

## Resilience and Transformation: Analyzing the Success of Crypto Exchanges Post-Pandemic and Global Conflict Using the DeLone & McLean Model

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### ABSTRACT

The purpose of this research is to analyze the success of digital currency using DeLone and McLean Model, which include some factors such as system quality, information quality, service quality, user satisfaction, and intention to continue using platform. This research focus on crypto exchanges, such as Binance, Coinbase Exchange, and Kraken and the impact of Covid Pandemic on crypto markets. The data was taken from CoinMarketCap during 2018 to 2024, and focus on the ten largest digital currencies based on market capitalization. The result shows that market capitalization and trading volume of crypto currencies increased significantly during 2018 to 2024. Although there was decrease in 2022 because of global economy instability which was triggered by Russia - Ukraine war. BTC and ETH were still dominating market, while the new coins such SOL and AVAX showed rapid growth. The factors such as system quality, information quality, and service quality really influenced on user satisfaction and also the intention to continue using crypto exchanges platform. Beside increasing volatility of crypto markets, Covid Pandemy caused acceleration of digital asset adaption. This research concluded that crypto markets has significant resilience on global economy turmoil with the strong recovery in 2023 to 2024

**Keywords:** Digital Currency; Crypto Exchanges; Delone and Mclean Model; Market Capitalization; Trading Volume.

## **INTRODUCTION**

Since crypto currency was introduced by Satoshi Nakamoto in 2019, it has increased significantly. This increasing was caused by various factors, one of them is the existances of crypto exchange. The aim of this research is to analyze the success of digital currency by using DeLone and McLean Model, included some factors such as system quality, information quality, service quality, user satisfaction, and intention to keep using the platform.

In October 2023, more than 500 crypto exchange have been trading digital currencies (<https://coinmarketcap.com>). There are three crypto exchange that have the largest number of daily trading around the world, namely Binance, Coinbase Exchange, Kraken (<https://coinmarketcap.com>).

In the beginning of 2020 Covid Pandemy has given significant impact on many sectors of economy and also crypto market. This analysis aims to know the change of crypto ranking and its performance before and after covid pandemy by using datas from available tables. These datas were from crypto ranking in 2018 to 2024, and focus on before pandemy (2018-2019) and after pandemy (2020 -2024). The theory in this analysis is DeLone and McLean Model (1992), for the success of information system and some studies dealing with the impact of Covid on crypto market.

In Indonesia, crypto exchange that has been recognized by crypto users are Indodax, Toko crypto, Pintu, and so on. The development of crypto market has created competition among crypto exchanges and up to now the number of crypto users who use crypto exchange keep on increasing. It indicates that potential of crypto market is open widely for investor to participate in its development.

According to GKillas and Katsiampa (2018), although crypto currency market grew fast, the research about crypto currency, beside Bitcoin, was still limited. In Indonesia, the development of crypto exchange is not accompanied by public understanding about digital currency and there are some research that observe this topic, so it encourages researchers to conduct further studies.

### **Problem Limitation**

The data of this research is taken from <https://coinmarketcap.com>, it is coin crypto with the top ten ranking. This page is as reference for crypto user in getting information about crypto ranking, crypto market capitalization, and the number of trading volume in 24 hours of each crypto.

## **LITERATURE REVIEW**

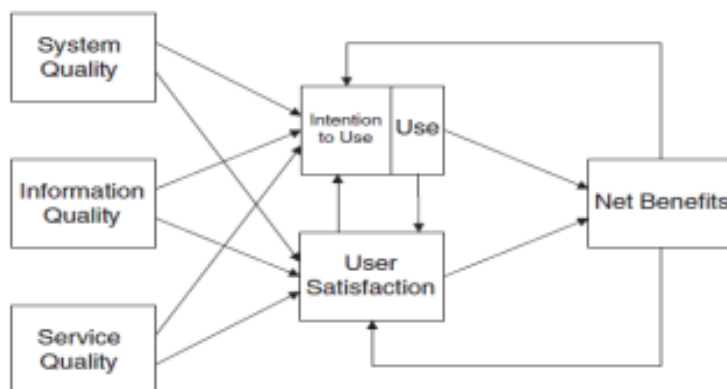
DeLone and McLean Model (1992): This model is used to analyze the success of information system, including factors such as system quality, service quality, service quality, user satisfaction, and intention to keep using the system. This Model is relevant for understanding how exchange can influence the success of digital currencies (DeLone and McLean;1992).

The impact of Covid on crypto market: Several studies showed that Covid Pandemy had increased crypto market volatility. Corbet et al. (2020) found that Covid led to increase volatility in crypto market, especially Bitcoin, because of global economy uncertainty. In addition, Conlon and McGee (2020) noted that Bitcoin was considered as "save haven" during the crisis, but later, it was decrease significantly because of market pressure.

Crypto Market Resilience: Goodell and Goutte ( 2021) examined the co-movement between Covid and Bitcoin by using wavelet analysis. They found that crypto market showed significant resilience although global crisis happened. This study supported the finding that crypto market was able to recover after periode of high volatility.

The Appearing of new coins : Mnif et al. (2020), examined how can new coins such as Solana (SOL) and Avalanche (AVAX) appeared as strong competitor during and after pandemy. It showed dynamic of high competition in crypto market.

**DeLone and McLean Model (2003)**



**Figure 1. DeLone and McLean Model (2003)**

This chart below is some of the previous research that conducted studies on crypto.

Number	Title	Researchers	Year	Results
1	Is Bitcoin a Safe Haven or a Hedging Asset? Evidence from Stock, Bonds, Gold, and Commodities	Kristoufek	2018	This research explored whether Bitcoin can be Save Haven Asset or Hedging Asset toward traditional Asset such as Stocks, Bonds, and Gold. The result showed that Bitcoin has Safe Haven characteristic in certain situation, especially during uncertainty of market.
2	Geopolitical Risk and Cryptocurrency Returns	Corbet et al.	2020	This researcher analyzed the relation between Geopolitical Risk and Crypto asset performance. This research found that the increasing of Geopolitical Risk tent to increase volatility and demand for Bitcoin, especially in countries with political instability.
3	The Impact of War and Terrorism on Financial Markets	Bates	2008	Although this research did not discuss about crypto specifically, but this research gave a theoritical framework on how war and terrorism effected traditional finance markets, which can be applied to understand the similar impact in crypto market.

4	Cryptocurrency Adoption in Developing Countries: Evidence from Venezuela and Zimbabwe	Hileman & Rauchs	2019	This research examined the adoption of crypto in some countries with instability of economy and politic, such as Venezuela and Zimbabwe. The result showed that crypto was often used as a tool to protect wealth from hyper inflation and currency devaluation.
5	Cryptocurrencies and Economic Sanctions: The Case of Iran	Rostamy et al.	2021	This research explored how crypto was used in Iran to avoid economy sanctions and to conduct internasional transactions. The result showed that crypto can be an important tool in facing financial restriction during conflict.
6	Cryptocurrencies and Financial Stability: A Systemic Risk Perspective	Auer & Claessens	2020	This report discussed the potential of systemic risks which was caused by crypto on financial stability, especially in the context of geopolitical and economy instability.
7	The Role of Cryptocurrency in the RussiaUkraine War	Chykina	2022	This research analyzed how crypto was used during Russia Ukraine war, both to raise donation and as a tool of cross-border transaction.
8	The Energy Consumption of Blockchain Technology: Beyond the Myth	Vries	2018	This research examined the relation between crypto and energy consumption which was relevant (in the context of war) which effected global energy supply.

### Operational Definition

Number	Variables	Operational Definition
1	Use	The intensity of digital currency usage by crypto users. There are two types of usage, namely <i>mandatory</i> and <i>voluntary</i> . This research used voluntary type, which was known that the variations of usage and level of effect on user satisfaction and gave freedom for user to use or not to use this system (Nasoha, 2015).
2	System Quality	Quality with some variables in it that affect the success of information system. According to Kurniawati et al, (2022). System quality is the ability or performance of system to provide information according to user needs (DeLone & McLean, 1992). Its indicators ate system of reliability and system of flexibility.

3	Information Quality	Measuring the user-perceived value of output which was produced by crypto exchange. The characteristics of information is being <i>up-to-date</i> , accurate, useful, complete, and persentation had been described as mind determiner of information quality which was perceived (Nasoha, 2015). Information quality is quality of output that was produced by system information that used (Rai et al, 2002). Its indicators that use to measure the information quality are completeness, relevance, accuracy, and timeliness (Kurniawati et al,2022).
4	Service quality	Service quality is the result of a comprison among users for services they want and receive (Parasuraman et al, 1998). The indicator that is used to measure sevice quality are empathy and presentation format of information.
5	User Satisfaction	User respons eon usage of information system (Jogiyanto, 2007: 23). Indicators that was used to measure the success of crypto exchange applicatiion were user convenience, response time, and satisfaction oof information.
6	Intention To Use	An alternative measurement that is useful in saveral contexts and it is an attitude, while usage is a behavior (Hartwick and Barki, 1994; DeLone and McLean , 2003; Nasoha, 2015).
7	User Participation	Behaviors, assignment, and activities of users or its represent that are shown during the process of information system development (Nasoha, 2015; Jogiyanto, 2007).
8	Digital Currency	A form of digital or virtual money that relies on cryptographic techniques to secure the transactions and control the creation of new units. These currencies operate independently without central authority, using decentralized ledger technology, such as blockchain, to maintain transparency and security (Nakamoto, 2008; Catalini and Gans, 2016).

## RESEARCH METHOD

This research used secondary data from CoinMarketCap to analyze the market capitalization and trading volume of cryptocurrencies from 2018 to 2024. The data included the ten largest digital currencies based on market capitalization. This analysis was conducted by looking at trends of marketcap growth and trading volume, and the changing of digital currency ranking from year to year.

## RESULTS

Table 3. Crypto Marketcap and Trading Volume

Year	Market cap	Volume (24 H)
2018	\$111,350,771,279.19	\$13,235,897,230.39
2019	\$176,078,373,794.53	\$68,090,680,462.82
2020	\$633,421,735,388.73	\$223,379,011,026.96
2021	\$1,877,073,632,871.68	\$95,357,611,189.71
2022	\$683,548,616,931.14	\$35,860,891,078.84
2023	\$1,390,302,375,877.73	\$64,659,948,682.07

2024	\$2,847,785,520,377.13	\$127,394,092,132.67
<b>Total</b>	<b>\$7,719,561,026,520.13</b>	<b>\$627,978,131,803.46</b>

Table 3 presents the development of cryptocurrency market capitalization and 24-hour trading volume from 2018 to 2024. The data indicate a generally upward trend in both indicators, demonstrating the increasing importance of cryptocurrencies within the global financial ecosystem. Market capitalization represents the total value of all cryptocurrencies circulating in the market, while trading volume reflects the level of market activity and investor participation. Together, these indicators provide a comprehensive overview of the growth and dynamics of the cryptocurrency market over time.

In 2018, the total cryptocurrency market capitalization was recorded at **USD 111.35 billion**, with a 24-hour trading volume of **USD 13.24 billion**. At this stage, the cryptocurrency market was still relatively small compared to traditional financial markets. Although Bitcoin and several major cryptocurrencies had already gained international recognition, adoption remained limited and market participation was dominated by individual investors and technology enthusiasts. Regulatory frameworks governing cryptocurrencies were also still developing in many countries, contributing to uncertainty and market volatility.

A significant increase was observed in 2019, when market capitalization rose to **USD 176.08 billion**, representing an increase of approximately 58% compared to the previous year. Trading volume experienced an even stronger growth, reaching **USD 68.09 billion**. This increase suggests growing investor confidence and a broader acceptance of digital assets as an alternative investment instrument. During this period, cryptocurrency exchanges expanded their services globally, making crypto assets more accessible to retail and institutional investors.

The upward trend continued in 2020, when market capitalization surged to **USD 633.42 billion**, while trading volume reached **USD 223.38 billion**. This remarkable growth can be attributed to several factors. First, the COVID-19 pandemic accelerated digital transformation across various sectors, encouraging greater adoption of digital financial technologies. Second, expansionary monetary policies implemented by many governments and central banks increased liquidity in global markets, prompting investors to seek alternative assets with higher return potential. As a result, cryptocurrencies became increasingly attractive as speculative and investment assets.

The cryptocurrency market reached one of its highest levels in 2021. Market capitalization increased dramatically to **USD 1.88 trillion**, almost three times the value recorded in 2020. This period marked a milestone in the evolution of the cryptocurrency industry, as several major corporations and institutional investors began incorporating digital assets into their investment portfolios. The growing popularity of decentralized finance (DeFi), non-fungible tokens (NFTs), and blockchain-based applications also contributed to the rapid expansion of the market. Although the trading volume recorded in 2021 was **USD 95.36 billion**, lower than the 2020 figure, the substantial increase in market capitalization indicates that asset values rose significantly due to strong investor demand and positive market sentiment.

Despite the strong growth recorded in previous years, the cryptocurrency market experienced a substantial decline in 2022. Market capitalization dropped to **USD 683.55 billion**, representing a decrease of approximately 64% compared to 2021. Similarly, trading volume fell to **USD 35.86 billion**. Several global events contributed to this

downturn. Geopolitical tensions arising from the Russia–Ukraine conflict increased uncertainty in financial markets worldwide. At the same time, rising inflation rates prompted central banks, particularly the United States Federal Reserve, to implement aggressive interest rate hikes. These policies reduced market liquidity and encouraged investors to move toward safer investment instruments. Furthermore, several high-profile failures within the cryptocurrency industry weakened investor confidence and intensified market volatility. Consequently, both market valuation and trading activity declined significantly during this period.

The market began to recover in 2023. Cryptocurrency market capitalization increased to **USD 1.39 trillion**, while trading volume rose to **USD 64.66 billion**. This recovery reflects the gradual return of investor confidence following the market correction experienced in 2022. Improved regulatory clarity in several jurisdictions, continued technological innovation in blockchain applications, and growing institutional interest contributed to the positive performance of the cryptocurrency market. Investors increasingly viewed the market correction as an opportunity to re-enter the market, leading to renewed trading activity and asset accumulation.

The strongest performance during the observation period was recorded in 2024. Market capitalization reached **USD 2.85 trillion**, while trading volume increased to **USD 127.39 billion**. This achievement indicates that the cryptocurrency market not only recovered from the previous downturn but also surpassed its earlier peaks. The substantial increase in market value and transaction activity demonstrates the growing maturity of the cryptocurrency ecosystem and the increasing integration of digital assets into the broader financial system. The approval of various crypto-related financial products, greater institutional participation, and advancements in blockchain technology further strengthened market growth. These developments suggest that cryptocurrencies are increasingly being recognized as a legitimate component of global investment portfolios.

Overall, during the 2018–2024 period, the cryptocurrency market accumulated a total market capitalization of **USD 7.72 trillion** and a total trading volume of **USD 627.98 billion**. These figures illustrate the enormous scale of economic activity generated by cryptocurrency transactions. The consistent growth observed over the long term indicates that cryptocurrencies have evolved from a niche technological innovation into a significant segment of the global financial market. Although the market remains susceptible to economic shocks, geopolitical events, and regulatory changes, its long-term growth trajectory demonstrates increasing investor acceptance and market resilience.

From a public finance perspective, the substantial value of cryptocurrency transactions creates significant opportunities for governments to generate tax revenue. As the number of cryptocurrency users and transaction volumes continue to increase, the potential tax base associated with digital asset trading also expands. Consequently, effective taxation policies and regulatory frameworks are necessary to ensure compliance, reduce tax avoidance, and optimize government revenue collection from cryptocurrency-related activities. The large market capitalization and trading volume observed in recent years suggest that cryptocurrency taxation may become an increasingly important component of national fiscal strategies in countries that have adopted regulations governing digital assets.

## **DISCUSSION**

The findings reveal that the cryptocurrency market experienced remarkable growth between 2018 and 2024, despite facing substantial fluctuations caused by global economic and geopolitical events. The continuous increase in market capitalization and trading volume demonstrates that cryptocurrencies have evolved from a niche financial innovation into a significant component of the global financial ecosystem. The total cryptocurrency market capitalization during the observation period reached approximately USD 7.72 trillion, while total trading volume amounted to USD 627.98 billion, highlighting the substantial economic value generated by digital asset transactions.

One of the most notable findings is the persistent dominance of Bitcoin (BTC) and Ethereum (ETH) throughout the study period. Bitcoin consistently maintained the highest market capitalization from 2018 to 2024, while Ethereum remained in the second position. This result suggests that investors continue to perceive these two cryptocurrencies as the most reliable digital assets despite the emergence of numerous competitors. The strong market position of Bitcoin and Ethereum can be attributed to their first-mover advantage, widespread adoption, strong network effects, and extensive institutional support. The findings support previous studies suggesting that established cryptocurrencies tend to retain their market leadership because investors perceive them as relatively safer compared to newly introduced digital assets.

The study also demonstrates that the cryptocurrency market is highly dynamic and competitive. While Bitcoin and Ethereum maintained their leading positions, several cryptocurrencies experienced significant changes in ranking over time. Tether (USDT), Binance Coin (BNB), Solana (SOL), Terra (LUNA), Avalanche (AVAX), and USD Coin (USDC) emerged as major players during different periods. The rise of these cryptocurrencies reflects investors' growing interest in alternative blockchain ecosystems, decentralized finance (DeFi), stablecoins, and innovative technological solutions. In particular, the growing prominence of stablecoins such as Tether and USD Coin suggests that investors increasingly seek assets capable of preserving value during periods of market uncertainty. This phenomenon became particularly evident after the COVID-19 pandemic and during periods of heightened market volatility.

The results further indicate that the COVID-19 pandemic significantly influenced cryptocurrency market development. Prior to the pandemic (2018–2019), the market exhibited relatively moderate growth, with Bitcoin maintaining clear dominance and limited competition among alternative cryptocurrencies. However, during and after the pandemic, cryptocurrency adoption accelerated substantially. Market capitalization increased from USD 176.08 billion in 2019 to USD 633.42 billion in 2020, eventually reaching USD 1.88 trillion in 2021. This surge can be explained by increased digitalization, expansionary monetary policies, and growing investor interest in alternative investment opportunities during periods of economic uncertainty. As traditional financial markets experienced instability, many investors diversified their portfolios by allocating funds to digital assets, contributing to the rapid growth of the cryptocurrency market.

These findings are consistent with previous research conducted by Corbet et al. (2020), who argued that the COVID-19 pandemic increased volatility within cryptocurrency markets due to heightened global uncertainty. Similarly, Conlon and McGee (2020) found that although Bitcoin was initially perceived as a potential safe-haven asset during periods of crisis, its performance remained highly sensitive to broader market conditions. The findings of this study suggest that cryptocurrencies function neither as entirely

independent assets nor as perfect safe havens. Instead, their performance appears closely linked to global economic sentiment and investor confidence.

Another important finding concerns the significant market correction observed in 2022. Both cryptocurrency market capitalization and trading volume declined sharply during this period. Market capitalization fell from USD 1.88 trillion in 2021 to USD 683.55 billion in 2022, while trading volume decreased from USD 95.36 billion to USD 35.86 billion. This contraction can be associated with multiple external factors, including the Russia–Ukraine conflict, rising inflation, increasing interest rates, and broader macroeconomic instability. These events reduced investor risk appetite and encouraged capital movement toward more traditional and less volatile assets. The findings support the argument that cryptocurrency markets remain highly sensitive to macroeconomic shocks and geopolitical uncertainty despite their decentralized nature.

Nevertheless, the recovery observed in 2023 and 2024 demonstrates the resilience of the cryptocurrency market. Market capitalization rebounded to USD 1.39 trillion in 2023 and further increased to USD 2.85 trillion in 2024, while trading volume reached USD 127.39 billion in 2024. This recovery suggests that investor confidence gradually returned as economic conditions improved and regulatory frameworks became clearer in many jurisdictions. Furthermore, increased participation by institutional investors and major technology companies contributed to strengthening market legitimacy and encouraging wider adoption of cryptocurrencies. The recovery also indicates that cryptocurrency markets have become more mature and capable of adapting to adverse economic conditions compared to earlier stages of development.

From the perspective of information systems success, the growth of cryptocurrencies can be explained through several critical factors. First, system quality plays a crucial role in attracting and retaining users. Major cryptocurrency exchanges such as Binance and Coinbase provide reliable, secure, and user-friendly platforms that facilitate efficient transactions. According to the DeLone and McLean Information Systems Success Model, system quality significantly influences users' perceptions and behavioral intentions. Second, information quality contributes to decision-making effectiveness. Accurate and real-time information regarding prices, market capitalization, and trading volume enables investors to evaluate market opportunities more effectively. Third, service quality enhances customer satisfaction through responsive support and reliable transaction services. Together, these factors influence user satisfaction, which subsequently encourages continued platform usage and long-term participation in cryptocurrency markets.

The ranking analysis further illustrates the evolutionary nature of the cryptocurrency ecosystem. The emergence of cryptocurrencies such as Solana, Terra, and Avalanche demonstrates that technological innovation remains a major driver of market competition. New blockchain platforms that offer faster transaction speeds, lower transaction costs, and enhanced scalability can rapidly attract investors and challenge existing market leaders. However, the collapse or decline of some projects also highlights the risks associated with speculative investment and technological uncertainty within the digital asset sector. Consequently, market rankings remain highly dynamic and subject to rapid changes driven by innovation, regulation, and investor sentiment.

Finally, the findings have important implications for policymakers and tax authorities. The substantial increase in cryptocurrency market capitalization and trading volume indicates that digital asset transactions represent a growing source of potential tax revenue. As cryptocurrency adoption continues to expand globally, governments face increasing pressure to establish effective taxation frameworks that balance innovation with

regulatory compliance. Well-designed regulations can enhance investor protection, improve market transparency, and generate additional public revenue without hindering technological development. Therefore, understanding cryptocurrency market dynamics is essential not only for investors and financial institutions but also for policymakers seeking to integrate digital assets into modern economic and fiscal systems

## **CONCLUSION**

This research showed that the success of digital currency particularly crypto exchange is influenced by various factors that include in DeLone and McLean Model. System quality, information quality, and service quality are key factors that influence user's satisfaction and intention to keep using crypto exchange platform. In addition, the fast-changing dynamic of crypto market with the arrival of new crypto mean that the competition in this market is very high.

In Indonesia, although crypto market keep ngrowing, the public understanding about digital currency still need to be improved. Therefor it needs more research and education to encourage participation of public in crypto market.

COVID pandemy has brought significant change in crypto market, the increasing of volatility and interest on digital asset are bigger. Bitcoin and Ethereum still dominate crypto market, the arrival of new coins and the growth of stablecoins show high dynamic and competition in crypto market. The instability of global economy and war give significant impact on crypto market, but market shows resilience and recovery significantly in 2023 and 2024.

In other word, war can affect crypto trading, includes the increasing of volatility, capital flight, the impact of fiat currency, the fluctuation price of energy, and the changing of regulation. Crypto can play role as tool to protect wealth, to make cross-border transaction, and to avoid capital control during crisis. However, these impacts are not always linier and can be variative depend on the context of conflict, government policies, and market sentiment.

Further studies are needed to understand deeply how war can affect crypto market, especially by considering historical data and quantitative analysis.

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## **DECLARATION OF CONFLICTING INTERESTS**

The authors have declared no potential conflicts of interest concerning the study, authorship, and/or publication of this article.

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