Digital Wallets and the Impact on Socio-Economic Aspirations

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Abstract:

Recent developments in technology confirm the positive impact of decentralised finance and digital wallets in improving many Environment, Social and Governance (ESG) initiatives, namely carbon emissions reduction and financial inclusion, which are both necessary for inclusive growth. The aim of this paper is to understand how digital wallets are making such an impact, by supporting the economic goals of lowering carbon emission across the globe and supporting financial inclusion in developing nations. This paper specifically examines the direct impact of both digital and crypto wallets in impacting socio-economic aspirations.

Keywords

Digital wallets, blockchain, cryptocurrency, ESG, financial inclusion, environment, social, governance, sustainable economic growth, mobile money, carbon trading, decentralization, emission reduction, artificial intelligence; information security; UN sustainable development goals; UN SDGs; carbon trading; dApp

What is a Digital Wallet?

A digital wallet (or e-wallet) is a software application that stores payment information, additional credentials as well as passwords for payment methods, such as credit cards and bank accounts. Some act like bank accounts as well, and store value, so no need for separate payment tools like credit cards anymore or even bank accounts. Users can complete purchases easily and safely with strong and encrypted technology. These wallets have been in wide circulation for over 10 years now.

Digital wallets differ from digital payments apps and retailer apps:

- Digital payments apps, such as Venmo, allow businesses and consumers to make and receive payments digitally. Unlike a digital wallet, they do not provide for the ability to store additional credentials, beyond payment cards, that could be of great value when making transactions or conducting everyday tasks.
- Retailer apps, such as the Walmart Pay, allow consumers to browse for goods at the select retailer and purchase goods through a payment instrument, such as a credit/debit card or gift card. Unlike digital wallets, retail apps only work at that specific merchant. Additionally, retail apps do not allow users to store additional credentials beyond store-specific or payment cards.

Digital payments using digital wallets.

Payment innovations are offering incredible convenience to most, yet not to all. But this convenience also raises concerns not only about the safety of our payments and our personal data, but also about how the already marginally poor may get even more excluded from the economy. Governments are looking to both foster safer payments innovation as well as to prioritize efforts to enhance economic mobility and resilience, particularly for the poorest segment of the populations.

The benefits of digital wallets to effect payments also bring inherent risks, such as:

- Privacy: digital wallets bring innovation, but this innovation has led to a proliferation of data: personal information is no longer "personal", and policymakers are wanting to ensure that consumers understand their liability and consent.
- Resiliency: each payment node is an opportunity for malicious hacking.
- Fraud: as with all new technologies, fraud migrates to the vulnerabilities in new payments mechanisms that have not yet been fully made bulletproof.
- Regulation and compliance: digital payments through digital wallets operate in a double complex regulatory and legal environment when you include crypto wallets that operate on blockchain for the transfer of crypto currencies. Relevant rules and regulations have not kept pace with rapid technological advancements and new nonbank entrants to payments.
- Accessibility: digital wallet innovation may benefit some consumers but exclude others, especially in cases where new options leverage bank accounts or require internet or mobile phones; those consumers who rely on cash or do not have internet could be left behind.

Because digital wallets have become so readily available, more and more businesses, organizations and even countries are moving in the direction to exclude cash altogether. And more recently, the coronavirus pandemic has led to an upsurge in digital wallet payment methodologies owing to another benefit of not using cash: minimal need for contact between the customer and the service provider. Yet every move to a more and more cashless society brings with it the risk of excluding the poorest unless the government intervenes to ensure that these consumers have the ability to gravitate to another lowest cost means to acquiring goods and services.

Blockchain Introduction:

Blockchain, as the bedrock for crypto wallets and cryptocurrencies like Bitcoin, is no longer just a buzzword in this new crypto era – it is the technological enabler for mass adoption of cryptocurrency and offers the promise of enhanced security for digital assets. Not only that, blockchain is also the essential network infrastructure in the coming era of intelligent

connectivity, where everything will be connected via Internet of things (IoT) and 5G; powered by Big Data and Artificial Intelligence (AI); experienced through Augmented Reality (AR) and Virtual Reality (VR). More fundamentally, the blockchain technology represents an IT infrastructure evolution – from a platform for communicating information to a platform for creating and transmitting value. It is transforming the way we do business, and every industry will be affected; digital wallets riding on these platforms will propel financial inclusion throughout the world.

From the late 20th century onwards, there has not been any significant breakthrough in the IT infrastructure. This issue has largely been overlooked because application vendors such as Facebook, Google, Amazon, Alibaba, Tencent… have been able to be successful by exhausting the current infrastructure, but very few have realised the capacity has been stretched to its limits. Many existing digital wallets are based on these applications and are contributing to the exhaust of the underlying technology foundation. New age technology in the form of ultra-high performance blockchain infrastructure platforms is needed to replace the ageing foundations and insert trust in trust-less transactions – and with this comes the emergence of crypto wallets.

At the same time, social mindfulness has greatly increased during the COVID-19 pandemic. Cryptocurrencies and tokens are starting to have positives impacts on the subjects of social benefits, such as the opportunity for greater financial inclusion and privacy protections resulting from censorship-resistant transactions. Cryptocurrencies allow users to easily transfer value across the world through a network that is proven, and to a certain extent, free of censorship, and less impacted by geopolitical influences. The only barrier to entry is an internet connection.

Digital wallet on a blockchain: a crypto wallet

A blockchain digital wallet, or crypto wallet, is a subset of digital wallets: they are wallets that mostly allow users to store and manage their crypto currencies such as bitcoin and ether, but also many other crypto currencies and tokens. A blockchain digital wallet could in fact be considered the killer application for blockchain and the impetus to make blockchain a mainstream technology. Unlike traditional digital wallets, blockchain wallets do not need to go through a centralised organisation (such as a bank) to effect transactions as they happen in a peer-to-peer format. This is a great advantage to positively impact the unbanked and improve financial inclusion in less developed societies.

The other significant advantage of crypto wallets is the advent of tokens: in the not-so-distant future, everything that is tangible (i.e., real-estate) or not tangible (i.e., a Tweet, licensing rights, digital ID…) will be tokenized. Even virtual assets are or soon will be on the blockchain as tokens. For example, carbon trading management enablers are starting to be tokenised

which will greatly facilitate and streamline the process to maximise the effectiveness of the carbon reduction initiatives.

Another application of crypto wallets is Central Bank Digital Currencies, or CBDCs – these are a special category of stablecoin (unlike Bitcoin, the value of a stablecoin is pegged to an asset, such as the fiat currency of a nation that is issued and controlled by the central financial institution of a country, which limits its volatility). They are intended to replace all payment currencies with digital, increasing security and monitoring. In 2021, China is by far the most advanced nation in implementing widespread trials of digital yuan, or eCNY. China's state-backed banking providers issue digital wallets to individuals and are responsible for conducting Know Your Customer (KYC) and anti-money laundering compliance. While far behind China in this space, in the U.S., the Fed is collaborating with MIT to research technologies to build and test a CBDC platform. Digital and crypto wallets will be the window into this next generation payment ecosystem.

Blockchain/Crypto and ESG

"Blockchain is a great tool to bring transparency to the entire world, and therefore keep everyone accountable for their obligations." Says Michael Fabing from the Wood Tracking Protocol. The crypto wallet then becomes the window into the transaction as well as the tool to execute it, to facilitate and monitor processes that will enable this game-changing technology to create completely new approaches to how we find collective solutions in mitigation, adaptation, and climate financing. However, the broad and mainstream use of the technology in this realm remains in the future still. The perception of blockchain technology is still linked to cryptocurrencies, and relevant organisations, both government and private, are now just exploring the potential of using blockchain and crypto wallets for climate applications. Climate change is a problem that concerns everyone and every country, but each country defines its own policies and there is a lack of transparency into not only the policies but also the way they are implemented and monitored – the governance is still lacking. The core purpose of blockchain is to establish trust which is not in abundance when it comes to climate change policies at the moment, and there will need to be a mind shift to make this happen.

UN Sustainable Development Goals (SDGs) [1]

The Sustainable Development Goals, as the agenda that the 70th UN General Assembly held in 2015 resolved to achieve by 2030, are 17 shared goals for realizing the ideology of sustainable development. The 2030 Sustainable Development Goals, together with the slogan "Leave no one behind," consist of 17 goals and 169 detailed goals for humanity in five areas: human, earth, prosperity, peace, and partnership. In 2015, the expiration of the MDGs'

(Millennium Development Goals) implementation target deadline required governments to continue their efforts to achieve their goals and address new issues. Over the past 15 years, the United Nations has been discussing what the global priorities should be. At the Rio+20 meeting in June 2012, the UN agreed on the post-2015 global development system and came up with 17 new goals or global priorities: the UN Sustainable Development Goals (SDGs).
Clean energy is the core of the major challenges and opportunities facing the world today. Energy use is essential for jobs, security, climate change, food production, or income growth. Trying to achieve this goal is particularly important because it is linked to other sustainability goals. Focusing on the generalization and efficiency of energy, the increasing use of renewable energy through new economies and job creation and exerting pressure on high polluters through financial penalties will help create sustainable and inclusive communities and address environmental issues such as climate change. Fortunately, over the past decade, there has been great progress in the use of hydroelectric, solar, and wind power, and energy use per unit of GDP has decreased. Nonetheless, the challenges at hand have not yet been resolved. We need greater access to clean fuel and technology, and more progress needs to be made to integrate renewable energy into the sustainability ambitions.
Because of not implementing clean energy is climate change, that is now affecting all countries across the world. Weather patterns are changing, sea levels are rising, climate change is frequent, and greenhouse gas emissions are now at their highest levels. If no action is taken, sea level temperatures are expected to rise above an average of three degrees this century. This has the most effect on the poor and vulnerable. The pace of change is accelerating as more people seek ways to use renewable energy and reduce and adapt to greenhouse gas emissions. However, climate change is a transnational global challenge. We need an international level of improvement to help developing countries move toward a low-carbon economy. To strengthen the international response to the threat of climate change, governments are using a 2-thronged approach: incentive and punishment; an agreement to limit the Earth's temperature rise to less than two degrees Celsius and direct financial consequences of being high polluters: carbon trading is a direct result of all these initiatives.

Application of Blockchain in Carbon Trading and UN SDG's [2]

Carbon credits are certificates that represent 1 ton of carbon dioxide that has been conserved, captured, or is otherwise not in our atmosphere because of the recipient's activity. Most are sold to companies required to buy them under regulated cap-and-trade systems. However, there is a growing voluntary market for carbon credits bought by companies and individuals concerned about global warming.

These carbon credits translate into more and more transactions, and they are divided into 17 important subdivisions in the UN SDGs (United Nations Sustainable Development Goals) at the United Nations. To recognize these carbon credits, carbon credits are accurately measured using blockchain technology.

Carbon trading is a mechanism to buy and sell carbon credits and promote emission reduction of global greenhouse gas (i.e., carbon dioxide). The “Kyoto Protocol” adopted in 1997 by the United Nations commoditised the carbon dioxide emissions into these credits, and thus enabled a way for them to be traded as commodities. Low emission companies have excess carbon quota that they can then resell to higher emission companies who will need to purchase extra quota – this creates and awareness in low-carbon benefits as it hits companies where it hurts the most: on their bottom lines.

Blockchain is truly ideally suited to manage the process of carbon trading: blockchain will enable each transaction between network participants to be faithfully recorded. Each record will be timestamped and a unique cryptographic signature, which ensures that each transaction can be traced back to the historical record. Specific to the application of carbon trading, blockchain technology can truly and reliably record and transmit information flow in carbon emissions trading and avoid problems such as lost quotas and repeated transactions. Even if an illegal trading activity or fraud occurs, it will be detected, and the normative operation of carbon market will be further strengthened. Blockchain will add the trust element for the entire carbon trading mechanism to function seamlessly.

Carbon Credits in Crypto Wallets [3]

Because carbon credits have been defined as commodities, they can be tokenised (turned into tokens). This opportunity has captured the cryptocurrency community’s interest: many crypto companies are now looking into the business of tokenizing carbon credits that will be accessed through crypto wallets.

Crypto is good for carbon credits as the market for carbon credits is divided between the many different government regulations and verification standards that feed it. The organizations that verify CO2-reducing activities have struggled to measure CO2 impact and prove “additionality” — that the reduction in carbon dioxide was not going to happen anyway without a carbon credit.

Because of these challenges, carbon credit markets are highly fragmented, inefficient, and expensive compared to other financial markets. All this friction hurts liquidity, but are challenges that cryptocurrency technology is uniquely well-suited to address:

- Cryptocurrency platforms are globally accessible and allow trading between all kinds of digital assets, improving liquidity and making it easy for buyers to compare the competing standards for CO2 credit verification.
- Cryptocurrency’s architecture allows for much lower brokerage fees.
- Today’s carbon markets require trust in several intermediaries. Cryptocurrency trading is permissionless, eliminating a layer of trust.

At the same time, carbon trading is also good for crypto – crypto has long been associated with Bitcoin and has struggled to reach a wider audience and deliver real-world value. Yet the slow change in the regulatory environment has slowed down the opportunities that will arise from the diversity to crypto's value created by security token offerings. Carbon credits can support crypto to create more awareness and trust.

Why does Financial Inclusion matter? [4]

Financial inclusion matters because it is the only way to get a large number of people not to remain left behind. Billions of people in the world still do not have a bank account; this leaves them without the daily life facilities that most of us take for granted, such as an identity; the ability to save, manage cash flows and reduce the need to sell assets in times of crisis; to get loans, or insure themselves or their assets, such as crops for poor farmers. Financial inclusion matters because it is essential to grow an economy that is more equitable, sustainable, and inclusive. Financial inclusion provides households and firms greater access to resources needed for finance consumption and investment and thereby raises the level of economic activity and creates economic growth.

Financial inclusion is not just microfinancing, opening a bank account or access to financial services and products. It is also about how reachable these are, and about regular usage. In some countries, many of the population has a bank account, but only about half use it to receive and hold funds. And here, government's role is the one success factor to increase financial inclusion. As Bill Gates famously said, financial inclusion is a "paradigm shift in the way the poor are able to approach life: seizing control of it, rather than trying to manage it."

What does "being unbanked" mean?

In recent decades, policy has often focused specifically on those consumers who have no relationship with a banking institution, i.e., the unbanked; and on those who have a bank account but use alternative financial services, i.e., the underbanked.

According to the World Bank, around 1.7 billion don't have any access to banking facilities. The consequences of this are numerous as well as devastating for the people who found themselves in this situation:

- Lack of trust in mainstream banking
- Poor credit history
- Lack of steady income
- Unemployment
- Bankruptcy
- No financial cushion in case of crisis

These consequences result in a poverty vicious circle situation: there is no way out. However, digital wallets have proven to be a key technology to alleviate and minimise the unbanked, which results in alleviating poverty: in fact, poverty is not just a lack of money, it also means a lack of access to other means through which they could improve their standard of living. One of the most common barriers to these poor people is they are being excluded from the former financial systems in their respective countries. Digital wallets can be the answer.

How Digital Wallets Boost Financial Inclusion? [5]

Digital wallets are as close to a perfect solution as it gets for the unbanked who need to access bank-like services without even having a bank account to start with. Digital wallets work like bank accounts in many ways: they enable customers to make payments, store funds, and transfer funds and assets to others. Digital wallets have become the platform that is transforming entire economies, as its use spreads across all business sectors like commerce, health care, agriculture, and many more.

In many ways, digital wallets can be easily compared to regular bank accounts when it comes to the benefits as they provide the unbanked the convenience and ease of financial transactions and resources that are mainstream to the rest of us.

According to the World Economic Forum [2020], India is a case in point in leveraging digital wallets and other technologies, including big data analytics, machine learning, blockchain, cloud computing and artificial intelligence (AI) to effect programs to alleviate poverty through programs of financial inclusion enabled by these latest technology trends. The support and drive by the Indian government and regulatory bodies which have rolled out several policies and financial initiatives aimed at inclusive rural growth is also an integral part of the programs. While the uptake and impact has not been as quick as had been originally hoped due to a lack of education in rural areas and a lack of trust in the technologies, India is leading the way by ensuring that as many people in rural areas have access to financial services through digital wallets that is augmented by phygitalisation of the rural ecosystem which when combined, becomes the immediate solution to accelerate rural inclusion.

Role of government and public policy in financial inclusion [5]

Most governments are now just starting to realise the importance of digital wallets in improving financial inclusion in their countries, which is the impetus for them to set up regulatory frameworks that enables these services to flourish; while regulations for cryptocurrencies, tokens and crypto wallets are still lagging, many western nations are now looking into adding regulations that will also enable widescale adoption all the while protecting the users. Some of the regulations being implemented for digital wallets to support their use are:

- Providing a level playing field to digital wallet services: governments are encouraging rules and regulations that create an open and level-playing field to the digital wallet ecosystem.
- Inserting trust and ensuring the safety of customer's money in digital wallets: government are implementing strict due diligence in the countries where non-bank providers are given licenses to offer mobile money and digital wallet services.
- Flexible due diligence for users: many unbanked users do not have a permanent address and other official identification. So, regulators are looking at ways to provide some leeway on usually strict KYC guidelines.
- Flexible regulations on third-party agents which are an integral part of the digital wallet ecosystem.
- Forcing interoperability by working with providers: this follows on the recommendations of the GSMA in 2014, which states that "allowing interoperability will accelerate transaction growth and enhance the customer experience by making it easier for consumers and businesses to send money across networks". At the same time, interoperability has the potential to slow down widescale adoption if rules such as strict KYC and compliance are implemented so a balance in flexibility and rules is required and today, this finding "the right balance" is implemented through a trial-and-error implementation of new regulatory processes.

Conclusion

Digital Wallets and their subset, crypto wallets, are the future of money – and the underlying suite of technology enablers such as mobile phones and blockchain, will continue to move the world in that direction.

But make no mistake, digital wallets not only here to stay, but will take over all payments' methods in a not-so-distant future: digital wallets are much more than payments; they bring considerable value to the entire ecosystem and more: governments, corporations, banks, retailers, and consumers. They generate massive customer data streams that can be used to deliver new and innovative services and targeted campaigns which is the incentive for businesses that are not specialised in the financial space.

Digital Wallets enable companies and governments to take control of their customers, providing them with relevant applications and services such as companion cards, QR code payments, in-app loyalty offerings coupled with appropriate services such as expenditure analysis, bill payment, and in the case of retail, inventory, and supply chain management. And they are good for the environment and for supporting the UN SDGs ambitions. It is a win-win-win and that simply says it all.

Author:

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