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| HCCOMP2, HCCOMPE2, BSHC2, BSHCE2, BSHTM2 |
| Requirements Specification (RS) |
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# Introduction

As this project cover about the cryptocurrency which is a decentralized system which runs by blockchain technology and it’s a virtual currency that uses Cryptography as security based on that this branch will manage retrieving real time price information on crypto, for better understanding this branch will display the prices using symbols mentioned below.

* current, price (us-dollar),
* 24 h Volume (us-Dollar)
* Market Capitalization (US-Dollar)
* Percent Change (1h), (24h), (7d)
* The symbol of the currency.

## Purpose

The purpose of this document is to set out the requirements for the development of the website that give a service/ function of the checking the price of any cryptocurrency such as Bitcoin, Tether, Solana, Cardano …etc. users will benefit from this functionality because as the price/Value of the cryptocurrency is consistently changing up and down.

The intended customers are Individual investors who invest in cryptocurrency as a form of asset, Traders who are actively traded on different exchanges and engaged in buying and selling to capitalize price movement, it also used by people who are developer, involve in global transactions and businesses.

## Project Scope

The project scope encompasses the development of a user-friendly website that allows users to track real-time prices of various cryptocurrencies. The website will provide essential information, including current prices in US dollars, 24-hour trading volume, market capitalization, and percentage changes over 1 hour, 24 hours, and 7 days. The scope further includes accommodating a diverse user base, including individual investors, traders, developers, businesses, and those involved in global transactions. This section also details any constraints that were placed upon the requirements elicitation process, such as schedules, costs, or the software engineering environment used to develop requirements.

## Definitions, Acronyms, and Abbreviations

* **Cryptocurrency:** A decentralized virtual currency that uses cryptographic techniques for security.
* **Blockchain:** A distributed ledger technology used to secure and verify transactions.
* **US Dollar (US):** The official currency of the United States.
* **Crypto Symbols:** Abbreviations representing different cryptocurrencies (e.g., BTC for Bitcoin, ADA for Cardano).

# User Requirements Definition

**Description:**Users should be able to receive real-time updates on the prices of selected cryptocurrencies. The system must provide accurate and up-to-date information, including the current market price in US dollars.

**Rationale:** Individual investors and traders need timely information to make informed decisions. Real-time updates ensure that users have the latest data to react to market changes promptly.

# Requirements Specification

All requirements should be verifiable. For example, experienced controllers shall be able to use all the system functions after a total of two hours’ training. After this training, the average number of errors made by experienced users shall not exceed two per day.

## Functional requirements

The functional requirements specify the features and capabilities that the system should provide to its users. These requirements focus on the core functionalities related to retrieving real-time cryptocurrency price information and displaying it with relevant details.

1. **Realtime crypto prices**
   * The system shall fetch and display the current price of the specified cryptocurrency in US dollars.
   * The displayed price shall be updated in real-time, reflecting any changes in the cryptocurrency market.
2. **24 h Volume (us-Dollar)** 
   * The system shall retrieve and present the 24-hour trading volume of the selected cryptocurrency in US dollars.
   * The 24-hour volume information shall be displayed alongside the current price.
3. **Market Capitalization (US-Dollar)**
   * The system shall obtain and exhibit the market capitalization of the chosen cryptocurrency in US dollars.
   * Market capitalization details shall be displayed in a clear and concise format.
4. **Percent Change (1h)**
   * The system shall calculate and exhibit the percentage change in the cryptocurrency's price over the last 1 hour.
   * The percentage change information shall be presented with appropriate visual indicators.
5. **Percent Change (24h)**
   * The system shall calculate and display the percentage change in the cryptocurrency's price over the last 24 hours.
   * Percentage change details for the 24-hour period shall be clearly visible to the user.
6. **Percent Change (7Days)**
   * The system shall calculate and showcase the percentage change in the cryptocurrency's price over the last 7 days.
   * Users shall be able to view the percentage change trends over the 7-day period.
7. **User Interaction**
   * Users shall be able to select and specify the cryptocurrency for which they want to view real-time price information.
   * The system shall provide an intuitive and user-friendly interface for interacting with cryptocurrency data.
8. **Symbol-based Dispaly**
   * Cryptocurrency prices shall be displayed using symbols or abbreviations for quick recognition (e.g., BTC for Bitcoin, ETH for Ethereum).
   * The symbol-based display shall enhance user understanding and usability.
9. **Error Handling**
   * The system shall incorporate error-handling mechanisms to manage situations where real-time price retrieval fails or encounters issues.
   * Users shall receive clear and informative error messages in such cases.

**3.1.1 Use Case Diagram**

A diagram of a cryptocurrency price monitor

Description automatically generated

3.1.2 Requirement

3.1.1.1 **Description**

Searching crypto data and prices: user will be able to search the cryptocurrency by searching the name of the crypto, and if they user input the correct name of the currency the system will display the crypto data.

### 2 Use Case

**Scope:** The scope of this use case is to enable users to retrieve cryptocurrency data and prices through a search functionality.

**Description:** This use case describes how users can search for cryptocurrency data and prices by entering the name of the cryptocurrency they are interested in. The system will then display the relevant data for the searched cryptocurrency.

**Flow Description Precondition:**  The system is initialized and has access to real-time cryptocurrency data.

**Activation:** This use case starts when a user triggers the search functionality by entering the name of a cryptocurrency.

**Main Flow**

1. The system identifies the user's input as a search query for cryptocurrency data.
2. The system validates the user's input to ensure it matches the name of an existing cryptocurrency.
3. If the user input matches the name of a cryptocurrency:
   * The system retrieves the relevant data and prices for the searched cryptocurrency.
   * The system displays the cryptocurrency data to the user.

**Alternate Flow A1:** If the user input does not match the name of any existing cryptocurrency:

1. The system notifies the user that the entered cryptocurrency name is not recognized.
2. The system prompts the user to enter a valid cryptocurrency name.
3. The use case continues at position 2 of the main flow.

Exceptional flow E1: If there is an error retrieving cryptocurrency data:

1. The system displays an error message indicating that cryptocurrency data could not be retrieved.
2. The system prompts the user to try again later or contact support for assistance.
3. The use case continues at position 2 of the main flow.

## Non-Functional Requirements

### Performance/Response time requirement

The system will take inputs from user and perform a task by displaying the crypto data with in 3 or less second to ensure effective user experience.

### Availability requirement

The system will be stay working 24/7 with out any crash or errors the user will not face any issue at any time of operations hours.

### Recover requirement.

Backups and robust will be on operation if there are system crash or system failure occurs in that way we could prevent losing essential data.

### Robustness requirement

The system will be robust enough to handle unexpected inputs or user behaviors without crashing. It will provide appropriate error messages and maintain stability in adverse conditions.

### Security requirement

Cryptocurrency data is sensitive; hence, the system might implement robust security measures.

### Reliability requirement

The system will be reliable, ensuring accurate and up-to-date cryptocurrency data is consistently provided to users.

### Maintainability requirement

The system will be designed and documented in a way that facilitates easy maintenance. Code should be well-organized, and updates or modifications should be straightforward to implement.

### Portability requirement

The system will be compatible with major web browsers (Google Chrome, Mozilla Firefox, Safari, Microsoft Edge) and accessible from various devices, ensuring portability across different platforms.

### Extendibility requirement

The system architecture will allow for easy extension to incorporate additional features or deals with new data sources as the project evolves.

### Reusability requirement

Code components within the system will be reusable, promoting efficient development and reducing redundancy in future improve.

### Resource utilization requirement

The system will optimize resource utilization, ensuring efficient use of server resources to handle concurrent user requests without significant performance breakdown.

# GUI

The GUI will be designed with a clean and intuitive layout, ensuring ease of navigation for users. It should follow established design principles for a positive user experience.

**5 System Architecture**

**6 System evolution**