Final Project: Business Analysis and Modeling for an eBike Rental Startup

Exemplar solution

This document serves as a reference to guide you in developing your own analysis and modeling solutions for the eBike rental startup project. While your answers may differ from those in this document, you can use it to verify your approach and compare your responses to the tasks in the project.

Overview

This exemplar solution aims to guide learners through the business analysis process, focusing on a startup company that specializes in renting e-bikes. The project will provide a comprehensive example based on a fictional case study, helping learners clarify their understanding of the requirements and modeling techniques presented in the earlier steps.

Step 1: Identifying stakeholders for requirement gathering

Example solution

Stakeholder	Example	Interest
Customers	Enthusiasts and tourists looking for convenient transportation	Easy rental process, availability of bikes, and pricing
Business owners	Founders of Mobi-e-rides	Profitability, customer satisfaction, and market growth
Employees	Rental agents and maintenance staff	Efficient processes, job security, and training
Local government	Municipalities regulating transportation	Compliance with laws and environmental impact
Investors	Individuals or firms funding Mobi-e-rides	Return on investment and business viability

Step 2: Drafting interview questions for gathering requirements

Example solution

Questions for customers (Enthusiasts and tourists)	Business owners (Founders of Mobi-e-rides)	Employees (Rental agents and maintenance staff
Which features would make renting a bike easier for you?	What are your main priorities in terms of profitability and customer experience?	What tools would help you perform your tasks more efficiently and improve customer service?
Which factors, such as price, bike availability, and rental locations, would you consider	How do you plan to grow the business to meet demand while keeping quality high?	What kind of training or support do you think is required to ensure smooth operations?

when choosing a transportation option?		

Step 3: Employing techniques for requirements prioritization

Example solution

Using the MoSCoW method, Mobi-e-rides prioritizes the following requirements:

Must have	Should have	Could have	Won't have
User-friendly booking system	Customer loyalty program	Integration with local tourist attractions	GPS tracking for individual bikes at launch
Payment processing functionality	Mobile app for rentals		
Bike availability tracking			

Step 4: Traceability tools for requirements

Example solution: Mobi-e-rides creates a requirements traceability matrix:

Requirement ID	Description	Stakeholder	Status	Comments
R1	User-friendly booking system	Customers	In Progress	Initial design phase
R2	Payment processing functionality	Business owners	Planned	Research payment options
R3	Bike availability tracking	Employees	Completed	Implemented

Step 5: Facilitating workshops

Example: Mobi-e-rides organizes a workshop with stakeholders:

Agenda

1. Introduction and objectives
2. Brainstorming session for features
3. Prioritization of features using dot voting

Notes

1. Customers want an intuitive mobile app
2. Employees suggest an internal chat system for communication

Step 6: Observation techniques

Example solution: Not applicable

You can consider analyzing existing rental services (if you have access to it) to understand their processes.

Step 7: Designing surveys

Example solution: Mobi-e-rides creates a survey targeting potential customers.

Question 1:
How often do you use eco-friendly transportation options, such as e-bikes and e-scooters?

- Daily
- Weekly
- Monthly
- Never

Question 2:
What would be the main reason you will consider for renting an e-bike?

- Convenience
- Environmental impact
- Cost savings
- Other (please specify): _____

Question 3:
How much are you willing to pay per hour for an e-bike rental?

- Under $10
- $10–$20
- $20–$30
- $30 or more

Question 4
What features would you value most for renting an e-bike?

Question 5
Do you have any concerns about renting an e-bike? If so, please describe them.

Step 8: Prototyping [Optional]

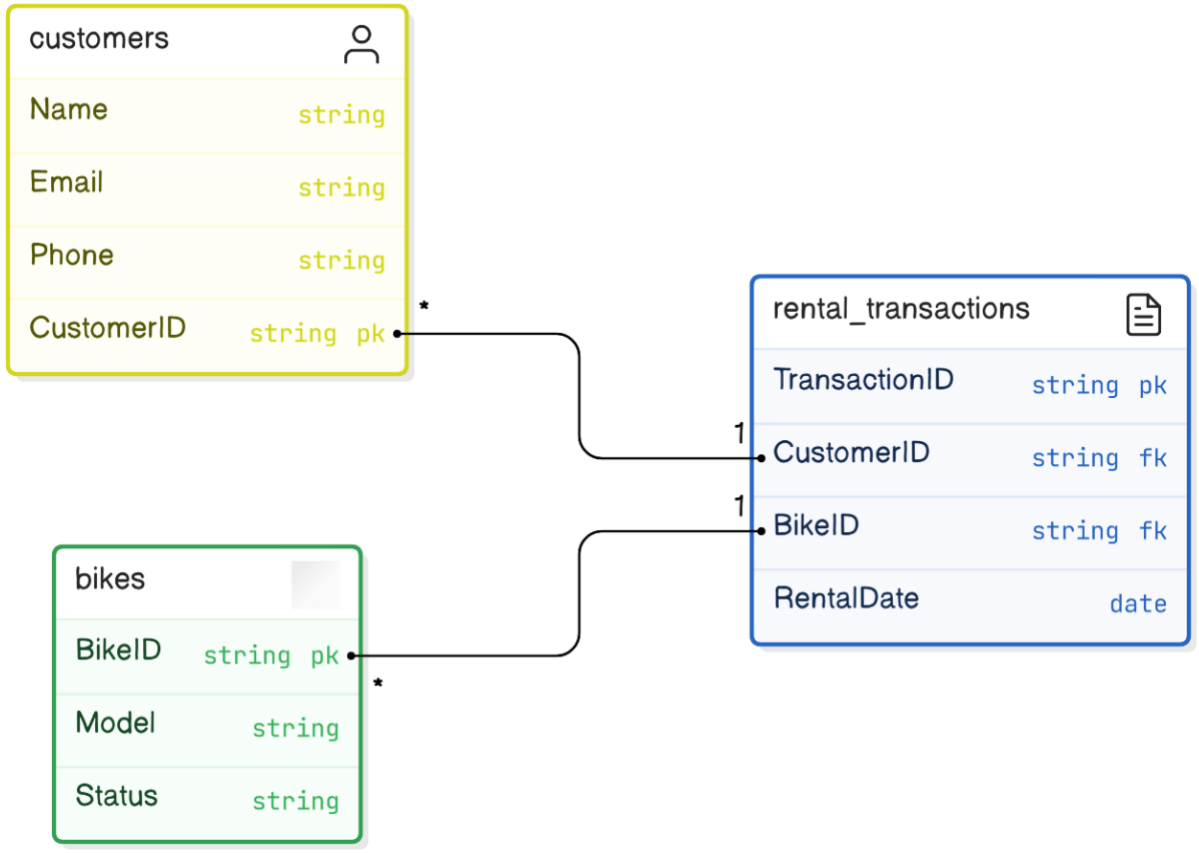
Example: Mobi-e-rides develops low-fidelity wireframes for their website:

- **Key features**:
  - Homepage featuring available bikes
  - Booking interface with date selection
  - Payment page with multiple options

Step 9: Modeling business processes

Example solution: Mobi-e-rides creates an ERD showing relationships between entities:

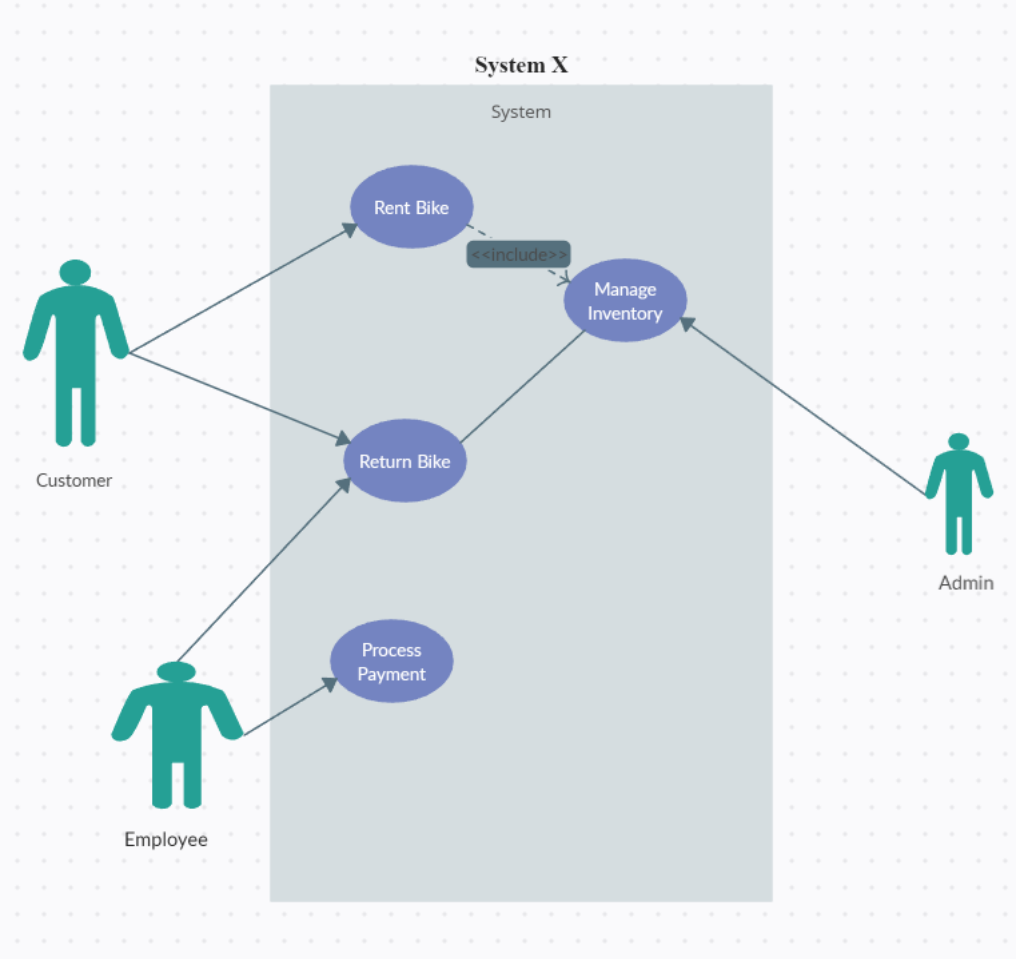
Entity	Attributes
Customer	CustomerID, Name, Email, Phone
Bike	BikeID, Model, Status
Rental Transaction	TransactionID, CustomerID, BikeID, RentalDate



Step 10: Use case diagrams

Example solution: Mobi-e-rides identifies actors and creates use case diagrams:

- **Actors**: Customer, Employee, Admin
- **Use cases**:
  - Rent Bike
  - Return Bike
  - Process Payment
  - Manage Inventory

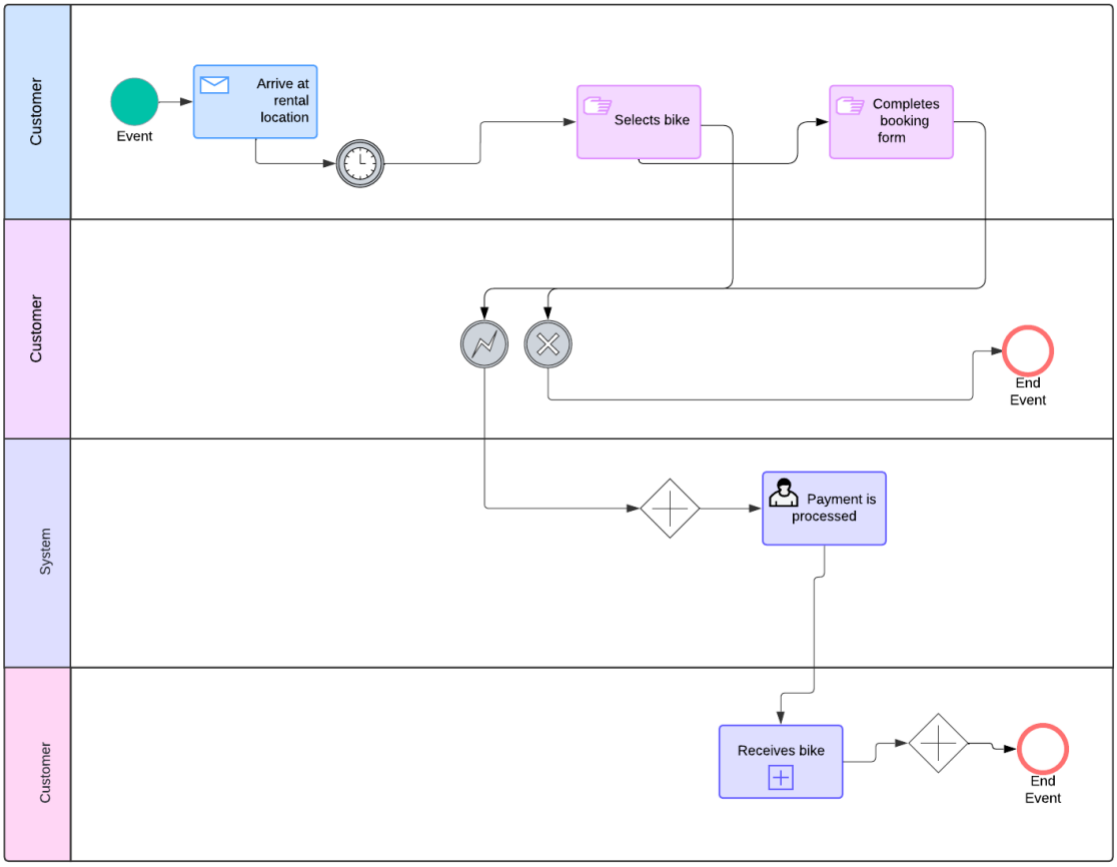


Step 11: Mapping out business processes

Example: Mobi-e-rides maps out the rental process using BPMN.

Process steps:

1. Customer arrives at rental location
2. Customer selects bike
3. Customer completes booking form
4. Payment is processed
5. Customer receives bike



Step 12: Systems analysis

1. Introduction

The systems analysis phase is crucial for evaluating the technical requirements, constraints, and potential solutions for the eBike rental system. This step involves understanding the current systems, identifying gaps, and proposing a robust solution that aligns with business goals and stakeholder needs.

2. Objectives of systems analysis

- Identify technical requirements for the eBike rental system
- Assess constraints that may impact system design and implementation
- Explore potential solutions that meet identified requirements
- Ensure the system is scalable, secure, and user-friendly

3. Key components of the analysis

A. Technical requirements

- **User registration and authentication**:
    - Users must securely register using email or social media accounts
    - Implement multi-factor authentication (MFA) to enhance security
- **Payment processing**:
    - The system should support multiple payment methods (credit/debit cards, digital wallets)
    - Transactions must be processed securely with PCI compliance
- **Inventory management**:
    - Real-time tracking of e-bike availability, status, and maintenance schedules
- **User profile management**:
    - Users must be able to update personal information, view rental history, and manage payment methods
- **Mobile responsiveness**:
    - The system should be fully functional on mobile devices to accommodate users on the go

B. Constraints

- **Budget constraints**:
    - Limitations on funding may restrict the choice of technologies and features implemented at launch
- **Technical expertise**:
    - The development team's familiarity with specific technologies (e.g., cloud services, databases) could impact implementation speed and effectiveness
- **Compliance and regulatory constraints**:
    - Adherence to local regulations concerning data privacy (GDPR, CCPA) and safety requirements for e-bikes
- **Integration issues**:
    - The need to integrate with existing systems (e.g., payment gateways, third-party services) may introduce compatibility challenges

C. Potential solutions

- **Cloud-based identity management**:
    - Consider implementing a service like Auth0 or Firebase Authentication for secure user registration and login. These platforms offer built-in features such as social logins and MFA.
- **Payment processing solutions**:
    - Use a reliable payment gateway like Stripe or PayPal that complies with PCI DSS standards. These services provide APIs for easy integration and support multiple payment methods.
- **Database management**:
    - Implement a relational database management system (RDBMS) such as PostgreSQL or MySQL to store user data, rental transactions, and inventory details securely. Choose NoSQL options like MongoDB if flexibility in schema design is needed for certain features.
- **Real-time inventory tracking**:

    - Utilize cloud-based inventory management software that can integrate with the rental platform. This allows for real-time updates on bike availability and maintenance status.
- **User interface design**:
    - Invest in user experience (UX) design to ensure the website and mobile app are intuitive. Tools like Figma or Adobe XD can be used for prototyping and user testing before full-scale development.

4. Risk analysis

- **Data security risks**:
    - Potential risks include data breaches due to inadequate security measures. Mitigation strategies include implementing strong encryption methods (e.g., AES-256) for data at rest and in transit.
- **Operational risks**:
    - Users may struggle with the new registration or payment process, leading to abandoned accounts or lost revenue. To address this, provide comprehensive user documentation and a help center with FAQs and tutorials.
- **Technical risks**:
    - Integration issues with third-party services can lead to delays or budget overruns. Conduct thorough testing in a staging environment before moving to production.

5. Proposed implementation plan

- **Phase 1: Requirements gathering**
    - Collaborate with stakeholders to finalize technical requirements
- **Phase 2: System design**
    - Create detailed architecture diagrams outlining system components and data flows
- **Phase 3: Development and testing**
    - Begin development using Agile methodologies, allowing for iterative feedback and adjustments
- **Phase 4: Deployment**
    - Launch the system in a controlled manner, monitoring performance and user feedback closely during the initial rollout
- **Phase 5: Maintenance and support**
    - Establish a support team for ongoing maintenance and troubleshooting based on user feedback

Step 13: Reflection and validation

Example reflection points:

- **Challenges faced**: Difficulty in engaging all stakeholders during interviews
- **Lessons learned**: The importance of continuous feedback from stakeholders to refine requirements
- **Application of skills**: Prepared to apply these skills in real-world projects by understanding stakeholder dynamics and effective communication techniques

---

Here's a breakdown of the exemplar solution aligned with the six knowledge areas of the BABOK:

1. Business analysis planning and monitoring
    - Identifying stakeholders for requirement gathering
        - Identify and list stakeholders, considering their interests and concerns
    - Employing techniques for requirements prioritization
        - Use the MoSCoW method to prioritize requirements from stakeholders
    - Traceability tools for requirements
        - Create a requirements traceability matrix to track requirements and their sources
2. Elicitation and collaboration
    - Conducting effective interviews
        - Prepare and conduct interviews with key stakeholders to gather business requirements
    - Facilitating workshops
        - Organize workshops for eliciting and validating requirements
    - Observation techniques
        - Observe existing services to gather insights that influence the business model
    - Designing surveys
        - Create surveys to collect broader customer input
3. Requirements life cycle management
    - Employing techniques for requirements prioritization
        - Ensure ongoing validation of prioritized requirements with stakeholders
    - Traceability tools for requirements
        - Maintain traceability of requirements throughout the project
4. Requirements analysis and design definition
    - Modeling business processes
        - Create an entity relationship diagram (ERD) for data relationships
    - Use case diagrams
        - Develop use case diagrams identifying actors and their interactions
    - Prototyping
        - Create low-fidelity prototypes reflecting key features
5. Solution evaluation
    - Mapping out business processes
        - Use BPMN techniques to map out key business processes and identify inefficiencies
6. Underlying competencies
    - Reflection and validation
        - Reflect on the learning process, challenges faced, and potential real-world applications of the skills developed