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The Forceful Reevaluation of Cash-Based Transactions by COVID-19 and Its Opportunities to Transition to Cashless Systems in Digital Urban Networks

INTRODUCTION

COVID-19 is impacting, at the time of writing, over 210 countries, and the number of those confirmed to be positive globally exceeds 2.4 million people (WHO, 2020a). The increase in the number of these cases is unprecedented, since, by the end of January, those confirmed globally were only 9826 people, with only 106 cases reported outside China (WHO, 2020b). This high rate of infection has prompted increased attention and research as scientists, and those in the medical sphere, try to establish how the virus evolves and the various ways infections can be passed to one another. On this, numerous theories and hypothesis have been developed, with some being rejected and others confirmed (Chunshan, 2020; Molten and Webster, 2020). For instance, it took scientists and the medical fraternity across the globe to almost a month to ascertain that, truly, the virus is transmittable from human to human (WHO, 2020c). There before, agencies, including the World Health Organization (WHO), were adamant that the virus could not be passed from one person to the other.

Following those developments, the most surprising medium through which the virus may spread is through monetary transactions (banknotes and coins) (Gardner, 2020). This is extremely astonishing as in all economies, people are accustomed to using hard currencies. This is true though in the recent past, there has been some steps toward the introduction of digital currencies aimed at promoting cashless economies. On the issue of money being a conducive medium for the COVID-19 virus, there is research showing that beyond money, there are other surfaces such as plastics and other hard surfaces that may have the potential to allow for the spread of

viruses. According to van Doremalen et al. (2020), the COVID-19 virus may survive at least 24 h on cardboards, and even longer in nonporous materials such as plastics and stainless steel. But, on money, a study done by Thomas et al. (2008) highlights that some viruses, especially those associated with human flu, have the potential to persist for days on banknotes. Therefore, while nonporous surfaces have higher propensity to spread the virus, the frequency of touching money makes it more “dangerous” as a medium for infection and propagation, as virus can be there for longer. In particular, this would be more pronounced in case of smaller denominations that circulate faster by changing hands and are more common with people in remote rural areas (Auer et al., 2020). When hard currencies are handled by asymptomatic individuals, it is understood that they have the potential to spread the virus even more.

The revelation that hard currency could spread the virus has led to some panic as people, especially in the beginning, were not sure how they would transact, especially for basic amenities and items that only require small valued currencies. Some reprieve was, and is still is, on those countries with established digital transaction practices, such as the use of mobile money, use of card swipes, card taps, or even through mobile phones (Fig. 8.1).

The greatest challenge, in such circumstances, is on the banking sector, which has been facing stiff competition from the digital platforms and are forced to establish strategies allowing them to preserve their ecosystem and retain their customer base. Among some of the strategies that have been observed in different economies is the widespread disinfection (sterilization) of banknotes and coins by some banks (The Financial, 2020). In other cases, central banks of countries such as Kuwait,



FIG. 8.1 Mobile phone payment wireless tap.

China, Kenya, South Korea, and other economies have been observed to emphasize the quarantine of banknotes to ensure that any currency released to the public is free from the viruses (France-Press, 2020).

In addition, banks are also seen to be partnering with digital money service providers and other Fintech companies to continue servicing their customers, while also delivering a wide scope of options (Crowder et al., 2020). Such include digital banking opportunities that allow customers to access financial services from their banks via the Internet without having to be physically present in banking halls. Such a strategy aligns well with calls for social distancing and “stay-at-home” protocols that are emphasized as a strategy to reduce human-to-human infection. Therefore, it is true that the emergence of COVID-19 led to disruptions on how businesses operate, especially with a majority of them opting for online payment or cashless payments options.

However, while this paradigm shift in payment behavior is playing a critical role in the fight against COVID-19, the question that remains is whether postpandemic, the financial institutions, in particular, banks, will revert back to the traditional way of doing business and traditional payment options. From a historical perspective, it is apparent that the banking sector in different economies has been bracing for digital opportunities,

and the emergence of the pandemic may be a perfect springboard to actualize such an unprecedented move. For instance, in Singapore, before the emergence of COVID-19, banks had already started embracing digital solutions, with most of them providing digital cards to their clients. Therefore, during the COVID-19 outbreak, Wong (2020) reported that it only accelerated their resolve to move to cashless options, as their customers have already taken the lead by maximizing the digital transaction option for their daily transactions. This option of using digital platforms for daily transactions is also being encouraged in least developed economies such as in Africa, and going forward, it would be emphasized in most economies as it not only presents better financial solutions, but it is also seen as a platform that could increase opportunities for investors and corporations alike. In addition, especially where partnership between traditional financial institutions such as banks and insurances and modern startups such as Fintech is emphasized, this will provide opportunities, even to the unbanked in the society to have opportunities to access financial services at reach. Opening the financial doors for this segment of the population will not only provide them with the opportunities to grow economically but also act as a tool that can be used to fight pandemics, even in the future, as use of hard currency will slowly fade away.

In view of the aforementioned background, this chapter explores how this “forced” transition (from hard currency to digital and cashless payments) may impact future digital cities and explore the opportunities that may emerge from this trend, if pursued.

INFORMATION AND COMMUNICATION PAYMENTS TRENDS IN CITIES

As the global population continue to increase toward the projected figures of 8.5 and 9.7 billion people by 2030 and 2050, respectively, it is prompting several global phenomena in view of the increasing pressures on urban infrastructures. For instance, today, the population of urban residents is reported to be approximately 54% of the 7.6 global population, but by 2030, those living in urban areas and cities will reach approximately 68%. This rapid urbanization is prompting a surge in demand for both products and services, with monetary transactions being at the core. This is further emphasized in view of the direct impacts on the economic performance of urban areas. These transactions, as noted by [Courbe et al. \(2016\)](#), have been catalyzed by the emergence of newer, safer, and more efficient and faster monetary systems that have been enabled by the availability of advanced technological applications. [Lyons et al. \(2017\)](#) note that besides an increase in infrastructural development focusing on the financial sector, financial institutions and corporations have introduced innovative ways to ensure that the increasing urban population is able to access and use their financial systems for both profitability and efficiency.

These financial transactions are not only riding on financial institutions but also driven by the surge of technological application in cities, more so through the smart cities concept, that have captured the attention of large information and communication technology (ICT) corporations. To maximize on the potentials created by the smart city concept, despite it is still in its infancy stage, ICT corporations have been seen to provide different types of tech-inspired products, which in turn are stirring transaction-geared systems in positive ways. For instance, such technologies such as ridesharing in the likes of UBER and AirBnB in the hospitality industry have disrupted the economic activities in cities and increased transactions to unprecedented high numbers.

With profitability prospects in mind, companies such as MasterCard, Paypal, and mobile service providers in different countries are actively working to gain the trust of national and regional institutional bodies to drive the future toward a cashless system. This promises a number of benefits including efficiency, safety, increased financial inclusion, and the formalization of industries and merchants and benefits that have substantially been achieved in some developed and developing economies. According

to [Rogoff \(2015\)](#), by moving toward a cashless economy, countries are assured of increased tax returns and reduced illegal activities, differing with the current case of cash. [Lee](#) further adds that cashless systems have the potential to increase the traceability of payments, and this ensures that the different forms of shadow economy that have existed in different economies would be reduced. This, according to [Nasr et al. \(2018\)](#), would be facilitated by the increased inclusion of larger groups of people into formalized financial systems.

While the said benefits are prompting positive economic performances, there are a number of notable challenges that surround the increase in transactions especially related to cashless systems in urban areas. In this regard, issues such as privacy, security, and oversight become paramount and need to be weighed against the advantages of the systems. It is then understood that overlooking these has the potential to delay or hamper the global uptake of cashless systems in cities, and this would have far reaching impact on the tech giants and startups that are gearing to rely on such systems. On the same, as shared by [Cohen et al. \(2020\)](#), such systems have the premise to lead to a reallocation of resources, where the formal economy would be more favored than the informal sector, which constitute a large part of the economy in developing and less developed economies, hence increasing tax revenues, transparency, and accountability in various levels.

To lead to its actualization, the exploitation of advanced technologies such as blockchain technology, quantum cryptography, 5G, and others are pursued to aid in overcoming some of those challenges related to security and privacy of transactions ([Allam, 2018c](#), [Allam, 2019a](#), [Allam, 2020b](#), [2020c](#); [Allam and Dhunny, 2019](#); [Allam and Newman, 2018b](#); [Allam and Jones, 2019](#); [Shahab and Allam](#)). In instances where such have been used for the formulation of contracts, technologies such as blockchain are observed to show potential to increase transparency and trustworthiness, qualities that are sought in monetary transactions. As shared by [Elisa et al. \(2018\)](#), these technologies allow for decentralization of services such that transactions do not require the interventions of third parties and are securely disturbed across networks both in a verifiable and immutable way. Combining these different technologies in actualizing the cashless system can render it even more feasible, as each of those is fashioned to achieve specific role within the digital realm. For instance, 5G, though being seen to expose users to issues of privacy and security breaches, has the potential to accelerate the capability of Internet of things (IoT) by reducing energy consumption while at the same time increasing on communication quality ([Yan, 2019](#)). In addition, quantum cryptography promises enhanced security of future

Internet (Zhou et al., 2018), whereas blockchain technologies allow for decentralization of systems and distribution of information via networks. The utilization of these technologies, coupled with others, in an efficient manner can ensure they complement each other and, in the long run, render a secure, fast, efficient, and reliable platform conducive for a future cashless society.

CITIES AND TRANSACTIONS

The increase in transactions is being influenced not only by the increasing population and the associated rise in urbanization but also by the ever-increasing number of IoT devices in cities. As the smart cities concept gains traction, ICT corporations are also observed to increase their investments, R&D, and other activities to ensure that they produce high-quality and on-demand products that can allow them to share and, where possible, to dominate the digital market (Allam, 2017, Allam, 2018a, 2018b, Allam, 2019b, Allam, 2020a; Allam and Newman, 2018a; Allam and Jones, 2020; Allam and Jones, 2019; Allam and Allam, 2020). Such activities as highlighted by Statista Research Department (2016) have prompted the number of IoT devices to increase from approximately 15.5 billion devices in 2015 to 26.66 billion devices in 2019. Going forward, Manyika et al. (2015) estimate that the activities in the digital market will prompt the numbers to increase to approximately 43

billion devices by 2022 and over 75 billion devices by 2025. Here, the main impetus for these companies to continue increasing their production is the expected return from this market, which according to Market Watch (2019) is expected to reach a high of USD 2108.2 billion in 2023 from a previous recorded high of USD 679.4 billion in 2016. Another report by Manyika et al. (2015) predicts that this IoT market (representing over 75 billion projected devices) has the potential to grow to between USD 3.9 trillion to USD 11.1 trillion by 2025. Despite the variation in estimates, the constant supports a lucrative economic frontier, which is expected to continue attracting even more players. Such increase in both the market share and number of IoT devices translates to an exponential increase in transactions as devices communicate with each other (also a form of transaction), whether financial, contractual, and others.

The exponential increase in the number of IoT devices also translates to an increase in the functions that such are designed to perform. Today, these are ubiquitous in different sectors such as health, transport, education, and security sector, where data are sourced in different forms, such as through wearable devices, smart cameras, smart locks, drones, and sensors among others (Fig. 8.2).

They are also popular in communication, especial across social media platforms, data centers, operational quarters, and others. These are also in use in security sectors with smart sensors and cameras being very popular.



FIG. 8.2 Common smart devices.

The apex of all these increases and widens the uses of said devices, leading to the creation of a lucrative market, especially one that has emerged from the transaction payments through these devices. Roy (2019) expresses that the increase in transaction payments based on these IoT devices is influenced by, among other things, the ability to enhance identity management and the uniform and efficient experience that the devices offer when financial transactions are performed in their platforms. On the same, Gill et al. (2019) note that the popularity of financial transactions via IoT devices is also increasing due to the fact that such have allowed for increased financial inclusion, rendering easier ways of conducting the said transactions. Their ability to integrate with different financial platforms and service providers makes them even more popular, and when that element is coupled with increasing online shopping platforms, and other e-commerce related businesses, the transactions thereof are vast.

To put the aforementioned into perspective, the use of IoT devices in banking and other financial institutions such as insurances will see financial transactions reach a total of USD 116.27 billion by year 2026, a growth rate of approximately 26.5% (Fortune Business Insight, 2019). Such transactions, as reported by Tata Consultancy Services (TCS, 2015), are stimulated by the budgetary investment by financial institutions, with some allocating even more than 30% of their budgets to IoT technologies, and following the positive outcome that such investments have had, the report notes that some institutions are willing to increase their spending to reach 34% this year (2020). Tanna (2019) expresses that such investments include financial institutions increasing their collaboration with tech companies to ensure quality and customized devices are produced that would improve not only payment experiences but also their potential to allow customers to access statement reports and notifications among other benefits. With such investments, it is expected that transaction costs have continued to reduce, and this has translated to a 64% adoption rate of financial IoT transactions globally (Shevchyk, 2019).

Besides the financial sector, IoT devices have also increased payment transactions in other diverse sectors, more so those that rely on the automation dimension that is enabled by some of the smart IoT devices. For instance, it is not unusual to find automated hypermarkets such as Alibaba, Amazon, and other online shopping platforms that integrate different types of payment methods. These have become very popular in different countries, and their numbers keep on increasing as IoT platforms keep on increasing. In the transportation sector, availability of IoT technology has allowed for the introduction of autonomous vehicles in a number of cities. It has also made it possible for startups to

emerge that concentrates on bike-sharing services in different urban areas across the globe, and all these are benefiting from availability of different payment options built from IoT platform. On the increase in payment options, McKee (2019) explains that this is happening due to the capacity of IoT to allow connected devices or endpoints to be used as a platform for purchasing and receiving payment. Due to this development, McKee (2019) argues that the growth rate of IoT-enabled transaction has been rising and will continue to grow at a compound annual rate of growth (CARG) of 125%.

As large corporations continue to compete to tap into this IoT-enabled market and hence continue to support the rationale of increasing IoT-enabled transaction, much progress is expected to ease fluidity of digital monetary exchange. In particular, their involvement is expected to help in reducing the time for monetary transactions in a secure and transparent fashion while encouraging the emergence of new startups focusing on offering digital solutions for urban challenges, and all these will ultimately benefit urban dwellers who will have more time at their disposal to enjoy the plethora of activities that cities have to offer.

PAYMENT GIANTS AND SMART CITIES

As the concept of smart cities gains ground across the globe and the importance of IoT networks is better understood by diverse sectors, as elaborated earlier, the increasing future impact of digital monetary transaction in cities is further underlined by the rush of different payment giants to position themselves into this arena. As noted by Sito (2019), such includes opening the “doors” and lifting of stringent local and regional regulations to allow clients, especially those based in overseas to link their accounts to international banks cards. This is evident in the case of conservative payment giants such as Alipay and WeChat Pay, both based in China (Liu, 2019). In other fronts, some have seen to enter into agreements and buying stakes from overseas local Fintech companies such as in the case of VISA, which is reported to have paid USD 200 million to Nigeria’s Interswitch payment company for a 20% stake (PYMNT, 2019).

Payment giants that are seen to be repositioning themselves to better tap into the future digital market include MasterCard, VISA, American Express from North America, Alipay, TenPay and WeChat Pay from China, and Worldline from South Africa. Others include Paytm based in India, Apple Pay, and Amazon Pay among others. Currently, AliPay is observed to be among the largest payment platform with over 1.2 billion active users against 926 million (Szmigiera, 2020a) active users and 1.14 billion (Szmigiera, 2020b) users for MasterCard and VISA, respectively, and the decision to allow

users from other regions to link their accounts with international bank cards means that it would continue to grow. This payment platform and WeChat Pay are observed to be pivoted by their mother companies; Alibaba and Tencent, both having an active stake in online businesses (CGAP, 2019). Following the introduction of their individual payment platforms, Badi et al. (2017) report that these two payment platforms have managed to attract unprecedented payment transaction volumes, and as the global population continue to embrace the concept of a cashless society, such transactions, irrespective of geographical location, will be massive. MasterCard, one of the most widespread payment platforms, has been instrumental in actualizing the vision of digital monetary transactions. In addition to its 926 million credit card holders across the globe, the payment giant has an ambitious program dubbed MasterCard Lab that focuses on bringing financial inclusion to over 500 million people who have had no opportunity to join formal financial platforms (Szmigiera, 2020a). They intend to achieve this by investing in agricultural sectors, microretail sectors, and education sectors. Others, such as VISA, as shared earlier are seen to be active in acquiring or partnering with local Fintech companies to ensure that they increase their market transactions and, in the course of doing this, they bring on board more clients into the digital monetary service arena.

While different payment giants across the globe may have different backgrounds, visions, and missions, they share a commonality in their bid to move the global financial and monetary services from the rigid cash-based system to a more flexible one. The emergence of digitally oriented urban fabrics, especially based on the smart cities concept, has played a critical role in actualizing this mantra as most stakeholders in these cities positively welcome such systems that support seamless transactions. The complexity of urban fabrics coupled with the demands by the increasing urban population is seen to be slowly becoming disconnected with the idea of a cash-based economy and is preferring digital transactions that offer numerous alternatives and flexibilities, including security. The proliferation of smart devices, especially smartphones, has been instrumental in advancing digital payment services, and as Merchant Savvy (2020) reports, these have allowed over 1 billion people to transact via different mobile payment apps worldwide. On this, it is expected that the spirited effort in bringing more people on board will see the number of mobile payment users rises to approximately 1.3 billion people globally. Such an increase in the number of users will push the mobile payment market size to over USD 3081 billion by 2024, from the USD 881 billion recorded in 2018 (Lewis, 2019). In addition to the

proliferation of smart devices in cities, the availability of technologies such as blockchain technologies, quantum cryptography, and faster mobile Internet such as 4G, and now 5G, are becoming key elements not only in promoting the speed of transacting but also in increasing transparency, security, costs, and privacy.

Another key factor in pushing the transition from the cash to cashless-based payment system is to increase the collaboration between different payment giants. Though these payment giants have traditionally been seen as competitors, it is surprising that they are seen to have slowed down competition against each other and directed their competitive attention against the use of physical cash. For instance, as noted earlier, AliPay and WeChat Pay and others have allowed their customers to link their accounts with international banks so they can enjoy unlimited digital monetary transactions (FOMO Pay, 2020). Khanna and Martins (2018) of McKinsey argue that the success of the digital payments is gaining traction due to change in mind-set of global population that is seen to favor the digital payment. In such, the digital payment giants are poised to continue boosting their revenues and, hence, their spirited efforts to position their products in line with digital technologies. One of the strategies used for this repositioning is the forming of mergers between two or more payment companies, irrespective of geographies. For instance, the Payments Journal (2018) reported that the Japanese Rakuten Company invested \$20 million to form a merger with Azimo, a UK-based payment service provider, and the purpose was to help them wage a spirited challenge against their rival PayPal. Another strategy that is seen to be popular in the recent past is that of giant e-commerce businesses and companies introducing their own digital payment platform, like the case of Alibaba with AliPay, Samsung with Samsung Pay, and Google introducing Google Pay, such that their clients are provided with an all-inclusive experience when purchasing their products. Such start-ups are also observed to have opened their “doors” so that their customers can link their conventional bank accounts with digital payment platforms, and this has seen the slow phasing out of hard currency to give way to digital ones functioning with e-wallets.

THE PAYMENT MARKET OF URBAN SERVICES

As shared in the sections earlier, the rapid urbanization rate is leading to increased pressures on resources and services, and such trends have resulted into numerous challenges, including resource scarcity, increasing vulnerabilities to climate change, increasing cases of

informal settlements, and increasing numbers of informal economies among numerous others. These challenges are widely discoursed and documented in high level meetings, and varying economies are seen to undertake diverse measures, which include introducing a wide range of products to ensure that universally agreed recommendations, such as those proposed in the Sustainable Development Goals (SDGs) (UN Environment Program, 2015) and the New Urban Agenda (NUA) (United Nations, 2016) document, are adhered to. In particular, the products are seen to target an efficient delivery of services to urban dwellers coupled with the preservation of qualities pertaining to safety, privacy, resiliency, liveability, economic equality, and other such elements.

One such product that has become popular is the employment of digital solutions, especially those that abide to the smart cities concept. For instance, it is not unusual to find governments, especially in developed economies advocating and implementing the concept of mixed-use high-rise buildings incorporating digital solutions to ensure an optimal consumption of resources such as water, energy, and construction materials. The use of high-rise buildings ensures that available spaces are efficiently utilized to cater for the increasing urban population residential needs, while providing better options to access services such as entertainment and recreation, hotel, financial services, and shopping within the same building. Effective integration of such mixed services in each locality is facilitated by the availability of different digital solutions from the use of sensors and smart devices that monitor, control, and report on the demand, usage, and other aspects appertaining to available resources.

Another solution that is being taken to address the phenomenon is what is seen a rush in urban areas to formalize economies, an issue that is prevalent in most developing economies that are dominated by economic activities that are mostly unregulated. Dasgupta (2016) postulates that this is achieved through the creation of a conducive environment for informal sectors to manage and engage in individual transactions and for them to engage in commercial relations while supporting the value chain of subcontracted relationships. Such environments are achieved by streamlining the regulatory framework such that those in informal sectors are able to access tax breaks and able to register their business without encountering bottlenecks while also having access to different incentive packages that would allow them to compete with those already in formal sectors. McCaig (2015) shares that the formalization of economies allows governments to not only increase their

revenue collection base but also address issues such as unemployment, which in part are to blame for the creation of informal settlements in developing, and in a majority of least developing, economies.

Creating a conducive environment has seen the rise of startups, especially those relying on modern technologies to offer avant-garde solutions to challenges posed by urbanization. On this, while large corporations are synonymous with large transactions, the governments' rush to integrate small businesses to formal arenas means even more transactions, which ultimately translates to increased governmental revenue, derived from the increased work opportunities that are created when the small business joins the formal mainstream. It is also tied to the increased, prompt, and voluntary tax submissions as those who join the formal sector are able to derive incentives in form of government protection and financial support so they can manage to compete with established business and large corporations in particular. While this is the case, Banks et al. (2020) acknowledge that in the global south, the informal sector represents a large consumer market that has little competition, but this could be corrected by formalization.

One of the strategies that has been observed to be popular with governments in this digital era in their bid to bring onboard the informal sector into the mainstream is the emphasis on the adoption of online services such as registration of businesses, application for licenses, payment of mandatory fees and taxes, to name a few. Such approaches have reduced bureaucracies, bottlenecks, and red tapes that crowd traditional business environments. O'Mahony et al. (2019) postulate that the availability of advanced technologies and the integration of such technologies in different devices, especially smart phones and other such mobile devices, have increased formal transactions. A report by the World Bank (Klapper et al., 2019) further showcases that in the recent past, due to ubiquitous digital technologies, a large number of informal business have gained access to financial institutions, and this has been enabled by the increased penetration of mobile devices. The report also acknowledges that financial inclusion has provided millions of such businesses a lifeline and, even more, allowed governments that leverage on digital technologies to increase their financial base from those businesses.

By having informal economies into formal financial systems, they are able to access financial support, which has been a hindrance for them to enter into formal markets, and large corporations have capitalized on such to increase their economies of scale, hence edging out any competition from such small-scale businesses (Bennett

and Lewis, 2012). But, as is evident in different economies, the small-scale startups have valuable services to offer in all sectors. For instance, in the transport sector, these have revolutionized the taxi and car-sharing businesses by introducing innovative online services such as requesting for a ride and integrating digital payment methods among other smart services. In the art and creative sector, the availability of digital solutions has allowed remote communities to preserve and showcase their works and arts and, by so doing, has not only expounded their income base but has also served to place their economies in the global map, as art enthusiasts, travelers, and tourism are able to sample some of products and services that such economies can offer (Cotirlea, 2014; Genç, 2017; Hocaoğlu, 2017). There are numerous other such examples when it comes to showcasing how much the formalization of economies can transform an economy and solve emerging challenges experienced in the urban areas.

URBAN SOLUTIONS BY PAYMENT GIANTS

The contribution of technology today is apparent in various facets of the economies. As has been showcased earlier, technologies have brought a wide array of digital solutions especially in the urban areas and have eased the pressure brought about by population increase and urbanization. Technology has also been instrumental in shaping political and economic agendas that have been set, not only in local scenes but also in international spheres. For instance, in the discourse about climate change mitigation, financial inclusion, reduction of social and economic inequality, and other issues, the role of technology has been apparent. For instance, to actualize the SDGs advanced by the United Nations in 2015, Tjoa and Tjoa (2016) acknowledge that diverse technologies are required for every single of the 17 SDGs. In the case of the Paris Agreement, the role of technology is clearly outlined, and it is categorically noted that the goals outlined in the agreement would be rapidly accelerated through the integration of different technologies in varying processes of the agreement. On the local scene, sectors such as communication, transport, education, health, tourism, and others have benefited from an advancement in technology. All these transformations that the world is experiencing as a result of technological advancement are being taken seriously due to the highlighted potential in economic and social terms, and both large and small payment giants have been seen to contribute to this growth as it is evident that their efforts are directed toward creating products that would centrosome control on this growing market.

In the payment arena, the digital revolution sparked an innovative wave that has seen the emergence of companies such as PayPal, Alipay, TenPay, Samsung Pay, and WeChat Pay among many others. These have disrupted numerous industries, leading to the emergence of others. In Kenya, for instance, the mobile payment platform M-Pesa has become ubiquitous such that it is integrated in any sector where payment is required. In addition, these also sparked the emergence of online markets, especially online shopping platforms where sellers and buyers across the globe interact seamlessly at convenience and are able to pay and sell goods courtesy of these payment platforms. The payment services are not only popular with those trading on tangible products but also gain ground in the service industry. The popularity of these new startups has been seen to also prompt traditional international payment giants such as MasterCard and VISA to expand their trading limits by joining the digital industry. Their engagement in the digital platform, however, is different, as it clearly depicts how the payment industry have taken a detour to embrace the new technological wave. It also shows that competition in this industry is increasing and traditional financial approaches are becoming almost obsolete, especially if the target customer base comprises of those shifting from informal to formal economies and those who had been previously locked out of the financing realm by bureaucracies, bottleneck, and regulations that are synonymous with the traditional financial sector.

On this front, the traditional payment giants have been forced to propose innovative strategies allowing their old clients and those joining their customer base to experience the conveniences brought about by digital technologies. On this, MasterCard introduced programs such as Cities Possible, Priceless Cities, and an array of Smart City solutions such as the MasterCard Lab, MasterCard City Key (MasterCard, 2019), and MasterCard Engage (MasterCard, 2020) among others. On its part, VISA support program such as FastTrack was initiated in Dubai and is intended to help startups specializing in providing digital support to urban areas to increase their connections to support highly innovative solutions (Geronimo, 2018). It also has a product dubbed *Visa Global Transit Solutions* and *Visa Ready* that target to offer seamless commuting experience across the globe. Other payment giants such as Western Union have also been seen to offer innovative solutions, like the introduction of their mobile app: *WU App*, which is compatible with smart devices, hence allowing clients to transact from any place at any time (Western Union, 2020).

The digital solutions for cities offered by those payment giants, as shown earlier, are well defined, and there is an increasing shift from closed-loop to open-loop systems, meaning that companies are less keen on developing proprietary technologies to maintain their competitiveness. This is shown by how companies such as AliPay are now allowing their customers to link international bank accounts, allowing transactions from their AliPay accounts. Therefore, on this, it looks like the first traditional payment giant to engage the market in a meaningful fashion will benefit from consumer retention. The “meaningful fashion” here entails ensuring that clients are able to derive benefits, while at the same time, they are assured of their privacy and security.

On this, [Elliott and Laker \(2019\)](#) demonstrate that MasterCard has already initiated work toward shifting to open-loop system with pilot programs in transportation sector having been initiated in cities such as London, Vancouver, and Sydney. Here, like in the case of AliPay that has allowed its clients to link their international bank accounts, MasterCard allows clients to use a payment platform they are already accustomed to while paying for transit, and this has been seen to work considerably well. But while that is the case, [Zamer \(2018\)](#) establishes that there are some hurdles that MasterCard and other traditional payment giants have to overcome to win the confidence of clients. Such include transaction security, data protection, and the associated costs that clients must bear. Regarding data protection, it would be an underestimation to wish the threat away as ownership, access, and control of data have become one of the lucrative businesses in this modern era. On this, it then behooves the competing traditional payment giant that are gearing to take control of the increasing payment market by fully shifting to open loop system to demonstrate to clients of its better framework and to guarantee on both privacy and the security of transactions.

CONCLUSION

This chapter explored how COVID-19 provided an increasing pressure to shift from cash-based to cashless system and showcased how payment giants and ICT corporations have, for long, been active in providing the foundational structures for this transition. One challenge is that this disruption may see the emergence of new players, supporting that economic systems and players need to be proactive and early movers if they want to keep a competitive edge on the market.

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