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Electronic Alternatives to Raw Cash:The Advent of Cashless Society.

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***Abstract*— Implementation of electronic commerce based on electronic alternative to cash as the main engine driving global economic activity will determine the future of society. Evolution and development of technological instruments that form the basis of cashless society leaveno one in doubt as to the direction and future of global financial transactions where raw cash as we know it today will become history. This paper provides an insight into the technological readiness for full cashless transactions and posits that although the instruments necessary for cashless-ness are in place, security, religious and socio-economic factors (SRS) may yet delay full implementation of a cashless society. E-payments, Automated Teller Machines (ATM), credit cards, smart cards, e-money have become buzz words in global financial transaction.However, the solutions to SRS factors will be important in achieving complete cashless environment.**

Keywords*— *cashless society, electronic cash, e-money, moneyless economy

I. INTRODUCTION

Cash usually refers to money in the form of currency, such as banknotes or coins. Cash can also refer to cheques, money orders, cashier's cheques, bank drafts, or traveller's cheques. In all these forms, the term indicates the most liquid form of assets, which have a fixed value and can easily be converted to currency. Money, on the other hand, is any marketable good or token used by a society as a store of value, a medium of exchange, or a unit of account. Money objects can meet some or all of these needs. Since the needs arise naturally, societies organically create a money object when none exists. In other cases, a central authority creates a money object; this is more frequently the case with paper money in modern societies.

The first instances of money were objects which were useful for their intrinsic value [13]. This was known as commodity money and included any commonly-available commodity that has intrinsic value; historical examples include pigs, rare seashells, whale's teeth, and (often) cattle. In medieval Iraq, bread was used as an early form of currency. Commodity money was adopted to simplify transactions in a barter economy; thus it functioned first as a medium of exchange. It quickly began functioning as a store of value such as gold, since holders of perishable goods can easily convert them into durable money. In modern economies, commodity money has also been used as a unit of account. Gold-backed currency notes are a common form of commodity money.Fiat money is a relatively modern invention. A national government through its central bank creates a new money object (paper or coin) that has minimal intrinsic value. The public's use of the money exists only because the government mandates the money's acceptance under penalty of law. In cases where the public loses faith in the fiat money, there is little a government can do to prevent the adoption of other money objects by society. To function effectively in a modern economy, money must have some desirable features. Hence a good or token used in a modern economy must have a stable value. It must also be easily divisible and transportable (which is one justification for the printing of large denomination currency notes). But more importantly, it must be difficult to counterfeit. Finally, it must be fungible. That is one artefact of the token or good must be equivalent to another. Put another way, a commodity must be freely interchangeable with another in satisfying an obligation.

In modern times, money may be used anonymously, the most common methods being cash (either coin or banknotes) and store-value cards. Money can also be used in the form of substitutes in such a way as to leave a financial record of the transaction; the most common methods are cheques, debit cards, credit cards, and digital cash. The bottom line is that money itself must be a scarce good. Many items have been used as money, from naturally scarce precious metals and conch shells through cigarettes to entirely artificial money such as banknotes. However, modern money (and most ancient money too) is essentially a token -- an abstraction. Paper currency is perhaps the most common type of physical money today. However, goods such as gold or silver retain many of the essential properties of money.

Money makes the world go around, but not always as conveniently as one might wish. There is never enough cash in your wallet; the coins in your purse often weigh you down. Then in the advanced countries, there is the pile of bank cards to squeeze in, and as if that weren't enough, store cards just keep multiplying.But that is all set to change. A raft of new technologies is appearing that will suck up that cash and dump it into a handy electronic device, liberating one's pockets from crumpled notes, jangling change and wads of cards.

Implementation of electronic commerce based on e-cash as the main engine driving global economic activity will determine the future shape of society [11].These electronic alternatives are promising to bring about an explosion in the number of ways of paying for things and perhaps usher in currencies that work quite differently from dollars, pounds, yen or euros.In the advanced industrialised countries and some

developing economies they are already used to paying with credit or debit cards rather than cheques or cash. But what if one wants to make a payment on the Internet that is as anonymous as cash? An international system being developed could do the trick. Other times one might buy goods with one's frequent-flier miles. Or if you commute every day, you might use a payment card that will net you a discount on your next underground railway ride. You might even choose a payment system that is designed to benefit your community. And because it is all computerised, the pain of managing all these accounts is handled automatically.

A. Electronic or Digital money

Electronic money (or digital money) refers to cash and associated transactions implemented using electronic means. Typically, this involves the use of computer networks (such as the Internet) and digital stored value systems. Electronic Funds Transfer (EFT) is an example of electronic money. It is also a collective term for financial cryptography and technologies enabling it.While electronic money has been an interesting problem for cryptography, the use of digital cash to date has been relatively low-scale. One rare success has been Hong Kong's *Octopus* card system, which started as a public transportation payment system and has grown into a widely used electronic cash system. Another success is the Canadian *Interac network*, which, as of the year 2000, surpassed cash as a payment method at retail in Canada.

Technically, electronic money can be an independent currency, like e-Gold or just like Euro before the legal tender of Euro was introduced in 2002. In the case of *Octopus Card* in Hong Kong, deposits work similar to banks. After *Octopus Card Limited* receives money for deposit from users, the money is deposited into banks, which is similar to debit-card issuing banks re-depositing money at central banks. Some community currencies work with electronic transactions. *CyclosSoftware* allows one to create such electronic community currencies.

Today most currencies are issued by national central banks. But there is no fundamental reason it must be this way. Indeed in many countries, the issue of private paper currencies has been severely restricted by law. In the United States, the Free Banking Era lasted between 1837 and 1866, during which almost anyone could issue their own paper money. States, municipalities, private banks, railroad and construction companies, stores, restaurants, churches and even individuals printed an estimated 8,000 different monies by 1860. Hence in principle anyone can legally issue a currency. All it needs to make it work is a large enough community of people who respect its value. For that to happen, there have to be safeguards against counterfeiting - for an electronic currency this means cryptographic protection.

And what about the hardware that will make wallets, purses and cards obsolete? In Japan, millions of people are already getting a taste of electronic cash in the form of a service run by the cell phone operator *NTTDoCoMo*. The company sells handsets with built-in wireless electronic payment systems for small cash transactions. It looks as though in the near future the mobile phone will double as a personal banking device, keeping track of your money and maintaining order in your electronic wallet.

II. CASHLESS SOCIETY INSTRUMENTS

Some of the electronic instruments facilitating the drivingforce of electronic alternatives to cash payments are now well established with credit and debit cards in popular usage. In addition, new technology has enabled the development of smartcards where additional data can be stored on a microchip [4].

A. The advent of credit cards

It is not out of place to ask whether the way we pay for things will change so dramatically that the need for cash might completely evaporate?The story of credit cards suggests that this is not a pipe dream. Just two generations ago, they did not even exist: they arrived in the US only in 1958, the UK had to wait another eight years, Australia eventually caught up in 1974 [5], and here in Nigeria, the more progressive banks are now only beginning to introduce it. The Central Bank of Nigeria has recently introduced a kind of semi-cashless operations in some cities in Nigeria to minimize carrying large amount of cash.

Yet worldwide, there are now more than 1.7 billion credit cards in circulation. The majority of cards are the same size of 85.60 × 53.98 mm, as set forth by the ISO 7810 international standard. Between 1971 and 2001, the number of cards per household in theUnited States grew from 0.8 to 7.6 [4],[14]. Similar in appearance and usage to credit cards, debit cards are a further popular alternative to the use of cash when making purchases. Credit cards, and their younger siblings, debit cards, dominate the payment habits of the man in the street in the advanced countries [13]. But they are no longer alone. Other payment options have appeared on the scene, and some have many key attributes of an alternative currency. Take frequent-flyer miles for example. As well as buying flights, Air Miles "earned" with British Airways can be used to pay for shopping at *Sainsbury's* supermarkets in the UK. Frequent-flyer miles given to *CathayPacific* air passengers can even be used to pay for surgery at one private hospital in Thailand.

Also available is the Stored Value Card. Stored value cards are typically similar in appearance to credit cards and either employs a magnetic stripe or smart card technologies in order to store data. Under this scheme, using an appropriate reader an amount can be electronically added or deducted from a balance on the card. As at the year 2002, such a scheme was seen by some as an initial step toward a cashless society [17].

B. Smart Cards

Indeed, while credit cards are used mainly for large or medium-value purchases, other options are starting to appear for "micro payments" down to just a few pence. In Hong Kong, as mentioned earlier,*Octopus* smart card, which was designed to speed access to public transport systems, has since 2000 also been accepted in shops as a way to buy low-value items like newspapers and drinks. And in London, the

Oyster card now widely used to pay for journeys on London's buses and underground trains is on trial in a similar system.

A smart card is a plastic card, similar in appearance to acredit card, and containing one or more embeddedsemiconductor chips [7]. Smart cards typically have a storagearea in EEPROM and may also include a microprocessor ableto process any data stored. Recent technological progress has seen the development of a contactless‖ smart card in which the chip communicates with a card readerusing radio frequency identification.Smart cards have significant potential over magnetic-stripe swipe cards, in that it will not only permit more data to be stored, but data can also be processed. Despite privacy concerns, it is likely that smart cards are the way forward, withincreasing systems merging together.

Schacklett [15] predicts that ―as smart cards gain momentum in the financial services marketplace, it‘s likely that other forms of plastic like credit, debit, and ATM cards will all meld into one universal, multifunctional smart card‖.

C. *Electronic Cash*

Despite the high-tech alternatives, cash has proved remarkably hard to dislodge from our lives. Several companies have taken this idea further and developed cards which can be used in multiple retail outlets, effectively as electronic cash‖. In the mid-1990s there were high hopes in the US and other western countries for e-money systems such as Mondex and Visa Cash, but they failed to catch on. Mondex, was developed by the National Westminster Bank in the UK and later sold to MasterCard International. Mondex[10] was originally developed in 1996 as a smart card alternative to cash‖. Graham Higgins, a banker and co-inventor of Mondex, had been quoted as explaining that the scheme would help alleviate the burden of counting, storing, as well as the security associated with, physical cash‖ [10].At the time, it was argued that electronic money was more convenient than cash. But it turned out that most people did not agree.

Perhaps these attempts were too ambitious. "One thing that Mondex did wrong was that it tried to be everywhere," says Jean Camp of Harvard University, the president of the International Financial Cryptography Association [13]. On the other hand, a new payment system can't afford to be too small, either. It's the chicken-and-egg problem: merchants won't accept a new currency or payment method unless they know that customers are going to use it; customers won't use it unless they know merchants will accept it. As Jean Camp puts it, "To succeed, you have to pick the right kind of 'everywhere'."

For the Oyster card, "the right kind of everywhere" means the nearest bus stop or underground station. With 150 tube stations and 8000 buses across London accepting it as payment for journeys, 3.2 million people already use one. In January 2006 payment devices in 3850 London shops allowed people to use an Oyster card to pay for such things as newspapers, food and drink. At the same time the cards were expected to entirely replace cash on buses.That large pool of existing users is why Oyster might succeed where Mondex failed. But it started out with humbler ambitions. Originally it was seen as a straight replacement for the magnetic-stripe cards previously issued as tickets, Oyster cards are read simply by waving them in front of a pad, and these "contactless" reader pads were deemed more reliable than the magnetic readers they are replacing. But they also allowed passengers to charge up a card with credit for multiple journeys, and to have free travel once they had spent a certain amount in one day. It's that flexibility and adaptability that gives Oyster extra potential.

D. *Other electronic-payment systems*

Like Octopus and Oyster, other e-payment systems are concentrating their efforts on a limited geographical range. In the mid-1990s, when RenahPersofsky was the chief executive officer of the Bank of Montreal's e-commerce division, she witnessed the failure of numerous digital cash schemes. She developed the *Dexit*.For users, one of the big advantages of the Dexit card over ordinary cash is that it can recharge itself automatically. Strictly speaking, the Dexit card isn't even a card any more. The chip that started out at the heart of the smart card can now be built into a key ring tag, or a sticker that you attach to your cell phone or personal digital assistance (PDA). And customers can sign up to be sent an SMS cell phone 1message to remind them when their account needs a top-up. All this activity has not gone unnoticed by the giants of traditional electronic payment system. After watching from the sidelines for a decade credit card companies, *Visa*, *MasterCard* and *American Express* have started issuing cards that can be used to pay sums as small as a few pennies simply by waving them in front of a reader. No signature or PIN required.

E. *Smart Phones*

Japan shows where these payment cards may be going. About a decade ago*NTT DoCoMo* began selling mobile phones containing chips based on Sony's *FeliCa* smart card system. Today there are more than 3.7 million of these "i-mode" FeliCa phones in circulation. Users can use the phones to pay for transport or goods at hundreds of locations across the country. Other mobile phone companies are following suit. *Nokia* and *Philips* are developing their own versions of the technology, and the three companies have signed agreements to make their systems compatible.

From the UK Guardian of Saturday May 28, 2011 [16], the following information was written "Get ready to start paying for sandwiches, magazines and pints down the pub with nothing more than a swipe of your mobile phone as a payment revolution hits Britain's high streets". The idea is that your mobile phone will be embedded with a chip that contains your credit and debit card details. For low-value items, selling for no more than £15, all you will have to do is wave the phone in front of the shop's sales terminal. For higher priced goods, you'll have to punch a pin number into the phone as well. Orange has unveiled its Quick Tap service, while Google has also launched Google Wallet for Android phones which might soon make the traditional wallet stuffed with cards, notes and coins outmoded. Users will be able to check their balance on the mobile phone's screen to see how much they are spending.

F. Automated Teller Machine (ATM)

An Automated Teller Machine (ATM) card (also known as a bank card, client card, key card or cash card) is a card issued by a bank, credit union or building society that can be used at an ATM for deposits, withdrawals, account information, and other types of transactions, often through interbank networks. ATM cards are typically about 86 × 54 mm, ISO/IEC 7810 ID-1 size (Wikipedia).

Unlike a debit card, in-store purchases or refunds with an ATM card can generally be made in person only, as they require authentication through a personal identification number or PIN [7]. In other words, ATM cards cannot be used at merchants that only accept credit cards. However, other types of transactions through telephone or online banking may be performed with an ATM card without in-person authentication. This includes account balance inquiries, electronic bill payments or in some cases, online purchases.

G. Point of Sale Terminals– Automated Cash Register (ACR)

Point of sale (POS) or checkout is the location where a transaction occurs. A "checkout" refers to a POS terminal or more generally to the hardware and software used for checkouts, the equivalent of an electronic cash register.A POS terminal or machine manages the selling process by a salesperson's accessible interface. The same system allows the creation and printing of the receipt. Point of Sale (POS) Terminals are the preferred way of processing credit cards, debit cards, cheques, smart chip cards, electronic benefits transfer (EBT), and other electronically submitted transactions in a traditional retail environment. The terminals are used in "face-to-face" transactions. The merchant will swipe the customer's card through the terminal or key-in payment information and the terminal does the rest.

Electronic payment systems may also help alternative currencies grow. Many such socially or politically motivated currencies have been around since long before e-payment systems became practical. *Ithaca Hours*, a currency circulating in the college town of Ithaca, New York (population 30,000), is one well-known example [13]. Founded in 1991 by a social activist called Paul Glover, *Ithaca Hours* reflects the idea that an hour of labour should always have the same value, no matter whether it's for babysitting or running a company. The currency itself is printed on locally made paper by a local printer. There are over 12,000 Ithaca Hours in circulation, and around 600 members are listed in the Ithaca Hours directory, including both individuals and merchants who accept Hours as payment. Ithaca Hours has inspired a new generation of high-tech currencies. "Conventional money is, in my view, not designed for social purposes," says Bernard Lietaer, who worked for Belgium's central bank on the introduction of the euro but is now based in the US. "It is more appropriate for competitive purposes." Lietaer thinks the solution to many social problems lies in linking economic reward to social behaviour. "We've been throwing money at social issues for a long time, but it just doesn't work." As an example, he cites the paradoxes thrown up by the US healthcare industry. "It makes money when you are sick, and it is remarkably effective at doing that," he says. But if you stay healthy, only the health insurance companies win out. "Imagine that you could earn a currency by doing healthy things. That is one of the projects I'm working on, a health-promoting currency that would tie in with insurance companies." Lietaer isn't the only one developing a high-tech social currency. Agnes Koltay, a Hungarian based in Dubai, and Daniel Nagy, who lives in Toronto, are treading a middle path between Lietaer's idealism and the profit-oriented pragmatism of Oyster, Dexit and their ilk. The two have come together in their spare time to create ePoints, a system that people can use to create their own electronic currency. Unlike the ill-fated internet currencies of the 1990s, the payment system itself is not intended to make a profit; that will come through the distribution of enabling software, allowing the payments themselves to be fee-free, just like cash. "Some other systems make the mistake that they want to keep it very centralised, to make a profit on exchange rates and service," Koltay says. By contrast, ePoints will be totally decentralised, much like the internet itself. Anyone can set themselves up to issue electronic ePoint "notes", and anyone can use them.That might sound radical, but in fact a world full of different currencies is nothing new. As far back as in the 17th century, in Europe and America, privately printed currencies coexisted with, and often outnumbered, government-issued currency.. In the future the single currency economies might seem like a quaint hiccup.

H. Personal e-currencies

Anyone who has used *eBay*(the world-wide online market place) will know about *PayPal.* It's a system that allows individuals selling goods to receive payments from the buyer's credit card, a facility normally reserved for established businesses. PayPal has made person-to-person payments possible, internationally as well as nationally, but it has downsides. Every time money is withdrawn from a PayPal account into a normal bank account, PayPal takes a cut. And unlike cash payments, PayPal is not anonymous.

The cashless solutions that seem to get the most attention these days are really just making it easier for more people to access the existing electronic payment networks owned and operated by Visa and MasterCard, both of which are using existing state-issued currencies. But BitCoin and other electronic currencies are quite different. BitCoins are not issued by a state or a central bank. BitCoin is an alternative currency, one that is parallel to the dollar, pound, euro, yen, etc., and can be exchanged for these central-bank currencies according to market-based, variable exchange rates. The BitCoin system is certainly "cashless"—all their accounts and transactions are processed electronically.

The ePoints system set up by Agnes Koltay and Daniel Nagy is different. It allows anonymous person-to-person transactions (just like cash exchange) over the web, and though the software itself costs money, Nagy says every subsequent transaction will be free. To use ePoints, a person requests an ePoint "note" - in reality an encrypted code that represents some amount of ePoints - from an ePoints issuer. The issuer is the person or body that administers the system and ensures that ePoints aren't duplicated. The issuer cryptographically signs each ePoint note in exchange for some money of equivalent value in another currency, say pounds or dollars, or for some work done, or as payment for some other service. When someone spends ePoints, the person receiving

them in payment contacts the issuer to verify they are not counterfeit. The cryptographic algorithms ensure the issuer cannot tell where the ePoint originated, nor the chain of hands it has passed through; only that he has been asked to confirm an ePoint is authentic.

But anonymity alone is not going to make people use it. If ePoints is going to catch on, it will have to find a niche that makes it attractive to a large pool of users. That is where ePoints' cheap and borderless nature comes in. ePoints can be seen as an international electronic currency and this, Nagy and Koltay believe, along with security and anonymity, will provide the niche it needs. ePoints may also be attractive to companies that want an electronic method for handling payments of a few pennies. Credit card companies charge a minimum fee for each transaction they process, and for transactions of less than a few dollars this can represent a large slice of the total. In return, credit card companies provide a high level of security. But as Nagy points out, this is overkill when only small sums are changing hands. A penny transaction should not need a lot of security, Nagy says. A thief will gladly invest five pennies of effort to steal a credit card, but no smart thief will spend five pennies to steal a one-penny ePoint.

Nagy and Koltay are not the only ones aiming at the micro payments niche. In spite of the rocky beginning of digital cash in the 1990s, several alternative micro payment systems have sprung up, including *Peppercoin*, *PayCash*and *Open Money*.

I. Electronic Chip Implants

Possibly the most frightening aspect of the movement toward a cashless society is the emergence of technology that would allow a microchip to be placed in the human hand that would identify every human being on the planet and allow them to buy and sell without coins, paper or a card [12]. A human microchip implant is an integrated circuit device or Radio Frequency Identification (RFID) transponder encased in silicate glass and implanted in the body of a human being. A sub-dermal implant typically contains a unique ID number that can be linked to information contained in an external database, such as personal identification, medical history, medications, allergies, and contact information (Wikipedia).Theoretically, a Geographical Positioning System (GPS)-enabled chip could one day make it possible for individuals to be physically located by latitude, longitude, altitude, speed, and direction of movement. This GPS-enabled chip would be able to work with the microchip implants. Though, such implantable GPS devices are not commercially available at this time. Convenience or conspiracy may ignite the cashless society however it might be prudent to admit that cashless society is on the way but there are challenges.

III. THE CHALLENGES OF ELECTRONIC ALTERNATIVE TO CASH

Any attempt at new predictions about the imminent "death of cash" just as were made in the 1960s are as likely to be incorrect this time as they were half a century ago [1]. Clearly, the technological infrastructure is much more advanced now, but it takes much more than technical engineering to build a cashless society; one must also "engineer" the relevant social dynamics and challenges, bothering on Security, Religion and Social (SRS) concerns that have always been the far more difficult part. Thus, the goal of this paper is also to inform and influence both the popular and the academic discussion surrounding cashless payments.

Current discussions about the cashless society often seem to imply that it is a relatively new idea, one that was introduced by the adoption of credit cards and now mobile payment systems, but Mathew Hollow [2] insists that the idea of cashless society is actually quite an old one. The technologies may have changed significantly over the centuries, but the social implications are still largely the same, and utopian thinkers offer some valuable insights that could inform our contemporary discussions. Utopian literature also reminds us that simply introducing a new payment method may not be enough to effect a truly cashless society; it may also require larger social changes, which naturally take generations to accomplish

A. Security and Fraud Challenges

Resolution of security and fraud issues will determine how fast the cashless society will arrive. Security is clearly of crucial importance in considering any alternative to physical cash. At the root of this lies the problem of authentication, i.e. the process of verifying the identity of a person. This is typically performed by examining some identifying information such as a password or digital signature. Over £402 million was lost in UK through plastic card fraud in 2003, which has led to the advancement of a new system, marketed in the UK under the name Chip and PIN'5 [2]. The following are the emerging fraudulent challenges associated with electronic payment system.

a) Credit card fraud

Credit card fraud is one of many forms of frauds that involve credit cards, charge cards, debit cards, or prepaid cards [7].

Typically, the fraudster causes a credit card of another person to be charged for a purchase. Today, half of all credit card fraud is conducted online, meaning that the fraudsters make online purchases with the credit card details of other people.

- "Mail non-receipt fraud" is when a new or replacement card is sent by the bank, never to be received by the intended recipient. Many banks send out *inactive* cards, which will not be authorised until the account holder confirms their identity and card number.
- "charge back fraud" is when a legitimate cardholder uses the card to purchase goods, or a service, and then when the statement comes, claims that they never authorised the transaction, or they never received goods or service ordered.
- "Skimming" is when an unscrupulous employee at a legitimate merchant takes a second copy of the card details magnetic strip before processing the payment through the official EPOS terminal. This copy of card details is sold on the black market to fraudsters who clone the cards.

- Skimming of magnetic stripe details has become slightly less prevalent after the introduction of CVV or CVS codes, which are not encoded on the magnetic strip, but are printed on the card - normally on the reverse of the card.
- Skimming of magnetic stripe details together with recording of PIN numbers entered into ATMs (An automated teller machine is an electronic device that allows a bank's customers to make cash withdrawals and check their account balances without the need for a human teller. Many ATMs also allow people to deposit cash) has been seen, where a small skimmer device that reads the magnetic stripe is attached to the card slot of an ATM, together with various devices to monitor the keypad, either by attaching a fake fascia over the genuine keypad, or by a spy camera.

b) Duplication of Card Information

Credit card "double scan" machines can copy info from the magnetic strip of your card and create a new duplicate card for which your account will be billed for any purchases.

While card issuers have fraud detection software which picks up unusual spending patterns, smaller purchase "skimming" can be subtle and prolonged, compared to the flurry of spending when a card is stolen outright.

c) Stolen payment cards

Often, the first indication that a victim's wallet has been stolen is a 'phone call from a credit card issuer asking if the person has gone on a spending spree; the simplest form of this theft involves stealing the card itself and charging a number of high-ticket items to it in the first few minutes or hours before it is reported as stolen.A variant of this is to copy just the credit card numbers (instead of drawing attention by stealing the card itself) in order to use the numbers in online frauds [6].

d) Duplication or skimming of card information

This takes a number of forms, ranging from a dishonest merchant copying clients' credit card numbers for later misuse (or a thief using carbon copies from old mechanical card imprint machines to steal the info) to the use of tampered credit or debit card readers to copy the magnetic stripe from a payment card while a hidden camera captures the numbers on the face of the card [8].Some thieves have surreptitiously added equipment to publicly accessible automatic teller machines; a fraudulent card stripe reader would capture the contents of the magnetic stripe while a hidden camera would sneak a peek at the user's PIN. The fraudulent equipment would then be removed and the data used to produce duplicate cards that could then be used to make ATM withdrawals from the victims' accounts.

e) Impersonation and theft of identity

Theft of identity has become an increasing problem; the scam operates by obtaining information about a victim, then using the information to apply for identity cards, accounts and credit in that person's name. Often little more than name, parents' name, date and place of birth are sufficient to obtain a birth certificate; each document obtained then is used as identification in order to obtain more identity documents. Government-issued standard identification numbers such as "social security or identity numbers" are also valuable to the identity thief. Information may also be obtained from insiders (such as dishonest bank or government employees).

f) Wire fraud

Wire transfer networks such as the international S.W.I.F.T interbank fund transfer system are tempting as targets as a transfer, once made, is difficult or impossible to reverse. As these networks are used by banks to settle accounts with each other, rapid or overnight wire transfer of large amounts of money are commonplace; while banks have put checks and balances in place, there is the risk that insiders may attempt to use fraudulent or forged documents which claim to request a bank depositor's money be wired to another bank, often an offshore account in some distant foreign country.

B. Religious Factor

Religious bigots may resist the cashless society based on the faith they profess. Electronic cash in itself is not evil, nor is money evil. Real obstacle may have to be overcome if the technology of electronic microchip implants will be performed on humans in the future. This obstacle pertains to religious connotations that are interpreted by many religious people as end time prophecy being fulfilled as outlined in the Holy Bible [9].

A view held by many Christians is that electronic cash is the vehicle that will introduce the cashless society and facilitate the arrival of the Antichrist, and in time, the implanted microchip on all human beings that wish to buy and sell. This view is deeply founded in the Christain belief and in the Holy Bible, in particular the passages that refer to the end of time prophecy, Revelation 13:16–17, (The Bible). The implications of a world in which money can only be accessed through personal identification marks in relation to this prophecy are evident to any fundamentalist Christian. Because of Christian's strong beliefs in this area, it will be very difficult to implement a system that will please everyone, and corporations that expect to introduce this type of system can expect a high degree of resistance. The subtleness of implementing this over a long period of time may have some effectiveness, but when it comes down to the actual implanting of foreign devices in human body, there will be an alarm ringing in their head warning them of implications of doing this. The majority of society, both Christian and non-Christian, will probably not accept this as the norm unless there is some overwhelming series of events that happen that could be sold as preventable' by having an implant on every human on the planet [16].

C. The Socio-Economic Challenges

One of the main issues regarding the implementation of a smart card/chip that would record and control all financial transactions electronically is the assault on privacy. With all private monetary data exposed to government officials many citizens may believe that the government has substantial power over society by having access to these types of confidential information. People value their ability to make

some of their purchases using cash, with absolutely no record, electronic log, or audit trail of those transactions, as a way to safeguard their privacy [3].

In March 15, 2013, the central Bank of Cyprus announced a 15 day closure of the banking system (similar only to the US in 1933 and Argentina in 2002), and all electronic transactions and money transfers were frozen with the exception of credit/debit cards and ATM withdrawals.In spite the Central Bank of Cyprus's instructions to banks that they should keep re-supplying the ATMs with money several times, by March 22nd (seven days into the crisis) long queues have formed at almost every one of the bank's ATMs throughout the Island. This was partly a result of panic and partly a result of the rejection of card payments by merchants. In other words (and like was the case in New York during HuracainCatrina), the payments ecosystem suffered a massive blow 'as every card transaction directs the retailers' money into a bank account. With a bank system under the threat of bankruptcy, or levy as the best option, most retailers prefer to turn down customers rather than accept their cards.

a) Issues in Developing Countries

At the other side of the spectrum, however, are micro-finance institutions working in developing countries such as Mexico. At BancoCompartamos, a Mexican microfinance institution, staff do not handle cash. Yet Compartamos has to rely on larger banks and a network of correspondents (such as a chain of convenience stores) to collect deposits and distribute loans. Most of these, in turn, will charge individual depositors onerous fees to provide their service.

Mobile payments are not the solution at present. For one, the service is highly unreliable outside of big cities and in some of the regions where Compartamosoperates, there is no network cover at all. Second and most important, individuals who borrow from Compartamos work in a cash economy. Their business (such as market stalls, beauty products, or seasonal goods) is carried out in cash. Few have access to the Internet or a smart phone (yet all have a mobile). The issue of unbanked sector of the population and those without electric power will have to be addressed.

b) Different Views of Cashless Society

One of the interesting aspects of the cashless economy is lack of clear views of its nature when it finally arrives. In many ways, this lack of positive definition was actually a good thing. It enabled several different groups and firms to all pursue a common goal, even though they disagreed, sometimes vehemently, about the specific details. Amongst the bankers of the 1960s, the goal was relatively clear: replace paper checks, notes, and coins with some kind of electronic payment system. But how that system should be structured, who should govern it, who should pay for it, who should operate it, and how consumers and business should access it, were all open questions. For each of these questions, there was money to be made and lost, so not surprisingly, different groups had very different opinions about the potential answers. A general meaning of "the cashless society" might have been shared, but the specifics were hotly contested.

Despite these disagreements about the specifics, however, US bankers in the 1960s assumed that these new electronic transactions, as well as the accounts they accessed, would still be denominated in US Dollars. In other words, the cashless society might eliminate paper bank notes and checks, but it wouldn't eliminate money altogether, nor would it replace the centralized, state-issued currency with a host of privately-issued ones. Thus, "Cashless" simply meant "electronic transactions." The cashless society promised to automate the mechanisms of monetary exchange, but it would leave the existing state-issued fiat currencies firmly in place.

These days, however, there is a broadening of the meaning of "cashless" to include such things as privately-issued electronic currencies such asBitCoin), as well as the dream of a completely moneyless society.

IV. BENEFITS OF A CASHLESS ECONOMY, CONCLUSION

A. Benefits

A cashless society has numerous advantages, as it is easier for consumers and businesses to conduct transactions. In Nigeria, the Central listed the benefits of cashless policy in its website, (www.cbn.gov.ng). The CBN believes that the policy will: A) Drive development and modernization of payment system in line with the Nigeria's vision 2020 of being amongst the top 20 economies by the year 2020. An efficient and modern payment system positively correlated with economic development is a key enabler for economic growth. B)Reduce the cost of banking services (including cost of credit) and drive financial inclusion by providing more efficient transaction options and greater reach. C) Improve the effectiveness of monetary policy in managing inflation and driving economic growth.

In a cashless society there is no need to carry money inform of coins or cash, which will reduce insecurity and crime. When people are travelling, the foreign currency is not necessary because money will be transferred electronically. In cashless society, there is no forgery of currency and people get the exact value for their products, rather than down valuing.Onefactor underlying adoption of cashless payments in developing countries is that of financial inclusion: mobile phones are widespread and thus, with a little push, more people would escape the tyranny of the cash and join the financial system.For 30 years or so the likes of the World Bank and the Bill & Melinda Gates Foundation have supported mobile banking initiatives as well as their predecessors, namely microfinance institutions. In Mexico,BancoCompartamos, like many other microfinance institutions, the distribution channel is challenging growth and diversification.

NurdilekDalziel and Can Ali Avunduk gave an insight into the mobile payment system in Turkey where direct carrier billing (DCB) is practiced. DCB is an approach to mobile payment system where the mobile network operator manages the accounts and plays the central clearing role instead of a bank or bank-owned service organization. With this approach, anyone with a mobile phone can send and receive electronic payments, even if that person doesn't have a

bank account. They estimated that 37% Turkey's Inhabitants have no bank accounts but most of them do have mobile phones. Thus, DCB could be one method by which this "unbanked" section of the population can gain access to electronic payments.

V. CONCLUSION

There is no doubt that the technology infrastructure is well in place for the arrival of cashless society. The electronic payment systems are well advanced in developed countries, and developing countries are indeed catching up with the instruments for cashless economy. The pervasiveness of mobile phones in both developed and developing countries facilitated the spread of electronic cash even to the unbanked section of the population.

However, although there are certainly developmental benefits to technologically enabled finance, but it would be a shame to ignore the downside or fail to address the type of foundational questions that challenge and advance our understanding of innovations such as microfinance and mobile money in the envisaged cashless economy.

Indeed we need a conceptual and empirical body of knowledge that looks beyond fads and into what works better for society. To achieve our dream of a cashless society, the challenges raised in the SRS above must be adequately addressed and then we will decide which way to go: cashless society or moneyless economy.

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