

Systemes d'Information et Management

Challenges, Opportunities and Levers in Digital Finance

Special issue – SIM

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Individuals, companies, institutions: providers and users of financial instruments and services are increasingly turning to digital technology. The trend towards dematerialization and technological integration within financial systems (banks, markets, etc.) is not new, dating back to the 70s with the introduction of super calculators and early computers in investment firms. However, it has taken a new turn over the past decade, with the Fintech revolution and innovation in artificial intelligence (Gomber et al., 2018). More recently, the infusion of digital technology into consumer behavior and corporate finance practices has become particularly pronounced since the health crisis (Feyen et al., 2021).

The growing trend towards an all-digital world can be observed both at the level of infrastructure supporting interactions, and at the level of purely individual use. On the one hand, operational systems - transactional processing systems (TPS) - are helping to decentralize transactions at the market level (Gudgeon et al. 2020). On the other hand, the use of decision support systems (DSS) by professionals, individuals or organizations is a constant aid - if not a substitute - for strategic investment and financial decisions (Gottschlich & Hinz, 2014). The applications and relationships resulting from these information systems have a profound impact on financial practices, institutions and markets.

Challenges of the special issue

Today, these transformations are at the heart of the debate between regulators, consultancies and academics, both in terms of support and of timing (see Currie, W. L., & Seddon, J. J. (2022), Xu & Bao (2023), ESMA "Call for Evidence on Digital Finance 2022" OECD "Business and Finance Outlook 2021: AI in Business and Finance"). Regulators are faced with a paradigmatic debate that goes far beyond a simple choice of legal position. The evolution of the rules governing our financial systems is now a transdisciplinary process, linked to the very conception of algorithms and artificial intelligence. What role should

regulations and incentives play in ensuring the ethical and value-creating use of information systems? Effective regulations (covering all areas of RegTech and decentralized finance - data analytics, reporting, Know Your Customer, compliance and identity management) could be developed by incorporating the knowledge and experience of all the stakeholders, based on their backgrounds and uses, into a unified conceptual framework (Gudgeon et al. 2020, Werner et al., 2021). For augmented, equitable and sustainable finance.

Thus, this special issue aims to bring together ideas and develop contributions on the production and use of information systems within financial services (Gomber et al. 2018, Gomber et al. 2017, Haried et al. 2021, Hendershott et al. 2021). In particular, certain themes at the heart of Information Systems Management (ISM), such as regulation, ethics and accountability, the digitization of customer relations, cybersecurity risks, and the strategic scope and governance of technology, are still not sufficiently addressed, and need to stimulate a discussion that can no longer be exclusively financial. The conceptual framework and state of the art must be based on methods, language and key articles in the field of information systems. Research may focus on the banking environment, financial markets, individual savings, payment methods or corporate financing practices. In addition to empirical research, whether quantitative (simulations, data analysis, etc.), qualitative (case studies, field surveys, design science, etc.) or mixed, this special issue could include theoretical or conceptual articles to help structure the topic.

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These themes have been long studied in terms of impact in academic journals specializing in finance, and they are now becoming well researched in the field of information systems management (ISM), particularly in terms of usage. More specifically, three fields of application are increasingly feeding the literature: market finance, banking services and corporate finance.

New ecosystems are emerging (participative finance, crypto or smart money), while others are evolving (open banking, neo-banking, algorithmic trading), and it is essential to bring an ISM perspective to bear on broader issues such as governance, strategy and organizational evolution.

Area 1: Financial markets

Structurally stable in terms of organization since the creation of formal stock exchanges, financial markets have undergone incredible transformations since the 1980s with automation, decentralization and the gradual integration of computerized decision support tools into desks (Arena et al., 2018). Modern financial systems can be seen as adaptive and complex "socio-technical" systems (Somerville et al. 2012, Cliff & Northrop, 2012). Adaptive, because they evolve rapidly around information and communication technologies. Complex, because contemporary financial systems can generate a certain level of unpredictable and potentially disruptive behavior. The digitization of financial systems has led to radical changes in the very conception of securities trading, which is now totally dematerialized and algorithmically driven. For brokers, this has meant first and foremost the introduction of smart order routers to find the best liquidity for a given security at a given time, and the development of a first generation of algorithms designed to replicate basic execution strategies. Today, algorithms can react at high speed to instantaneous data (textual or quantitative) and anticipate market

trends. But with them, legal and illegal price manipulation techniques have been transformed, leading to the emergence of disruptive trading strategies based on the very architecture of the organization of exchanges. How are these algorithms, which shape both our market infrastructures and the trading process, to be understood in legal terms? Should they be defined according to their lines of code? According to their strategic purpose? Or according to an impact linked to their interactionist dimension (Coombs, 2016)? How can we ensure that markets remain fair?

Area 2: Banking services

The banking industry and, more generally, day-to-day financial services for individuals and businesses are also being turned upside down by digital transformation, whether in terms of organizational transformation, product/vehicle innovation or the structuring of new competition. While banks took full advantage of the democratization of the Internet in the 90s to develop the first remote banking initiatives, the democratization of connected objects has profoundly altered the consumption of banking services by households and businesses. The volume and management of customer data is of major strategic importance. Today's digitalized applications for everyday services concentrate a wealth of data that goes beyond the bank's perimeter (invoices, various insurance policies, official documents, etc.). Customer demands (for instantaneous, seamless, personalized service and "self-servicing" autonomy) and increased mobility mean that ergonomics must be constantly improved to optimize the user experience. While the level of technological maturity is sufficient for simple underwriting processes (account opening, consumer credit, etc.), the complexity of certain products, such as long-term credit, hinders automation, both because of the need for an analyst to check compliance upstream of applications, and because of the customer's need for assistance. These obstacles are beginning to be overcome thanks to the development of expert systems, for example for credit scoring (Dimitrescu et al., 2022), the implementation of increasingly sophisticated chatbots (Mogaji et al., 2021) and the use of roboadvisors for investment choices (Brenner & Meyll, 2020). But in terms of internal processes, the management of megadata and operational risks (particularly in terms of authentication, open banking sharing and fraud management) remains a constant concern. In addition to internal processes, the competitive environment is also a challenge for long-established banks. In particular, banks are having to reinvent themselves in the face of several new competitors. First and foremost, there are now players offering fully digital banking services (neo-banks). The Tech Giants are not to be outdone (Clot, 2019), offering new payment and credit services backed by a major strike force in terms of data management. In terms of financing, the crowdfunding ecosystem offers an interesting alternative for companies and individuals (Darmon et al. 2022, Gleasure et al. 2019). Finally, innovation through the use of Distributed Ledger Technology (the keystone of cryptocurrencies) is both a source of opportunities and leads to the emergence of new entrants (Liu et al. 2023, Mastui et al. 2022, Rossi et al. 2019, Zamyatin et al. 2019). These also bring with them challenges linked to personal protection issues, the risks of monetary sovereignty and system fragmentation (stablecoin issues), and operational risks, particularly in terms of cybersecurity. This raises the question of the trade-offs between the fluidity of the user experience and the security of financial systems.

Area 3: Corporate finance and accounting departments

Finally, new technologies are revolutionizing finance functions within companies. Investment in strategic information systems is an important lever in the quest for competitive advantage. Seizing new digital or artificial intelligence functionalities is therefore at the heart of finance departments' concerns (Dong et al. 2021, Tong & Tian, 2023). It is not just a question of speeding up processing, streamlining exchanges or lowering costs, but of achieving true augmented finance, capable of perceiving new risks and detecting new trends in an increasingly complex world. Leveraging rapid, accurate analysis of large-scale data, decision-support and information-sharing systems are revolutionizing the way companies are organized, offering new opportunities for growth and innovation. By way of illustration, predictive analytics, data visualization and RPA (Robotic Process Automation) are profoundly transforming the strategic dynamics and organization of companies (Ma & Wang, 2023). E-invoicing, integrated procurement or delivery solutions (Procure-to-Pay/Order to Cash) and the implementation of SaaS (Software-as-a-Service) are reshaping relationships with stakeholders, whether they are service providers, employees, customers or suppliers. But the digital maturity of finance functions in companies - especially in France and for smaller structures - is still far from being achieved. It is not only essential for finance departments to rethink the way they carry out their roles to achieve a unified approach to planning, reporting and data analysis. This transition is taking place at the very heart of the traditional organizational chart, combining historical responsibilities with pro-action in digital transformation. What impact do these new practices have on corporate governance and strategy? How can we support change, particularly for smaller structures, and avoid the digital divide? What organization charts, profiles and processes are needed for the new ISM responsibilities of finance departments?

The three fields of application presented are intended as a guide, but are neither separate nor exhaustive.

This call for submissions therefore covers a wide range of topics, including :

- Sustainable digital finance
- Digital payments, smart money
- Fraud prevention and new AI-based solutions
- Personalized banking experience including chatbots using advanced NLP techniques
- Temporality, predictivity, scalability of financial data
- Distributed registry technologies, blockchain, cryptofinance and quantum computing
- Trading and investment strategies (algorithmic trading, high frequency...)
- RegTech & financial regulation
- AI-based scoring systems
- Crowdfunding platforms, e-banking, neo-banks, open banking
- Technological risks in finance
- Online advisors, robo-advisors, trading agents, online communities
- Automation, Big Data and Machine Learning in finance
- Financial inclusion, financial literacy, and MIS
- IT and governance of financial institutions

Submissions in French or English are accepted

To submit your paper:

<http://revuesim.org/sim>

For any questions regarding the special issue, please feel free to contact Nathalie ORIOL (nathalie.oriol@univ-cotedazur.fr) or Iryna VERYZHENKO (iryna.veryzhenko@lecnam.net)

Provisional timetable:

January 22, 2024: Specific call for papers in conjunction with the 29th AIM Conference, where a new edition of GTAIM New IS Issues in Finance will be held. Presentation of papers at the GTAIM is not mandatory for submission to the special issue, but papers presented at the conference may be selected for priority submission.

<https://aim.asso.fr/fr/conferences/conference-annuelle>

Submission due: **June 30, 2024**

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2nd Round notification: **January 15, 2025**

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William Knottenbelt (Imperial College, London) : Prof William Knottenbelt is Professor of Applied Quantitative Analysis in the Department of Computing and Director of the Imperial College Centre for Cryptocurrency Research and Engineering (IC3RE) at Imperial College London. He has served as General or Program chair of numerous conferences and workshops related to blockchain, cryptocurrency and quantitative analysis. He is an expert of the World Economic Forum on blockchain and is technical advisor to several companies including Aventus, Predyktable, DeepRender and DeepSearch Labs. He also holds £3m+ lifetime research funding from EPSRC, Innovate UK and industry and accumulated 200+ peer-reviewed papers generating 5000+ citations.

Nathalie Oriol – Université Côte d’Azur – EUR ELMI – GREDEG CNRS : As a lecturer at the EUR ELMI (Economics, Law and Management of Innovation) of the Université Côte d’Azur, her research focuses on the development of digital finance, particularly concerning the

impact of algorithmic decisions and Fintechs. Her publications focus on the history of technology use and the regulation of new financial ecosystems. In addition to regular participation in AIM and ECIS, she has published various articles at the crossroads of IS and finance in journals such as *Decision Support Systems*, *Systèmes d'Information et Management*, *Revue Française de Gestion*, *Management & Data Sciences*, *Quantitative Finance*, or *Intelligent Systems in Accounting, Finance and Management*.

Iryna Veryzhenko - LIRSA- CNAM : Associate Professor of Finance at the Conservatoire National des Arts et Métiers in Paris, Iryna Veryzhenko graduated from State University of Kyiv with a master's degree in Computer Sciences, and she completed her PhD in Finance at the Sorbonne School of Management. In her papers, she explores the intersection between two disciplines, Finance and Information Systems. She mainly contributes to the understanding of the effect of technologies on financial market quality, organization, and regulation. Her research interests focus on algorithmic trading, financial market regulation, market microstructure and portfolio management. She has published various articles at the crossroads of IS and finance in journals such as *Financial Innovation*, *Systèmes d'Information et Management*, *Decision Support Systems* and *Journal of Economic Interaction and Coordination*.

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