Technological Breakthroughs in Financial Services: Payment Services, BNPL, and CBDCs

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Abstract This chapter explores some technological breakthroughs in financial services since the 2008 credit crunch. Intriguingly, no aspect of the financial services value chain, i.e., payment, loans and advances, and deposits, is spared in this technological revolution. Payment services have witnessed most of these innovations. Attributable to the increasing consumer demand for faster payment services, which attracted the attention of other service providers. This renewed interest in payment services has resulted in highly competitive financial services with an attendant impact on the banks' margins. Some innovations in the payment service industry discussed are Mobile payment, Mobile Wallets, Online Payment, Debit/Credit Cards, and Cross-border payment. Also, the chapter briefly examines Buy-now-pay-later (BNPL) services offered by retail giants and the Central Bank Digital Currency (CBDC), a low-cost payment digital currency backed by Central banks. The chapter further explores how financial institutions develop strategic alliances around payments, loans and advances, and deposit services with other service providers.

Introduction

The technological revolution is evidenced in almost all aspects of our socio-economic lives. This feat is attributed to the increasing computing powers as small chips with higher processing powers flood the marketplace. The financial services industry is one of the early prime movers that tapped into the potential inherent in this technological growth. The fallout is the rise in novel financial services that the

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world has never witnessed. Among the trio of conventional financial services, i.e., payment (deposit/withdrawal/transfer), loans, and investment, the payment services have witnessed more innovations than the remaining two, adduced mainly to the rising consumer demand, dynamic business operating model, technological trends, increased competition, and favorable regulatory environment. Trendy payment services such as Mobile payment, Mobile wallets, Online payment, Card payment, and Cross-border payment are explored. The chapter then investigates Central banks' digital currency (CBDCs) before concluding with remarkable alliances between financial and non-financial institutions.

Payment Services Outlook by 2030

Before discussing these payment service innovations, it is essential to have a glimpse at the payment service outlook. Global payment services have continued to grow impressively even after the COVID-19 pandemic. For instance, in 2022, credit card payments accounted for the highest global market value at $ 510 billion, followed by Mobile Wallets at $ 240 billion. BNPL, Digital Payment, and Mobile Payment only recorded less than $ 100 billion in global market value (Fig. 1).

Before 2030, the compound annual growth rate (CAGR) of these payment technologies is expected to rise in favor of Mobile payment and Buy-Now-Pay-Later by more than 20%, followed by Digital payment and Mobile wallets at greater than 10%. The credit card payments market value is expected to hover at less than 10% CAGR (Fig. 2). This indicates the changing landscape of consumer preference in response to technological trends.

By 2030, Mobile wallets are expected to reach the highest market value of $970 Billion, followed by Credit Card payments at $884.4 and Mobile Payment at $607

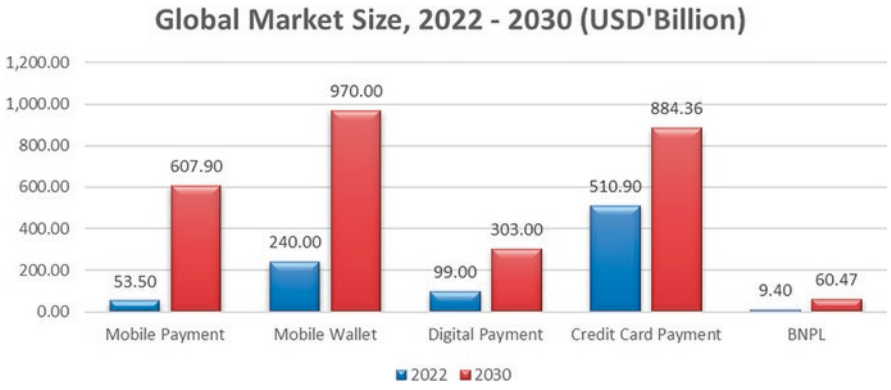

Fig. 1 Global market value of different payment services. *Note:* Projected Global Market Value of various Payment systems between 2022 and 2030. Source: Data for Mobile Wallet is from Global Market Insights (2022), Data for Digital Payment is from Data Bridge Market Research (n.d.), Data for Mobile Payment is from Globe News Wire (2023), Data for Credit Card payment is from Vantage Market Research (n.d.), Data for Buy-Now-Pay-Later (BNPL) is from Grand View Research (n.d.)

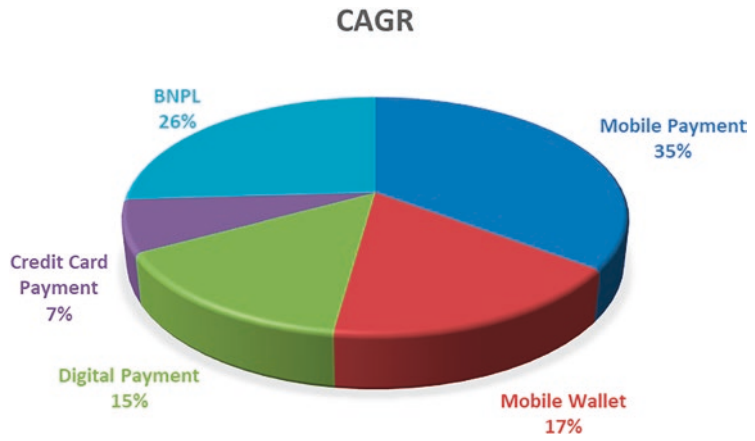

Fig. 2 Compound annual growth rate of global payment services. *Note:* Compound Annual Growth Rate of Global Payment Services from 2022 to 2030. Source: Data for Mobile Wallet is from Global Market Insights (2022), Data for Digital Payment is from Data Bridge Market Research (n.d.), Data for Mobile Payment is from Globe News Wire (2023), Data for Credit Card payment is from Vantage Market Research (n.d.), Data for Buy-Now-Pay-Later is from Grand View Research (n.d.)

Billion. Digital payment is valued at $303 Billion, while BNPL is expected to reach a $ 9.4 billion market value. Overall, Payment services will continue to evolve and adapt to changing demography and consumer preferences as banks and non-bank entities adopt a novel approach to meet these needs.

Payment Services

Mobile payment involves transacting and making payments for goods or services using a smartphone, tablet, or any mobile device. Mobile payments can be made through different methods, including Short Message Service (SMS), Mobile Apps, Mobile Web Payment, and Contactless mobile (Near-Field Communication) payment, all of which have made payment seamless and further drive financial inclusion. The first mobile payment came out in 2014 when PayPal and Apple Pay introduced mobile payments by incorporating a barcode that could be scanned using a store's barcode reader.

Custom Market Insights (2022) report that the Global Mobile Payments market size was USD 1.97 trillion as of 2021, and it is expected to hover around USD 11.83 trillion by 2030. The key drivers of this growth are transitioning in most developing countries to a cashless economy and broad Internet connectivity, enabling people to use their smartphones and mobile phones to make payments conveniently. The top three end users in this market are the Banks and Financial Institutions, the media and entertainment industry, and the Retail and E-commerce sector. The top ten major players in this sector in alphabetical order are Amazon.com Inc., American

Express Company, Apple Inc., Ali Baba Group, Google LLC, MoneyGram International, PayPal Inc., Samsung Group, Visa Inc., and Wet Chat.

Mobile Wallets—It is a digital container (e-wallet) that stores payment information such as credit card numbers, debit cards, prepaid cards, gift cards, and or loyalty cards securely on mobile devices. Like Mobile payment, Mobile Wallet can make contactless payments, QR codes, mobile payments, online shopping, and in-app mobile transactions. The global mobile wallet is dominated by the Asia-Pacific region, led by China and India, due to the growing population, increasing broadband penetration, and rising adoption of smartphones, while the Middle East and Africa continue to experience the fastest growth due to their youthful populations (Yahoo Finance, 2022).

Online payment—Allows consumers to make payments and conduct transactions such as paying bills, account-to-account transfers, and online purchases. Online payment sits at the center of payment system innovation as it allows various payment methods, such as credit/debit cards, digital wallets, and in-apps mobile payment, to be used for payment purposes. The use of online payment mediums, though, initially suffered drawbacks due to the perceived and actual risk encountered when conducting financial information over the Internet. During the COVID pandemic, however, increasing adoption and penetration are observed as more and more consumers, businesses, and public entities opted to use Online mediums to receive/pay for goods and services as it became the "safest" means of transacting during this health crisis.

Card Payment System—The issuance, activation, and management of debit, credit, and prepaid cards fall under the general term Card payment system. It is a system built around customers and key partners such as the merchant, the card network provider, and issuers. Whenever a customer visits a merchant location and decides to use credit/debit cards, the merchant captures the card information using a terminal or a card reader. The card reader captures the card number, card verification value (CVV), personal identification number (PIN), and sometimes card expiry date. In China, Union Pay accounted for over 90% of the country's card payment services, while Visa Inc. is the dominant market player in the United States. The remaining three major players in the United States are Mastercard (24%), American Express (20%), and Discover (4%), all of which accounted for significant global market share (The Business Research Company, 2018).

Cross-border payment—Regional and transnational trade is a common feature of the world trade system. Cross-border payments are some sort embedded in this economic activity. It is a complex process that involves the transfer of funds between buyers and sellers in different jurisdictions and across the globe. Two or more intermediaries, such as financial institutions, clearing houses, and payment processors, are involved. It arises in any form, such as when an importer purchases goods or services from overseas exporters; when someone invests in foreign stocks and fixed-income instruments; when an individual sends personal support and upkeep to friends and family; and even pay for services such as medical bills, overseas professional training, and school tuition. The use of the SWIFT system that allowed wired transfer through financial institutions has been around for over a century. However,

innovation in financial services has led to the coming onboard of additional mediums, such as credit/debit cards, mobile wallets, and other online payment systems. Some initiatives to facilitate cross-border payments are cross-border payment regulations, international payment networks and standards, and digital-ready multilateral platforms aimed at supporting global trade and commerce in secured, transparent, and cost-effective ways.

Buy-Now-Pay-Later (BNPL)

As the name suggests, it is an alternate payment system that gives customers opportunities to purchase goods or services and make payments later within an agreed period. BNPL enables consumers to save their cash while at the same time having the advantage of buying an item of their choice with "free money" because payment is made in installments at a zero percent interest rate. Though very similar to the credit card system, where a customer uses the bank's money to purchase goods and services, the main difference is that BNPL does not require minimum repayment unlike the credit card repayment where a customer can opt to pay the required monthly minimum card repayment as an installment. By default, most retailers allow repayments to be structured for a fixed term either monthly or quarterly. In addition, consumers cannot enjoy bonuses and rewards that come with using credit card payment services. BNPL payment method has evolved in recent years, in response to the Gen-Z consumers who sometimes prefer it to credit cards. It is a convenient scheme for any consumer wanting to purchase large items but needing more cash to cover them. Some BNPLs by design, do require credit checks, but some do not. The scheme is largely offered by retailers in-store or online, and customers can apply for it at any merchant touch point, i.e., point of sale. This innovative payment method has received criticism as some believe it encourages overspending. However, others believe it helps manage a personal financial budget and cash flow.

Central Bank Digital Currency

Central Bank Digital Currency (CBDC) is a digital form of a nation's fiat currency issued and supported by its central bank. It is also a means of payment to store value, Turi and Thilakarathnei (2023); Turi (2020a). Its conception and implementation by central banks are in response to the use and distribution of non-centralized and unregulated Cryptocurrencies such as Bitcoin, Ethereum, Tether, etc. It is a complementary digital form of the existing traditional currencies that are secured and efficient as a medium of exchange. Both CBDCs and Cryptocurrencies operate on the same blockchain technology. However, the major dissimilarity is that CBDCs are backed by the central bank and have the legal status as the existing physical

cash. Other technologies that support CBDCs issuance are the ideal centralized database and distributed ledger technology (DLT), Turi (2020b). It is designed to retain unique features such as interoperability, anonymity, and programmability with other payment systems earlier discussed. More and more countries are launching their own CBDCs in a bid to drive financial inclusion, reduce the cost of printing physical cash, and ensure efficiency and effectiveness in currency management.

According to the Bank of International Settlement (2021), the two common variants of CBDCs are Wholesale and Retail CBDCs. The Wholesale CBDCs help settle interbank transfers, cross-border payments, and other allied whole transactions between financial institutions. In contrast, the Retail CBDCs are issued to the public to fast-track open settlement between consumers and merchants. The first major economy to launch CBDC is the China Reserve Bank. There are already over 80 jurisdictions across the globe that are either at early or advanced stages of implementation as of December 2021. The implementation of CBDCs, however, in most jurisdictions is faced with a few risk factors, such as privacy concerns, safety concerns, and cybersecurity threats.

Some Strategic Alliances in Recent Years

The innovation in the financial services sector led to increased collaboration between financial institutions and other third parties. Some benefits of this alliance are expanded product offerings, reduced costs, greater access to new markets, and improved customer experience. While these positive sides have been applauded by many Industry pundits, the financial institutions have also lost market dominance and suffered reputation damages resulting in increased costs of doing business. Intense competition in hitherto unchallenged territory is equally eroding margins. Here are some examples of major strategic alliances between financial institutions and other players in recent years in relation to payment, loans and advances, and deposit services.

1. Amazon vs. JP Morgan: Linking Amazon Accounts to JP Morgan's online banking platform in 2020 enables Amazon customers to easily access banking services, including savings, deposits, and loans (Liu, 2018).
2. Apple vs. Goldman Sachs: Launching of a joint credit card in 2019 that provides a credit card to Apple customers based on cashback provided by Goldman Sachs (Sheetz, 2019).
3. Uber vs BBVA: Alliance established in 2016 which allows Uber drivers to open BBVA Compass checking accounts using Uber Apps. The account comes with cool features such as cashback rewards and discounts on car maintenance (Finextra, 2019).
4. Zelle vs. Wells Fargo: This alliance helps Wells Fargo customers to send and receive money using email addresses and mobile phones (Hillary, 2017).
5. Google Pay and Citibank: This alliance allows Citibank customers to make payments contactless and access banking services through Google Pay (Cherlynn, 2020).

Conclusion and Recommendations

Finally, financial institutions are making giant strides in harnessing and adapting to the technological revolution within the confined permissible regulatory environment. This regulatory environment has encouraged third-party providers such as technology companies, app developers, e-commerce businesses, and retail giants to contribute meaningfully to financial service innovations Added to this positive development, regulators are stepping up their games in the role they play on how consumers access financial services by employing accommodative policies and programs and joining the market participants to roll out financial services either explicitly or implicitly requested by the consumers. This development accelerates the pace of marked-to-market financial services innovations with products across payments, loans and advances, and deposits designed to improve customer offerings and experience.

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