

**Impact of digital payment systems on societal wellbeing**

**Muhammad Sheraz Zahid**

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## **Abstract**

Digital payment systems are being increasingly adopted in both developed and developing economies. The objective of this study is to examine how the adoption of digital payment systems affects communities, societies, and countries. Using a systematic review of the literature, the various societal outcomes affected by digital payment systems are identified, as well as the pathways through which these effects occur. The study's findings may help countries, especially those which are less well-off economically, when they are deciding whether and how much to invest in the infrastructure to support digital payment systems.

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## **Attestation of Authorship**

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Signature:

*30<sup>th</sup> July-2021*

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## **Chapter 1: Introduction**

Digital payments refer to any type of payment where digital instruments are used, these may include mobile payments, electronic payments, mobile wallets and cryptocurrency (Alkhowaiter,2020). Digital payments are cash-less transactions, and no physical cash is involved in digital payment transactions. Over the last two decades, development and advancement in ICT such as mobile telephony and cheap Internet access have supported the development of digital payments. Different types of digital payment systems are in use, such as ePesa, Alipay, WeChat Pay, Apple Pay and Google Pay, each with different levels of maturity and popularity. The idea of digital payments has been around for at least fifty years and underpins the idea of a “cashless society” (Armer, 1968). There has been substantial research on its benefits to consumers, businesses, and societies, but less on the possible negative impacts. My study’s objective is to examine the relationship between the adoption and usage of digital payments and societal wellbeing holistically.

To understand the societal outcomes of the adoption of digital payment system, which could be both negative and positive, I will draw on research about the effect of technology on societies. This chapter presents an overview of the dissertation. It begins with an introduction of the phenomenon, before discussing the relevant theories and the methodologies which are applied to answer the research question.

### **1.1 Digital payment systems**

Digital payments can be defined as payments made through digital technologies. These technologies are not limited to handheld devices, and the devices may have or not have access to telecommunication networks (Raharja, Sutarjo, Muhyi, & Herawaty, 2020). Such digital financial transactions are not necessarily are connected to any financial institution (FI) or banks (Diniz, de Albuquerque, & Cernev, 2011). Digital transactions are conducted over digital payment systems (DPS). DPS complement the growth of cashless transactions and help societies move away from cash transactions. ICT advances have played a critical role in

the evolution of digital payments, which includes stages such as Internet banking, mobile banking, debit/credit card use, digital wallets, and payments through apps.

While digital payment systems have evolved over last five decades, they all share some key components:

- 1) **The ICT infrastructure** to support a digital payment system, including the movement of funds from one account to another, and shared infrastructure, such as banking switches to process interbank fund transfers, telecommunications technology to process transactions through terminals supported by mobile broadband or fibre broadband, and EFTPOS devices and payment gateway infrastructure enabling merchants to accept cards or electronic payments at the retail level. EFTPOS devices may be connected through telephone lines or the Internet, and EFTPOS payments can also be made over websites.

Figure 1 shows the flow of digital payments and the layers needed to process cashless transactions between customers and merchants or businesses. Digital payment components, such as physical payment cards (e.g., prepaid, credit, debit) and mobile wallets, are used to initiate digital transactions. These components are supported by ICT infrastructure, such as card management systems where all the cards are hosted. These systems can be on physical servers placed in dedicated data centres or in the cloud. Digital payment transactions are processed over the web or on EFTPOS devices, which use wired or wireless mobile network to send authorisations to banks to complete the cashless transactions and move funds from customers' bank accounts to merchants' bank accounts.



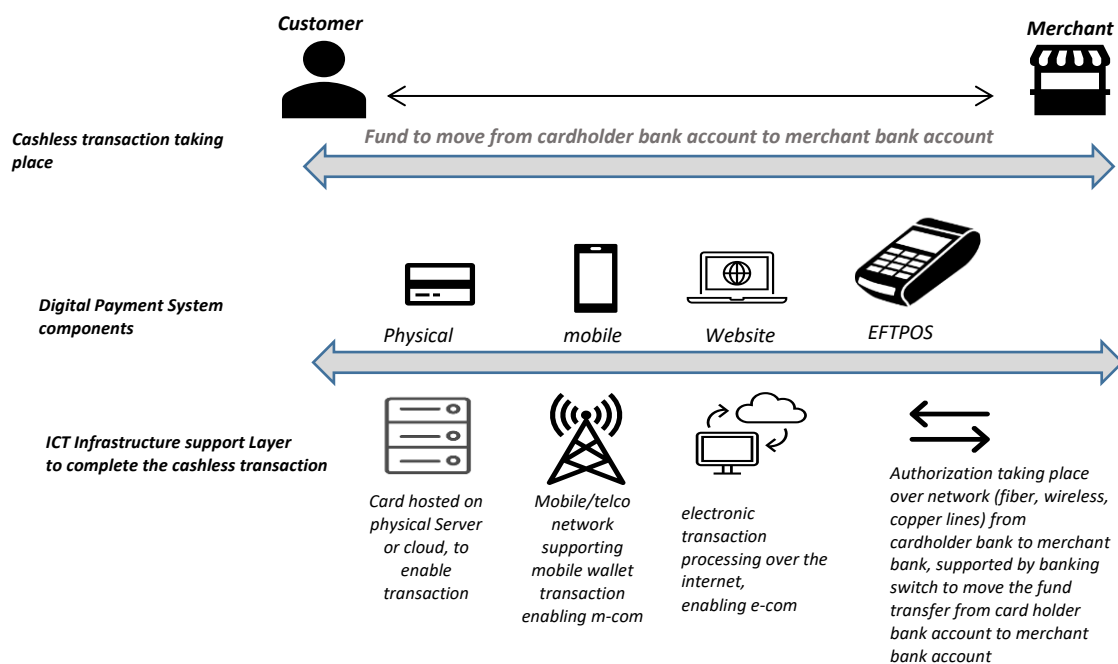


Figure 1 - DPS reliance on ICT Infrastructure

- 2) **Government regulations** relating to digital payment systems: they are critical because the payment eco-system changes frequently, as new payment methods and technologies are developed. Some of the areas these policies cover include access to payment technologies, evaluating new payment technologies (such as crypto currency and contactless payments), developing a credit risk framework for peer-to-peer (P2P) lending, and supporting government-to-person (G2P) payment disbursements such as pensions and benefit payments.
- 3) **Industry policies and compliance frameworks:** to drive growth of DPS, regulators and policymakers have a significant role to play, adopting different approaches due to different financial and social economic situation within their jurisdiction. The goals of their intervention are usually efficiency, financial inclusion and competition (Urbiola et al., 2020). These goals support the scaling and mass adoption of digital payment technologies without increasing the associated risks, such as operational risk, business risk, and fraud. Two key domains these frameworks cover are anti-money laundering assessment procedures and data protection guidelines. These policies and frameworks are usually developed by national-level forums that involve the various

stakeholders, such as regulators, infrastructure enablers, and service providers. This supports a consistent, unified approach towards compliance so that the digital payment systems being used are fully compliant at the national or global levels (Capgemini, 2020).

There are different levels of digital payment adoption around the world. European, Canadian, Australian and New Zealand cities are considered global leaders in terms of digital payments (Visa & Roubini ThoughtLab, 2015). Their positions are based on a few factors:

- 1) A well-developed banking and digital payment infrastructure
- 2) High usage and high readiness of electronic and mobile devices
- 3) A highly banked population: most residents have bank accounts, i.e., only a very small fraction of the population is unbanked.

Digital payment systems are becoming more common in countries that have a high population and a high level of mobile device penetration, such as Thailand, India and Russia (Visa & Roubini ThoughtLab, 2015). The 2020 World Payments Report (Capgemini, 2020) indicates that non-cash transaction volume is expected to reach US\$1.1 trillion by 2023. Global non-cash transaction volume in 2018-19 grew by 14% to US\$708.5 billion, which was the highest increase in a decade. Thus, the use of digital and mobile wallets and apps, such as Apple Pay and Google Pay, is expected to keep growing. In New Zealand, many retailers saw a surge in electronic and digital payments during the 2020 Covid-19 pandemic (Newshub, 2020). While cash was previously the primary mode of payment, it declined tremendously in the Covid-19 environment, because handling physical bills and coins increased the risk of spreading the Covid-19 virus.

## **1.2 Prior Research on Digital Payment Systems**

Previous studies suggest that digital payment systems can bring economic benefits to the societies. For example, a study by Visa & Roubini ThoughtLab (2015) estimated that increasing digital payments across 100 cities could result in total direct net benefits of US\$470 billion per year. This study estimated that the higher use of digital payments could increase a

city's GDP by 0.19%, support over 45,000 additional jobs per year and increase productivity and wages by 0.14% and 0.16% respectively per year per city. Moreover, this number may be understated because many digital aspects of economies, such as digital payments, are unaccounted for in GDP figures (Brynjolfsson, 2019).

A potential societal benefit of digital payment systems is the increase in financial inclusion. Financial inclusion refers to having easy and convenient access to a range of financial services (Demirguc-Kunt et al., 2017). Bruhn and Love (2014) argued that increased access to financial services increases the income of low-income individuals. Increasing financial inclusion can help reduce poverty and inequality by allowing individuals to make financial transactions more efficiently and safely (Demirguc-Kunt et al., 2017): they can invest in their future by investing in education, make more informed decisions, and manage their financial risks by having access to market information. Financial risks include negative income shocks, such as unemployment or the loss of a breadwinner; families can use insurance to prepare against such risks. This impact is especially relevant for people living in the poorest households, as they are most in need of resources to cope with risks and emergencies (Collins et al, 2009). Insurance against negative shocks may prevent individuals from falling into poverty in the first place (Demirguc-Kunt et al., 2017). Table 1 below highlights some research on digital payment systems and their impact on society, economy and business.

Reference	Findings
Mukhopadhyay (2016)	The study investigates aspects of societal outcomes with cashless payments. There was a small correlation between cashless payment use and income earned, as well as a small correlation between cashless payment use and education level. The study suggests strong correlation and benefits of cashless transactions to GDP, lower cost of storing and processing physical currency and increased tax collections.
Widjaja, 2016	The study provides insight towards Malaysia's drive towards cashless transactions. It details different method of cashless transaction such as paying through cards, internet banking and mobile banking. The paper discusses the benefits of cashless transactions, such as security and convenience when cards are used. The author also explains the regulatory framework of cashless transactions in Malaysia.
Ng, 2017	The study discusses the digital payment initiative taken by Singapore's government after looking at China's successful growth in DPS. The author discusses the types of payment methods, such as card, mobile and QR codes, the types of payment cards, and types of interfaces, such as point of sale (POS) systems or QR codes. It also discusses the use of digital payment in mass transit in Singapore.
Gomber, Kauffman, Parker, & Weber (2018)	This study discusses three major areas of financial services which are impacted through the fintech revolution: technology innovation, process disruption, and services transformation.
Iman (2018)	The paper discusses the evolution of mobile payment systems and asks if the mobile financial system is still relevant in this era of fintech.
Alkhowaiter,2020	The paper discusses the growth and uptake of digital payments in the Gulf Cooperation Council (GCC) region and how different DPS methods are gaining popularity in the region.

*Table 1 – Previous literature on ICT and DPS*

There is an argument that payment digitisation creates economic growth (Bukht and Heeks, 2017), For example, Malaysia's adoption of non-cash payment solutions, beginning with credit cards in the 1970s, enabled rapid growth in the economy. Credit cards have since become

the primary payment method for large ticket items in Malaysia and have also become a social symbol of an affluent lifestyle (Widjaja, 2016)

Consumer readiness to adopt digital payment system is rapidly growing in the global context (Shailza & Sarkar, 2019), with perceived convenience and usefulness as factors which may have a positive impact on consumer attitudes. Mobility, security, simplicity, compatibility and trust may also affect consumer attitudes to adopt digital payment systems. As the demand for digital payment system increases, the anxiety behind the security of digital payment systems will also increase.

### **1.3 Impact of ICT on Societies**

Information and communication technology is recognised as a major contributor towards national progress and social transformation (Majchrzak, Markus, & Wareham, 2013). The impact of ICT on societies can be examined through various dimensions. This section looks at how ICT has affected societies in these three aspects: economic, political and social.

Solomon & Klyton (2020) study distinguishes between the impact of individual, business, and government usage of ICT on economic growth in African countries. The study suggests that the digital technology stimulates the economy by enabling and facilitating communication, creating employment, empowering individuals, and encouraging innovation.

From mobile commerce to e-commerce and business process outsourcing, digital technology has revolutionised and transformed how organisation can operate globally (Lacity, Khan, & Yan, 2016) and (Liu & Aron, 2014). Digital technologies have created an environment for virtualisation and datafication (Bukht and Heeks, 2017). The significance of digital technology was quite evident in the Covid-19 pandemic around the world, as government-mandated social distancing to control the spread of the virus and the use of digital technology to minimise the impact of economic shutdowns (Solomon & Klyton, 2020).

### Economic aspect:

Researchers have found that ICT investment improves a country's economic growth, despite numerous challenges (Xiao, 2013). One way ICT does this is by significantly reducing the costs of business operations, such as search costs, monitoring costs, and transaction costs, resulting in less friction in commerce and an increase in the level of economic activities and entrepreneurship. Considering these benefits, the World Bank encourages developing countries to drive innovation and productivity gains through investing in ICT, ICT can help reduce poverty, boost economic growth and improve accountability and governance. (Journal of E-Governance, 2013).

While we discuss different aspects of the impact of ICT usage, its impact on business in context of digital payment adoption is meaningful. For businesses, shifting payments from cash to digital accounts allows for more efficient and more transparent payments from governments or businesses to individuals, and from individuals to government or businesses. Digital payment systems could provide businesses in the informal economy with access to the formal financial system and appropriate credit that may support investments in business opportunities that could, in the long term, boost economic growth and productivity. For example, providing credit facilities, such as working capital, may increase economic activity through increased employment opportunities and greater productivity (Demirguc-Kunt et al., 2017).

### Political aspect:

The political aspects of the impact of ICT investment are less visible and the least understood among the three aspects, despite increased focus on ICT investment by the United Nations (UN), EU and the World Bank (Soper et. al, 2012). The role of ICT investment in facilitating democratization has been identified as an important area of study, because on average, multi-national corporations invest significantly more in democratic societies (Busse, 2003). ICT also has the potential to improve democratic principles in developed societies (Gronlund, 2001).

The other critical element of the political aspect is corruption in politics. ICT has helped minimise corruption and provided more transparency at national level (Srivastava et al., 2016),

Social aspect:

ICT advancement has helped tremendously in alleviating overall societal welfare in countries by improving the transfer of information and knowledge on several aspects of quality of life (Gani, 2006). ICTs can impact directly and indirectly on people's lives and improve the welfare of the poor in developing countries. Quibria et al (2002) list these impacts as:

- Access to market information: through ICTs, consumers can get information on low prices, suppliers and firms, helping reducing transaction costs and removing barriers.
- New opportunities for income enhancement: With the advancement in globalisation, remote villages have now access to internet and mobile thus creating business opportunities which help to improve their revenue stream and increase their household income.
- Improvements in human capital: one of the ways to improve human capital and eradicate poverty is education, ICTs have helped to give access to education and learning opportunities in developing countries.
- Improvements in health care and life expectancy: For example, mobile healthcare and virtual dispensaries have given people adequate access to health which they did not have before.

These aspects can be aggregated under societal wellbeing, which can be measured through the Human Development Index (HDI), developed by the United Nations Development Program (2001). HDI is comprised of four variables: Income, literacy, life expectancy and educational attainment.

However, at the same time, ICT use has had negative impacts on the environment and society. For example, computer equipment manufacturing requires complex assembly and includes several toxic materials, which are not environmentally friendly. Similarly, more water and electricity are required with the advancement in semi-conductor wafer production, which could easily be equated to water supply for 60,000 people for 1 year in a city. (Yi & Thomas, 2007). Also, the benefits of ICT may not fully realise in countries who lack governance and

infrastructure. To fully utilize the benefits of ICT investment, countries must have legal and governance frameworks to support consistent reach of ICT services to people to improve their HDI and reduce poverty (Yi & Thomas, 2007).

#### **1.4 Motivation and Research Question**

Digital payments are being increasingly adopted globally, both in developed and developing economies. Most studies have focused on its benefits to consumers, businesses, and societies. The objective of this study is to examine and understand as how the adoption of digital payment systems affects communities, societies, and countries. The aim is to understand various societal outcomes affected by digital payment systems and the pathways through which these effects occur.

At a glance, digital payment systems can have a variety of impacts at different levels: individuals, families, societies, economies. This study will focus on aggregating research on the impact of digital payment systems on the wellbeing or quality of life of societies. Societal wellbeing has many indicators (Allin, 2007; Cummins et al, 2003), such as the OECD's Better Life Initiative (Durand, 2015; OECD, 2011/19), which comprises objective indicators for domains such as health, employment, education, and housing, as well as a subjective indicator, life satisfaction. The breadth of the index will help in exploring the different ways digital payment systems can affect societies.

My research question is "How does the use of digital payment systems influence societal wellbeing?"

#### **1.5 Methodology**

To answer the research question, I have undertaken a systematic review of the literature. In the next chapter, I will detail out the conceptual development of the research and the literature review. Chapter 3 outlines the methodology of my research. In Chapter 4, I will present my findings. In Chapter 5, I discuss future opportunities in this area of research.



## **Chapter 2: Conceptual Development**

In this chapter, I will discuss the broad impacts of ICT on society and how it has changed many people's way of life. Having understood the impact of IT, I will explain the impact of digital payment systems on the wellbeing or quality of life of societies. Societal wellbeing has many indicators (Allin, 2007; Cummins et al, 2003) but I will be relying on the OECD's Better Life Initiative (Durand, 2015; OECD, 2011/19), which comprises objective indicators such as health, employment, education, and housing, as well as a subjective indicator, life satisfaction. The primary reason for choosing this indicator is that it is more holistic and all-encompassing, especially compared to indicators such as gross domestic product (GDP), the level of foreign direct investment, unemployment, and inflation which only represent the economic aspect of societies.

### **2.1 Evolution of information and communication technology (ICT):**

The world has seen tremendous growth in ICT investment and use over the last few decades. One positive outcome of this growth is that it has widened individual participation in social, political and economic aspect of life (Nishijima, Ivanauskas, & Sarti, 2017). As discussed in Section 1.3, ICTs have increased transparency and accountability, access to market information, created employment opportunities and removed barriers for business by lowering costs, hence increasing economic activity and boosting entrepreneurship. On the social dimension of life, ICTs have enhanced access to quality education and health care. ICT has also helped to broaden information exposure, because computers and related ICTs offer new ways for people to get information and communicate with each other (Dutton, 2001). People can now go online using ICT to obtain the information they need with convenience and ease. Fast and consistent progress in computer technology and the convergence of development efforts in computing and telecommunication has created an array of information and communication technologies. From hand-held devices to the World Wide Web, these innovations and their application have contributed immensely to all sectors of society. These advancements in technology have made computers a defining technology in transforming the

late twentieth century. ICTs have evolved during the last few decades and contributed significantly to shape individual household, firm and national access to information (Dutton 2001). ICT's impact can be examined across multiple levels: organizations, industries, society, and economy (Lucas et al, 2013), and these effects are summarised in Table 2.

Table 2 - Transformation of key sectors of the economy

<b>Sectors</b>	<b>Transformation</b>	<b>Impact</b>
Financial Industry	More integrated systems (software) to provide single view combining investing and implementation to fund managers to optimize stock performance	Less human interaction, electronic system in place to invest in stocks, transformation forced companies to merge and to change industry structure, completely changed the way of investing in stocks, there are also concern on market volatility in context of high-speed algorithm back up by the technology, there are regulatory policy issues, risk framework for new products entering into the market
Health care	Creation of electronic medical records (EMR) through health care information technology (HIT), providing safer and cheaper health care system which is less prone to errors	EMR system provide core patient information and allow workflow functionality EMR adoption reduce the administrative cost and improve health care by reducing the duplicate errors, encouraging more preventive medicines
The consumer experience	The merchant and the customer relationship are redefined, no need for customer to have in-person experience for shopping	Customers have more choices; online sales have removed barrier for merchant to reach out to customer and deliver service at low cost
Media	Advances in broadband digital networks transforming preferences across media, entertainment, music. Online gaming etc. New digital platforms to create demand	Customers have more choices on media, huge inflow of information, online streaming movie platform, digital media including social media have increased access to information. There

	and enable access to entertainment, gaming	is also negative concern of unregulated communication through social media which could also generate speculation and chaos
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## 2.2 Economic Impact of ICT:

Advances in computer technology and telecommunications have enabled innovations such as video games, cell phones, smart phones, mobile broadband, and smart /digital TV, which have provided businesses with new capabilities and shaped societal behaviour. The impact of ICT on society differs for developed and developing countries, depending on factors such as the approach to usage, adoption level, and early-stage investment. For example, China had around 10 million PCs in 1997 and 1 million internet users. By 2011, China had 400 million internet users and overtaken the US as the largest PC manufacturer (Dedrick, 2013). We can see similar trends in India and Southeast Asia which provided transformational change in ICT landscape in developing countries.

ICT investment is one driver which has impacted society to larger extent. Data from the late 1980s showed a huge gap in ICT investment between developing countries as compared to developed countries. However, this gap decreased in the 2000s, as developing countries made rapid progress. This has enabled them to enjoy the benefits of ICT investment in terms of higher productivity, improved access to education, higher foreign investment, lower costs for telecommunication service; as the influence of ICT has increased, its contribution in overall GDP growth has also increased (Dedrick, 2013). For developed countries, society is affected by the level of foreign direct Investment, the penetration of cellular phone networks, and the spread of Internet networks.

Increasing ICT use in the late 2000's combined with the continuous evolution of ICT to create a wide impact on societies and individual behaviours. As new technologies and devices are introduced, they are also rapidly adopted. Examples include smartphones, smart TVs, laptops, broadband internet, and artificial intelligence. The use of ICTs continuous to spread

to different fields, such as health care, education, politics, and trade. The increase in usage and adoption of ICTs have provided tremendous opportunities to innovate, and innovation has played a greater role in emerging countries in growing the economy. Emerging countries (also referred as emerging markets) are those who have experienced economic development at a rapid pace. Both innovation and economic growth are directly correlated (Xiao, 2013).

The ICT revolution has created a concept of a global village and brought the world economy together by removing intermediaries and reducing the distance (Torre & Moxon, 2001). However, there is a great deal of interest growing in big data and the internet of things (IoT). Both technologies may be disruptors and have the potential to transform individual lives in the context of service delivery. The customer experience and the interactions take place over ICT devices. These technologies are driven on the back of Internet and cloud computing which are considered “mother platforms”, both components transforming many aspects of economic activity (Kenney et. al, 2015).

### **2.3 Societal Impact of ICT:**

ICT is an important catalyst for national progress and social transformation. An insight that motivated early 20<sup>th</sup> century telecom regulation ensuring universal access for all citizens. More recently, governments, non-government organisations and organic social movements have started to use and adopt ICT to increase participation, transparency, and accountability for previously voiceless people in developing nations (Majchrzak et al., 2013). The increase in IT influence on society has drawn great public attention and enhanced visibility. However, theoretical concepts that explain the complex relationship between ICT and societal impact remains very limited (Faik, 2020) and have not been understood to a greater extent. The societal changes that have taken place, as a result of the increased pervasiveness of ICT, are complex. For example, while higher use of ICT has alleviated poverty, increased political participation and social inclusion, it has also reduced privacy, increased systematic risk, and de-regulated employment, with more individuals in precarious working conditions (Dutton, 2001). With access to personal information in the public domain and on social platforms,

individual details are more susceptible to be stolen now than ever before, increasing systematic risk and identity theft risk. Similarly, as more work is moving into the digital space, employment scope and the nature of work are becoming more casual, which is making employment environments more deregulated and vulnerable for workers working for overseas client and businesses on digital channels without entering into proper employment or work agreements.

As the advancement in IT will continue to make an impact on societal outcome, there is going to be huge focus by policy makers to tackle challenges to support and nurture these changes as they will be dynamic in nature, while minimising and streamlining some of the outcomes to safeguard privacy, fair taxation and income equality (Martin Kenny, 2015). Societal wellbeing has many indicators (Allin, 2007; Cummins et al, 2003), however, indicators on the OECD's Better Life Initiative (Durand, 2015; OECD, 2011/19) are most relevant in context of this study, which comprises the following indicators: Health, Employment, Education Housing and Life satisfaction. The breadth of these indicators will help in exploring different ways in which digital payment systems can affect societies.

Development of ICT with quick pace and strong penetration have shown to have beneficial welfare effects at individual levels. Table 3 shows well-being indicators of various low-income countries: arguably, improvements in those indicators is happening due to the uptake and development of ICTs during 1990s. Some Indicators, such as GNP per capita, have shown an improvement, infant mortality has a declining trend, and life expectancy has shown upward trend slightly. There are also clear drops in the illiteracy rates among adults and youth. Although the diffusion rate of ICT in these low-income countries are slow due to different range of factors such as inadequate human capital, lack of focus on regulation, low purchasing power and poor competition (Gani, 2006).

<b>Well-being Indicator for low-income countries</b>	<b>1990</b>	<b>1995</b>	<b>1999</b>
GNP per capita (US\$)	1,470	1,690	1,870
Illiteracy rate, adult total (% of people aged between 15 to 24)	45.7	41.7	38.5
Illiteracy rate, youth total (% of people aged between 15 to 24)	32.1	27.9	24.9
Immunisation DPT (% of children under 12 months)	79.9	75.9	70.4
Immunisation measles (% of children under 12 months)	75.4	73.1	64
Life expectancy at birth (years)	57.6	58.8	59.1
Mortality rate, infant (per 1000 live births)	87.6	81.0	77.3
Population density (people per square Kms)	67.6	67.7	73.2

Table 3 - Well-being Indicator

*Adapted from Gani (2006), source - The World Bank (2001b)*

However, ICT consequences are not universally positive. ICT can contribute unemployment and increased economic disparity, as well as labour and financial market instability (Kling, 1996). ICT has contributed hugely to the automation of work and tasks. Before ICT advancement, there was no infrastructure to support electronic communication, for example a postal service, while ICTs have enabled almost real-time communication, with e-mail. Before this ICT innovation, there were traditional postal services, involving a huge labour force, which are now not needed as much due to advancement in ICTs. Similarly, developing countries where ICT penetration is slow and do not have sufficient investment opportunities to invest in ICTs lag behind in economic activities, increasing their disparity in terms of economic development (Gani, 2006).

#### **2.4 ICT and Innovation in Financial Services and Products**

The above sections have explained the social and economic impact of ICT in general. This section examines ICT's impact on a particular industry, which is, financial services and products. ICT has led to the growth of various new financial services and products; one example is micro-finance (MF) segment. Microfinance enables low-income individuals to access funds and thus provide opportunities to elevate their living standard and become self-reliant. While microfinance has existed for some time, advances in ICT, such as mobile telephony and messaging, have enabled microfinance firms to expand their reach. Microfinance, and indirectly ICT, has had a significant impact on poverty eradication (Kauffman,2012). For example, Grameen Bank of Bangladesh has uplifted many individuals' financial situation. Grameen Bank was founded in 1976 and had a portfolio of 260 million and 2.3 million members by 1997. Most of its members were poor and 90% of them were women

and the average loan disbursement was \$170. Grameen Bank's micro-finance proposition provided relief to those in the extremely low-income group who were affected by the constant challenges of flooding, a corrupt government system, and a social system that had restricted women's movement, leading to a huge disparity between income and health. Microfinance improved access to loans and savings services for low-income people and is considered an effective tool to alleviate poverty (Schreiner, 1999)

The mass adoption of ICT has revolutionised the microfinance industry and enhanced its overall contribution to economic development. The key areas of ICT's impact on the microfinance industry ecosystem are:

- **Customer-level** – ICT has provided more transparency, accessibility and financial inclusivity of diverse group of customers.
- **Microfinance industry-level** – ICT enabled accessing new markets to grow the customer base, and new ways of delivering services.
- **Donor Level** – ICT provides transparency and visibility to donors, so that they are confident that the donation is used for intended purposes.

Technology is transforming major areas of financial services through innovation, process disruption, and service transformation, and the financial services industry is known for being a deep user of ICT (Gomber, 2018). For example, the industry has used ICT to develop new applications, such as mobile wallets, and deliver services and financial products without having in person interaction or human assisted services. With the invention of smartphones, service delivery models are now built around the smart phone. For example, banking mobile apps can enable customer to provision new credit card, open new bank account, buy insurance, and remit money in seconds globally (World Remit and Western union mobile app). Advancement in ICTs have transformed financial services and customer expectations in terms of service are now based on virtual delivery models and self-service kiosk (without human assistance).

Fintech can simplify process management and provide significantly enhanced customer services enabled through payment technology. Key areas which have been strongly influenced by fintech include customer acquisition and retention, credit scoring and approval, real time credit and monitoring (Gomber, 2018), moving away from the brick-and-mortar model of delivering financial services, and becoming more agile and expanding their digital footprint and moving towards branchless banking.

## **2.5 Digital Payment Systems**

While advances in ICT have created a substantial impact on all segments of life, digital payment systems (DPS) are one of the prominent domains. They have evolved hugely in the last decade, and potentially created an impact on individual lives by changing their approach towards payments. This study will focus on aggregating research on the impact of digital payment systems on the wellbeing or quality of life of societies. Such systems can have a variety of impacts at different levels (individuals, families, and societies/economies). The study will frame these impacts by using the OECD's Better Life Initiative and the indicators discussed previously. The breadth of the indicators will help in exploring the different ways digital payment systems can affect societies.

### **2.5.1 Key Features of Digital Payment Systems**

Digital payment systems are as defined as any transfer of money or funds which is carried out by an individual or business through order or instruction to financial institution (including bank) by debiting or crediting the account managed in any financial institution (including bank) using electronic ways including credit or debit card, Automated Teller Machines (ATMs), Point of sale (POS) or mobile POS, internet banking or mobile banking platforms (Shailza & Sarkar, 2019).

Digital payments are cashless payments made through any type of payment using digital instruments, which can be any one of the following (Alkhowaiter, 2020): mobile payment, mobile wallets, electronic banking (ATMs), internet banking, and cryptocurrency (e.g., Bitcoin) transfers. The payment industry has experienced robust growth in last 10 years. The global



digital payment market was valued at USD 5.44 trillion in 2020 and expected to reach USD 11.29 trillion by 2026 (Morder Intelligence, 2020)

Among the BRICS countries (Brazil, Russia, India, China and South Africa), Russia's rate of moving to digital or cashless transaction is highest- on average, 200 annual cash-less or digital payments are made by an adult-, whereas in India, 20 transactions on an annual average are made by an adult (Shailza & Sarkar, 2019). According to data from the Bank for International Settlements in 2017, China's ratio of digital payment transactions to GDP was 45%, whereas India lagged behind at 1.7%, which was the lowest among the BRICS nations.

### 2.5.2 Economic Impact of Digital Payment benefits

Digital payment systems are widely reported to bring economic benefits to societies. For example, a study by Visa & Roubini ThoughtLab (2015) estimated that increasing digital payments across 100 cities could result in total direct net benefits of US\$470 billion per year. This study estimate that higher use of digital payments could increase a city's GDP by 0.19%, support over 45,000 additional jobs per year and increase productivity and wages by 0.14% and 0.16% respectively per year per city. Moreover, this number may be understated because many digital aspects of economies, such as digital payments, are unaccounted for in GDP figures (Brynjolfsson, 2019).

Table 4 shows the cost of cash with respect to GDP in various countries:

<b>S.no</b>	<b>Country</b>	<b>Year</b>	<b>% of GDP</b>
1	India	2015	1.7
2	Australia	2009	0.8
3	Sweden	2009	0.5
4	Denmark	2009	1
5	Hungary	2009	1.1

*Table 4 - Cost of cash and GDP*

*Adapted from Patra (2018) – electornic payment adoption in India: Development and Policy issue*

Moving from a cash society to cashless society may result in direct and indirect benefits (Mukhopadhyay, 2016). Moody's Analytics (2013) studied the correlation of card usage and Gross Domestic Product (GDP) of 51 countries and found that cards were used for USD 1.1

trillion in real dollars among private consumption and GDP from 2003 to 2008. The study found that an increase of 1% in card transactions proportionally increased consumption each year by 0.039% and GDP growth by 0.024%. There are also other studies undertaken to understand the multiplier effect of digital payment systems on GDP and GDP growth. For example, Moody's Analytics (2013) researched the effect of GDP of card usage. Looking across 56 countries over the period of 2008-2012, the study revealed that USD 983 billion were added to cumulative real GDP, which amount to 0.30% of their GDP per year. The study estimated that an annual increase of 1% in card usage in the future would result in an increase of consumption of 0.032%. In the light of these findings, we need to understand if increase in digital payment and cashless payment, would drive GDP growth which may contribute towards increased economic activity. However, the studies point towards two key benefits from digital using payments on GDP growth: low cost of storing and processing physical currency and higher tax collections. In other study by Bolt et al. (2008), based on banking data from Norway and Netherland, through digital payment systems, Norway saved 0.7 million Euro in 2004 which was 0.35% of GDP in 2004, whereas Netherlands's saving were 2.9 billion Euros, which accounted for 0.61% of their GDP. Digital payments leave digital footprints and provide better financial records which are traceable. This creates transparency in the system and hence could result increase tax collection. For example, the based Economic Index of Freedom data, Indian Tax revenue to GDP is 17% whereas global average is 25%,

There are other indirect benefits of digital payments which have influence on societal impacts.

These are:

*Financial inclusion* – the term refers to accessibility to financial services to people who are unbanked or don't have access to banking or financial system, emerging markets have huge focus to drive financial inclusion, providing basic financial services to unbanked population. It is believed that financial inclusion alleviate poverty and increase standard of life of people.

Efficient mass payment disbursements to individuals – digital payment and cashless payment methods provide transparency, safety and efficiency for government disbursement to individuals for welfare and pension payment, these are referred as G2P payment (government to person), also through G2P payment processing through digital methods, unbaked population get access to financial services. Recently, Pakistan’s government disbursed Covid-19 subsidies and welfare payment through the “Ehsaas program” (Barber et al. 2020). The entire process for disbursing welfare and support payment has increased transparency and stopped leakages, removed barrier and layers, so these welfare payments can go to the beneficiary directly.

### 2.5.3 Social Impact of Digital Payment Systems

Digital payment systems adoption level varies in different regions and countries, developed and emerging markets are experiencing shift in the payment preference and consumers have more choices, this is shaping up new behaviour and different attitude towards digital payment and, hence creating social impact.

Strong aspect of digital payment system to societies is the increase in financial inclusion. Financial inclusion refers having easy and convenient access to a range of financial services (Demirguc-Kunt et al., 2017). Bruhn and Love (2014) argued that increased access to financial services improves the income of low-income individuals. Increasing financial inclusion can help reduce poverty and inequality by allowing individuals to make financial transactions more efficiently and safely (Demirguc-Kunt et al., 2017): they can invest in their future by investing in education, make more informed decisions, and manage their financial risks by having access to market information. Financial risks include negative income shocks, such as unemployment or the loss of a breadwinner; families can use insurance to prepare against such risks. This impact is especially relevant for people living in the poorest households, as they are most in need of resources to cope with risks and emergencies (Collins et al, 2009). Insurance against negative shocks may prevent individuals from falling into poverty in the first place (Demirguc-Kunt et al., 2017).

Emerging markets have more potential to experience financial disruption due to inadequate level of access to water, health, education and financial services. 75% of Worlds' population who are financially excluded live in 25 developing countries, India and China constitute 32% of those individuals who do not have access to financial services (Razaq, 2017)

Businesses which are shifting payments from cash to digital accounts allows for more efficient and more transparent payments from governments or businesses to individuals, and from individuals to government or businesses. Digital payment systems could provide businesses in the informal economy with access to the formal financial system and appropriate credit that may support investments in business opportunities that could, in the long term, boost economic growth and productivity (Demirguc-Kunt et al., 2017). For example, providing credit facilities, such as working capital, may increase economic activity through increased employment opportunities and greater productivity.

Cash transfer programs by governments and nongovernmental organizations are moving towards digitization (Bachas et al., 2018). Instead of cash, benefits payments are directly deposited into bank accounts, which are tied to debit cards or mobile money accounts. One example is Mexico's conditional cash transfer program Oportunidades (now called Prospera). The cards enable account holders to withdraw cash and to check their account balances at any bank's ATM, as well as make electronic payments at stores accepting cards. Bachas et al. (2018) found that the debit cards lowered transaction costs by reducing the distance to access bank accounts. This change reduces the proportion of the community who had to forgo important activities, such as work or childcare, to withdraw their transfer. Mavromaras et al. (2019) examined the use of cashless debit cards to reduce the levels of harm associated with alcohol consumption, illicit drug use and gambling by limiting participants' access to cash and by restricting the purchase of alcohol or gambling products.

However, there have been concerns by some researchers about the possible negative impact of digital payments. For example, Bielefeld & Beaupert (2019) asserted that providing cashless debit cards to people with disabilities reduces their autonomy, subjects them to stigma and

denies their dignity. Digital payment system may contribute towards possible loss of privacy (Armer, 1968). Another threat of digital payments is the element of identity theft and inappropriate use of payment as a result, impacting the sanctity and integrity of this domain. Identity theft is big business (Schreft, 2009), with the United States' Federal Trade Commission (FTC) estimating that in 2006, identity thieves stole about \$49.3 billion from U.S. consumers, encompassing both new account fraud and existing account fraud. Cryptocurrency and blockchain payment method are talk of the town, there is significant interest in understanding and usage of cryptocurrency and blockchain payment method, these payment methods are at very early stage of adoption due to challenges they pose from regulatory compliance perspective.

Digital payment systems impact could be on going, however, there has been change in behaviour and it has contributed to change the social fabric, it has impacted people life in different ways which are both positive and negative. This study points out some of the benefits and challenges digital payment systems have, which certainly have impact on societal outcomes.

## Chapter – 03: Methodology

The objective of this study is to understand the impact of digital payment systems on societal outcome. I aim to investigate this in two ways: using a systematic literature review, following Templier & Pare (2015) guidelines and through case studies based on secondary data. This chapter discusses the methodologies which have been chosen for this study and their relevance. I will also present the research context and any ethical concerns related to the research.

### 3.1 Systematic Literature Review:

This study uses the systematic literature methodology for the research topic. Templier and Pare' (2015) identified four type of Literature reviews:

- **Narrative** – these types of reviews summarize research on a topic of interest which were previously published. The review provides current state of knowledge which is under investigation.
- **Cumulative** – these reviews use empirical data and evidence; it is then mapped to body of literature and are used to drive to conclusion in a particular topic of interest.
- **Aggregative** – these reviews use previous findings and hypothesis or proposition from specific test. This is achieved by collecting data and combining prior empirical data. These reviews are normally used in evidence-based validation of pre-specified theoretical models.
- **Developmental** – these reviews provide new concept, theories, model and framework to research community, these reviews are normally highly iterative, these reviews develop new innovative approaches which were grounded in previous research in particular area or body of knowledge.

My study is based on the narrative review as it appropriately fits on my research topic, the narrative review summarizes previously published research on topic of interest and provide concept and theories. Narrative review assembles and join the existing knowledge on the topic of interest to give reader comprehensive understanding and report of the current state of

knowledge. Narrative review aligns nicely to my research to identify impact of digital payment system usage on societal outcomes.

The systematic review must have an objective and it must provide clear and concise report to the reader, I will be following the guideline of Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) Statement (Liberati, 2009), which provides clear guideline to conduct the systematic review. There are different phases in systematic review through which the information, these are the following phases

Identification Phase:

- To identify number of records through database searching
- To identify number of additional records through other sources

Screening Phase:

- To remove number of records after duplicates
- To start screening of records

Eligibility:

- To assess full-text articles for eligibility

Included

- Studies included in qualitative synthesis
- Studies included in quantitative synthesis (meta-analysis)

### **3.2 Ethical Concerns**

In my research, I am only using secondary data which is available publicly. I have not used any private document which is confidential, hence there is no ethical concern.

### **3.3 Data Collection**

The data collection is based on systematic review, I have followed the guideline of PRISMA statement as explained in previous chapter. In this chapter, I am going to discuss all those phases of PRISMA statement in this chapter, which I have applied in my data collection and its analysis.

### 3.3.1 Identification Phase:

The first step was to structure the study, I have used articles related to ICT and its impact on the society, I have explained general concept of ICT and how society has changed due to the usage of information and technology, I have searched pertinent literature from two primary databases which covers both these topics and are correlational in nature. I have used the following key word and data bases in my literature search

Keywords:

DPS or cashless society AND societal outcomes or poverty or wellbeing

I have also used following key words to search on google scholar.

- “ICT” and “Societal outcome”, “digital Payment system” or “Influence”
- “Digital Payment System” and “Influence” and “people well-being”, “economy” or “digital age” or “benefit” or “reducing poverty”
- “ICT” and “societal Challenges” and “Impact”,
- “Digital Payment system” and “politics” and “health”
- “Digital Payment System” and “financial impact” and “society”
- “Advancement in ICT” or “evolution of Digital payment system”, “Visa” or “Mastercard”

### Grey literature:

In addition to the academic literature, I have also reviewed grey literature and have incorporated in my research. Grey literature can be described as the diverse and heterogenous body of material which is not included in the academic literature and are not subject to peer-to-peer review (Adams et al. 2017). Grey literature includes publications, corporate reports, statistics released by organisations, regulators or policy makers.

### 3.3.2 Screening Phase:

In the screening phase, I shortlisted relevant literature which details out impact of Information and technology on the society, this is further narrowed down to view in the context of digital payment systems. At the same time, putting the impact of DPS in context of societal outcome, I used several literatures including Article journal, grey literature including report from card brand on the digital payment systems.



### 3.3.3 Eligibility:

I have assessed full text articles and systematically review all those papers and added in this study which provide correlation between impact of digital payment system and societal outcomes.

### 3.3.4 Included:

The information is both quantitative and qualitative in nature, I have analysed the information and structured the study to give guidance to reader about the evolution of digital payment system and how over the years digital payment systems have evolved on the basis of information and communication technology. I have included India and China's digital payment adoption and discussed their OECD Better Life Initiative indicator to provide more context on the research topic in the later chapter.

## **3.4 Data Analysis**

I have used thematic analysis to analyse my data collections, thematic analysis is widely used across of range of epistemologies and research question (Lorelli S. Nowell, 2017). The method covers the step of identifying, analysing, organising, describing and reporting themes revealed in the data themes (Braun & Clarke, 2006). The method is applied to the data I have collected to understand the knowledge and overall pattern in this field.

## Chapter 4: Findings

In this chapter, key findings will be presented based on the literature undertaken and explained in Chapter 2. I have followed Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) Statement (Liberati, 2009) and have gone through all the process pertinent to PRISMA statement as explained in chapter 03 to collect the data.

I have used two databases for my research, ACM Digital Library and EBSCO Host. These two databases have had extensive number of literature relevant to my study, both on ICT and DPS topics as shown in Table 5. Up to 90% of literature has come from EBSCO host. Table 5 shows the keyword and number of articles were found.

Database	Keyword	Number of articles found
ACM Digital Library	Cashless society and People quality of life	30
	digital payment System and reducing poverty	61
EBSCO host	ICT and Societal outcome	86
	cashless society	260
	Digital payment Systems	280
	ICT and Reducing Poverty	18
	Evolution of Digital payment system	200

Table 5 - Database used for academic literature

the structure of my research is primarily focused on DPS; however, ICT is integral part of DPS advancement, therefore I had to first understand ICT impact on societal outcome, hence I used key words of ICT and people quality of life and other similar key words to get relevant study, then further narrowed it down to understand DPS and societal outcome which is my core research question.

In the identification phase, I first searched with ICT key word search as per Table 4. I found over 250 articles which were related to ICT and relevant to the topic of the study. Similarly, I used DPS keywords as per Table 2 and then found over 600 articles. All together there were over 850 articles which I found through my key word research.

Screening and eligibility phases were important to remove duplicate articles, also screened articles which were directly related to the objective of the study, so I included those articles where were eligible and relevant to economic and social outcomes.

**Some examples of paper below which were ineligible and were not added in the analysis:**

(Andrews & Kroeger, 2016) - It talks about the liquidity of commercial banks, due to high reserve requirement from the regulator after global financial crisis, overall efficiency of the payment balance is improved due to this change. This paper discusses more remedial measures taken by the regulators to increase resilience of the banks after Global financial crisis, the study is out of scope to my study which is to understand societal impact through digital payment systems.

(Ismail, Steyn, & Phelane, 2020) – the paper forms the hypothesis and discusses the policy matter for introducing digital cash as instrument, it provides suggestion to regulator to develop policy which could provide benefits of digital currency as replacement of cash while sustaining the benefits of cash. The paper is more positioned for policy and framework suggestion for digital cash in future and hence there is not much relevance on DPS.

Timelines of Literature Paper

I selected over 90% of literature published after year 2000 and 70% of literature are after 2010 literature, Table 06 shows breakdown of number of literatures which are before 2010 and after 2010. It also shows breakdown of grey literature. I have also included report, publication, data from consulting firm, regulators and policy makers after undertaking grey literature.

<b>Year</b>	<b>Articles reviewed (including grey literature)</b>	<b>Grey literature</b>
Before 2010	24	5
After 2010	58	21
Total	82	26

*Table 6 - Timelines of paper*

#### 4.1 Analysis of final set of articles

The articles included in my research have shown some consistent pattern and themes when I studied them in the context of research question, I have reviewed around 82 paper articles. Table 7 shows the summary of key themes which emerged in my review.

Themes	Impact	Reference
Transparency Tax collection Welfare payments	Increased transparency of payment which can be tracked due to DPS, which cannot be tracked with cash payment, it also improves tax collection for the government and distribution of welfare payments.	Mukhopadhyaya (2016), Majchrzak et al. (2013), Srivastave et al (2016), (Barber et al. 2020)
Accountability Political	ICT innovation has influenced in political aspect, it has minimised corruption and provided visibility at national level. ICT can help improve democratic principles to increase efficiency of political and social system.	Busse (2003), Gronlund (2001), Srivastave et al (2016), Solomon & Klyton (2020)
Access to information	Access to information in quick timeframe such as internet which can provide information as and when required. It also provides market information which provides consumer more choices and reduce their expense. It has also shaped social behaviour	Quibria et al. (2002), Shailza & Sarkar (2019), Azmat Gani (2006), Dutton (2001), Torre & Moxon (2001)
Economic activity Productivity Job creation Entrepreneurship FDI	Digitisation can create economic growth and digitisation is enabled through ICT, Digital payment system can provide access to business in the informal businesses with formal access to financial system credit, which create entrepreneurship, boost economic activity and long-term productivity gains. FDIs are influenced by the technology invention and its adoption, it increases economic growth and create job opportunity	Bukht and Heeks (2017), Kabongo and Okpara (2014), Demirguc-Kunt et al. (2017), Xiao (2013), Soper et al. (2012)
Financial inclusion Reducing Poverty Health Education	Increase financial inclusion can help reduce poverty, people can invest in education, make more informed decision, manage financial shocks or negative income by having access to financial products like insurance. The other product which has elevated people quality of life is Micro finance, it enables low-income individuals to access funds and provides opportunity to elevate their living standard and become self-reliant.	Collins et al. (2009), Demirguc-Kunt et al. (2017), Bruhn and Love (2014)

Systematic risk Identity Theft Unemployment due to automation, Loss of Privacy	ICT innovation has led to the reduced privacy, de regulation of employment, loss of job due to automation and other systematic risk, it has increased reliance on the technology.	Dutton (2001), Faik (2020), Kling (1996)
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Table 7 - Themes of key findings

During the analysis of literature review, there were common themes appearing, I arranged those themes such as transparency, accountability, access to information, economic activity, financial inclusion and systematic risk. Themes were overarching, I have created codes under each theme to reflect the effect of these codes on themes to show relevance, for example, Transparency provide improve tax collection and better distribution of welfare payment. Similarly, Systematic risk points to challenges and negative aspects, these aspects are defined under codes such as identity theft, loss of privacy which could pose risk due to increase DPS usage. Recent years papers on payment discuss success of QR payment in China and strong adoption of mobile wallets (Alipay/WeChat) and how it is creating economic and social impact, there has been consistent pattern in the literature on China's strong growth in digital payment space and the impact it has created on the payment landscape and social outcomes. I have found more relevant literature in journal of Payment & Strategy.

The primary focus of the study remains DPS adoption and impact on societal outcomes, however, to understand DPS impact, I had to review ICT impact on society first, hence ICT literature has significant relevance to the context of this study, so the study shifted to discuss ICT impact first before discussing the impact of DPS on society.

## **Chapter 5: Discussion and Conclusion**

In this chapter, an overall discussion of the key findings and conclusion will be presented, this chapter may also provide direction to future researchers, who may want to undertake research within this area of knowledge.

### **5.1 Discussion**

#### 5.1.1 Summary of findings:

We learn through this study that the advancement in ICT has supported development of DPS. ICTs have evolved during last 50 years which has worked as impetus for innovation in different field, DPS is one of the prominent fields which has been influenced hugely due to advancement in ICT. DPS heavily rely on ICT infrastructure, government policies and compliance and regulatory framework at the industry level, it has created societal impact in both social and economic perspective. DPS complementing the adoption of cashless transaction and helping societies to move away from cash. There are different levels of DPS adoption in the World and countries who are leading, and their position is based on the few factors such as well- developed banking system, high usage of electronic devices, majority of population have ownership of bank accounts. DPS improves the overall transparency, government has better tax collection due to tracking of payment, welfare payment distribution method is more effective and secured due to increased visibility of payment movement within the system. We learn that cost of cash is substantial % of GDP of developing countries, through DPS, these costs can go down and can be spent on segments which can contribute to improve people well-being such as health, education. The other key point is the financial inclusion through digital payment system, financial inclusion plays an important role in uplifting people of quality of life and contribute to alleviating poverty, it creates employment and hence uplift education and health standards of individual. Financial inclusion is one of the integral parts which helps moving towards digital payment system. From India and China case studies on cashless adoption, we can

understand that the financial inclusion has provided solid foundation to accelerate digital payment reach. Developing countries may need to develop clear policy framework and road map to achieve better financial inclusion. Based on the literature review, it can be concluded that financial inclusion helps in alleviating poverty and contribute towards financial independence for society and individual which in turn help to achieve better societal outcomes such as health, literacy rate, employment and better housing.

While digital payment systems have continued to touch individual lives and has changed people behaviour and how payments are viewed today as compared to 20 years ago, it has also increased risk at many levels, such as identity theft, improper use of personal information and high reliability on technology. One of the key challenges is responsible credit lending to the consumers, high credit lending without servicing ability is resulting in other societal challenges such as suicide (BBC,2010). There is also an impact on job market due to advancement of ICT, automation has resulted in unemployment and also de regulated job market due to freelancing platform (e.g., Upwork, ridesharing platforms).

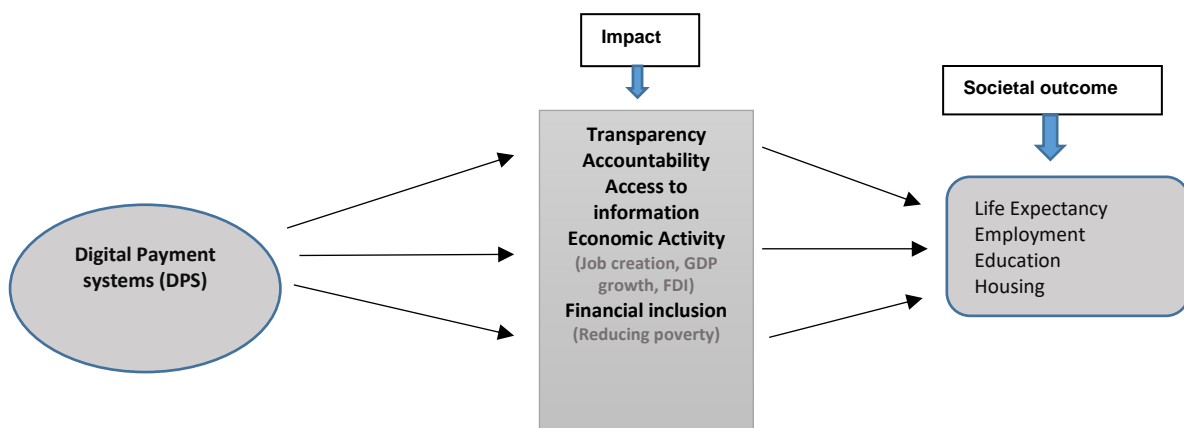


Figure 2- DPS Impact and Societal outcomes

### 5.1.2 Reflections on findings

The study findings have been put into perspective by looking into China and India’s digital payment adoption pace, through the lens of the OECD Better Life Initiative indicators: Life Expectancy, Employment, Education, and Housing. I compare India and China in terms of

their DPS usage- they have similar populations but different payment adoption rate- and then compared their OECD better Life Initiative figures to reflect the finding of this study.

## **China**

China is the largest country in the World in terms of population, which is 1.411 billion (as per China's seventh National Population Census 2020), GDP of China is worth 14.7 trillion US dollar in 2020 (China GDP, 2021). China's GDP has been growing on an average of 9.29% per annum from 1989 to 2021 (Trading Economics, 2021).

### Digital Payment Usage in China.

China was expected to process USD 1.9 trillion worth of digital payment in 2020, which is estimated to be 45% of total digital payments, China has seen huge increase in their digital payment user in last three years, Chinese consumers using online payment method have grown from 840 million to 1.3 billion (Toledo Business Journal,2020). Digital transactions such as POS – transactions have increased by 325% and Cash in Circulation to GDP ratio fell 13% over the same period of four years from 2012 to 2016 (Knaap, Vries, & Boesenach, 2018). China has highest number of bank ownership of 79% (Kunt et al, April 2015), this means majority of people are financially inclusive, providing solid foundation to grow digital payments.

### OECD's Better Life Initiative Factors – China

- 1) Life expectancy – China's life expectancy has been growing in last 3 years, it has grown to 76.96 years in 2020 from 76.32 in 2017, showing more people are living longer age (Macro trends, 2021).
- 2) Employment – Unemployment rate in China has been on decline before Covid-19 and was 3.62% in 2019, however, it had increased during Covid-19 to 4.2% but it is projected to be dropping to 3.64% in 2021 (Textor, 2021). This shows that that employment rate is strong, and less people are unemployed.



- 3) Education – China’s literacy rate has grown in last three decades significantly. The literacy rate for adult as % of people ages 15 and above has been increasing consistently (The World Bank, 2020), showing more people are achieving education.
- 4) Housing – China’s per capita living space in urban areas of Beijing has been increasing consistently, it was 32.5 square meters in 2019 (Slotta, 2021)

While the adoption of digital payments has shown significant growth, all OECD’s better life initiative factors have also shown consistent growth, making China as one of prominent countries in the world to achieve high scale of growth in both economic and social aspects in last few decades. The growth is remarkable in a perspective when it was just a cash economy two decades ago (CGAP, 2019).

## **India**

India is the second largest country after China with population of 1.38 billion as of 2020 as per the World Bank. The GDP is worth USD 2.62 trillion in 2020 as per the World Bank official data.

### Digital Payment Usage in India

India’s strong push towards digital payments is evident after demonetization in 2016, Mobile payments have increased by 163% to USD 286 billion in 2019, credit and debit card transaction grew 24% to USD 204 billion (Nariyanuri, 2020), Ownership of account in India increased to 80% in 2017 (Global Findex database, 2017). Cash in circulation to GDP ratio has increased to 12% in 2019-20 as per Reserve Bank of India (RBI), while there is huge uptake of digital payment due to increased competition within mobile payment space among FinTech companies, the cash in circulation is still increasing.

### OECD’s Better Life Initiative Factors - India

- 1) Life expectancy - Life expectancy has been consistently increasing in last 3 years as per World bank data.

- 2) Employment - India's unemployment rate has been operating on an average between 6% to 7%, the unemployment rate has seen improvement after strong economic development (Trading Economics, 2021).
- 3) Education - As per the World bank figures, literacy rate has been increasing constantly since 1981, it jumped from 40.76% to 74.36% in 2018.
- 4) Housing - As per sixty ninth National Sample Survey, the per capita space available for scheduled caste people is 70.3sq ft while for scheduled tribes, it is 85.7 sq. ft. (Times of India, 2017).

We learn from the comparison that China's huge leap forward in payment space has shown improvement in themes which we have discussed in Table 6 such as boost in economic activity and financial inclusion. We also learn that the OECD's better life initiative factors are improving too.

Digital payment systems are constantly evolving and influencing change in behaviour, which is creating new social and economic outcomes. The increased usage of digital payment system moving societies towards cashless and creating new avenues for business and government to increase their reach and accessibility to people with more financial benefits.

Developing countries have put strong focus and reliance on digital payment system, which is certainly influencing people way of life. With DPS and society moving towards cashless, factors like accessibility, reliability, sustainability and scalability have varied impacted on society and on individual lives. Mobile money and app based DPS have enabled developing countries to leapfrog developed countries in using DPS. But developing countries may not have established proper governance to mitigate the possible negative effects of DPS.

While DPS is a fast and dynamic space, it is providing impetus to generate increased financial and economic activity through improved customer and business relationships, the other important aspect of digital payment system is reducing the cost of cash handling, which we have seen sizeable impact on growing economy, DPS can be hugely beneficial for those economies. We learn from China's case study that digital payment system usage by the

masses resulted in reducing Cash-in-Circulation (CIC) to GDP ratio, thus saving from CIC can result in increased spending on other segments which can improve societal well-being.

### 5.1.3 What's missing from the literature and opportunity for future researchers?

The study does not investigate multiple levels of impacts such as individual, business or national level with each type of payment method. For example, how mobile payment such as QR is contributing to change consumer behaviour and how it impacts societal outcomes. The study has not looked into granular details of each negative impact of DPS, such as irresponsible credit lending and impact on high suicide rates, less control of personal information which are on shared platforms. For example, registering card number, personal details on payment apps which can be used by third parties, such as ridesharing or food ordering apps, can be risky practices.

There is also the opportunity to investigate governance frameworks for DPS, such as credit scores, credit policy for high DPS usage society and reflections on lending systems. This will help investigate link between DPS and unregulated employment platforms via platforms such as Upwork or ridesharing apps.

Another topic for study could be to understand how impact has changed as the nature of cashless transactions changes, from credit cards to mobile money, apps to digital cash and blockchain and so on. How do these changes affect the benefits and problems of DPS use?

### **5.2 Limitations:**

The study's limitations include only looking for studies from two databases. The study also did not examine the impact of different forms of DPS on different societal outcomes. This requires understanding each type of DPS in greater detail. For example, future researchers could look into relationship as how app based DPS, and mobile money are different in terms of their impacts (positive and negative). Another limitation is incorporating research on the regulatory and compliance framework of DPS in each region. The study does not cover regulatory impact which could limit or increase the growth of DPS. For example, governments use legislation or incentivize to support the growth of DPS; similarly with each country's financial institutions or

banks, are they willing to invest in DPS and have long term commitment which is reflective on their policy? Regulations effect the legality and possibility of the activity. These factors can be reviewed for future study.

### **5.3 Conclusion:**

This study provides the review of digital payment system adoption and its impact on societal outcomes, I can conclude that there is certainly an impact at collective level and also at individual level, there are impacts of themes and code which are identified in this study to the OECD's Better Life Initiative factors as illustrated in Figure 2. However, it is not conclusive that DPS is the only factor that is driving the change and impacting societal outcomes, DPS is evolving very fast and there are more recent technologies such as mobile wallets and crypto currency, which will continue to change the dynamics of digital payment system. Further studies could look into policies and frameworks for cryptocurrency and other new digital payment methods. Their impacts on the social fabric of the society in the future needs to be better understood as interest in them increased greatly during the pandemic of 2020/21.

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