



A technological readiness survey for ongoing research in a Blockchain & Cryptocurrency based framework for carbon footprint reduction.

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ABSTRACT

Blockchain & Cryptocurrency are offering promising solutions in the information domain and new initiatives are gaining popularity where various activities are synchronized with cryptocurrencies [1]. Many sustainable initiatives and cryptocurrencies are coming up with promising acceptable flavors to the ongoing crisis about climate change [2-4]. One such initiative is being investigated by the authors of this paper where carbon footprint reduction activities are undertaken by the users and in turn, they are awarded crypto after a rigorous verification and calculation of reward points. Henceforth, a survey was conducted and responses were obtained from individuals of different nations who participated and shared their valuable inputs on the present scenario highlighting expectations and knowledge. Around 39 questions were put forward in a prepared questionnaire and around 176 anonymous respondents from different nations participated. The responses were collected and analyzed to look into valuable insights regarding Carbon Footprint Reduction (CFR). This paper deals with Part 1 of the survey where the first 9 Questions were investigated and fresh opinions is brought forward.

Keywords: *Cryptocurrency, Blockchain, Survey, Climate Change, Carbon footprint reduction.*

I. INTRODUCTION

There is an urgent need for more research to be done on global warming in order to lessen its impacts. Scientists and environmentalists are collectively working to develop fresh strategies to combat it. Intelligentsia bears the burden of coming up with a worthwhile effort that can both mitigate the harmful impacts of rising temperatures and offer a means of reversing them [5]. Google searches for the term "save the environment" suddenly increased. This demonstrates unequivocally that there is a widespread awakening taking place in relation to the issues that govern life on Earth. As the environment is very precious for the existence of human life, it is time for the world's strongest species, to understand their part is to protect and ensure the planet's ecology. A technology framework that connects conscientious people and rewards them for engaging in environmentally beneficial, sustainable activities also appears to be lacking, which would entice many to everyone to actively pursue such activities. This will help change behavior in the direction of a more sustainable future [1-4, 6]. A unified framework that links with nature and revolutionizes the continuing undercurrent where people are eager to contribute to the protection of this planet's ecology is possible; given the breakthroughs in Blockchain technology and the tempting cryptocurrencies. It is crucial for us to keep in mind that we won't be able to engage in a fruitful dialogue or, better yet,

create a scenario that favors the sustainability of this planet as a massive living organism. We need to shift the environmental concerns to individuals and give them a platform to participate. Experiences from the pandemic point to the possibility of launching a mediator-backed mass movement; to inform people about the negative effects of unsustainable living and to awaken them to the need to reduce their individual carbon footprint, which can then be offset to advance a carbon-neutral scenario[5-9]. This paper consists of III sections. Section I consists of a brief introduction. The resulting survey is included in section II along with analysis, discussion and inference. Section III deals with conclusion.

II. RESULTING SURVEY

The survey study comprised 39 questions and individuals' anonymous responses to each one of them were collected. We have selected the first 9 questions as Part 1 and hereby from this point forward we will discuss each question alongside their results, and inferences are thereby discussed per question wisely.

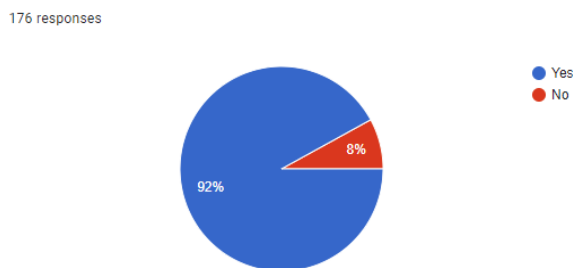
The survey questionnaire and resultant outcome are presented as graphs/tables, discussion, and inferences are discussed as follows.

Q1. Do you think advancements in technology must be used to achieve climate change targets?

In this question the options were 'Yes' and 'No', the purpose of asking this question was to enquire about the possible feasibility and need if any of a sustainable initiative that reduces carbon footprint backed by a technological framework.

Obtained inputs:

Out of total 176 responses around **92%** i.e. 162 respondents chose 'Yes' and **8%** i.e. 14 chose 'No'.



Discussion:

A large majority of individuals across all age groups agree with an outstanding majority that a technologically backed initiative must be put forth to favor the need for an initiative for better managing climate change. The majority affirms that there is a need for a sustainable initiative that is backed by recent advancements in technology.

Inference:

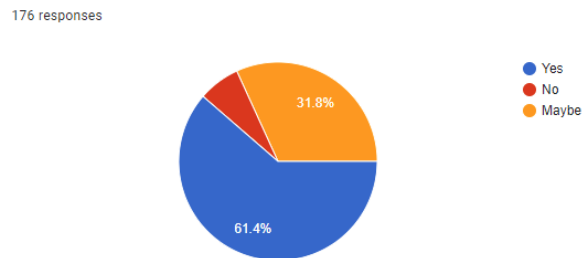
The outcome of the question affirms that individuals today hopefully look at technology to better manage climate change and are confident that such an initiative will bring forth the desired change if the technology is used at its best combination.

Q2. Would you like to take up sustainable activities that significantly reduce your carbon footprint on day to day basis, without any reward?

In this question, three options were 'Yes', 'No', and 'Maybe'. The purpose of asking this question was to enquire if people are voluntarily willing to participate individually regarding contribution or support daily towards reducing their personal carbon footprint without expecting any reward in return.

Obtained inputs:

Out of total 176 responses around **61.4%** i.e. 108 respondents chose 'Yes', **31.8%** i.e. 56 chose 'Maybe' and remaining **6.8%** i.e. 12 chose 'No'.



Discussion:

The majority of the survey respondents are confident in undertaking sustainable activities for reducing their carbon footprint on a daily basis and that too without any reward. A significant number of individuals have chosen 'Maybe' which is a supplement to 'Yes', this clearly indicates that a large segment of individuals is open to contributing their efforts for the betterment of the environment, the individuals who chose 'Maybe' may contribute if a reward is associated with the activities undertaken. Hence, it can be said that only **6.8%** of the individuals showed a non-cooperative stand towards climate change when it comes to individualistic efforts. This percentage is negligibly very low and their responses could be converted to affirmation by counseling or by an associated reward.

Inference:

The survey outcome of the question affirms that the majority of individuals are certainly ready to support towards the ongoing issue of climate change without seeking any reward which shows pure commitment and highlights the individualistic concern on the ongoing issue.

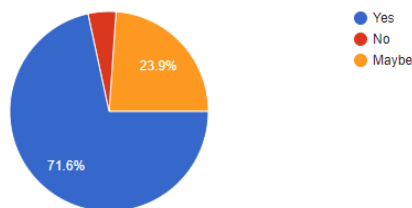
Q3. Would you like to take up sustainable activities that significantly reduce your carbon footprint on day to day basis, with some reward?

In this question three options were ‘Yes’, ‘No’, and ‘Maybe’, the purpose of asking this question was to enquire if people are voluntarily willing to participate individually in any collective movement to do their bit daily towards reducing their personal carbon footprint and specifically with expecting a reward in return.

Obtained inputs:

Out of total 176 responses around **71.6%** i.e. 126 respondents chose ‘Yes’, **23.9%** i.e. 42 chose ‘Maybe’ remaining **4.5%** i.e. 8 respondents chose ‘No’.

176 responses



Discussion:

Interestingly a majority of individuals (**71.6%**) chose to perform daily activities for reducing their carbon footprint in return for a reward; it is notable because in Q2 the majority (**61.4%**) of individuals aspired to contribute individually when no reward was promised. In Q3 there is a significant growth of **10.2%** in the number of individuals who are willing to cooperate with a reward. This clearly demonstrates that if the reward is associated with individual carbon footprint reduction activities more individuals are willing to contribute on a daily basis. In addition, **7.9%** chose 'Maybe' which may be added to the 'Yes' category making them a total of **79.5%**. The individuals not agreeing is very less, only **2.3%**.

Inference:

The survey outcome of the question affirms that the individuals are willing to contribute if there is a reward associated in return for undertaking carbon footprint reduction activities or say activities that favor the reversal of climate change. The reward mechanism

works in favor of such cases, it is psychologically proven that people are more willing to contribute if there is a reward associated with actions they are going to undertake. The underlying purpose of this ongoing research is to investigate the technological possibility of such a framework where users may be rewarded for undertaking environment-friendly activities involving a robust framework that is not only secure but efficient.

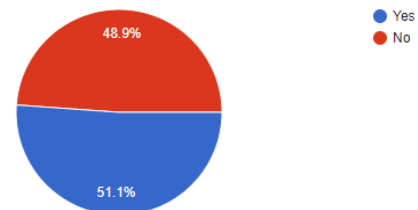
Q4. Are you aware of Blockchain technology and the benefits it can offer?

In this question two options ‘Yes’ and ‘No’ were provided, the purpose of asking this question was to get a hint of the technological awareness of the latest technologies of the participating individuals. We tried to know the acceptability of our Blockchain-based framework in terms of technological acceptance through background knowledge inquisition.

Obtained inputs:

Out of total 176 responses around **51.1%** i.e. 90 respondents chose ‘Yes’ and **48.9%** i.e. 86 chose ‘No’.

176 responses



Discussion:

Interestingly nearly **50%** of all of the respondents know about Blockchain, and as it was a random survey and as there was no control over the responses of the individuals it fairly allows one a glimpse into the modern psyche of all individuals over a random sample **50%** know what blockchains are and their benefits are apparent to half of the respondents. Also, nearly **50%** of individuals are not aware of blockchains and their benefits, it could still be alarming but it demonstrates that not all are still aware of the recent breakthrough in the information domain and computing.

Inference:

The survey results of this question affirm despite half of the participant’s positive awareness about Blockchain technology that still half of the participants are unaware of the giant space Blockchain operates in, hence it becomes necessary for the intelligentsia of the computer domain to devise solutions that make use of the latest technologies and to hide the complexity fairly from

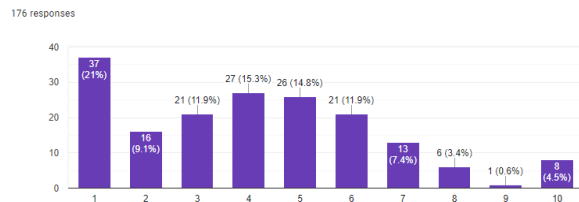
these consumers of technology so that it fairly suits everyone. Hence, it becomes a worthwhile task to be undertaken to fairly investigate user interfaces and backend technological frameworks for larger acceptance and usage.

Q5. Rate on a scale of 10 your knowledge about Blockchain technology. (1 Means - Nothing, 10 Means - Expert Level)

In this question, we asked the respondents to choose numbers on a scale from '1' (Nothing) to '10' (Expert Level) rating their knowledge about Blockchain technology. For outcome responses from '1' to '3' as No to fairly less workable knowledge and on the contrary from '4' to '10' as fairly larger knowledge about Blockchain technology was assumed.

Obtained inputs:

Out of a total of 176 responses around 42% i.e. 74 respondents endorsed the '1' to '3' rating which is No to fairly less workable knowledge of Blockchain and 58% i.e. 102 chose from '4' to '10' as fairly larger knowledge about Blockchain technology. Only 21% i.e. participants have no knowledge about Blockchain technology, the rest are aware of Blockchain at varying degrees of familiarity. It is also interesting to observe that 53.9% of participants i.e. majority lie between scale points '3' to '6'.



Discussion:

It can be stated from the outcomes obtained that most people are aware of the benefits of Blockchain technology and have interacted with information pertaining to the domain. Nearly half of the respondents have a firm background in Blockchain and surely can become ambassadors of the technology. As the people's participation will be quite fair in terms of acceptance of such a technological initiative it may be concluded that the benefits of Blockchain technology are not hidden from the masses and this technology can further be harnessed to bring about a social reform related to the ongoing issue of climate change.

Inference:

Around 80% of respondents are at varying degrees familiar with advancements in Blockchain technology and in some or other way have accessed the technology. It gives a firm background and foundation to harness this technology for the purpose of reversing climate change to a certain degree of achievement, owing to its

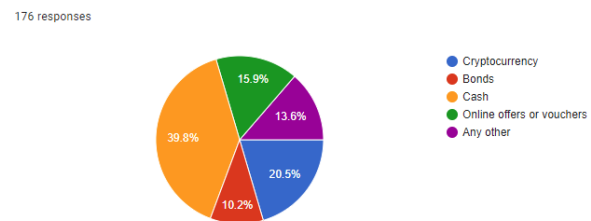
popularity it will also be a swift task to popularize this technology and market it.

Q6. Would you like to be rewarded for reducing your carbon footprint everyday?

In this question, the respondents were provided a choice of 5 options viz 'Cryptocurrency', 'Bonds', 'Cash', 'Online offers or vouchers', and 'Any other'. The aim was to enquire about the mode of reward dissemination and the top preferred form of reward payment. Given 5 options were chosen after conducting a rigorous survey of available options for reward dissemination however this is out of the scope and focus of this paper.

Obtained inputs:

Out of a total of 176 responses around 39.8% i.e. 70 respondents chose to be rewarded in form of 'Cash' as the most preferred mode of payment of reward, however cash payment is not feasible under the scope of this ongoing research due to various factors, this option was however placed strategically to understand the prevailing affection in general psyche around, demonstrably people still like to own and get paid in cash. Moving on to next most preferred mode of payment of reward points was 'Cryptocurrency' which was chosen and selected by 20.5% i.e. 36 respondents, furthermore 15.9% of respondents i.e. 28 nos. selected and chose 'Online offers & vouchers' as the preferred mode for reward transfer. The remaining 13.6% i.e. 24 nos. preferred and expected 'Any other' mode of payment which is quite interesting because it allows for a scope for further research.



Discussion:

It is evident from the outcome that just after the choice 'Cash' the most preferred mode of reward payment was 'Cryptocurrency', largely 20.5% of respondents chose to be paid in Crypto. If there is a Cryptocurrency that can be converted into cash through any mode that may also lure the 39.8% of the respondents whose preferred mode of payment was cash. A fair amount of respondents also chose 'Bonds' and 'Online offers or vouchers' which signifies that people indeed wish to be paid for the good to utilize the fruits and seek pleasure from the rewards.

Inference:

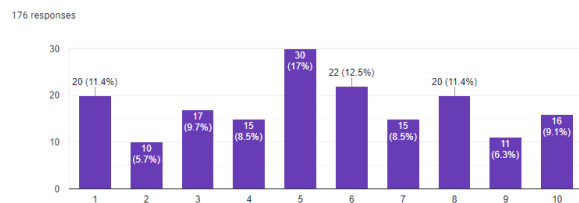
Considering the outcome it is evident that a framework to be evolved that could use Blockchain for management and Cryptocurrency for the payment of the reward. Hence, the result of this question can shed ample light on the modus operandi through which this Cryptocurrency may be made viable and available. Further, it can be observed that people still seek to be paid and own Cash rewards, the second Cryptocurrency is also welcomed preferably if it could be easily converted into cash then it could be more appreciated. This provides us with a better understanding of the functions that need to be incorporated into the said framework.

Q7. Rate on a scale of 10 your interest & liking in Cryptocurrency. (1 Means - No interest, 10 - Means Highly Interested)

In this query, respondents have to choose from a scale of ‘1’ (No interest) to ‘10’ (Highly Interested) rating of their interest & liking in Cryptocurrency. The query was placed with the intent to know about the likes of Cryptocurrency in the masses. After ‘1’ as ‘No interest’, the rest of the ratings signify varying degrees of interest in Cryptocurrency from ‘2’ to ‘10’ i.e. ‘Highly Interested’. The scope of this question answers if a New Cryptocurrency will be acceptable to the consumers given it is designed as per the flavor of the ongoing research.

Obtained inputs:

Out of a total of 176 responses around **6.3%** i.e. 11 respondents showed no interest in Cryptocurrency, which is fairly small. Maximum respondents have shown interest in Cryptocurrency at varying degrees from ‘2’ to ‘10’. It is interesting that **22.2%** of the total respondents i.e. 39 nos. chose option ‘6’, which clearly signifies that a large number of respondents have an above-average interest in Cryptocurrencies. A total of **47.8%** i.e. 84 nos. of respondents chose options from ‘5’ to ‘7’ which is a very good number as it justifies that a significant percentage of respondents have a fair knowledge about Cryptocurrencies and are more likely to either invest or own cryptocurrencies in future.



Discussion:

As it is evident from the outcome of the query that **62.5%** of respondents chose options from ‘6’ to ‘10’ which is above average

understanding to mature understanding of the term Cryptocurrency. Only **31.2%** of the respondents chose options from ‘2’ to ‘5’ which signifies that these respondents are aware of Cryptocurrencies even if they have a less technical or working knowledge. It is evident that **93.7%** of respondents were aware of the concept of Cryptocurrencies as only **6.3%** showed completely no interest in it.

Inference:

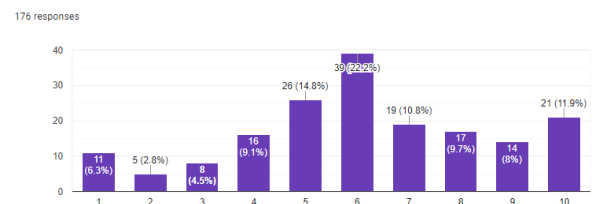
The outcome of the query affirms that there is an ongoing awakening amongst the masses about Cryptocurrencies and considering the results obtained from Q5 it can be said that a fair amount of respondents were aware of the concepts of Blockchain and Cryptocurrencies clubbed together. This further strengthens the idea that any venture that is launched in the market combining these two with climate change (Results from Q1) can yield good performance. Also, it is clearly evident from Q5 & Q7 if seen together that people are more aware of Cryptocurrencies than Blockchain. The backend foundation of any Cryptocurrency is Blockchain; this gives us a hint that people seek to associate themselves with the rewards of any technological initiative over getting deeper into the backend technology. This further enhances the need for a framework.

Q8. How bright according to you is the future of cryptocurrency on a scale of 10. (1 Means - Not Bright, 10 Means - Very Bright)

This query initiates respondents to choose from a scale from ‘1’ (Not Bright) to ‘10’ (Very Bright) rating of their insights into the future of Cryptocurrency. The key aim is to acquire views on the upcoming future of cryptocurrencies.

Obtained inputs:

Out of a total of 176 responses around **11.9%** i.e. 21 respondents justified that the future of Cryptocurrencies is ‘Very Bright’, as they chose the option ‘10’ on the rating scale. A major chunk of respondents i.e. **22.2%** (39 nos.) chose option ‘6’ which further justifies the bright future of cryptocurrency.



Discussion:

As it is evident from the results of this query that **62.6%** of respondents chose options from '6' to '10' which is above average belief in the secure future of cryptocurrencies. Only **6.3%** of the respondents chose option '1' which is 'Not Bright', which is fairly less in comparison to the other results obtained. The sure confidence in the bright future of cryptocurrencies begins from options '6' to '10', and over **60%** of the respondents are confident about it. The remaining **31.2%** of the respondents are only slightly confident about the future of Cryptocurrency and seem to be mostly confused however some of them chose option '5', which is the border value between low surety and high surety, a total of **14.8%** i.e. 26 respondents chose it, it's also a fairly good statistically.

Inference:

Predicting the future of Cryptocurrency is an ardent task for people involved in Crypto trading and exchange. The persistence of Crypto Currencies in near future is debatable. The outcome justified that majority of the respondents have faith in the positive future of cryptocurrencies and believe that Cryptocurrencies are going to stay in near future as well. This strengthens our research idea to investigate the future and framework for a Cryptocurrency reward-based carbon footprint reduction mechanism.

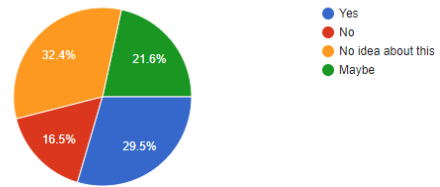
Q9. Do you think all governments must legalize Cryptocurrency?

The query initiate respondents to choose from four options viz. 'Yes', 'No', 'No idea about this', 'Maybe' The aim is to know the people's views on the government's role in legalizing or regularizing Cryptocurrency. Should governments across the globe come up with a formal charter to legalize Cryptocurrency or it should remain an uncharted domain? This question was placed strategically after Q8 which enquired about the perspectives on the future of Cryptocurrency, we sought to enquire what the respondents think a government must do when it comes to Cryptocurrency, also this question's results will help us to identify the niche area where we can focus more accurately and investigate for any sort of collaborations with governments.

Obtained inputs:

Out of the total 176 responses **32.4%** i.e. 57 respondents chose 'No idea about this' and a total of **16.5%** i.e. 29 respondents chose the option 'No'. **29.5%** of respondents i.e. 52 nos. chose the option 'Yes', **21.6%** of respondents i.e. 38 nos. are unsure about whether cryptocurrencies must be legalized by governments or not and hence they chose the option 'Maybe'.

176 responses



Discussion:

As it is evident from the results of this question that **32.4%** i.e. 57 respondents chose 'No idea about this', this indicates that these respondents have not updated their knowledge regarding the ongoing debate across almost all countries whether there is a role for government in sustaining Cryptocurrencies or not. A total of **16.5%** i.e. 29 respondents chose the option 'No' which clearly indicates (a) They deliberately want no interference of government in the subject as it could lead to taxation or other legal formalities to come up. (b) They are informed about the Crypto domain and wish to keep it decentralized and unregulated. This also strengthens that the respondents which chose the option 'No' are very aware of cryptocurrencies. Moving further, **29.5%** of respondents i.e. 52 nos. chose the option 'Yes', which means they seek governments to legalize cryptocurrencies so that Cryptocurrencies may create their own market and can be used to trade as fiat currency. Also, this indicates that these respondents are aware that once cryptocurrencies are legalized taxes may be levied upon them but will come with superlative freedom to use cryptocurrencies in regular trade, commerce, and individual payments. Furthermore, **21.6%** of respondents i.e. 38 nos. are unsure about whether cryptocurrencies must be legalized by governments or not and hence they chose the option 'Maybe', which indicates that these respondents do not have a firm opinion (either Yes or No) about the matter of legalization of Cryptocurrency, but seemingly are mostly aware of cryptocurrencies and the benefits it can offer, also it indicates that these respondents can own a Cryptocurrency in any of the cases, either legalized or not.

Inference:

Governments across the globe are pondering upon their role in the ongoing debate about cryptocurrencies [8, 9] and are discussing at various levels of government the stance they need to foretake when it comes to Cryptocurrency. Cryptocurrencies are decentralized and don't have formal authority or control over them. The mechanism is such that it leaves no one's single control over it, but still some countries either are relaxing the use of Cryptocurrencies or are taking up firmer stances by legalizing and bringing the profits from Cryptocurrency exchange under taxation. The results from this Question gave us a hint about the ongoing projections about the theme, if we only take up pure 'Yes' and 'No', the total responses

reach **46%**, which is clearly indicative of the clarity these respondents have.

III. CONCLUSION

The main takeaway of this part of the survey i.e. Part-I assures that the technological understanding of today's youth and their concerns about climate change are looking out for a solution to manage the ongoing issue technologically. It is a growing concern internationally to bring up technological advancements ahead and work and to lend a tool to the majority of youths to participate individually and make a change as soon as possible. We took this survey to gather present information and ground reality of how a technological initiative that can connect individuals globally and makes them perform carbon footprint reduction activities on a day-to-day basis. Our survey has resulted in providing us with fruitful insights and has considerably increased our confidence to further research this solution and present our ideas in more research papers or intellectual properties.

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