

# Assignment: Introduction to Architecture and Design

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## Question 1

You have joined the IT team of FikaHome Transport as the Solution Architect. The Business team wants to start allowing online ticket booking for their customers traveling from Nairobi to/from Western Kenya.

- **List the requirements for the proposed solution.**
  - Customer registration and authentication to save ticket booking details
  - Seat Reservation Map to allow customers choose their preferred seat
  - Bus Schedules for the trips to and from Western Kenya and Nairobi
  - Payment gateway/module for ticket payment
  - Ticket Confirmation module for customers (via email/ SMS) to get final details regarding the booking
  - Help/Feedback center to allow customers to ask questions
  - Search Functionality for trips available on a specific day
  - Trip details like fare, route and arrival/departure time to be displayed

- **What questions do you need to ask the Business team to better articulate the requirements?**
  - Will the online ticket be used throughout the journey or will they be required to print the ticket?
  - Are tickets refundable? If Yes, under what circumstances will they be refunded?
  - Can customers also pay in cash at the station?
  - Is online booking more efficient than booking at the station? What difference will it make for the customer?
  - Can a customer book multiple seats? If so, what is the maximum number?
  - Will there be discounts to encourage customers to book online? Will prices be the same online and at the station?
  
- **What questions do you ask the IT team to better design the solution.**
  - How will we ensure the customer's personal information is protected?
  - Will the customers need to upload any identification files to the system to book a ticket?
  - Will the system support multiple payment gateways i.e Visa Card, MasterCard or just Mpesa?
  - Will confirmation details be sent to customers email or phone?
  - How will the boarding pass/ticket be generated?
  - Will the system be implemented as a web application or mobile?

- **What applications/systems/technologies can we use to meet this requirement?**

- Database Management System through relational, non-relational or NoSQL databases (SQLAlchemy/ Firebase /MongoDB) for daily bus schedules and customer bookings
- Google Maps API for bus route information and arrival time estimation
- Daraja API for Mpesa payment enabling
- IDE and version control system integration i.e Git, Sublime Text, Jupyter Notebook
- Mailing/ SMS APIs and libraries i.e Twilio, Nexmo, Smtplib for Python
- Feedback mechanisms like GoogleForms API or TypeFormAPI

- **What is the proposed solution?**

The solution proposes that the FikaHome Transport can allow online ticket booking for enhanced flexibility and smoother customer experience when planning for a trip. It will allow the customers to sign up, view bus schedules and search for available seats of a specific bus. The solution, we believe will provide 24/7 accessibility and convenience for the customers while still allowing bus managers to track trends and provide better services. The system is expected to give real-time updates to the customer via email or SMS regarding the bus, incase of any delays. Designing a simple and attractive user interface will allow customers to navigate through the system and book their tickets with little to no assistance.