

# Adoption of Bitcoin as a payment method: An empirical investigation of UK Small and Medium Businesses

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**Abstract**— From the introduction of Bitcoin in 2008 by Satoshi Nakamoto, the cryptocurrency ecosystem can be seen as a disintermediating and disruptive technology which has incited huge growth of the fintech space over the last decade with an estimated 12,000 currencies in circulation. The growth of cryptocurrency is unprecedented and there is a world-wide increase in the number of companies that are accepting digital assets such as crypto currencies for transactional as well as other investment purposes. Despite the innovativeness of cryptocurrencies and the use of public, decentralised ledger through the underlying blockchain technology, small and medium businesses have been slow at adopting it. While several studies have looked at uptake of cryptocurrencies by using quantitative methods, there is a lack of studies employing qualitative data for exploring concepts and themes associated with the adoption of cryptocurrencies. The aim of this study is to uncover the qualitative factors that contribute to the adoption of cryptocurrency, e.g. Bitcoin, as a payment. Furthermore, researchers have paid attention to the adoption of this technology globally and very few studies focus specifically on public adoption and not much heed is given on determinants of cryptocurrency adoption especially among Small and Medium Enterprises (SMEs) and Micro SMEs (MSMEs). Using a sample of 75 SMEs/MSMEs in the UK, this study applies Leximancer qualitative tool to analyse the narrative data and identify the pivotal technology adoption factors. The UK has been chosen for this study as the Government has an ambition to make UK the “global hub for cryptoassets”. More specifically, the report by FCA showed that 2.3 million individuals in the UK owned cryptocurrencies in 2021 and this was estimated to grow further. This research has empirical and practical contributions related to the understanding of how users adopt new technologies in their own organizations. The findings show that social influence and benefits of the technology play an important role in adoption of Bitcoin, while regulation and lack of knowledge act as detriments in the adoption decision of business users.

**Keywords**— adoption of Bitcoin, Payment, Small and Medium Enterprises (SMEs), qualitative data, Leximancer concept map, users' behavior, United Kingdom.

## I. INTRODUCTION

The emergence of new technologies has implications for how customers and organizations carry out transactions in business environments. There is a huge focus on flexibility and convenience from the customers while businesses look at cost and time efficiency. These are seen as drivers of technology acceptance in business settings in general and more specifically for payment platforms [1]. Businesses often aim to minimize costs through avoiding or even eliminating middlemen where possible while ensuring business operations continue smoothly. As such, Decentralized

Finance (DeFi) technology “enables financial transactions and interactions happen by eliminating or marginalizing the need for traditional intermediaries” [2]. Cryptocurrencies are seen as a reflection of this emerging financial system because it promises cheaper, faster transactions that are peer-to-peer while ensuring efficiencies in asset transfers using protocols supported by the blockchain. In traditional markets, transactions are slower and more expensive considering the number of intermediaries. This is especially true in the case of cross-border payments that are not transparent, riddled with uncertainties, liquidity blockage and risk of frauds [3]. In a digital currency market, these inefficiencies are removed, while transaction time and costs are decreased. Furthermore, security of transactions is provided by the distributed ledger technology (DLT) which offers immutability of transactions, anonymity and privacy [4], with transactions being efficient and straightforward [5]. To this end, adopting cryptocurrency is appealing because: “users get to control their own money” [6]. Despite its appeal, the adoption of cryptocurrencies alone cannot be a panacea for all financial inefficiencies of the centralized, traditional markets or enable businesses to completely overcome issues such as economic rents that particularly have a huge impact on Small and Medium Enterprises (SMEs) [7]. Nevertheless, it is still imperative to explore the factors of adoption of cryptocurrencies among SMEs considering their need for digital transformation [8], highlighting the opportunities and challenges of such adoption [9] and to fill in the dearth of research in this domain [10]. The diffusion of cryptocurrency payment is particularly relevant for understanding UK SMEs sector because the HM Treasury in April 2022 announced its regulatory approach to DLTs and cryptocurrencies, emphasizing the government's intention to facilitate the regulation and adoption of cryptocurrency and stablecoins, including exploring how it can regulate DeFi loans. As such Kalifa Report on UK Fintech (2021) [11] emphasizes that UK government regulations should (a) focus on delivering better outcomes to SMEs and (b) maintain the UK's position as the best place in the world for cryptocurrencies.

Considering these, this paper answers the question: what are the determinants driving UK Micro/Small and Medium Enterprises (MSMEs/SMEs) accepting cryptocurrencies as a payment method? The empirical occasion for answering the research question is represented by primary data that has been piloted on 75 UK SMEs across different sectors.

While researchers have used several quantitative methods to test and validate the factors that drive users' behavior, there are few studies that use qualitative methods to explore factors pertaining to adoption of cryptocurrencies payments [6]. This research thus employs a qualitative tool, Leximancer, to

unfold the factors that contribute to understanding the adoption of cryptocurrency payment through presenting a conceptual map. This paper contributes to a better empirical and practical understanding of cryptocurrency adoption among small businesses while highlighting how cryptocurrency payment adoption would impact organizational outcomes. The results from the paper support several factors that are presented in the literature that influence organizational decision to adopt Bitcoin including lack of knowledge (technical), uncertainties around regulation (role of Government) and volatility (market-price). The pilot study helps to evaluate the current benefits and drawbacks that SMEs perceive while adopting cryptocurrency payments and identifies future research directions.

## II. DATA AND SAMPLE

Data was collected through semi-structured interviews that were conducted between October – December 2022 to explore the determinants of adoption. The timeline is interesting and important as this comes after the HM Treasury announcement for making the UK a global hub for cryptocurrencies, with the economic secretary to the treasury saying, “Above all, we want to position the UK as a pro-innovation jurisdiction... which is attractive to inward investment, and to firms who don’t yet have a settled base” [11]. Further commitment from the government and its stance as a pro-crypto, pro-innovation hub has been evidenced by the Financial Conducts Authority collaborating with business and industry partners to run the crypto sprints that enabled the Government to obtain inputs on policy reviews.

The interviews lasted for 40 minutes on average and participants were small and medium enterprises in and around London who accepted bitcoin as a payment method. Prior to the interview, socio-demographic details such as the industry in which the organization operates on, the gender of the business owner, education, age-range were collected. Considering factors outlined in the technology adoption literature [3, 5, 14, 15, 16, 17], the interview questions focused on perceived usefulness, perceived ease of use, trust, role of the government/regulation and social influence. Prior to conducting the research, ethical approval was obtained through the University Research Ethics Committee.

**Sample:** The sample includes SMEs/MSMEs that accept cryptocurrency payments in the UK. The definition of SMEs/MSMEs is taken from the guidance given by the Foreign, Commonwealth and Development Office (FCDO), UK where SMEs are defined as firms with a headcount of 250 or less and with a turnover of less than EUR 50 million. The sample includes 75 participants that have knowledge of bitcoin as a payment methodology as suggested in prior studies [18]. A purposeful sampling has been used in this study to ensure that cases are selected deliberately, with the goal that they would elicit responses from participants that can be deemed “information rich” [19][28]. First, the list of retailers in the UK that accept bitcoin as a payment method was obtained through a web crawler – this bot was written using Python code to scan the internet with predefined search terms including “retailers accepting bitcoin payments London”, “London retail cryptocurrency payment”, “pay with bitcoin + London”. Once a systematic search was done with the bot, the webpage links was returned by Google’s

SERP (Search Result Page). The next step was to obtain the list of retailers, and this was semi-automated where in the first step Python code using Beautiful Soup library was written to identify the retailers along with the name of the retailer, their address, phone numbers and email address [29]. In the second step, manual cleaning of the data was done and where data was not available, the records were removed. There were 103 retailers identified at this stage [30]. Next, large businesses (over 50 million Euro turnover) were removed and there were 92 businesses on the list that were SMEs/MSMEs. These businesses were contacted, and their consent was obtained for conducting interviews. 75 businesses consented to be part of the research [31].

Specifically, the sample is balanced and comprise of different types of organizations that operate in varied industries including advertising, off-licence/convenience stores which accounted for the highest participation (13.3%) followed by retail/e-commerce stores accounting for 10.67%. Other industries represented includes veterinarian clinics, small and private clinics, tattoo shops, boutique (small) retail stores, solicitors, advertising companies [32].

A sector analysis of the sample shows a significant variation across industries which contributes to the richness of the collected data (Figure 1) and showcases that varied perceptions that businesses have. Looking at the number of employees 32 businesses had 1-10 employees, 10 businesses had between 11 and 50 employees, 13 businesses had between 51 and 100 employees, 15 businesses had between 101 and 150 employees and 5 businesses had more than 150 but less than 250 employees. All businesses had a turnover of 500,000 GBP or less annually. Most of the participants were female as shown in the table 1.

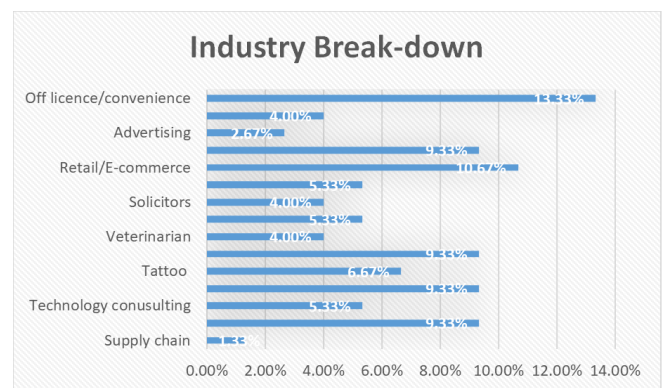


Figure 1: Industry breakdown of participants

Male	26
Female	34
Non-binary/third gender	15

Table 1: Gender break-down of participants

### III. ANALYSIS AND RESULTS

The interviews were analysed using the Leximancer tool that has been used by several researchers in varied contexts [20, 21, 22, 23,33]. This analytical tool was used to pinpoint the overall concepts that were referred to by the interview participants and to see how these concepts connected through the use of concept maps. The use of Leximancer also provides a novel insight through the use of semantic networks that maps the experiences that the respondents share. The software also uses probabilistic models that bring out the concepts or the thematic composition that the textual data brings and also allows the researcher to decide on whether it should be supervised or unsupervised [24]. This study used an unsupervised approach considering that this was exploratory in nature thereby relying on a data-driven approach, thereby avoiding any researcher bias [25]. The only intervention done was removal of stop words and merging synonymous words such as crypto, crypto currency.

The analysis showcased four prominent clusters as shown in Figure 2. The themes from the interviews are represented as bubbles and the concepts are the connecting words clustered together [26]. The size of the bubble is significant in explaining the relative importance of the theme as highlighted by the interviewees and the position of the bubbles in the map indicate proximity of the concepts and how they are inter-related.

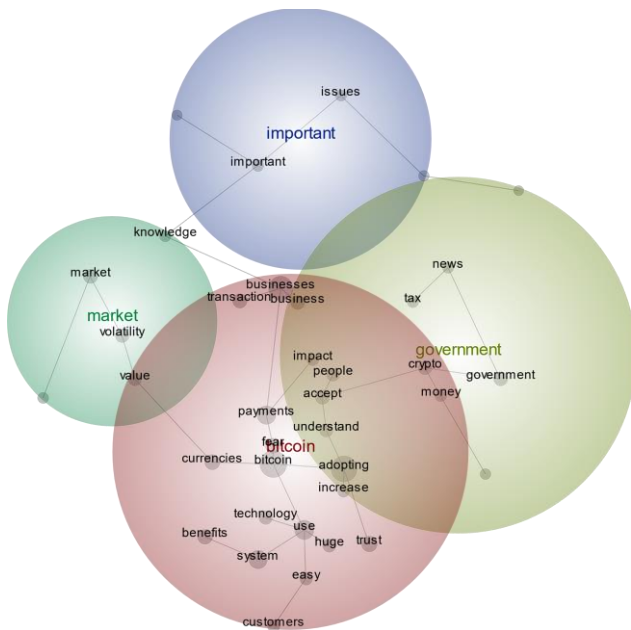


Figure 2: Leximancer map showing 4 themes.

#### A. Theme 1: Bitcoin- Motivation and benefits of adoption

The first theme was around bitcoin adoption and where the key concepts included trust, novelty of technology, ease of use, sense of community, social and peer influence. For instance, one interviewee [INT015] discusses about social influence saying, “Social and peer influence is what motivates small and micro business owners adopt. They fear something bad will happen if their peers accept cryptocurrency and they don’t”. Adoption of bitcoin payments according to another interviewee [INT032] brings a “Sense of belonging to a community, good conversation starter”. This is also corroborated by [INT021] who says, “It is not just about novelty of the technology, it is the huge influence someone

else – be it friends, family, support groups, acquaintances, clients, customers using it or the fear that not adopting might lead to being eliminated from the social system”. The factors of ease of use, the flexibility it provides to businesses are also highlighted in this theme and [INT002] says bitcoin provides, “Faster transactions, flexibility of exchange rates, when prices go up, it’s great”. Similar to this, [INT019] says, “it is easier and cheaper to convert to any other currency, faster cross-border payments”.

#### B. Theme 2: Role of Government

The second theme that was highlighted was the role of government agencies and how regulatory frameworks facilitate or hinder cryptocurrency adoption. This theme focussed on issues of taxation and government policy, although the views expressed had more of a negative sentiment. For instance, one of the interviewees [INT009] says, “Lots of government departments having different views. They keep changing their mind especially in the UK”. In line with this this, [INT034] says, “Government policy has a huge impact on adoption. For example, in the UK, the government says that crypto assets have unique identity – not everyone understands this. It is not your conventional payment; it is not the regular investment and if it is unique then tax becomes confusing because it means that it depends on different factors. To fall trap to any of these issues, businesses avoid adopting it”.

#### C. Theme 3: Markets

The third theme discussed was around “economic markets” concerning topics like risk, volatility. The level of risk that participants were willing to take was reflected in their decision to convert to other currencies and this is highlighted when [INT021] says, “I didn’t have to keep the bitcoin as bitcoin. The payment can instantly be converted into GBP without waiting, so essentially, I get back the value of what is being sold without having to fear that market volatility will impact me”. On the other hand, [INT003] says, “I believe market volatility is good – I wait, take a bet on the markets going up always”. This sentiment is also reflected by [INT019] who says “better rates if you are able to capture the market volatility and benefits of bitcoin hedging”.

#### D. Theme 4: Issues

The final theme was clustered around the factors that were hinderances to adoption of cryptocurrencies by businesses. The concepts included in this theme were knowledge, security and finding information sources. For instance [INT056] says, “Reading a few news headlines doesn’t make someone an expert” arguing that there are so many people or “consultant” who claim to know everything, but smaller businesses struggle to find the right source of information. In line with this, [INT033] says, “Businesses, especially small ones don’t have the expertise or knowledge. So, it is important to ensure businesses are equipped with the right knowledge. Provide them with good sources of information”. Moving on to the point of security, [INT043] points out, “Not being aware of issues related to security, safety of wallets, what you are, and you aren’t protected against is important. You read lots of news and suddenly don’t think your decisions on adopting the currency is good”.

#### IV. DISCUSSIONS AND CONCLUSION

With the technological landscape evolving rapidly and businesses both large and small taking up cryptocurrencies, the related environments in which organisations operate also change. Through this research, the factors that facilitate and hinder businesses from adopting bitcoin payments were identified. Factors such as social influence or wanting to feel part of the community and a sense of belonging are seen to be drivers of cryptocurrency adoption along with ease of use, flexibility, cheaper and faster transactions. On the other hand, lack of awareness about the technology as well as the regulatory landscape, mixed messages from government agencies and lack of support for MSME/SMEs to find the right information about cryptocurrency holdings are seen to detriment businesses from adopting it as a payment method.

The empirical setting of UK was chosen for this research given how UK is a leader in emerging technology and the UK Digital Roadmap clearly outlines how varied government organisations and agencies are providing support to support the organisations big and small. Furthermore, it can be said that the UK has a regulatory system that can be considered to be less fragmented and its commitment to regulatory standards is higher. An advantage that UK has over other nations is its expertise in the fintech sector and the availability of skills and talent. As highlighted in the role of governments from the findings, the potential for cryptocurrencies cannot be undermined and Governments can embrace it but to be able to do so requires significant efforts to standardise language and to ensure that the end users (individuals and businesses) understand the repercussions of the regulatory environment.

The learnings from the UK can be applied to other developed and developing economies to bring together varied stakeholders in the cryptocurrency ecosystem, ensure better coordination and help remove obstacles for SMEs to adopt cryptocurrencies. The digital assets and the cryptocurrency domain is ever changing at a rapid pace. This poses huge challenges for the regulators across different countries and regulators are grappled with how the technology can be regulated. This is evident from the lack of clear international approach – bitcoin payments in particular and cryptocurrencies at large require an international approach given their “borderless” nature. When regulations across countries or even within the countries are inconsistent, this creates further challenges for businesses to adopt such innovations. This study shows that while there are significant benefits, there is still a lack of understanding of the technology and uncertainties surrounding regulations impacting mass adoption to happen at a slower pace. While there are benefits of adoption, there should be steps taken to ensure that the regulation is future-proofed, balanced and proportionate thereby not stifling innovation, growth or resilience of SMEs. While prior research on bitcoin/cryptocurrency adoption have used several models and quantitative methodology, this research has adopted a qualitative approach to delve further into identifying specifically what perceptions of small business owners about the adoption and provided a concept map of these factors of adoption.

#### Limitations and way ahead

While the research has contributed to furthering the understanding on cryptocurrency adoption as a payment method for SMEs, limitations need to be acknowledged. First, this research applied cross-sectional design for this study

which limited the ability to observe any further modifications of factors that can alter adoption decisions of SMEs. Future research can look at how intention adoption changes over time and apply longitudinal design. Second, our study did not collect information about regional placements of organisations in the UK. This might add further interesting insights on how geographic dispersal of firms might have an effect on the adoption behaviour of business users.

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#### REFERENCES

- [1] Al-Amri R, Zakaria NH, Habbal A, Hassan S. Cryptocurrency adoption: current stage, opportunities, and open challenges. *International journal of advanced computer research*. 2019 Sep 1;9(44):293-307.
- [2] Vasudevan S. DeFi: A risky business or silver bullet for SMEs?. In *2022 International Conference on Cyber Resilience (ICCR) 2022 Oct 6 (pp. 1-5)*. IEEE.
- [3] Abbasi GA, Tiew LY, Tang J, Goh YN, Thurasamy R. The adoption of cryptocurrency as a disruptive force: Deep learning-based dual stage structural equation modelling and artificial neural network analysis. *Plos one*. 2021 Mar 8;16(3):e0247582.
- [4] Zhang JY. The Rise of Market Concentration and Rent Seeking in the Financial Sector. *The Harvard John M. Olin Fellow's Discussion Paper Series*. 2017 Apr 25(72).
- [5] Buhalis D, Harwood T, Bogicevic V, Viglia G, Beldona S, Hofacker C. Technological disruptions in services: lessons from tourism and hospitality. *Journal of Service Management*. 2019 Oct 4;30(4):484-506.
- [6] Dehghani M, Kennedy RW, Mashatan A, Rese A, Karavidas D. High interest, low adoption. A mixed-method investigation into the factors influencing organisational adoption of blockchain technology. *Journal of Business Research*. 2022 Oct 1;149:393-411.
- [7] Frizzo-Barker J, Chow-White PA, Adams PR, Mentanko J, Ha D, Green S. Blockchain as a disruptive technology for business: A systematic review. *International Journal of Information Management*. 2020 Apr 1;51:102029.
- [8] Kergroach S. SMEs going digital: policy challenges and recommendations.
- [9] Ma W, Huang K. *Blockchain and Web3: Building the cryptocurrency, privacy, and security foundations of the metaverse*. John Wiley & Sons; 2022 Aug 19.
- [10] Mahjoub YI, Hassoun M, Trentesaux D. Blockchain adoption for SMEs: opportunities and challenges. *IFAC-PapersOnLine*. 2022 Jan 1;55(10):1834-9.
- [11] Kalifa R. Kalifa Review of UK Fintech. Independent report on the UK Fintech sector by Ron Kalifa OBE, Policy Paper. London: HM Treasury.[Google Scholar]. 2021.
- [12] Molnar A. SMARTRIQS: A simple method allowing real-time respondent interaction in Qualtrics surveys. *Journal of Behavioral and Experimental Finance*. 2019 Jun 1;22:161-9.
- [13] Carpenter TP, Pogacar R, Pullig C, Kouril M, Aguilar S, LaBouff J, Isenberg N, Chakroff A. Survey-software implicit association tests: A methodological and empirical analysis. *Behavior research methods*. 2019 Oct;51:2194-208.
- [14] Folkinshteyn D, Lennon M. Braving Bitcoin: A technology acceptance model (TAM) analysis. *Journal of Information Technology Case and Application Research*. 2016 Oct 1;18(4):220-49.

- [15] Taherdoost H. A critical review of blockchain acceptance models—blockchain technology adoption frameworks and applications. *Computers*. 2022 Feb 8;11(2):24.
- [16] Polites GL, Karahanna E. Shackled to the status quo: The inhibiting effects of incumbent system habit, switching costs, and inertia on new system acceptance. *MIS quarterly*. 2012 Mar 1:21-42.
- [17] Davis FD. Technology acceptance model: TAM. Al-Suqri, MN, Al-Aufi, AS: *Information Seeking Behavior and Technology Adoption*. 1989:205-19.
- [18] Gökalp E, Gökalp MO, Çoban S. Blockchain-based supply chain management: understanding the determinants of adoption in the context of organizations. *Information systems management*. 2022 Apr 3;39(2):100-21.
- [19] Patton MQ. *Qualitative research & evaluation methods: Integrating theory and practice*. Sage publications; 2014 Oct 29.
- [20] Vasudevan S, Piazza A, Carr M. Qualitative Factors in Organizational Cyber Resilience. In 2022 International Conference on Cyber Resilience (ICCR) 2022 Oct 6 (pp. 1-5). IEEE.
- [21] Byun H, Chiu W, Won D. The Voice from Users of Running Applications: An Analysis of Online Reviews Using Leximancer. *Journal of Theoretical and Applied Electronic Commerce Research*. 2023 Jan 18;18(1):173-86.
- [22] Yigitcanlar T, Agdas D, Degirmenci K. Artificial intelligence in local governments: perceptions of city managers on prospects, constraints and choices. *AI & SOCIETY*. 2023 Jun;38(3):1135-50.
- [23] Kaushal V, Yadav R. Learning successful implementation of Chatbots in businesses from B2B customer experience perspective. *Concurrency and Computation: Practice and Experience*. 2023 Jan 10;35(1):e7450.
- [24] Smith AE, Humphreys MS. Evaluation of unsupervised semantic mapping of natural language with Leximancer concept mapping. *Behavior research methods*. 2006 May;38:262-79.
- [25] Sotiriadou P, Brouwers J, Le TA. Choosing a qualitative data analysis tool: A comparison of NVivo and Leximancer. *Annals of leisure research*. 2014 Apr 3;17(2):218-34.
- [26] Conrad RA. Media coverage of crises faced by higher education institutions. University of Nevada, Reno; 2011.
- [27] Rawat, R. (2022) A SYSTEMATIC REVIEW OF BLOCKCHAIN TECHNOLOGY USE IN E-SUPPLY CHAIN IN INTERNET OF MEDICAL THINGS (IOMT). *International Journal of Computations, Information and Manufacturing (IJCIM)*, 2(2).
- [28] SRAIDI , N. (2022) STAKEHOLDERS' PERSPECTIVES ON WEARABLE INTERNET OF MEDICAL THINGS PRIVACY AND SECURITY. *International Journal of Computations, Information and Manufacturing (IJCIM)*, 2(2).
- [29] Kasem, J., & Al-Gasaymeh, A. (2022). A COINTEGRATION ANALYSIS FOR THE VALIDITY OF PURCHASING POWER PARITY: EVIDENCE FROM MIDDLE EAST COUNTRIES. *International Journal of Technology, Innovation and Management (IJTIM)*, 2(1).
- [30] Qasaimeh, G. M., & Jaradeh, H. E. (2022). THE IMPACT OF ARTIFICIAL INTELLIGENCE ON THE EFFECTIVE APPLYING OF CYBER GOVERNANCE IN JORDANIAN COMMERCIAL BANKS. *International Journal of Technology, Innovation and Management (IJTIM)*, 2(1).
- [31] T. M. Ghazal, M. K. Hasan, H. M. Alzoubi, N. A. Al-Dmour, A. Alsuwaidi and Y. Agha, "The Application of HCI in Industry and IT," 2022 14th International Conference on Mathematics, Actuarial Science, Computer Science and Statistics (MACS), Karachi, Pakistan, 2022, pp. 1-4, doi: 10.1109/MACS56771.2022.10022662
- [32] El khatib, M., Al Abdooli, K., Alhammadi, R., Alshamsi, F., Abdulla, N., Al Hammadi, A., Alzoubi, H. M., & Alshurideh, M. (2023). The Role of Distance Learning Technology in Mitigating Unknown-Unknown Risks: Case of Covid-19. In *The Effect of Information Technology on Business and Marketing Intelligence Systems* (pp. 551–567). Springer.
- [33] Ravikumar, R., Kitana, A., Taamneh, A., Aburayya, A., Shwede, F., Salloum, S. and Shaalan, K. (2022) "The Impact of Big Data Quality Analytics on Knowledge Management in Healthcare Institutions: Lessons Learned from Big Data's Application within The Healthcare Sector", *South Eastern European Journal of Public Health (SEEJPH)*. doi: 10.11576/seejph-6194.