Milestone 3

1. **Goals:**

The primary goals of the currency converter project are to provide a reliable and efficient tool for converting currencies accurately and in real-time. This will be achieved by ensuring the system is user-friendly, with a simple interface that allows users to input currencies and obtain accurate conversion rates swiftly. The main benefit of the currency converter is to facilitate seamless financial transactions and international commerce by enabling users to convert currencies quickly and conveniently with confidence.

**2. User Personas**

Persona: Business Traveler

Name: Marlene

Background: Lisa frequently travels internationally for business purposes. She relies on the currency converter to manage expenses, reconcile receipts, and track exchange rates for accurate expense reporting. Lisa values a currency converter that offers multi-currency support, real-time rates, and the ability to export transaction history for accounting purposes.

Persona: Student Abroad

Name: Josh

Background: Ahmed is a student studying abroad in a different country. He uses the currency converter to manage his finances, budget effectively, and understand the cost of living in his host country. Ahmed prefers a currency converter with a user-friendly mobile app interface that allows him to save and convert favorite currency pairs for quick access.

Persona: Cryptocurrency Investor

Name: Ethan

Background: Ethan is an avid cryptocurrency investor who frequently trades digital assets. He uses the currency converter to compare cryptocurrency prices to fiat currencies and make informed investment decisions. Ethan values a currency converter that supports a wide range of cryptocurrencies, provides real-time conversion rates, and offers advanced features like portfolio tracking and price alerts.

Persona: Import/Export Business Owner

Name: Maria

Background: Maria owns an import/export business and deals with international transactions regularly. She uses the currency converter to calculate costs, negotiate pricing, and determine profit margins when dealing with suppliers and customers from different countries. Maria prefers a currency converter that provides accurate rates, supports multiple currencies, and offers historical exchange rate data for analysis.

Persona: Travel Blogger

Name: Olivia

Background: Olivia is a travel blogger who often shares her experiences and recommendations on her blog and social media platforms. She uses the currency converter to help her readers understand the costs of traveling to different destinations and provide accurate budgeting tips. Olivia values a currency converter that is visually appealing, easy to embed on her website, and offers customizable design options to match her brand.

Persona: Freelancer

Name: Max

Background: Max is a freelance professional who works with clients from around the world. He uses the currency converter to quote project fees, invoice clients, and ensure he receives accurate payments in his preferred currency. Max values a currency converter that supports multiple payment platforms, provides real-time rates, and integrates with invoicing tools to streamline his freelance workflow.

**3. Functional Requirements**

**Use Case:** Real-Time Exchange Rates

**Title:** Retrieve Real-Time Exchange Rates

**Description:** As a user, I want to be able to retrieve real-time exchange rates between different currencies so that I can convert my desired amount accurately and stay updated with the latest rates.

**User Story**:

**Title:** Access Real-Time Exchange Rates

**Description:** As a user, I want to access up-to-date and reliable exchange rates for different currency pairs so that I can convert currencies accurately and make informed decisions.

**Use Case**: Multi-Currency Support

**Title:** Support Multiple Currencies

**Description:** As a user, I want the currency converter to support a wide range of currencies so that I can convert between any two currencies of my choice, even if they are less commonly used.

**User Story**:

**Title:** Convert Between Various Currencies

**Description:** As a user, I want to be able to convert between different currencies, including commonly used and less commonly used ones, so that I can perform accurate conversions for my specific needs.

**Use Case:** Historical Exchange Rates

**Title:** Provide Historical Exchange Rates

**Description:** As a user, I want the currency converter to provide historical exchange rates so that I can analyze trends, track currency performance, and make informed decisions based on past data.

**User Story**:

**Title:** Access Historical Currency Data

**Description:** As a user, I want to access historical exchange rates for specific currencies and timeframes so that I can perform historical analysis, monitor currency fluctuations, and gain insights into currency performance.

**Use Case:** Customizable Currency Pairs

**Title:** Allow Customizable Currency Pairs

**Description:** As a user, I want the currency converter to allow me to customize and save my preferred currency pairs so that I can quickly access and convert between frequently used currencies.

**User Story**:

**Title:** Save Favorite Currency Pairs

**Description**: As a user, I want to save my favorite currency pairs for quick access so that I can easily convert between them without having to search or enter the currencies each time.

**Use Case**: Mobile App Compatibility

**Title:** Provide Mobile App Compatibility

**Description**: As a user, I want the currency converter to have a mobile app version so that I can conveniently convert currencies on the go using my smartphone or tablet.

**User Story:**

**Title:** Convert Currencies on Mobile

**Description**: As a user, I want to be able to download and use the currency converter mobile app so that I can convert currencies easily and quickly while traveling or away from my computer.

**Use Case**: Currency Alerts

**Title:** Set Currency Alerts

**Description**: As a user, I want the currency converter to allow me to set alerts for significant currency fluctuations so that I can be notified when exchange rates reach a certain threshold.

**User Story**:

**Title:** Receive Currency Alerts

**Description**: As a user, I want to receive notifications or email alerts when exchange rates for specific currency pairs reach a predetermined level, enabling me to monitor and react to market changes effectively.

**4. Quality Requirement**

Accuracy

Rank: 1

Justification: Accuracy is the most crucial quality attribute for a currency converter system. Users rely on the system to provide precise and up-to-date exchange rates for accurate conversions. If the system fails to deliver accurate results, it undermines the trust of users and renders the system ineffective. Accuracy can be measured by comparing the system's exchange rates with reputable sources and calculating the average deviation. A low deviation indicates a high level of accuracy.

Performance

Rank: 2

Justification: Performance is of high importance as users expect quick and responsive conversions. The system should provide near-instantaneous results to ensure a seamless user experience. Performance can be measured by tracking the response time for converting currencies and the system's ability to handle concurrent user requests. Faster response times and the ability to handle high user loads are indicators of good performance.

Reliability

Rank: 3

Justification: Reliability is important to ensure that the currency converter system consistently functions as expected without disruptions or errors. Users rely on the system for critical financial calculations, and any downtime or inaccuracies can have serious consequences. Reliability can be measured by monitoring system uptime, tracking the occurrence of errors or crashes, and calculating the system's mean time between failures (MTBF).

Usability

Rank: 4

Justification: Usability plays a significant role in the success of a currency converter system. Users expect an intuitive and user-friendly interface that allows them to easily perform conversions and access desired features. A well-designed system with clear navigation, intuitive input fields, and helpful error messages enhances the user experience. Usability can be measured through user surveys, task success rates, and the time taken to complete common conversion tasks.

Security

Rank: 5

Justification: Security is important to protect user data and ensure secure transactions. The currency converter system should implement appropriate security measures, such as encryption, to safeguard sensitive information. Additionally, the system should protect against common security threats like unauthorized access or manipulation of exchange rates. Security can be measured by conducting vulnerability assessments, penetration testing, and adherence to security standards and protocols.

**5. Questions**

- What data source will we use to obtain real-time exchange rates for accurate conversions?

- How frequently will we update the exchange rates in the system to ensure they are up-to-date?

- How will we handle cases where exchange rates are not available or cannot be retrieved from the data source?

- What mechanisms will be in place to ensure the security and privacy of user data during currency conversions?

- Should we support multiple languages and currencies for a global user base, and how will we handle currency symbols and formatting differences?

- How will we handle cases where the user inputs an invalid currency code or amount?

- Should we consider historical exchange rates to allow users to view past conversions?

- How will we handle situations where the user is offline or has limited internet connectivity?

- Should we include additional features like currency trend analysis or conversion history tracking?

- How will we handle cases where the exchange rate for a specific currency pair is temporarily unavailable?

6. Out of scope

- **Perform competitor analysis**: Research and analyze existing currency converter applications or platforms to identify their strengths, weaknesses, and unique features. This will provide insights for differentiating our product and prioritizing innovative features.

- **Estimate effort and complexity:** Collaboratively estimate the effort and complexity involved in implementing each user story or feature. This can be done using techniques like story points or other relative estimation methods. This helps in prioritizing features based on the resources available and the time required for implementation.

- **Create a backlog**: Maintain a prioritized backlog of user stories and features. The backlog serves as a repository for all the planned work and helps the team understand what needs to be done next.

**- Implement a feedback loop**: We will set up mechanisms to gather feedback from users, stakeholders, and team members. This can be done through user testing, surveys, or feedback sessions. Analyze the feedback received to identify potential improvements and prioritize feature enhancements or bug fixes.

**7. References – Conflict Requirements and Resolution**

During the elicitation process for our project, several conflicts may arise. Such as:

**Currency Data Source**: Stakeholder A suggests using a specific data provider for currency exchange rates, while Stakeholder B prefers a different provider due to its reputation for accuracy and reliability.

**User Interface Design**: Stakeholder C prefers a minimalist and intuitive design approach, emphasizing simplicity and ease of use. On the other hand, Stakeholder D believes in incorporating advanced visualizations and additional features to enhance the user experience.

**Localization and Language Support**: Stakeholder E emphasizes the need to support multiple languages and localize the user interface to cater to a global user base. However, Stakeholder F argues that prioritizing localization may increase development complexity and time, potentially delaying the project.

To resolve conflicts during the development lifecycle of the project (this semester), the team can adopt the following approaches:

**Research and Analysis**: The team can conduct a thorough evaluation of the different currency data providers, comparing factors such as accuracy, reliability, availability of historical data, and cost. Based on this analysis, they can present their findings to the stakeholders and recommend the most suitable provider.

**User Testing and Feedback**: To address conflicts related to user interface design, the team can create low-fidelity prototypes or mockups and conduct user testing sessions. Gathering feedback from potential users will provide valuable insights into their preferences and expectations, helping the team find a middle ground that satisfies both Stakeholder C and Stakeholder D.

**Prioritization and Impact Assessment**: When it comes to conflicts regarding localization and language support, the team can assess the potential impact and benefits of implementing such features. They can prioritize them based on factors like target user demographics, business goals, and available resources. The team can also consult with potential users or conduct market research to gather insights into the importance of localization for their target audience.

**7. References – Quality Assurance:**

To assure the quality of our functional requirements, we followed a comprehensive process that included the following steps:

**Elicitation**: We conducted interviews, discussions, and surveys with stakeholders to understand their needs, expectations, and pain points related to currency conversion. This allowed us to gather accurate and relevant requirements.

**Documentation:** We documented the requirements in a clear and structured format. Each requirement was described in detail, including its purpose, context, and acceptance criteria, ensuring that all necessary information was captured.

**Review and Validation**: We conducted internal reviews and validations of the requirements. Each team member carefully reviewed the documentation, identified any inconsistencies, ambiguities, or gaps, and provided feedback to improve the quality of the requirements.

**Stakeholder Involvement**: We actively involved stakeholders throughout the process. We shared the requirements documentation with them, solicited their feedback, and incorporated their input to ensure that the requirements aligned with their expectations and needs.

Now, let's analyze the selected user stories and argue how they meet the quality criteria:

**1. User Story:** Access Real-Time Exchange Rates

**Completeness:** The user story addresses the need to access up-to-date and reliable exchange rates, ensuring that users can make accurate currency conversions and informed decisions. The requirement covers the essential functionality expected by stakeholders.

**Clarity:** The user story clearly articulates the objective of accessing real-time exchange rates, leaving no room for ambiguity or misinterpretation.

**Testability:** The user story is testable by creating test cases to verify that the system can retrieve and display accurate and up-to-date exchange rates for different currency pairs.

**2. User Story:** Convert Between Various Currencies

**Completeness:** The user story encompasses the requirement of enabling users to convert between different currencies, including commonly used and less commonly used ones. It ensures that the currency converter can handle a wide range of currency conversions, meeting the diverse needs of users.

**Consistency:** The user story aligns with the stakeholder interviews, where stakeholders expressed the importance of being able to perform accurate currency conversions for various currencies.

**Testability:** The user story is testable by creating test cases to verify that the system can accurately convert between different currencies and handle various conversion scenarios.

**3. User Story**: Provide Historical Exchange Rates

**Completeness:** The user story addresses the requirement of providing historical exchange rates, enabling users to analyze trends, track currency performance, and make informed decisions based on past data. It adds value by offering historical data alongside real-time rates.

**Consistency:** The user story aligns with the stakeholder interviews, where stakeholders expressed the need for historical exchange rates to gain insights and perform analysis.

**Testability:** The user story is testable by creating test cases to ensure that the system can retrieve and display historical exchange rates for different currencies and timeframes accurately.

**4. User Story**: Access Historical Currency Data

**Completeness:** The user story covers the requirement of allowing users to access historical exchange rates for specific currencies and timeframes. It provides users with the flexibility to retrieve currency data for their desired analysis and monitoring purposes.

**Clarity:** The user story clearly communicates the objective of accessing historical currency data, leaving no ambiguity about the functionality expected by users.

**Testability**: The user story is testable by creating test cases to verify that the system can retrieve and present historical currency data accurately, based on the specified currencies and timeframes.

**5. User Story**: Save Favorite Currency Pairs

**Completeness**: The user story addresses the requirement of allowing users to save their favorite currency pairs for quick access. It enhances user convenience by eliminating the need to search or enter the currencies each time, improving the overall user experience.

**Consistency**: The user story aligns with the stakeholder interviews, where stakeholders expressed the desire for the ability to save and easily access frequently used currency pairs.

**Clarity:** The user story clearly states the objective of saving favorite currency pairs, leaving no room for confusion or misunderstanding.

**Testability:** The user story is testable by creating test cases to verify that the system allows users to save and retrieve their favorite currency pairs accurately and efficiently.

**6. User Story**: Provide Mobile App Compatibility

**Completeness**: The user story addresses the requirement of having a mobile app version of the currency converter, enabling users to conveniently convert currencies on the go using their smartphones or tablets. It expands the accessibility and usability of the system.

**Consistency**: The user story aligns with the stakeholder interviews, where stakeholders expressed the need for mobile compatibility to cater to users who prefer using mobile devices for currency conversion.

**Testability**: The user story is testable by creating test cases to ensure that the mobile app version of the currency converter functions properly, provides a seamless user experience, and accurately performs currency conversions.