PREDICTING THE UNPREDICTABLE- THE ETHICS OF DIGITAL FINANCE

Gonçalo Costa

Aroska (Portugal)

goncalo.costa@aroska.pt

EXTENDED ABSTRACT

Introduction

Digital technologies underway are reshaping societies today and in the future. Economy digitalisation is an ongoing and continuous process, which promises to spur innovation, generate efficiencies, and improve services. Besides, a successful transition is a key condition to boost more inclusive and sustainable growth; although, digitalisation can be a disruptive process with unforeseen results (OECD, 2018).

Digital finance is a blurred and multidimensional concept under debate which the following data demonstrate:

a) "annual data generation is estimated to be doubling every year, and the overall size will reach 44 zettabytes (that's trillions of gigabytes) by 2020" (Bayat-Renoux, Svensson & Chebly, 2021), as well as it is expected the world generate 181 zettabytes by 2025 (Pointing, 2022);

b) digital finance potential boost of emerging economies` GDP (Gross Domestic Product) expectation is $3.7 trillion by 2025, with a six per cent increase versus a business-as-usual scenario (Khera, 2021);

c) Artificial Intelligence (AI) alone could lift global GDP by an estimated US$15-20 trillion by 2030 through digital finance optimisation (Report Linker, 2023).

However, some doubts arise: i) digital finance will be a novel concept?; ii) which data or statistics acknowledge it?; iii) to what extent digital finance will occur?; iv) which potential technologies fuel it?; and v) potential ethical issues?

Digital finance

Definition

In the literature, there is no agreement on the digital finance definition despite a wide spectrum of international and national institutions, as well as private companies that lead with a large range of novel products or technologies in finance. Some keen examples are:

a) digital financial services are an ecosystem consisting of users who require digital and interoperable financial products and services through digital means from providers. These providers are responsible for financial, technical and other infrastructures; while, complying with laws and regulations to make such services accessible, affordable, and safe (ITU, 2023);

b) digital financial services can integrate any financial process through digital technology, which can include electronic money, mobile or online financial services, iteller solutions, and branchless banking (European Union, 2023);

c) digital finance acknowledges services delivered over digital infrastructure with low usage of cash and traditional bank branches. Digital infrastructure encompasses whole devices that connect individuals and businesses to digitized national payment infrastructure, facilitating transactions across all parties (Feyen *et al.*, 2021).

Therefore, the author will attempt to draw conceptual boundaries in interconnected definitions. Some examples are “e-money”, “electronic banking”, “mobile banking”, “fintech”, etc.

Conceptual boundaries

To draw conceptual boundaries several procedures are required: i) define each related concept; ii) understand their potential relationships; and, iii) the author rationale.

E-money is as an electronic store of monetary value for making payments to entities other than the e-money issuer (European Central Bank, 2023). E-banking is a procedure between a bank/financial institution and its customers for encrypted transactions through the web or, customer basic requirements (personal data, balance inquiry or account state) (Team FinFirst, 2022). Mobile banking is widely recognised as e-banking services through APPs in order to retort customers demand (mobility and immediate access) (CFI Education, 2021). Fintech refers to a myriad of technologies to augment, streamline, digitize or disrupt traditional financial services. Some examples are: i) make a deposit through a snapshot of a paycheck; ii) peer-to-peer lending; or, iii) immediate currency exchange (Walden, 2022).

This interconnected *continuum* is strongly aligned with the ITU definition; however, it encompasses numerous social and ethical dilemmas (equity, digital divide, security, etc).

What to predict?

Predict is guessing! Although, despite the shade, it is possible to shed some light upon forthcoming technologies in financial services. IBM argues that cloud computing is becoming mainstream in banking, namely, to search the optimal mix between traditional IT, public and private clouds. “With hybrid cloud, banks have the flexibility and benefits of both private and public cloud, while addressing data security, governance, and compliance” (Marous, 2018a).

API platforms are changing entirely the banking ecosystem since financial institutions serve as platform. I.e., other stakeholders build their own applications using the bank’s internal data; so, traditional commercial or retail banking will be under pressure (Marous, 2018b). This process will be enhanced with robotic process automation (RPA), because it simplifies compliance by retaining detailed logs of automated processes, automatic reports to auditors or managers. Recent estimates denote that intelligent automation, a blend between machine learning and data patterns analysis, will reduce administrative and regulatory processes costs by at least 50% (Rajan, 2018; Donelly, 2022).

Instant payments technology is already available in some countries through P2P services, which are a tempting opportunity to achieve speed, experience, and availability that fulfil generation

Y consumers' expectations (Marous, 2018c). However, extended mobile solutions require a different digital structure, as well as, organizational in which Artificial Intelligence (AI) will play a decisive role. From the mashup explosive growth of structured and unstructured data, novel technologies (e.g., cloud computing, machine learning, etc.) several pressures arise (European Union, 2023).

Those pressures along with security and privacy enable blockchain technology; although, despite the transformational impact on the baking industry that some experts argue (Quindazzi, 2017) some recent cases regarding blockchain and cryptocurrencies deny it (Xu *et al.*, 2022). Therefore, a recent trend on cyber risks is prescriptive security, which explores AI and other tools to monitor, detect and stop in real-time potential threats before they strike (Streeter, 2018).

Marous (2017) also suggests that augmented reality (AR) and virtual reality (VR) can help bank customers autonomy in physical investments, i.e.., during a visit to a house, store or land immediate information on property sales, price tendencies, current listings, and properties selling or sold in the area is delivered. The scope is narrowed and most likely will occur for other financial products. Interconnected technologies to AR and VR such as smart vision systems, virtual assistants, natural language processing technologies will arise shortly. One example is Amazon's Alexa, a virtual assistant, for the Bank of America. Therefore, smart machines attempt to digitally engage customers through guidance and support (avoid customer loss) (Rock Paper, 2022).

At last, but not least, quantum computing will support the entire network or infrastructure. These represent a major leap forward in computing power, surpassing cloud or blockchain potential. JP Morgan and Barclays have an agreement to investigate quantum computing potential (Brown, 2016).

Gray predictions

Some institutions, for instance, the World Bank describe "digital finance" as an important milestone for societal inclusion; although also is a potential minefield regarding supervisory and regulatory actions (ITU, 2023), because digital finance is a sociotechnological-driven process. I.e.., requires education upon decision making, financial and technological literacy. The author believes that neuroeconomics will play a decisive role, since it is an interdisciplinary research field that explains decision making, multiple alternative procedures and what actions are to be followed (Rebecca & Belden, 2011)

KEYWORDS: Ethics, digital finance, digital technologies.

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