Andres Ardila - 40274138
Weichen Wan -40072743
Ting Lok Hui - 40254405
Alina Budhathoki - 40279328
Diego Palacios - 40270954

Feasibility Study

Technical Feasibility

The proposed platform will require a robust technology stack, focusing on scalability, security, and performance.

Evaluation of the Technology Requirements for the Software Solution

- **Software Requirements**: Users will be able to access the platform on many devices through its mobile app and web version. One codebase may function on both iOS and Android by using frameworks like React Native or Flutter, which saves time and money. Django and Node.js are good frameworks for the backend that can handle complicated features and numerous users. Big data sets, including vendor lists, user information, and wedding specifics, will be handled by a database like PostgreSQL or MongoDB.

- **Hardware Requirements**: The application will be hosted on cloud infrastructure (such as AWS or Azure), which will grow with demand and offer dependable performance. Options for Content Delivery Networks (CDNs) and load balancers to manage high traffic during periods of high usage.

- **Network Infrastructure**: Low latency and high availability are essential, particularly for updates and real-time communication. Real-time vendor interactions can be facilitated via WebSocket or comparable technology.

- **APIs and Third-party Integrations**: Payment gateway integrations (like PayPal and Stripe) enable smooth in-app purchases. Integration of social media for marketing and user registration. Email and SMS services allow consumers and vendors to receive alerts, reminders, and real-time information.

- **Scalability and Performance**: With services that may be independently scaled to satisfy changing demands, the design will facilitate horizontal scaling. As the user base expands, database sharding and caching techniques should be taken into account to maximize query performance.

Assessment of the Feasibility of Implementing the Required Technology

Assessing the technical feasibility includes analyzing potential risks, alternatives, and strategies for addressing challenges.

Technical Risks:

- Data Security: As sensitive user data (personal details, payment info) will be handled, strict data encryption protocols and compliance with standards like GDPR and CCPA are necessary.
- System Reliability: To mitigate downtime, a fault-tolerant architecture with fallback mechanisms is essential.
- Scalability Challenges: If the user base grows rapidly, there may be an increased load on real-time features like vendor collaboration and guest management.

Alternative Approaches

The project could use existing platforms (like Firebase for real-time databases) to speed up development rather than creating custom solutions for every feature. Critical components like guest management and payment processing might be autonomously scaled according to usage using a microservices design.

Strategies to Overcome Challenges

- Adopting containerization with tools like Docker and Kubernetes for better scalability and environment consistency.
- Regular security audits and penetration testing to ensure data protection.
- Implementing a content delivery network (CDN) for static resources, reducing server load and improving load times globally.

Risk vs. Reward Analysis

AI-Powered Personalization:

- Reward: Users will find the platform more interesting if they receive personalized experiences.
- Risk: These algorithms are expensive to build since they require a lot of resources and are complex.
- Trade-off: The investment is justified because this feature improves user engagement and distinguishes the platform from competitors.

Real-Time Vendor Collaboration:

- Reward: Allows users and vendors to communicate directly, avoiding delays and misunderstandings.
- Risk: This function puts a lot of strain on the network and calls for dependable, quick servers, which can be costly to operate.
- Trade-off: The enhanced user experience justifies the additional infrastructure cost.

In conclusion, the platform is technically feasible, with detailed plans for necessary technologies and strategies for overcoming challenges. The emphasis is on balancing the benefits of high-impact features with manageable risks while utilizing scalable and secure technology solutions to develop an efficient, user-centered wedding planning platform.

Operational Feasibility

Analysis of the Operational Impact of the Proposed Solution on Existing Processes

- **Workflow Changes:** By centralizing guest management, scheduling, budgeting, and communication, the platform will streamline the planning process. As a result, there is less need for manual tasks (such as email correspondence or spreadsheet management) and more time for high-level decision-making. Current booking, payment, and communication procedures will change as vendors and couples interact directly within the site. A single platform will replace the current method of overseeing several distinct channels.

- **Changes in Roles and Responsibilities:** As couples are on boarded to the platform, wedding planners will guide them through the available options. Vendors will be more

accountable for handling contracts, answering questions, arranging logistics, and communicating directly with couples via the platform.

- **Effect on Productivity**: The centralized platform will boost productivity, minimize errors brought on by misunderstandings, and cut down on time spent on administrative duties. Because the platform would facilitate real-time updates, automated reminders, and a structured workflow, wedding planners and vendors will be able to manage several clients more effectively.

- **Training and Adoption**: All users, particularly those who are not comfortable with digital technologies, will need to undergo initial training. Tutorials for core features like guest monitoring, checklist management, and vendor collaboration are included.

Identification of Potential Challenges and Benefits in the Operational Context

Operational Challenges

- User Resistance: Adoption of the new platform may be resisted by certain users, especially those accustomed to more conventional approaches.
- Infrastructure Requirements: Couples or vendors without reliable internet connectivity can find it difficult to interact with a cloud-based platform.
- Training Needs: With a varied user base, a variety of training resources (films, manuals, live demonstrations) will be required to suit various learning preferences.
- Data Management: Robust security and monitoring mechanisms will be necessary to guarantee data privacy and regulatory compliance.

Operational Benefits

- Increased Efficiency: Streamlined communication and automation of repetitive tasks, such as issuing reminders or tracking expenses, will boost planning efficiency and allow users to focus on more important duties.
- Cost Savings: The platform reduces the need for physical resources (such as printed schedules and contracts), lowering the costs associated with traditional planning.
- Enhanced Collaboration: Real-time features and shared planning tools improve collaboration among couples, vendors, and planners, reducing delays and misunderstandings.
- Scalability: The platform can scale to meet demand, providing for a larger customer base without requiring extra physical or logistical resources.

Strategies for Managing Challenges

- Training and Onboarding: Provide significant support, such as training videos, live sessions, and 24-hour help, to assist users in adjusting to the platform.
- Feedback Mechanism: Collect customer feedback regularly to discover pain points and improve the overall user experience.
- Data Security: Implement and convey strong data protection measures to build user trust in managing personal and financial information.

Transition Plan and Change Management Strategy

To ensure a smooth transition, the following change management strategy is recommended:

- **Transition Plan**: Begin by testing the platform with a small sample of couples, suppliers, and planners. This enables fine-tuning before a complete launch. We can then introduce the platform in phases, beginning with high-impact features (such as vendor collaboration and guest management) and gradually adding more tools.

- **Training Programs**: Firstly, create various training options, such as online courses, live Q&A sessions, and one-on-one support for consumers who need more assistance. After that, provide role-specific training for vendors, planners, and couples, focusing on the platform features that are most relevant to their needs.

- **User Adoption Strategies**:
    - To attract sign-ups, provide early adopters with incentives such as discounts on platform costs or additional features.
    - Identify and train ”platform champions” (early adopters who are extremely engaged) to help and urge others to use the platform.
    - Continuously gather feedback to identify adoption barriers and iteratively enhance the platform in response to user needs.

- **Operational Support**: A dedicated support team should be available during and after the implementation to address issues, offer direction, and help users transition to the new system. Users should receive regular updates, as well as release notes on new features or upgrades, to keep them engaged and informed.

To summarize, the operational feasibility of this wedding planning platform may be achieved by a structured approach to managing workflow changes, addressing training needs, and executing a

change management strategy that includes a pilot program, training, and ongoing user support. This thorough strategy guarantees that the platform meets user requirements while also promoting adoption and operational efficiency.

Economic Feasibility

To determine the economic feasibility of this wedding planning software system, both financial costs and estimated return on investment (ROI) must be considered. This analysis comprises an estimate of short- and long-term expenses, as well as a cost-benefit analysis to assess whether the project is economically feasible.

Estimation of the Economic Viability of the Project

- **Breakdown of Project Costs**

  The project will incur a variety of costs for development, maintenance, and operation. Development expenditures encompass the platform's initial conception and refining, including the hiring of software engineers, designers, and project managers to build fundamental functionality such as user accounts, vendor collaboration, budgeting, and guest management. In addition to development, significant resources will be dedicated to testing and quality assurance to ensure a seamless user experience. This testing phase will involve user testing, beta testing, and any necessary changes based on input.

  Maintenance and updates are continual expenses necessary for the platform's long-term performance. Regular maintenance will ensure that the platform runs smoothly, resolves errors, and incorporates enhancements based on user feedback. As the platform evolves, updates and upgrades will be required to ensure peak performance and the incorporation of new features. For example, increasing AI capabilities for personalized suggestions or expanding functionality will necessitate further investment over time.

  Operational expenses will cover critical activities such as cloud hosting and infrastructure, which allow for scalability as the user base expands. Cloud services like as AWS or Azure will be critical for managing server loads, data storage, and bandwidth requirements. A specialized customer support team will be required to address user inquiries, troubleshoot difficulties, and maintain user happiness, thereby helping to retain users and increase brand loyalty. Furthermore, marketing and user acquisition expenses will be critical in bringing

people to the platform, with monies set aside for digital marketing, partnerships, and incentives for early adopters.

- **Short-term vs. Long-term Costs**
  In terms of short-term versus long-term costs, the project will incur significant short-term spending for development, testing, marketing, and the platform's launch phase. This short-term investment will be important for developing and promoting the platform, establishing a user base, and gaining a strong market entry. In the long run, the emphasis will move toward maintenance, scaling, and continual updates.

- **Future Expenses for Scaling or Upgrades**
  As the platform grows, the continuing costs for cloud hosting, customer support, and feature improvements will rise, making scalability an important consideration. Scaling the infrastructure and reacting to new technology advances may necessitate further investments to keep the platform competitive and responsive to user demands.

Consideration of Resource Availability, Potential Return on Investment (ROI), and Cost-Benefit Analysis

- **Resource Availability**
  - Human Resources: The availability of qualified developers, UI/UX designers, and support people will be critical to meeting development deadlines and providing quality service after launch.
  - Technological Resources: Access to a secure and reliable cloud infrastructure ensures that the platform can scale effectively. Additionally, tools for development, testing, and analytics will help monitor and optimize platform performance.

- **Return on Investment (ROI) and Cost-Benefit Analysis**
  Revenue Streams:
  - Subscription Model: The site might provide premium services through a membership model, as well as ad-free experiences for couples and planners. Monthly or yearly subscriptions would provide a consistent revenue stream.
  - Vendor Fees: Vendors can obtain visibility on the site by paying a commission or listing fee. This price varies according to vendor size, popularity, and placement.
  - Transaction Fees: Fees on payment transactions (e.g., vendor payments, guest gifts) can also provide revenue.

ROI Calculations

- Payback Period: A payback period can be calculated by comparing initial costs to predicted monthly revenue. For example, if the platform costs 500, 000 to create and the monthly revenue is expected the payback period is about 10 months.
- Long-term ROI: After the payback period, any money earned will be profit, minus maintenance and operational costs. With an increasing user base, the ROI may improve dramatically over time.

- **Cost-Benefit Analysis**

  Benefits

  - Increased Market Reach: By offering a cheap wedding planning option, the site can attract couples who do not hire planners, broadening its market reach.
  - Efficient Resource Use: The platform eliminates the need for traditional materials (such as printed invitations and timetables) and in-person meetings, reducing logistical costs for users and vendors.
  - Enhanced User Experience: Features such as vendor collaboration, budget management, and visitor tracking add significant value, distinguishing the platform from competitors and increasing user loyalty.

  Costs

  - Initial Investment and Operational Costs: These are significant upfront investments, and careful planning will be required to manage recurring expenses and ensure long-term financial viability.
  - Customer Acquisition and Retention Costs: To recruit and maintain customers in a competitive market, a considerable marketing budget is required, particularly when the user base is first established.

To conclude, the platform's economic feasibility appears promising, as expected revenue streams might cover the initial expenditure and provide significant long-term returns. With a clear cost-benefit analysis and appropriate resource allocation, the platform has a high chance of generating a positive ROI. If the platform meets its growth ambitions, it might become a long-term and profitable solution in the wedding planning sector.

Solution Proposal

Solution Overview

The Virtual Wedding Planning Concierge is designed to be an all-in-one solution for wedding planning. It mainly focuses on simplifying the process and saving couples time on the wedding planning experience by covering all major steps for wedding planning. We propose a cloud-based solution to improve the scalability, combined with a flexible architecture, encrypted data flows and multiplatform support.

Based on our research of the previous deliverable, many couples have suffered from unstable services, especially for RSVP and gift management and the cloud-based solution can improve the accessibility and solve this problem. Besides, traditional wedding planning can be fragmented and time-consuming which means the users need to manage planning themselves with many dedicated tools for each planning requirement. With a comprehensive solution, couples can gather all information and manage it together. In addition, many existing wedding planning solutions on the market do not have many personalized recommendations unless a wedding planner is hired. Our proposed solution will have built-in AI to recommend based on personal needs and current citations.

Key Features and Functionalities

Features list

Vendor Selection and Contact

Priority: High
Technical Feasibility: Achievable with cloud services
Market Demand: High; since it is one of the main reasons for users to look for wedding planning tool
Rationale: Couples can handle all vendor management processes here, which is one of the core features of wedding planning apps.

Budget Management

Priority: Medium
Technical Feasibility: High; with real-time data from the vendor contract and extra input from the user
Market Demand: High, since target users of wedding planning apps usually value budget quite high.
Rationale: Managing wedding budgets is a top concern, and a real-time budgeting tool helps users maintain financial control.

AI-Driven Recommendations

Priority: High
Technical Feasibility: Achievable; can be done by adjusting existing AI APIs or training new model with existing data
Market Demand: Trending, as users start to try AI solutions in every field
Rationale: This is a unique feature with limited options on similar products with increasing demands

RSVP Management

Priority: Medium
Technical Feasibility: Medium; with cloud-based RSVP management for stability and digital invites management
Market Demand: High, as a core feature for wedding planning apps
Rationale: This feature is in high demand and one of the key features for couples to switch to online wedding planning apps

Gifts Management

Priority: Medium
Technical Feasibility: Medium; with cloud-based gift management for stability and digital invites management similar to RSVP management
Market Demand: High, as a core feature for wedding planning apps
Rationale: This feature is in high demand and one of the key features for couples to switch to online wedding planning apps

Multi-platform Support

Priority: Medium
Technical Feasibility: High; requires using frameworks that have built-in cross-platform support and compatibility testing
Market Demand: High, as users expect access across devices, especially from guests' sides.
Rationale: Couples might need to visit local vendors, update plans with phones and have full checks at home with a desktop. The guests might also need to accept and select gifts on different devices

Use Cases

Vendor Selection and Management

1. Couples go over available vendor lists with details like budget, service offering and contact information.
2. Couple find vendors that potentially fit their plan and message them on the platform
3. Couple sign contracts with vendors and budgets are updated automatically based on the contract

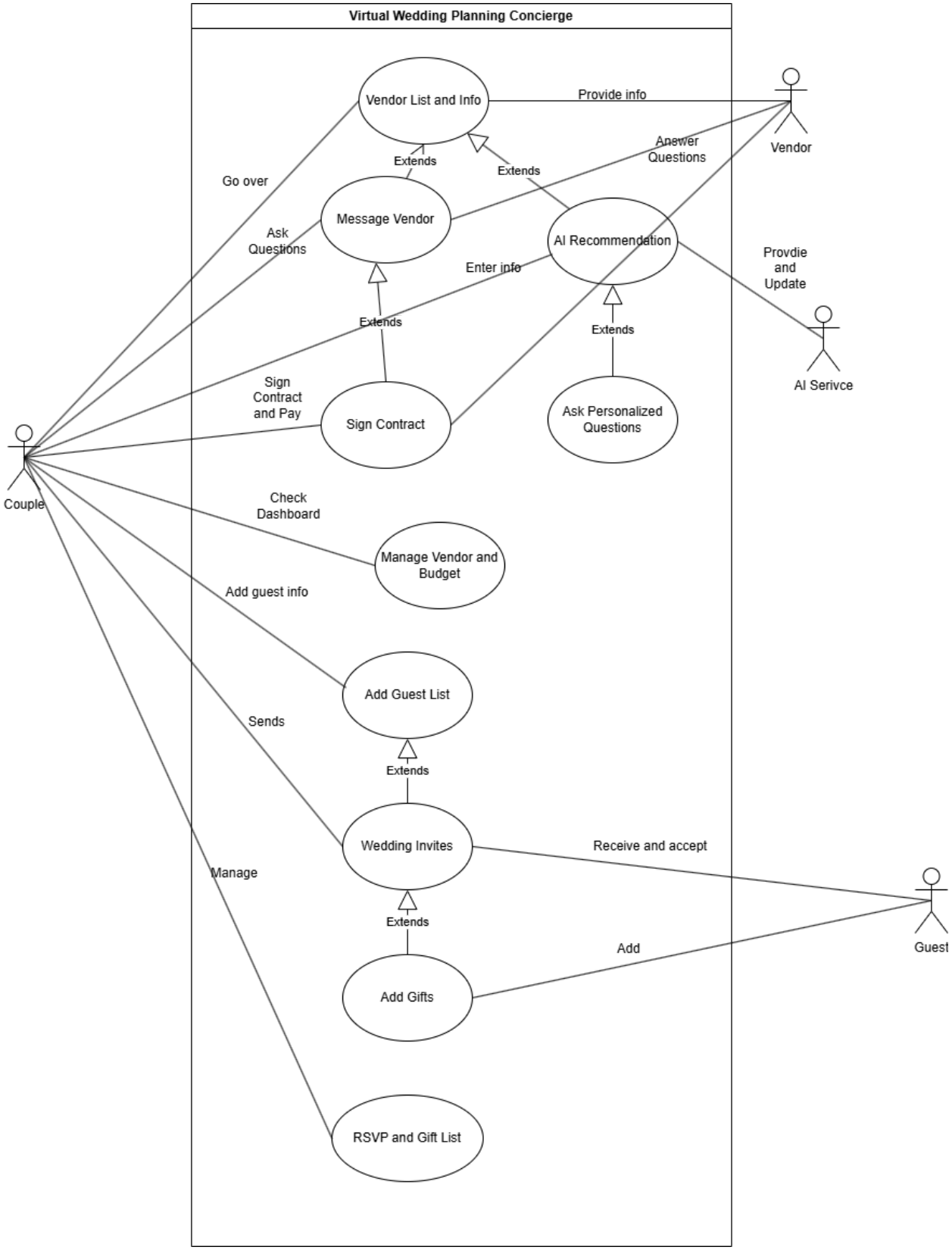
4. Couple view the dashboard for vendors and budgets, contact vendors and update costs other than vendors if needed

AI-Driven Recommendation

1. Couple enter basic information for location, budget, style preferences, guest count and wedding size
2. AI recommend vendors and plans with detailed information
3. Couple select some options and the system provides new recommendations based on the current selection
4. Couple ask more advanced questions to the AI chatbot and refine the plan
5. Couple finalize plan with AI and start to sign contracts with vendors

RSVP and Gift Management

1. Couple write templated invites with the app and send out invites
2. Guest receive wedding information and accept invites
3. Guest add gifts and send blessing messages with the app
4. Couple manage RSVP and gifts with guest dashboard and reply to messages


Virtual Wedding Planning Concierge
Vendor List and Info
Provide info
Vendor
Extends
Extends
Anewer Questions
Go over
Message Vendor
AI Recommendation
Ask Questions
Enter info
Provdie and Update
AI Serivce
Extends
Extends
Sign Contract and Pay
Sign Contract
Ask Personalized Questions
Couple
Check Dashboard
Manage Vendor and Budget
Add guest info
Add Guest List
Sends
Extends
Wedding Invites
Receive and accept
Manage
Guest
Extends
Add
Add Gifts
RSVP and Gift List

Benefits and Impact

The Virtual Wedding Planning Concierge can be beneficial for stakeholders. Couples can benefit from an all-in-one solution and get personalized question answering and advising with AI without needing to hire a wedding planner which also saves their time for management. Guests can access event details, manage gifts and get updates whenever and wherever they need. Vendors can have more exposure and promotion which can increase their contract number and bring more profit. For the business owner, the cloud-based solution can improve stability, be cost-efficient and easy to extend in the future, which can bring more customers and be profitable in the long run.

The platform brings together all dedicated tools and provides extra advice from AIs which can reduce the need for expensive wedding planners on the market. It will be easier for young couples to hold their wedding completely independently with their own preferences. Guests can access the platform more easily, which can also engage them to participate more compared to traditional planning tools. On a broader scale, the cloud-based platform and AI can show the potential revelational new solution to the industry which can set new standards in wedding planning services. It can also reshape the impression of complex planning processes and engage them to plan themselves.

Project Plan (WBS)

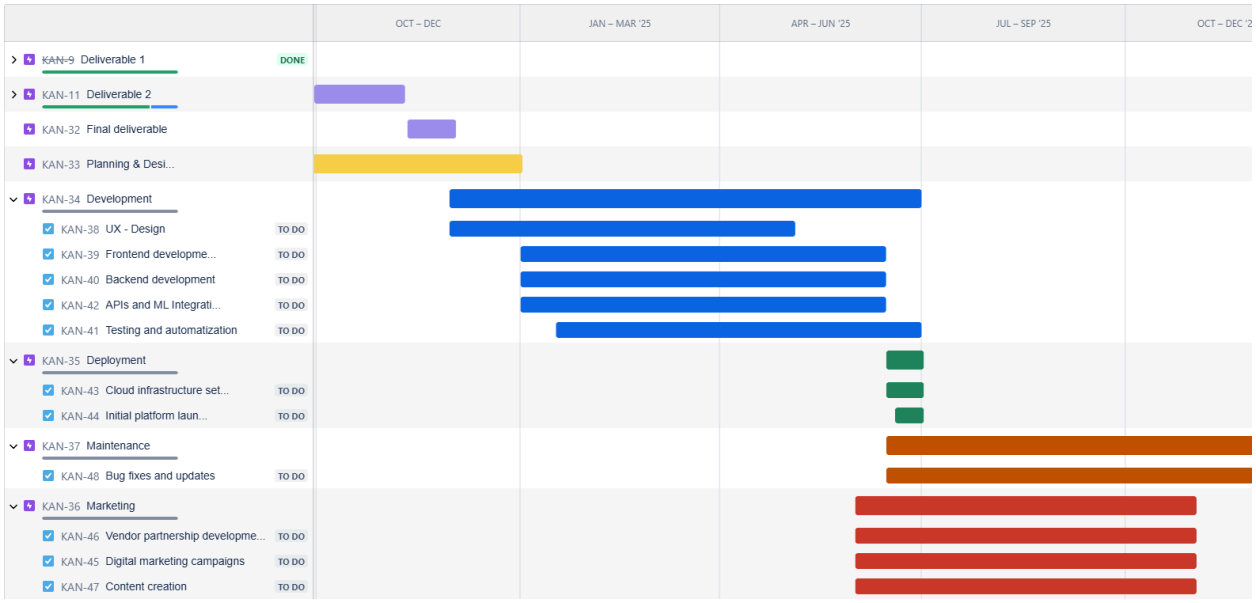
Project Timeline

The Virtual Wedding Planning Concierge platform is designed to revolutionize the wedding planning experience for couples and vendors. Using advanced technology, the platform aims to streamline planning processes, provide personalized recommendations, and foster seamless collaboration between all stakeholders.

The project is structured into six phases: Planning and Design, Development & Testing, Deployment, Marketing, and Maintenance. Each of these phases is planned to ensure the platform's success and long-term sustainability.

From the project initiation on **September 1, 2024**, to the conclusion of the Marketing phase on **November 1, 2025**, the project spans approximately **14 months and 1 week**, providing a n optimal timeline for development, testing, and marketing. The ongoing Maintenance phase ensures the platform remains reliable and competitive post-launch.

Gantt Chart:



See page 18 or this link.

Planning and Design

The Planning and Design phase is the foundation of the Virtual Wedding Planning Concierge platform. It focuses on gathering requirements, analyzing stakeholder needs, and creating the blueprints for the development phase. This phase ensures that the project's goals align with user expectations and technical feasibility, setting the groundwork for a successful product. It integrates all of the current deliveries in addition to future engagement with stakeholders and in-detail design.

Key Objectives

1. Understand Stakeholder Needs - 40 story points (~320 hours)
2. Define Project Scope - 30 story points (~240 hours)
3. Establish Technical Architecture - 50 story points (~400 hours)
4. Visualize User Experience - 60 story points (~480 hours)

Timeline - 4 Months
September 1 2024 - December 31 2024

Development

The Development phase focuses on transforming the designs and requirements from the Planning and Design phase into a functional platform. This phase includes UX/UI design, coding, integration, and testing to ensure all core features are implemented as envisioned.

Considering the platform consists of six major key features, the estimated development time would be allocated to 6 months, one per feature, divided in 4 weekly sprints implemented using Agile methodologies.

The UI/UX design will also span 6 months, initially overlapping with the Planning and Design phase, to ensure each feature is designed properly before its development and implementation.

Testing ensures the platform functions as intended, is secure, and provides a seamless user experience. This focuses on identifying and resolving bugs, verifying that all components work cohesively. It will start after 2 sprints and will extend, overlapping with the Deployment phase to ensure the platform meets performance, usability, and security standards. An in-detail planning for each sprint will be done as soon as the UI/UX design starts, determining the priority of each of the user stories and tasks related to the development of the project.

This phase depends on the successful completion of the **Planning and Design** phase.

Key Objectives

1. Build a robust, scalable, and secure platform with all core functionalities.
2. Ensure seamless integration between the front-end, back-end, database, and external APIs.
3. Develop AI/ML features to provide personalized recommendations and streamline user experiences.
4. Implement secure mechanisms for user authentication, data protection, and payment processing.

Timeline - 30 weeks

- UI/UX design - 80 story points (~640 hours)
    - 6 months - November 30 - 2024 - May 04 2025
- Frontend development - 200 story points (~1,600 hours)
    - 6 months - January 01 - 2025 - June 14 -2025
- Backend development - 200 story points (~1,600 hours)
    - 6 months - January 01 - 2025 - June 14 -2025
- APIs and ML integration - 300 story points (~2,400 hours)
    - 6 months - January 01 - 2025 - June 14 -2025
- Testing and automatization - 150 story points (~1,200 hours)
    - 6 months - January 17 - 2025 - June 30 -2025

Deployment

The Deployment phase is critical for transitioning the Virtual Wedding Planning Concierge platform from the development and testing environment to live production. It involves setting up infrastructure, configuring the platform for real-world use, and ensuring a smooth launch. Deployment will start as soon as development is done and implemented and will consist of 2 sprints.

This phase depends on the successful completion of the **Development** phase.

Key Objectives

1. Set up and configure the production environment to host the platform.
    a. 50 story points (~400 hours)
2. Deploy the platform with all features fully functional and accessible.
    a. 30 story points (~240 hours)
3. Ensure data integrity and system stability during the transition.
    a. 30 story points (~240 hours)
4. Monitor performance and address any immediate post-launch issues.
    a. 20 story points (~160 hours)

Timeline - 2 weeks
June 15 2025 - July 01 2025

Marketing

The Marketing phase focuses on creating awareness, driving user adoption, and building credibility for the Virtual Wedding Planning Concierge platform. Effective marketing ensures that couples, vendors, and other stakeholders understand the platform's value and are motivated to use it. This phase also involves building partnerships and fostering a community of users. Marketing will start 1 month prior to the platform lunch, building up excitement and gathering all potential vendors in time to ensure customer satisfaction. It will extend 6 months to ensure we reach all potential users and invite them to engage with the platform.

This phase depends on the ongoing progress of the **Development** phase.

Key Objectives

1. Reach the target audience through online and offline channels.
    a. 50 story points (~400 hours)
2. Encourage user sign-ups, engagement, and platform utilization.
    a. 80 story points (~640 hours)
3. Position the platform as a trusted and innovative solution in the wedding planning industry.
    a. 80 story points (~640 hours)
4. Establish relationships with vendors, influencers, and wedding planners to expand the platform's reach.
    a. 80 story points (~640 hours)
5. Engage users post-launch to ensure long-term loyalty and continued usage.
    a. 70 story points (~560 hours)

Timeline - 6 months - July 1 2025 - November 1 2025

Maintenance

The Maintenance phase ensures that the Virtual Wedding Planning Concierge platform remains reliable, secure, and up-to-date post-launch. This phase is ongoing and involves monitoring the

system, addressing issues, incorporating user feedback, and adding new features to maintain user satisfaction and competitive advantage.

Maintenance will start as soon as development ends, overlapping with the final testing and deployment, ensuring the platform continues operating smoothly throughout its life cycle. It will extend beyond the project completion and will be handed over to a third party who will maintain the platform.

This phase depends on the successful completion of the **Deployment** phase

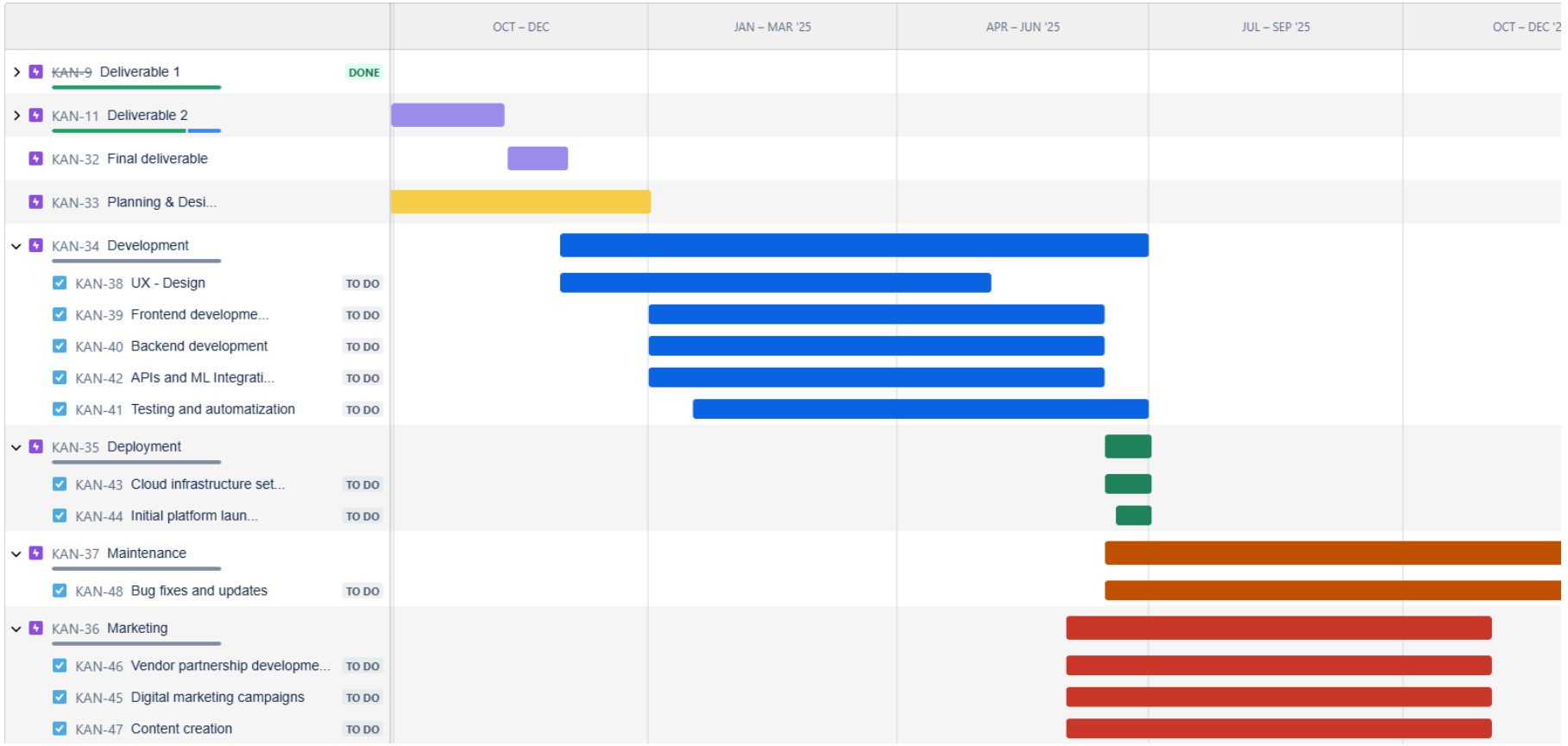
Key Objectives

1. Ensure the platform operates smoothly with minimal downtime.
    a. 30 story points/month (~240 hours)
2. Address technical issues and resolve bugs reported by users or identified during monitoring.
    a. 30 story points/month (~240 hours)
3. Protect user data through regular updates and adherence to data protection standards.
    a. 30 story points/month (~240 hours)
4. Continuously improve the platform by implementing new features and refining existing ones based on user feedback.
    a. 40 story points/month (~320 hours)
5. Adapt the platform to accommodate an increasing user base as it grows.
    a. 40 story points/month (~320 hours)

Timeline - from June 15 -2025

Summary of Estimated Total Effort

Phase	**Story Points**	**Hours**
Planning & Design	180	1440
Development	930	7440
Deployment	130	1040
Marketing	360	2880
Maintenance (monthly)	170	1360


OCT – DEC
JAN – MAR '25
APR – JUN '25
JUL – SEP '25
OCT – DEC '2
~~KAN-9~~ Deliverable 1
DONE
KAN-11 Deliverable 2
KAN-32 Final deliverable
KAN-33 Planning & Desi...
KAN-34 Development
KAN-38 UX - Design
TO DO
KAN-39 Frontend developme...
TO DO
KAN-40 Backend development
TO DO
KAN-42 APIs and ML Integrati...
TO DO
KAN-41 Testing and automatization
TO DO
KAN-35 Deployment
KAN-43 Cloud infrastructure set...
TO DO
KAN-44 Initial platform laun...
TO DO
KAN-37 Maintenance
KAN-48 Bug fixes and updates
TO DO
KAN-36 Marketing
KAN-46 Vendor partnership developme...
TO DO
KAN-45 Digital marketing campaigns
TO DO
KAN-47 Content creation
TO DO

Milestones and Deliverables

Identification and Description of Major Project Milestones

Major project milestones are critical checkpoints that mark significant progress and achievements throughout the lifecycle of the platform. These milestones help monitor the project's trajectory, ensure alignment with objectives, and provide a clear understanding of dependencies between phases. By defining criteria for completion, dependencies, and alignment with project phases, these milestones offer a structured roadmap to guide the project team toward successful delivery.

Each milestone represents a tangible deliverable or outcome, serving as a foundation for subsequent activities and ensuring the project remains on track and within scope. Through careful identification and description, these milestones enable efficient project management and provide stakeholders with a transparent overview of progress.

Completion of Planning and Design Phase

- **Criteria for Completion:** Approved project scope, finalized architecture, and documented user experience designs.
- **Dependencies:** Successful stakeholder engagement and requirement gathering.
- **Alignment with Project Phases:** Signals readiness to begin the **Development** phase.
- **Expected Date:** December 31, 2024.

Midpoint Development Review

- **Criteria for Completion:** Completion of initial sprints with core features developed and integrated, and successful unit testing for those features.
- **Dependencies:** Progress in front-end, back-end, and API development.
- **Alignment with Project Phases:** A critical checkpoint during the **Development** phase.
- **Expected Date:** March 15, 2025.

End of Development Phase

- **Criteria for Completion:** Full implementation of all six key features, completion of UI/UX design, and successful integration of AI/ML components.
- **Dependencies:** Completion of coding, feature testing, and functional integration.
- **Alignment with Project Phases:** Transition from **Development** to **Deployment**
- **Expected Date:** June 14, 2025.

Deployment Readiness

- **Criteria for Completion:** Platform passes end-to-end testing, security checks, and performance benchmarks.
- **Dependencies:** Finalized testing and infrastructure setup.
- **Alignment with Project Phases:** Marks the transition to the **Deployment** phase.

- **Expected Date:** June 15, 2025.

Platform Launch

- **Criteria for Completion:** Platform is live in production with full functionality and initial marketing campaigns in effect.
- **Dependencies:** Completion of deployment activities and infrastructure configuration.
- **Alignment with Project Phases:** Launch milestone of the **Deployment** phase.
- **Expected Date:** July 1, 2025.

Completion of Marketing Phase

- **Criteria for Completion:** Achieved user adoption targets, vendor partnerships established, and active user engagement metrics recorded.
- **Dependencies:** Ongoing platform stability and marketing campaign execution.
- **Alignment with Project Phases:** Marks the end of the **Marketing** phase.
- **Expected Date:** November 1, 2025.

Deliverables at Each Project Phase

The deliverables at each phase of the project represent the tangible outputs that define progress and contribute directly to the project's success. These deliverables are aligned with the objectives of each project phase, ensuring that every milestone builds upon the previous one.

A comprehensive and detailed list of deliverables not only provides clarity but also ensures accountability, enabling efficient tracking of progress and adherence to project timelines. Each deliverable plays a critical role in achieving the overall vision of the platform.

Planning and Design Phase Deliverables

- **Requirements Document:** Comprehensive details on functional and non-functional requirements.
- **Project Scope Statement:** Defined goals, objectives, and boundaries of the project.
- **Technical Architecture Document:** Blueprint of the platform's infrastructure, including technology stack and system design.
- **Wireframes and Prototypes:** Visualizations of the user interface and key workflows.
- **Stakeholder Engagement Plan:** Strategy for continuous stakeholder collaboration.

Development Phase Deliverables

- **UI/UX Designs:** Finalized designs for the user interface and user experience.
- **Functional Features:** Developed and integrated six key features of the platform.
- **APIs and AI/ML Models:** Implemented APIs and machine learning components for personalized recommendations.
- **Codebase:** Well-documented and version-controlled source code.
- **Testing Scripts:** Automated and manual test cases for quality assurance.

- **Test Reports:** Detailed documentation of test results, including bug resolutions and performance benchmarks.
- **Quality Assurance Certification:** Verification of platform adherence to usability, security, and performance standards.
- **Deployment Checklist:** Validated readiness of all components for deployment.

Deployment Phase Deliverables

- **Production Environment Configuration:** Fully configured and optimized hosting environment.
- **Live Platform:** Fully functional platform accessible to users.
- **Performance Monitoring Tools:** Set up tools to monitor system stability and performance post-launch.

Marketing Phase Deliverables

- **Marketing Campaigns:** Executed campaigns targeting couples, vendors, and planners across various channels.
- **User Onboarding Materials:** Guides, tutorials, and help documentation for new users.
- **Vendor Partnerships:** Formalized agreements with vendors and influencers.

Maintenance Phase Deliverables

- **Monitoring Reports:** Regular reports on system uptime, user activity, and issues.
- **Patch Updates:** Bug fixes and security updates as required.
- **Feature Enhancements:** Continuous updates and new features based on user feedback.

Risk Assessment and Mitigation

Risk Identification

After executing a deep analysis to the projects features, services and overall functionality, these are the risks that present a high level of probability to appear during development and/or after deployment:

Potential Risks

Technical Risks

- **System Integration Failure**: Challenges may arise while following the integration process of third-party services and APIs, such as payment processing and vendor directories, which are critical for smooth user experience.

- **Data Security and Privacy Risks**: The project will have the users providing their personal information, this gives opportunity for data breaches if proper security measures are not implemented correctly.
- **Scalability Issues**: As the platform's popularity grows, performance issues may arise if the infrastructure isn't capable of handling high traffic efficiently.
- **Platform Downtime**: Unplanned outages or maintenance issues could disrupt user access and negatively impact reputation.

Operational Risks

- **Vendor Delays**: Some vendors may not provide timely updates on their availability or present a delay on their responses, affecting the users' planning experience overall.
- **Dependency on Vendor Quality**: Users' satisfaction depends on vendor quality for the most part. Vendor services that cannot reach the expectations may harm the platform's reputation.
- **Internal Limitations**: Limited team experience and resources, or the management of them, may slow down the development and restrict the scope of important features.

Financial Risks

- **Poor Budget Management**: Unexpected costs due to technical issues or inconsistent timelines could exceed the initial project budget.
- **Revenue Model Risk**: The platform not being attractive for paying users or vendors may challenge its financial sustainability.
- **Market Competition**: Competitors may launch similar features, potentially reducing user acquisition and retention.

Environmental Risks

- **Public Health Risks**: Public health issues, such as a pandemic, could reduce demand for wedding planning services.
- **Economic Downturn**: Economic recessions may limit users' wedding budgets, impacting platform usage.
- **Legal and Compliance Risks**: Compliance with data protection laws, such as GDPR, is essential to avoid legal penalties and ensure user trust.

Market Risks

- **Changing User Preferences**: Shifts in trends or preferences could make certain features less relevant.
- **Demand Variability**: Demand for wedding planning tools can fluctuate, impacting steady revenue.
- **Vendor Attrition**: Vendors may leave the platform if they don't find any benefit in being part of it.

Risk Categorization

- **Technical:** Risks that impact the system's functionality, integrations, and performance.
- **Operational:** Risks related to internal processes, vendor interactions, and resource management.
- **Financial:** Risks that affect budget, revenue potential, and market position.
- **Environmental:** External factors that may affect platform use, beyond immediate control.
- **Market:** Risks driven by demand, user preferences, and vendor partnerships.

Risk Impact Analysis

After identifying the potential risks that may appear during the project's development, a detailed analysis is made to prioritize each risk based on their impact to the project:

Risk	Probability	Impact	Consequences
Data Security and Privacy Risks	High (3)	High (3)	Legal penalties, reduced user base, and difficulty regaining trust in the long term.
System Integration Failure	Medium (2)	High (3)	Could slow platform growth, limit functionality, and increase maintenance requirements over time.
Scalability Issues	Medium (2)	High (3)	Poor user experience could lead to churn and limit platform scalability and reputation as the user base grows.
Vendor Delays	Medium (2)	Medium (2)	Decreased user satisfaction, potential for negative reviews, and reduced vendor platform engagement over time.
Market Competition	Medium (2)	Medium (2)	Platform may lose relevance, struggle to attract new users, and

			face a decline in competitive positioning over time.
Public Health Crises	Medium (2)	High (3)	Long-term reduction in demand for wedding planning; possible permanent vendor closures, impacting available options.
Economic Recession	Medium (2)	High (3)	Lower sustained demand as users' budgets tighten, impacting revenue projections and platform growth.

Taking a look at the table mentioned, it is safe to say that the biggest concern for the project and at first position of priority would be a hypothetical data breach and security risk.

Risk Mitigation Strategies

Mitigation Strategies

For the most urgent risks viewed during the analysis, mitigation strategies were made in order to address them. Additionally, contingency plans were made into consideration for approaching these risks:

- **Data Security and Privacy Risks**
  - **Mitigation Strategy**: Implement end-to-end encryption, multi factor authentication, and regular security audits. Partner with third-party security providers for ongoing monitoring and compliance with standards like GDPR (General Data Protection Regulation).
  - **Contingency Plan**: Establish an emergency response team to address breaches and communicate with affected users offering customer service. Budget for potential fines and crisis management.

- **System Integration Failure**
  - **Mitigation Strategy:** Schedule extra time for integration testing with third-party providers, and maintain clear communication channels for more efficiency.
  - **Contingency Plan:** Develop minimal fallback versions of critical integrations to maintain functionality if certain integrations fail.

- **Scalability Issues**
    - **Mitigation Strategy**: Build a cloud-based infrastructure to allow scalable performance. Conduct regular stress tests and monitor platform metrics to preemptively address performance bottlenecks.
    - **Contingency Plan**: Plan server upgrades or distribute load through a content delivery network during the most concurrent periods.

- **Vendor Delays**
    - **Mitigation Strategy**: Establish service level agreements (SLAs) with vendors to set clear response expectations and incentivize timely updates.
    - **Contingency Plan**: Maintain a list of alternative vendors in each key category (e.g., venues, catering) to ensure replacements are available if delays persist.

- **Market Competition**
    - **Mitigation Strategy**: Regularly monitor competitor offerings and gather user feedback to inform feature updates and remain competitive.
    - **Contingency Plan**: Develop unique features based on user research that address unmet needs, setting the platform apart from competitors.

Contingency Plans for Unforeseen Challenges

To address unforeseen challenges, we've developed a general contingency framework:

- **Resource Reallocation:** Reallocate team members to high-priority tasks when unexpected issues arise, ensuring critical project aspects are not delayed.
- **Timeline Adjustments:** Include buffer time in the project timeline for high-risk activities, such as system integration and vendor collaboration.
- **Vendor and Service Alternatives:** Maintain relationships with alternative vendors and service providers, ensuring flexibility if primary options become unavailable.

Budgeting

Cost Categories

To cover the development, testing, marketing, ongoing maintenance, deployment, and customer support needed for this platform, funds are allocated based on each category's priority, market demand, and technical feasibility. Assume the total budget is $1300000.

Cost Category	Budget Allocation	Total Cost	Description and Justification
Development	40%	$520000	**Core platform creation**: This involves building a stable, user-friendly interface and robust backend.Real-world considerations include the high cost of skilled developers, the need for scalable architecture, and security to protect user data. Development also includes database setup and API integration, essential for linking vendors and providing real-time updates.
Testing	15%	$195000	**Testing for functionality and user-friendliness:** Includes automated and manual testing to identify bugs, optimize performance, and ensure usability, especially for critical RSVP and gift management features. Real-world considerations include the need for consistent quality assurance to avoid post-launch issues that could impact user satisfaction and brand reputation.

Marketing	20%	$260000	**Digital marketing and brand presence**: This allocation covers social media ads, SEO, and partnerships to reach a large, diverse audience of couples and vendors. With the competitive nature of wedding planning platforms, targeted marketing ensures the platform attracts a solid user base. Real-world considerations highlight the high costs of effective online advertising and the need to establish a recognizable brand in the market early on.
Ongoing Maintenance	5%	$65000	**Maintenance and regular updates**: Includes costs for server upkeep, software updates, and minor improvements based on user feedback. This is essential to ensure long-term platform stability and address emerging needs. Real-world considerations include continuous updates for compatibility with evolving technologies and security standards to protect sensitive user information.

Deployment	5%	$65000	**Initial setup and cloud deployment:** Covers the cost of establishing a stable infrastructure for platform accessibility and data security. Using cloud services provides flexibility, but the initial setup must be robust enough to handle varying user loads, ensuring the platform's accessibility and reliability. Real-world considerations include costs for cloud infrastructure and compliance with data protection regulations.
Customer support	5%	$65000	**Customer support for user queries and issues**: Dedicated support addresses questions about platform usage, especially RSVP functionality, vendor communication, and troubleshooting. Real-world considerations include the need for responsive support to build trust, improve user satisfaction, and manage issues that can directly affect the platform's reputation and user retention.
Contingency Plan	10%	$130000	Reserved for unforeseen expenses related to development, market changes, or technical issues. A 10% contingency is appropriate given the project risks identified, providing a buffer for unexpected costs.

2. Detailed Category Breakdown

I. Development

This category includes building the core functionality and interface of the platform, essential to the user experience and usability of the tool.

1. **Front-End Development**
    - **Description**: The goal is to design and develop a responsive, intuitive interface across devices (mobile, tablet, and desktop) for couples, guests, and vendors accessing the platform.
    - **Resources Needed**: UI/UX designer and front-end software developer are charged at approximately $92,625 per year or $47.50 per hour [1] and $103,429 per year or $53.04 per hour [2] respectively based on Canadian market rates for average front-end developers.
2. **Back-End Development**
    - **Description**: The goal is to define the architecture of the local and cloud data storage, cloud infrastructure setup, and support key features such as vendor contracts and RSVP management.
    - **Resources Needed**: Based on Canadian market rates, backend developers are charged at $126,750 per year or $65 per hour [3], cloud developers are charged at $142,500 per year or $73.08 per hour [4].
3. **Database Configuration and Administration**
    - **Description**: This component covers the setup, configuration, and ongoing management of the platform's database infrastructure. It ensures the efficient storage and retrieval of wedding planning data, including vendor information, user preferences, RSVP responses, gift management, and other critical details.
    - **Resources Needed**: Based on Canadian market rates, database administrator is charged at $91,650 per year or $47 per hour, ensuring data storage security and optimization for multi-user access. [5]
4. **API Integration**
    - **Description**: Integrating with payment gateways and external services for vendor payments, digital invites, and real-time RSVP updates.
    - **Resources Needed**: Based on Canadian market rates, API developers are charged at $130,000 per year or $66.67 per hour [6] to set up and test API integrations. Assume
5. **AI/ML Integration**
    - **Description**: This category covers the development of AI and machine learning functionalities, such as personalized recommendations, guest list predictions, and budget optimization.
    - **Resources Needed**: Based on Canadian market rates, AI/ML developers are charged at $110,020 per year or $56.42 per hour [7].
6. **Security**
    - **Description**: It involves implementing encryption, secure authentication, and monitoring systems to prevent unauthorized access and potential data breaches.

- **Resources Needed**: Based on Canadian market rates, a security engineer is charged at $127,334 per year or $65.30 per hour [8].

B. Testing

Testing ensures platform stability, especially for RSVP and gift management—two high-demand features, tested by unit testing, integration testing, user acceptance testing, security testing, performance testing.

1. **Automated Testing**
   - **Description**: Continuous testing of functionality, usability, and device compatibility.
   - **Resources Needed**: Based on Canadian market rates, Test Automation Engineer is charged at $122,287 per year or $62.71 per hour [9] .
2. **Manual Testing**
   - **Description**: User-centric testing to simulate real-world scenarios and validate ease of use.
   - **Resources Needed**: Based on Canadian market rates, Manual Tester is charged at $117,000 per year or $60 per hour [10].

C. Marketing

A comprehensive digital marketing strategy is vital to reach couples and vendors.

1. **Digital Marketing**
   - **Description**: Online advertising (social media, Google ads), SEO, and targeted marketing campaigns to attract both couples and wedding vendors.
   - **Resources Needed**: Based on Canadian market rates, Digital Marketing Specialists are charged at $67,445 per year or $34.59 per hour [11] for social media and digital ad agencies.
2. **Content Creation**
   - **Description**: Producing blog posts, tutorial videos, and wedding planning guides to engage users.
   - **Resources Needed**: Based on Canadian market rates, writers are charged at $64,350 per year or $33 per hour [12], video creators are charged at $29,250 per year or $15 per hour [13].
3. **Vendor Partnerships**
   - **Description**: Establishing partnerships with key vendors to drive platform credibility and encourage vendor adoption.
   - **Resources Needed**: Based on Canadian market rates, vendor manager is charged at $113,700 per year or $58.31 per hour [14].

D. Ongoing Maintenance (% of Total Budget - $)

Essential to provide continuous support, handle system updates, and ensure RSVP feature reliability.

1. **Customer Support**
    - **Description**: A dedicated support team to handle user inquiries, helping retain users through quick responses to RSVP or vendor issues.
    - **Resources Needed**: Based on Canadian market rates, customer service representatives are charged at $35,775 per year or $18.35 per hour [15].
2. **Platform Maintenance**
    - **Description**: Regular updates, bug fixes, and server monitoring to maintain a stable, secure platform.
    - **Resources Needed**: Based on Canadian market rates, DevOps is charged at $150,429 per year or $77.14 per hour [14].

E. Deployment

The initial setup and deployment of cloud infrastructure are crucial for multi-platform access and data security.

1. AWS Pricing (General Purpose Setup)

    Instance Type: t4g.xlarge (4 vCPUs, 16 GB RAM)

    On-Demand Pricing: Approximately $0.1344 per hour.

    Reserved Instance (1-Year Commitment): Costs reduce to about $0.084 per hour, reflecting a 41% discount.

    Estimation: $735 per month, totaling around $8,820 annually

2. Azure Pricing (General Purpose Setup)

    Instance Type: B4ms (4 vCPUs, 16 GB RAM)

    On-Demand Pricing: Around $0.166 per hour.

    Reserved Savings (1-Year Commitment): Pricing drops to approximately $0.1118 per hour, reflecting a 32% discount.

    Estimation: $880 per month, totaling around $10,560 annually

Resource Costing

2.1 Human Resources

Development Team (Based on current Canadian market rates)

- UI/UX Designer: $47.50/hr × 160 hrs/month × 6 months = $47,520
- Front-End Developer: $53.04/hr × 160 hrs/month × 6 months = $48,998.40

- Backend Developer: $65/hr × 160 hrs/month × 6 months = $62,400
- Cloud Developer: $73.08/hr × 160 hrs/month × 6 months = $70,156.80
- Database Administrator: $47/hr × 160 hrs/month × 6 months = $45,120
- API Developer: $66.67/hr × 160 hrs/month × 6 months = $64,003.20
- AI/ML Developer: $56.42/hr × 160 hrs/month × 6 months = $54,163.20
- Security Engineer: $65.30/hr × 160 hrs/month × 6 months = $62,688
- Test Automation Engineer: $62.71/hr × 160 hrs/month × 6 months = $60,115.20
- Manual Tester: $60/hr × 160 hrs/month × 6 months = $34,560

Marketing Team

- Digital Marketing Specialist: $34.59/hr × 160 hrs/month × 6 months = $33,984
- Writer: $33/hr × 160 hrs/month × 6 months = $31,680
- Video Creator: $15/hr × 160 hrs/month × 6 months = $14,400
- Vendor Manager: $58.31/hr × 160 hrs/month × 6 months = $56,032

Customer Support Team

- Customer Support Representative: $18.35/hr × 160 hrs/month × 6 months = $17,568

DevOps

- DevOps Engineer: $77.14/hr × 160 hrs/month × 6 months = $73,142.40

2.2 Technology Resources

- Cloud Infrastructure: By comparing the price of AWS and azure, we would choose the Azure as our cloud infrastructure: $10,560/year
- Development Tools and Licenses: $2,500/month × 12 months = $30,000.
- Security Tools and Certificates: $ 2,000/month × 12 months = $24,000
- AI/ML Services: $4,000/month × 12 months = $48,000 (Based on Canadian pricing for services like AWS SageMaker, Azure ML)

2.3 External Services

- Legal Services: $ 65,000 (Based on average Canadian technology law firm rates of $ 400-600/hour) [15]
- UI/UX Consulting: $ 50,000 [16]
- Market Research: $ 20000 - 50,000 [17]

Contingency Budget

It is essential to have a contingency budget in place to guarantee that any unforeseen challenges, whether technical, market-related or resource-driven, do not jeopardise the project. The proposed

contingency budget of 10% has been set at $130,000 and is based on the risks identified across different categories, taking into account both the likelihood and potential impact of each risk. The distribution of this budget is based on a comprehensive risk analysis, with the highest portion allocated to technical risks, followed by market risks and resource risks.

1. **Technical Risks (40% of Contingency - $52,000)**

Technical risks have the potential to cause significant disruptions to the platform's functionality, performance, and security, which are crucial for user satisfaction and retention. These include:

- **Server stability issues:** Potential downtime or outages can degrade user experience, especially for key features like RSVP management and vendor interactions.
- **Integration challenges with third-party services:** Integrating payment gateways, APIs for vendors, and other services may be more complex than anticipated, leading to delays or functionality issues.
- **Security vulnerabilities**: Ensuring that user data is secure from potential breaches is essential, and failure to address security threats could result in financial and reputational damage.
- **Performance optimization needs:** As the platform scales, performance issues might arise that require additional server capacity, optimizations, or infrastructure upgrades

Allocated Budget:

$52,000 will be reserved to address technical challenges that may require rapid intervention, such as purchasing additional infrastructure, engaging specialized technical consultants, or covering unexpected integration costs.

2. **Market Risks (30% of Contingency - $39,000)**

Market risks are external factors that can impact platform adoption and user behaviour. The success of the platform is contingent upon favourable market conditions and a competitive positioning strategy.

- **Changes in market conditions:** Shifting trends, such as economic downturns or changes in wedding industry demand, can impact user spending on wedding planning tools.
- **Competitive pressures:** Competitors may introduce similar features or more attractive offerings, reducing market share or user engagement.
- **User adoption challenges:** If the platform does not meet the expectations or needs of users, the expected growth in user base may not materialize.

Allocated Budget:

$39,000 will be reserved to navigate market fluctuations. This budget may be used for market research, user acquisition campaigns, or adjustments to the platform to better compete with market trends or competitor offerings.

3. **Resource Risks (30% of Contingency - $39,000)**

The team's ability to meet development milestones, maintain project timelines and ensure the availability of adequate skills for project success represent the main resource-related risks.

- **Staff turnover:** High turnover rates could result in the loss of key personnel, requiring new hires or temporary replacements.
- **Skill gaps:** Some technical areas might require specialized knowledge or expertise, leading to the need for external consultants or additional training for the team.
- **Additional training needs**: New tools or technologies might require upskilling of the development team.
- **Extended development time:** Unexpected delays in development due to unforeseen technical or operational challenges may result in the need for additional resources or time.

Allocated Budget:

$39,000 will be earmarked to address potential delays, hire temporary staff, or provide additional training or recruitment to fill gaps in the development process.

Bibliography

---

[1] Ui Ux Designer average salary in Canada, 2024

Available: https://ca.talent.com/salary?job=ui+ux+designer [Accessed:08-Nov-2024]

[2] Front End average salary in Canada, 2024

Available: https://ca.talent.com/salary?job=front+end+developer [Accessed:08-Nov-2024]

[3] Backend Developer average salary in Canada, 2024

Available: https://ca.talent.com/salary?job=backend+developer [Accessed:08-Nov-2024]

[4] Cloud Developer average salary in Canada, 2024

Available: https://ca.talent.com/salary?job=cloud+developer [Accessed:08-Nov-2024]

[5] Database Administrator average salary in Canada, 2024

Available: https://ca.talent.com/salary?job=database+administrator [Accessed:08-Nov-2024]

[6] Api Developer average salary in Canada, 2024

Available: https://ca.talent.com/salary?job=api+developer [Accessed:08-Nov-2024]

[7] Artificial Intelligence average salary in Canada, 2024

Available: https://ca.talent.com/salary?job=artificial+intelligence [Accessed:08-Nov-2024]

[8] Security Engineer average salary in Canada, 2024

Available: https://ca.talent.com/salary?job=security+engineer [Accessed:08-Nov-2024]

[9] Test Automation Engineer average salary in Canada, 2024

Available: https://ca.talent.com/salary?job=test+automation+engineer [Accessed:08-Nov-2024]

[10] Manual Tester average salary in Canada, 2024

Available: https://ca.talent.com/salary?job=manual+tester [Accessed:08-Nov-2024]

[11] Digital Marketing Specialist average salary in Canada, 2024

Available: https://ca.talent.com/salary?job=digital+marketing+specialist [Accessed:08-Nov-2024]

[12] Writers average salary in Canada, 2024

Available: https://ca.talent.com/salary?job=Writers+ [Accessed:08-Nov-2024]

[13] Video Creators average salary in Canada, 2024

Available: https://ca.talent.com/salary?job=video+creators [Accessed:08-Nov-2024]

[14] Vendor Manager average salary in Canada, 2024

Available: https://ca.talent.com/salary?job=vendor+manager [Accessed:08-Nov-2024]

[15] Special Reports 2025

Available: https://www.glassdoor.ca/Salaries/ux-consultant-salary-SRCH_KO0,13.htm [Accessed:08-Nov-2024]

[16] UI/UX Consulting Available: https://www.canadianlawyermag.com/rankings [Accessed:08-Nov-2024]

[17] What is the Cost of Custom Market Research?

Available: https://www.thefarnsworthgroup.com/blog/market-research-cost [Accessed:08-Nov-2024]