Project Proposal[1] **:** *Let's Shop Ecommerce Website*

Solution Direction

We propose using OutSystems, a low-code web and mobile application development platform for this project. Some alternative tech stacks that can be used are LAMP, MERN, WordPress, and Shopify.

Tech stack	Description	Reason for discard
MERN	Stands for MongoDB, Express.js, React.js, Node.js, is a popular choice for building web applications using JavaScript.	1. Not as secure as other stacks like LAMP, which can be a concern for e-commerce websites that handle sensitive customer information. 2. Not the best choice for large-scale e-commerce websites that require high levels of scalability.
LAMP	Stands for Linux, Apache, MySQL, PHP, is a popular choice for building web applications using PHP.	1. Can be slow and inefficient when handling large amounts of data, which can be a concern for e-commerce websites that handle many transactions. 2. Not be the best choice for e-commerce websites that require high levels of security, as it is more vulnerable to attacks than other stacks like MEAN or MERN
WordPress	A popular content management system that can be used to build e-commerce websites.	1. Not be the best choice for e-commerce websites that require high levels of scalability and security. 2. Can be slow and inefficient when handling large amounts of data, which can be a concern for e-commerce websites that handle many transactions. 3. Is more vulnerable to attacks than other stacks like MEAN or MERN.
Shopify	A popular e-commerce platform that provides a range of features and functionalities.	1. Not the best choice for e-commerce websites that require high levels of customisation and flexibility. Shopify is a closed platform that limits the ability to customise the website beyond the available templates and themes. 2. Shopify charges a transaction fee for each sale made through the platform, which can concern businesses that handle many transactions.

Figure 1: Alternative tech stacks explanation and reason for discard

OutSystems, on the other hand, provides a low-code platform that can help businesses achieve faster development time, higher productivity, better performance, easier maintenance, and scalability. Here is how OutSystems fits in a KoST analysis of our Let's Shop E-commerce Website project:

Criteria	Analysis
Knowledge	1. **Problem domain**: Retail industry, electronic products that the store sells. This would include knowledge of the target audience, the products, and the competition. 2. **Solution domain**: Knowledge of e-commerce platforms, web development, and digital marketing.
Skills	1. **Experience**: Web development, e-commerce platforms, and digital marketing will significantly benefit this project. 2. **Other skills**: Other skills that would be useful include knowledge of user experience design, search engine optimisation, and content creation.
Technology	1. **Existing solutions**: There are many solutions for e-commerce websites, including Shopify,

[1] This document is by no means a “full project proposal”. It has been simplified and customized for the purposes of SWE30010 teaching. The full project proposal includes many other sections which have not been discussed during the first few weeks of SWE30010 teaching.

	WooCommerce, Magento, and BigCommerce. These platforms provide a range of features and functionalities that can be customised to meet the business's specific needs. 2. **OutSystems**: OutSystems is a low-code platform that enables rapid application development and delivery. It provides a visual development environment that allows developers to build applications without writing code. OutSystems can help businesses achieve faster development time, higher productivity, better performance, easier maintenance, and scalability.

Figure 2: KoST analysis for the project

OutSystems is a low-code platform that can develop custom applications quickly and efficiently. It offers a range of pre-built templates and accelerators that can be customised to meet your specific needs and requirements. OutSystems provides a wide range of features, making it an ideal choice for developing a highly scalable e-commerce website that sells electronic products from a local retail store in Hanoi. Here are some reasons why:

- **Rapid development**: With OutSystems, you can create custom apps more quickly and effectively, which will shorten the time it takes for your e-commerce website to go live.
- **Scalability**: OutSystems' high scalability design enables you to add new features and functionalities as your company grows.
- **Customizability**: OutSystems offers a selection of accelerators and pre-built templates that can be altered to satisfy your unique specifications.
- **Integration**: OutSystems makes combining your e-commerce website with your current data sources and systems simple by integrating with various platforms and systems.
- **Security**: To guarantee that your e-commerce website is safe and secure from online attacks, OutSystems offers strong security measures.

In summary, OutSystems is an ideal choice for developing a highly scalable e-commerce website that sells electronic products from a local retail store in Hanoi. Its rapid development, scalability, customizability, integration, and security features make it a powerful platform for building custom applications.

High-level design

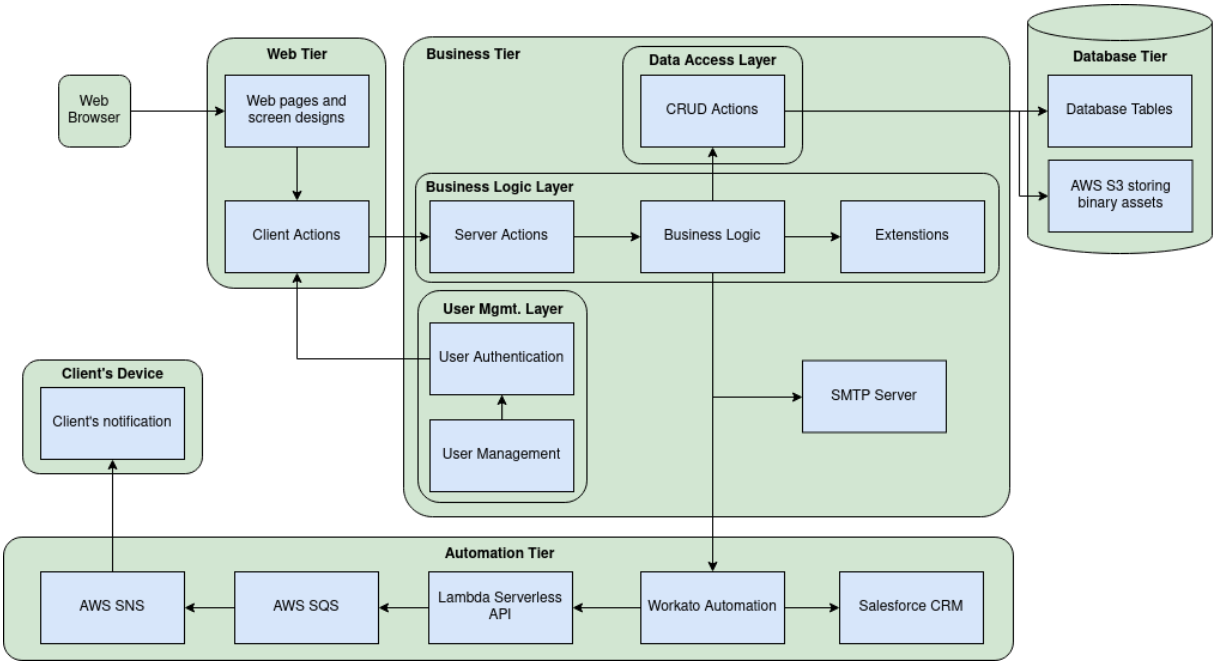

Figure 3: High-level Design Architecture Diagram

The high-level architecture diagram provides a bird's-eye view of the proposed system, illustrating the components' interactions. Let's Shop E-commerce Website will follow a 4-tier architecture design:

1. **Web Tier**: Includes the UI components of the project.
    a. Web pages and screen designs: Include the project's interface, the client interface for shopping and order placement and the admin interface for order management and data analytics.

    b. Client Actions: These are the screen-level functions in OutSystems used to handle client-side events and screen interactions.
2. **Business Tier**: Includes the server action and serves as a bridge for the client to handle multiple services and access the Data and Automation Tier.
    a. **Business Logic Layer**: Handles the core business logic.
        i. Server Actions: runs on the server side. It contains server-side logic and can perform. Server actions are typically used to implement business logic and are called from client, screen, or server actions.
        ii. Business Logic: Deals with different services, including data retrieval, manipulation, input/output with Excel and CSV files, emailing, customer service automation, and validation tasks.
        iii. Extensions: We will use extension assets primarily for input handling, Excel input/output, and PDF compilation.
    b. **Data Access Layer**: Directly interacts with the database for data retrieval and manipulations.
        i. CRUD Actions: Create, Reade, Update, and Delete actions to records stored in the database tables.
    c. **User Management Layer**
        i. User Authentication: Using OTP mechanism and session for granting user access.
        ii. User Management: Manage how different roles can interact with the system, following the least-privilege principle for various roles.
    d. SMTP Server
3. **Database Tier**: Stores critical data of the system.
    a. Database Tables: Relational database table with schema storing product details, orders, user accounts, and references to assets in AWS S3.
    b. AWS S3: Stores binary assets of the system, including images, videos, and imported Excel files.
4. **Automation Tier**: Includes external services the system interacts with for customer management.
    a. Workato: Automation platform, servers as a skeleton to trigger other services, handles input/output and provides easy integration with the OutSystems platform.
    b. Salesforce CRM: A service for managing and maintaining customer relationship management.
    c. Lambda Function: Serverless API to handle SNS messaging.
    d. AWS SQS: message queuing to decouple and scale our serverless API.
    e. AWS SNS: managed messaging service for communication, allowing messaging directly to users