



NextAddress Project Management Plan Part I

Business Case, Initiation, and Scope Management

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NextAddress, Inc.

ITSM6204 – IT Project Management – Dr. Nina McGarry

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Business Case

Introduction

The demand for selling and renting housing is growing continually, as is technology. An innovative approach to real estate transactions is desirable to cater to this dynamic market. Real estate has fallen short in its failure to adapt to the resurgence of DIY culture, and crowd sourcing. NextAddress believes there is an opportunity to capitalize on modern technology to facilitate real estate transactions between people without a “middleman.”

To achieve the objectives outlined by the business in this innovative approach to real estate transactions, there is an inherent need for a web-based technological platform that is highly scalable, accessible, and available. To meet the objectives of the project and reach as many users as possible in the market, we simplify the system by connecting tenant and customers directly without agents using a technology platform that is mobile-first and cross-platform.

In keeping with the spirit of facilitating transactions between people, we will provide customer-centric service.

Opportunity Statement

Currently, there are many applications created to meet the objectives of the business. However, the business innovations of NextAddress can help to create our own niche market.

1. Work exclusively with individual owners and renters, and will not work with companies
2. Provide proprietary recommendation algorithm based on users’ interests and viewing history
3. Facilitate rental property management with rent payment portal, messaging, and service requests
4. Build accountability with a unique rating system for both renters and owners
5. Professional legal facilitation tailored to the locale

Critical Assumptions and Constraints

1. When the app first starts out, there will be limited users – both sellers and buyers/renters. Consequently, there will be a limited number of supportable listings and longer sale/renting times.
2. Due to competition from other apps, initial advertising will be vital.
3. There are different local laws governing the transfer of real estate that must be accounted for.
4. There are privacy and security implications inherent with any platform that facilitates transactions between two parties that NextAddress must address.

Analysis and Recommendation

Marketing

To ensure the success of the launched app, NextAddress recommends a coordinated and extensive marketing campaign, coupled with a geographic area-of focus, namely the DC metro area (DC, Northern Virginia, Southern Maryland). This allows NextAddress to focus on cultivating supply and demand in a single market, as well as benefit from the high-turnover inherent in the region.

Features

NextAddress recommends employing a suite of innovative features that draw in both buyer/renters and sellers.

Technology

The technology stack used for NextAddress will align with and achieve the goals of the business. For the client application, we recommend using React Native + React, coupled with HTML5 and CSS. For the server-side application, we recommend Node.js hosted on a Microsoft Azure cloud. For the database, we recommend Microsoft SQL Server for relational data storage and Azure Document DB for document storage. For user support, we will use support desk software. The business advantages of this approach include:

- Same client codebase for iOS, Android, and the browser, significantly reducing development costs.
- Cost-savings incurred with cloud-hosting over self-hosting the application
- High-availability and scalability achieved at low cost in Azure cloud
- Efficient tracking and completion of user support tickets using automation

Preliminary Project Requirements

- User to user messaging: the tenants can communicate directly with former and current tenants to get advice.
- User to owner messaging: A messaging platform will be provided to our customers (landlords and tenants) so that they can chat with each other.
- 3D Pictures provide the real sight inside the homes, so our customers will use it as a tool to take a tour reducing the need for home visits.
- Ratings: comprehensive ratings of tenants by owner and of owners by tenants.
- Provide comprehensive background check and credit history report. The app will facilitate the collection of rental history checks.
- NextAddress will provide mortgage service to customers by partnering with third parties.
- Multi-platform, Cloud-hosted application developed to high standards of quality.
- Service desk with comprehensive support and documentation.

Budget Estimate and Financial Analysis

Projected Expenses

The total budget for the project is \$1,000,000 dollars. There are six parts of budget including Salary, Benefits, Hardware & Infrastructure, Marketing, and Software Development. In labor, each staff person will work full-time, 40-hour weeks. Total labor costs including salary and benefits is \$560,000. Hardware infrastructure includes cloud infrastructure subscription costs totaling \$60,000.

The third part is marketing. The cost includes the marketing activities cost and advertisement cost amounted to \$200,000 dollars.

The final budget is Software, which includes cloud storage, database, development tools and other software involved in project. This amounts to \$60,000 dollars.

Projected Income

Income is derived mainly from commission and membership fees. The commissions of selling and renting are 1.5% and 5%, respectively. If home owners want their listing to have priority on search results, they have the choice to pay additional membership which is 0.5% of the trade price for selling and 5% of contract price for renting excess of base commission. Projected income following the first year after launch is \$300,000 dollars in sales commission and \$200,000 dollars in renting commission. Following year one, NextAddress projects a 50% year-over-year increase in volume.

Schedule Estimate

The total project is planned to be completed in two years. The base milestone schedule is provided in the Project Charter.

Potential Risks

1. Shortage of available housing.
2. Shortage of available buyers and renters.
3. Real estate market is unpredictable due to external factors – success of the app is dependent on market forces.
4. Marketing activities may be at risk of not attracting enough customers.
5. Development costs may rise due to unforeseen delays.
6. Users may attempt to commit fraud on the application.
7. Facilitation of legal documents may open NextAddress up to liability.

Project Charter

Project Dates:

November 1st, 2018 – December 31st, 2020

Purpose & Description

The demand for selling and renting housing is growing continually, as is technology. An innovative approach to real estate transactions is desirable to cater to this dynamic market. Real estate has fallen short in its failure to adapt to the resurgence of DIY culture, and crowd sourcing. NextAddress believes there is an opportunity to capitalize on modern technology to facilitate real estate transactions between people without a “middleman.”

Approach

Under the leadership of each executive, the project is split into several functions: Application Development and Infrastructure Development; Legal and Security; User Experience; Listing Management; and Finance and Marketing. Using market research, the team will produce an app that meets the market’s needs. The development team will begin with predictive approach then switch to agile after first launch.

Item	Cost
Salary	\$560,000
Benefits	\$100,000
Hardware Infrastructure	\$92,000
Marketing	\$200,000
Software	\$60,000
Total	\$1,012,000

Project Objectives

1. 5,000 Active Daily Users within first 30 days post-launch
2. 4.5/5 App Store Rating
3. 1000 successful deals completed in-app within first 30 days post-launch
4. 50,000 app downloads within first 30 days post-launch

Assumptions & Constraints

See the appendix for detailed assumptions and Constraints. Here are key assumptions:

1. When the app first starts out, there will be limited users – both sellers and buyers/renters. Consequently, there will be a limited number of supportable listings and longer sale/renting times.
2. Due to competition from other apps, initial high-volume advertising will be vital.
3. There are different local laws governing the transfer of real estate.
4. There are privacy and security implications inherent with any platform that facilitates transactions between two parties that NextAddress must address.

High-Level Requirements & Key Deliverables

- User to user messaging: the tenants can communicate directly with former and current tenants to get advice.
- User to owner messaging: A messaging platform will be provided to our customers (landlords and tenants) so that they can chat with each other.
- 3D Pictures provide the real sight inside the homes, so our customers will use it as a tool to take a tour reducing the need for home visits.
- Ratings: comprehensive ratings of tenants by owner and of owners by tenants
- Provide comprehensive background check and credit history report. The app will facilitate the collection of rental history checks.
- NextAddress will provide mortgage service to customers by partnering with third parties.
- Multi-platform, Cloud-hosted application developed to high standards of quality.
- Service desk with comprehensive support and documentation

Milestone List

Table 1: Milestone List

Name	Date
Legal documents templates and samples release	1/3/2019
Input membership system	1/3/2019
Software Procured	1/31/2019
Infrastructure Provisioned	3/1/2019
Design customers benefits	3/3/2019
Design market activities	3/3/2019
Messaging platform completed	4/6/2019
Google Map & Yelp API completed	4/6/2019
Base Platform Created – Security Module - Authentication, Authorization, Database	5/30/2019
Input feedback monitoring system	6/3/2019
User Interface Designed and Implemented	7/30/2019
Mapping, Listings, and Chat Developed	8/30/2019
User Advisory Board First Meeting	9/30/2019
Property Management Module Developed	10/30/2019
Legal Module Developed	12/31/2019
Private Beta Pilot Program Completed	1/30/2018
Third Party Integrations Completed	3/30/2020
City-Wide Pilot Program Completed	9/30/2020
App Published to App Stores	12/25/2020

Key Stakeholders

Table 2: Key Stakeholders

Name	Role	Position	Contact Information
Kevin Stone	IT Infrastructure, Software	Vice President & Project Manager	kevinstone@gwu.edu

	Development, User Support		
Jing Zhou	Legal & Security	Vice President	gabriellezhou@gwu.edu
Weizhen Kong	Marketing & Finance	President & CEO	weizhenkong123@gwu.edu
Yinghan Lu	Features & User experience	Vice President	yinghanlu@gwu.edu
Guojun Li	Listings	Vice President	045610958@qq.com

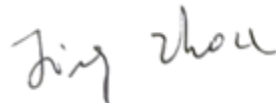
Authorizations

Dr. Nina McGarry
Project Sponsor



Kevin Stone
Vice President & Project Manager, NextAddress

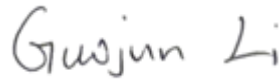
Weizhen KONG
Weizhen Kong
President & CEO, NextAddress



Jing Zhou
Vice President, NextAddress



Yinghan Lu
Vice President, NextAddress



Guojun Li
Vice President, NextAddress

Table 3: Signatures

Financial Analysis

Summary

This analysis concludes that the project will break even after five years. The total initial budget is \$1,012,000 dollars. We estimate that the variable cost for completing implementation, which includes personal salaries and other flexible costs is \$1,000 at first year. Over time, the variability will decrease by increased volume of work and improved efficiency. The fixed costs include the infrastructure and software fees at \$10,000, but the depreciation of the fixed instrument is estimated at \$5,000 dollars each year.

As for income, we combine selling of one house and renting of 5 houses as a unit. The income of one unit is around \$10,000 dollars and our planned sales for first year is 20 units. Then the sales should be increased by 20 units each year. After calculating the tax and discount factor, the cash flow of each year can be seen. The estimated of years of covering the budget is less than 5 years. The break-even point is about 35 to 38 units. The Internal Rate of Return is 18.8%.

NextAddress believes that following this, the business model will continue to grow in popularity and income will also grow, increasing profits significantly over time.

Detail

Table 4: Financial Analysis

Year:	0	1	2	3	4	5
Initial Investment	(\$1,012,000)					
Units		20	40	60	80	100
Unit Price		\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
Variable Cost		\$1,000	\$800	\$800	\$500	\$500
Revenue at BE		\$200,000	\$400,000	\$600,000	\$800,000	\$1,000,000
Variable Costs		\$20,000	\$32,000	\$48,000	\$40,000	\$50,000
Fixed Cost		\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
Depreciation		\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Earnings Before Interest and Taxes		\$165,000	\$353,000	\$537,000	\$745,000	\$935,000
Tax at 34%		56,100	120,020	182,580	253,300	317,900
Earnings Before Interest and Taxes (1-t)		108,900	232,980	354,420	491,700	617,100
Plus Depreciation		\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Operating Cash Flow (OCF)		\$113,900	\$237,980	\$359,420	\$496,700	\$622,100
Discount factor at 18%	1.00	0.85	0.72	0.61	0.52	0.44
Present Value Cash Flow	(\$1,012,000)	\$96,525	\$170,914	\$218,754	\$256,192	\$271,926

Net Present Value	\$2,311	IRR	18.08%
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Investment Amount	(\$1,012,000)		
Annuity factor 18%, 5years	3.1272		
EAC	\$323,612.18		
Financial Breakeven			
Fixed Costs	10,000		
Plus EAC	323,612		
Total	333,612	333,612	333,612
Price-Variable Cost	9,000	\$9,200	\$9,500
Financial Breakeven	37.068	36.262	35.117

Milestone Report

Table 5: Milestone Report

Name	Date	Status	Responsible	Issues/Comments
Market research and report	10/5/2018	Completed	All Team members	Market volume is estimated; Major competitive apps features gathered and analyzed
Legal documents templates and samples release	1/3/2019	Pending	Jing Zhou	
Input membership system	1/3/2019	Pending	Weizhen Kong	
Software Procured	1/31/2019	Pending	Kevin Stone	
Infrastructure Provisioned	3/1/2019	Pending	Kevin Stone	
Design customers benefits	3/3/2019	Pending	Weizhen Kong	
Design market activities	3/3/2019	Pending	Weizhen Kong	
Messaging platform completed	4/6/2019	Pending	Yinghan lu	
Google Map & Yelp API completed	4/6/2019	Pending	Yinghan lu	
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User Interface Designed and Implemented	7/30/2019	Pending	Kevin Stone	
Mapping, Listings, and Chat Developed	8/30/2019	Pending	Guojun Li	
User Advisory Board First Meeting	9/30/2019	Pending	Yinghan lu	
Property Management Module Developed	10/30/2019	Pending	Kevin Stone	

Legal Module Developed	12/31/2019	Pending	Jing Zhou	
Private Beta Pilot Program Completed	1/30/2018	Pending	Kevin Stone	
Third Party Integrations Completed	3/30/2020	Pending	Kevin Stone	
City-Wide Pilot Program Completed	9/30/2020	Pending	Kevin Stone	
App Published to App Stores	12/25/2020	Pending	Kevin Stone	

Team Charter

Code of Conduct: As a project team, we will:

- Be open to ideas and discussion, anticipate problems and proactively analyze and solve problems.
- Keep each team member informed of project related information.
- Focus on innovation, honesty and integrity.

Participation: We will:

- Participate in project activities such as meetings, discussions, editing files.
- Provide equal opportunities to voice out ideas and new approaches.
- Inform all team members in advance when one or more team members cannot be present in meetings

Communication: We will:

- We will use face-to-face as our primary way of communication. We will meet up every Tuesday at 12:00 EST. We will use e-mail, text message and other technology to assist in communicating.
- We will use SharePoint for sharing and co-editing files.
- Assign a team coordinator, he will facilitate all meetings and arrange for offices. He will be sending reminders and helping with coordination when needed.

Problem Solving: We will:

- Encourage each team member to provide solutions to problems.
- Focusing on solving problems instead of blaming people.
- Try to build better solutions using all contributed ideas.

Meeting Guidelines: We will:

- Outline meeting agenda before each meeting and keep all team members informed.
- Record meeting minutes and upload to SharePoint within 24 hours after each meeting.
- Create action plan and deliverable due date.
- Review meeting content at the end of each meeting and make sure all team members are on the same page.

Roles: In this project, each team member oversees a certain function of our project:

- Weizhen Kong is responsible for Marketing & Finance
- Yinghan lu is responsible for Features and User experience
- Kevin Stone is responsible for IT infrastructure, Software Development and User support
- Jing Zhou is responsible for Security and Legal
- Guojun Li is responsible for Listings.

Project Team Members' Name and Sign-off:

Table 6: Team Charter Sign-Off

Name	Date
Guojun Li	10/16/2018
Jing Zhou	10/16/2018
Kevin Stone	10/16/2018
Weizhen Kong	10/16/2018
Yinghan Lu	10/16/2018

Stakeholder Management

Stakeholder Registry

Table 7: Stakeholder Registry

Name	Position	Internal/External	Project Role	Contact Information
Kevin Stone	Vice President & Project Manager	Internal	App IT Designer	kevinstone@gwu.edu
Yinghan Lu	Vice President	Internal	Feature Designer	yinghanlu@gwu.edu
Weizhen Kong	Vice President	Internal	Marketing and Finance Analyst	Weizhenkong123@gwu.edu
Jing Zhou	Vice President	Internal	Security and Legal Analyst	gabriellezhou@gwu.edu
Guojun Li	Vice President	Internal	Listings Manager	guojun_li@gwu.edu
Dr. Nina McGarry	Lead Investor	External	Project Sponsor	nmcgarry@gwu.edu
John Doe	Principal Consultant	External	Real Estate Consultant	John.doe@contoso.com
M. Katherine Jane	Senior Consultant	External	Marketing & Public Relations Consultant	mjane@contoso.com
Clinton Baca	Government Regulator	External	Auditor	clintonb@contoso.com
Pilot Group #1	Customers	External	Pilot Testers	PilotGroup1@contoso.com
Barbara Wiley	Lawyer	External	Legal Consultant	bwiley@contoso.com

Stakeholder Management Strategy

Table 8: Stakeholder Management Strategy

Name	Level of Interest	Level of Influence	Management Strategy
Kevin Stone	High	High	Seek feedback from others to avoid self-affirming tendencies and proper project control. As project manager, has authority to influence overall project.
Yinghan Lu	High	High	Set scope boundaries to avoid scope creep with features. Contact daily to see if there are any new ideas to incorporate into the project plan.
Weizhen Kong	High	High	Sell the importance of the features and functions of the app to avoid over-emphasis on the bottom line.

Jing Zhou	High	High	Reiterate priority of business objectives to keep balance between legal and security control, project performance, and user satisfaction.
Guojun Li	High	High	Involve in design sessions to ensure expert feedback on listings is included in overall app architecture.
Dr. Nina McGarry	High	High	Keep informed of all milestone progress and ensure timely follow up of any questions. In some cases, assert authority over project decisions based on subject matter expert advice to avoid over-influence.
John Doe	Low	Low	Incorporate feedback and bring in for on-site visits to encourage excitement in the project. Known for not thinking out of the box, we will ask critical questions and challenge him to drive innovation.
M. Katherine Jane	Medium	Low	Send memos on brand strategy and business objectives to ensure she stays on message.
Clinton Baca	Low	High	Provide frequent documentation and proof of compliance with all federal, state, and local taxes, and respond to inquiries promptly. The objective is to keep Clinton's interest low to avoid over-bearing regulatory control.
Pilot Group #1	High	Low	Take good notes and listen intently to feedback. Incorporate suggestions and feedback that improve product to keep users interested. Keep informed of all new features and progress made on development.
Barbara Wiley	Medium	Medium	Standard interactions and approach should work in this case.

Scope Management

Scope Statement

Project Justification

The innovative approach to real estate transaction management is designed to cater to the market. To meet the objectives of the project and reach as many users as possible, we simplify the system by connecting tenant and customers directly without agents and the technology platform will be mobile-first and cross-platform. Our product features are unique to customers. We provide 3D Pictures of rental or on sale homes, a messaging platform, a forum, rating from users, and mortgage service. We will provide security features to mitigate risks such as fraud. To ensure the legitimacy of each contract, NextAddress will also hire lawyers to draft contracts and provide legal advice.

Product Characteristics and Requirements

1. Product feature: If the home owners want their home information have priority on search result listing, they have choice to pay membership which is 0.5% of the trade price for selling and 5%

of contract price for renting more than base commission. The base commissions of selling and renting are 1.5% and 5% respectively.

2. Marketing activities: the tenant who is interested in moving forward with a property can live in the house for one night free of charge to experience the environment and facilities.
3. Marketing activities: a new tenant who needs to deliver furniture can enjoy free delivery service, if moving from a home with less than 1200 square feet.
4. Communication function: the tenants who need second-hand furniture can communicate with other home owners living around to trade the second-hand furniture.
5. Communication function: the tenants can communicate directly with home owners and former tenants to get advice.
6. 3D Pictures provide the real sight inside the homes, so our customers will use it as a tool to take a tour to limit home visits.
7. A messaging platform will be provided to our customers (landlords and tenants) so that they can chat with each other.
8. Ratings: both landlord and tenant can rate each other
9. After background check, we can provide mortgage service to customers.
10. Contract templates: The app will allow users to download contract once the deal is closed. The contract file will be in PDF format and comply with all federal, state, and local laws.
11. Background form and home owner agreement: The website must ask home owners to fill out background check form and sign on our legal agreement to proceed listing house on our website.
12. Cookie Policy: Create a cookie policy for users' reference and acceptance when visiting the website.
13. Security: The website must provide several levels of security. Users will have access to all listings once they have signed up. Users must provide ID document, approved credit and approved background to proceed with renting from the website. Users must agree to our privacy & cookie policy to proceed with the transaction. Users can choose to use MFA and biometrics to secure their accounts. Network security features such as firewalls, penetration test and attack mitigation will be implemented.

Product User Acceptance Criteria

1. Successful implementation of technology platform which is mobile-first and cross-platform.
2. Successful implementation of features in platform without glitches.
3. Users can use our website without worrying about any kind of information leaking and fraud. Users can be assured their rights are being protected by our legal team.
4. Our app should be simple and intuitive for users.

Summary of Project Deliverables

Project management-related deliverables include business case, charter, team contract, scope statement, WBS, schedule, cost baseline, status reports, final project presentation, final project report, lessons-learned report, and any other documents required to manage the project.

Product-related deliverables include research reports, design documents, software code, hardware, etc.

1. Research reports: A report that illustrate the market volume, market trend, main market players, and a chart that demonstrate unique features in each main apps in the market.
2. Mind-map: Using mind map to design our product, this mind map can be used for developing the WBS.

3. WBS and WBS dictionary: Using mind map to breakdown deliverables, add WBS dictionary entry to each item.
4. Front-end design: User interface design that will be used in implementation by the front-end engineer.
5. Back-end setup: Back end code integrated with database and ready to use.
6. Files for templates: the legal team will draft at least 10 documents for contract and other legal use.
7. Examples of completed templates: the legal team will include sample documents for users to refer to.
8. Form and agreement file for house owner to fill out and sign: the legal team will provide a form for house owner to fill out essential information such as house information, house picture, owner's criminal record and owner's background. An agreement includes legal information for house owners to sign on.
9. Cookie policy: Our legal team should provide us a cookie policy for us to put on our website.
10. Privacy policy: Our legal team should provide us a privacy policy to appear on all platforms and be GDPR-compliant.

Scope Management Plan

Preparing the Scope Statement

The preliminary scope statement will provide the basis for the future, detailed scope statement. The scope statement should be reviewed by key stakeholders such as project sponsor, relevant external stakeholders, and the customers. The project manager should be in the group to help define the scope and follow corporate templates. Each version of scope statement should be labeled and dated to ensure everyone in the project has the most recent document. Changes and additions should be highlighted, and the scope statement should be only available on the project website with limited access to relevant parties.

Creating the Work Breakdown Structure (WBS)

The leaders of the project groups (Infrastructure, Software, User Support, Marketing & Finance, Security & Legal, Listings and Features) will cooperate to create the WBS. The sponsor and executive committee will review the WBS to validate that all the work that should be done in the project is listed in WBS. The same team will review WBS and determine tasks requirements for each deliverable. The tasks include product and process content. The lowest level of WBS should take no more than two weeks. The WBS can be revised and must be approved by project sponsor and executive committee.

Verifying Completion of Project Deliverables

The project manager should develop the process of verifying completion of deliverables in conjunction with the project sponsor and the executive committee. The project sponsor and their associates should be responsible for verifying major deliverables. The contract for the project should contain the main process of scope verification.

Managing Requests for Changes to Project Scope

The party requesting the change must complete the change request form and follow all procedures outlined in the Change Management Plan. To prevent scope creep, it is important that all request for changes follow change control procedure.

Change Management Plan

Change Management Process

Table 9: Change Control Process

Step	Description
Generate change request	Submit formal Change Request and send it to the project manager
Log Change Request Status	Project Manager enters the change request into change control log. The change request status is updated throughout the process as needed
Evaluate Change Request	Project manager evaluates the impact on the project constraints: Time, scope, cost and quality.
Authorize	Change Control Board/steering committee signs-off on the change request
Implement	If approved, implement change and update change request status in change control log and inform stakeholders of completion.
Verify	Stakeholders must verify that the change was implemented correctly according to their own specifications and expectations. Update change control log with Verified status if completed, else, return to step 1.

Tools

Microsoft Project, Excel, Change Request Template, Change Control Log.

Reviewing and Approving Changes

1. Determine a change type: is it a corrective action, preventive action or defect repair?
2. Identify which category the change request falls into: Does it affect time, scope, cost or the quality of the project?
3. Approve the change request promptly: project can be halted when a change in action is reported, review and analyze it, and approve/deny it promptly so that the project schedule won't be affected.
4. Document the complete impact: document the complete process of a change request into change control log for future reference.
5. Coordinating changes throughout the project: sometimes an internal or external personnel can be influenced when a change occurs, make sure to coordinate and inform all people including stakeholders, vendors and people who are influenced by project change.

Requirements Management Plan

How requirements activities will be planned, tracked and reported

The NextAddress team will start by creating a mind map to illuminate the requirements the team has identified internally. Then, the team will invite outside consultants listed in the Stakeholder Registry to advise on requirements for the app. Based on their expertise, they will provide a much more comprehensive picture of the requirements.

The team will also engage with focus groups to understand pain points with existing applications as well as what works well for them. The team will collate this data into logs and determine where and how NextAddress will either resolve these issues, or build upon preferred features.

How requirements are prioritized

To prioritize, the NextAddress team will employ several methods. First, the requirements will be fed through a simple algorithm with dimensions by which to measure by: (1) estimated complexity, (2) estimated cost, (3) relative importance to customers, (4) effect on other priorities, and (5) market positioning factor. This will create a calculated score to use for prioritization.

Once this has completed, the senior team at NextAddress will evaluate options, assess risk, and discuss how to proceed. After consultation with the project sponsor, the President & CEO will then make a unilateral decision on if to proceed with the requirement or not.

Schedule Management Plan

Introduction

The schedule management plan details how the project schedule will be created and maintained through the life of the project covering

1. Project scheduling tool
2. Defining and Sequencing Activities
3. Controlling Project Schedule
4. Estimating Task Duration
5. Level of accuracy
6. Rules of performance measurement
7. Reporting formats
8. Tool Samples/Examples

The project schedule will accommodate an Agile Software Development Lifecycle, incorporating all required cycles for each project milestone as defined in the Project Charter.

Project Scheduling Tool

For this project, we will use Microsoft Project to model the project schedule, including allocating resources, scheduling tasks, monitoring milestones, and controlling task dependencies. Using Project, tasks will be visualized in a Gantt Chart. The advantages of this approach are:

- Streamline schedule changes – MS Project automates several schedule management activities that would otherwise be very time-consuming. For example, since tasks will be entered with dependencies, when the start and end dates of a task with dependencies change, those changes will cascade automatically to the dependent tasks. Additionally, the Gantt chart will update automatically with any changes, and changes to the overall schedule baseline can be easily monitored and controlled.
- Optimize resource utilization – When entering resources into the program, the project manager can define resource availability for the project, including percentage of available time, work hours, and exemptions for vacation or other exceptions. When tasks are scheduled against overutilized resources, there is a visual warning to stakeholders viewing the schedule that the resource is overutilized. Microsoft Project will prevent.
- Facilitate report generation and schedule analysis – Various representations of the schedule are exportable in Microsoft Project, which can be sent to stakeholders to communicate project schedule. The program will also auto-generate a network diagram which facilitates critical path analysis.

Defining and Sequencing Activities

Activities will be defined using the Work Breakdown Structure (WBS) and the Milestone List from the Project Charter. First, the milestones will be added to the project schedule according to the Project Charter. Additional activities can be added as needed to the schedule to complete WBS deliverables. The project manager in close collaboration with other functional/technical managers will make the determination of needed activities.

Once activities have been determined, the project team will assign duration to each activity according to “Estimating Task Duration”, below. Estimates are provided using PERT, and will be given a set amount of buffer. Following the estimation, dependencies will be created between the activities. Lastly, resources will be assigned to each activity based on the roles defined in the Resource Management Plan.

Estimating Task Duration

Schedule estimates will be provided in days using the PERT weight average using a three-point duration estimate with optimistic, realistic, and pessimistic estimates. This allows some flexibility in project scheduling and will increase the

average accuracy of task estimates. Estimates are provided in days instead of weeks or hours because hours would be too short and would require too much detail, making it impossible to manage the schedule effectively, and measuring in weeks is too long since some key tasks in the WBS may take only days to complete, and should be noted on the schedule, controlled, and monitored.

Schedule estimates should have the following accuracy, based on estimated task duration:

Estimated Duration	Targeted Accuracy	Slack/Float
1-5 Days	100%	<= 1 Day
6-15 Days	95%	<= 3 Days
16-30 Days	90%	<= 5 Days
31+ Days	85%	>= 5 Days

While the project team will always strive for 100% accuracy of schedule estimates, the targeted accuracies will help the team manage stakeholder expectations and provide some flexibility to deliver solutions that meet or exceed quality standards and functionality.

To provide additional buffer, we will add buffer, or slack/float to each task to ensure we stay on schedule.

Controlling Project Schedule

The project team will employ several methods to control project schedule:

1. Change the scope as needed – working with key stakeholders, the project team will remove or reconfigure features to reduce scope, thus affecting effort and duration. All changes will follow the process described in the change management plan.
2. Request additional resources as needed – should project sponsor approve, additional resources can be assigned to the project in some cases to shorten task duration. This approach would be “crashing”, or adding additional resources when necessary to complete certain tasks for the least possible incremental cost.
3. Fast tracking – the team will work on certain tasks in parallel when they were originally to be completed in sequence, when resources permit and the tasks are deemed appropriate for fast tracking.

Rules of Performance Measurement

Project staff must update their progress against tasks daily. Bi-weekly, the project manager will conduct a project performance review - looking at all task progress throughout the week, and adjusting the project schedule as needed, in accordance with the change management plan. Daily updates of progress will encourage the team to keep progress up-to-date and bi-weekly reviews will ensure due diligence when tracking project schedule performance.

Reporting Formats

The team will issue several reports to keep various project stakeholders engaged, which are detailed in the below table:

Report	Target Audience	Frequency	Comments
Spotlight Report	Executives, Senior Management	Monthly	This report will show high-level milestones and their statuses – green meaning on schedule, yellow meaning 10% or less behind schedule and red meaning more than 10% behind schedule
Schedule Progress Report	External Investors	Quarterly	This report shows key highlights from the schedule – completed milestones, key setbacks, and solutions to setbacks. It will also show the overall percentage completion and

Schedule vs Actual	All Internal	Realtime	This report will show all tasks for the week that were scheduled to be completed next to the actual completion dates. This will show delays, and by distributing the report internally, it will motivate higher performance. The report will allow managers to derive patterns for certain resources that deliver tasks late.
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Tool Samples/Examples












	Task Mode ▾	Task Name ▾	Duration ▾	Start ▾	Finish ▾	Predecessors ▾	Resource Names ▾	W
		Infrastructure Provisioned	30 days	Mon 12/17/18	Fri 1/25/19			
		Web Client Application Infrastructure - Cloud	14 days	Tue 1/1/19	Fri 1/18/19			
		Development Server	4 days	Tue 1/1/19	Fri 1/4/19		<input type="checkbox"/> Kevin Stone[5	
		Staging Server	5 days	Mon 1/7/19	Fri 1/11/19	3	<input type="checkbox"/> Kevin Stone	
		Production Server	5 days	Mon 1/14/19	Fri 1/18/19	4	<input type="checkbox"/> Kevin Stone[4	
		Secure Socket Layer (SSL) Certificate	5 days	Mon 1/14/19	Fri 1/18/19	5FF	<input type="checkbox"/> Kevin Stone[4	
		API Backend Infrastructure - Cloud	13 days	Wed 1/2/19	Fri 1/18/19			
		Development Server	3 days	Wed 1/2/19	Fri 1/4/19	3FF	<input type="checkbox"/> Kevin Stone[5	
		Production Server	5 days	Mon 1/14/19	Fri 1/18/19	5FF	<input type="checkbox"/> Kevin Stone[4	
		Database Infrastructure - Cloud	5 days	Mon 12/17/18	Fri 12/21/18			

Figure 1: Example of Microsoft Project Gantt Chart with WBS activities, task duration, assigned resources, and predecessors (sequencing)

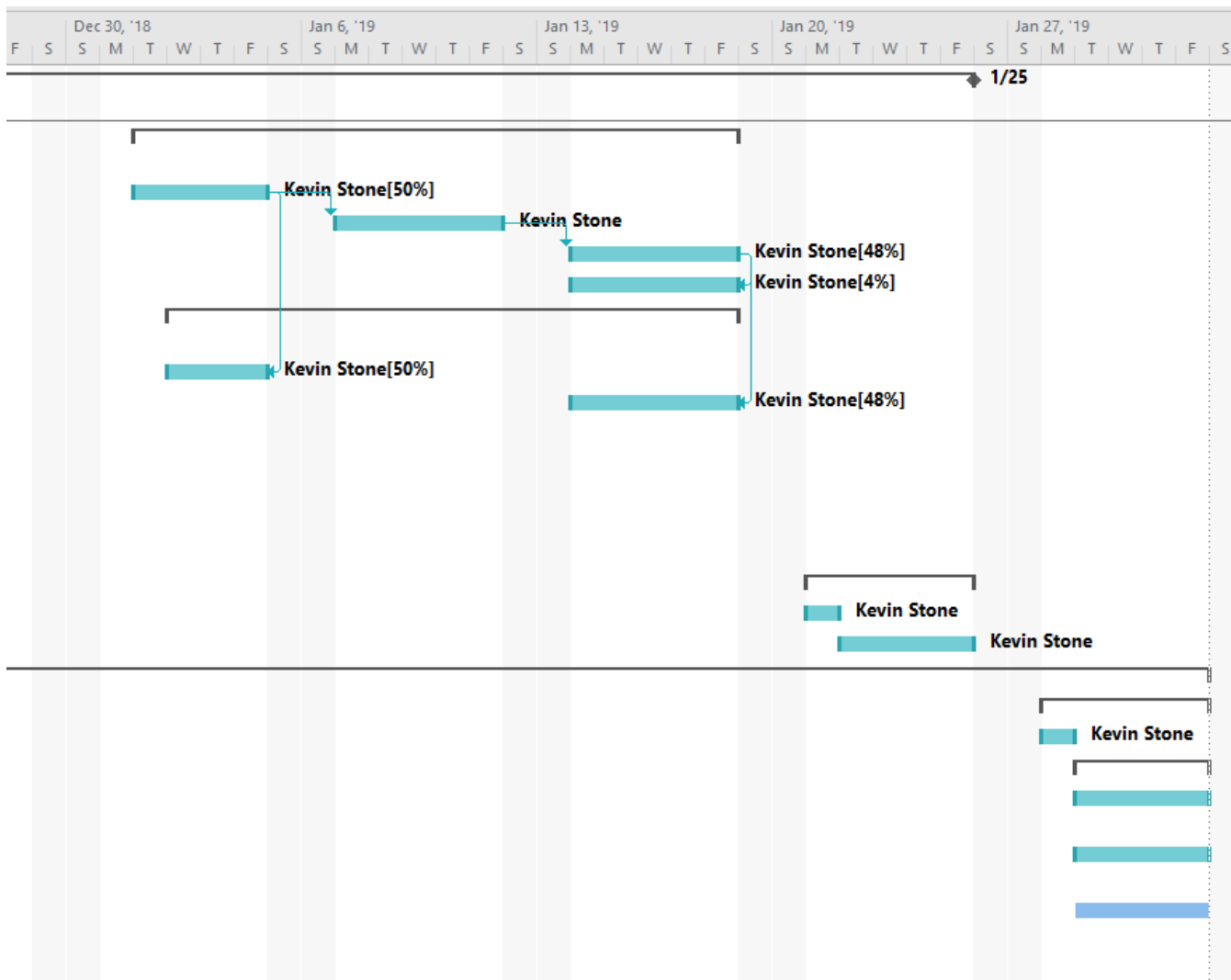


Figure 2: Gantt Chart example from Microsoft Project. The chart shows scheduled tasks, milestones, and task dependencies.

Change Working Time

Resource calendar for 'Kevin Stone':

Base calendar: Standard

Legend:

- Working
- Nonworking
- 31 Edited working hours
- On this calendar:
- 31 Exception day
- 31 Nondefault work week

Click on a day to see its working times: December 1, 2018 is nonworking.

December 2018

S	M	T	W	Th	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Based on: Default work week on calendar 'Standard'.

Exceptions Work Weeks

	Name	Start	Finish
1	Holiday Vacation	12/24/2018	12/28/2018

Details... Delete

Help OK Cancel

Figure 3: Example from Microsoft Project showing how project managers have the flexibility to schedule vacations for project resources.

1		Infrastructure Provisioned	30 days	Mon 12/17/18	Fri 1/25/19		
2		Web Client Application Infrastructure - Cloud	14 days	Tue 1/1/19	Fri 1/18/19		
3		Development Server	4 days	Tue 1/1/19	Fri 1/4/19		Kevin Stone[5]
4		Staging Server	5 days	Mon 1/7/19	Fri 1/11/19	3	Kevin Stone
5		Production Server	5 days	Mon 1/14/19	Fri 1/18/19	4	Kevin Stone[4]
6		Secure Socket Layer (SSL) Certificate	5 days	Mon 1/14/19	Fri 1/18/19	5FF	Kevin Stone[4]
7		API Backend Infrastructure - Cloud	13 days	Wed 1/2/19	Fri 1/18/19		
8		Development Server	3 days	Wed 1/2/19	Fri 1/4/19	3FF	Kevin Stone[5]
9		Production Server	5 days	Mon 1/14/19	Fri 1/18/19	5FF	Kevin Stone[4]
10		Database Infrastructure - Cloud	5 days	Mon 12/17/18	Fri 12/21/18		
11		Development Database	5 days	Mon 12/17/18	Fri 12/21/18		Kevin Stone[3]
12		Production Database	5 days	Mon 12/17/18	Fri 12/21/18		Kevin Stone[3]
13		Database Backup	5 days	Mon 12/17/18	Fri 12/21/18		Kevin Stone[3]
14		Version Control	10 days	Mon 1/14/19	Fri 1/25/19		
15		GitHub Enterprise	1 day	Mon 1/14/19	Mon 1/14/19		Kevin Stone
16		Continuous Deployment	4 days	Tue 1/22/19	Fri 1/25/19		Kevin Stone

Figure 4: An excerpt of the project schedule showing overallocated resources.

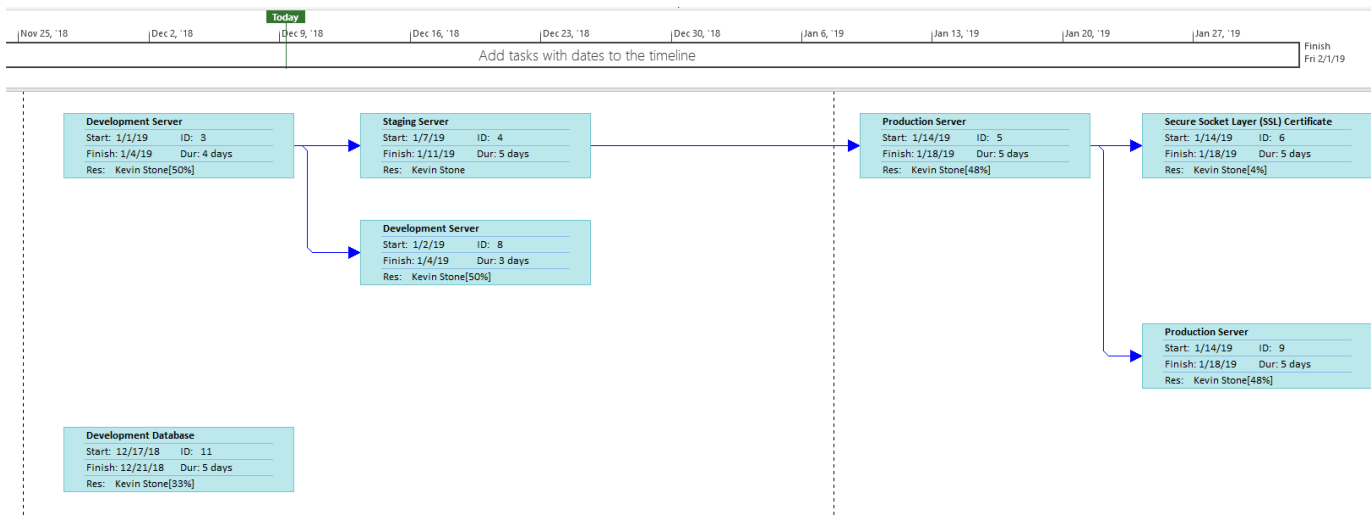


Figure 5: Example of an auto-generated network diagram from Microsoft Project.

Cost Management Plan

Cost Estimation

For our cost estimation, we plan to complete the project in two years and then make prediction on budget plan in five years. So, we choose budget estimate to operate our cost estimation as this type of estimation can fit our schedule of completion and realize the accuracy. We choose \$1 as our level of accuracy for rounding because the expense of specific, quantifiable technology can be predicted with high accuracy. As for units of measure, labor hours is used to for labor costs. The deliverables from the WBS structure is used to complete cost estimation and control thresholds is $\pm 10\%$ of the baseline cost. We use bottom-up estimates by dividing WBS items into subcategories and assign them to managers of each department. EVM is also used to track our actual cost since the start of project until now.

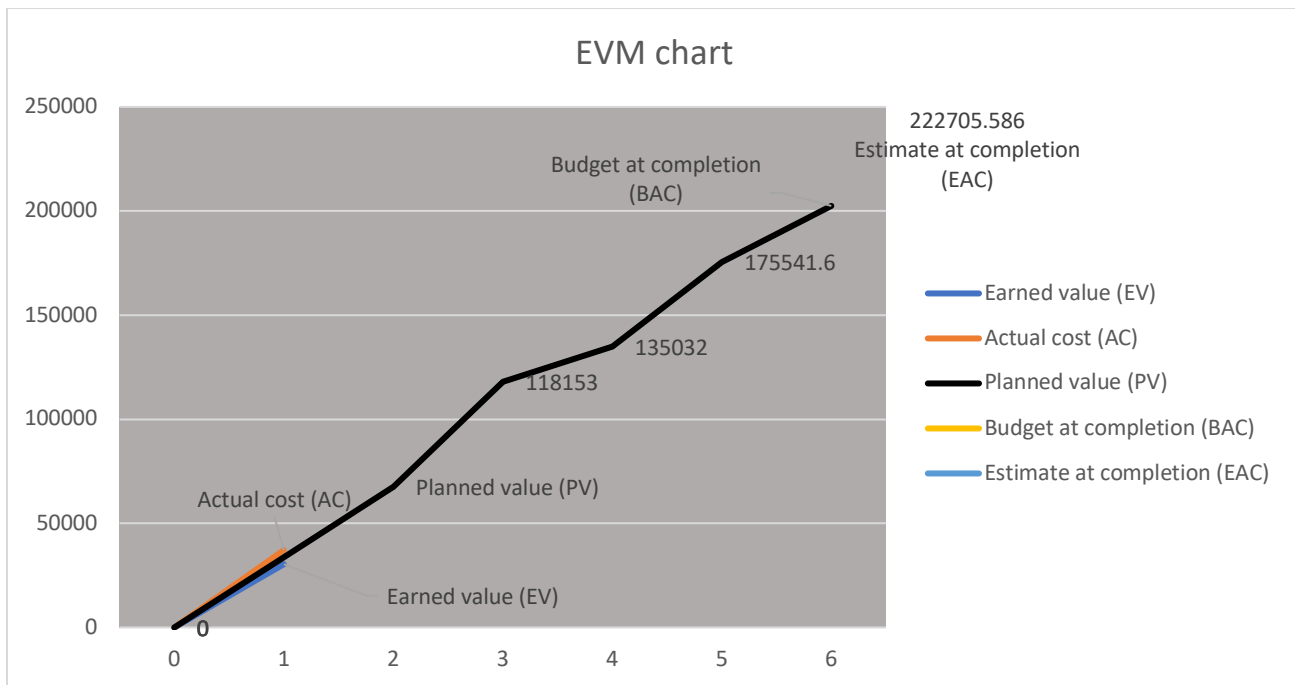
Budgeting

Costs for all the items in the WBS are estimated using research and expertise. Labor is calculated using rate for labor hours and materials are estimated based on unit price. Additionally, cost baseline is also completed based on the cost estimation. But the duration of cost baseline is only for one year.

Cost Control

To better track our budget and cost, EVM is also used to estimate our cost. Because our project starts from October 2018, the first two years cost can be tracked. The unit of time is two months and one year's estimation are made. Therefore, there are six units of time. The planned value (PV) should be \$33,758 dollars according to WBS items in first two months. The earned value (EV) is predicted as 90% of work items because some items might not be completed on time and actual cost (AC) is estimated as 110% of work items because some cost items might not be predicted. The estimate at completion is assumed as 110% of our budget of completion because there might be some cost not covered in our budget. So, we can see that the work efficiency should be improved, and cost should be better controlled. From the first two months of implementing the project, the cost exceeds budget, but the real work completed is behind the plan. So, the cost should be controlled into an available level. Some unnecessary cost will be waived and the budget will be transferred to some parts of the project which are more efficient.

Figure 6: EVM Chart



Profit Prediction

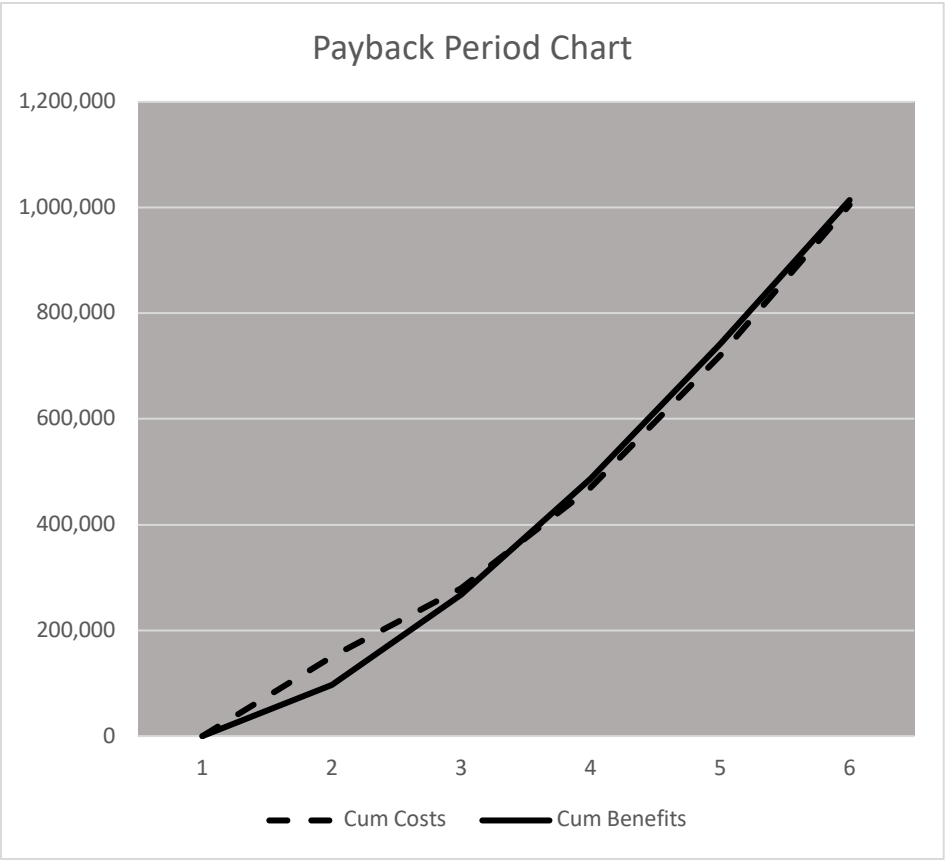
For profit prediction, the NPV and payback period chart are also used to predict the future profit condition. This analysis concludes that the project will break even after five years. The total initial budget is \$1,012,000 dollars. We estimate that the variable cost for completing implementation, which includes personal salaries and other flexible costs is \$1,000 at first year. Over time, the variability will decrease by increased volume of work and improved efficiency. The fixed costs include the infrastructure and software fees at \$10,000, but the depreciation of the fixed instrument is estimated at \$5,000 dollars each year.

As for income, we combine selling of one house and renting of 5 houses as a unit. The income of one unit is around \$10,000 dollars and our planned sales for first year is 20 units. Then the sales should be increased by 20 units each year. After calculating the tax and discount factor, the cash flow of each year can be seen. The estimated of years of covering the budget is less than 5 years. The break-even point is about 35 to 37 units. The Internal Rate of Return is 18.8%. NextAddress believes that following this, the business model will continue to grow in popularity and income will also grow, increasing profits significantly over time.

Payback Analysis

As for payback period chart, the revenue and cost in first five years are used to predict payback point. As the chart shows, at the first two years of project, the cost is much higher than the benefit, and then the benefit increases faster than the increase rate of cost. The payback period is estimated between the third year and the fourth year.

Figure 7: Payback Analysis



Quality Management Plan

Introduction

The purpose of the Quality management plan is to document the processes to identify, perform, and control quality requirements and standards in our project. We will address the following issues in the Quality management plan:

- How Quality management will be achieved
- Process for achieving quality management
- Example of tools that will be employed to assure quality

Explanation on How Quality management will be achieved

Our goal is to ensure the highest possible quality of our product, which is critical to achieving customer and other stakeholder satisfaction. To ensure quality management, we will first need to identify quality requirements and standards that are relevant to our project. Then we will work to satisfy those standards during implementation. To ensure that we have met our own standards, our team of internal auditors will periodically evaluate overall project performance and ensure all quality standards are satisfied. Additionally, we will conduct user testing to provide outside perspective and increase the likelihood of user satisfaction. Finally, on an ongoing basis, we will monitor specific project results for compliance and proactively identify areas for improvement.

Process for Achieving Quality Management

This will be the quality management process for NextAddress:

- Project Planning Phase: identify quality requirements and standards that are relevant to our project, determine what tools to use to plan and control our project's quality. In this phase we will develop quality management plan, quality metrics. We will make sure all stakeholders sign off the quality management plan before applying it to the project.
- Project Execution phase: periodically evaluating overall project performance to ensure that the project will satisfy the relevant quality standards. Define roles of all employees in quality assurance. We will use unit testing at each milestone to test each component and make sure each component is compliance with our quality metrics. We will perform integration testing to ensure components and components work together. At the end of system developing, we will perform system testing to test the entire system's functionality.
- Monitoring and controlling phase: monitor specific project results, ensure all results are compliant, and identify ways to improve overall quality. We will conduct user acceptance testing in this phase, collecting user feedback and we will work on improving our system based on user feedback.

Tools

In quality management, we will employ several tools to streamline the quality management process including:

- Quality Metrics - the quality metrics helps us define our quality requirements and standard. Those requirements and standards are used for continuous controlling and improving project's quality.
- Pareto Charts - they allow us to analyze frequency of quality issues and the issues. For example, if a bug or software issue reoccurs frequently, the Pareto chart will highlight that issue for us, prompting us to remediate. We use a pareto chart to determine the 80% cause of the quality issue and help us prioritize the quality issue to prioritize.
- Histograms – they will allow us to view trends in quality management over time, and allow us to monitor the effectiveness of our efforts.

Quality Metrics

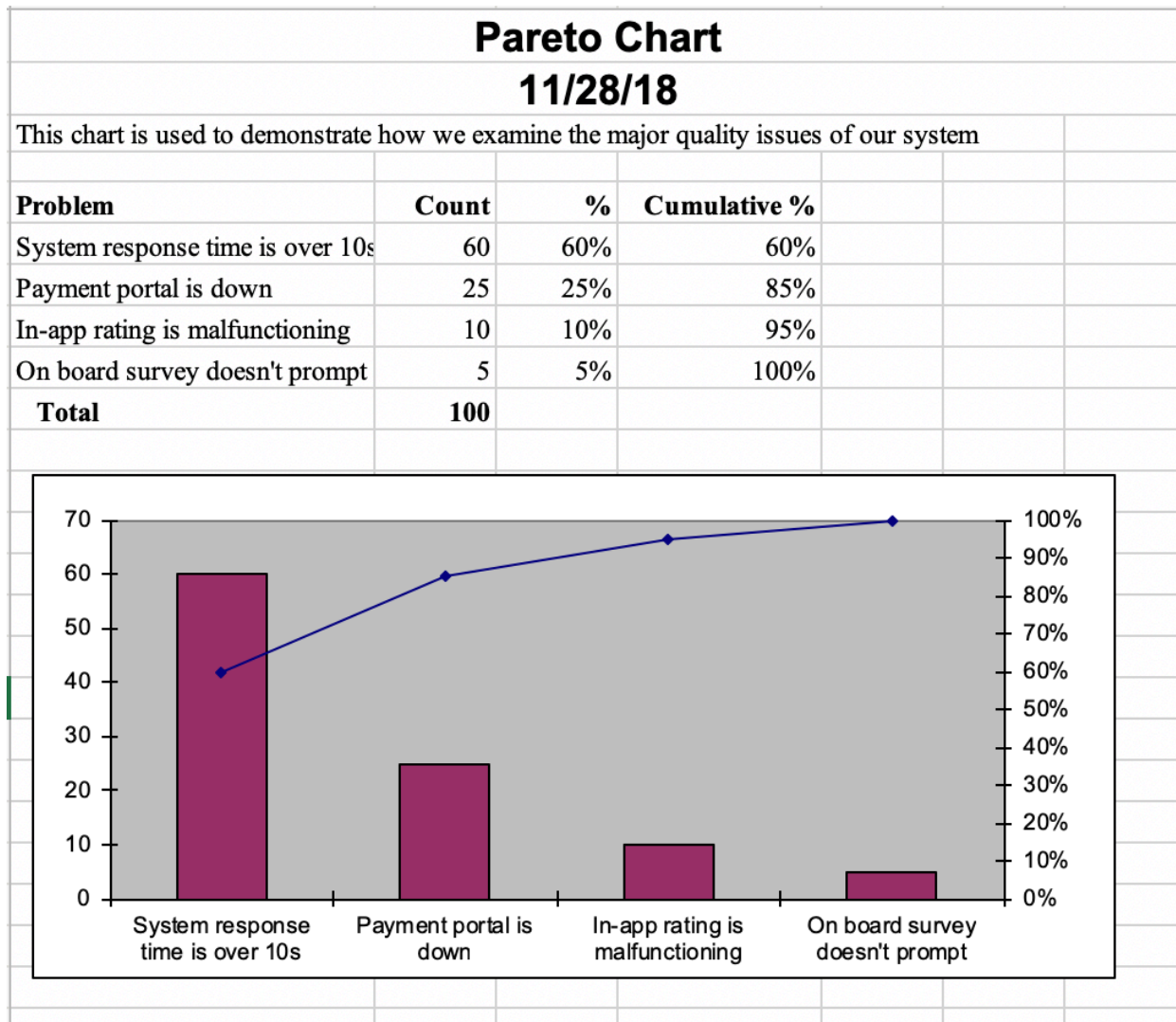
The following quality metrics apply to this project:

1. Loading time for the system is under 2 seconds.
2. System produce consistent and accurate result – data is consistent

3. Standard Help Desk response time is within 24 hours
4. Bug occurrence is less than 10 per month post go-live
5. System can handle 500,000 users simultaneously
6. Cost doesn't exceed 5% more than budget
7. Membership service achieve a 4 out of 5 rating
8. Mortgage approval accuracy achieves 99.999%
9. Contracts are free of error, approved by two legal consultants before releasing to users
10. Pass high-level penetration test and system are patched up-to-date
11. Comply with GDPR, customer private data are securely stored and confidential
12. Top-10 algorithmic search results result in "favoriting" by users satisfy more than 50% of the time
13. Listing mapping data is accurate and can provide demographic information for users.

Pareto Chart Example

Figure 8: Pareto Chart Example



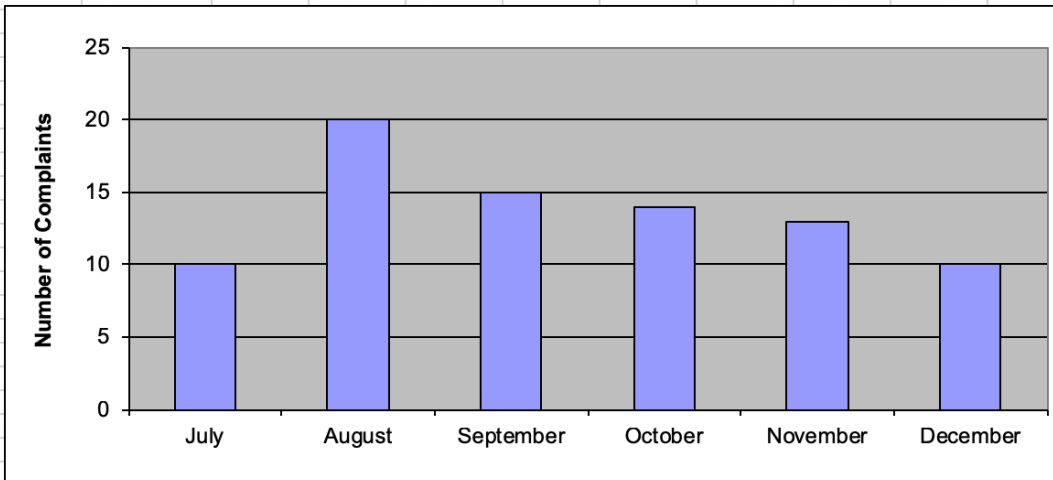
Histogram Example

Figure 9: Histogram Example

Histogram

11/28/18

Month	# Complaints	This diagram is used to demonstrate how we monitor our project's quality complaints by month									
July	10										
August	20										
September	15										
October	14										
November	13										
December	10										



Resource Management Plan

Introduction

The purpose of the Resource management plan is to document the processes of identifying, acquiring, developing, and managing the human resources necessary to complete our project. The plan will answer questions and present content such as:

- How we will select people for the project
- How we will motivate staff
- How we will instill a sense of discipline
- Task assignment
- How we will prevent over allocation of resources
- How we will control for resource allocation

Resource selection

We select our team based on skills needed for our project. Currently we have five VPs, and aside from doing management work, VPs will be directly leading teams specialized to their domain. VPs job descriptions is provided below. We plan to build the core part of our product in house, and we will also outsource experts to do penetration testing and system testing. Our total schedule for developing our app is roughly two years, so we will need to recruit experienced engineers who don't need a long learning curve to be efficient in developing and who can also help junior engineers grow their expertise. We will also recruit several junior positions to cut down budget and junior engineers can bring in new blood in our project, keep our team alive and energetic.

Resource motivation

As a tech start-up, our employee may face the situation of taking more than one role and do tasks outside their job description. We need to motivate our employee to be creative and productive, thus we will employ several methods to fulfil their motivational needs and make sure our employees accomplishments are well recognized. We will combine

several methods to ensure the fundamental needs of our employees are well met (salary, bonus, vacation), their social status and esteem needs can also be achieved in our organization (promotion):

1. **Bonus:** We will design a bonus plan for each employee, make sure their work is well measured and recognized, and we will encourage exceptional contribution with extra monetary bonus and vacation with family. For example, a marketing specialist has a baseline of achieving 100,000 downloads per quarter, when he/she achieves 80,000, we will give him/her 50% of base bonus, when he/she achieves 100,000, we will give him/her 100% of his/her bonus, when he/she achieves 110,000, we will give him/her 120% bonus, every 10% of over achieving will earn extra 20% of bonus with a cutoff of 200% bonus. Top achievers will also get company sponsored trip with family.
2. **Stock plan:** as a tech start-up, the best way to attract the best and brightest minds is to make them have the sense of ownership. Giving them stock option will help them feel they are belonged.
3. **Promotion:** Each employee will have the chance to be promoted based on their performance. Managers must design a performance evaluation method to evaluate an employee in various aspects. Promotion can be a change in job title, for example, junior engineer promote to senior engineer. This type of promotion will increase employees salary, bonus baseline and stock plan percentage according to different job title. Promotion can also be structural promotion, that means an employee will transition from a non-leadership role to a leadership role, manage his/her team, or manage multiple teams if he/she is previously managing a team.

Resource discipline

We encourage our employee to work flexibly, assuming we are on our schedule. We will employ several techniques to assist in discipline our project team:

- **Periodic conversation:** We will use formal and informal one-on-one conversations to assess team members feedback and performance. We will encourage our team members to address their concerns and their problems, giving them assistance and positive feedback.
- **Set out rules:** We will set rules and consequences clearly and have team members have online training and assessments to understand those rules, to keep project team disciplined.
- **Collaboration in planning and decision-making:** We will involve project team members in project planning and decision-making, emphasize ownership in our project and giving project team members feedbacks on their progress to prevent them from indiscipline.
- **Provide training opportunities:** We will provide technical trainings as well as soft skills or interpersonal skills trainings to our employees to improve our project team effectiveness. We will also encourage team members to help each other in their tasks, allowing team members to be more effective when they face challenges and providing a collaborative atmosphere.

Task Assignment

Using the organizational chart, RAM chart and resource availability schedules, and expertise of management, we will assign tasks to appropriate resources.

Tools

The following are the tools we will use to facility resource management. Examples of each tool is provided below.

- We will create an organizational chart, this will clearly show the reporting relationship and their responsible domain.
- We will also use a histogram to show resources assigned to our project over time and help us readjust task assignment.
- We will use RAM to map the work of the project from WBS to each responsible unit.

Prevent Resource Over-Allocation

Overallocation will cause more budget and resource burnout. One reason for resource overallocation happens when project schedule is unrealistic, so our first and foremost task is to design a reasonable schedule per the schedule management plan. When assigning tasks, we will use MS project to help visually see which employees are overallocated and reallocate work to make it reasonable. Our employees are planned to work 40 hours per week, with 80% effective work time, that means 28-32 hours effective work time, we will build our schedule accordingly, leave some wiggle room in project schedule.

Control resource allocation

We will use resource leveling to utilize slack time in tasks and avoid conflict in schedule. Some employees might be overallocated while others might be under allocated. We will change the schedule to prevent resource overallocation or under allocation.

Table 10: Senior Leadership Roles & Responsibilities

Name	Role	Responsibilities
Kevin Stone	Project Manager & VP	<ol style="list-style-type: none">1. Manage project team, develop project management plan.2. Manage IT infrastructure, software development team and user support team
Weizhen Kong	CEO & VP	<ol style="list-style-type: none">1. Design and develop marketing plan2. Manage marketing and finance team
Guojun Li	VP	<ol style="list-style-type: none">1. Design listing algorithm, leading house resource team and customer information team
Yinghan Lv	VP	<ol style="list-style-type: none">1. Design system UI2. Lead UI team
Jing Zhou	VP	<ol style="list-style-type: none">1. Lead legal and compliance team

Figure 10: NextAddress Organizational Chart

Figure 12: RAM Sample

	A	B	BM	BN	BO	BP	BQ	BR
1								
2			5.5.4.1	6.1	6.2.1	6.2.2	6.3.1	6.3.2
3		Software Engineer Team		p	p	p	p	p
4		User Support Team	R P					
5		Customer Benefit Team						
6		Housing Resource Team						
7		Customer Information Team						
8		UI team						
9		Legal Team		R	R	R	R	R
10	OBS units	Compliance team		R	R	R	R	R
11								
12		R = Responsible organizational unit						
13		P = Performing organizational unit						
14								

Communication Plan

Introduction

The NextAddress Communications Management Plan (CMP) defines how Project Status will be communicated and how communication will occur in terms of frequency and medium.

Plan for Communicating Project Status

To track project performance and to keep stakeholders informed about how resources are being used to achieve project objectives and motivate workers, we will employ performance reporting as our tool to track project status. Specifically, we will be using status reports, for they provide information about where the project stands in terms of meeting scope, time, cost, and quality goals.

Communique will include the various required communications by each project plan. For Cost Management, it would include, for example, much money has been spent to date. For Schedule Management, it would include a schedule report showing task on-time performance.

All communications – written, verbal, and visual – will be tailored to the needs and preferences of the receiving stakeholder. Another technique we will use is periodic status review meeting, since holding meetings is a good way to highlight information provided in important project documents, empower people to be accountable for their work, and have face-to-face discussions about important project issues.

Plan for Meetings

Meetings are important because it not only can foster team building but also reinforcing expectations, roles, relationships, and commitment to the project. To make high quality communication through meetings, we will:

- Define the purpose and intended outcome of the meeting: Be specific about what we are going to discuss in this meeting, what expected outcomes we try to achieve will help us focus on important things and keep stakeholders interested.
- Determine who should attend the meeting: Once the purposes are defined, we should consider who should attend this meeting. If this meeting is about to make a decision, try to involve just the people who are relevant.
- Provide an agenda to participants before the meeting: Provide the agenda to all expected attendees so that they can come to the meeting prepared.

- Prepare handouts and visual aids, and make logistical arrangements ahead of time: print handouts if necessary. Based on the length of the meeting, prepare refreshments or meals for all participants.
- Set the ground rules for the meeting: Set rule before the meeting begin, such as when can they ask questions, can they use their electronic devices during the meetings etc.

Non-Meeting Communications

Based on the nature of the message that is to be communicated, and the types of people that are involved in the process of communication, we shall use multiple methods to communicate:

- Email: using emails as a formal communication method
- SharePoint: exchange documents and collaborate on documents
- Web conference: for employees that are based offsite to participate in meetings.
- Internal instant messaging: easy to get access, efficient to use for conveying simple messages.
- Phone call: easy to use and efficient to convey complicated messages. Might consider to send out following up emails or instant messages as reminders.

Plan for Who Will Receive Communications

To avoid overcommunication, we need to classify our stakeholders and employees, and tailor frequency to those classifications. This will ensure we only communicate to the people we need. We will use a stakeholder communication analysis in assisting us to classify who we need to communicate, how often do we communicate with them, what documents are needed, and what method to use to communicate.

Table 11: Stakeholder Communications Analysis

Stakeholders	Document Name	Document Format	Contact Person	Due
App IT Designer	Project Prototype	Meeting and E-mail	Kevin Stone	2/1/2019
Feature Designer	Feature Prototype and detail	Meeting and E-mail	Yinghan Lu	5/1/2019
Marketing and Finance Analyst	Marketing plan, finance analysis	Meeting and E-mail	Weizhen Kong	6/1/2019
Security and Legal Analyst	Security and legal plan	Meeting and E-mail	Jing Zhou	1/3/2019
Listings Manager	Listing gathering plan	Meeting and E-mail	Guojun Li	6/1/2019
Project Sponsor	Monthly Status Report	Meeting and E-mail	Dr. Nina McGarry	First day every month
Real Estate Consultant	Weekly status report	Intranet and E-mail	John Doe	Every Monday
Marketing & Public Relations Consultant	weekly status report	Intranet and E-mail	M. Katherine Jane	Every Monday
Auditor	Quarterly status report	Hard Copy and E-mail	Clinton Baca	First week every quarter
Pilot Testers	Weekly status report	Intranet and E-mail	Pilot Group #1	Every Wednesday

Frequency of Communication

Important updates, such as reaching a milestone, we will send out emails to stakeholders and keep them updated. This kind of communication is more schedule oriented than frequency-based. However, we will keep our stakeholders as well as our employees informed periodically. The following items will be communicated regularly:

- Project status: We will communicate to our employees about current project status weekly, so that all team members are aware of what we have achieved and how much money we have spent, are we on schedule etc.

Project stakeholders also need to be informed on project status, but not as often, we plan to update our stakeholder in a quarterly manner.

- Performance Assessments: We will evaluate employees performance twice a year, to keep hard working employees properly motivated. Performance assessment usually will be held on June and December, and all relevant communications will be sent around those times.

Revising the Communication Plan

When we need to revise our communication plan, we need to go through the Change Management procedure. As it pertains to Communications:

- Identify the reason and requirements to revise communication plan
- Update stakeholder communication analysis
- Update communication frequency
- Have stakeholders and team members sign off
- Executing updated communication plan

Glossary of Terms

Table 12: Glossary of Terms

term	definition
SharePoint	A portal that allows users to create custom websites to access documents and applications stored on shared devices

Risk Management Plan

Introduction

The risk management plan introduces what the risks we have, how to track risks, how to mitigate risks and how to manage risks.

Identifying Risks

We will mainly identify risks using a SWOT analysis formed by collaboration between managers from NextAddress' business functions. This method provides us a direct and structured method of identifying risks in a relatively short amount of amount of time, which we can then use later qualitative and quantitative risk analysis.

SWOT Analysis

Figure 13: SWOT Analysis

Strength: <ul style="list-style-type: none">• Customer strength• Innovative business ideas• No agent fees• Cheaper accommodation• Online based – easily accessible	Opportunity: <ul style="list-style-type: none">• Niche market• New settlement of Amazon• Creative marketing activity
Weakness: <ul style="list-style-type: none">• No reputation• Lack of financial resource• Lack of technical staff• Long time of completion• Low number of users at beginning – not enough tenants or landlords	Threat: <ul style="list-style-type: none">• Competition in the industry• Private rentals• Possible lack of appropriate rentals• Unreliable tenants, chance of them not paying• Data privacy and security• Local, state, and federal laws governing real estate

The SWOT analysis presents the internal and external advantages and disadvantages. As for internal advantages, our project has multiple strength and many shortcomings. A significant strength the market we will operate in. Washington DC area is transient - people come to Washington D.C to look for jobs or go to school and often leave. Because the rent and price of buying housing or apartment in Washington D.C is relatively high, we have another advantage that our fees are lower than a traditional agent. Therefore, the accommodation price will be relatively lower in our platform.

Our innovative approach can produce profits at a lower price, and out platform will result in higher customer satisfaction – especially for those exploring the local market from outside the area. However, our weakness is that we have no reputation as a start-up. Therefore, we run the risk of lower users – both buyers & sellers – and we may not turn a profit immediately.

As for external risk analysis, we will plan to capitalize on opportunity. For example, the coming of second headquarters of Amazon in Crystal City will bring a lot of new residence to D.C area, increasing the number of potential customers. As for external threats, there is significant competition in the industry. We will actively work to mitigate this risk by focusing on customers' needs and producing innovative, value-add features.

Risk Register

We will produce a risk register to track the risks we have identified. Below, we've included an example of the risk register:

Table 13: Risk Register Example

No.	Rank	Risk	Description	Category	Root Cause	Risk Owner	Status
-----	------	------	-------------	----------	------------	------------	--------

R22	1	No reputation	As a start up, we lack reputation	Structure/process risk	Inherent	VP, Finance & Marketing	Under Review
R90	2	Lack of profitability	Funding will eventually run out unless we are profitable	Financial risk	Inherent	VP, Finance & Marketing	Pending Review
R87	4	Long time of completion	It will take 36 months to complete the project.	Structure/process risk	Complex software development	VP, Development	Pending Mitigation Plan
R09	5	Competition in the industry	Due to the saturated markets, we have to face a highly competitive industry.	Market risk	Inherent	VP, Finance & Marketing	Accepted
R82	6	Competition with private rentals	We must compete with other private house owners who rent their house.	Market risk	Inherent	VP, Finance & Marketing	Pending Mitigation Plan
R65	7	Possible lack of appropriate rentals	There might be no enough rental in the market	Market risk	Market Demand	VP, Finance & Marketing	Under Review
R23	8	Unreliable tenants	We might have high-risk that tenants that don't pay rent.	Market risk	Economic Diversity	VP, Finance & Marketing	Pending Review

Risk Categories

The total risks will be categorized as

1. Market risks – external factors connected to market forces that may impact NextAddress's implementation
2. Financial/Economic risks – involving money; cashflow, budget, credit, investments, etc., and the current economic climate.
3. Technology risks – involving inherent problems engineering complex technological solutions
4. People Risks –involving human behavior or motivation
5. Policy risks – related to local, state, and federal policies that affect NextAddress as well as the political climate

Qualitative Risk Analysis and Monitoring

Qualitative risk analysis is also conducted to measure risks. We will use two tools to perform qualitative risk analysis: (1) Probability/impact matrix and (2) the top ten risk term tracking.

The probability/impact matrix allows the team to see the impact versus the probability of relevant risks. The matrix establishes a relationship between probability and impact, allowing us to prioritize and giving us a tool to visualize risk listed in the Risk Register.

Figure 14: Probability/Impact Matrix Example

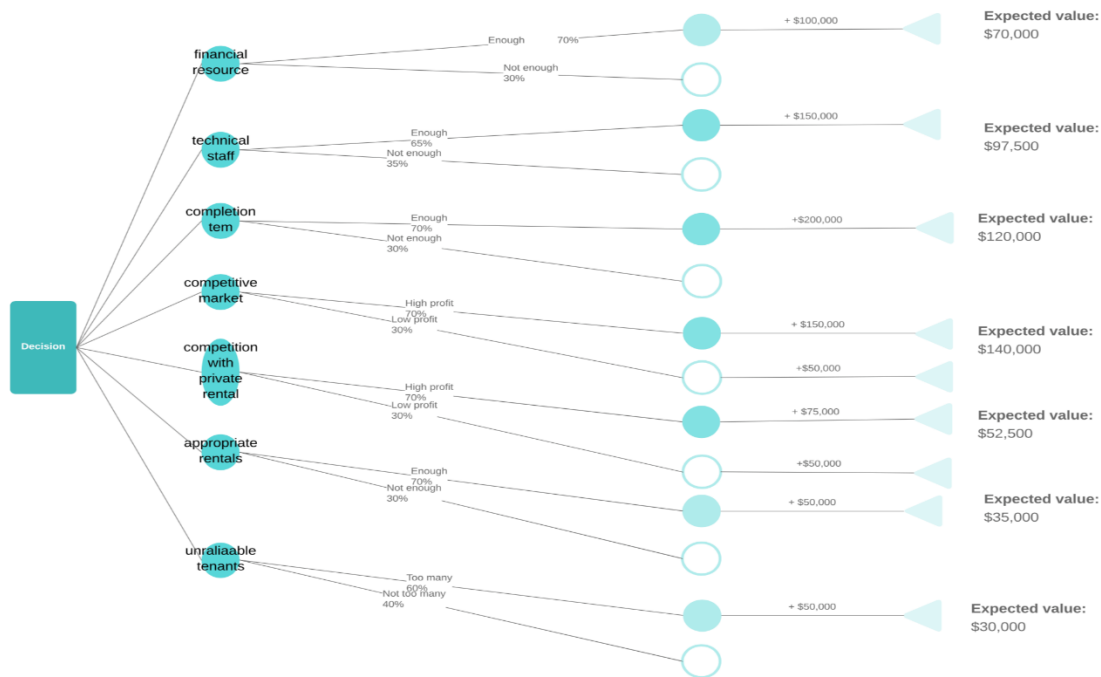
Probability	High	Risfrk 6	Risk 8	Risk 1
	Medium	Risk 4	Risk 5	
	Low		Risk 7	Risk 2
		Low	Medium	High
	Impact			

The top-ten risk tracking tool allows senior leadership to monitor the highest priority risks and their statuses. The tool allows the team to perform periodic reviews of risk, and the changes in position and status, giving executives situational awareness and avoiding surprises.

	Monthly ranking	Monthly ranking	Monthly ranking	
Risk Event	Rank This Month	Rank Last Month	Number of Month in Top Five	Risk Resolution Progress
No reputation	1	3	2	Implementing multiple marketing activities online and offline
Lack of financial resource	2	5	2	Cutting unnecessary budget terms
Lack of technical staff	3	6	1	Recruiting part-time technical staff or contract technique workers
Long time of completion	4	2	2	Improving efficiency
Competition in the industry	5	1	2	Identifying niche market and create new market

Quantitative Risk Analysis

The main tool that we plan to use for Quantitative Risk Analysis is a decision tree. The decision tree shows expected monetary value of each possible outcome of each risk. By assigning probability of occurrence and the risk's monetary value to each outcome, a hard number can be calculated. This provides the NextAddress team valuable analytics for decision making when it comes to risks, and a tool to understand the financial impact of risks.



Risk Mitigation

The risk mitigation is implemented based on the probability/impact matrix. Qualitative risk analysis provides the unique benefit of clear categorization of risks and the owning member. The category, severity, and inherent cause of the risk changes the approach for mitigation.

To mitigate risks with high impact and high probability, close attention will be paid to factors influencing those risks, and proactive action will be taken to lessen influencing factors. To mitigate risks with high impact and low probability of occurrence, the risk factors can be monitored less frequently, and action can be contingent on occurrence. For the risks with lower impact but higher probability, we should prepare to face the risks and control the risks by minimizing the cost of risks. For the last risk with lower probability and lower impact, we should not ignore them as accumulated questions might become a big issue.

Risk Control

To better control risks, project management will prepare weekly risk reports for distribution to risk owners. In collaboration with project management, they can work to stem risk costs. We will set multiple risks stop light such as the frequency and damage it has caused. For example, we will analyze the risks turnover rate which means that the risk is going to become real damage. Once the damage is too much or same kind of risk happens too many times, we will focus on the specific risks to deal with it. Such as the risk of lacking technical teams, we will look for experienced technical teams if the technical work get in way of project completion.

Procurement Plan

Introduction – Make or Buy

The core of NextAddress is developed 100% in-house. As a technology startup, NextAddress focuses on the development of software and the supporting infrastructure. This will allow NextAddress to be the subject-matter expert of its own codebase. Most importantly, building in-house will allow NextAddress to nurture innovation.

While most of NextAddress will be built in-house, there are clear benefits to outsourcing limited sub-projects:

1. Penetration Testing – outside sources provide the necessary cybersecurity expertise that NextAddress does not possess.
2. Quality Assurance Testing – while NextAddress implements several quality control measures according to the Quality Management plan, outside professional testing will provide an alternative perspective, allowing NextAddress to focus on its core business.

A benefit in both cases, NextAddress benefits from significantly higher accountability. Third-party verification of security and quality is a selling point for the company and avoids conflicts of interest. NextAddress strives to produce high-quality applications for customers, and investing additional resources in Quality Assurance is an important step.

Contract Type

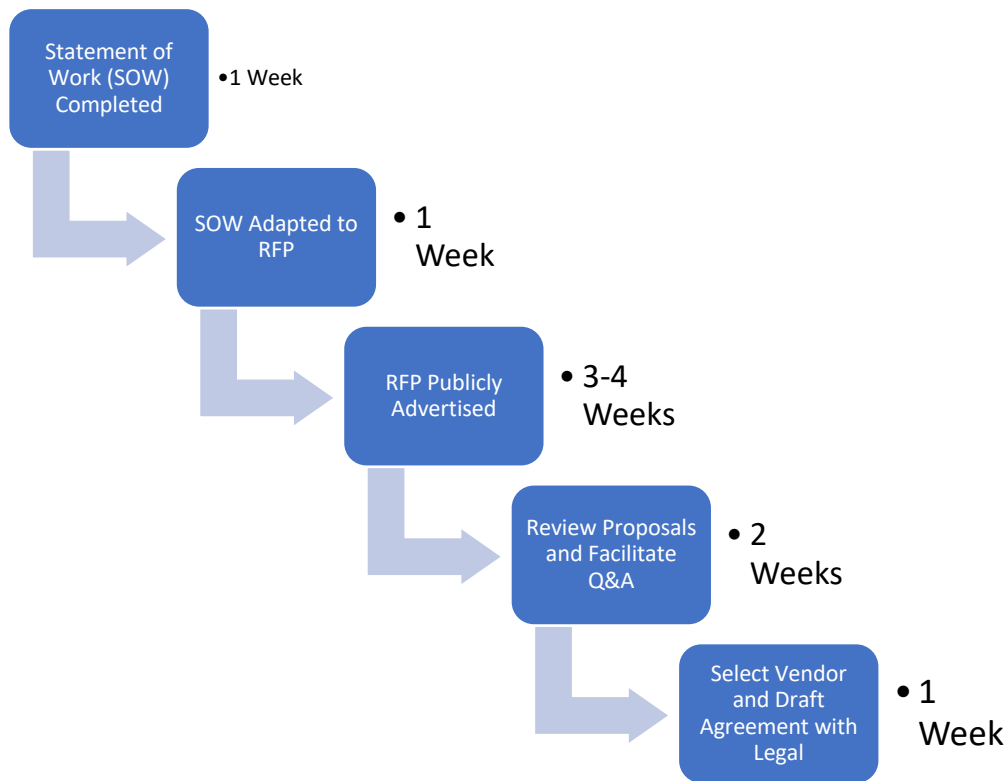
Company policy will be to use cost plus incentive fee (CPIF) contracts for procurements. Not only do CPIF contracts cap the cost of the project, but they also provide an incentive for our contractor to limit its costs. Additionally, a CPIF contract provides NextAddress relatively lower risk. As a start-up, NextAddress is already managing many risks. By selecting a CPIF contracting mechanism, we reduce the chances of loss due to litigation and poorly executed contracts.

Vendor Timeline

The following timeline provides NextAddress with a consistent and traceable approach to each procurement, and can be used as a template for future procurements.

The overall timeline for each procurement process is 8-9 weeks. Since there are no significant dependencies on the WBS to these procured services, we estimate low impact to project schedule and resources. In terms of Return on Investment, the added security benefits provide intangible sense of security which is difficult to quantify. For quality assurance testing, ROI is likely tangible, but we will evaluate success based on the number and severity of issues uncovered not a calculated cost savings.

Figure 15: Vendor Selection Process & Timeline



Selection Criteria

Our criteria and weights include the technical approach (40% weight), management approach (20 % weight), past performance (20 % weight), and price (15 % weight), and completion time (5 % weight). As a software development company, we believe the technical part plays an important role in our project, so we will give the biggest weight to technical approach. Keeping costs low is important to investors, as well as sticking to project schedule, but cost is a more important factor. In the meantime, we will make the criteria specific and objective. In our procurement documents, we will state our requirements clearly and follow it during the award process.

Change Management in Procurement

First, we will assign the same person to review, approve, and document changes to any part of the project. Second, if there is a change to a part of the project, we will do an evaluation of the change with an impact analysis, which will explain how the scope, cost, schedule, or quality of products will be affected, all according to the Change Management Plan. Third, we will document all important meetings and phone calls, record all changes on paper, and communicate all changes to the vendor.

Appendix

A: Change Control Log

Change Request #	Title	Description	Type (corrective action, preventative action, defect repair)	Category (Scope, Schedule, Cost, Technology)	Description of Change in Cost, Time, Scope, User Satisfaction	Requester (source)	Approval Status (Pending Approval, Approved, Declined)
1	Cancel VR Feature	<ol style="list-style-type: none"> 1. Implementing this feature exceeds project budget. 2. Special gear required to utilize this function. 3. Lack of specialized engineers to implement this technology, could delay project deployment. 	Preventive action	Scope Time Cost Technology	This change will not delay project finish date; it will not exceed project budget; it changed project scope: one feature is taken out of project scope	Jing Zhou	Pending
2	WBS dictionary update	<ol style="list-style-type: none"> 1. Add explanation and justification to WBS 6.4.1 GDPR 	Corrective action	Scope	This change will explain to our stakeholders why we choose to use GDPR; it is within project scope, however it will not change our project scope; no features are affected	Jing Zhou	Approved
3	Project charter update	<ol style="list-style-type: none"> 1. Revise the cost estimation from 1,000,000dollors to 1,012,000 dollars 	Corrective action	Cost	This change will make the cost of project in project charter consistent with the financial analysis.	Weizhen Kong	Approved
4	WBS update – GDPR	Clarified the GDPR item on the WBS	Corrective action	Scope	There was no change in scope, the scope was just clarified	Dr. McGarry	Approved

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Table 14: Change Control Log

B: Change Control Request

Change Request # (to be completed by program manager)		1	
Date of request	10/10/2018	Requested By	Jing Zhou
Overview of change: Cancelling VR touring feature			
Reason for change (including impact of not making change, and alternatives): 4. Implementing this feature exceeds project budget. 5. Special gear required to utilize this function. 6. Lack of specialized engineers to implement this technology, could delay project deployment.			
Will change delay the program completion date? (Discuss with program manager)		Yes / No	Delay = *** days
Explain:			
Will change require additional resources? (Discuss with program manager)		Yes / No	Increase = *** effort days
Explain:			
Will change result in additional cost? (Discuss with program manager)		Yes / No	Increase = \$***
Explain:			

To be completed by program manager:

Date entered in change log	10/16/2018
----------------------------	------------

Date reviewed with stakeholders	TBD	Approved?	Yes / No
Date decision communicated to requestor	TBD		
Date closed in change log	TBD		
Date program plan updated	TBD		

Guidelines

- **Change Request #:** A unique number assigned to the request. By having this field controlled by the program manager, the risk of duplicating numbers is reduced.
- **Date of Request:** The date when the request for change is first made.
- **Requested By:** The individual requesting the change.
- **Overview of Change:** The summary of the change that is being requested with links to information where more details can be found.
- **Reason for Change:** The justification for why the request is being made, including any alternative approaches that were considered and the implications of not making the change. This will likely link to additional documentation providing more detailed analysis.
- **Will Change Delay the Program Completion Date?** An indication of whether the change will delay the schedule, and if so by how much. This should be completed by the project team once the impact assessment has been completed. An explanation must be provided if the answer is yes.
- **Will Change Require Additional Resources?** An indication of whether the change will increase the effort cost, and if so by how much. This should be completed by the project team once the impact assessment has been completed. An explanation must be provided if the answer is yes.
- **Will Change Result in Additional Cost?** An indication of whether the change will delay the dollar cost, and if so by how much. This should be completed by the project team once the impact assessment has been completed. An explanation must be provided if the answer is yes.
- **Date Entered in Change Log:** The date that the change request is logged in the master tracking tool.
- **Date Reviewed With Stakeholders:** The date that the change control committee, governance committee or similar reviewed the change and whether the change was approved.
- **Date Decision Communicated to Requestor:** The date that the program manager advised the originator of the decision of the stakeholders.
- **Date Closed in Change Log:** The date that the master log was updated to reflect the decision of the stakeholders.
- **Date Program Plan Updated:** The date that the plan was updated to reflect the approved change (if required).

C: Assumption Log

Assumption Description	Category	Owner
The staff can accept the working time and salaries as planing	Marketing	Weizhen Kong
The marketing activities would not increase too much that breaks the budget bottom-line	Marketing	Weizhen Kong
The software expense would not increase by increased users	Marketing	Weizhen Kong
The income can reach the aim amount and the product can attract enough users	Marketing	Weizhen Kong
All the house owners can accept our requirement for free try	Marketing	Weizhen Kong
All the house buyers can pay the fees on time	Marketing	Weizhen Kong

We can find a payment method that will cooperate with us	Features	Yinghan Lu
Both owners or landlords and customers are willing to use our messaging system	Features	Yinghan Lu
The first year's basic housing registration will be less than 20000.	Listing	Guojun Li
All housing is located in the United States.	Listing	Guojun Li
Our users will choose to buy a house or rent a house.	Listing	Guojun Li
Active User Base will be less than 50,000 in first year	IT	Kevin Stone
The client application is not expected to work offline	IT	Kevin Stone
We will not support Windows Phone	IT	Kevin Stone
Our user base will primarily be on mobile	IT	Kevin Stone
The service will be US-based for foreseeable future	Marketing	Kevin Stone

Table 15: Assumption Log

D: Project Control Log

Action Item Log

#	Open Items	Owner	Open Date	Target Date	Status	Completion Date
1	Decide the main structure of the cross-platform application and website	project manager	November 1 st , 2018	10/15/2018	completed	10/15/2018
2	Establish project team and assign functional department	project manager	October 1, 2018	10/15/2018	completed	10/15/2018
3	Review ideas of memberships system	project manager	October 7, 2018	10/15/2018	completed	10/15/2018
4	Complete project chart	project manager	October 1, 2018	10/15/2018	completed	10/15/2018
5	Identify the scope location of preliminary stage	Marketing department	October 1, 2018	10/15/2018	completed	10/15/2018
6	Complete scope statement from different department	project manager	October 1, 2018	10/15/2018	completed	10/15/2018
7	Declare the suggestion of promise for length of time	project manager	October 12, 2018	10/15/2018	completed	10/15/2018
8	Change the commission level	Finance department	October 12, 2018	10/15/2018	completed	10/15/2018
9	Declare the suggestion of target customers only for international students	project manager	October 12, 2018	10/15/2018	completed	10/15/2018
10	Review budget plan	project manager	October 12, 2018	10/15/2018	completed	10/15/2018
11	Complete business case	project manager	October 12, 2018	10/15/2018	completed	10/15/2018
16	Complete other detailed project deliverables	project manager	October 12, 2018	10/15/2018	completed	10/15/2018

#	Closed Items	Owner	Open Date	Target Date	Status	Completion Date
1	Brainstorm the structure of the house renting and selling platform	project manager	October 1, 2018	10/15/2018	completed	10/15/2018
2	Assign different departments to different staff	project manager	October 1, 2018	10/15/2018	completed	10/15/2018
3	Identify the initial target market in D.C.	project manager	October 1, 2018	10/15/2018	completed	10/15/2018
4	Identify commission level	Finance department	October 12, 2018	10/15/2018	completed	10/15/2018
5	Ensure the feature of platform	Feature department	October 12, 2018	10/15/2018	completed	10/15/2018
6	Ensure the legal system of platform	Legal department	October 12, 2018	10/15/2018	completed	10/15/2018
7	Ensure the listing items on platform	Listing department	October 12, 2018	10/15/2018	completed	10/15/2018

Table 16: Project Control - Action Items

Issue Log

#	Issue	Owner	Open Date	Target Date	Status
1	The shortage of available house source	MKT department	January 1, 2019	January 31, 2019	planning
2	The transaction market risks that are unpredictable.	MKT department	January 1, 2019	January 31, 2019	planning
3	The marketing activities cannot attract enough amounts of customers.	MKT department	January 1, 2019	January 31, 2019	planning
4	The additional activities might break the budget bottom line.	MKT department	January 1, 2019	January 31, 2019	planning
#	Closed Items	Owner	Open Date	Target Date	Status
1	Form groups to look for sources& output advertisement attracting customers	MKT department	January 2, 2019	January 31, 2019	planning
2	Plan to keep volume of transactions controllable	MKT department	January 2, 2019	January 31, 2019	planning
3	Prepare backup activities plan	MKT department	January 2, 2019	January 31, 2019	planning
4	Complete detailed budget plan	MKT department	January 2, 2019	January 31, 2019	planning

Table 17: Project Control - Issue Log

Decision Log

#	Decision Point	Owner	Date
1	Cloud-hosted architecture	IT department	March 1, 2019
2	Multi-platform application	IT department	March 1, 2019
3	Service desk with comprehensive support	IT department	March 1, 2019

4	Get a certain number of housing sources	MKT department	January 31, 2019
5	Add communication function	Feature department	April 6, 2019
6	Provide customers with 3D Pictures service	Feature department	April 6, 2019
7	A messaging platform will be provided to our customers	Feature department	April 6, 2019
8	Ratings	Listing department	April 6, 2019
9	Provide mortgage service after background check	Finance department	January 31, 2019

Table 18: Project Control - Decision Log

Document Control

Link to SharePoint site: <https://gwu0.sharepoint.com/sites/ITSM6204-Team4>

:: Requirements Traceability Matrix

ID	Requirement Description*	Requirement Priority*	Requirement Owner*	Rationale for Requirement	Original Source of Requirement	Original Source Location	Requirement Category	Requirement Level*	Requirement Attribute*	Scope and Objectives Addressed	Success Criteria	Business Need Addressed	Security Related?
1	Membership Enrollment	M	Weizhen Kong	Need to have mechanism for users to enroll with the service	Market Research	Project Charter and Scope Statement	Marketing	Solution	F	Members have priority to list their houses at a better place	10% of our users purchase membership	Customers can sign up as members on app	No
2	Hire Staff	M	Weizhen Kong	Staff are required to implement all aspects of the project.	Market Research	Project Charter and Scope Statement	Marketing	Solution	F	Hire more staff on MKT	Hire a target number of staff on MKT	Staff required to conduct business	No
3	No external advertisements	S	Weizhen Kong	As a new app, to provide a better experience for customers, we will exclude inline advertisements in any platform	Market Research	Project Charter and Scope Statement	Marketing	Solution	T	Provide a high-quality user experience	Remove the external advertisement successfully	Limit clutter in the application	No
4	Allow users to reset passwords	M	Weizhen Kong	It is necessary for users to create an account and have their password reset if it is forgotten	Market Research	Project Charter and Scope Statement	Security; Application Development	Solution	F	Provide a secure solution	Feature implemented	prevent fraud and hacking	Yes
5	The App needs to be downloadable from Apple App Store and Google Play	M	Guojun Li	App stores are the main mechanism by which we will deliver our product to customers.	Listings Management	Project Charter and Business Case	Application Development	Solution	F	Encourage user adoption and market penetration with easy-to-use software	The app is downloadable from both app stores	The app should work on mobile phones	No
6	The website and API need to have SSL	M	Jing Zhou	Required to secure transmissions to the server from the App	Security Best Practice	NA	Security; Application Development	Solution	F	Protect user privacy and integrity of transactions	The SSL certificate is installed and validated	The app must have security to protect the integrity of real estate transactions	Yes

7	Implement payment portal function	M	Kevin Stone	Having property management features after the lease is signed is a key feature which differentiates NextAddress	Market Research	SharePoint - Business Case	Application Development	Solution	F	Keep our customers continually using the app by their monthly payment	60% of our customers will constantly use the app after they found a house through us	The app provides payment service	No
8	Create a rating system	M	Kevin Stone	Customers can rate each other	Security Best Practice	NA	Features	Solution	F	Let customers know more about their landlords, tenant or buyers	80% of our customers will leave a comment or rate their landlords, tenant or buyers	Customers can rate each other on the app	No
9	All templates must comply with laws	M	Yinghan Lu	Each template used in the platform for customers must be compliant with the law	Features Management	NA	Features	Solution	F	Legal Services provided to facilitate the leasing and buyign processes	Language is verifeid to be legal by lawyers	We provide usable templates to facilitate the process	No
10	Support Email, Call, Chat User Support	S	Yinghan Lu	All customers will have access to the user support center to help with their needs	Features Management	NA	Features	Solution	F	Provide customer support to retain users	We receive high marks on customer support engagements in user surveys	Provide customer service	No
11	Support 3D imaging	C	Yinghan Lu	The app needs to allow for 3D imaging to create an immersive experience	Features Management	NA	Features	Solution	F	Provide an immersive experiene	Feature implemented	Allow users to view homes virtually to limit in-person visits	No
12	Messaging system	M	Yinghan Lu	The messaging system must be created to fulfill one of the key objectives of the app.	Market Research	NA	Features	Solution	F	Provide an innovative way to communicate with other users and landowner	95% user adoption	Allow users to contact land owners to submit service requests and discuss other matters	No

Requirement ID	Requirement Description	Rationale for Requirement
1	Membership Enrollment	Need to have mechanism for users to enroll with the service
2	Hire Staff	Staff are required to implement all aspects of the project.
3	No external advertisements	As a new app, to provide a better experience for customers, we will exclude inline advertisements in any platform
4	Allow users to reset passwords	It is necessary for users to create an account and have their password reset if it is forgotten
5	The App needs to be downloadable from Apple App Store and Google Play	App stores are the main mechanism by which we will deliver our product to customers.
6	The website and API need to have SSL	Required to secure transmissions to the server from the App
7	Implement payment portal function	Having property management features after the lease is signed is a key feature which differentiates NextAddress
8	Create a rating system	Customers can rate each other
9	All templates must comply with laws	Each template used in the platform for customers must be compliant with the law
10	Support Email, Call, Chat User Support	All customers will have access to the user support center to help with their needs
11	Support 3D imaging	The app needs to allow for 3D imaging to create an immersive experience
12	Messaging system	The messaging system must be created to fulfill one of the key objectives of the app.

G.1: Input Mind Map

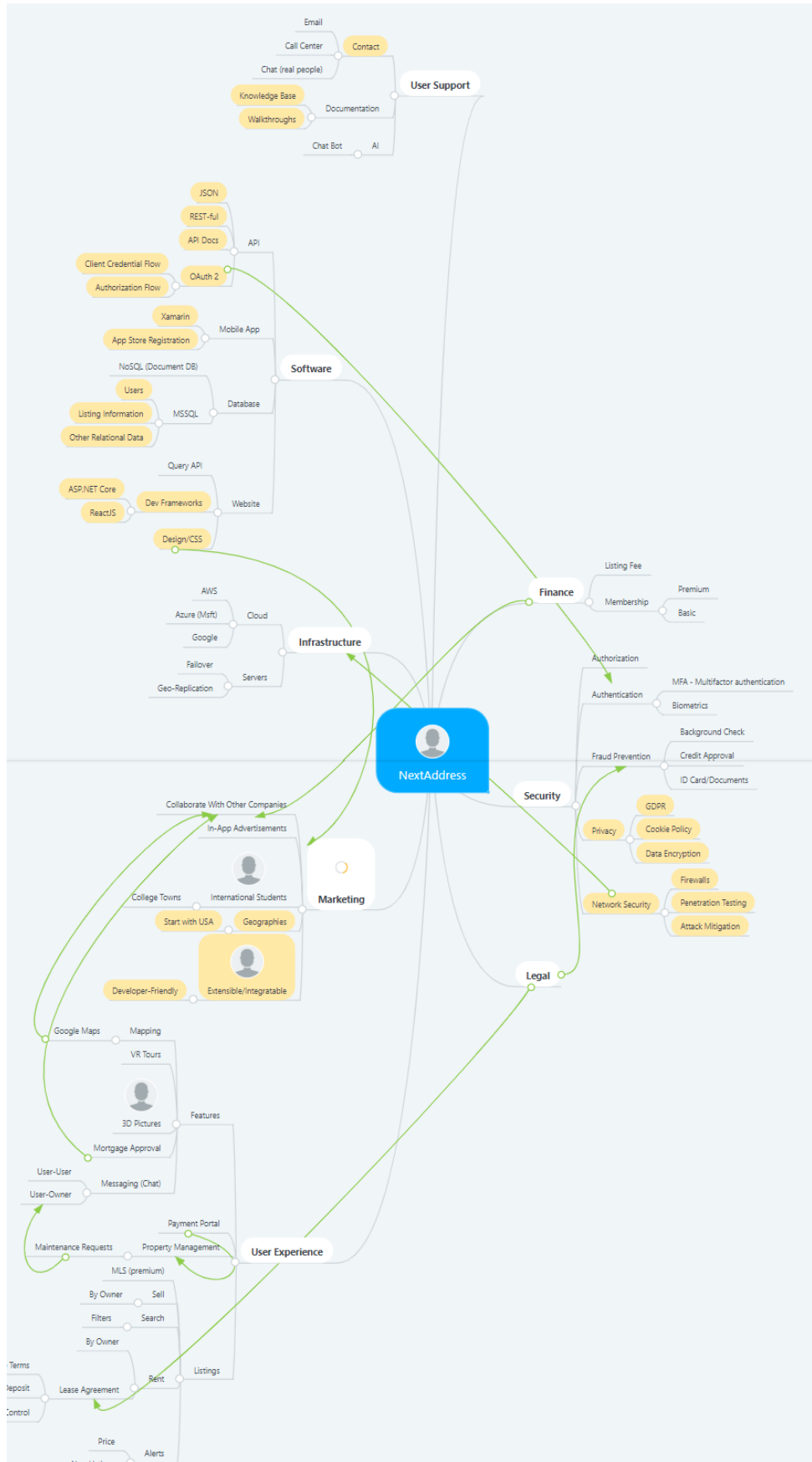


Figure 17: Mind Map

1. Infrastructure
 - 1.1. Web Client Application Infrastructure - Cloud
 - 1.1.1. Development Server
 - 1.1.2. Staging Server
 - 1.1.3. Production Server
 - 1.1.4. Secure Socket Layer (SSL) Certificate
 - 1.2. API Backend Infrastructure - Cloud
 - 1.2.1. Development Server
 - 1.2.2. Production Server
 - 1.3. Database Infrastructure - Cloud
 - 1.3.1. Development Database
 - 1.3.2. Production Database
 - 1.3.3. Database Backup
 - 1.4. Version Control
 - 1.4.1. GitHub Enterprise
 - 1.4.2. Continuous Deployment
2. Application Development
 - 2.1. Development Environment
 - 2.1.1. Integrated Development Environment
 - 2.1.2. Frameworks
 - 2.1.2.1. React Native/React Native Web
 - 2.1.2.2. HTML5/JavaScript ES6/TypeScript
 - 2.1.2.3. Node.js/NPM/Modules
 - 2.2. Database Development
 - 2.2.1. Entity Relationship Diagram
 - 2.2.2. Database Objects
 - 2.2.2.1. Tables
 - 2.2.2.2. Views
 - 2.2.2.3. Stored Procedures
 - 2.2.3. Performance Optimization
 - 2.2.3.1. Indexes and Keys
 - 2.2.3.2. Query Optimization
 - 2.3. Programming
 - 2.3.1. Debugging
 - 2.3.1.1. Test Scripts
 - 2.3.1.2. Unit Testing
 - 2.3.1.3. Bug Logging
 - 2.3.2. Code Organization
 - 2.3.2.1. Entity Relationship Diagram (ERD)
 - 2.3.3. Coding
 - 2.4. Documentation
 - 2.4.1. Code Comments
 - 2.4.2. Readme
 - 2.4.3. Knowledge Base
 - 2.5. Version Control
 - 2.5.1. GitHub Enterprise
 - 2.5.2. Push Requests
 - 2.5.3. Bug Reports

- 2.5. Marketing
- 2.6. Application Delivery
 - 2.6.1.App Store
 - 2.6.1.1. Google Play
 - 2.6.1.2. Apple App Store
 - 2.6.2.App Store Compliance
- 3. Design
 - 3.1. Color Palette
 - 3.2. Mockups
 - 3.3. Style Sheets
 - 3.4. Animation
 - 3.5. Graphic Design
 - 3.6. Fonts
- 4. Quality Assurance
 - 4.1. Testing – Internal
 - 4.2. Testing – External
 - 4.2.1.Pilot Users
 - 4.2.2.Advisory Board
 - 4.3. Test Scripts
- 5. User Support
 - 5.1. Knowledge Base
 - 5.1.1.Articles
 - 5.1.2.Moderation
 - 5.1.3.FAQs
 - 5.2. Call Center
 - 5.2.1.Call Scripts
 - 5.2.2.Call Routing
 - 5.2.3.Support Agents
 - 5.2.4.Escalation Path
 - 5.3. Chat
 - 5.3.1.Chatbot
 - 5.3.2.Chat Support Agents
 - 5.3.3.Escalation Path
 - 5.4. Email
 - 5.4.1.Email Support Agents
 - 5.4.2.Automated Response
 - 5.4.3.Automated Ticket Logging
 - 5.5. Ticketing System
 - 5.5.1.Ticket Creation
 - 5.5.2.Workflow/Escalations
 - 5.5.3.Reminders
 - 5.5.4.Analytics
 - 5.5.4.1. Recurring Issues
- 6. Security
 - 6.1. Create Authorization module
 - 6.2. Create Authentication module
 - 6.2.1. add MFA feature
 - 6.2.2. add Biometrics authentication feature
 - 6.3. Fraud Prevention

- 6.3.1. add background check feature
 - 6.3.2. add Credit approval feature
 - 6.3.3. add feature to upload ID document
- 6.4. Privacy
 - 6.4.1. GDPR
 - 6.4.2. Cookie Policy
 - 6.4.3. Data Encryption
- 6.5. Network Security
 - 6.5.1. Firewalls
 - 6.5.2. Penetration Testing
 - 6.5.3. Attack Mitigation
- 7. Legal
 - 7.1. Prepare contract sample
- 8. Input membership system
 - 8.1 design membership levels
 - 8.2 design the content
 - 8.2.1 the length of promise
 - 8.2.2 the prices for different levels
 - 8.3 set priority in search result
 - 8.4 mandatory promotion for emergence
- 9. Increase customers benefit
 - 9.1 contact the house owners and delivery company
 - 9.2 organize the groups for arranging service for customers
 - 9.2.1 free try
 - 9.2.2 free delivery
 - 9.3 track the service and get feedbacks
- 10. Marketing activities
 - 10.1. Organize groups to brainstorm activities
 - 10.2. Executive activities
 - 10.2.1. Online promotion
 - 10.2.2. Offline activities
 - 10.3. Track service and get feedbacks
 - 10.4. Make reports showing the effect of marketing activities
- 11. Feedback monitoring
 - 11.1. Set evaluation function to get feedbacks
 - 11.2. Analyze negative feedbacks
 - 11.2.1. Products feedbacks
 - 11.2.2. Activities feedbacks
 - 11.3. Rewards for advice
 - 11.4. Make change due to feedbacks
- 12. Mapping
 - 12.1. Google Maps
 - 12.2. Collect housing information
 - 12.3. Create a database
 - 12.4. Input housing information
- 13. VR /AR Tours/3D Pictures
 - 13.1. Contact sellers
 - 13.2. Send people to take 3D Picture for sellers
 - 13.3. Process raw pictures

- 13.1. Upload completed pictures
- 14. Mortgage Approval
 - 14.1. Background check
 - 14.2. Credit approval
 - 14.3. ID/Documents
- 15. Messaging
 - 15.1. Online chat
 - 15.2. Messaging between user and user
 - 15.3. Forum
- 16. Reviews from Yelp
 - 16.1. Get access to reviews from Yelp
- 17. Listings Management
 - 17.1. Multiple Listing Service
 - 17.2. Owner Verification
 - 17.3. Housing Verification
 - 17.4. Selling Management
 - 17.5. Renting Management
 - 17.5.1. Renter Verification
 - 17.5.2. Lease Agreement
 - 17.6. Searching Support
 - 17.6.1. Filters
 - 17.6.2. Price Matching Alert
 - 17.6.3. New Listings Alert

G.3: Work Breakdown Structure Dictionary

WBS Item Number: 1.

WBS Item Name: Infrastructure

Description: This is the server, hardware, DevOps portion of implementation

WBS Item Number: 1.1.

WBS Item Name: Web Client Application Infrastructure - Cloud

Description: This is the infrastructure for the website. Each instance of the site will be a separate Azure App Service with dedicated IP and deployment. This allows for a fully-managed solution

WBS Item Number: 1.1.1.

WBS Item Name: Development Server

Description: This is the development instance of the website

WBS Item Number: 1.1.2.

WBS Item Name: Staging Server

Description: This is the staging/pre-production instance of the website

WBS Item Number: 1.1.3.

WBS Item Name: Production Server

Description: This is the production instance of the website

WBS Item Number: 1.1.1.

WBS Item Name: Secure Socket Layer (SSL) Certificate

Description: This is the SSL certificate used to encrypt connections on the website.

WBS Item Number: 1.2.

WBS Item Name: API Backend Infrastructure - Cloud

Description: This is the separate Web Application which will host the API. It will be a separate Azure App Service with two instances – development and production

WBS Item Number: 1.2.1.

WBS Item Name: Development Server

Description: This is the development instance of the API for testing and development purposes

WBS Item Number: 1.2.2.

WBS Item Name: Production Server

Description: This is the production server instance of the API.

WBS Item Number: 1.3.

WBS Item Name: Database Infrastructure - Cloud

Description: Includes resources required for hosting the app database. It will be a dedicated, cloud-hosted, managed Microsoft SQL server.

WBS Item Number: 1.3.1.

WBS Item Name: Development Database

Description: This is the development/testing environment for the database

WBS Item Number: 1.3.2.

WBS Item Name: Production Database

Description: This is the production version of the database used by the app

WBS Item Number: 1.3.3.

WBS Item Name: Database Backup

Description: The database will be backed up daily to a replica in case of data compromise.

WBS Item Number: 1.4.

WBS Item Name: Version Control

Description: All development artifacts including all code will be under constant change by multiple developers through the life of the project. The version control system, GitHub, will ensure that all changes are logged and monitored by development directors.

WBS Item Number: 1.4.1.

WBS Item Name: GitHub Enterprise

Description: This is the version control system commonly used in development projects. It allows issue tracking and full version history tracking.

WBS Item Number: 1.4.2.

WBS Item Name: Continuous Deployment

Description: When the new version of code is published, it will automatically deploy to all infrastructure.

WBS Item Number: 2.

WBS Item Name: Application Development

Description: This is the category of IT that includes all software development and programming, and all related activities.

WBS Item Number: 2.1.

WBS Item Name: Development Environment

Description: This is the program or programs used to write code

WBS Item Number: 2.1.1.

WBS Item Name: Integrated Development Environment

Description: This is the program specifically used to write code

WBS Item Number: 2.1.2.

WBS Item Name: Frameworks

Description: This is existing code that can be used in other code to facilitate programming

WBS Item Number: 2.1.2.1.

WBS Item Name: React Native/React Native Web

Description: This is a cutting-edge JavaScript framework that is used to program user interface logic and components.

WBS Item Number: 2.1.2.2.

WBS Item Name: HTML5/JavaScript ES6/TypeScript

Description: This is the code that is compiled and also that is written for user interface.

WBS Item Number: 2.1.2.3. Node.

WBS Item Name: js/NPM/Modules

Description: The packages used to facilitate and speed up development

WBS Item Number: 2.2.

WBS Item Name: Database Development

Description: The creation of database artifacts that meet business need.

WBS Item Number: 2.2.1.

WBS Item Name: Entity Relationship Diagram

Description: The diagram that shows all data fields and how they are related to other fields.

WBS Item Number: 2.2.2.

WBS Item Name: Database Objects

Description: The database artifacts

WBS Item Number: 2.2.2.1.

WBS Item Name: Tables

Description: A set of rows and columns that stores data

WBS Item Number: 2.2.2.2.

WBS Item Name: Views

Description: Representation of data from a table or tables with rows and columns

WBS Item Number: 2.2.2.3.

WBS Item Name: Stored Procedures

Description: Automated and scripted functions in the database to facilitate transfer of data.

WBS Item Number: 2.2.3.

WBS Item Name: Performance Optimization

Description: The activity of ensuring database queries run at maximum speed

WBS Item Number: 2.2.3.1.

WBS Item Name: Indexes and Keys

Description: Method to improve performance by indexing data on the disk

WBS Item Number: 2.2.3.2.

WBS Item Name: Query Optimization

Description: Structuring queries in the best way to achieve highest performance.

WBS Item Number: 2.3.

WBS Item Name: Programming

Description: Writing code

WBS Item Number: 2.3.1.

WBS Item Name: Debugging

Description: Testing code

WBS Item Number: 2.3.1.1.

WBS Item Name: Test Scripts

Description: Step-by-step tests that users can follow to test common scenarios and look for problems in the program.

WBS Item Number: 2.3.1.2.

WBS Item Name: Unit Testing

Description: Testing bits of code in an automated fashion

WBS Item Number: 2.3.1.3.

WBS Item Name: Bug Logging

Description: Tracking all bugs and issues found in the program and their statuses

WBS Item Number: 2.3.2.

WBS Item Name: Code Organization

Description: The way the developer fashions the code so it balances reusability with simplicity

WBS Item Number: 2.3.2.1.

WBS Item Name: Entity Relationship Diagram (ERD)

Description: Code diagram to show how all methods, inputs, and outputs are connected

WBS Item Number: 2.3.3.

WBS Item Name: Coding

Description: Writing code

WBS Item Number: 2.4.

WBS Item Name: Documentation

Description: This is documentation for other developers, so they understand certain intricacies and so future developers can apply upgrades or perform maintenance.

WBS Item Number: 2.4.1.

WBS Item Name: Code Comments

Description: In-line code documentation. They allow other programmers to understand why certain code was made a certain way.

WBS Item Number: 2.4.2.

WBS Item Name: Readme

Description: Another form of documentation for users and programmers

WBS Item Number: 2.1.3.

WBS Item Name: Knowledge Base

Description: The main repository of information for the platform, available to end users. Shows issues, frequently asked questions, service bulletins and more.

WBS Item Number: 2.5.

WBS Item Name: Version Control

Description: The mechanism to control different changes to code

WBS Item Number: 2.5.1.

WBS Item Name: GitHub Enterprise

Description: The platform used to track versions of code.

WBS Item Number: 2.5.2.

WBS Item Name: Push Requests

Description: The process by which a developer requests to publish changes to code to the main repository. The lead developer or admin then reviews the suggested changes and takes appropriate action.

WBS Item Number: 2.5.3.

WBS Item Name: Bug Reports

Description: If there are any bugs uncovered in the program, a report can be created so a fix can be added to the queue

WBS Item Number: 2.5.4.

WBS Item Name: Readme

Description: The documentation that is web-based for programmers

WBS Item Number: 2.6.

WBS Item Name: Application Delivery

Description: This is the process of delivering the app to market

WBS Item Number: 2.6.1.

WBS Item Name: App Store

Description: An app store is the place where mobile phone users go to download apps from third parties

WBS Item Number: 2.6.1.1.

WBS Item Name: Google Play

Description: The app store run by Google.

WBS Item Number: 2.6.1.2.

WBS Item Name: Apple App Store

Description: The app store run by Apple

WBS Item Number: 2.6.2.

WBS Item Name: App Store Compliance

Description: Each app store has different requirements and processes that must be fulfilled before the app can be made available in them.

WBS Item Number: 3.

WBS Item Name: Design

Description: This is the look and feel of the app.

WBS Item Number: 3.1.

WBS Item Name: Color Palette

Description: These are the colors used by the app. They are a pre-defined array of colors that are pleasing to the eye and complement each other.

WBS Item Number: 3.2.

WBS Item Name: Mockups

Description: The loose representations of what the user interface will look like. Typically shown to users before development to help them understand what they want to see.

WBS Item Number: 3.3.

WBS Item Name: Style Sheets

Description: The code that contains the look and feel

WBS Item Number: 3.4.

WBS Item Name: Animation

Description: Movements, fades, and other visual effects that make the application feel smooth and seamless

WBS Item Number: 3.5.

WBS Item Name: Graphic Design

Description: The images used in the app including icons, logos, background images, or other images

WBS Item Number: 3.6.

WBS Item Name: Fonts

Description: The font used by the app

WBS Item Number: 4.

WBS Item Name: Quality Assurance

Description: The process to ensure that the code is high-quality and free of bugs

WBS Item Number: 4.1.

WBS Item Name: Testing – Internal

Description: Testing conducted by internal stakeholders such as developers or other team members.

WBS Item Number: 4.2.

WBS Item Name: Testing – External

Description: Testing completed by external stakeholders including pilot groups and beta testers.

WBS Item Number: 4.2.1.

WBS Item Name: Pilot Users

Description: Pilot users are test users selected for their interest and ability to test the app.

WBS Item Number: 4.2.2.

WBS Item Name: Advisory Board

Description: The group that approves changes to functionality of the app

WBS Item Number: 4.3.

WBS Item Name: Test Scripts

Description: Step-by-step procedures users can follow to test specific functionality. One of many ways to test with users

WBS Item Number: 5.

WBS Item Name: User Support

Description: Customer service

WBS Item Number: 5.1.

WBS Item Name: Knowledge Base

Description: A repository of information for end-users to review

WBS Item Number: 5.1.1.

WBS Item Name: Articles

Description: these are troubleshooting steps, service bulletins or tutorials about the product

WBS Item Number: 5.1.2.

WBS Item Name: Moderation

Description: There will be combination automated and manual intervention to ensure appropriate use of comments sections in the knowledge base.

WBS Item Number: 5.1.3.

WBS Item Name: FAQs

Description: These are answers to common questions users might have.

WBS Item Number: 5.2.

WBS Item Name: Call Center

Description: The group that accepts live calls from customers experiencing issues

WBS Item Number: 5.2.1.

WBS Item Name: Call Scripts

Description: The scripts support staff use to maintain consistency and professionalism.

WBS Item Number: 5.2.2.

WBS Item Name: Call Routing

Description: An automated way of routing calls to an available number

WBS Item Number: 5.2.3.

WBS Item Name: Support Agents

Description: The people working the customer support desk

WBS Item Number: 5.2.4.

WBS Item Name: Escalation Path

Description: The pre-defined way that requests can be escalated to more highly skilled workers.

WBS Item Number: 5.3.

WBS Item Name: Chat

Description: Another way to communicate with support agents.

WBS Item Number: 5.3.1.

WBS Item Name: Chatbot

Description: An automated chat agent that will respond to common inquiries.

WBS Item Number: 5.3.2.

WBS Item Name: Chat Support Agents

Description: These are the agents supporting the chat service desk

WBS Item Number: 5.3.3.

WBS Item Name: Escalation Path

Description: The pre-defined path by which an issue can be routed to others

WBS Item Number: 5.1.

WBS Item Name: Email

Description: Another source for potential service requests.

WBS Item Number: 5.4.1.

WBS Item Name: Email Support Agents

Description: The agents supporting email service requests

WBS Item Number: 5.4.2.

WBS Item Name: Automated Response

Description: Automated responses sent by the system once an email is received.

WBS Item Number: 5.4.3.

WBS Item Name: Automated Ticket Logging

Description: The process of logging a support ticket in the ticketing system after an email has been received.

WBS Item Number: 5.5.

WBS Item Name: Ticketing System

Description: The tracking system to show where issues are currently

WBS Item Number: 5.5.1.

WBS Item Name: Ticket Creation

Description: A form used to create support tickets in the database

WBS Item Number: 5.5.2.

WBS Item Name: Workflow/Escalations

Description: The automated routing of approval of support tickets

WBS Item Number: 5.5.3.

WBS Item Name: Reminders

Description: Task reminders for workflow approvals

WBS Item Number: 5.5.4.

WBS Item Name: Analytics

Description: All data concerning service desk activities

WBS Item Number: 5.5.4.1.

WBS Item Name: Recurring Issues

Description: Issues that continue to happen over and over again for unknown or unsolvable reasons.

WBS Item Number: 6.

WBS Item Name: Security

Description: Build module of security features

WBS Item Number: 6.1

WBS Item Name: Create Authorization module

Description: Our website will allow different users to have different levels of access. Create a module to allow users to sign up, log in, indicating the user level (admin, house owner, house seeker), save user information into database.

WBS Item Number: 6.2

WBS Item Name: Create Authentication module

Description: Our website will allow users to sign up, log in, save data.

WBS Item Number: 6.2.1

WBS Item Name: Add MFA feature

Description: Our website should allow users to choose to log in with multifactor authentication method, add a feature allows users to choose to use multifactor authentication, this includes matching user id with user password, and a one-time temporary code sent to user's mobile phone. User id can be replaced with user email address, user phone number.

WBS Item Number: 6.2.2

WBS Item Name: Add Biometrics authentication feature

Description: Our website should allow users to choose to log in with biometrics authentication. Create a feature that enables users to either log in with fingerprint or face ID (iOS).

WBS Item Number: 6.3

WBS Item Name: Fraud prevention

Description: Each house owner who lists their house on our website should upload a legitimate government-issued ID documentation and should cooperate with us with a background check. Each potential user should provide his/her credit information to be able to rent from our website.

WBS Item Number: 6.3.1

WBS Item Name: Add background check feature

Description: Create a form for users to fill out, this should include criminal record, house information, house pictures, an agreement for users to sign, this agreement should indicate the user's legal responsibility to provide legitimate information. Finally, users need to sign the agreement before he/she can put house information on our website.

WBS Item Number: 6.3.2

WBS Item Name: Add Credit approve feature

Description: Create a portal to connect to national credit database for us to access user's credit history.

WBS Item Number: 6.3.3

WBS Item Name: Add feature to upload ID

Description: this feature should allow users to upload their government issued id. this feature should include a function to automatically check if the photo on ID is recognizable, the information on ID must also be recognized by machine in order to be submitted for human approval.

WBS Item Number: 6.4

WBS Item Name: Privacy

Description: We will make sure our user's information is safe.

WBS Item Number: 6.4.1

WBS Item Name: GDPR

Description: Create a module that ensures us follow General Data Protection Regulation (GDPR). GDPR is the European Union's privacy regulation. If any customers are European citizens, their company must adhere to GDPR. While not required by US law, NextAddress intends to maintain a high-level of data privacy, and meet the GDPR standard. Note: GDPR is different from Data Protection Act, the latter is adopted by UK while the former is adopted by EU. We will use GDPR which is adopted by EU and has a higher standard.

WBS Item Number: 6.4.2

WBS Item Name: Cookie policy

Description: Create a cookie policy for users to read and agree.

WBS Item Number: 6.4.3

WBS Item Name: Data Encryption

Description: Use a method to encrypt data.

WBS Item Number: 6.5

WBS Item Name: Network Security

Description: Our website should implement multiple methods to secure data, prevent malware and cyber-attack.

WBS Item Number: 6.5.1

WBS Item Name: Firewalls

Description: Implement firewalls to prevent our website from attack and malware.

WBS Item Number: 6.5.2

WBS Item Name: Penetration

Description: Use tools for penetration testing.

WBS Item Number: 6.5.3

WBS Item Name: Attack Mitigation

Description: Use tools to mitigate cyber-attack.

WBS Item Number: 7.

WBS Item Name: Legal

Description: Build module that enables legal documents upload and download, edit and save.

WBS Item Number: 7.1

WBS Item Name: Prepare contract sample

Description: Legal team should provide a sample contract for users' reference.

WBS Item Number: 8.0

WBS Item Name: input membership system

Description: establish the membership system to increase incomes and attract more customers

WBS Item Number: 8.1

WBS Item Name: design membership levels

Description: the membership is designed as three levels. If the house owners want to sell or rent out their houses in three months, they should pay the highest membership which is 2% of the trade price for selling and 10% of contract price for renting. The other two memberships is attached with the promise of 6 months and 12 months. The ratios of fees for 6 months are 1.5% and 7.5% respectively. The ratios of fees for 12 months are 1% and 5% respectively.

WBS Item Number: 8.2

WBS Item Name: design the content

Description: design the details of the length and prices of the memberships

WBS Item Number: 8.2.1

WBS Item Name: the length of promise

Description: the length is divided as three months, six months and one year based on the difficulty of completing trades

WBS Item Number: 8.2.2

WBS Item Name: the prices for different levels

Description: the prices is combine the ratio and the total trade price to get the price reasonable and acceptable

WBS Item Number: 8.3

WBS Item Name: set priority in search result

Description: if the users who want to buy houses or rent houses search on our product based on their preference, the houses whose owners have paid the memberships will have priority to show on the top of the list. The priority can accelerate the process of selling the houses to realize promise

WBS Item Number: 8.4

WBS Item Name: mandatory promotion for emergence

Description: once the houses whose owners have paid the memberships cannot make a deal before the promised time, there will be staff promoting houses

WBS Item Number: 9.0

WBS Item Name: increase customers benefit

Description: provide the customers with benefit to attract more customers

WBS Item Number: 9.1

WBS Item Name: contact the house owners and delivery company

Description: make corporation with house owners and delivery companies to persuade house owners willing to provide free try and companies to give discounted prices

WBS Item Number: 9.2

WBS Item Name: organize the groups for arranging service for customers

Description: recruit staff for contact with house owners and deliveries

WBS Item Number: 9.2.1

WBS Item Name: free try

Description: contact with the house owners and the users to determine the date of free try

WBS Item Number: 9.2.2

WBS Item Name: free delivery

Description: contact with the delivery companies and the users to determine the date and workload of delivery

WBS Item Number: 9.3

WBS Item Name: track the service and get feedbacks

Description: provide the questionnaires to users to adapt the process

WBS Item Number: 10.0

WBS Item Name: marketing activities

Description: create effective activities to attract more users and increase the trade volume

WBS Item Number: 10.1

WBS Item Name: organize groups to brainstorm activities

Description: make creative activities ideas with minimum budget

WBS Item Number: 10.2

WBS Item Name: executive activities

Description: the marketing activities can be divided into two parts for online and offline activities

WBS Item Number: 10.2.1

WBS Item Name: online promotion

Description: make advertisement on some websites or tv programs

WBS Item Number: 10.2.2

WBS Item Name: offline activities

Description: organize activities at the community of our targeted customers

WBS Item Number: 10.3

WBS Item Name: track service and get feedbacks

Description: the users will be required to write the questionnaires checking the satisfaction level if they want coupons

WBS Item Number: 10.4

WBS Item Name: make reports showing the effect of marketing activities

Description: the amount of audience of marketing activities and our advertisement who become users will be analyzed to realize the effect of marketing activities

WBS Item Number: 11.0

WBS Item Name: feedback monitoring

Description: collect feedbacks from audience or users to improve our products

WBS Item Number: 11.1

WBS Item Name: set evaluation function to get feedbacks

Description: input the function in our products

WBS Item Number: 11.2

WBS Item Name: analyze negative feedbacks

Description: select the negative feedbacks and find valuable information to make improvement

WBS Item Number: 11.2.1

WBS Item Name: products feedbacks

Description: test the satisfaction level of users experience towards our products by requiring users to write questionnaires with the rewards of coupon

WBS Item Number: 11.2.2

WBS Item Name: activities feedbacks

Description: test the satisfaction level of users experience towards our activities by requiring audience to write questionnaires with the rewards of coupon

WBS Item Number: 11.3

WBS Item Name: rewards for advice

Description: give them coupon to have a discount if they buy or rent houses by our products

WBS Item Number: 11.4

WBS Item Name: make change due to feedbacks

Description: change the products or activities based on the valuable negative advice

WBS Item Number: 17.0

WBS Item Name: Listings Management

Description: Detailed management of user registered housing

WBS Item Number: 17.1

WBS Item Name: Multiple Listing Service

Description: Looking for housing from MLS

WBS Item Number: 17.2

WBS Item Name: Owner Verification

Description: Ensure that housing owners do not have any bad records to provide protection for customers.

WBS Item Number: 17.3

WBS Item Name: Housing Verification

Description: Ensure that the house does not have any unregistered damage and provides protection for customers.

WBS Item Number: 17.4

WBS Item Name: Selling Management

Description: Manage the transactions between the owners and the purchasers.

WBS Item Number: 17.5

WBS Item Name: Renting Management

Description: Manage the transactions between the owners and the renters.

WBS Item Number: 17.5.1

WBS Item Name: Renter Verification

Description: Ensure that renters do not have any bad records to provide protection for housing owners.

WBS Item Number: 17.5.2

WBS Item Name: Lease Agreement

Description: Manage lease agreement of housing owners and renters.

WBS Item Number: 17.6

WBS Item Name: Searching Support

Description: Help customers find housings suitable for them.

WBS Item Number: 17.6.1

WBS Item Name: Filters

Description: Customers can choose their own housings according to their preferences.

WBS Item Number: 17.6.2

WBS Item Name: Price Matching Alert

Description: The system will remind customers when the housings price is reduced.

WBS Item Number: 17.6.3

WBS Item Name: New Listings Alert

Description: The system will remind customers when have new listings.

4: Cost Baseline

able 19: Cost Baseline

	Month												
	1	2	3	4	5	6	7	8	9	10	11	12	
WBS items													
1. Infrastructure													
1.1. Web Client Application													
Infrastructure - Cloud	119.00	119.00	119.00	119.00	119.00	119.00	119.00	119.00	119.00	119.00	119.00	119.00	1428.00
1.2. API Backend Infrastructure - Cloud	238.08	238.08	238.08	238.08	238.08	238.08	238.08	238.08	238.08	238.08	238.08	238.08	2856.96
1.3. Database Infrastructure - Cloud	378.82	378.82	378.82	378.82	378.82	378.82	378.82	378.82	378.82	378.82	378.82	378.82	4545.86
1.4. Version Control	7.67	7.67	7.67	7.67	7.67	7.67	7.67	7.67	7.67	7.67	7.67	7.67	92.00
2. Application Development.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2.1. Development Environment	274.08	274.08	274.08	274.08	274.08	274.08	274.08	274.08	274.08	274.08	274.08	274.08	3289.00
2.2. Database Development	600.00	600.00	600.00	600.00	600.00	600.00	600.00	600.00	600.00	600.00	600.00	600.00	7200.00
2.3. Programming	583.33	583.33	583.33	583.33	583.33	583.33	583.33	583.33	583.33	583.33	583.33	583.33	7000.00
2.4. Documentation	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	3000.00
2.5. Version Control	666.67	666.67	666.67	666.67	666.67	666.67	666.67	666.67	666.67	666.67	666.67	666.67	8000.00
2.6. Application Delivery	251.65	251.65	251.65	251.65	251.65	251.65	251.65	251.65	251.65	251.65	251.65	251.65	3019.80
3. Design	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3.1. Color Palette	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	2000.00
3.2. Mockups	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	2000.00
3.3. Style Sheets	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	2000.00
3.4. Animation	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	2000.00
3.5. Graphic Design	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	2000.00
3.6. Fonts	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	2000.00
4. Quality Assurance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4.1. Testing – Internal	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	2000.00
4.2. Testing – External	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	6000.00
4.3. Test Scripts	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	3000.00
5. User Support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5.1. Knowledge Base	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	3000.00
5.2. Call Center	666.67	666.67	666.67	666.67	666.67	666.67	666.67	666.67	666.67	666.67	666.67	666.67	8000.00
5.3. Chat	666.67	666.67	666.67	666.67	666.67	666.67	666.67	666.67	666.67	666.67	666.67	666.67	8000.00
5.4. Email	583.33	583.33	583.33	583.33	583.33	583.33	583.33	583.33	583.33	583.33	583.33	583.33	7000.00
5.5. Ticketing System	583.33	583.33	583.33	583.33	583.33	583.33	583.33	583.33	583.33	583.33	583.33	583.33	7000.00

6. Security	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
6.1. Create Authorization module	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	2000.00
6.2. Create Authentication module	333.33	333.33	333.33	333.33	333.33	333.33	333.33	333.33	333.33	333.33	333.33	333.33	4000.00
6.3. Fraud Prevention	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	6000.00
6.4. Privacy	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	2000.00
6.5. Network Security	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	6000.00
7. Legal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
7.1. Prepare contract sample	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	50.00
8. Input membership system	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
8.1 design membership levels	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	1000.00
8.2 design the content	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	1000.00
8.3 set priority in search result	41.67	41.67	41.67	41.67	41.67	41.67	41.67	41.67	41.67	41.67	41.67	41.67	500.00
8.4 mandatory promotion for emergence	41.67	41.67	41.67	41.67	41.67	41.67	41.67	41.67	41.67	41.67	41.67	41.67	500.00
9. Increase customers benefit	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
9.1 contact the house owners and delivery company	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	2000.00
9.2 organize the groups for arranging service for customers	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	120.00
9.3 track the service and get feedbacks	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	1000.00
10. Marketing activities	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
10.1. Organize groups to brainstorm activities	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	1000.00
10.2. Executive activities	2916.67	2916.67	2916.67	2916.67	2916.67	2916.67	2916.67	2916.67	2916.67	2916.67	2916.67	2916.67	35000.00
10.3. Track service and get feedbacks	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	2000.00
10.4. Make reports showing the effect of marketing activities	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	1000.00
11. Feedback monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
11.1. Set evaluation function to get feedbacks	333.33	333.33	333.33	333.33	333.33	333.33	333.33	333.33	333.33	333.33	333.33	333.33	4000.00
11.2. Analyze negative feedbacks	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	50.00
11.3. Rewards for advice	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	1000.00
11.4. Make change due to feedbacks	33.33	33.33	33.33	33.33	33.33	33.33	33.33	33.33	33.33	33.33	33.33	33.33	400.00
12. Mapping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
12.1 Google Maps	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	1000.00
12.2 Collect housing information	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	62.50	750.00
12.3 Create a database	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	2000.00
12.4 Input housing information	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	2000.00

13. VR /AR Tours/3D Pictures	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
13.1 Contact sellers	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	2000.00
13.2 Send people to take 3D Picture for sellers	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	2000.00
13.3 Process raw pictures	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	2000.00
13.4 Upload completed pictures	33.33	33.33	33.33	33.33	33.33	33.33	33.33	33.33	33.33	33.33	33.33	33.33	400.00
14. Mortgage Approval	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
14.1 Background check	20.83	20.83	20.83	20.83	20.83	20.83	20.83	20.83	20.83	20.83	20.83	20.83	250.00
14.2. Credit approval	41.67	41.67	41.67	41.67	41.67	41.67	41.67	41.67	41.67	41.67	41.67	41.67	500.00
14.3. ID/Documents	8.33	8.33	8.33	8.33	8.33	8.33	8.33	8.33	8.33	8.33	8.33	8.33	100.00
15. Messaging	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
15.1. Online chat	333.33	333.33	333.33	333.33	333.33	333.33	333.33	333.33	333.33	333.33	333.33	333.33	4000.00
15.2. Messaging between user and user	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	1000.00
15.3. Forum	333.33	333.33	333.33	333.33	333.33	333.33	333.33	333.33	333.33	333.33	333.33	333.33	4000.00
16. Listings Management	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
16.1. Multiple Listing Service	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	2000.00
16.2. Owner Verification	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	2000.00
16.3. Housing Verification	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	2000.00
16.4. Selling Management	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	166.67	2000.00
16.5. Renting Management	104.17	104.17	104.17	104.17	104.17	104.17	104.17	104.17	104.17	104.17	104.17	104.17	1250.00
16.6. Searching Support	354.17	354.17	354.17	354.17	354.17	354.17	354.17	354.17	354.17	354.17	354.17	354.17	4250.00
Total cost estimation	16879.30	16879.30	16879.30	16879.30	16879.30	16879.30	16879.30	16879.30	16879.30	16879.30	16879.30	16879.30	202551.62