Groupwork: Project management

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Contents

Phase 1: Initiation Phase

Main Objective:

Launch a revolutionary online shopping platform that transforms the way people shop online.

Sub-objectives:

i. Develop a robust and scalable technology framework to support diverse product types and innovative features.
ii. Provide a seamless and user-friendly interface that enhances the online shopping experience.
iii. Incorporate cutting-edge features such as AI-powered recommendations, XR Product Visualization, and dynamic pricing.
iv. Establish strong partnerships with suppliers, logistics providers, and payment processors.
v. Conduct extensive market analysis to understand customer needs and preferences across different segments.
vi. Create a profitable business model while ensuring accessible and competitive pricing for customers.

Feasibility study

Market Analysis

- Detailed market research and competitor analysis to understand the e-commerce landscape and customer preferences, including trends, consumer behaviour, and market size.

Rapid growth in the e-commerce industry is fuelled by factors like increased internet penetration, mobile shopping, and evolving consumer preferences.

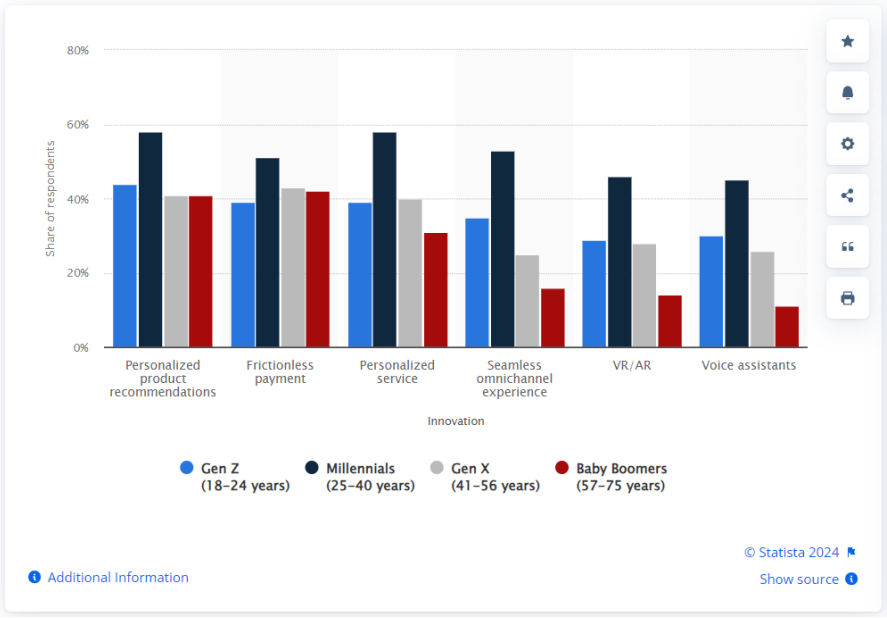
Notable trends include mobile commerce, personalized shopping experiences, and sustainability initiatives.

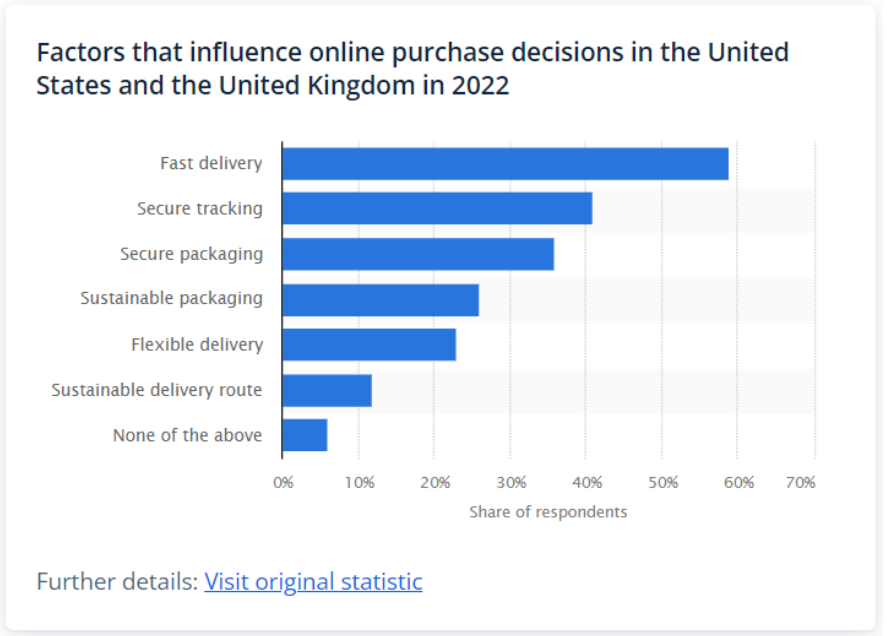
Worldwide, there were nearly **four billion consumers** purchasing goods online in 2021.

Trends include personalization, omnichannel experiences, subscription models, and sustainability initiatives.

A McKinsey & Company report can attest to that, indicating that 71% of today's consumers expect **personalized interactions** from brands. Even more (76%) find it frustrating when it doesn't happen.

Target customer segments span demographics (age, gender, income) and psychographics (lifestyle, interests), with a growing preference for online shopping across generations.





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Competitive analysis

- Assess the competitive landscape and identify unique selling points.

Key competitors include major e-commerce marketplaces (e.g., Amazon, eBay, bol.com) and specialized retailers (e.g., Pearle Vision).

Strengths of competitors lie in brand recognition, extensive product catalogues, and established logistics networks.

Differentiation opportunities exist in offering personalized experiences, innovative features (e.g., AI recommendations, XR visualization), and advanced shipping options.

AI Integration for Streamlined Operations:

- AI-powered insights streamline operations by analysing past purchases and browsing histories to deliver **personalized shopping experiences**.
- **Optimization of pricing strategies** through AI considers demand patterns, seasonal fluctuations, and competitor pricing to improve conversion rates.
- **Enhanced inventory management** with AI predicts demand and minimizes issues associated with overstocking or understocking, aided by real-time tracking technologies.
- AI contributes to **data privacy and security** by detecting and alerting businesses of potentially fraudulent activities, fostering customer trust and loyalty.

Arriving at New Business Models with AI Innovation:

- **AI-driven chatbots and virtual assistants** revolutionize engagement models in e-commerce, enhancing customer interactions.
- **Visual recognition technology** improves the search experience, enabling quick product discovery through image-based searches.
- **Virtual "try-on" technology** powered by AI allows consumers to virtually experience products like clothing, glasses, and makeup from their homes, enhancing the shopping experience.

Technical Feasibility

- Technical evaluation of the required infrastructure, architecture, and integration capabilities for the proposed platform.

i. Platform Architecture and Infrastructure

Can the proposed platform architecture support the required features, scalability, and performance needs?

Is the necessary infrastructure (servers, networking, storage, etc.) available or can it be obtained within the project's constraints?

ii. Technology Stack and Third-Party Integrations.

Can the platform integrate with required third-party services and systems (e.g., payment gateways, logistics providers, AI/ML services)?

Are there compatible APIs or integration points available?

- Identify the suitable technology stack, frameworks, and programming languages for development.
- Evaluate the compatibility and integration requirements with third-party services (e.g., payment gateways, logistics providers).
- Assess the feasibility of integrating innovative features such as AI-powered recommendations, XR Product Visualization, and dynamic pricing.

iii. Performance and Scalability

Can the proposed solution meet the expected performance requirements (e.g., response times, throughput, concurrent users)?

Is it possible to scale the solution horizontally or vertically as the demand grows?

iv. Security and Compliance

Can the platform meet the required security standards and data protection regulations (e.g., GDPR, PCI-DSS)?

Are there established methods or tools available to ensure compliance?

Financial Feasibility:

Estimate the project's costs, including development, infrastructure, and operational expenses.

Conduct a cost-benefit analysis to assess the project's financial viability.

Identify potential funding sources and investment opportunities.

Resource availability:

Are there enough skilled resources (developers, architects, DevOps engineers, etc.) available to build and maintain the proposed solution?

If not, can they be acquired or trained within the project's timeline and budget?

Legal and Regulatory Feasibility

Assess legal and regulatory requirements for e-commerce operations.

Ensure compliance with data privacy, consumer protection, and intellectual property laws.

Evaluate the need for specific licenses or certifications.

Technology Risk

Does the project rely on cutting-edge or unproven technologies that may pose a risk?

Contingency plans should address potential technology failures or disruptions.

Ethical considerations, including data privacy and algorithmic bias, must be addressed in platform design and implementation.

Phase 2: Definition phase

- The project scope, requirements, and deliverables are clearly defined. This phase helps ensure that everyone involved in the project has a shared understanding of what needs to be accomplished and sets the foundation for the subsequent planning and execution phases.

Project Scope Definition

Boundaries and Initial Release

The initial scope of the project is to develop and launch a **revolutionary online shopping platform** that supports a wide range of product types, including physical goods (e.g., clothing, electronics), digital products (e.g., e-books, software), variable products (e.g., size, colour options), composite products (e.g., customizable computers), and subscription services (e.g., monthly snack boxes, streaming services).

The platform should incorporate **innovative features** such as AI-powered recommendations, XR Product Visualization, and a dynamic pricing system that finds the best deals and promotions for customers.

Advanced shipping options, including international shipping, dropshipping, and eco-friendly delivery options, should be supported.

Product Types

1. **Simple Products**

   These are basic, single-item products with no variations or customization options.

   - Examples: Books, electronics, apparel without variations in size/colour.

2. **Variable Products** (or Configurable Products)

   These products have multiple variations or configurations based on attributes like size, colour, material, etc.

   - Examples: Clothing with different size and colour options, electronics with varying specs.

3. **Grouped Products**

   These are collections or bundles of related products that can be purchased together.

- Examples: A camera bundle with a camera body, lens, and accessories sold as a group.

4. **Virtual Products**

   These are non-physical products like services, subscriptions, or digital downloads.

   - Examples: Software licenses, e-books, video streaming subscriptions.

5. **Downloadable Products**

   These are digital products that can be downloaded after purchase.

   - Examples: Music files, e-books, software applications.

6. **Subscriptions**

   These are products or services that customers can subscribe to on a recurring basis.

   - Examples: Monthly subscription boxes, streaming service subscriptions, software subscriptions.

7. **Composite Products** (or Bundled Products)

   These allow customers to build or customize their own product by selecting individual components or options.

   - Examples: Customizable computers, tailored clothing, or custom-built furniture

Geographic Markets and Localization

Initially, the platform will target the **international market**.

Support for **additional languages** and currencies, based on **geographic implementation**.

Requirements Gathering and Analysis

- This covers the key steps of analysing and prioritizing requirements, defining functional and non-functional requirements, and identifying integration requirements with third-party systems. These are high-level requirements.

Stakeholders Identification and Analysis

- Conduct detailed stakeholder interviews and workshops to gather requirements from various perspectives (customers, business, operations, technology, etc.).

1. The major **stakeholder groups** involved, and their roles:

   Internal stakeholders: Project team, Management, IT department, Operations, Marketing; and **external entities**: Customers, Suppliers/Vendors, Logistics Partners, Payment Processors, Regulatory Bodies.

2. Stakeholder roles, responsibilities, and expectations:
   i. Project Team (Development, Design, Testing, etc.): Responsible for development, design, and testing. Requires clear requirements and direct involvement throughout the project lifecycle.

   ii. Project Management: Oversees execution, resource allocation, and risk management. Requires efficient coordination and direct participation.

   iii. IT Department: Manages infrastructure and support. Requires compatibility with existing systems and involvement in relevant phases.

   iv. Operations and Logistics: Manages order fulfilment and inventory. Requires streamlined integration and consultation during testing phases.

   v. Marketing Team: Drives business goals and marketing initiatives. Requires consultation for data infrastructure and integration planning.

vi. **External stakeholders**: End-users, suppliers, logistics partners, etc. Involved through focus groups, consultation, and information sharing.

3. **Requirements gathering**
    - By gathering requirements from diverse stakeholders and sources, you can ensure that the e-commerce platform addresses the needs and expectations of customers, aligns with business objectives, and integrates seamlessly with existing processes and systems.

i. Conduct customer research, stakeholder interviews, and workshops to understand preferences, pain points, and business objectives.
ii. Review existing documentation, such as process flows and integration specifications, and analyse industry standards and market research reports.
iii. Conduct site visits to observe current processes and workflows, identifying opportunities for improvement.

Requirements Analysis and Prioritization

- Analyse and prioritize the requirements based on business value, technical complexity, and dependencies.

Categorize the gathered requirements into different buckets such as must-have, should-have, and nice-to-have, based on their business value and criticality.

Functional and Non-Functional Requirements:

- Define functional requirements (e.g., product catalogue management, checkout process, order tracking) and non-functional requirements (e.g., performance, security, accessibility).

  Define functional requirements (e.g., product catalogue management, checkout process) and non-functional requirements (e.g., performance, security).

  Ensure compliance with standards such as GDPR, PCI-DSS, WCAG, and focus on usability, scalability, and interoperability.

Integration Requirements

- Identify integration requirements with third-party systems (payment gateways, logistics providers, AI/ML services).

Payment Gateways: popular payment processors (e.g., Bancontact, PayPal,) to facilitate secure online transactions and support various payment methods.

Logistics Providers: domestic and international shipping carriers (e.g., PostNL, DHL) for order fulfilment, tracking, and delivery.

AI / ML Services: Integrating with cloud-based AI / ML platforms (e.g., AWS, Google Cloud, Azure) or third-party recommendation engines for personalized product recommendations.

Customer Relationship Management (CRM)

Enterprise Resource Planning (ERP)

Content Delivery Networks (CDNs)

Solution Architecture and Design

- This part involves collaboration between architects, designers, developers, and subject matter experts to translate the requirements into a comprehensive and detailed architectural blueprint. The output of this part should be a well-documented solution architecture, detailed component designs, data models, and integration plans, which will serve as the foundation for the subsequent implementation and testing phases.

High-Level Solution Architecture

- Develop a high-level solution architecture that outlines the major components, technology stack, and infrastructure requirements.

Identify the architectural patterns and principles to be followed (e.g., microservices, event-driven, serverless, etc.).

Design the data architecture, including database systems, data models, and data flows.

Detailed Component Design

- Create detailed designs for key components, such as the product catalogue, checkout flow, recommendation engine, and order management system.

i. Product catalogue and Content Management

Design the data structures and APIs for managing product information, descriptions, images, and multimedia content.

Define the workflows for product creation, updates, and approval processes.

ii. Shopping Cart and Checkout

Design the user flow and experience for adding products to the cart, applying promotions, and completing the checkout process.

Define the integration points with payment gateways and order management systems.

iii. Order Management and Fulfilment

Design the order processing workflows, including order status updates, tracking, and integration with logistics providers.

Define the data structures and APIs for managing orders, inventory, and fulfilment processes.

iv. Customer Accounts and Profiles

Design the user account management system, including authentication, profile management, and order history.

Define the data structures and APIs for storing and retrieving customer data securely.

v. Search and Navigation

Design the search and navigation capabilities, including faceted search, filtering, and category browsing.

Determine the appropriate search engine and indexing strategies.

vi. Recommendation Engine

Design the architecture for the recommendation engine, including data ingestion, model training, and real-time scoring.

Define the integration points with customer data, product catalogues, and machine learning platforms.

vii. XR Product Visualization

Design the architecture for integrating augmented reality (AR) capabilities, including 3D model rendering and device compatibility.

Define the workflows for creating and managing AR content including other extended reality and Visual recognition technology.

viii. Dynamic Pricing

Design the architecture for dynamic pricing, including data ingestion, pricing algorithms, and integration with product catalogues and order management.

Define the rules and constraints for pricing strategies.

Data Modelling and Database Design

- Define data models and database structures to support the diverse product types and features.

Design the logical and physical data models for storing and managing product data, customer data, orders, and other domain entities.

Define the database schemas, indexes, and partitioning strategies for optimal performance and scalability.

Determine the appropriate database systems (e.g., relational, NoSQL, or a combination) based on the data requirements and access patterns.

Integration and API Design

Define the APIs and integration points for external systems, such as payment gateways, logistics providers, and AI/ML services.

Design the API contracts, authentication mechanisms, and data exchange formats (e.g., REST, GraphQL, messaging protocols).

Plan for API versioning, documentation, and testing strategies.

Non-Functional Requirements Design

- Plan for scalability, performance, and security considerations.

i. Performance and Scalability

Design caching strategies, load balancing, and autoscaling mechanisms to ensure optimal performance and scalability.

Plan for content delivery networks (CDNs) and other performance optimization techniques.

ii. Security and Data Protection

Design security measures, such as encryption, access controls, and auditing mechanisms, to protect customer data and transactions.

Plan for compliance with data privacy regulations (e.g., GDPR, PCI-DSS) and industry standards.

iii. Accessibility and Usability

Design the user interface and experience with accessibility standards in mind (e.g., WCAG, Section 508).

Plan for usability testing and iterative refinement of the user experience.

iv. Internationalization and Localization

Design the architecture to support multiple languages, currencies, and cultural conventions.

Plan for content translation workflows and localization strategies.

Specific technologies

1. **Frontend Development:**
    - **Languages:** HTML5, CSS3, JavaScript (ES6+)
    - **Framework/Libraries:** React.js or Vue.js for building interactive user interfaces
    - **Responsive Design:** Utilize CSS frameworks like Bootstrap or Tailwind CSS for responsive and mobile-first design
    - **State Management:** Redux or Vuex for state management, especially for handling complex application states
2. **Backend Development:**
    - **Language:** Node.js with Express.js framework for building scalable and efficient server-side applications
    - **Database:** MongoDB or PostgreSQL for storing product data, user information, and other relevant data

- **Authentication:** Implement JSON Web Token (JWT) based authentication for user authentication and session management
- **RESTful API:** Develop RESTful APIs to handle CRUD operations for managing products, user accounts, and orders

3. **Payment Gateway Integration:**
    - **Providers:** Integrate with popular payment gateways like Stripe, PayPal, or Bancontact for secure online transactions
    - **APIs:** Utilize the APIs provided by the payment gateway providers to handle payment processing, refunds, and subscription management
4. **Logistics Integration:**
    - **Providers:** Integrate with logistics partners such as PostNL, DHL, or UPS for order fulfillment, shipping, and delivery
    - **APIs:** Utilize the APIs provided by logistics partners to track shipments, calculate shipping rates, and manage inventory
5. **AI/ML Integration:**
    - **Machine Learning Models:** Develop and deploy machine learning models for dynamic pricing, inventory optimization, fraud detection, and personalized product recommendations
    - **Frameworks:** Utilize machine learning frameworks like TensorFlow or PyTorch for model development and training
    - **Cloud Platforms:** Deploy AI/ML models on cloud platforms like AWS, Google Cloud, or Azure for scalability and reliability
    - Personalized Product Recommendations:
    - Technology: Machine Learning (ML) algorithms such as collaborative filtering, content-based filtering, or hybrid recommendation systems.
    - Tools/Frameworks: Python (scikit-learn, TensorFlow, PyTorch), Apache Mahout, Apache Spark MLlib.
    - Dynamic Pricing Strategies:
    - Technology: Machine Learning for predictive analytics, reinforcement learning, or deep learning.
    - Tools/Frameworks: Python (scikit-learn, TensorFlow, Keras), R, Apache Spark.

- Inventory Optimization:
- Technology: Predictive analytics, time-series forecasting, and optimization algorithms.
- Tools/Frameworks: Python (pandas, NumPy, SciPy), R, IBM Planning Analytics, SAS Inventory Optimization.
- Fraud Detection and Prevention:
- Technology: Anomaly detection, pattern recognition, supervised and unsupervised learning algorithms.
- Tools/Frameworks: Python (scikit-learn, TensorFlow, Keras), Apache Spark MLlib, IBM Watson.
- Chatbots and Virtual Assistants:
- Technology: Natural Language Processing (NLP), machine learning, and conversational AI.
- Tools/Frameworks: Dialogflow, Microsoft Bot Framework, Rasa, TensorFlow, PyTorch.
- Visual Search and Virtual Try-On:
- Technology: Computer vision, image recognition, and augmented/virtual reality.
- Tools/Frameworks: OpenCV, TensorFlow Object Detection API, ARKit (for iOS), ARCore (for Android), Unity 3D.
- AI-powered Content Generation:
- Technology: Natural Language Generation (NLG), deep learning, and generative models.
- Tools/Frameworks: OpenAI GPT (Generative Pre-trained Transformer), Hugging Face Transformers, TensorFlow, PyTorch.
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6. **Content Delivery Network (CDN):**
    - **Provider:** Use a CDN provider like Cloudflare or Amazon CloudFront for efficient delivery of static content such as product images, videos, and website assets
    - **Caching:** Implement caching strategies to reduce latency and improve website performance for users across different geographical locations

7. **Security Measures:**
    - **SSL/TLS:** Implement SSL/TLS certificates to ensure secure data transmission over HTTPS protocol
    - **Data Encryption:** Encrypt sensitive data at rest and in transit using industry-standard encryption algorithms
    - **OWASP Best Practices:** Follow OWASP security best practices to mitigate common web application security risks such as SQL injection, cross-site scripting (XSS), and CSRF attacks
8. **Monitoring and Analytics:**
    - **Tools:** Utilize monitoring and analytics tools like Google Analytics, New Relic, or AWS CloudWatch for tracking website performance, user behavior, and application metrics
    - **Error Logging:** Implement error logging and monitoring to identify and troubleshoot issues proactively, ensuring high availability and reliability of the website.

Project Deliverables

- By defining the project deliverables, creating a detailed project plan, identifying resource requirements, and establishing governance and communication structures, the stage for a successful execution phase is set.

Define the project deliverables

i. Identify the core features and functionality that will constitute the initial release of **Minimum Viable Product** (MVP) of the e-commerce platform.

These include essential components:

- the **product catalogue**,
- **shopping cart**,
- **checkout process**,
- **order management**, and
- basic integrations with **payment gateways** and **logistics providers**.

The MVP provides a foundational platform that can be iteratively enhanced with additional features and capabilities.

ii. Subsequent Releases or Phases:

Plan for future releases or phases that will introduce more advanced features and capabilities beyond the MVP.

These could include:

- AI-powered recommendations,
- EX reality product previews,
- dynamic pricing,
- support for composite products or subscription services, and
- integrations with AI / ML services or other third-party systems.
- marketing deliverables: **Collaterals** e.g. branding guidelines, product catalogues, website copy / **Campaigns** e.g. search, social, affiliate marketing / **Content** e.g. blogs, guides, videos.

Define the high-level roadmap and timeline for these subsequent releases based on priorities and dependencies.

Phase 3: Design/Planning phase

- The planning phase is crucial for ensuring that the project execution is well-organized, resourced, and aligned with the defined objectives

and requirements. The outputs of this phase typically include a detailed project schedule, budget, risk management plan, quality assurance plan, and communication plan.

Resource Planning

The project team structure and roles

This is based on the identified resource requirements. The team can recruit and onboard any additional team members or external resources needed. Specific tasks and responsibilities are allocated to team members based on their skills and expertise.

1. Project Manager (1 person: Mr Mamadou Touré)
    - Responsibilities: Overall project coordination, stakeholder management, risk management, and progress tracking.
2. Technical Lead (1 person: Mr Sissako Traoré)
    - Responsibilities: Architectural design, technical decision-making, code reviews, and team mentoring.
3. Front-end Developers (3 people: Ms. Zahara Adegoke, Mr. Tariq Obi, Mr. Simba Ndlovu)
    - Responsibilities: Developing the user interface, implementing UI/UX designs, and integrating with back-end APIs.
4. Back-end Developers (4 people: Mr. Kwame Adisa, Ms. Zola Tshabalala, Ms. Kemi Ajayi, Ms. Nala Obi)
    - Responsibilities: Building the server-side logic, APIs, integrations with third-party systems (payment gateways, logistics providers, AI/ML services), and implementing core e-commerce features.
5. UI/UX Designers (2 people: Ms. Aisha Nkrumah, Ms. Ngo Um Nyobe)
    - Responsibilities: Designing the user interface and user experience for the e-commerce platform, including wireframes, prototypes, and visual designs.
6. Technical writers (2 people: Mr. Jelani Osei, Mr. Oluwaseun Eze)
    - Responsibilities: Document the codebase, APIs, and system functionalities to facilitate future maintenance and understanding.
7. QA Testers (2 people: Ms. Ayanna Adesina, Mr. Amadi Onyekachi)

- Responsibilities: Developing and executing test cases, performing functional, integration, and user acceptance testing, and ensuring quality standards.

8. DevOps Engineer (1 person: Mr. Chinedu Okonkwo)
    - Responsibilities: Setting up the development and deployment environments, implementing continuous integration and delivery pipelines, and ensuring infrastructure scalability and reliability.
9. E-commerce Subject Matter Expert (1 person: Mr. Jelani Osei)
    - Responsibilities: Providing domain expertise, validating requirements, and ensuring alignment with industry best practices and trends.
10. Logistics and Supply Chain Expert (1 person: Ms. Fanta Abimbola)
    - Responsibilities: Advising on logistics and supply chain integrations, order fulfillment processes, and optimizing shipping and delivery options.
11. AI/ML Expert (1 person: Ms. Sade Muwaso)
    - Responsibilities: Guiding the implementation of AI-powered recommendations, dynamic pricing algorithms, and integrating with AI/ML platforms or services.

Project Planning

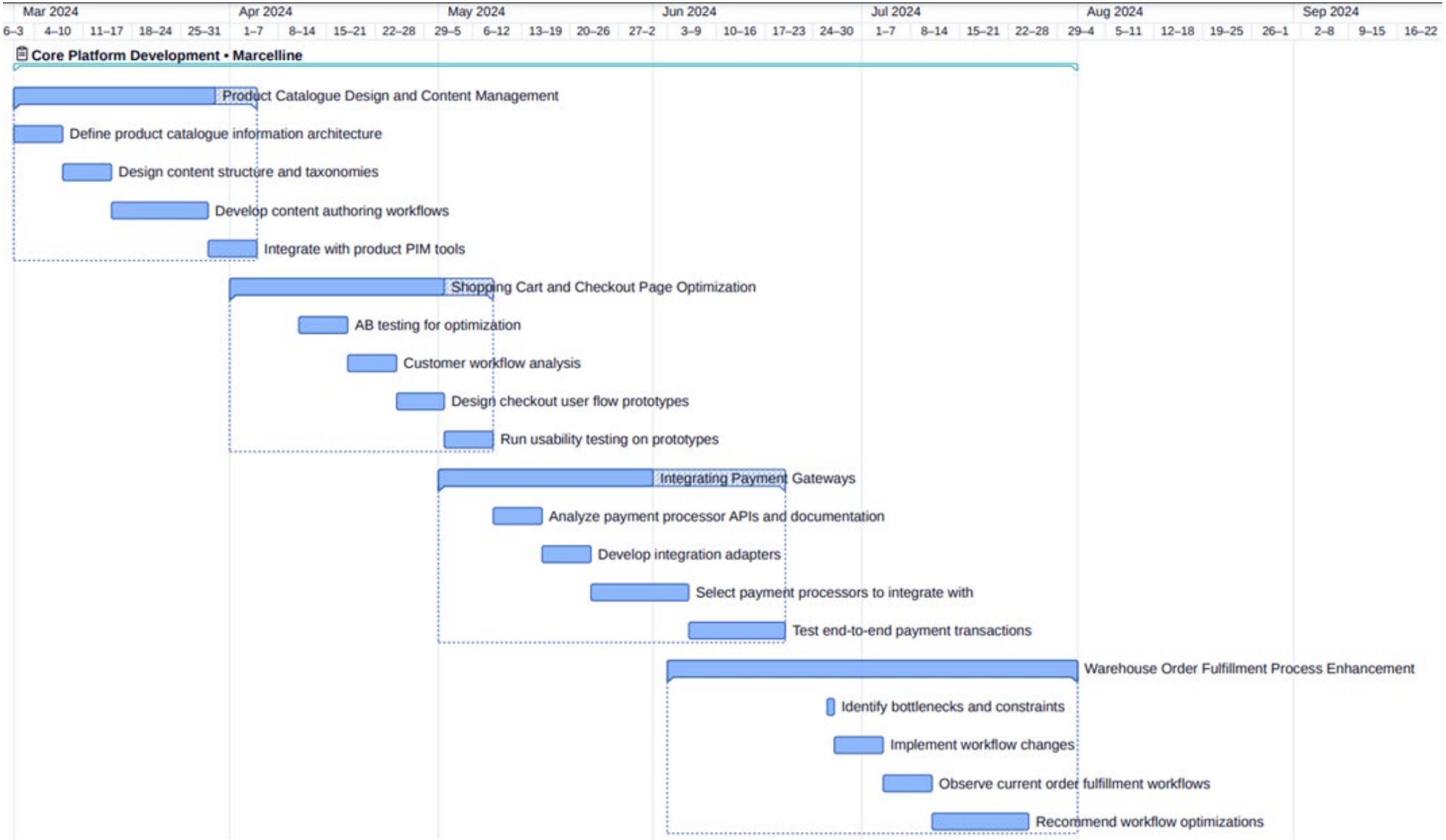
Phases	Responsible	Description	Start	End
Project Initiation and Planning	Project Manager, Technical Lead	Finalize the project plan, schedule, and resource allocation	01/01/2024	31/01/2024
UI/UX Design and Prototyping	UI/UX Designers, with input from Subject Matter Experts	Design wireframes, prototypes, and visual designs for the e-commerce platform	01/02/2024	28/02/2024
Core Platform Development	Front-end Developers, Back-end Developers, DevOps Engineer	Develop the core e-commerce platform components, including product catalogue, shopping cart, checkout, order management, and integrations with payment gateways and logistics providers.	01/03/2024	31/07/2024
AI-powered Recommendations and Dynamic Pricing	Back-end Developers, AI/ML Expert	Implement AI-powered recommendation engines, dynamic pricing algorithms, and integrate with AI/ML platforms or services.	01/06/2024	31/08/2024
XR Product Visualization	Front-end Developers, Back-end Developers, UI/UX Designers	Develop augmented reality (AR) capabilities for product previews, including 3D model rendering and device compatibility.	01/07/2024	30/09/2024
Marketing and Promotions	Project Manager, backed by marketing team	Account for marketing team bandwidth for promotional activities. Budget for paid advertising and lead generation costs. KPIs e.g. traffic, conversions, cost per lead Dashboards for campaign monitoring Funnel reporting for customer analysis.	01/07/2024	Ongoing
Testing and Quality Assurance	QA Testers, with support from Developers	Perform functional, integration, and user acceptance testing, ensuring quality standards and addressing any issues or defects.	01/08/2024	30/09/2024
Deployment and Go-Live	DevOps Engineer, Developers, Project Manager	Deploy the e-commerce platform to production environments, conduct final testing, and prepare for the official launch.		
Training and Knowledge Transfer	Project Manager, Technical Lead, Subject Matter Experts	Provide training to internal teams and stakeholders on platform usage, maintenance, and ongoing support.	01/11/2024	30/11/2024
Annexes				
Procurement of required software licenses, tools, and infrastructure resources	All	cloud services, hosting, CDNs		
Engagement with external vendors or contractors for specific tasks or expertise	All	logistics integration, AI/ML services		
Regular meetings and communication channels for team collaboration, progress tracking, and stakeholder updates	All			
Contingency plans and risk mitigation strategies for potential delays, resource constraints, or scope changes.	All			

Detailed Task Planning (Core Platform development)

- Break down the high-level project plan into more granular tasks and activities. b. Estimate the effort and duration for each task more accurately based on the available resources and technical complexities. c. Identify and plan for any dependencies, constraints, or risks associated with specific tasks.

Tasks	Responsible	Start date		Required Resources
Product catalogue design and content management				
Define product catalogue information architecture	UI/UX Designer	01/03/2024	07/03/2024	PIM tools funding and licensing Subject matter expert support for taxonomy planning
Design content structure and taxonomies	UI/UX Designer	08/03/2024	14/03/2024	
Develop content authoring workflows	UI/UX Designer	15/03/2024	28/03/2024	
Integrate with product PIM tools	Front-end Developer	29/03/2024	10/04/2024	
Shopping cart and checkout page optimization				
Customer workflow analysis	UI/UX Designer	11/04/2024	17/04/2024	Research panel and survey tool subscription Google Optimize or AB testing tool license
Design checkout user flow prototypes	Front-end Developer	18/04/2024	24/04/2024	
Run usability testing on prototypes		25/04/2024	01/05/2024	
AB testing for optimization		02/05/2024	08/05/2024	
Integrating payment gateways:				
Select payment processors to integrate with	Back-end Developer	09/05/2024	15/05/2024	Sandbox accounts for payment gateways Engineering time from payment gateways
Analyse payment processor APIs and documentation		16/05/2024	22/05/2024	
Develop integration adapters		23/05/2024	05/06/2024	
Test end-to-end payment transactions		06/06/2024	19/06/2024	
Warehouse order fulfillment process enhancement:				
Observe current order fulfillment workflows	Warehouse Operations Manager	20/06/2024	26/06/2024	Labour and training budget Warehouse management system support
Identify bottlenecks and constraints	Warehouse Operations Manager	27/06/2024	03/07/2024	
Recommend workflow optimizations	Warehouse Operations Manager	04/07/2024	10/07/2024	
Implement workflow changes	Software Integration Lead	11/07/2024	24/07/2024	

Gantt Chart


Mar 2024
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15–21
22–28
29–5
6–12
13–19
20–26
27–2
3–9
10–16
17–23
24–30
1–7
8–14
15–21
22–28
29–4
5–11
12–18
19–25
26–1
2–8
9–15
16–22
Core Platform Development • Marcelline
Product Catalogue Design and Content Management
Define product catalogue information architecture
Design content structure and taxonomies
Develop content authoring workflows
Integrate with product PIM tools
Shopping Cart and Checkout Page Optimization
AB testing for optimization
Customer workflow analysis
Design checkout user flow prototypes
Run usability testing on prototypes
Integrating Payment Gateways
Analyze payment processor APIs and documentation
Develop integration adapters
Select payment processors to integrate with
Test end-to-end payment transactions
Warehouse Order Fulfillment Process Enhancement
Identify bottlenecks and constraints
Implement workflow changes
Observe current order fulfillment workflows
Recommend workflow optimizations

Risk Management and Mitigation Planning

- Conduct a comprehensive risk assessment to identify potential risks that could impact the project. b. Develop risk mitigation and contingency plans for high-priority risks. c. Establish risk monitoring and reporting processes to track and manage risks throughout the project lifecycle.

1. Project Initiation and Planning

Risks and Limitations:

- Scope creep due to ill-defined requirements (Risk Level: Medium)
- Planning delays due to unavailability of key stakeholders (Risk Level: Low)

Risk Mitigation:

- Freeze high-level requirements early and define change control processes.
- Identify backup stakeholders for input into planning.

2. UI/UX Design and Prototyping

Risks and Limitations:

- Multiple design iterations delaying finalization of prototypes (Risk Level: Medium)
- Resource constraints for conducting user research and usability testing (Risk Level: Low)

Risk Mitigation:

- Define maximum number of design iterations upfront.
- Prioritize must-have user research and testing activities.

3. Core Platform Development

Risks and Limitations:

- Integration issues with third-party systems like payment gateways (Risk Level: High)
- Changing requirements based on feedback during development (Risk Level: Medium)

Risk Mitigation:

- Account for additional time for troubleshooting integrations.

- Freeze requirements early for core functionality.

4. AI-powered Recommendations and Dynamic Pricing

Risks and Limitations:

- Delays in procuring or accessing required datasets (Risk Level: Medium)
- Model accuracy issues requiring additional training (Risk Level: Low)

Risk Mitigation:

- Explore alternative open datasets early.
- Plan for incremental model improvements post-launch.

5. XR Product Visualization

Risks and Limitations:

- Compatibility issues across different devices and platforms (Risk Level: High)
- Higher than estimated complexity for realistic 3D model rendering (Risk Level: Medium)

Risk Mitigation:

- Prioritize support for popular devices first.
- Explore using placeholders and iterating visual quality.

6. Marketing and Promotions

Risks and Limitations:

- Delays in collateral preparation (Risk Level: Low)

Risk Mitigation:

- Initiate marketing input and preparatory activities early

Budget and Cost Planning

- Develop a detailed project budget based on the estimated costs for resources, infrastructure, tools, and other expenses. b. Allocate budget to different phases, milestones, or work packages. c. Plan for contingencies and risk mitigation strategies that may impact the budget.

Revenue & Funding Targets:

- Seek €2M in seed funding from venture capital investors.
- Target €10M in revenue in first year of operations

Expense Categories:

1. Human Resources
    - In-house Team (Total: €1M/year)
        - Project Manager - €10,000 per month
        - Technical Lead - €9,000 per month
        - 3 Frontend Developers - €7,500 each per month
        - 4 Backend Developers - €8,000 each per month
        - 2 UI/UX Designers - €6,000 each per month
        - 2 Technical writers - €6,000 each per month
        - 2 QA Testers - €5,000 each per month
        - 1 DevOps Engineer - €8,000 per month
        - 1 Ecommerce Subject Matter Expert - €6,000 per month
        - 1 Logistics and Supply Chain Expert - €6,000 per month
        - 1 AI/ML Expert - €8,000 per month
    - External Contractors
        - €20,000 budgeted
2. Infrastructure
    - Cloud Hosting Services
        - Estimated €3,000 per month based on usage - €36,000/year
    - CDN, Load Balancers

        - Estimated €2,000 per month - €24,000/year

3. Software & Tools
    - Product Information Management (PIM) system: €25,000 (5 user licenses)
    - Google Optimize/AB testing tool: €9,900 per year
    - Agile software development tools (JIRA etc.): €5,000 upfront + €1,000 per year
4. Specialized AI/ML and XR capabilities
    - XR Product Visualization
        - 3D model rendering - €100,000
        - Compatibility testing across devices - €50,000
    - AI Capabilities
        - Dynamic pricing algorithms - €100,000
        - Inventory optimization - €50,000
        - Fraud detection - €75,000
        - Chatbots - €60,000
    - Visual Search Functions - €80,000
    - Virtual Try-On Technology - €100,000
    - Personalization Capabilities - €150,000

5. Marketing
    - Search Engine Optimization & Advertising: €300,000
    - Social Media Advertising: €200,000
    - PR Firms & Content Development: €150,000
6. Transaction Related
    - Payment Gateway Processing Fees: Budget 2% on revenue = €200,000
    - Chargeback Costs: Budget 0.5% on revenue = €50,000
7. Contingency Buffer
    - Allocate 15% buffer for unplanned overruns: €250,000

Total Budget = €2,493,900

Quality Management Planning

1. a. Define quality standards, guidelines, and best practices for the project deliverables. b. Establish processes for code reviews, testing (unit, integration, system, and user acceptance testing), and quality assurance. c. Plan for continuous integration, delivery, and deployment processes to ensure quality and consistency.

Communication and Stakeholder Management Planning

1. a. Refine the communication plan established during the definition phase, including the frequency, format, and channels for communication. b. Develop a stakeholder engagement plan to ensure effective collaboration and buy-in from key stakeholders. c. Plan for regular progress reporting, meetings, and decision-making processes.

Procurement and Vendor Management Planning

1. a. Identify any external vendors, suppliers, or contractors needed for the project. b. Plan the procurement processes, contract negotiations, and vendor onboarding activities. c. Establish vendor management processes, including performance monitoring and issue resolution mechanisms.

Phase 4: Execution phase

Kick-off project execution

Conduct project kick-off meeting with team to announce start of execution phase.

Review project plan, timeline, roles and responsibilities.

Ensure team has all necessary resources and tools in place.

Development work packages

Break down project plan into manageable development sprints or work packages.

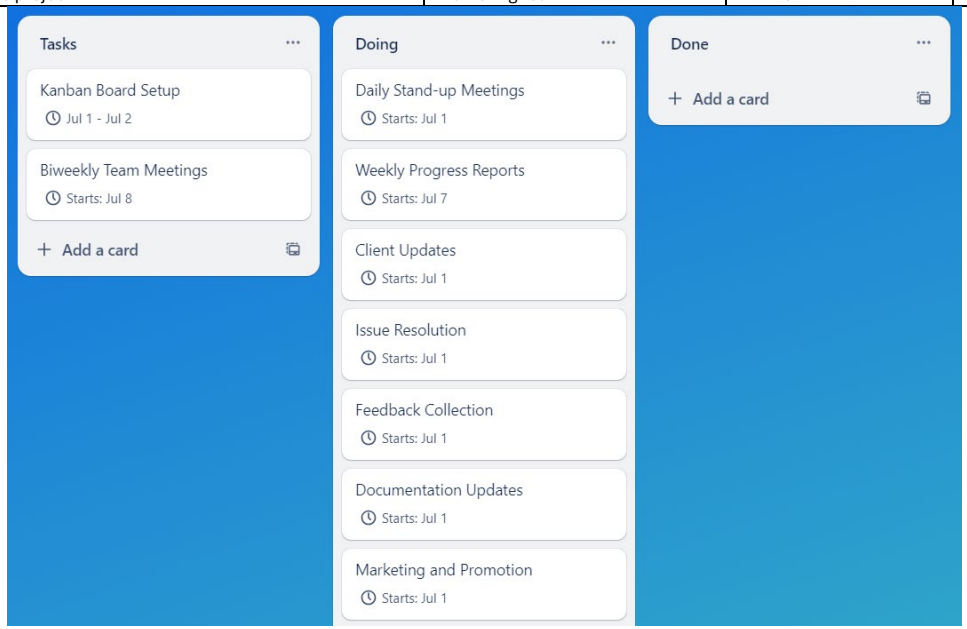
Assign resources and begin development per project plan.

Complete coding, testing, documentation for each work package

Conduct reviews of progress at end of each sprint

Internal Communication Plan for Execution Phase

Tasks	Responsible	Start date	End date	Status
1: **Kanban Board Setup**				
Set up Kanban board for project management	Project Manager: Mr. Mamadou Touré	1/7/2024	2/7/2024	To Do
2: **Daily Stand-up Meetings**				
Conduct daily stand-up meetings for progress updates and issue resolution	Project Manager: Mr. Mamadou Touré	1/7/2024	Ongoing (Daily)	In progress
3: **Weekly Progress Reports**				
Compile and distribute weekly progress reports to stakeholders	Project Manager: Mr. Mamadou Touré	7/7/2024	Ongoing (Every Friday)	In progress
4: **Biweekly Team Meetings**				
Organize biweekly team meetings to discuss overall progress and address any challenges.	Project Manager: Mr. Mamadou Touré	8/7/2024	Ongoing (Every other Wednesday)	To Do
5: **Client Updates**				
Provide regular updates to the client on project status and milestones.	Project Manager: Mr. Mamadou Touré	1/7/2024	Ongoing (As needed)	In progress
6: **Issue Resolution**				
Address and resolve any project-related issues or blockers.	Project Manager: Mr. Mamadou Touré	1/7/2024	Ongoing	In progress
7: **Feedback Collection**				
Collect feedback from team members and stakeholders to improve processes and performance.	Project Manager: Mr. Mamadou Touré	1/7/2024	Ongoing	In progress
8: **Documentation Updates**				
Maintain and update project documentation, including requirements, plans, and reports.	Project Manager: Mr. Mamadou Touré	1/7/2024	Ongoing	In progress
9: **Marketing and Promotion**				
Initiate marketing and promotion activities for the project.	Marketing Team	1/7/2024	Ongoing	In progress



Ongoing testing (unit testing, integration testing, UAT)

Set up development, staging and production environments.

Develop test cases and scripts for system, integration, UAT testing.

Execute tests in testing environments with each new release.

Report and track bugs and issues until resolution.

Stakeholder reviews/training

Conduct demos and working sessions with stakeholders.

Gather feedback on features or prototype increments.

Incorporate feedback into next set of requirements and developments.

Deployment and release management

Plan release process and cadence.

Deploy increments to staging environment for final testing.

Deploy approved releases to production environment.

Develop and execute cutover checklist for each release.

Monitoring performance and gathering user feedback (UAT)

Monitor application performance and system health.

Review logs to identify errors and exceptions.

Resolve reported bugs, issues, and service requests.

Troubleshoot deployed environment for unforeseen issues.

Issue resolution and updates based on feedback.

Evaluate change requests for scope and impact.

Obtain approvals as per change management process.

Implement approved changes into subsequent work packages.

Phase 5: Closing phase

Final Deliverable Acceptance: Ensuring that all project deliverables meet the agreed-upon requirements and are accepted by the stakeholders.

Handover and Transition

After successful deployment and acceptance, the project is handed over to the operations or support team for ongoing maintenance and support. Key activities include:

- **Documentation Handover**: Providing all project documentation, including technical specifications, user manuals, and training materials, to the support team.
- **Knowledge Transfer**: Conducting knowledge transfer sessions to transfer expertise from the development team to the support team.
- **Support Setup**: Setting up processes and systems for ongoing support, such as a helpdesk or ticketing system.

Project Review and Closure

The final step in the execution phase is to review the project's performance, ensure all deliverables have been met, and formally close the project. Key activities include:

- **Project Review Meeting**: Conducting a review meeting to assess project performance, identify **lessons learned**, and celebrate successes.
- **Final Documentation**: Updating project documentation with any final changes or lessons learned during the project.
- **Project Closure**: Formally closing the project, including **archiving project files**, and **releasing project resources**, including team members, equipment, and facilities, back to their respective departments or organizations.
- **Celebration and Recognition:** Recognizing the efforts of the project team and celebrating the successful completion of the project.
- **Client Satisfaction:** Obtaining feedback from the client or stakeholders to assess their satisfaction with the project outcomes and overall experience.

Financial assessment

Budget Review

Budget Posts	Initial Budget	Actual Expenses Incurred	
Human Resources:	€1,192,000	€1,242,000	
Infrastructure:	€60,000	€72,000	
Software & Tools:	€41,900	€40,000 (upfront) + €1,000/year	
AI/ML and XR Capabilities:	€615,000	€600,000	
Marketing:	€650,000	€600,000	
Transaction Related:	€250,000	Based on revenue generated	
Contingency Buffer:	€250,000	Not fully utilized, €200,000	
Transaction Related:	Budgeted at 2.5% of revenue		
Total:	**€2,950,000**		

Budget Performance Analysis:

- Total Revenue Generated: To be calculated based on sales and funding received.
- Total Expenses Incurred: Sum of actual expenses in each category.
- Profit/Loss: Total Revenue Generated - Total Expenses Incurred.
- Financial Position: Positive if Profit > 0, Negative if Loss < 0.

Recommendations:

- Conduct a detailed analysis of budget variances to identify areas of overspending or inefficiencies.
- Implement tighter budget controls and monitoring mechanisms to prevent future budget overruns.
- Consider reallocating resources or renegotiating contracts with vendors to optimize expenditure.
- Review project scope and requirements to ensure alignment with available budgetary resources.
- Plan for more accurate forecasting and contingency planning in future projects to mitigate budget risks.