do)



- **Track and manage household chores using a gamified XP and leveling system.**
- **Allow caregivers to assign tasks to multiple children at a time, verify completion (via photos/videos), and approve reward redemptions.**
- **Provide custom rewards, reminders, a shared family calendar, and strengthen bonds through collaborative family goals.**

Features and Functionality

(What it will not do)



- **Caregivers must manually assign tasks to each family member. The system does not provide automatic chore suggestions or equitable task distribution.**
- **Chore verification relies on photo or video submissions reviewed by caregivers. The app does not use automated validation to confirm chore completion.**
- **The application tracks rewards like extra screen time but cannot enforce device locks or manage screen time at the system level.**



Competition Matrix

FEATURES

FEATURES	QUESTNEST	OURHOME	COZI	NEATKID	HOMEEY
Gamified XP	✓	✗	✗	✓	✗
Child-Centric UI	✓	✓	✗	✓	✗
Tiered Leveling System	✓	✗	✗	✗	✗
Collaborative Family Rewards	✓	✗	✗	✗	✗
Customization	✓	✓	✓	✓	✓
Validation/Verification	✓	✓	✗	✓	✓
Cross Platform (iOS/Android)	✓	✓	✓	✓	✓
Shared Calendar	✓	✓	✓	✗	✗
Paywall			✓	✓	✓
Track and Manage Chores	✓	✓	✓	✓	✓
Special Features	Collaborative family rewards	Shopping lists	Shopping lists and recipes		Chore completion linked to cash allowances; family chat

Annotations:

- Tiered Leveling System** and **Collaborative Family Rewards** are circled in blue.
- Paywall** is circled in blue.
- A callout box for **Minimalistic UI with some animations** points to the **OURHOME** row.
- A callout box for **Goal setting system to unlock certain rewards** points to the **NEATKID** row.

Development Tools and Software

- IDE - Visual Studio Code
- Version Control - GitHub
- CI and CD - GitHub Actions & Workflows
- Firestore SDK - Python Admin SDK
- Automated Testing - pytest
- Documentation - Swagger UI & pydoc

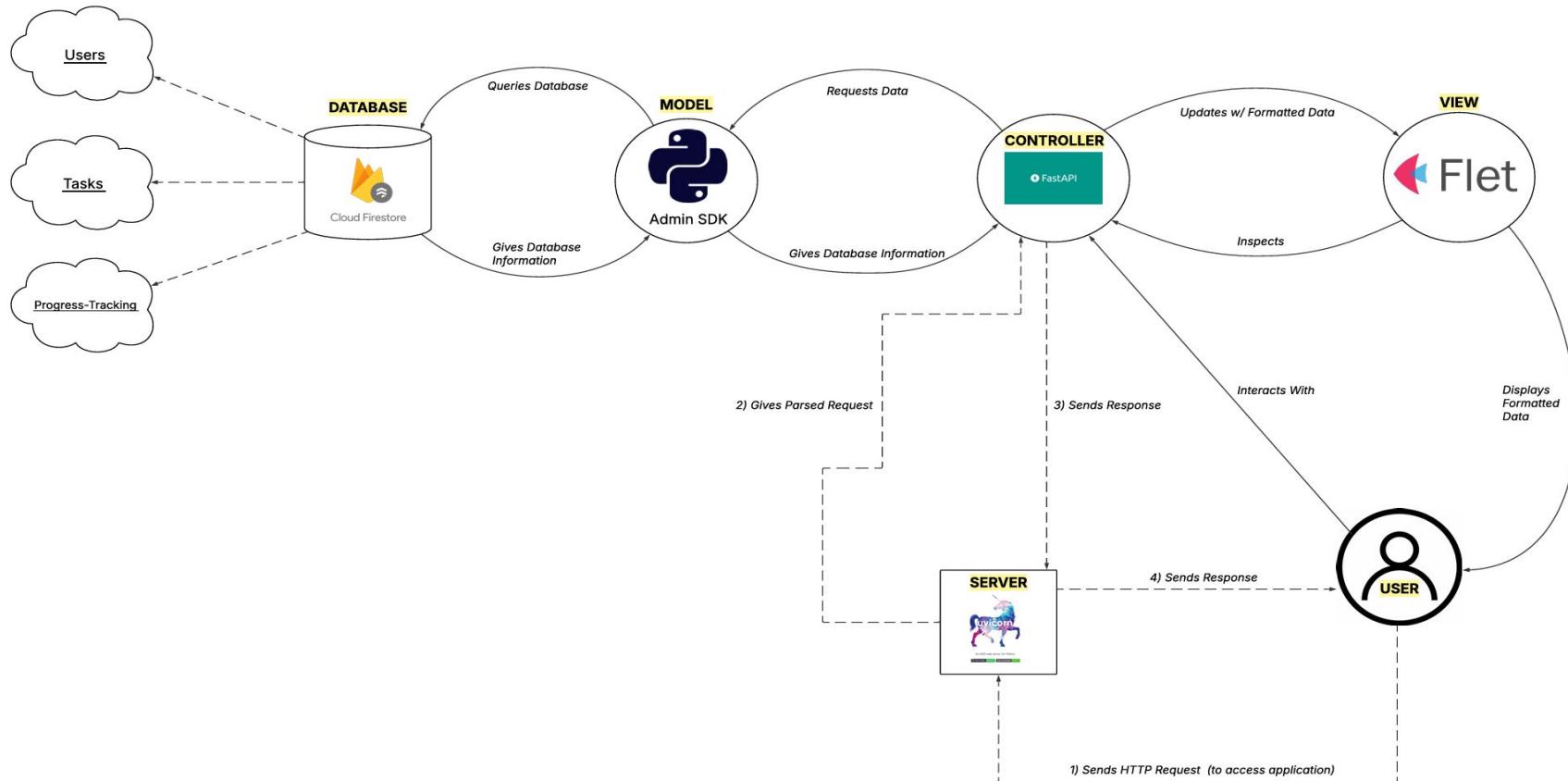


Major Functional Components

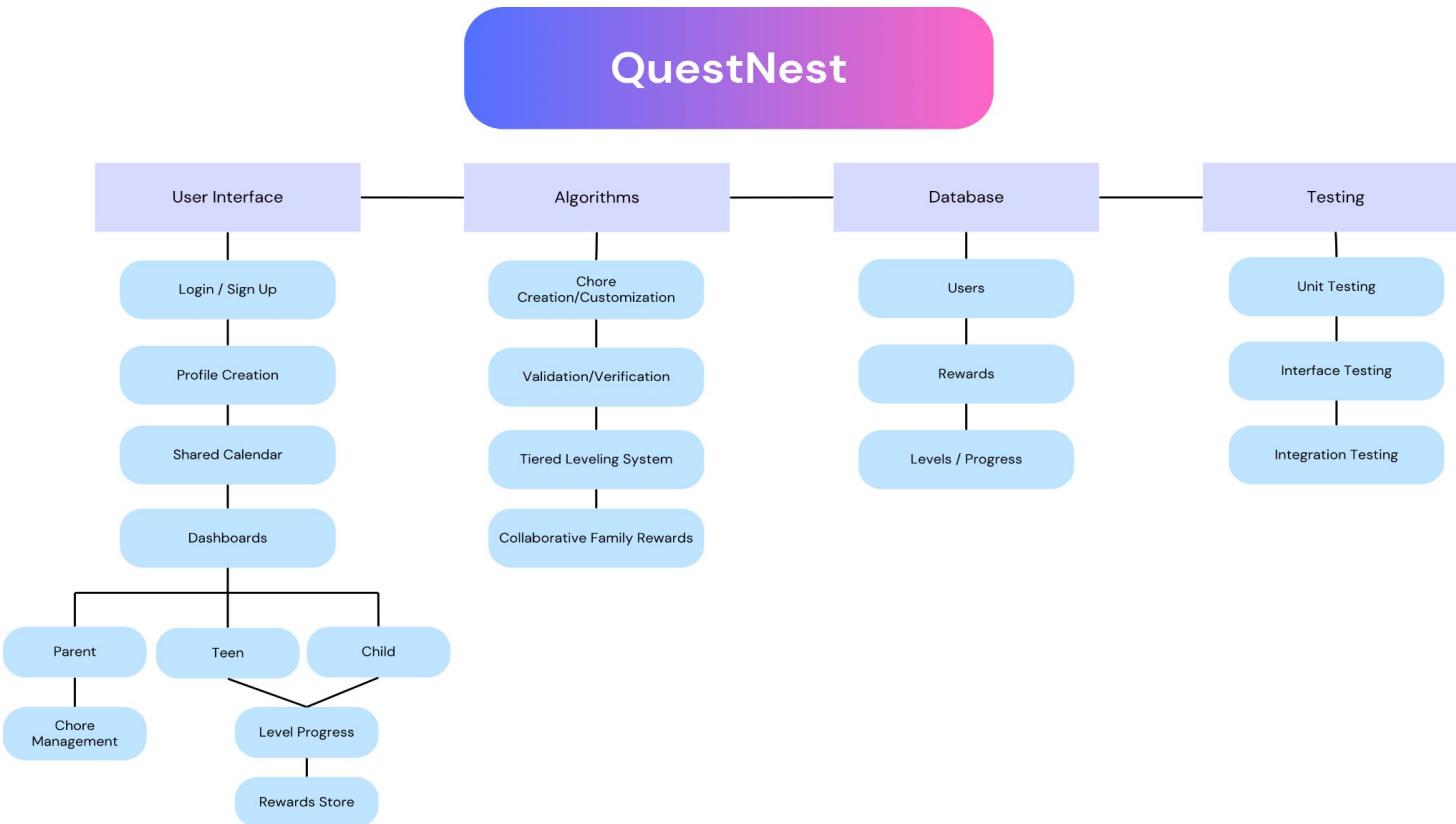
- Operating System - Docker
- Web Server - Unicorn
- Database - Firebase's Firestore
- Script-Interpreter - Python 3.13.5
- Front-End Framework - flet
- Back-End Framework - FastAPI



Major Functional Components Diagram



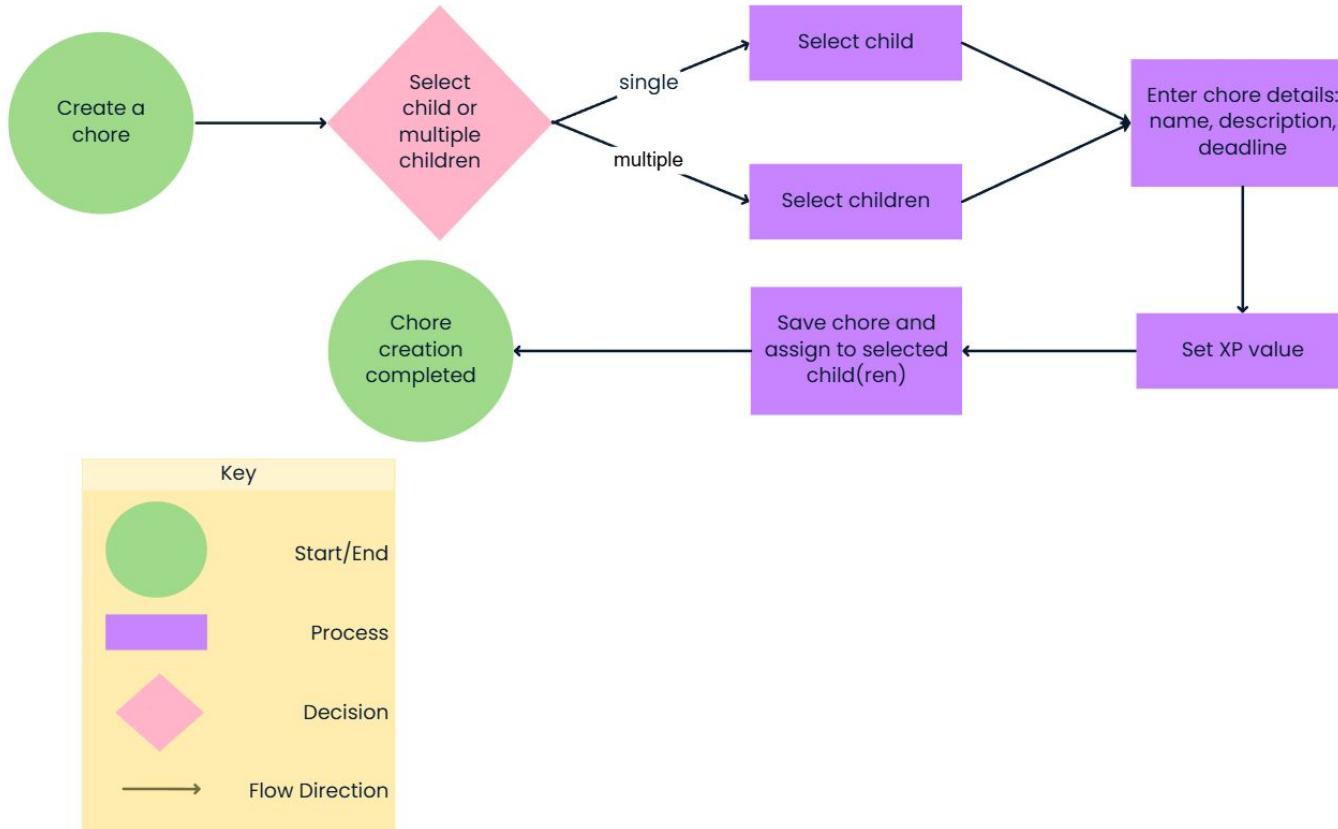
Work Breakdown Structure



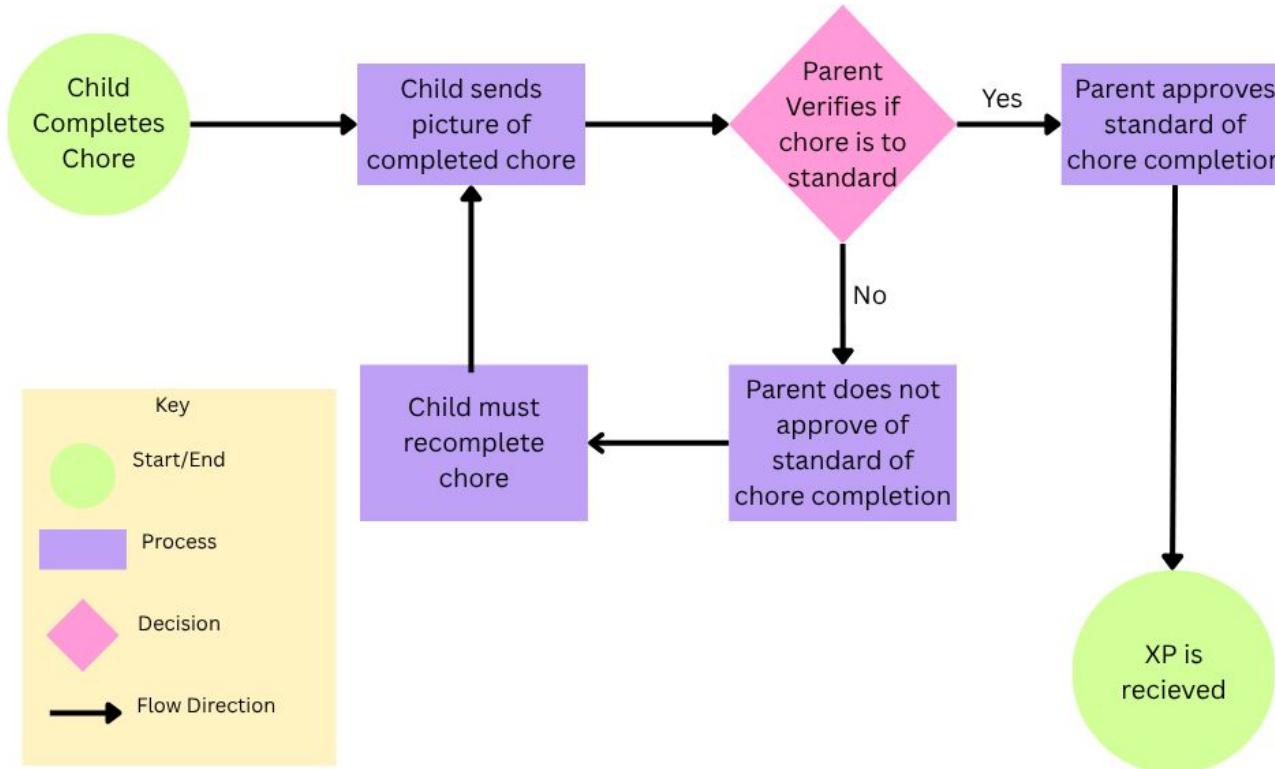
Algorithms

- Chore creation and customization
- Verification and validation of submitted photo/video proof
- Tiered leveling system
- Collaborative family rewards

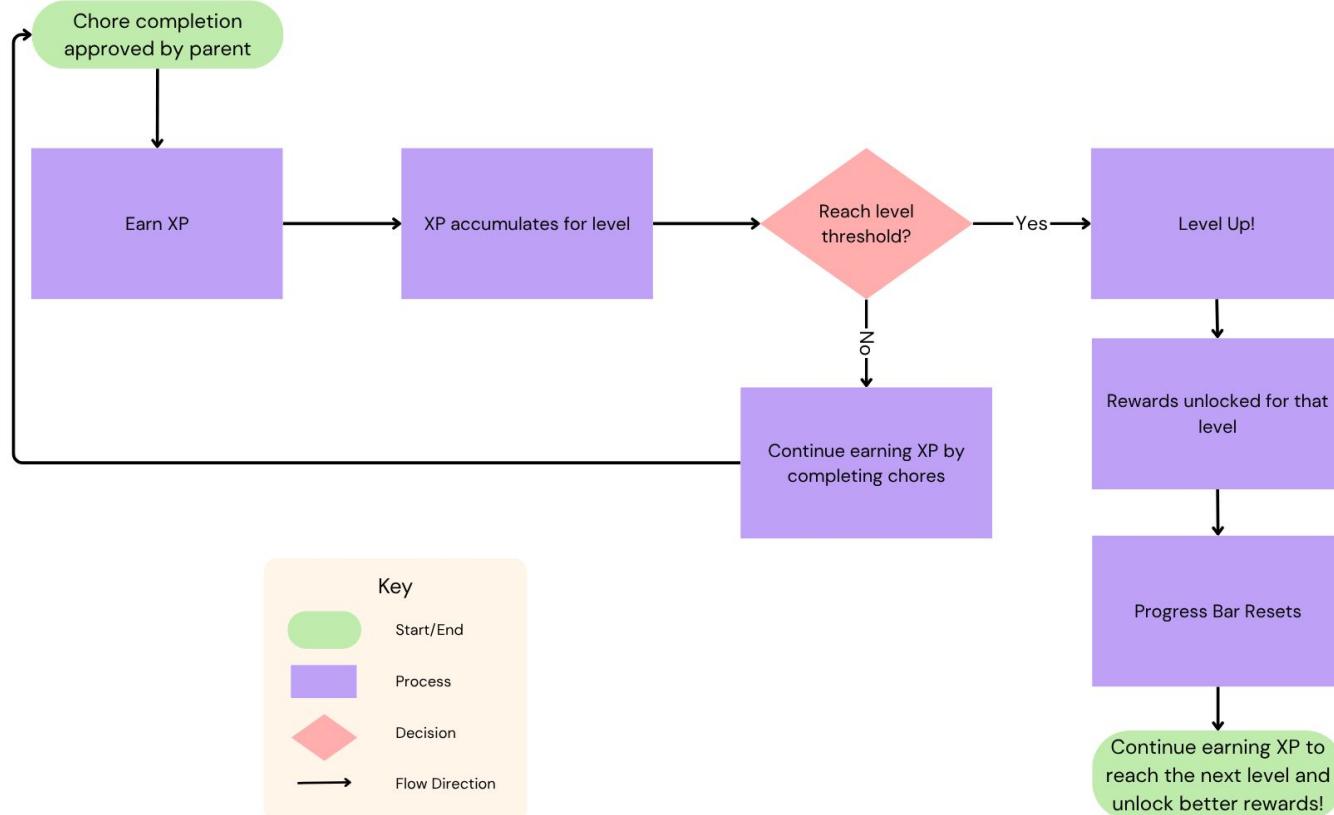
Chore Creation/Customization



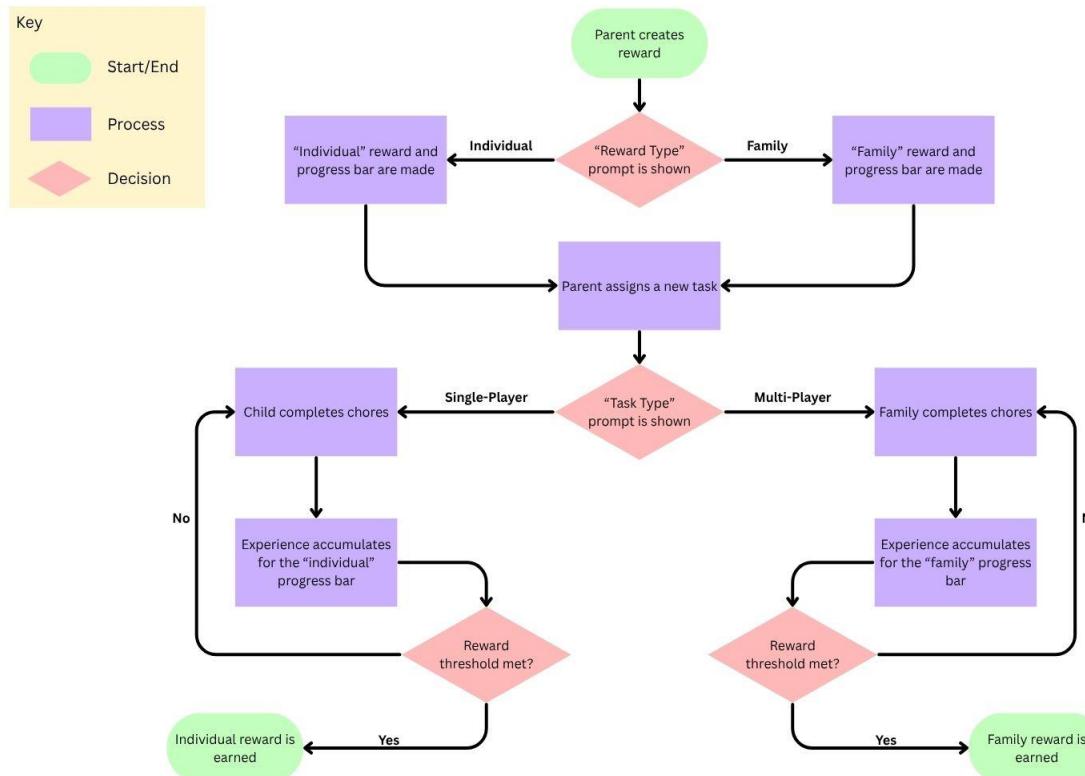
Verification/Validation



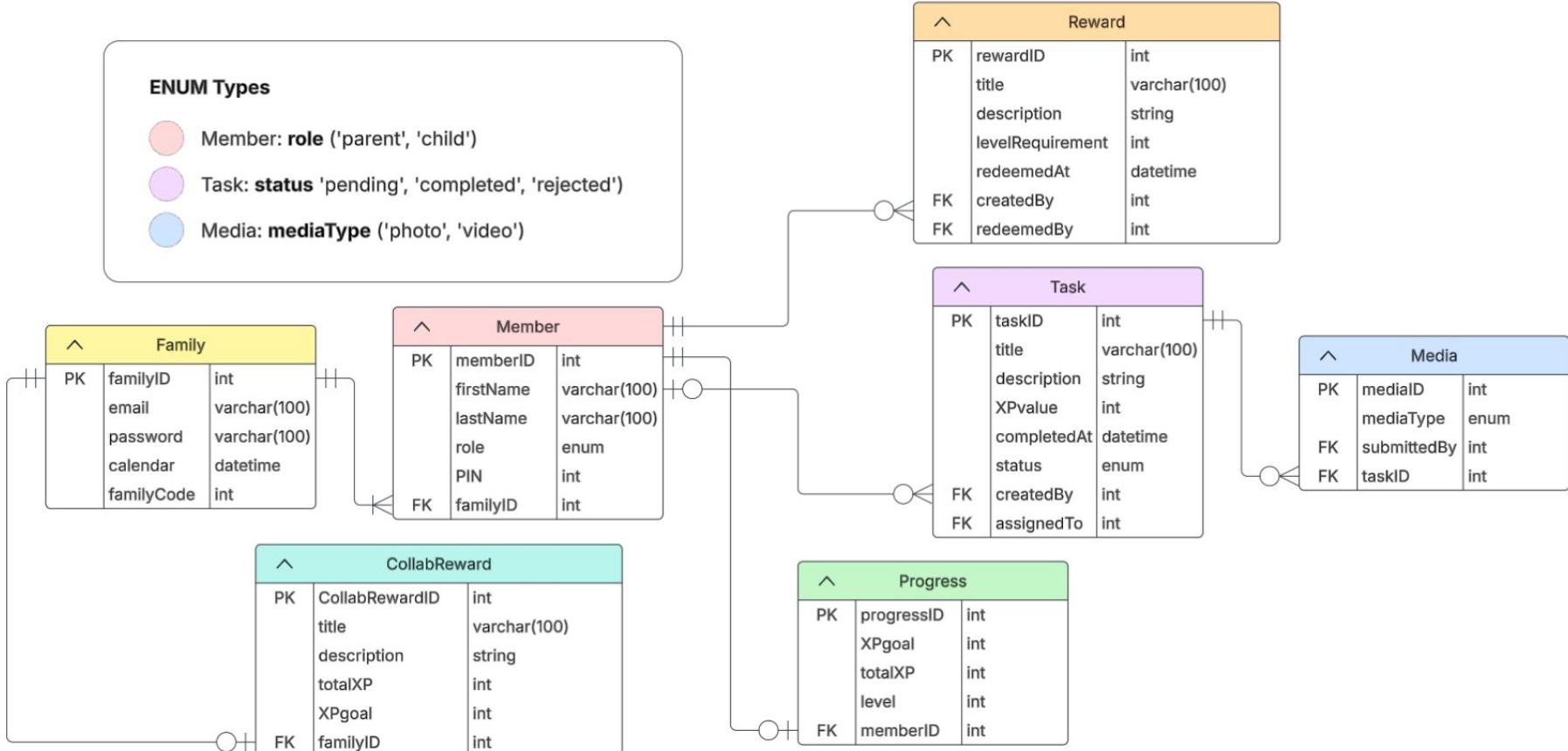
Tiered Leveling System



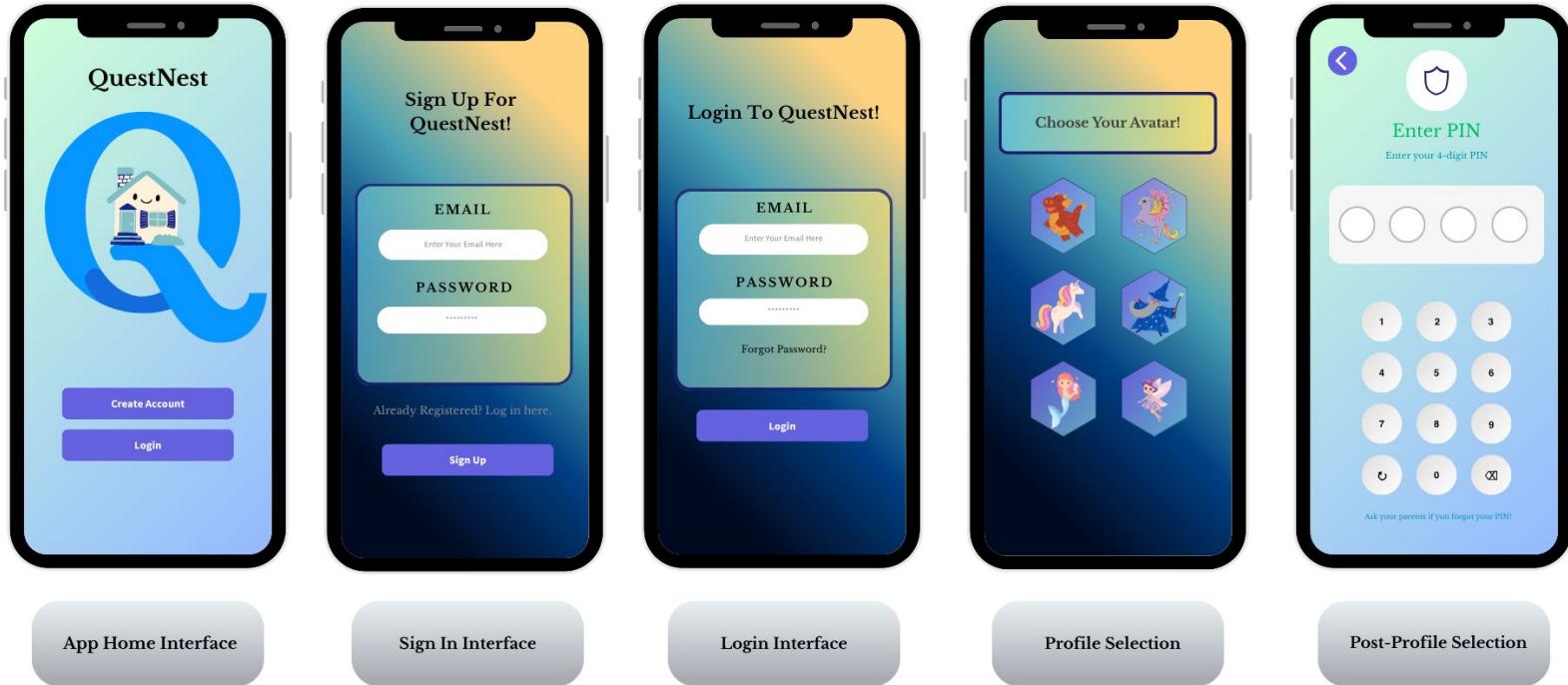
Collaborative Family Rewards



Database Schema



GUI Mockups-Account Access



GUI Mockups-Parent View

The image displays five mobile phone mockups arranged horizontally, each showing a different screen from a Parent View of a family management application.

- Chore Creation & Customization:** This screen shows the "Create New Task" form. It includes fields for Task Name (placeholder: Enter task to be completed...), Description (placeholder: Describe the task and expectations...), Task Type (dropdown: Select type), Assign Task (dropdown: Select family member), XP Amount (input: 50), Due Date (input: mm/dd/yyyy), and a toggle switch for Require Photo Proof. A "Submit" button is at the bottom.
- Shared Calendar:** This screen shows the "Calendar" view for July 2025. It features a grid of days from Sunday to Saturday. Below the calendar, there's a section for "Today's Schedule" with entries: 10:00 AM Soccer Practice and 3:00 PM Dentist Apppt.
- Verification/Validation:** This screen shows a "Task" card for "Clean Room". It asks "Did Kaleb Complete the Chore?" and includes a photo of a child's room. A feedback input field says "Describe how the task could be improved or send positive message". At the bottom are "X" and checkmark buttons for "Verify Task as Completed".
- Parent Dashboard:** This screen shows the "Family Reward" progress bar at 9000 XP / 15000 XP. It lists "Family Progress" for Kaleb (Wash Dishes, Vacuum, Fold Laundry), Scarlett (Scarfetti), and Jackson (Adventure Awaits). It also shows an "Adventure Awaits" entry for Wash Dishes due June 15 at 3:00pm with +50 XP. Navigation icons for shopping bag, people, and calendar are at the bottom.
- Child Overall Progress:** This screen shows the "XP Progress" for Kaleb, currently at Level 5. It includes an icon of a dragon, two yellow stars, and a breakdown of XP: Current Total: 3255, Level-Up Needs: 745, All-Time Earnings: 34253. It also displays "Household Rankings": 1st Mom, 2nd Kaleb, 3rd Scarlett, 4th Jackson, 5th Dad.

GUI Mockups-Child View



Chore Details



Collaborative Family Rewards



Rewards Store



Teen Dashboard



Child Dashboard

Legal Risks

Severity		Very Low (1)	Low (2)	Medium (3)	High (4)	Very High (5)	Risk #	Description & Mitigation
Likelihood	Very High (5)						L1	<p>Risk: Non-compliance with COPPA (Children's Online Privacy Protection Act)</p> <p>Description: The app collects data from users under 18, it could violate child privacy laws.</p> <p>Mitigation:</p> <ul style="list-style-type: none"> • Implement verifiable parental consent mechanisms • Clearly disclose data usage policies • Allow parents to access and delete children's data • Maintain logs of consent
	High (4)				L1			
	Medium (3)							
	Low (2)	L1						
	Very Low (1)							

Customer and End User Risks

Severity		Very Low (1)	Low (2)	Medium (3)	High (4)	Very High (5)	Risk #	Description & Mitigation
Likelihood	Very High (5)			C1			C1	Risk: Kids find the app “boring” Description: Children may find the app too complex to use or disengaging.
	High (4)				C2			Mitigation: <ul style="list-style-type: none"> • Add engaging animations and sounds • Send reminders that rewards are available
	Medium (3)							Risk: Kids try to falsify chore completion Description: Children may try to upload previous photos, or just rush through the chores and do them incorrectly.
	Low (2)	C1	C2				C2	Mitigation: <ul style="list-style-type: none"> • Require parent for reward approval • Require pictures of completed chore • Gamify honesty with a streak offering more XP points or an extra reward
	Very Low (1)							

Technical Risks

Severity		Very Low (1)	Low (2)	Medium (3)	High (4)	Very High (5)	Risk #	Description & Mitigation
Likelihood	Very High (5)						T1	Risk: Data loss due to app crash Description: App crash during chore submission could cause lack of XP or lack of submission. Mitigation: <ul style="list-style-type: none"> • Use offline-first architecture with sync queue; auto-backup every 60 seconds • Retry queue after failed syncs or offline connection • Backend change log for action verification
	High (4)							
	Medium (3)						T2	Risk: Image/video storage overload Description: As users upload photo or video evidence for completed chores, storage usage may exceed capacity or cause lag, especially if files are large or numerous. Mitigation: <ul style="list-style-type: none"> • Use compression before upload • Set file size limits • Auto-delete older media after reward approval (with user notice)
	Low (2)							
	Very Low (1)							

Security Risks

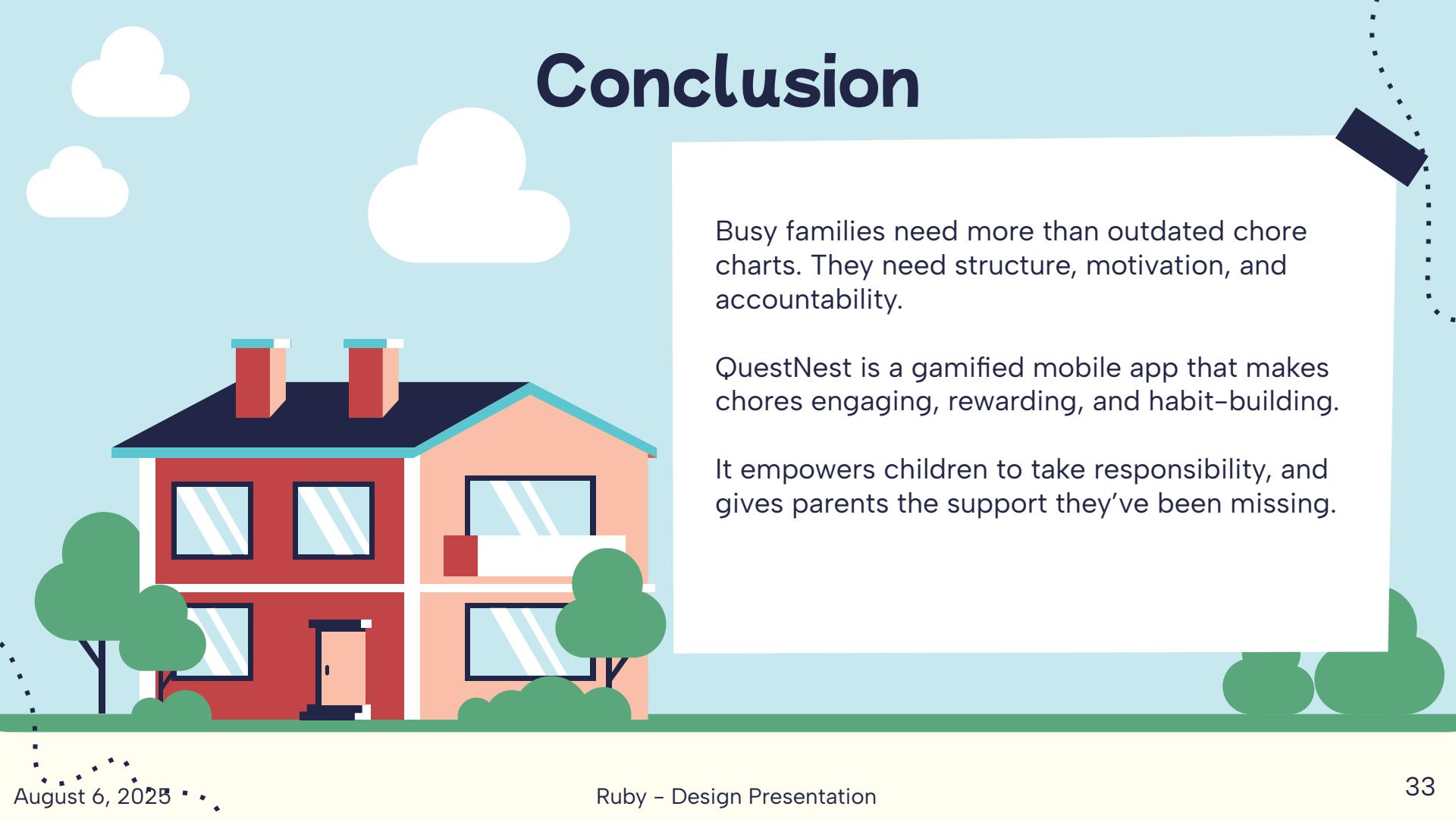
Severity		Very Low (1)	Low (2)	Medium (3)	High (4)	Very High (5)	Risk #	Description & Mitigation
Likelihood	Very High (5)						S1	Risk: Unauthorized Access to Accounts Description: Weak passwords, lack of multi-factor authentication (MFA), or shared devices could allow unauthorized individuals (e.g., siblings, others) to access a child or parent account.
	High (4)				S1	S2		Mitigation: <ul style="list-style-type: none"> Enforce strong password requirements Optional Multi-Factor Authentication (MFA) for parent accounts Session timeout for inactive users
	Medium (3)							Risk: Exposure of Personal Data Description: Data breaches or insecure data storage could expose sensitive user information, including children's names, progress, or photos.
	Low (2)			S1 S2			S2	Mitigation: <ul style="list-style-type: none"> End-to-End encryption for personal data in transit and at rest Strict access control for stored media Regular security audits and vulnerability scans
	Very Low (1)							

Real World Product vs. Prototype Table

Features	Real World Product (RWP)	Prototype	Explanation
Track Chores	YES	YES	Tracking chores are core features.
Manage Chores	YES	YES	Managing chores are core features.
Gamified XP	YES	YES	Gamified XP is a core feature.
Tiered Leveling System	YES	YES	Prototype will include tiered progression levels.
Collaborative Family Rewards	YES	YES	Prototype will include separate, collaborative rewards.
Child-Centric UI	YES	YES	UI tailored for children from the start.

Real World Product vs. Prototype Table

Features	Real World Product (RWP)	Prototype	Explanation
Customization	YES	YES	Chores and XP amounts will be customizable upon creation.
Validation/Verification (e.g., photo/video proof)	YES	YES	Prototype allows image/video submissions for proof of completion.
Cross Platform (iOS/Android)	YES	YES	Prototype targets multi-platform use with Python/flet. This will be scaled back depending on time constraints.
Shared Calendar	YES	PARTIAL	Partially functional due to complexity.
Paywall	NO	NO	QuestNest will not hide features behind a paywall.



Conclusion

Busy families need more than outdated chore charts. They need structure, motivation, and accountability.

QuestNest is a gamified mobile app that makes chores engaging, rewarding, and habit-building.

It empowers children to take responsibility, and gives parents the support they've been missing.

References

Federal Trade Commission. (2000). *Children's Online Privacy Protection Rule ("COPPA")*.

[https://www.ftc.gov/legal-library/browse/rules/childrens-online-privacy-protection-rule-cop
pa](https://www.ftc.gov/legal-library/browse/rules/childrens-online-privacy-protection-rule-coppa)

Lam, C. B., Greene, K. M., & McHale, S. M. (2016). Housework Time from Middle Childhood through Adolescence: Links to Parental Work Hours and Youth Adjustment.

<https://pmc.ncbi.nlm.nih.gov/articles/PMC5125879/>

Rende, R. (2015). The developmental significance of chores: Then and now.

https://www.researchgate.net/publication/269578645_The_developmental_significance_of_chores_Then_and_now

References

Society for the Psychology of Women. (2017). *Research on Household Chores*. household-chores.

<https://www.apadivisions.org/division-35/news-events/news/household-chores>

Appendix



User Stories -Parent

- As a parent, I want to create different chores for my child or children, so I can assign customized tasks.
- As a parent, I want to check photo or video proof for specific chores to verify that they were completed properly.
- As a parent, I want to define certain rewards that are locked or unlocked based on the child's level, so I can promote long-term commitment.
- As a parent, I want to set a cooling time for different rewards, so I can prevent my children from over rewarding.
- As a parent, I want to view the family calendar, so I can coordinate goals and schedules.
- As a parent, I want to set up a simple PIN for my younger child's account, so they can log in easily without remembering a complex password while keeping their account secure.

User Stories -Teen

- As a teen, I would like to see a list of assigned chores so I can complete my tasks for XP.
- As a teen, I would like to upload a picture in order to verify the completion of assigned chores for XP.
- As a teen, I would like to see what level I am currently, and the amount of XP I have attained, so I can know what I can attain, as well as stay motivated.
- As a teen, I want to be able to redeem awarded XP for rewards, so I continue to feel rewarded for completing chores.
- As a teen, I would like a verification of if the chores standard of completing was accepted or rejected, so I know if I need to do better to earn XP.
- As a teen, I would like to see the progress of other people in my family, in order to feel motivated to complete chores.

User Stories - Child

- As a child, I want the app to keep track of my chores and show me my progress, so that I can complete all my tasks and earn rewards.
- As a child, I want to choose an avatar for my profile, so I can differentiate my account from others.
- As a child, I want to receive notifications that there are new chores available, so I don't miss the opportunity to earn points and level up.
- As a child, I want to able to see total XP and level, so that I can track my progress and stay motivated to reach the next level.
- As a child, I want to get feedback when a chore is approved or rejected, so that I understand what I did well or need to do better.
- As a child, I want to use the app easily without needing help, so that I can feel independent and responsible.