Cryptocurrency – A Rising Coin or a Falling Star? – Analysis of Experts, Public Opinions and Scientific Literature with Text Mining Approaches.

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Abstract

It is a well-known phenomenon that technology, information, and applications are becoming integrated into many facets of daily life, such as the purchase and use of goods and services, remote learning via websites like Zoom, telemedicine, and autonomous driving. The use of digital applications for financial transactions also applies to traditionally conservative businesses like banking. Due to lockdowns and prohibitions on physical contact, the COVID-19 epidemic has expedited the spread of digital wallets even further. Despite this development, the popularity and potential of cryptocurrencies, a digital form of money, are still up for debate among experts and academics. By evaluating scientific research and consumers attitudes toward the adoption of such currency, this study tries to gauge public perceptions of cryptocurrency use and determine if consumers tendency to adopt cryptocurrency through digital wallets will continue to rise or if the increase in its usage will also expose the fear of digital abuse by criminals, thus impacting the tendency of people to transfer into more conventional applications and alternatives. The discussion also includes the study's conclusions and their implications.

Keywords: Cryptocurrency; Cryptocurrency abuse; Fintech services, Peer to Peer.

INTRODUCTION

When computers were first employed for scientific and military objectives in the middle of the 20th century, digital technologies started to be widely adopted. This eventually results in international cooperation and communication. The widespread use of personal computers and the development of the internet in the 1990s opened up new possibilities for e-commerce and the digital economy.

People could communicate and conduct business wherever they were because to the development of wireless networks and mobile devices in the 2000s. Digital technologies were being adopted more quickly as a result of the COVID-19 epidemic in order to continue social and commercial activities during lockdowns and social seclusion measures. Digital technology has since let remote employment, online education, telemedicine, and virtual entertainment to blend into society. Additionally, cryptocurrency was seen as a novel form of digital asset.It was stand out among digital technologies because it is developed directly by and between peers without the intervention of manufacturers or central intermediaries. The first instance of cryptocurrency being used by a person or group of people was when the bitcoin was first released in 2009 under the pseudonym Satoshi Nakamoto. Only a limited number of enthusiasts and tech-savvy people first embraced Bitcoin as a substitute for conventional payment methods and as a store of value. Bitcoin and other cryptocurrencies are becoming more popular over time due to their efficiency for quicker and less expensive transactions compared to conventional payment methods.

The dangers and difficulties connected to cryptocurrencies, including as market volatility, regulatory uncertainty, and cybersecurity threats, must be evaluated against the advantages. The first significant hack of a Bitcoin exchange, which resulted in the theft of thousands of bitcoins, happened in 2011. Bitcoin's price reached over $1,000 in 2013 before falling sharply, costing many investors to lose their investment. The skyrocketing price of cryptocurrencies in 2017 eventually attracted regulatory scrutiny, fraud, and scams, which ultimately resulted in a large market correction in 2018.

As a result, the impact and implications of the adoption of cryptocurrencies are complicated, necessitating ongoing evaluation and discussion among all stakeholders. Their divergent points of view could cause misunderstandings and mistrust in a field where cooperation and trust are valued. It is crucial to encourage a more inclusive approach to the adoption to this type of digital technology and promote communication and understanding among stakeholders in order to prevent polarization and conflict, which will stifle crypto-dynamism.

Because of their unique characteristics, academics, professionals, and individuals (the public) have arguably had a considerable influence on the development of the cryptocurrency sector.

For the most part, academics use meticulous research, empirical data, and peer-reviewed papers to comprehend and explain the phenomenon of cryptocurrencies, while professionals use their knowledge and skills to create useful managerial solutions for the cryptocurrency sector. To engage in the cryptocurrency economy, people might rely on their own subjective opinions, secondhand accounts, media reporting, and social media content.

When they hold divergent opinions, the differences may encourage productive debate and discussion to better understand the phenomenon of cryptocurrencies, but they can also result in misunderstandings and sluggish adoption and development of cryptocurrencies as well as the polarization of opposing camps, which breeds hostility and animosity between stakeholders.

Therefore, it is crucial for academics, professionals, and individuals to be aware of and comprehend each other's opinions and work toward a common understanding of cryptocurrencies in order to prevent harming the developing field of cryptocurrencies. By doing so, it can increase the potential advantages of cryptocurrencies while lowering their hazards.

To the best of our knowledge, there is very little or no academic research on the differences in viewpoints among academics, professionals, and individual stakeholders in a particular industry. We fill this gap by doing the following study: *Do academics, professionals, and regular consumers have the same opinions about the advantages, risks, and different sorts of solutions offered by the cryptocurrency industry?*

Specifically: the research lies with the following **research questions**:

1. Which factors affect the tendency of the public to adopt cryptocurrency and how they are reflected in scientific literature.
2.a. What current attitudes toward cryptocurrency exisits among individuals?
2.b. What are the concerns of indivduals related the cryptocurrency use (that can be mitigated in order to increase the potential use of cryptocurrency among the public)?
3. Is the experts' outlook on the future of cryptocurrency in line with the attitudes of individuals (the public)?

To answer these questions, we carried out an analysis of 1. Scientific papers corpora collected from the Web of Science (WoS) databases. 2. Cryptocurrency attitude data of users using existing questionnaires sourced from Mendeley's repository. 3. Expert opinion data on cryptocurrency as presented in TED videos, which were transcribed to text. Our research indicates that the general public has not yet fully embraced cryptocurrency, but it has the potential to become a widely used digital currency in various fields, gradually replacing traditional forms of money.

The remaining of the paper is structured as follows. In chapter 2, we review the literature on cryptocurrency and its evolution as a digital currency among the public. In chapter 3 we present the research methods, that are used to show consumer's sentiment trends and attitudes towords cryptocurrency adoption and usage. In chapter 4 we present the deployment of the the research methos for the presentations of the study's findings and their implications. Finally, in Chapter 5 we present the discussion and conclusions of the current stuy. In chapter 6 we present the limitations and future direction of this study.

LITERTURARE REVIEW

Initially known as "cypherpunks," cryptocurrencies were created in the 1990s to safeguard privacy on the internet as information became widely accessible. The public primarily used these digital currencies for buying and selling in virtual online stores. Exchange platforms like Binance, Coinbase, and Bitstamp were utilized for purchasing and reselling. Today, cryptocurrencies come in many forms, including Litecoin, dogecoin, dash, Monero, and the first and most renowned one, Zcash. The concept of using cryptocurrency as a digital coin instead of physical money was first introduced in the paper "Bitcoin: A Peer-To-Peer Electronic Money System" by S. Nakamoto in 2008. A year later, the first "block" of Bitcoin laid the foundation for anonymous online transactions without relying on government or third-party verification mechanisms. Each transaction was encrypted and listed chronologically in a series of "blocks." However, as time went on, it became clear that many transactions were still voluntary and untraceable, making cryptocurrencies illegal in several countries. While some countries regulate the currency, such as France, converting cryptocurrency movements to euros is subject to taxation.

The percieved value and the adoption of cryptocurrency by consumers.

According to the literature, cryptocurrencies offer several advantages to customers over physical currencies due to their open, decentralized, peer-to-peer network. These benefits include easy transferability with low transaction fees and an increasing adoption rate among individuals and professionals (Zutshi et al., 2021). However, these digital currencies also have "negative" impacts that are primarily exploited by cyber criminals. For instance, money laundering and tax evasion in the dark web are facilitated by the untraceable nature of bitcoins, which poses a challenge for law enforcement agencies (Paesano, 2022). Additionally, cryptocurrencies like bitcoins are used to pay ransom in cases of ransomware virus attacks.

The literature has explored the perception and adoption of cryptocurrency attributes in recent years. For instance, Gagarina et al. (2019) conducted a linear regression analysis of 262 participants aged 17-30 and found that belief and confidence in using cryptocurrency depend on one's belief in its potential to become a suitable payment instrument. Positive attitudes towards the financial system also lead to a

positive belief in the currency, while a negative attitude towards money or the government reduces willingness to adopt it.

Similarly, Almajali et al. (2022) studied 1000 active Facebook users in Jordan and used SEM analysis to reveal that subjective norms, perceived risk, perceived usefulness, perceived enjoyment, perceived ease of use, and trust all have a positive impact on the intention to use cryptocurrency. However, perceived risk, perceived usefulness, perceived enjoyment, and perceived ease of use do not influence users' intention to adopt cryptocurrency for daily use.

Chen et al. (2022) investigated the adoption of cryptocurrency in Malaysia by analyzing data from 295 respondents who use the digital currency. They used a PLS-LSM approach to analyze the correlation between independent variables such as social influence, transparency, price value, traceability, attitude, and customer satisfaction, which served as a mediator variable. The authors found that social influence, price value, traceability, and attitude were highly correlated with the tendency to adopt cryptocurrency, while transparency was the most critical and negatively influencing element. These findings indicate that the adoption of cryptocurrency in the digital market in Malaysia depends on the customer's satisfaction, understanding, and acceptance of the advantages and disadvantages resulting from using the new crypto currency in the country.

Similarly, Schaupp et al. (2022) demonstrated that users' intention to adopt new technologies can be explained through the Theory of Planned Behavior model presented by Davis et al. (1989), Venkatesh et al. (2004), and later used by Hung et al. (2006). This model emphasizes that attitudes, perceived behavioral control, and subjective norms influence individuals in their decision to adopt new technologies. However, the authors found that the model explained only 63.5% of the variance to adopt new cryptocurrency for transactional usage. Therefore, additional factors should be analyzed to understand how this cryptocurrency is perceived and adopted among consumers.

Another study by Anser et al. (2020) explored the impact of contextual and psychological variables that predict individuals' behavioral intentions toward adopting cryptocurrency. Through the analysis of questionnaire data from 443 respondents in China, the authors found that cryptocurrency usage is positively associated with users' intentions through their attitudes, subjective norms, and perceived behavioral control. The individuals' perceived risk was found as a moderator on the relationship between the intentions of individuals and their actual behavior.

Namahoot and Rattanawiboonsom (2022) conducted another study on 456 respondents in Thailand by collecting questionnaire-based data, which showed a significant positive influence of perceived usefulness, perceived ease of use, innovativeness, attitude, and perceived risk on cryptocurrency platform adoption. Similar to Hung et al. (2006), the authors only managed to explain 62.9% of the variance in the intention to use the cryptocurrency platform among the respondents.

Hasan et al. (2022) also found that the intention of using cryptocurrency among Pakistani students is supported by the TPB model. Nevertheless, the authors mention that additional variables such as effort expectancy, performance expectancy, hedonic motivation, and price volatility of cryptocurrency may play an important role in the impact of individuals' intention to adopt cryptocurrency.

Recently, Cristofaro et al. (2023) found through structured equation modeling (SEM) analysis of data extracted from a survey delivered in the U.S. and China among 2,352 respondents that financial literacy does not have an influence on users' intention to use cryptocurrencies compared to the other explored variables (attitude, subjective norms, perceived behavioral control, and herding behavior), which all have a positive impact on the user's intention.

The literature review shows that although some important variables and models used to explore the indicators related the attitudes and individual's intention to use cryptocurrency, the impact of experts on individual's perceptions through various social media platforms is still lack in many studies.

For this reason, the objective of this study is to demonstrate how sentiment analysis of the views expressed by cryptocurrency experts on the adoption and usage of this currency can help bridge the existing gap in this area. Text analysis tools will be used to accomplish this goal.

RESEARCH METHODOLOGY

Data Sources

The data sources in the study was based on three types of sources: 1. Collection of academic papers from the Web of Science (WoS) that are relevant to our topic, and 2. Two databases published in MendeleyTM. One of these databases was created by Platt et al. in 2023 (platt al., 2023) that contains information on Nigerian people's attitudes toward cryptocurrency, while the other was developed by Zhu and Qinan in 2021 (Zhu and Qinan., 2021) and contains tweets related to bitcoin usage attitudes and future price. 3. Videos from the Ted^{TM} platform (https://www.ted.com/) featuring cryptocurrency experts discussing the future of this currency.

Scientific Corpus & Ted Data Analysis

The process of analyzing the scientific corpus and Ted data entails utilizing text mining tools to process and examine large volumes of written and spoken content about cryptocurrencies. This analysis involves various techniques such as sentiment analysis and document embedding to uncover patterns and trends and gain insights into individuals' and groups' attitudes and behaviors towards cryptocurrency adoption and usage. This analysis is vital to comprehend the present situation of cryptocurrency adoption and to identify factors that might influence its future development and growth.

Analysis of the scientific corpus

The scientific survey was extracted using the InCites Web of Science (WoS). The corpus was based on scientific academic papers published in peer-reviewed journals and conference proceedings. Each paper was examined in accordance with Sardi et al. (2017), both by using a topic modeling approach and manually to verify that they are relative to the current field domain. Following the guidelines of Gheyas and Abdallah (2016), a systematic literature corpus collection was performed for the period between 2012 and 2022. The search was configured by the graphical search combo box and contained the following editions:

- Science Citation Index Expanded (SCI-EXPANDED): 1993–present
- Social Sciences Citation Index (SSCI): 1993–present
- Arts & Humanities Citation Index (AHCI): 1993–present
- Conference Proceedings Citation Index–Science (CPCI-S): 1990–present
- Conference Proceedings Citation Index—Social Science and Humanities (CPCI-SSH): 1990–present
- Emerging Sources Citations Index (ESCI): 2015–present

The keywords "cryptocurrency attitude" and/or "adoption" were utilized to conduct a search for relevant papers. The text was then analyzed using Ornage^{TM} software, employing two key features: 1) identifying frequently occurring and prominent words associated with cryptocurrency adoption; and 2) using sentiment analysis in combination with topic modeling to gain insight into the public's overall attitude and concerns towards the use of cryptocurrencies.

Analyzing data obtained from Ted Videos.

35 interview podcasts featuring experts were downloaded from the Ted Site (https://www.ted.com/). The selection process for these podcasts involved three criteria: 1) Relevance to cryptocurrencies; 2) Demonstration of a professional attitude by the experts on the subject; and 3) Credibility of the hosting platform among listeners. Out of a total of 1,220 hours of cryptocurrency-related interviews and discussions, only 35 podcasts met these criteria and were selected for analysis. The podcasts were translated into text and subjected to text mining tools. Analysis was performed in the same manner as the Scientific Corpus one.

Findings

The findings suggest that there is a relatively low number of publications related to cryptocurrencies, with only 17 out of 24 papers focusing on cryptocurrency adoption or usage between 2016 and 2023. However, there was a significant increase in the number of publications in 2022 compared to previous years (as shown in Figure 1). It is worth noting that most of the papers (5 out of 17) were from the fields of economics and management (as indicated in Figure 2). A word cloud analysis revealed several important keywords, including use, factors, perceived, adoption, adopting behavior, behavioral, blockchain, attitude, technology, trust, influence, payment, digital, and controls. Notably, adoption, user perception, intention, and behavior were the most commonly observed themes (Figure 3). The experts data that was analyzed with Ornage reveiled 4 main clusetrs whose common features were Still under doubt (green), Authentication and regulation (purple), Rapid development and still under adoption and exposure to people (Blue Light). Table 1 shows that sentiment analysis concerning public viewpoints on cryptocurrency is overwhole Neutral (78%) compared to those of the experts which is Positive (84%) (Table 1 & 2).

Discussion

The research findings show that cryptocurrency is considered as a currency that might be percieved as a rising coin. Anlysis of experts an d public opinions as well as scientic corpus exhibits that the currency is perceived as positve currency among experts whose sentiment to it is quite positive. In comparison the data that was based on public opinions in malezia and england show that it is still a currency in "question" i.e., the tendency to adopt it is still under question and people are tend to be neutral to adopt it for their day to day purposes. Concerns among the public are mainly related to government contro and legisltation, the currency safety and usefulness.

Implications

The research findings may be used for future resaerch, in which attitudes and adoption behavior among consumer will be tested through quantiative and qualitaitve questioners in different countries, thouse that are more modern and have a westren culture compared with those that are still considered as developed countries. Such comparison could contribute more insight to the future of cryptocurrencies adoption and attitude among consumers.

Future Research and Limitations

The current study was aimed at evaluating attitudes toward cryptocurrency through adoption and usage. The study had shown that cryptocurrency is perceived as being of importance to many users due to the convenience of handling digital money in the modern world. Although, according to an analysis of individual sentiment, it is still perceived as a currency that might not be safe for usage, there has been an increase in its influence and a tendency for individuals to use it in the future. The same trend is reflected in the analysis of experts. Yet, the current study has some limitations. 1. The sample size related to individuals is based on a specific market of individuals from Malesia and England. 2. The data related to the experts is based on only 35 Ted videos, and it is suggested that in future studies it will be elaborated. In addition, the findings of the research were not correlated with the theory of planned behavior (TPB) model. This model should be included and evaluated in comparison and adequacy with additional analysis methods as shown in this paper for the improvement and implementation of the theory of adoption and consumption of new products.

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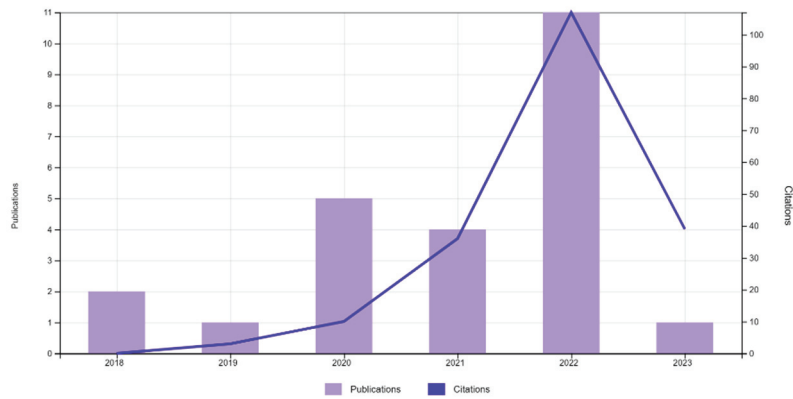
Figures

Figure 1: Analyzing scientific papers related to cryptocurrency in the Web of Science (WoS).

Figure 2: Visualization of scientific papers related to cryptocurrency across various academic disciplines (WoS).

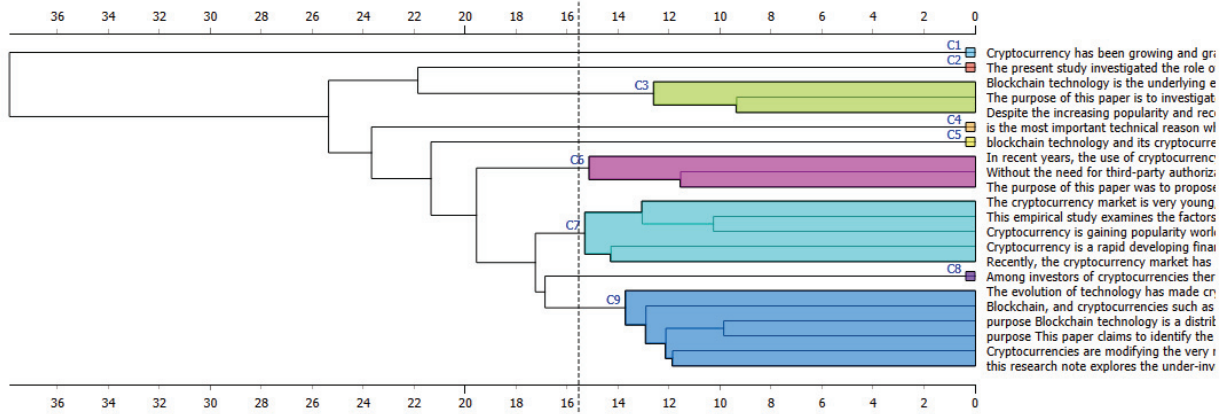*Figure 3: Word cloud of prominent words in the WoS corpus*

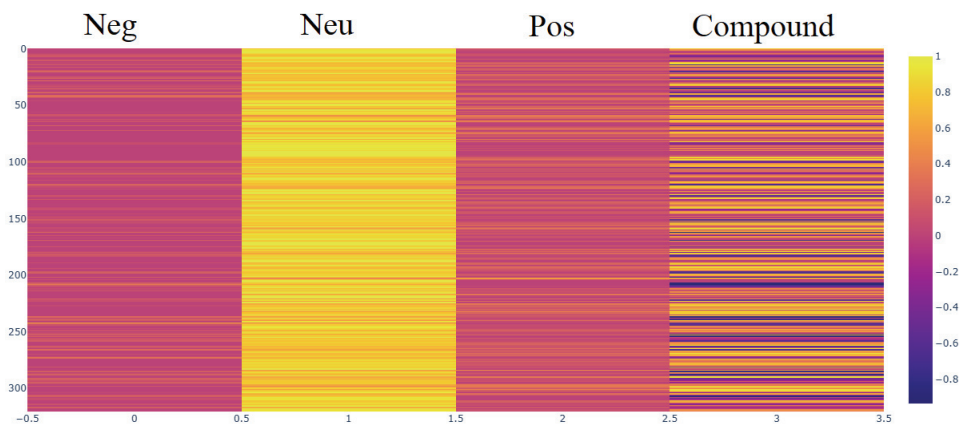*Figure 4: Hierarchical Clustering to Scientific Corpus (WoS).*

Figure 5: Sentiment analysis concerning people's viewpoints on cryptocurrency.

Sentence #	Sentiment Type		Sentiment Type		Sentiment Type		Overwhole Sentiment Type
1	neg	0.036	neu	0.84	pos	0.124	0.6705
2	neg	0	neu	0.908	pos	0.092	0.5261
3	neg	0.036	neu	0.909	pos	0.055	0.1779
4	neg	0.102	neu	0.794	pos	0.104	0.0258
5	neg	0.122	neu	0.83	pos	0.048	-0.6369
6	neg	0	neu	0.754	pos	0.246	0.8856
7	neg	0.078	neu	0.922	pos	0	-0.7096
8	neg	0.27	neu	0.73	pos	0	-0.6486
9	neg	0.104	neu	0.839	pos	0.057	-0.7194
10	neg	0.317	neu	0.683	pos	0	-0.891
11	neg	0.157	neu	0.707	pos	0.136	-0.1779
12	neg	0.11	neu	0.776	pos	0.114	0.1027
13	neg	0.167	neu	0.803	pos	0.03	-0.9186
14	neg	0	neu	0.721	pos	0.279	0.836
15	neg	0.161	neu	0.811	pos	0.028	-0.8885
16	neg	0.212	neu	0.73	pos	0.058	-0.802
17	neg	0	neu	0.721	pos	0.279	0.836
18	neg	0.072	neu	0.598	pos	0.329	0.9601
19	neg	0.054	neu	0.892	pos	0.054	0
20	neg	0.04	neu	0.796	pos	0.165	0.9421
Total		0.1019		**0.7882**		0.1099	-0.0215

Table 1: The embedded expert content underwent hierarchical clustering

Sentiment Type	Value
Negative	0.059
Neutral	**0.84**
Positive	0.10
Compound	0.152

Table 2: Sentiment Analysis related to public opinion about cryptocurrency

Appendix A: Example of Crypto-threats and -challenges mentioned by experts

Difficulty level	Different crypto-hazards and sample of quotes.
Individual	**Hacking into crypto account-** (Gus Dimitrelos) "This year, I've done more cryptocurrency fraud investigations than all other years combined. It's because that's where the money is today."
	Locked out from wallet- (Amir Bandeali) "Investors are finding that the system's high-security makes it easy for them to get locked out. Currently, there are more than 3 million bitcoins that have been lost, according to blockchain tracking company, Chainalysis. Since bitcoin was created in a way that makes its supply finite, that means that 14 percent of the currency could be gone for good."
	Scams / Thefts- (Philip Raymond) "They're less than one in the number of stars in the universe. So there are inherently built in safety features However, that doesn't mean you can't be scammed. It doesn't mean that there are people who are not trying hard to infect your computer and figure out what you're doing and get access to your wallet."
	Ponzi Schame- (Caitlin Kiska) "We're also seeing a lot of different emails asking users to kind of participate in Ponzi scheme. saying, you need to pay money, so we can tell you how to invest in Bitcoin and makes money as well."
	Crypto Mining attacks (Caitlin Kiska) "A trend towards seeing more crypto mining based attacks…This coin mining attacks are very under-reported as a whole, but so if you're elapses documented just between Q3 and Q4 (in 2020 GK), and this is really when there was a huge spike in Bitcoin. There was a 53%. Increase in coin mining attacks. "
	Coin seller copied password- (Amir Bandeali) "[That's] because people's keys are a long string of numbers and letters, and if you typed in one wrong character, it's unlikely that you actually found another key. In reality, the person was probably defrauded by whomever convinced them to send his or her coins… This is the newest rendition of fraud."
	Installing malware in wallet- (Norbert Pohlmann) "Most important here is a remote validation function and we have to protect the wallet. The wallet is quite important because if you own the wallet you can manipulate the blockchain. And we have to be sure that the blockchain application is malware free."
	Crypto-jacking- (Michael Nadeau) "Cryptojacking is the unauthorized use of someone else's computer to mine cryptocurrency. Hackers do this by either getting the victim to click on a malicious link in an email that loads crypto mining code on the computer, or by infecting a website or online ad with JavaScript code that auto-executes once loaded in the victim's browser. Either way, the crypto mining code then works in the background as unsuspecting victims use their computers normally. The only sign they might notice is slower performance or lags in execution."
	Lack of human contact/ Validation process- (Paul Lee) "The lack of tying the validation of an actual human to a Bitcoin address or, sorry, a crypto address has been a problem."
Organization	**Ransom/ RaaS-** (William Kraus) "Ransomware is still big - it's effective because they get money. One of the biggest problems, of course, is that in the US we have guidance with the FBI and others that say don't pay that ransom. But for many companies if they don't have good backups, they have no choice. And right now you're also getting what we call double extortion. And that is not only do they encrypt your data and require money for you to get it back. But they also threaten to release it to make it publicly available. And that has huge implications."
	(Caitlin Kiska) "2020 was by far the most prolific year of ransomware attacks. We have seen it's saddening, tensely, disturbing trend within our industry and as humans by our very nature."
	DOS attacks- (Allot comp) "DDoS extortion (RDoS or ransom-driven DDoS) campaigns have become very common and are driven, in part, by their ability to use cryptocurrency payments, which make it difficult for investigators to track the money as it flows from victims to criminals. The tactic is the following: cybercriminal blackmails organizations by asking them to pay Bitcoin to avoid their site or service being disrupted by a DDoS attack. Many hackers are motivated by the potential for financial gain and the ease at which such attacks can be performed. Extortion is one of the oldest tricks and one of the easiest ways for hackers to profit."
	Certificate hacking- (Jake Yocom-Piatt) "You were pretty frustrated about the central risks that everything faced, including certificate authorities, and that was one of the first things that raised your eyebrow about how vulnerable the internet and certificates were... So way back in 2011, Dutch certificate authority called DigiNotar was actually hacked and as well as Komodo and the hackers who claimed to have done an offense when they hack into the local side. And definitely from DigiNotar, the hacker issued certificates... He essentially owns the product and see all the communications for this issue, which is pretty be concerned"
National/Inter national	**Money Laundering-** (Christine Lagarde) "The result is a potentially major new vehicle for money laundering and the financing of terrorism. One recent example reveals the scope of the problem. In July 2017, an international operation led by the United States shut down AlphaBay, the largest online criminal marketplace on the internet. For more than two years, illegal drugs, hacking tools, firearms, and toxic chemicals were sold all over the world through AlphaBay. Before the site was taken offline, more than $1 billion had been exchanged through crypto-assets."
	(Seth D. DuCharme) " my understanding is cryptocurrency, like any other instrumentality of wealth, any other tool of wealth transfer, can be used both for money laundering and sanctions evasion.
	Illegal payments- (Allot comp) "Due to their anonymous nature, cryptocurrencies play an essential role in the underground economy. They are used for most criminal-to-criminal (C2C) payments on Darknet forums and marketplaces. Around $76 billion

of illegal activity per year involves Bitcoin1, and by 2021 Cybersecurity Ventures predicts that more than 70 percent of all cryptocurrency transactions will be for illegal activity. Also, many hackers demand payment from victims for attacks, such as ransomware or DDoS extortion, in cryptocurrencies (V2C – victim-to-criminal)."

(Anne M. Termine)- "Clearly the word sanctions and the agency OFAC became a conversation with the Russia war on Ukraine. And within that, there was a lot of fraud, I should say about crypto and crypto companies. Maybe being used to avoid those sanctions? "

(Seth D. DuCharme) "My understanding is cryptocurrency, like any other instrumentality of wealth, any other tool of wealth transfer can be used both for money laundering and sanctions evasion. "