



**AUTORITÉ
DES MARCHÉS
FINANCIERS**

Insights into the risks and benefits of digital financial services for consumers

Issues Paper

Original text in French

Issues paper

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Legal Deposit – Bibliothèque et Archives nationales du Québec, 2022

ISBN 978-2-550-93391-5 (PDF)

Preface

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The Autorité des marchés financiers (AMF) was created in 2004 to oversee Québec's financial markets and assist consumers in the areas of insurance, securities, derivatives, deposit institutions (except banks), and the distribution of financial products and services. Since then, the AMF's mission has been broadened by the government to include supervision of the mortgage brokerage sector and supervision and monitoring of the commercial and management practices of credit assessment agents. As an integrated regulator, the AMF is able to rely on a highly diversified pool of expertise and an overview of new trends and risks emerging in the markets.

Nearly 20 years later, this integrated regulator model appears well suited for addressing the issues arising from the digital transformation of the financial industry. Our 360-degree view of the financial sector gives us a distinct advantage for observing rapid advances in digitalization and new technologies and their effects on consumers of financial products and services.

We have been leveraging that advantage since 2016, when we set up a cross-functional working group to monitor technological innovations. This working group is still active today and, as part of its work, is studying a number of issues, including the responsible use of technology in the financial sector. The report [Artificial intelligence in finance – Recommendations for its responsible use](#), released in 2021, is just one example of the work we have done in this area.

In line with that work, this issues paper reflects observations pooled from across the sectors of the AMF regarding the impact of the digital transformation on consumers of financial products and services. Generally, we are seeing a gradual shift from human-driven processes toward the automated processes put in place by financial sector participants. At the same time, peer-to-peer exchanges, like the ones offered by cryptoasset markets and decentralized finance, are emerging as alternatives to the intermediaries of the traditional distribution model.

Consumers, while benefitting from these changes, are also being exposed to new risks. More people than ever consider themselves to be self-directed in their financial decision making and are therefore at risk of being offered new products or services that are not suited to their circumstances, are overly complex, or are based on incomplete or inadequate information. The Internet gives consumers access not only to local financial sector participants' products and services, whose distribution is regulated, but also to the products and services of many other companies located elsewhere in the world, including some that are unregulated or simply ill-intentioned or fraudulent. As a result, they may become targets of malicious actors using digital channels with the intent of deceiving them. We are concerned about these trends.

We are also concerned about the low level of financial literacy among consumers, who must also acquire the digital skills needed today to securely use financial services offered on-line or via mobile apps. Consumers need to be able to recognize phishing scams, protect their personal information and tell the difference between reliable and misleading information on social media.

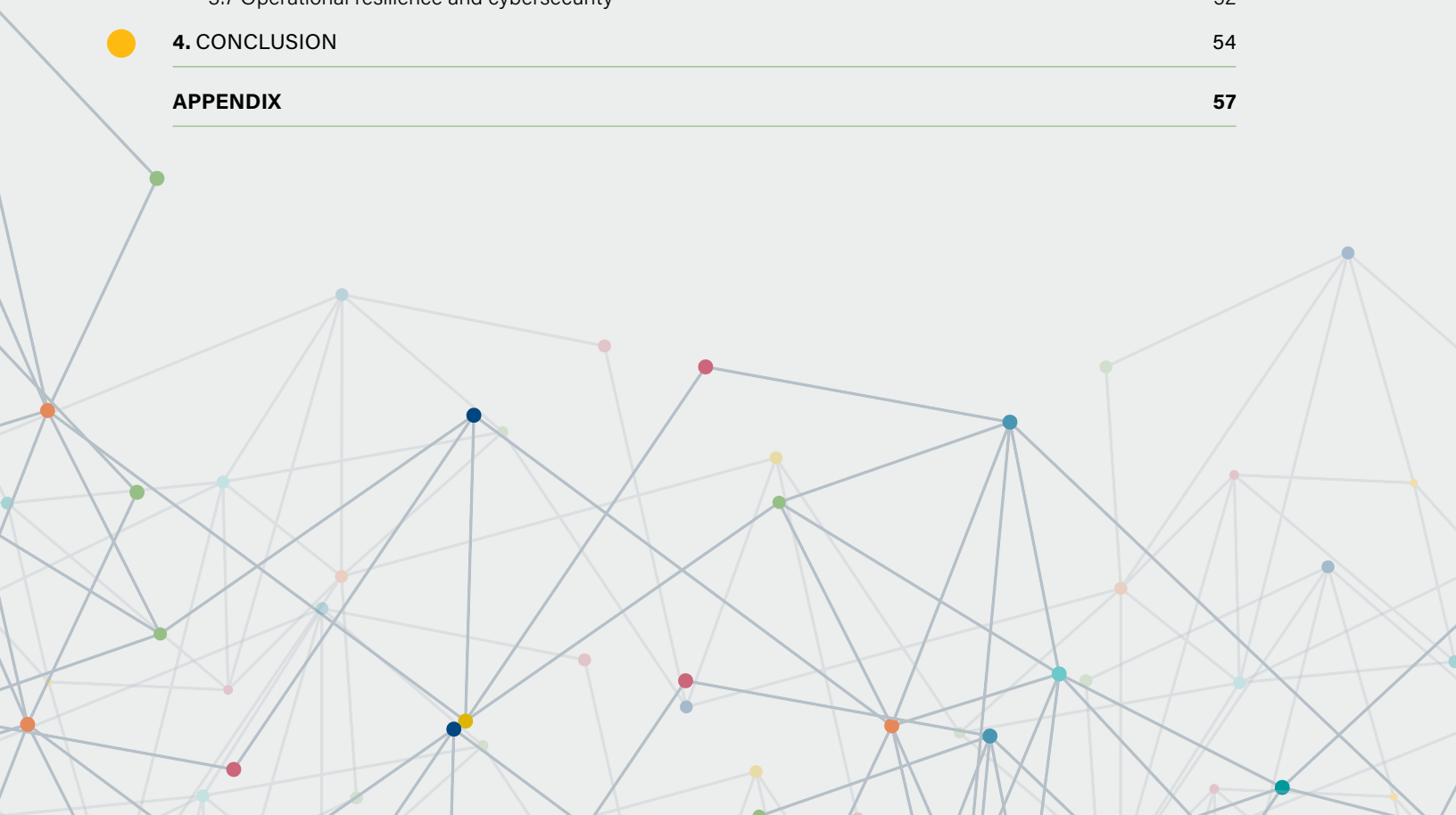
The ever-increasing volume of information on the Internet, the elimination of intermediaries in some markets (such as the cryptoasset markets) and the provision of digital financial services by companies based in jurisdictions where regulation is lax or non-existent are significant challenges for all regulators. We will respond to these challenges by continuing to enforce the laws and maintaining our financial education and awareness efforts so that consumers are conscious of any new abusive or illegal practices to which they might be exposed. We will also continue to work with our peers at the national and international levels to develop and implement common approaches to these challenges.

In addition, we are calling on financial institutions and other financial sector participants to continue their efforts to incorporate more elements of digital and financial education into their interactions with clients, who are more receptive to such messages when they are already engaged in a purchase action. We also invite members of the academic community to initiate research projects that will collectively help us use digital technology to promote education and the development of sound financial habits.

Let us act together now to better empower Québec consumers to deal with digital issues. Developing consumers' vigilance practices is a profitable investment that will help ensure the integrity of today's and tomorrow's financial sector.

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Executive summary

The digital transformation of the financial sector is profound. Driven by increasingly powerful and sophisticated computers, software and computer networks, the transformation was already well underway in banking and payment services before the pandemic. There was already talk about open banking and the many digital services it might facilitate, such as aggregators, personal finance management apps, comparison and recommendation platforms, and new credit rating services. In the capital markets, robo-advisors were making headlines by offering mass market consumers access to portfolio management services. In insurance, plans were already in the works to distribute some products without a representative via digital spaces. In addition, two innovations were emerging that have led to changes in insurers' practices: the sharing economy and telematics.

However, the acceleration of these trends and the profound changes in consumer habits that took place during the pandemic cannot be ignored. One of the consequences of social distancing and other restrictions, such as those on business operating hours, is that consumers spent more of their time searching for information, shopping, and streaming entertainment on-line. With more free time on their hands and money in the bank, a larger percentage of the population took up an interest in investing, often through on-line brokerage platforms or in the cryptoasset markets.

The result is a growing shift toward the self-directed consumption of financial products through digital channels and away from the traditional model, where the consumer is assisted by an intermediary (advisor, dealer or banker) when making a purchase. Consumers are turning in increasing numbers to easy-to-access, 24/7 digital financial services to manage their personal finances. In so doing, consumers are also exposing themselves to various risks. They may encounter several of these risks concurrently in any given action to purchase a digital financial service. The potential harm for the consumer is therefore increased.

Digital fraud

Because consumers have been spending more time on-line since the start of the pandemic, they have been more exposed to on-line fraud. In addition to phishing and malware, consumers are dealing with known scams but in digital form, often on social media. For example, a fraudster uses social media to approach a potential victim and, after building trust, asks the victim to send funds electronically in aid of someone in need or in exchange for something of higher value, such as an award, an inheritance or an investment.

There are also securities sales promotions where the fraudster attempts to increase the price of a security through fake recommendations posted on social media. The fraudster already owns a position in the security, which they then sell after the fraudster's recommendations cause consumers to buy the same security and thereby artificially push up its price, to the fraudster's benefit.

Also, few consumers today have the necessary knowledge to understand how cryptoassets work. Fraudsters may take advantage of consumers' lack of knowledge and "fear of missing out on an opportunity" to manipulate them into taking part in fraudulent schemes.

Information on digital financial services: complex, difficult to access, overwhelming and often incomplete

When information is inadequate, insufficient or not disclosed in a timely manner, it limits a consumer's ability to understand the terms and conditions of use of a digital financial service and the associated risks, especially if that information is viewed on a smart phone screen, with its limited size. For some consumers, the ever-growing number of reliable and accessible information sources could lead to information overload, also known as "infobesity, where there is so much information that the consumer cannot process it all. Infobesity can lead to decision paralysis.

Moreover, consumers, particularly younger people and self-directed investors, are increasingly turning to social media for information about financial products and services. Their investment and buying decisions are more influenced by friends, family and "finfluencers" than by professionals registered with a regulator. Social media platforms are also channels that facilitate the dissemination of unreliable information and rumours, which sometimes trigger mass movements of investors acting on the fear of missing out on an opportunity.

Privacy and personal information protection

The abundance, diversity, granularity and permanence of data of a personal nature, also called personal information, are giving rise to new risks to consumer privacy. For example, a consumer's digital footprint contains a large amount of sensitive data that can reveal a great deal about the person's private life. That data, when shared, becomes vulnerable to theft and misuse. The imposing amount of data being generated and the increased time spent on-line mean it is becoming increasingly difficult, if not impossible, for consumers to maintain control over their personal data.

Analyzing personal information as part of the process for granting a credit or insurance product is not a new practice. Today, however, it can be enriched by cross-referencing a consumer's personal information with other, previously unavailable, data sources, such as the consumer's digital footprint and social media posts.

A consumer's informed consent to share their data, including personal information, is one of the legal foundations of privacy legislation. However, most consumers who consent to having their personal information processed do not read or understand all of the terms they have agreed to, which are frequently complex.

Digital engagement practices

Digital engagement practices are an array of techniques used with clients in a digital environment. They include targeted marketing (the ability to personalize messages for a particular target audience), gamification (applying incentive techniques commonly used in gaming to marketing practices) and digital nudging (drawing consumers' attention to something or encouraging them to take a particular action).

The use of digital engagement practices in the financial sector can be beneficial to consumers. For example, consumers can be supported by a mobile app in tracking their budget or managing their personal finances. However, these same digital engagement practices can be used to confuse consumers or prompt them to perform an action that is not in their best interests. This could result in consumers becoming unwittingly involved in financial transactions that are inconsistent with their investment goals or risk tolerance.

Digital financial services not suitable for their target audience

With a wide variety of providers and services to choose from, it is hard for consumers to find and analyze, within their specific context, information that is relevant and accurate. More choice can mean more risk: consumers often make a suboptimal choice when multiple options are available, such as opting for a product that is not suitable for their situation. While this risk exists when fraud, inadequate disclosure or abusive digital engagement practices are not present, it is definitely increased when they are present.

Recognizing the limits of financial product/service disclosure and consumer financial literacy, some jurisdictions (e.g. Australia and Europe) are advancing a regulatory framework that takes into account the alignment of a product's features and risks with the needs and objectives of the target audience. The obligations under this regulatory framework are in addition to the conduct and disclosure rules and provide increased protection to consumers being offered an ever-growing number of financial services on digital platforms.

Access to digital financial services

Given the increasing adoption of digital financial services, some financial intermediaries may choose to promote digital distribution channels and close physical service points, which are less frequented by consumers. This trend could limit access to financial products and services for some consumers.

Having access to digital financial services does not just mean having access to technology hardware (such as smart phones). It also means possessing or acquiring the skills required to use the hardware and use it appropriately. For example, older consumers generally do not have the same affinity for digital technology as younger consumers. This may be due to a variety of factors, such as unfamiliarity with the technology or age-related physical or cognitive issues.

Operational resilience and cybersecurity

The collective dependence on the operational resiliency of the technology infrastructure of financial intermediaries and telecom service providers is also on a steady rise. A large-scale outage, such as Rogers' July 2022 telecom service outage, could have critical effects for consumers of digital financial services. In addition, consumers are indirectly exposed to cyberattacks on financial intermediaries. Given the volume and value of the personal information they store, financial institutions and credit assessment agents are a profitable target for cyber criminals.

While the integrity and security of major blockchains have not yet failed, many cyberattacks in the cryptoasset ecosystem have made headlines, with some resulting in substantial losses for operators and users. In addition, decentralized finance apps and smart contracts are prone to coding errors and cyberattacks.

Conclusion

We have drawn two major conclusions from all these observations. First, it is more important today than ever before that consumers be vigilant. Consumer vigilance is the first line of defence in the fight against fraud and the various abusive practices prevalent in digital channels. Second, traditional financial literacy is no longer enough. Consumers must also develop the knowledge and skills necessary to securely navigate a digital environment. For example, they must be able to recognize phishing attempts, protect their personal information and give their informed consent to sharing it, tell the difference between reliable information and misleading information on social media, and understand the terms of use of the digital financial services they wish to acquire.

This is a major challenge for the financial industry, which relies heavily on the confidence of Québec consumers. It is essential to act in a concerted manner to increase consumer vigilance against these new risks.

At the AMF, we will continue to carry out significant awareness and financial education efforts, into which we will incorporate a digital literacy component, through the broadened dissemination of warnings, in order to empower consumers in a timely manner to deal with the new risks to which they may be exposed. In addition, we will continue our enforcement efforts while stepping up monitoring and the fight against emerging illegal practices. Lastly, because the issues at hand have no geopolitical boundaries, we will continue to work with our national and international peers to develop common approaches to these challenges.

We will continue to work with the academic community, first through the [AMF-Finance Montréal Fintech Research Chair](#), and then—as will be announced in detail shortly—through the AMF's [Strategic Financial Education, Outreach and Research Partnerships Program](#). In the appendix attached to this report, the AMF proposes seven areas of research focused on the use of technological innovations to increase consumers' financial and digital literacy, responsible innovation among digital financial service providers and consideration of emerging issues related to the digital transformation of the financial sector. We wish, among other things, to contribute concretely to the advancement of knowledge about the responsible use of digital engagement practices, including to promote education and the development of sound financial habits among consumers. We also propose a strategy for collecting data on digital adoption in the financial sector in order to promote academic research, policy development, and the responsible design and distribution of financial products and services.

In addition to these efforts, we are calling on financial industry participants, who can and must act to maintain consumer confidence, to incorporate more elements of financial and digital literacy into their interactions with clients, who are more receptive to such messages when they are already engaged in a purchase action. In our work leading to the Applied Financial Literacy Report,¹ we learned that financial literacy is not acquired theoretically but through experience. Financial intermediaries, whether they are brokers, advisors or deposit institutions, are therefore well positioned to strengthen consumers' financial knowledge or on-line security practices.

SEVEN OPPORTUNITIES related to innovative projects and areas of research dedicated to the digital transformation of the financial sector

1. Enhance financial consumers' financial and digital literacy using tools.
2. Use technological innovations and digital engagement practices to foster sound financial behaviours.
3. Promote the development of consumer knowledge of cryptoassets and decentralized finance.
4. Develop a responsible digital engagement practices guide for digital financial service providers.
5. Develop and implement a digital transformation data strategy for the financial sector.
6. Anticipate the potential issues arising from metaverse adoption for consumers of financial products and services.
7. Further delve into issues of data ownership in digital financial services.

¹ The 2022 edition of the Applied Financial Literacy Report will be published by the AMF on its website during the fall of 2022.

Introduction

The Autorité des marchés financiers (**AMF**) is unique in that it oversees, in an integrated manner, the areas of insurance, securities, derivatives, deposit institutions (except banks) and the distribution of financial products and services, including mortgage brokerage and the business of credit assessment agent. In order to fulfill its mission, since 2016, the AMF has undertaken various initiatives to observe and understand the digital transformation of the financial sector with the goal of anticipating regulatory and consumer protection issues. Those initiatives are still central to its *2021-2025 Strategic Plan*.

Driven by increasingly powerful and sophisticated computers, software and computer networks, the digital transformation of the financial sector is profound. The incorporation of technology into the processes underlying financial markets is nothing new. One need only think of the replacement in marketplaces of floor-based trading by automated trading. However, technological innovations are leading to major changes in the financial industry in both consumer services and infrastructure by, for example, eliminating many human interactions or even causing disintermediation of capital markets.

Terms and expressions used in this issues paper

We will use the expression **technological innovations** to refer to new technologies, such as digital platforms (including interactive websites and mobile apps), connected objects, big data, artificial intelligence (**AI**) and machine learning, and blockchain technology. **Digital financial services** are financial products or services that rely on technological innovations or that are distributed via digital channels.

For several years, **traditional financial intermediaries** (dealers, portfolio managers, deposit institutions and insurers) have relied upon technological innovations to renew or expand their financial product and service offerings. At the same time, **fintechs** and **insurtechs**² are start-ups that are using those same technological innovations to create new business models with the potential to compete with established financial institutions. We will use the expression **financial intermediaries** to refer to all providers of financial products and services, whether they be traditional financial intermediaries or fintechs.

Finally, the term **consumer** will refer to retail consumers, excluding institutional customers.

² The International Organization of Securities Commissions uses the term *Fintech* in its [IOSCO Research Report on Financial Technologies \(Fintech\)](#), released in February 2017, to describe a variety of innovative business models as well as emerging technologies that have the potential to transform the financial services industry. Similarly, in [The Annual Report on Financial Institutions and Credit Assessment Agents - 2021](#), the term *insurtech* refers to start-ups in the insurance sector that use new technologies to offer innovative and simplified concepts and a disruptive business model.

The emergence of fintech provides benefits to consumers and is therefore being encouraged by many governments around the world. In addition to a wider selection of financial products and services to choose from, consumers are benefiting from more personalized interfaces and promotional offers, faster turnaround times, easy-to-access, 24/7 on-line services, and a lower risk of error as a result of process automation. These benefits have seduced a growing number of consumers, especially during the pandemic. This growth will continue with the entry of Generation Z into the work force.

The digital transformation of the financial sector is also creating significant challenges in distributing financial products and services. More consumers today consider themselves to be self-directed in their financial decisions—decisions they are implementing directly owing to their having ongoing access to digital financial services. In addition, consumers are increasingly turning to non-traditional information sources, such as social media, to learn about new products and services. In so doing, they are exposing themselves to misrepresentations and even scams operated by individuals based abroad.

Accordingly, regulators cannot encourage innovation through the emergence of new digital financial services without also addressing consumer protection. We must therefore share our findings and observations on this matter in order to stimulate more widespread reflection within the industry and academic circles. The AMF supports the initiatives of international organizations such as the Organisation for Economic Co-operation and Development (**OECD**),³ the International Organization of Securities Commissions (**IOSCO**),⁴ and the International Association of Insurance Supervisors (**IAIS**),⁵ which recognize and are prioritizing the growing number of consumer protection issues associated with digital financial services.

Structure of this issues paper

Section 1 discusses three main fundamental trends that are having a significant impact on the changes observed in the various industries regulated by the AMF, which are addressed in Section 2. Section 3 describes the main issues related to digital financial services that are of concern to us as a regulator. Finally, we conclude with guidance and possible research opportunities for the future, in order to respond proactively to the challenges and risks to which consumers are and will be exposed.

It should be noted that the findings and observations in this issues paper do not stem from the AMF's inspection and investigation activities but from its monitoring, study and research activities, market data and overall findings.

3 [The OECD and the G20 are proposing revisions to the High-Level Principles on Financial Consumer Protection](#), including the addition of a cross-cutting theme addressing the impacts of digital transformation and technological advances. The consultation closed on February 25, 2022.

4 The digitalization of the retail distribution of financial products and services has been identified by IOSCO as [one of its six priorities for 2021–2022](#).

5 The IAIS has published various documents on the impact of technological innovations in insurance, such as the [Application Paper on the Use of Digital Technology in Inclusive Insurance](#).



1. KEY FUNDAMENTAL TRENDS

Before this report addresses the digital transformation of the financial sector in greater detail, this section describes three key fundamental trends that are having a significant impact on the evolution of the sector.



1.1 Connectivity, big data and computing power

The development of the Internet, a global, universally accessible computer network, has changed our society in unprecedented ways. More than 60% of the world's population has Internet access in 2022. The percentage is over 90% for North America and Europe.⁶

In Québec, the household Internet connection rate reached 93% in 2021, an increase of 17% in 10 years. It is estimated that 82% of adults in Québec use the Internet several times a day. The proportion of individuals who do not use the Internet is greatest among adults over 65 and households with an annual income of less than \$20,000. Moreover, 40% of seniors with annual family incomes under \$20,000 do not have access to the Internet.⁷

1.1.1 Connected objects

Since the 2010s, a growing number of Internet-connected objects have come onto the scene (**Internet of Things or IoT**). These objects collect and share a wide range of data (location, temperature, behaviours, etc.) using embedded sensors. For example, smart phones measure the distance travelled by their users, and telematics systems built into cars record driver behaviours.

Browsing the Internet also generates data, which is collected using tracers such as cookies. Together, this data, along with the data generated by the use of mobile apps and connected objects, constitute an individual's **digital footprint**.⁸ A digital footprint includes a large amount of information unique to an individual about websites visited, search engine queries, mobile apps used, certain physical behaviours (e.g. number of steps) and geolocation data.

Adoption of connected objects

In 2022, more than five billion people, or 67% of the world's population, own smart phones. That is 95 million more people than in 2021.⁹ The number of connected devices (computers, smart phones, etc.) is expected to be three times the global population in 2023.¹⁰

In Québec in 2021, 83% of adults had smart phones, 83% had laptops or desktop computers, 57% had tablet devices, and 27% had smart watches or smart wristbands. In total, 97% of adults in Québec have one of these electronic devices or another. In 2021, the smart phone became the electronic device most frequently used by Québec Internet users to access the Internet, both from home or elsewhere.¹¹

In 2012, 47% of Quebeckers also owned at least one connected object for the home (e.g., a connected household appliance, a smart speaker, a connected home surveillance and monitoring device, or a device to control doors, windows or the garage door). This rate jumps to 70% among adults aged 18 to 24.¹²

6 [Global internet penetration rate as of July 2022, by region](#) (Statista, 2022) and [Cisco Annual Internet Report \(2018-2023\) White Paper](#) (Cisco, 2020).

7 [Académie de la transformation numérique, 2022. NETendances 2021 – Portrait numérique des foyers québécois.](#)

8 Office québécois de la langue française – [trace numérique](#).

9 [Hootsuite – Digital 2022. Global overview report – The essential guide to the world's connected behaviours.](#)

10 [Cisco Annual Internet Report \(2018-2023\) White Paper](#) (Cisco, 2020).

11 [Académie de la transformation numérique, 2022. NETendances 2021 – Portrait numérique des foyers québécois.](#)

12 [Académie de la transformation numérique, 2022. NETendances 2021 – Fiche génération 18-24 ans.](#)

1.1.2 Social media

The use of social media, such as Facebook, Twitter or YouTube, is growing steadily. In 2022, these platforms together have 424 million more users than in 2021, for a total of 4.6 billion active users (who consume or share content), or nearly 60% of the world's population.¹³ In Québec, 78% of adults use one or more social media platforms. The electronic device most often used to access these platforms is the smart phone.¹⁴ Also, 59% of youth aged 6 to 17 have a personal page on a social media platform, compared with 47% in 2020.¹⁵

On average, social media users in Québec spend more than three hours per day on these platforms. The average time per day spent on social media is highest, at approximately five hours, among users with an annual household income of less than \$20,000 and among adults aged 18 to 34.¹⁶

Social media are a source of information for news and current events for 33% of all Québec adults and are the most frequently used information source for adults aged 18 to 34. However, trust in social media as a reliable source of information decreases among adults who are older.¹⁷

1.1.3 Big data and data science

Social media and connected objects are largely responsible for the creation of **big data**, which comes in a variety of formats: text, video, images, audio content, documents, sensor data, activity logs, web browser history, contact information, etc. Big data differs from more traditional data by its volume, but also by the fact that it is not always structured, as is usually the case with survey results, for example.

Big data would not be as valuable as it is today without a concurrent increase in computing power and advances in **data science**, an interdisciplinary field that uses scientific methods, processes, algorithms and systems to extract knowledge and ideas from large volumes of structured and unstructured data.¹⁸ High-performance computers are now used to deploy these techniques, which include AI and machine learning, for a wide range of use cases.

AI and machine learning can leverage computing power and big data to uncover correlations between various elements, structure non-traditional data sources, and automate work and decision-making processes at a level that far exceeds human abilities.

Data science has also paved the way for advances in natural language processing, including the development of intelligent personal assistants (such as Siri and Alexa). In Canada, 19% of Internet users aged 16 to 64 use intelligent personal assistants weekly (compared with 24% globally). Also, 23% of those same Internet users use on-line translation services, compared with 32% of the global population.¹⁹

1.1.4 Blockchain technology and cryptoassets

In 2009, Satoshi Nakamoto proposed bitcoin as a solution for transmitting value over the Internet without involving traditional financial intermediaries.²⁰ Blockchain technology has been adopted in several other use cases to facilitate exchanges between various parties, often in an anonymous or pseudo-anonymous context.²¹

¹³ [Hootsuite Digital 2022. Global overview report – The essential guide to the world's connected behaviours](#). The main reasons given for using social media: keeping in touch with friends and family, passing the time and reading about current events.

¹⁴ *Académie de la transformation numérique, 2022. NETendances 2021 – Actualités en ligne, réseaux sociaux et balados.*

¹⁵ *Académie de la transformation numérique, 2022. NETendances 2021 – La famille numérique.*

¹⁶ *Académie de la transformation numérique, 2022. NETendances 2021 – Actualités en ligne, réseaux sociaux et balados.*

¹⁷ *Académie de la transformation numérique, 2022. NETendances 2021 – Actualités en ligne, réseaux sociaux et balados.* Québec adults trust traditional media far more than social media as a source of news and current events. Two out of three adults, or 67% of all Québec adults, trust news and current events disseminated via traditional media such as print, radio and television, whereas only 25% trust such information when it is disseminated over social media.

¹⁸ Wikipedia – [data science](#).

¹⁹ [Hootsuite Digital 2022. Global overview report – The essential guide to the world's connected behaviours](#).

²⁰ [Bitcoin: A Peer-to-Peer Electronic Cash System](#)

²¹ In the context of cryptoassets, reference is generally made to the pseudo-anonymity of the participants, i.e., their transactions are linked to one or more unique public keys. However, the actual identity of the participants is not required.

In the case of cryptoassets, blockchain combines the Internet, distributed ledger technology and cryptography to create an immutable public ledger containing all transactions between the various users. To ensure its immutability and security, the ledger is deployed in a redundant and synchronized manner between multiple validators who co-operate according to predefined rules. This infrastructure allows users to exchange cryptoassets without involving a central operator and without an authorization or authentication process for accessing the network.²²

There are thousands of cryptoassets today, with bitcoin and ether being the most popular.

Some cryptoassets are unique or “non-fungible”; they are often used to demonstrate, on the blockchain, ownership of a digital asset, such as an image. Other cryptoassets, known as stablecoins, attempt to maintain a fixed value relative to a reference fiat currency.²³

The capitalization of all cryptoassets in circulation skyrocketed in 2020 and 2021, reaching nearly US\$3 trillion in November 2021. The cryptoasset ecosystem later sustained significant losses in the first half of 2022. By October 2022, the global capitalization of cryptoassets was just under US\$1 trillion.²⁴

Following the collapse in value in the spring of 2022, one might presume that consumers would be less interested in the cryptoasset market. However, some investors, especially the youngest among them, view this episode as an opportunity to buy cryptoassets at a discount in the hope that prices will rise again in the future.²⁵

Adoption of cryptoassets

By 2021, the proportion of Canadians holding bitcoins had increased to 13%, up from 5% in 2018–2020. Canadians who owned bitcoins in 2021 were predominantly men aged 18–34 with a university degree or high income who viewed bitcoin as an investment. In 2021, 70% of bitcoin owners reported holding CA\$5,000 or less. About half of current bitcoin owners became bitcoin owners during the COVID-19 pandemic (2020–2021). In addition, in 2020–2021, owners were more likely to obtain bitcoins via mobile apps than via on-line platforms or ATMs.²⁶

A 2021 study conducted by CIRANO in Québec indicates that knowledge about cryptoassets is increasing. However, only a small percentage (7%) of the population reportedly holds cryptoassets.

According to the survey, twice as many men as women own cryptoassets, and cryptoasset ownership is highest among young people aged 18 to 34. The rate of ownership increases with level of education and household income. Those who own cryptoassets acquired them for investment purposes and because of an interest in new technologies.

The study found that the more consumers purchased financial products on-line, the more cryptoassets they owned. The researchers also observed a “network” effect: the more people consumers know who own cryptoassets, the more likely they are to own them, too.

Another survey of investors conducted by the Ontario Securities Commission (**OSC**) reveals some similar results. In particular, 13% of Canadians own cryptoassets and/or investment funds with exposure to cryptoassets. The survey reveals that purchasers of cryptoassets relied most predominantly on word of mouth as a source of information before purchasing (41%), followed by social media influencers (21%), an expert in blockchain technology (20%) and their financial advisor (15%). Nearly three-quarters (74%) of those who purchased cryptoassets were not recommended to buy them by their financial advisor, and most never even discussed the option with their advisor.²⁷

22 There are also cases where a blockchain is used on a private network. It is then generally necessary to obtain an authorization from a central administrator to access the network. However, these use cases are not covered in this section.

23 Depending on their type, some stablecoins peg their value to an asset such as a currency (e.g., the U.S. dollar) or to a basket of assets and are backed by reserves of assets whose value is often expressed in fiat currency (e.g., U.S. dollars). Other stable tokens use algorithms that trigger buying and selling to stabilize their value. While they promise less volatility than other cryptoassets, stablecoin is still risky.

24 [Global Cryptocurrency Market Charts | CoinMarketCap](#), as at October 2, 2022.

25 The Globe and Mail, July 13, 2022. [Young investors are losing their enthusiasm for crypto as prices collapse](#). According to Bitbuy, younger crypto investors were more active on the platform after the crash. At the beginning of the year, investors aged 18 to 29 represented 4.7% of trading activity. After the crash, that percentage went up to 34.6%.

26 Bank of Canada, October 2022. [Private Digital Cryptoassets as Investment? Bitcoin Ownership and Use in Canada, 2016-2021](#).

27 [Crypto Asset Survey](#), Ontario Securities Commission (2022).

1.1.5 Metaverse

The metaverse, considered by many to be the next iteration of the Internet, is a virtual space the user is fully immersed in, generally by means of a sophisticated virtual reality headset. Users learn, work, shop and play through **avatars**, which are digital representations of themselves. They can give their avatars any appearance or personal attribute, such as digitally branded clothes.²⁸

Currently, metaverse users are spread across several separate platforms, including Decentraland²⁹ and The Sandbox,³⁰ two platforms based on the Ethereum blockchain. Other platforms, such as Fortnite, Minecraft and Roblox, are familiar names to video game enthusiasts.³¹ In the most ambitious vision of the metaverse, however, all virtual spaces are embedded and interoperable, allowing thousands of individuals to interact simultaneously.

The research and advisory firm Gartner predicts that by 2026, 25% of individuals will spend at least an hour a day in the metaverse for work, shopping, education, social activities and/or entertainment.³² The metaverse therefore has huge potential in terms of everything from employee engagement to client experience, including advertising, new product development and community building. Although the metaverse is still a futuristic concept for many, a number of companies are already investing in its development. Corporations and venture capital funds invested over US\$120 billion in the metaverse in the first five months of 2022, more than twice the US\$57 billion invested in 2021.³³

While the potential of the metaverse is impressive, the technology required to achieve the envisioned end state does not exist yet. Advances will be needed in computing infrastructure, network infrastructure and connected devices. In terms of governance, developments will also be needed to adequately address platform- and participant-related IT security issues and identity management and privacy protection issues.

1.2 Sociodemographic changes

In addition to the impact of technological innovations, significant sociodemographic changes are also affecting our society.

1.2.1 An aging population

Population aging is a global phenomenon. The United Nations predicts that, by 2050, there will be twice as many people aged 65 or older as there are children aged five or younger.³⁴ In Canada, the number of people aged 65 and over rose by 18% between 2016 and 2021, the second largest increase in 75 years after the one observed from 2011 to 2016 (+20%). According to population projections, by 2051, one in four Canadians will be 65 years of age or older.³⁵ The percentage of Quebecers over the age of 65 is also increasing rapidly: in 1971, it was 7%; in 2021 it was 20%, or one in five.³⁶

Still in Québec, 85% of seniors have an Internet connection and 92% have a device allowing them to connect to it (computer, tablet device or smart phone). Two-thirds of seniors use the Internet several times a day (74% of men and 61% of women in this age group).³⁷

28 Forbes (2022). [What We Can Learn From Top Brands Already In The Metaverse.](#)

29 [Decentraland](#) is a virtual world where one can buy "parcels of land," which exist in limited numbers, in the form of non-fungible cryptoassets on the Ethereum blockchain.

30 [The Sandbox](#) is a virtual world in which participants can build, own and monetize gaming experiences through cryptoassets issued on the Ethereum blockchain.

31 McKinsey & Company, 2022. [Value creation in the metaverse.](#) The development of the metaverse is intimately related to developments in the gaming industry. According to McKinsey, there are three billion gamers in the world. The gaming platform Roblox alone has nearly 55 million daily average users. Minecraft has about 140 million monthly active users, and Fortnite about 80 million.

32 [Gartner Predicts 25% of People Will Spend At Least One Hour Per Day in the Metaverse by 2026.](#)

33 McKinsey & Company, 2022. [Value creation in the metaverse.](#) Microsoft's planned \$69 billion acquisition of Activision represents a large percentage of the money invested in 2022.

34 United Nations, [World Population Prospects 2022.](#)

35 [2022, Statistics Canada, The Daily \(2022-04-27\).](#)

36 [Le bilan démographique du Québec. Édition 2021 \(gouv.qc.ca\)](#)

37 [NETendances 2021 – Les aînés connectés au Québec.](#)

1.2.2 Household savings and generational transfers

At the end of the second quarter of 2022, the value of financial assets of Canadian households amounted to \$8.8 trillion, and nearly 1.9 trillion for Québec households. By the end of 2021, the average net savings of Canadian households had declined across most household groups, and among middle-income and elderly households in particular.³⁸

The aging of Canada's and Québec's population will lead to a major transfer of wealth to Gen Xers, Millennials and Generation Z over the coming decade.³⁹ This transfer of wealth is making the younger segment of the population particularly attractive to financial intermediaries. According to a study, the compound rate of return on the financial wealth of Generation Z and Millennials could be 36.4% and 16.7%, respectively, for the period from 2021 to 2030.⁴⁰

1.2.3 Financial literacy and digital literacy

Financial literacy refers to the combination of knowledge, skills, attitudes and behaviours necessary to make informed financial decisions and achieve financial wellness.⁴¹ According to the Applied Financial Literacy Report, the level of financial literacy measured in 2021 in Québec is still low, at 54.1%.⁴² The report reveals that financially prudent attitudes and consumer skills are directly correlated with financial product ownership. Financial literacy is therefore the product of tangible experience. Accordingly, the level of financial literacy is lower among consumers who own few products owing to lower income and less financial activity.

Although a direct comparison is not possible as a result of methodological differences, the low score for Québec is consistent with a pattern of low scores on financial literacy surveys. The Canada-wide survey conducted by the Financial Consumer Agency of Canada (FCAC) found that only 46% of Canadians say they are well informed about financial matters.⁴³ Furthermore, in a survey conducted in 2021 by the OSC, 53% of respondents answered correctly to questions designed to assess their financial awareness, placing Canada among the jurisdictions with the highest financial literacy rate. However, in a more recent survey, the OSC found that almost one-third of investors surveyed (30%) were overconfident and rated their financial knowledge too highly.⁴⁴

In addition to financial literacy, consumers who adopt digital financial services need to develop the skills required to be able to operate effectively and securely in a digital environment. Digital literacy therefore supplements financial literacy as an essential competency for these consumers. Moreover, consumers also need to possess the knowledge required to give their fully informed consent to the sharing of their personal information, understand how the information is being used and fully exercise their rights in this regard.

However, in addition to low levels of financial literacy, Québec consumers also have low levels of digital literacy. In total, only 53% of Internet users surveyed in 2021 and 2022 said they felt empowered to perform actions on-line, such as banking or filling out a form to make a purchase. This percentage rises to 67% for Internet users aged 18 to 24, but drops to 41% for those aged 65 and over.⁴⁵

From these statistics, we can conclude that many consumers today are purchasing digital financial services without the knowledge needed to sufficiently understand the associated financial and security issues.

38 Statistics Canada (2022). [Distributions of household economic accounts, wealth indicators, by characteristic, Canada, quarterly, Distributions of household economic accounts, wealth indicators, Canada, regions and provinces, quarterly, The Daily—Distributions of Household Economic Accounts](#).

39 Statistics Canada (2022). [Generation](#). Generally speaking, Gen X refers to those born between 1965 and 1980, Millennials are those born between 1980 and 1996, and Generation Z refers to those born between 1996 and 2011.

40 Investor Economics Household Balance Sheet Report—Canada, 2022.

41 OECD, 2022. [Report on the implementation of the recommendation of the council on high-level principles on financial consumer protection](#).

42 The level of applied financial literacy is developed on the basis of these three variables: (i) consumers' prudent or imprudent attitudes, measured using statements describing their attitudes in financial matters; (ii) financial literacy, measured using OECD questions developed for this purpose; and (iii) financial product ownership. The responses are assessed and each respondent is assigned a score of 0 to 100. Based on data collected by telephone survey in the summer of 2021, the average level of financial literacy is 54.10.

43 Weighted results for the period from August 2020 to July 2022 taken from the [Summary of findings COVID-19 surveys: Financial Impact of the pandemic on Canadians](#), compared to 48% in 2020 and 2021.

44 OSC, 2022. [Investor Knowledge Study](#).

45 *NETendances 2021 – Portrait numérique des générations*.

1.3 The COVID-19 pandemic and shifts in consumer habits

Changing consumer habits and accelerated digital adoption during the COVID-19 pandemic cannot be ignored. These trends are unlikely to reverse themselves in the future.


One of the consequences of social distancing and other restrictions, such as those on business operating hours, is that consumers have been spending more of their time on-line: since the start of the pandemic, 75% of Canadians aged 15 or older have been engaging with greater frequency in various Internet-related activities.⁴⁶ In 2021, 75% of Québec adults made at least one on-line purchase, compared with 78% in 2020, the year when social distancing restrictions were the strictest.⁴⁷ This percentage jumped from 58% in 2017 to 78% in 2020, a significant increase of 20 percentage points over three years.⁴⁸ Also, the increase in on-line commerce, combined with the precautions taken by many consumers in order to reduce the handling of bank notes, is resulting in a major shift to digital and contactless payment services.

Household savings increased significantly during the pandemic. Extraordinary government support measures, the inability to shop for services in person and restrictions on many services, including air travel, restaurants and theatres, caused a momentary rise in the savings rate in Canada. The rate jumped to a record 27.2% of disposable income in the second quarter of 2020.

⁴⁶ Statistics Canada, 2021. [Internet use and COVID-19: How the pandemic increased the amount of time Canadians spend online.](#)

⁴⁷ *NETendances 2021- Le commerce électronique.* In 2020, due to the pandemic situation, non-essential businesses were completely shut down from March 22 to May 4, 2020, for those with direct access to the outside, and until May 25 for the remainder. These closures led to an increase in on-line purchases.

⁴⁸ *NETendances 2020 - Le commerce électronique au Québec.*



2. DIGITAL FINANCIAL SERVICES: FINDINGS AND OBSERVATIONS

This section summarizes our observations relating to the changes brought on by technological innovations in activities through which financial products and services are offered and distributed to consumers.



2.1 Banking, payment and credit assessment services

The consumer experience with various financial services has undergone significant technological transformations over the last few decades. Initially heavily paper-based and generic, these services were digitalized in the 1990s, becoming available on the Web and offering an enhanced client experience.

In Canada, 47% of Internet users use financial services on-line or by mobile app each month. This is significantly higher than the global figure of 28%.⁴⁹ In addition, a higher percentage of men than women are adopting digital financial services. According to a study released in March 2021 by the Bank of International Settlements, 29% of the men surveyed had adopted such services, compared with 21% of the women surveyed.⁵⁰ Also, adults aged 44 and under accounted for 75% of all users of digital financial services via a mobile app.⁵¹

2.1.1 Digital banking services

Digital banking services encompass both on-line and mobile app-based banking services. On-line banking services have now been widely adopted in Québec and Canada. According to a study by the Canadian Bankers Association, 9 out of 10 Canadians (89%) used on-line banking services in 2021. The percentage of people accessing banking services via a mobile app continued to increase, especially among young adults. Two-thirds (65%) of Canadians used a mobile app for to do their banking in 2021, up from 56% in 2018.

According to that same study, 57% of Canadians used in-branch banking in 2021, a 10% drop from the 2018 rate that was likely due to pandemic-related safety measures and the growing adoption of digital banking. In-person banking is now the most common way to bank for only 10% of Canadians. This is a significant change: about 20 years ago, 30% of respondents in a similar study said they did most of their banking in person, while 16% primarily banked on-line.⁵²

The percentage of Québec adults who use the Internet to check their bank account balances and perform routine transactions is 87%, up a record 22 percentage points since 2015. One in two adults in Québec uses a smart phone to perform these transactions.

In contrast, only 27% of Québec adults opted for on-line services for their financial investments. 43% of adults preferred to carry out such transactions in person. In addition, almost half of Québec adults preferred in-person meetings for financial planning (48% of respondents) or mortgage financing (48% of respondents). For financial matters, nearly two-thirds (63%) of Québec adults preferred to use the assistance services of an advisor over the phone.⁵³

49 [Hootsuite Digital 2022. Digital 2022: Global Overview Report – The essential guide to the world's connected behaviours.](#)

50 Based on 27,103 on-line interviews with adults in 28 countries. [The fintech gender gap \(bis.org\)](#)

51 Data for the United States. Statista, 2022. [Financial and non-financial app users in the United States in 2019.](#)

52 Canadian Bankers Association, 2022. [Focus: How Canadians Bank.](#)

53 [Académie de la transformation numérique, 2022. NETendances 2021 – Services bancaires en ligne.](#)

2.1.2. Payment and funds transfer services

The pandemic also accelerated significant changes in the way consumers make payments. In 2021, 85% of all transactions were made by electronic payment.⁵⁴ Consumers under the age of 30 are the main ones driving growth in the adoption of electronic payment solutions.⁵⁵ In addition, payments in cash or by cheque are declining (down 62% and 49%, respectively, since 2016).

Electronic payments

Electronic payments generally refer to any type of payment that is made by credit card, debit card or electronic funds transfer.

- Payments made by swiping a credit or debit chip card. The user is usually required to enter a personal identification number.
- Payments made through a website or mobile app.
- Contactless payments, made by tapping a credit or debit chip card on an in-store terminal. These types of payments have grown dramatically since the pandemic. Contactless transactions increased 12% in volume and 18% in value in 2021.⁵⁶
- Payments made with a digital wallet (an app on a smart phone like Apple Pay or Google Pay). Since the start of the pandemic, 45% of Canadians who have used a mobile wallet to pay for in-store purchases said they are using it more than before.⁵⁷ Among Québec adults, digital wallet usage increased from 17% in 2019 to 25% in 2021.⁵⁸

Payments Canada reports that the total value of electronic funds transfers has grown 49% over the past five years, and estimates that this amount will likely equal or exceed the value of debit card transactions in the coming years. In terms of international payments, 17% of Canadians regularly send money abroad. Younger Canadians (aged 18–34) have overwhelmingly chosen PayPal to make international payments because of the low transaction fees, ease with which payments can be tracked, and the security and convenience of the service. Generations that are older prefer financial institutions, for similar reasons.⁵⁹

2.1.3 On-line lending and credit rating services

Personal loan services have also been transformed by emerging digital technologies. It is now possible to apply on-line for a loan, whether the lender is a financial or non-financial institution. The digitalization of this process makes it easier and more convenient to access credit, but it can also increase known risks, such as the risk of over-indebtedness and of consumers being offered products that are not appropriate for their circumstances. For a consumer who is already in debt, a traditional, in-person process for accessing additional credit can lead to uncomfortable situations, unlike a process carried out via a digital channel.⁶⁰

Credit assessment services are also bound to change. These private companies collect, store and communicate information about a consumer's financial experience to a variety of creditors. Traditionally, a credit report is created by a credit assessment agent when a consumer borrows money or applies for credit for the first time. The agent then calculates a consumer's credit score, which is an indication of the risk the consumer represents to a lender.

54 Payments Canada, [Canadian Payment Methods and Trends Report 2022](#). Payments Canada is responsible for Canada's clearing and settlement infrastructure, and defines the processes and rules required to support this flow of funds.

55 Canadian Bankers Association, 2022. [Focus: How Canadians Bank](#).

56 Payments Canada, [Canadian Payment Methods and Trends Report 2022](#).

57 Payments Canada, [Canadian Payment Methods and Trends Report 2022](#).

58 Académie de la transformation numérique, 2022. [NETendances 2021 – Services bancaires en ligne](#).

59 Payments Canada, [Canadian Payment Methods and Trends Report 2022](#).

60 FinCoNet, 2017. [Report on the Digitalisation of Short-term, High-Cost Consumer Credit](#).

At the same time, in recent years we have seen the development of fintechs, separate from the main credit assessment agents, which are proposing an equivalent or enhanced offering of credit report tracking-up or management services to consumers or ongoing credit report monitoring to prevent identity theft.⁶¹ Through agreements with credit assessment agents, these fintechs leverage not only data from consumers' credit reports but also other types of data, such as consumers' digital footprints. In some cases, this information can then be employed for other commercial purposes or uses if the consumer agrees.

New types of algorithms for assessing consumer credit are also being used, such as algorithms based on consumer behaviour data collected via consumers' smart phones, including consumers' contacts, social media posts and movements. The use of non-traditional data is adding another dimension to credit assessment and is enabling consumers without a financial history to access credit. The use of alternative data can also allow for more accurate credit scoring and improve overall credit risk management. However, sharing this data can infringe on a consumer's privacy.⁶²

2.1.4 Increased competition in an ever-changing environment

The digitalization of banking or payment activities is resulting in increased consumer data mobility which, combined with connectivity and data science, is creating fertile ground for innovation and the development of new digital financial services for consumers to complement and compete with the services offered by traditional financial intermediaries.

Bigtechs and fintechs

Among the firms that have benefited from technological innovations are the **bigtechs**,⁶³ which dominate the dissemination of information and the means by which Internet users communicate with one other. Their business model extends to all areas of the digital world, including social media, search engines, apps, Internet access hardware and telecommunications infrastructure.

Their service offering and ubiquitous presence on the Internet mean that bigtechs are able to collect a substantial amount of data about Internet users. The data are then input into various algorithms, including AI and machine learning algorithms, in order to generate more Internet user activity and data. Because of this network effect and the data they have accumulated through the years, bigtechs are uniquely positioned to develop and launch new products and services in a number of sectors, including the financial sector.⁶⁴

However, bigtechs are not the only firms looking to leverage technological innovations in the financial sector. The 2008 financial crisis, which shook confidence in traditional financial intermediaries, paved the way for the emergence of fintechs. Today, there are more than 200 Québec fintechs employing more than 18,000 people. A quarter of those fintechs operate in the payment sector.⁶⁵

61 For example, the U.S. multinational Credit Karma offers Canadians a way to check their credit scores and get weekly or monthly credit reports using TransUnion data. Revenue from targeted ads for financial products offsets the cost of its free products and services. Credit Karma earns revenue from the lenders, who pay the Credit Karma when they obtain successful client referrals from Credit Karma.

62 FinCoNet, 2017. [Report on the Digitalisation of Short-term, High-Cost Consumer Credit](#).

63 According to [Wikipedia](#), "GAFAM" (or bigtech) refers to the web giants – Google (Alphabet), Apple, Facebook (Meta), Amazon and Microsoft – which are the five major U.S. firms (founded between the last quarter of the 20th century and the beginning of the 21st century) that dominate the digital market.

64 For example, Apple (Apple Pay) and Google (Google Pay) offer payment services in Canada.

65 Finance Montréal, [Rapport Fintech Québec, T2-2022](#).

Open banking

Open banking (also called consumer-directed finance) is part of the digital transformation of the financial industry. Open banking refers to the ability of consumers to share their financial data with third parties, be they fintechs or other financial intermediaries.

Services arising from open banking

- Aggregators, which enable consumers to consolidate all of their financial data on a single platform, providing them with an overall view of their assets and facilitating decision making.
- Personal finance management apps, which make it easier to track a budget and monitor consumption habits.
- Comparison and recommendation platforms, which enable consumers to compare fees and interest rates for various financial products and services, such as bank accounts, credit cards, mortgages and consumer loans. Comparisons and recommendations are made based on the consumer's financial situation, using the consumer's financial data.
- Credit assessment services, which are based on a consumer's habits.
- Fraud detection services, which alert consumers if abnormal activity is detected in their bank accounts.

An estimated four million Canadians use open banking-based digital financial services, primarily through a process called **screen scraping**.⁶⁶ Screen scraping is a practice that enables a third party's IT system to access a consumer's financial data through the consumer's on-line banking account. The practice is risky because it requires the consumers to share their banking account log-in and password information with the third party without their necessarily understanding the consequences of doing so. For example, sharing this data could violate the terms of use of the consumer's banking service, leaving the consumer with no recourse should an incident occur. Furthermore, the misuse of consumer financial data, including its use without the consumer's consent, can increase the risk of fraud and inappropriate recommendations (e.g., where incomplete or obsolete data are used).

In 2018, the Department of Finance Canada took a first step to mitigate these risks and support responsible development of open banking by establishing an advisory committee tasked with assessing the benefits of open banking, with the highest regard for consumer privacy, security and financial stability.⁶⁷ In March 2022, the Department of Finance Canada appointed an open banking lead tasked with engaging with industry participants and consumer representatives to design and implement the key pillars of the open banking system.⁶⁸

⁶⁶ Department of Finance Canada, 2020. [Consumer-directed finance: the future of financial services](#)

⁶⁷ Department of Finance Canada, 2018. [Minister Morneau Launches Advisory Committee on Open Banking](#). The advisory committee released its final report in 2020.

⁶⁸ Department of Finance Canada. [Open banking implementation](#).

Neobanks

Neobanks offer banking services primarily on-line or in-app. They are not regulated like traditional banks or digital-only banks (that do not have physical branches). Also, they usually do not offer the full range of mainstream banking services, but instead offer more economical alternatives to specific products or services such as credit cards, money transfers and savings accounts.⁶⁹

While deposits at provincially or federally regulated financial institutions are insured, deposits to an account offered by a neobank may not be covered by deposit insurance. It is therefore important for consumers to be vigilant.

Embedded financial services

Embedded finance, Embedding digital financial services into consumers' various digital journeys is a growing trend. Companies that are not financial intermediaries, like certain retailers⁷⁰ and bigtechs, are offering services such as lending ("buy now, pay later") or digital payment solutions through their websites and mobile apps using open banking or white-labeled financial services.

The same trend is observed for "super apps" such as WeChat in China, which offer their users a mesh of interconnected services using the same interface. In addition to a marketplace, they incorporate banking, payment and loan services and investment offers. These apps also use gamification features to influence user behaviours.

Embedded finance also includes the practices of financial intermediaries that are not deposit institutions but provide digital financial services similar to those offered by deposit institutions, such as a savings account, payment services and loans.⁷¹ These services aim to retain customers and even become a monetization lever.

In this context, financial institutions take charge of financial transactions without developing a relationship with the consumer. Instead, technology, media and entertainment companies take over the relationship with the customer through an enhanced user experience and personalized offers, without the requirement to comply with the regulations applicable to financial institutions.⁷²

2.1.5 Central bank digital currency

In recent years, many central banks around the world, including the Bank of Canada, have been exploring the possibility of implementing a central bank digital currency (CBDC). A CBDC is a digital version of the bank notes that are legal tender in a country. It is not to be confused with cryptoassets (which are not issued by central banks) or digital bank deposits held by financial institutions.

The Bank of Canada currently has no plans to launch a CBDC in Canada at this time, unless the use of bank notes were to continue to decline to a point where Canadians no longer had the option of using them for a wide range of transactions or digital currencies issued by private sector entities were to become widely used as an alternative to the Canadian dollar.⁷³

69 MoneySense, 2022. [When a bank's not a bank: How fintech - and neobanks in particular - are transforming banking in Canada.](#)

70 These retailers want to offer an ecosystem of interconnected products and services, all designed around an integrated, intuitive interface that is more attractive to consumers than the value proposition of an established bank. Brands such as Booking.com, IKEA, Uber and Starbucks are also entering the digital financial services world, determined to remove financial friction from their consumer interactions by offering credit products and other banking services such as payments.

71 McKinsey & Company, 2021. [What the embedded-finance and banking-as-a-service trends mean for financial services.](#)

72 PWC, 2022. [Five scenarios for the future of retail banking: Building strength amid transition.](#)

73 Bank of Canada, 2020. [Contingency Planning for a Central Bank Digital Currency.](#)

Although there are no plans to launch a CBDC in the near future, it is conceivable that issuing a CBDC would have an impact on the Canadian financial system, where most money exists in the form of bank deposits. A CBDC, however, is a claim on the central bank, not on a financial institution. Issuing a CBDC therefore has the potential to adversely affect the stability of deposit funding for banks or increase the risk of a bank run.⁷⁴ Some are even foreseeing a scenario in which financial institutions lose the basic bank account (an anchor of client relationships) to central banks.⁷⁵

However, there are many options for the design of a CBDC,⁷⁶ some of which help mitigate this risk. A CBDC could be designed to limit its attractiveness as a competitor for bank deposits: it would be cash-like and would not earn interest.⁷⁷ Other options involve producing and distributing a CBDC. In the first model, the central bank performs all the functions of the payment system, including issuing the CBDC, distributing it and interacting with end users. A second model involves the central bank issuing the CBDC but leaving interactions with the end-user to private companies—mainly financial institutions and other financial intermediaries.⁷⁸

Privacy of payments made with a CBDC

Privacy considerations are important in the design of CBDCs. Unlike electronic payments, bank notes are an anonymous means of payment because they allow consumers to make purchases without sharing any personal information. A CBDC that provides the same level of anonymity would make money laundering, terrorist financing, criminal activity and tax evasion much easier. A third-party approach, which places limits on anonymous holdings of CBDCs, provides some form of privacy but also makes it possible to apply anti-money laundering and anti-terrorist financing rules to transactions above a certain amount (these rules require the disclosure of certain types of personal information). Such an approach may also increase financial inclusion.⁷⁹

⁷⁴ Bank of Canada, 2020. [Contingency Planning for a Central Bank Digital Currency](#).

⁷⁵ PWC, 2022. [Five scenarios for the future of retail banking: Building strength amid transition](#).

⁷⁶ Jeremy Clark, 2021. [Design Handbook for Central Bank Digital Currencies](#).

⁷⁷ Bank of Canada, 2020. [Contingency Planning for a Central Bank Digital Currency](#). According to [Wikipedia](#), "a bank run or bank panic is a phenomenon, often self-fulfilling, in which a large number of a bank's clients fear that it will become insolvent and withdraw their deposits as quickly as possible."

⁷⁸ International Monetary Fund, 2022. [Behind the Scenes of Central Bank Digital Currency: Emerging Trends, Insights, and Policy Lessons](#).

⁷⁹ International Monetary Fund, 2022. [The Future of Money: Gearing up for Central Bank Digital Currency](#).

2.2 Securities

The advent and growth of digital investment and discount brokerage platforms has increased the opportunities for retail investors to access capital markets or obtain digital financial services. While most Québec adults still prefer traditional methods (in person and over the phone) for financial planning, investing or financial advice, a growing percentage of consumers are turning to digital platforms for these services.⁸⁰

2.2.1 Self-directed investing

Executing dealers

In Canada, executing dealers (or discount brokers) offer order execution only (OEO) services.⁸¹ They offer retail investors who wish to make their own investment decisions and trades (often referred to as **self-directed investors**) a wide range of investment products (e.g., equity securities, money market instruments and investment funds) that they can buy or sell at their own discretion from an account (an **OEO account**) and via digital platforms. They are required to meet a series of fundamental obligations governing their conduct.⁸²

Executing brokers typically charge a fee for each transaction performed by users. They also offer investors on their platforms a range of analytic and decision-making tools (such as research reports), in addition to other resources (including automatic rebalancing tools and filters).

Recent developments in self-directed investing

As elsewhere, in Québec the discount brokerage environment has changed considerably over the past few years, and the pandemic resulted in an influx of new self-directed investors into the market. According to one study, at the end of the fourth quarter of 2021, total assets in OEO accounts totalled \$762 billion in Canada, for a 54% compound annual rate growth over two years. The compound annual rate of growth was 39% in Québec for the same period.⁸³

In 2021, there was a significant, even record, increase in self-directed investor activity. After the start of the pandemic, account openings and the number of trades increased at a sustained pace compared to previous years.⁸⁴ According to recent research, more than 235 million trades were executed in 2021 in the discount broker network, totalling annual growth of 55% and representing 14 million additional trades compared with 2020 and 2019 combined.⁸⁵ By the end of the fourth quarter of 2021, the total number of accounts increased 16.9% over one year, for a total of 10.3 million accounts.⁸⁶

Other jurisdictions also saw an influx of new self-directed investors into the financial markets in 2020 and 2021. In the United States there was a significant increase in the number of retail investors opening OEO accounts in 2020 via digital platforms.⁸⁷ In May 2020, the Australian Securities and Investments Commission (ASIC) released the results of an analysis of retail investor trading during the pandemic.⁸⁸ This analysis showed a sharp increase in new retail investors, who were trading much more frequently. Also, many of them used short-term trading strategies, with little success.

80 *Académie de la transformation numérique*, 2022. *NETendances 2021 - Services bancaires en ligne*. According to one survey, 60%, 61% and 66% of respondents prefer traditional methods (in person and over the telephone) for financial planning, investing and financial advice, respectively. Furthermore, 18% of respondents prefer digital platforms for financial planning, 23% for investing and 16% for financial advice. More men than women are choosing digital: for example, 13% of women compared to 23% of men prefer the Internet for financial planning. Similarly, the number of people using digital platforms for financial planning or financial advice is highest among respondents aged 18 to 44.

81 Executing dealers do not complete the suitability determination set out in *Regulation 31-103 respecting Registration Requirements, Exemptions and Ongoing Registrant Obligations* pursuant to conditional exemptions set out in the rules of the Investment Industry Regulatory Organization of Canada. These exemptions are designed to, among other things, preserve the discount brokerage model, which ensures that clients of executing dealers make their own investment decisions.

82 Registered investment dealers, and the registered individuals attached to them, are subject to the provisions of *Regulation 31-103 respecting Registration Requirements, Exemptions and Ongoing Registrant Obligations* and the rules of the Investment Industry Regulatory Organization of Canada, including those relating to the conflict of interest, know your client, know your product and client-dealer relationship disclosure. These obligations are designed to remain in effect throughout the client-dealer relationship, complementing the statutory duty of registrants to act honestly, fairly, loyally and in good faith in their dealings with their clients.

83 *Retail Brokerage and Distribution Report—Canada Regional Perspectives in the Brokerage Channel 2022*, Investor Economics.

84 *La Presse* (2021). *Le boursicotage atteint un niveau sans précédent*.

85 *Retail Brokerage and Distribution Report - Canada, Winter 2022*, Investor Economics.

86 *Retail Brokerage and Distribution Report - Canada, Spring 2022*, Investor Economics.

87 *The rise of newly empowered retail investors*, Deloitte, 2021

88 *Retail investor trading during COVID-19 volatility*, Australian Securities & Investments Commission, May 2020.

Overall, the data shows that there has been increased self-directed investor activity and that an ever-growing percentage of consumers are interested in participating directly in the stock markets via digital platforms. Several reasons have been put forward to explain this recent appetite for self-directed investing, including platform access, more automated and direct account opening processes, fee reductions, and the opportunity to realize gains when the markets picked up in the spring of 2021. Some stakeholders have pointed to the alignment of several factors in 2021: (i) a decline in returns on certain asset classes, such as savings accounts and bonds; (ii) unprecedented fiscal stimulus that led into increases in the prices of several assets, including equities; (iii) a substantial rise in personal savings; and (iv) a market that has not experienced a marked slowdown in more than a decade (with the exception of the brief decline observed at the start of the pandemic).⁸⁹

Executing dealers have expanded their service offerings significantly over the past two years while featuring mobile apps⁹⁰ or developing digital platforms to enhance the investor experience.⁹¹ These strategies appear to have been successful: in the last quarter of 2021, 99% of trades processed by executing dealers were executed via digital platforms.

Some executing dealers are now combining these innovations with the elimination of trading fees.⁹² While they have not eliminated commissions altogether, other executing dealers are now offering discounts and reduced fees on a certain number of trades or on certain types of financial instruments, often ETFs.⁹³ Commissions are being eliminated or reduced to preserve the client relationship, attract new clients or sell additional products and services.⁹⁴

Discount brokers, particularly those not connected with a deposit institution, are leveraging the interest of self-directed investors in digital platforms by offering clients new types of on-line financial products and services, including:

- Mortgages offered on-line without the client having to meet with a representative.⁹⁵
- A debit card linked to the client's account that enables the client to withdraw or borrow funds without requiring payment of a minimum monthly payment or a late payment penalty fee.⁹⁶
- The possibility of trading cryptoassets with an experience is equivalent to the one provided by the discount brokerage platform.⁹⁷
- Automatic portfolio rebalancing services.⁹⁸

89 [Recent Retail-Driven Trading Volatility Poses Limited Threat to the Canadian Brokerage Sector](#), Commentary, DBRS Morningstar, February 25, 2021. [COVID-19, savings and household spending](#), Bank of Canada, March 2021.

90 For example, in January 2022, TD Bank launched the [TD Easy Trade](#) mobile app to make it quick and easy to trade stocks and TD ETFs. The app, offered by TD Direct Investing, requires no minimum balance or monthly fee. It offers 50 commission-free equity trades per year per client. Users can make an unlimited number of commission-free trades on 38 TD ETFs. The app has a strong focus on educational content and videos.

91 For example, in 2021, RBC Direct Investing launched the [Trading Dashboard](#), which allows investors to access a range of tools and fully customize the display and screen layouts for market data, account information, watch lists, real-time quotes and more.

92 For example, in August 2021, National Bank Direct Brokerage announced a new \$0 commission rate on stocks and exchange-traded funds for all transactions made on-line on the Canadian and U.S. markets ([La gratuité chez Banque Nationale Courtage direct](#), *La Presse*, Richard Dufour, August 23, 2021). On September 13, 2021 [Desjardins Online Brokerage eliminated](#) commissions on Canadian and U.S. stocks and ETFs traded on digital platforms.

93 For example, [QTrade Direct Investing](#) charges no transaction fee to clients who buy or sell the 100+ ETFs offered on its platform.

94 [Comment un courtier sans commissions génère-t-il ses revenus?](#) *La Presse*, July 2022.

95 Questrade launched the [QuestMortgage](#) platform in March 2022 to offer mortgage loans.

96 Interactive Brokers has been offering [a debit card linked to the client's account](#) on its platform since 2021.

97 Wealthsimple launched [Wealthsimple Crypto](#), a cryptoasset trading platform, in 2020.

98 National Bank Direct Brokerage offers [an automatic rebalancing service for portfolios consisting of ETFs](#) following market fluctuations, InvestCube.

New technologies and evolving systems now enable executing brokers to offer fractional shares, giving retail investors the ability to place buy and sell orders on fractions of exchange-traded shares. Fractional shares are presenting new opportunities for the discount brokerage industry, including greater access to high-priced stocks for smaller accounts.⁹⁹ This innovation, combined with the no-fee trading option, may attract younger investors, who generally have fewer assets, to self-directed investing.

It will be interesting to see whether the network of executing dealers will be able to capitalize on the influx of new investors by building a new sustainable client base. It will also be interesting to monitor changes in volumes and assets in the network, particularly considering the 2022 stock market decline.¹⁰⁰

Profile of the self-directed investor

According to an AMF survey of Québec self-directed investors conducted in 2021, 53% of respondents had begun to invest, resumed investing, or increased their trading activity during the pandemic. This is particularly true of the 18–34 age group (75% of respondents). Also, according to the survey:

- Fewer fees and investment platform user-friendliness were the top two reasons given for investing in the stock market on a self-directed basis. Acquiring knowledge and skills and having fun were the top two reasons given by investors aged 18–34.
- Only 24% of respondents reported engaging in self-directed investing to make a quick profit; 10% said they did so to beat the markets.
- Almost 90% of respondents said that they executed five trades or less per month. About one-third executed less than one trade per month. About one-third made less than one trade per month.
- Approximately 9 out of 10 self-directed investors focused on Canadian stocks, followed by foreign stocks and ETFs. Some (13%) used credit to invest in the stock market.
- Most respondents (70%) perceived self-directed investing as risky. Respondents who perceived it as low-risk or risk-free tended to be people who were either older or whose investment practices have not been affected by the pandemic. In contrast, 39% of respondents aged 18 to 24 said they considered it a low-risk activity.
- More than half of the self-directed investors aged 18 to 34 who responded held or had held cryptoassets.
- One-third of respondents preferred traditional sources of information (financial data published by listed companies and traditional media). However, nearly one quarter used less conventional sources of information, such as social media and friends and family.

In the United States, the Financial Industry Regulatory Authority (FINRA) conducted a survey to learn more about the motivations, knowledge and practices of the self-directed investors who surged into the markets during 2020.¹⁰¹ The survey results show that most new investors were under 45 and had a low level of investment knowledge and more frequently relied on the advice of friends and family when making investment decisions.

99 This is most prevalent in the United States. For example, the dealer Charles Schwab has been offering the [Schwab Stock Slices](#) service since 2020, allowing investors to own any U.S. company in the S&P 500 for as little as \$5 each, even if the company's share price costs more.

100 The 2022 stock market decline involves a bear market that is occurring following the economic crisis related to the COVID-19 pandemic and during the Russian invasion of Ukraine, the 2021–2022 inflationary surge and the 2021–2022 global supply chain crisis.

101 FINRA, February 2021. [Investing 2020: New Accounts and the People Who Opened Them](#).

2.2.2 Automated portfolio management: robo-advisors

Robo-advisors¹⁰² are an emerging sector in financial services in Canada. There can be certain advantages to using robo-advisors, such as access to a lower-cost asset management service with a low minimum investment amount,¹⁰³ which is attractive to mass market consumers, who typically do not have the financial resources to access the services of a traditional portfolio manager. By automating advice, robo-advisors are able to serve more clients than traditional portfolio managers, thereby improving mass market consumers' access to portfolio management services such as asset allocation and rebalancing.

Services offered by robo-advisors are also considered impartial, data-driven, efficient and free of human bias. According to some, using robo-advisors would prevent investment decisions from being made on the basis of personal feelings or bias and therefore the long-term negative impacts that such decisions can have on an investor's financial health (e.g., selling at a loss when markets go down).¹⁰⁴ However, the algorithms used by robo-advisors may include biases (e.g., if the data used to train it is biased).¹⁰⁵

How robo-advisors work

Consumers are typically asked to complete an on-line questionnaire (the client questionnaire), which collects key information for determining their investor profile, such as their investment needs and goals, financial situation, investment knowledge and risk tolerance. The robo-advisor may also contact the client directly for additional information to complete the client profile. The design quality of the client questionnaire is critical in collecting the information robo-advisors need to meet their Know Your Client obligations.¹⁰⁶

Robo-advisors may adopt various business models. While some may rely primarily on algorithms to monitor and manage client assets, others use hybrid models involving some degree of human interaction with clients. Software is generally used to make a preliminary decision about the client's investor profile and the appropriate model portfolio based on their profile.

In most cases, the robo-advisor proposes a portfolio of investments from a set of prebuilt model portfolios. The investments offered are typically low-cost investment funds, often index funds, or cash and cash equivalents. No leveraged strategy or short selling is used. When necessary, the client's portfolio is rebalanced to maintain the determined asset allocation.

Profile of investors who use robo-advisors

The services of robo-advisors draw investors with a preference for digital financial services, particularly Millennials and Generation Z. For example, more technologically advanced investors and those less inclined to meet in person with a representative may prefer a fully automated, digital account opening process.

102 The term "robo-advisors" is generally used in Canada to refer to portfolio managers who provide automated portfolio management services ("robo-advice") via digital platforms. In Canada, portfolio managers who provide advice via a digital platform are required to be portfolio managers and restricted portfolio managers registered under *Regulation 31-103 respecting Registration Requirements, Exemptions and Ongoing Registrant Obligations*. They are subject to the same regulatory framework as traditional portfolio managers.

103 According to [AdvisoryHQ](#), robo-advisors typically charge an annual management fee of between 0.25% and 0.50% on assets under management, to which additional charges may be added, including fund management fees and other transaction and administrative fees. Traditional portfolio managers, who rarely accept accounts under \$50,000, may charge higher management fees depending on the level of assets under management.

104 [The Promises and Pitfalls of Robo-Advising](#), Francesco D'Acunto, Nagpuranand Prabhal, Alberto G Rossi, April 2019.

105 [To stop algorithmic bias, we first have to define it](#), Emily Bembeneck, Rebecca Nissan and Ziad Obermeyer, October 2021. Human decision makers may introduce the possibility of bias into algorithms if the risks of algorithmic bias on the basis ethnicity, religion, or gender are not clearly identified and mitigated.

106 Under the regulatory framework that applies to them, robo-advisors must ensure that the investor profile generated from the client questionnaire is appropriate and consistent with the client's responses. They need to ensure that they collect enough information to know the client well and recommend investments that match their needs and goals, as well as update the client's personal information on a regular basis to ensure that the client's investments match their profile.

In 2022, 42% of Québec adults are familiar with or have heard of robo-advisors in the context of financial planning, and 22% have used the services of a robo-advisor in the past year. More than half of all adults aged 18 to 44 and university graduates are familiar with robo-advisors in the context of financial planning.¹⁰⁷

Developments and challenges for robo-advisors

Despite the popularity of robo-advisors among certain segments of investors, the percentage of financial assets managed by Canadian robo-advisors remains small. Nevertheless, their market share may continue to grow—with, for example, with the entry of Generation Z into the work force—leading to the increased use of automated portfolio management among mass and mid-market consumers. According to recent research, the share of Canadian household financial wealth managed by robo-advisors was 0.3% at the end of 2021. However, robo-advisors have registered a compound annual rate of growth of 117% over a two year period.¹⁰⁸

In the United States, GlobalData released figures in 2020 showing that services provided by robo-advisors are increasing across all age groups. For example, the percentage of baby boomers using this type of service was 8%, and the proportion of Generation Z was 16%.¹⁰⁹

Robo-advisors rely on data analytics and technology tools to enhance the services they offer and use digital engagement practices to improve interactions with their clients. While most robo-advisors use simple, rule-based algorithms, some now use predictive machine learning algorithms.¹¹⁰ Disclosing information relating to services based on advanced technologies (including any algorithms or machine learning processes) to consumers in simple, non-technical language remains a challenge for robo-advisors. Such information should, among other things, enable investors to understand the nature of the services offered and the associated risks.

2.3 Insurance

Like other financial sectors, the insurance industry has traditionally operated on a model characterized by generic products and services offered via conventional channels. Because of technological changes, this model has evolved considerably over the past few years. Many products are now being offered through the Internet, and a growing number of innovations are enabling growth in a new creativity that is transforming distribution and administration in the insurance industry.

Also, historically, insurance policies have covered property that is for the exclusive use of the insured. However, with the advent of the sharing economy, in which property can have a shared utility, certain fundamental principles in the insurance industry may be altered to reflect this new reality.

2.3.1 Use of connected objects in insurance

Connected objects are presenting a great opportunity for insurers, in transportation, housing and health. These objects are collecting a large volume of data on the behaviours and habits of their clients. The data can subsequently be analyzed with powerful tools, including AI and machine learning systems. Moreover, connected objects can also help insurers reduce their costs through risk prevention or more rapid intervention.

However, these practices may be perceived as raising privacy protection issues. To benefit from connected objects, insurers will need to propose solutions to address confidentiality issues or adequately compensate consumers who agree to share their data.¹¹¹

¹⁰⁷ Académie de la transformation numérique, 2022. [NETendances 2021 – Services bancaires en ligne](#).

¹⁰⁸ Retail Brokerage and Distribution Report—Canada Regional Perspectives in the Brokerage Channel 2022, Investor Economics.

¹⁰⁹ [Robo-advice to take center stage during COVID-19 crisis](#), GlobalData, 2020.

¹¹⁰ [The use of artificial intelligence and machine learning by market intermediaries and asset managers](#), Final Report, September 2021.

¹¹¹ Deloitte, 2016. [Opting in: Using IoT connectivity to drive differentiation – The Internet of Things in insurance](#).

Transportation and mobility

When setting auto insurance premiums, insurers have historically relied on information such as a driver's age, sex and financial responsibility. Now, insurers can also rely on data about a driver's behaviour and a vehicle's use, such as driving speed and frequency with which it is driven at night. In addition, more and more cars are being equipped with sensors that monitor the condition of the vehicle, such as oil temperature, brake wear and tire pressure. This data can be used, for example, to recommend a mechanical check-up before an incident occurs.¹¹²

Some cars today are not only connected but also automated. According to Transport Canada, an automated vehicle uses a combination of sensors, controllers and on-board computers, along with sophisticated software. It also allows the vehicle to control at least some driving functions instead of a human driver (e.g. steering, braking, acceleration and checking out and monitoring the driving environment).¹¹³

The development and adoption of connected and automated vehicles could significantly impact insurers and the overall operation of the automobile insurance plan. All or part of the liability for accidents in an automated and connected vehicle could shift from the driver to the vehicle manufacturer or software vendor, requiring modifications to automobile insurance policies.¹¹⁴

Housing

Because they help keep homes secure when their occupants are away, connected objects, such as smart security systems and connected smoke and water leak detectors, can lower home insurance premiums of those who have them. Smart home sensors, for example, could detect moisture in a wall from a leaking pipe and alert a homeowner to the issue before the pipe bursts. This could spare the insurer from a large claim and the homeowner from considerable inconvenience and the loss of irreplaceable valuables.¹¹⁵

Health care

Some insurers are also contemplating the use of "wearables" such as connected watches to collect and analyze insureds' behaviour and health data. This data not only affects the premiums insureds pay but also enables insurers to use nudging techniques (e.g., by comparing physical exercise done by an insured with the physical exercise done by the insured's peers) to incentivize insureds to adopt behaviours that the insurer considers to be healthier or safer. Insureds are expected to wear the connected object regularly in accordance with the conditions imposed by the insurer.

2.3.2 Insurance products provided via digital spaces

Offering insurance products via digital spaces enables consumers to purchase them without the involvement of representatives. Digital spaces can offer numerous benefits to consumers, such as time savings and 24/7 access to products.

Even though insurance products are increasingly accessible for purchase via the Internet, the data obtained through the firms' annual disclosures tends to show that adult Quebecers continue to prefer traditional channels such as the telephone or in-person meetings.

112 McKinsey & Company, 2019. [Digital ecosystems for insurers: Opportunities through the Internet of Things.](#)

113 Transport Canada, [Connected and automated vehicles.](#)

114 *Autorité des marchés financiers*, 2021. [Issues Paper – Preparing Québec for the arrival of connected and automated vehicles.](#)

115 Deloitte, 2016. [Opting in: Using IoT connectivity to drive differentiation – The Internet of Things in insurance.](#)

According to data for 2021, total premiums sold in Québec via a digital space were approximately \$96 million, compared with \$71 million in 2020. While 35% growth in the market may be significant, this market remains very small compared with the overall Québec insurance market, which reported \$13.9 billion in written premiums in 2021 (excluding group insurance premiums). In other words, less than 0.7% of the premiums written in 2021 were sold through a digital space. The most popular products are respectively automobile, home and travel insurance.

The number of digital spaces offering insurance products is growing steadily (+17% in 2020 and +13% in 2021), which could boost growth in the market. However, a 2021 survey conducted by the *Académie de la transformation numérique* could provide insight into why the Internet is off to a “slow start” in Québec:

- 78% of respondents said that new technologies have had little (28%) or no (50%) effect on their insurance consumption patterns;
- Nearly one in two respondents have personal data security concerns when it comes using a digital space for acquiring insurance products;
- Only 10% of respondents prefer to be a self-directed (digital space) when acquiring or modifying a life insurance contract and only 12% when acquiring or modifying a damage insurance product (home or automobile);
- Only 3% of respondents who purchased or modified an insurance policy in the past two years did so on-line on a self-directed basis.

For the time being, consumers appear to prefer human contact when it comes to insurance products.

A framework specifically applicable to the distribution of financial products and services via the Internet was introduced in Québec in June 2019.¹¹⁶ Under the law, one must be registered as a firm (or an independent partnership) to offer products and services on-line, and clients must have access to a representative and obtain the same level of advice as if they were dealing directly with a representative. The Regulation respecting Alternative Distribution Methods (RADM) sets out the information that the firm must provide to consumers on its digital space and the rules governing the operation of the space.

The AMF is continuing its work to provide an appropriate framework for this distribution method and intends to publish a report shortly that will give an overview of the situation.

Of course, the changes brought on by technological innovations in the insurance world are not limited to on-line product offerings. In 2018, in an issues paper on digitalization in insurance and its potential impact on consumers, the IAIS listed the following as three of the most widespread and significant changes to the nature of insurance products that have resulted from digitalization: the sharing economy, usage-based insurance and on-demand insurance.¹¹⁷ Moreover, a section of the paper was dedicated to price comparison websites.

An overview of the current situation in these four areas seems relevant in assessing the impact of technological innovations in insurance on consumers of insurance products.

¹¹⁶ Date of coming into force of the provisions specific to this distribution method in the *Act respecting the distribution of financial products and services* and the *Insurers Act* and the RADM.

¹¹⁷ IAIS, 2018. [Issues Paper on Increasing Digitalisation in Insurance and its Potential Impact on Consumer Outcomes](#).

Sharing economy

The advent of the sharing economy has caused a paradigm shift for insurers. Traditionally, insurance products have been based on exclusive ownership of property, whereas the sharing economy is based on shared use. In addition, traditional insurance products are generally intended to cover the personal or commercial use of property; they are not designed to cover part-time commercial use, whether the property generates income or not.

In 2018, the IAIS pointed out that participants in the sharing economy who were trying to obtain insurance coverage through traditional means were routinely being confronted with the impossibility of purchasing coverage that fully met their particular needs.

Today, the issues faced by participants in the sharing economy have disappeared. Most insurers have adapted their product line to meet these new needs; several insurers have even “partnered” with sharing economy platforms.

In addition, most sharing economy platforms grant additional coverages to their members to insure the risks of third-party liability and damage sustained when sharing property. These coverages, which are usually included, facilitate and promote participant adhesion (coverages usually offered only to individuals and not to businesses). However, consumers must remain vigilant, as these coverages have several exclusions or exceptions associated with them and cannot replace their personal insurance coverage.

“Peer-to-peer” sharing economy

In theory, peer-to-peer insurance, or risk pooling by participants, seems a natural “market” for the sharing economy. The technologies needed to implement risk pooling platforms are accessible and plentiful. This model also offers, a priori, advantages, such as a streamlined system with real potential to reduce costs.

“Peer-to-peer” insurance is divided into two broad categories:

- “Pooling” platforms. Consumers participate in them for the purpose of pooling the risk of their choice, such as insuring their bike against theft or their cellular phone against loss, without the intervention of an insurer.
- Deductible “pooling” or “co-insurance” platforms. Under an insurance policy taken out with an insurer, the consumer pays an amount of money (a premium or contribution) so that the “pool” compensates them when their claim does not exceed the amount of the deductible indicated in their policy.

“Pooling” platforms expose consumers to higher risk, as they do not benefit from the involvement of an insurer or regulatory supervision.

In its early stages, the idea of “peer-to-peer” insurance seemed highly promising. In practice, however, this model faces significant regulatory and financial challenges and is raising consumer protection concerns. In fact, the AMF issued a warning in this respect in 2016.¹¹⁸

Uncertainty about whether there will be sufficient funds to cover a claim appears to be the main issue with this model. Potential consumer issues also include governance (for, among other things, the administration of funds and the processing of claims), transparency and method of distribution.

In 2019, in Québec, the passage of Bill 141 made a peer-to-peer model called an “reciprocal union” legal in order to meet needs not otherwise served by the “regular” market.¹¹⁹ This “special” arrangement, which is not allowed in life and health insurance, was made possible to meet certain specific insurance needs of sophisticated clients (e.g., airports) It does not permit the formation of such unions for consumers who, moreover, have access to an ample, competitive supply of products from insurers. The peer-to-peer model has therefore not materialized in Québec.

¹¹⁸ *Autorité des marchés financiers* (2016). [AMF urges caution about peer-to-peer risk sharing platforms.](#)

¹¹⁹ Bill 141, *An Act mainly to improve the regulation of the financial sector, the protection of deposits of money and the operation.*

Usage-based insurance

A number of usage-based insurance (UBI) initiatives have emerged in recent years. The main initiatives have been in automobile insurance.¹²⁰ Typically based on a telematics program downloaded to the user's smart phone, this innovation allows for better alignment between property use and the insurance premium.

The assessment of the risk associated with use of the property relies on quality criteria (driving habits) in addition to quantity criteria (kilometres driven or usage time). Therefore, in addition to recording "quantity", the telematics program assesses the environment in which the vehicle is being used (urban versus rural roads, out of province or out of country, trips, time of day, etc.) and the consumer's driving habits (compliance with speed limits, hard-braking or hard-starting, etc.). This data is compiled to better assess risk and determine the insurance premium payable (by applying a credit or a surcharge, for example).

Some consumers would see significant savings, especially low-mileage drivers or young drivers whose insurance premiums are generally higher, as this age group is statistically more likely to be involved in collisions.

"Intensive" data collection would be the biggest obstacle for consumers. Many consumers are reticent in the face of what they perceive as an invasion of privacy. As far back as 2015, the AMF published a notice setting out its expectations of usage-based insurance programs in which it stressed the importance of effectively managing the risks related with data collected via telematics programs.¹²¹

Despite the reticence regarding data collection, these innovations are now firmly established and are still being refined to enable better pricing.

On-demand insurance or "microinsurance"

Insurers and insurtechs are endeavouring to develop new markets and meet ad hoc insurance needs with products with customizable coverage. This model has been made possible by technological innovations and the digitalization of financial services. The insured fully controls the duration of coverage through a mobile app using activation and deactivation options. The premium is thus paid as needed.

On-demand insurance typically covers portable property like laptops, smart phones, drones, watches, bicycles and cameras. For example, an insured could confine their insurance coverage to the times when they fly their drone. This model competes directly with optional insurance and extended warranties offered by stores.

This innovation also provides opportunities for travel insurance products. Consumers no longer have to negotiate an insurance policy piecemeal (for each trip) and can simply activate their coverage at the time of departure and deactivate it upon return. Despite the opportunities offered by this model, its profitability remains to be proven and, for now, it is not very widespread in Québec.

In addition, on-demand insurance involves risks for both the consumer and the insurer. These risks were identified by the IAIS in 2018 and still exist today. For example, the consumer must be constantly engaged in order to activate and deactivate their coverage. Its very qualities are also its weakness: forgetting to activate or deactivate the coverage results in a gap in coverage or, conversely, in an "over-insurance" situation. For the insurer, it may be difficult to confirm that coverage was in activated mode at the time of an occurrence. As a result, and in many regards, the model is far more suited for the connected object market. The object's incident logging function makes it easier to determine whether coverage was in fact in activated mode when breakage for which a claim is filed occurred.

¹²⁰ For example, Ajusto by Desjardins and *my Drive* by Intact Insurance.

¹²¹ [Notice regarding the offering of usage-based automobile insurance products.](#)

Comparators

Comparison websites are another service brought about by innovation. They made their debut about 20 years ago and offer consumers significant potential savings in time and money. Completing and submitting an insurance quote request takes time. By using a comparator, a consumer can obtain multiple quotes on a single request. Quotes from insurers are usually sent to the applicant within 24 to 48 hours.

Comparators who receive sales-based remuneration must register with the AMF as firms. The same applies to comparators whose service goes beyond comparison shopping to include participating in the offer process by, for example, giving advice. That being said, comparators appear to be solidly established in the habits of, and appreciated by, consumers. A number of financial articles have recommended using them, with the proviso that certain precautions be taken. These issues were brought to light in 2018 as a result of research carried out by *Option Consommateurs* that revealed deficiencies in the quality of disclosure provided, the absence of advice before the complexity of insurance products, conflict of interest risks stemming from business relationships between stakeholders, and issues arising from the disclosure of personal information.¹²² These same issues were also raised in 2018 by IAIS, which observed that there are *"issues around transparency in respect to the identity and independence of the owner/operator of the comparison website"* and that *"another major risk is that consumers focus only on the price to select a product and, as a result, are not adequately protected."* Users of comparison websites must therefore remain vigilant and ask the right questions when the time comes.

Apps to streamline the claims process

For some years now in other parts of the world, and more recently in Québec, apps have been developed to streamline the claims process in the event of a loss. Some apps allow consumers to handle their own claims in real time. For example, following an automobile accident (not involving an injury), the insured can open a claim file on their smart phone and submit photos of the loss and a description of the incident. Data analytics make it possible, in some cases, to even go through the entire claims process without any human involvement.

2.4 Cryptoasset ecosystem and metaverse

Unlike most financial products, cryptoassets were available to and adopted by consumers before institutional actors took notice of them. Overall, the cryptoasset markets are still largely unregulated, leaving consumers, in many cases, without the benefit of standardized information and without recourse in the event of an incident.

Because of the risks to consumers and, potentially, to financial stability, there is growing interest among international bodies, governments, and regulators in implementing a regulatory framework for the cryptoasset markets. At the international level, the Financial Stability Board published for consultation recommendations regarding the regulation of stablecoins, proportionate to their systemic importance, and cryptosset activities and markets.¹²³ More recently, IOSCO released its Crypto-Asset Roadmap for 2022–2023.¹²⁴ In Europe, the European Commission proposed a provisional EU regulation on cryptoasset markets in September 2020, to provide a regulatory framework for cryptoasset activities that are not already covered by existing financial services legislation.¹²⁵ In the United States, President Biden signed an executive order in March 2022 calling for a broad review of digital assets.¹²⁶

¹²² *Option Consommateurs* (2018). [Insurance price comparison websites: Are they an effective tool?](#)

¹²³ [FSB proposes framework for the international regulation of crypto-asset activities](#) (Financial Stability Board, October 2022).

¹²⁴ [IOSCO Crypto-Asset Roadmap for 2022-2023](#) (iosco.org).

¹²⁵ [Proposal for a Regulation of the European Parliament and of the Council on Markets in Crypto-assets, and amending Directive \(EU\) 2019/1937](#).

¹²⁶ The White House, 2022. [Executive Order on Ensuring Responsible Development of Digital Assets](#).

2.4.1 Intermediaries in cryptoasset markets

According to the original bitcoin concept, cryptoassets are acquired directly peer-to-peer, without going through an intermediary. In this context, a user cannot get help from a central operator to recover a lost password (the “private key”) or reverse a transaction made by error.

Cryptoasset trading platforms have therefore expanded to offer services to consumers who do not have the technical competences required to trade in cryptoassets on their own or want to use a more user-friendly app. This service is sometimes supplemented by other services enabling consumers to grow their cryptoassets. In some circumstances, cryptoasset trading platforms are subject to regulation by the AMF.¹²⁷

Also, some companies have issued “stablecoins,” which seek to maintain value in reference to a fiat currency, by relying on a reserve of assets. In addition to managing the assets held in the reserve, the company ensures the creation and destruction of its cryptoassets. In October 2022, the two largest stablecoins, Tether (USDT) and Circle (USDC), had capitalizations in excess of US\$100 billion.¹²⁸

Finally, more than 40 exchange-traded funds with exposure (directly or synthetically) to cryptoassets are now available to Canadian investors, most of which have exposure to bitcoin or ether.¹²⁹

2.4.2 Decentralized finance (DeFi)

The decentralization¹³⁰ of financial services is a fundamental principle for many crypto followers. The cryptoasset ecosystem is seeing the development of services that do not require the involvement of an intermediary,¹³¹ be it traditional or linked to the cryptoasset markets, such as decentralized trading, cryptoasset lending, investment fund or insurance product platforms. Other apps issue “stablecoins,” whose value is stabilized by an automated algorithm. While these services may be accessed by interacting directly with the blockchain, participants typically use mobile apps or on-line portals.

DeFi services rely on smart contracts that can be stored and executed on a public blockchain, without a central administrator. As a result, access to DeFi is open to anyone with an Internet connection and a cryptoasset digital wallet.

Although DeFi services are similar to traditional financial services, this ecosystem remains largely unregulated. The absence of intermediaries, whose role is central to consumer protection and market integrity, increases the risks to which participants in this ecosystem are exposed.

127 In the circumstances described in the [CSA Staff Notice 21-327 Guidance on the Application of Securities Legislation to Entities Facilitating the Trading of Crypto Assets](#), an investment contract (a security) or derivative instrument is created between a cryptoasset trading platform and its client. The platform therefore becomes subject to the registration and/or market requirements of securities legislation. The AMF publishes [a list of registered cryptoasset trading platforms](#) on its website.

128 [Cryptocurrency Prices, Charts and Market Capitalizations | CoinMarketCap](#), October 2, 2022.

129 [TSX ETF Investor Centre](#) (2022).

130 The full decentralization of an app means that, ultimately, no one owns or is responsible or accountable for the operations of the app. Decentralization must be seen as a spectrum and not a binary concept: many apps claim to be decentralized, whereas the developers maintain privileged access to the code.

131 In many decentralized apps, custody of the cryptoassets is handled by the users. However, in other apps, the smart contract “blocks” the cryptoassets of the user, who is then exposed to the risk of smart contract default or of the smart contract being fraudulent.

2.4.3 Digital financial services in the metaverse

In the near future, cryptoassets and DeFi services could be, respectively, the currency and financial infrastructure of the metaverse.¹³² Non-fungible cryptoassets are already being used to prove ownership of digital assets in the metaverse (e.g. “virtual land” or branded clothing for an avatar, digital artwork, or a ticket to a virtual concert). “Stablecoins” act as a value reserve and a “bridge” to the real economy.

The metaverse offers many opportunities for financial intermediaries. These institutions can create digital branches in the metaverse in order to build their brand with users, demonstrate their capacity for innovation and propose hybrid interactions with their clients. Financial institutions could also offer digital identity, payment, and digital asset custody services.

Financial services in the metaverse

In February 2022, JP Morgan acquired a large piece of land in Decentraland, in which it built the Onyx Lounge, where users are greeted by the avatar of its CEO.¹³³ Also in 2022, HSBC Bank opened a branch in The Sandbox and announced the launch of a metaverse-focused investment fund for its high-net-worth clients.¹³⁴ The fintech, Sokin, launched in 2021, offers full payment services, enabling brands and businesses to switch from their brick and mortar stores to the virtual world.¹³⁵

Metaverse platforms incorporate digital scarcity, making virtual real estate a potentially lucrative investment. Between November 2021 and January 2022, 8,000 parcels of virtual land were sold in The Sandbox.¹³⁶ Owners can use the virtual land for construction of a storefront or for rental. The virtual land’s location and the identities of the owners of neighbouring parcels may have an impact on its value.¹³⁷ Mortgage services are also being developed to facilitate this type of transaction.¹³⁸

Acquiring virtual land in the metaverse is not risk-free. Beyond the risk of price volatility, how regulations will apply to transactions in the metaverse is still uncertain. Also, as the metaverse has no physical constraints, the platform operator could decide to create additional parcels of virtual land, resulting in the depreciation in value of existing parcels.¹³⁹ Mass consumer adoption of a public decentralized metaverse could further increase existing consumer protection and systemic risks associated with cryptoassets.¹⁴⁰

Lastly, as the metaverse has no geopolitical boundaries, determining what law will apply may be a complex undertaking. The terms of service of the platform, the smart contracts involved in transactions, and the location of the individuals performing the transactions are factors that may affect that determination.¹⁴¹

132 Metaverses are also being developed in a centralized and closed format, as opposed to open development on the Internet. As of yet, it is not possible today to predict which vision will prevail.

133 [There's a Portrait of Jamie Dimon Hanging in JPMorgan's Metaverse Lounge - Bloomberg](#).

134 [HSBC to Make Metaverse Debut With The Sandbox Virtual Gaming Partnership - Bloomberg](#).

135 [Sokin to set up the first singular metaverse world for ecommerce](#).

136 [CFTE, 2022. Real Estate in the Metaverse: Analysis of Land Prices in The Sandbox](#).

137 [CFTE, 2022. Real Estate in the Metaverse: Analysis of Land Prices in The Sandbox](#). Perhaps the most famous landowner in The Sandbox is Snoop Dogg, who bought a virtual parcel of land to create the Snoopverse. A parcel next to the virtual Snoop Mansion reportedly sold for \$450,000.

138 For example, [the firm TerraZero](#) specializes in financing projects in the metaverse.

139 BLG, 2022. [Metaverse real estate: Legal considerations in Canada](#).

140 [Cryptoassets, the metaverse and systemic risk - Bank Underground](#).

141 BLG, 2022. [Key legal issues in the metaverse: A primer for Canadian businesses](#).



3. ISSUES RELATED TO DIGITAL FINANCIAL SERVICES



The facts presented in the previous section show that there is a growing shift toward the self-directed consumption of financial products and services via digital channels and away from the traditional model, where the consumer is assisted by an intermediary (advisor, dealer or banker) when making a purchase. Consumers are turning in increasing numbers to easy-to-access, 24/7 digital financial services to manage their personal finances.

However, consumers who use digital platforms on a self-directed basis may not receive all the support needed to adopt and maintain sound financial habits (e.g., not panic-selling after a major stock market decline and not investing based on talk in the media about a rising market). Loss aversion or familiarity bias are other factors that can cause consumers to make poor financial decisions, such as opting for a familiar investment despite the existence of alternatives that are more appropriate for their circumstances.

Furthermore, the digital financial services accessible to consumers are not always regulated, particularly when offered from foreign jurisdictions where law provides consumers with few legal protections. When using digital technology, which is not bound by physical distances or geopolitical borders, a consumer may purchase digital financial services without realizing that they are being offered through an intermediary based outside the country. If there is an incident, the consumer may not have access to the remedies or potential avenues for compensation that are available when the activity is duly regulated.

Even in a regulated environment, detecting fraudulent on-line activity is a major challenge for regulators owing to the volume of information to be scanned, the costs to access certain paid public sources, and the legal issues involved in collecting and storing large amounts of data. In addition, fraudsters can easily change the domain names and websites associated with their schemes after a regulator issues alerts or warnings. Instituting measures against individuals engaged in illegal on-line activities is often difficult in a cross-border environment where there are no physical addresses. It becomes even more difficult in the case of cryptoasset trading, where the identities of participants are masked.

In addition, self-directed consumers are exposed to various risks, which are addressed in this section. There is a greater potential for harm when consumers face multiple risks simultaneously.

3.1 Fraud

The environment created by the COVID-19 pandemic and the increasing use in various on-line services is creating an environment conducive to fraud. With digital, fraudsters can target potential victims all over the world, at little cost and effort, even in a cross-border context. Fraudsters use an array of sophisticated and effective tactics, inspired by known frauds but adapted to the digital environment, to build trust and exploit consumers' vulnerabilities.

Fraudsters can hide their identities, or can quickly or easily change them if their scheme is reported. They are also making increasing use of the contact information of legitimate businesses (i.e., names, logos, addresses, registration numbers and e-mail addresses) to gain consumers' trust.

Because they have been spending more time on-line since the start of the pandemic, consumers have been more exposed to this type of fraud. According to an FCAC survey, 35% of Canadians were targeted in 2021 by financial information hacking attempts, up 13% since 2019.¹⁴²

The AMF has also observed a significant increase in the number of reports received from Québec consumers since 2020. In 2021–2022, the teams of investigators had to process 1,206 inputs, compared with 768 inputs in 2019–2020. The AMF also added 125 cryptoasset companies or platforms to its list of websites and companies carrying on high-risk or possibly illegal activities.¹⁴³

¹⁴² FCAC, 2022. [Summary of findings COVID-19 surveys: Financial impact of the pandemic on Canadians.](#)

¹⁴³ Autorité des marchés financiers, 2022. [Enforcement report FY 2021–2022.](#)

3.1.1 Types of on-line fraud

The most common forms of on-line fraud include **phishing**, whereby scammers get consumers to provide personal information or passwords using e-mails, text messages, or social media. In addition, social media and search engines abound with investment recommendations and offers that lead to Ponzi schemes. The following types of fraud are also found there:

- **Advance-fee scams:**¹⁴⁴ Fraudsters use social media to approach their potential victims and, after exchanging a number of messages in order to build trust, ask them to send funds electronically to help someone in need, contribute to a worthy cause, or get a prize, inheritance, investment or transfer of money.¹⁴⁵
- **Fraudulent bank loan or credit card offers:** Fraudsters collect consumers' personal information through these fake offers.
- **Catfishing:** Consumers are induced to authorize a transfer of money to an account, they believe, belongs to a legitimate payee but that is actually controlled by a fraudster.
- **Pump-and-dump promotions:** A fraudster attempts to increase the price of a security through fake recommendations posted, for example, on social media. The fraudster already owns a position in the security, which they then sell after the fraudster's recommendations cause consumers to buy the same security and thereby artificially push up its price, to the fraudster's benefit.

- **Malware:** Victims click on an e-mail link or attachment, causing malware to execute on their computer or smart phone. The software may, for example, steal personal information or other sensitive data stored on the victim's device or perform unauthorized tasks. Malware includes ransomware, which blocks or restricts access to a computer or file, which is then held for ransom until money or cryptoassets are paid to unlock it. Fraudsters use these techniques in a variety of circumstances while, for example, passing themselves off as government agents (to facilitate the receipt of financial assistance during the pandemic, for instance) or as technical assistance agents.

It is estimated that 95% of cybersecurity issues can be traced to human error, which underscores a lack of digital knowledge among consumers, including cybersecurity knowledge.¹⁴⁶

3.1.2 Fraud in the cryptoasset ecosystem and the metaverse

Few consumers today possess the knowledge required to understand how the technologies underlying cryptoasset markets work. In an environment with no intermediary or advice, this is exploited by fraudsters, who can easily manipulate consumers into taking part in fraudulent schemes. These include **rug pulls**,¹⁴⁷ Ponzi schemes and other types of misconduct, such as the theft of private keys.

¹⁴⁴ OECD, 2021. [G20/OECD Report on Lessons Learnt and Effective Approaches to Protect Consumers and Support Financial Inclusion in the Context of COVID-19](#). According to this report, authorities from high-income jurisdictions were more likely to report that the prevalence of digital security risks (including theft and fraud) had increased during the pandemic. Particular concern was expressed about scams linked to social media or investment platforms, as well as frauds targeting recipients of emergency government benefits.

¹⁴⁵ For example: Le Soleil, 2022. [La crypto-romance : quand les fraudeurs s'invitent sur Tinder](#).

¹⁴⁶ World Economic Forum, 2020. [After reading, writing and arithmetic, the 4th "r" of literacy is cyber-risk](#).

¹⁴⁷ Rug pulls are schemes in which developers or influencers entice consumers to invest in a project and then escape with the invested cryptoassets.

The AMF has been witness to consumers' growing appetite for cryptoassets and DeFi, as well as to increasing fraud in this sector. The AMF Information Centre received three times as many calls relating to cryptoassets in 2021 as in 2020. Also, the AMF's enforcement teams processed 15 times as many cryptoasset-related inputs in 2021 as in the previous year. In response to this sharp growth, the AMF implemented an intervention and awareness approach to combat illegal activities in the cryptoasset ecosystem while taking actions such as obtaining website closure orders. The AMF also took a number of matters to court—in some cases, seeking freeze orders and bans upstream.¹⁴⁸

In addition, the AMF has launched video-based awareness campaigns on TikTok and YouTube about the volatility of cryptoasset markets and the associated fraud risks. Through these digital awareness campaigns, in combination with a radio campaign, the general public is being informed about cryptoasset-related messages disseminated on the AMF website, published warnings, and a cryptoassets component that is being included in seminars for young people and stakeholders.

The metaverse is also fertile ground for fraud. Among other things, fraudsters are taking advantage of the ability to operate anywhere in the world and the media hype surrounding this innovation. In addition, the metaverse is prone to security flaws that can make it vulnerable to hacking, financial fraud or theft of funds. Metaverse scams are similar to real-world scams but target non-fungible tokens such as those evidencing the ownership of virtual land.

Regulators are noting the potential for fraud in the metaverse. For instance, the North American Securities Administrators Association (NASAA) has issued a warning to investors regarding fraud in the metaverse. NASAA notes that, in May 2022, five U.S. state securities regulators filed enforcement actions against an organization for promoting fraudulent investments in the metaverse.¹⁴⁹

3.2 Information on digital financial services: Information that is complex, hard to access and often incomplete and information overload

Disclosure requirements relating to the features of, and risks and conflicts of interest associated with, financial products and services are a fundamental part of the consumer protection regime. Such disclosures are effective when consumers are attentive to the information provided and are able to interpret and incorporate it into their decision making. When this happens, information asymmetry between consumers and financial intermediaries is reduced.

In the context of digital financial services, consumers are typically alone in front of their screens when making decisions about their personal finances. Having quality information on digital financial services is therefore essential. For example, self-directed investors have full control over their investment decisions, manage their own financial risks, and remain responsible for any losses incurred as a result of a poor decision or a trading error.¹⁵⁰ A gap between what a consumer understands about a product and what is actually being offered, whether the gap is intentional (i.e. mis-selling) or not, can lead to an unpleasant outcome, such as over-indebtedness or financial losses.

¹⁴⁹ NASAA, 2022. [Informed Investor Advisory: The Metaverse](#). Fraudsters offered non-fungible tokens (NFTs) to investors that supposedly conveyed ownership interest in a metaverse casino and the rights to share profits in the casino. The regulators further alleged that the fraudsters had lied and did not have any partnership with a casino that allowed them to convey such an ownership interest.

¹⁵⁰ IIROC, February 2021. Investor Bulletin, [Is a DIY \(Do-It-Yourself\) account right for me?](#) Nevertheless, IIROC can take action when an investor suffers losses due to systemic quality or broker availability issues.

¹⁴⁸ Autorité des marchés financiers, 2022. [Enforcement report FY 2021–2022](#).

3.2.1 Information that is complex, incomplete and hard to access

Even for traditional financial products and services, the disclosures required under consumer protection regulatory frameworks are often long and hard to understand. Traditional financial intermediaries, who assist consumers in their purchase actions, facilitate client comprehension by putting everything into plain language.

In the context of digital financial services, some of which are particularly complex, consumers must assess the risks themselves by reviewing the information available. Some may not fully grasp the implications of certain features, such as the use of leveraging, despite the disclosures or caveats.

Consumers should also be informed about the existence of AI algorithms underlying certain digital financial services and about the effect of those algorithms on the product's risks and the way the product works. As with cryptoassets, a basic knowledge of the underlying technologies is important to fully understand the features of the product or service being offered.

These technical prerequisites increase information asymmetry between the intermediary and the consumer. In the cryptoasset or DeFi markets, little or no information is disclosed to consumers, since the blockchain data and smart contract code are publicly available. However, understanding this information requires a level of technical knowledge that the vast majority of consumers do not possess.

Although the use of interactive tools, infographics and even video content may improve consumers' comprehension, the digital context may decrease disclosure effectiveness. It is very hard to read PDF documents on a smart phone screen. Also, efforts made to shorten, simplify or compile the information in such a way as to fit a smart phone's small screen may end up making the information difficult to understand or ambiguous. Some digital financial service providers are choosing to supplement the information by providing a link to all the relevant details on a website separate from the mobile app. However, requiring the consumer to leave the app introduces friction, leading some consumers to not review the additional information.

Moreover, some mobile apps have complex menus and interfaces that make them less user-friendly. Consumers do not always have the possibility of printing or downloading relevant information for a particular digital financial service in order to further their understanding of the service at a later time.

Lastly, consumers are not generally inclined to read the terms of use of the various mobile apps.¹⁵¹ The same applies to information disclosed in the purchase process for a digital financial service.

3.2.2 Information overload and unreliable information: social media and influencers

The number of reliable information sources accessible to consumers is continually increasing, leading to a situation where there is too much information for consumers to process. Instead of improving consumers' comprehension, this situation, called information overload or "infobesity," can lead to decision-making paralysis.

¹⁵¹ Computers in Human Behavior, 2016. "[I agree to the terms and conditions": \(How\) do users read privacy policies online? An eye-tracking experiment](#)". According to this study, when a privacy policy is presented by default, users tend to read it quite carefully. However, when a privacy policy is not presented by default, most users will not click on a link to read the policy or, if they do, they will spend much less time and effort reading it.

Moreover, social media is affecting virtually every aspect of society. It is a communication channel that enables providers to use a blend of personalized, flexible and quick marketing approaches to reach and increase their interactions with a broad audience of consumers. Consumers—especially younger consumers, self-directed investors and people investing in cryptoassets—are increasingly adopting social media as their source of information about financial products and services. As a result, these consumers are relying more and more on the opinions of friends and other influencers, instead of the advice and recommendations of traditional financial intermediaries, when making financial decisions.¹⁵²

Investment recommendations or the information communicated about a digital financial service can sometimes be prone to conflicts of interest, misinformation, disinformation or malinformation (**MDM**).¹⁵³ For instance, social media investors may be exposed to the financial advice and recommendations of influencers. Influencers are individuals who are generally not financial professionals registered with a regulator and who hold themselves out as seasoned investors by posting messages or videos on their social media accounts in order to generate as many views (or clicks) as possible.¹⁵⁴

Furthermore, sponsors of initial coin offerings (ICOs), whether the ICO is legitimate or conducted without the requisite authorizations, promote their ICOs through various digital channels, including websites, messaging apps and other social media.¹⁵⁵

Social media can affect how investors behave—for example, by encouraging them to execute more trades or take on more risk. Social media platforms are spaces where individuals, especially young people, compare themselves against each other.¹⁵⁶ Social media are also channels that facilitate spread of rumours, which sometimes trigger mass movements of investors acting on the “fear of missing out” (FOMO)¹⁵⁷.

Meme stocks

In January 2021, the U.S. stock markets experienced a high volume of trading in a small number of “meme stocks,” including GameStop. The high volatility of these stocks was fuelled by social media hype, as opposed to changes in the company’s fundamental value. This phenomenon, coupled with FOMO, is raising a number of concerns because it could unduly lead investors to acquire a security in the hope of obtaining stellar returns without understanding the significant volatility and market manipulation risks involved.

While on-line discussions may be beneficial, consumers need to be vigilant against self-proclaimed investment professionals and other “gurus” who take advantage of the anonymity of social media to spread incorrect, outdated or altogether misleading information. Such vigilance is essential, as exhaustive detection of erroneous or misleading on-line information is a major challenge for regulators owing to the dizzying volume of publications on social media. Furthermore, many publications are not accessible to regulators because they are restricted to closed groups or are directly sent, unsolicited, to users’ mailboxes.

152 For example, [in February 2021, ESMA issued a notice](#) urging retail investors to be cautious when making investment decisions based exclusively on information from social media unless they can verify its reliability and quality.

153 [Canadian Centre for Cyber Security, 2022. How to identify misinformation, disinformation, and malinformation.](#) Misinformation refers to false information that is not intended to cause harm. Disinformation refers to false information that is intended to manipulate, cause damage or guide people, organizations, and countries in the wrong direction. Malinformation refers to information that stems from the truth but is often exaggerated in a way that misleads and causes potential harm.

154 According to [Hootsuite](#), 19.6% of Canadian Internet users between the ages of 16 and 64 follow a social media influencer, compared with 22.6% worldwide.

155 Like Facebook, Twitter, Telegram, Discord, Slack and YouTube.

156 [L'ADN, 2022. Selon Cathy O'Neil, susciter la honte est la machine à cash des réseaux sociaux.](#) The term “shaming” refers mechanisms that make shaming the basis of on-line interactions.

157 [In March 2021, the British Columbia Securities Commission released the results of a survey](#) that found that 38% of adults under 35 in British Columbia who experience FOMO agreed that social media is a good place to find investment opportunities. In addition, 41% of B.C. adults under 35 who say they experience FOMO agreed that if you do not act immediately, you might miss a good investment opportunity. That compares with 8% of adults aged 55 or older.

3.3 Protection of privacy and personal information

Technological innovations have significantly increased the capacity to collect, store, combine and analyze a wide variety of data about consumers, including their financial circumstances, preferences, on-line shopping and browsing habits, and where they are physically located. In addition, a growing number of financial intermediaries are leveraging data science to understand the tendencies and interests of consumers both as individuals and as a group. The abundance, diversity, granularity and permanence of data of a personal nature, also called personal information, are giving rise to new risks to consumer privacy.¹⁵⁸

Personal information is sometimes used on terms and conditions that were not anticipated at the time the information was collected, and consumers therefore do not always know or have a clear understanding of how their personal data is being collected, stored and used. For example, a digital footprint generated by a consumer's on-line activities could be used by a digital financial service provider to deduce the consumer's cash flows, assess the consumer's credit and adapt the features of a product to the consumer's specific needs. The increased time spent on-line and the imposing amount of data generated by this activity mean it is becoming increasingly difficult, if not impossible, for consumers to maintain control over their personal data.

Legislative framework for the protection of personal information

In 2021, Québec established a robust framework for the protection of personal information by passing Bill 64, *An Act to modernize legislative provisions as regards the protection of personal information* (the "Act"). The laws to protect the privacy and personal information of Quebecers¹⁵⁹ are now more stringent, with stronger requirements surrounding consent to the sharing and use of data and enhanced powers in the hands of the *Commission d'accès à l'information du Québec*.

While the regulators tasked with protecting consumers (in Québec, the AMF) are generally not responsible for administering the laws governing privacy or the protection of personal information, these aspects are nonetheless essential to the sound and prudent management and sound commercial practices that the AMF expects of financial institutions, particularly from the vantage point of the fair treatment of clients.

3.3.1 Excessive profiling, unjustified discrimination and surveillance

A growing body of consumer data and the ability to analyze it using sophisticated tools are offering attractive opportunities to financial intermediaries. New digital financial services have emerged from these innovations and are yielding significant benefits for consumers. However, consumer data can also be used to consumers' detriment, as is the case when there is excessive profiling, unjustified discrimination and surveillance.

Analyzing personal information as part of the process for granting a credit or insurance product is not a new practice. Today, however, it can be enriched by cross-tabulating a consumer's personal information with other, previously unavailable, data sources such as the consumer's digital footprint. The cross-tabulated data is then processed to determine or populate the consumer's risk profile.

¹⁵⁸ Biometric data also constitutes personal information and is primarily used in authentication processes (facial or voice recognition or fingerprints). Such data had never been generated in digital form or used in such large-scale processes before. Unlike passwords, which can be changed after a hacking attempt, biometric authentication is not easy to alter.

¹⁵⁹ [Act respecting Access to documents held by public bodies and the Protection of personal information](#) and [Act respecting the protection of personal information in the private sector](#).

How well AI systems and machine learning systems perform largely depends on the quality of the data used as inputs. Any biases in such data will be replicated by the system, potentially resulting in discriminatory decisions or other ethically undesirable outcomes,¹⁶⁰ such as the exclusion of high-risk groups of consumers or of consumers from minority communities. Furthermore, consumers who refuse to share certain personal information or provide access to their financial data may be denied, or charged a higher price for, the financial product or service requested.

In the credit sector, the use of non-traditional data, such as digital footprint data, can potentially improve credit risk assessments.¹⁶¹ Most of this data does not have a direct link to a consumer's creditworthiness but, instead, provides indications about their habits: where they shop, what they buy, their on-line browsing routines or physical movements, and the extent of their presence on social media. Including this data in credit assessment models could improve financial inclusion by, for example, enabling consumers with no credit history to obtain a loan. However, a consumer's digital footprint contains a large amount of sensitive data that can reveal a great deal about the person's private life. That data, when shared, becomes vulnerable to theft and/or misuse, such as assessment of the highest interest rate the consumer would be willing to pay for a loan. Digital footprint data is also being used to send targeted, unsolicited offers to consumers.

Furthermore, an increasing number of objects are becoming connected. These objects, such as smart watches or smart phones, capture and transfer information on a continual basis. Some insurance products use smart devices to assess insureds' lifestyle habits. In addition, some credit assessment models are based on a dynamic flow of data such as the consumer's internet browsing history, messages shared on social media and geolocation data. These products can make consumers feel like their under constant surveillance, which interferes with their sense of well-being and autonomy while exerting pressure on the way they choose to live their lives and making them feel vulnerable to judgment.¹⁶²

These issues are even more prevalent in the metaverse, where the creation and collection of personal data is increased through the use of virtual reality headsets. These connected objects can store data on the user's eye movements and gestures and even map the room the user is in. These devices can also collect biometric data, which may then be used by malicious actors to steal the user's identity.^{***}

3.3.2 Consent issues

A consumer's informed consent to the sharing of their data, including personal information, is one of the legal foundations of privacy legislation. However, such consent is not always informed. According to a UK study,¹⁶³ most consumers (even among those with higher socio-economic and educational backgrounds) stated that they do not feel informed when they read the terms and conditions for sharing data. Furthermore, most consumers who consent to the treatment of their personal information do not read or understand all of the terms and conditions they have agreed to, which are frequently complex.

¹⁶⁰ Equity is generally understood as the value that prohibits unjustified discrimination against people based on their community affiliation defined by ethnic group, religion or gender. The use of AI is fair if its consequences are neutral, i.e. if it does not disproportionately affect members of a given community. [Artificial intelligence in finance – Recommendations for its responsible use](#).

¹⁶¹ According to an [OECD report on personal data use in financial services and the role of financial education](#), studies show the superior discriminatory power of a model using both the credit assessment agent score and the digital footprint variables, suggesting that a lender that uses information from both sources can make more profitable, but also more exclusionary, lending decisions.

¹⁶² [Artificial intelligence in finance – Recommendations for its responsible use](#).

¹⁶³ Study by the [Financial Services Consumer Panel \(2018\)](#) cited in an [OECD report on personal data use in financial services and the role of financial education](#).

To make informed decisions, consumers need to be made aware of the consequences of sharing their personal information, including their digital footprint. Consumers must also be aware of their rights¹⁶⁴ and be able to adopt behaviours that can protect such data, such as adjusting the privacy settings on their smart phones or social media accounts.

3.4 Behavioural research and digital engagement practices

Behavioural research, which focuses on the behaviours of individuals and how they make decisions as individuals and as a group, has shown that human beings are naturally biased and may be strongly influenced by the way information is presented.¹⁶⁵ This type of research helps shed light on behavioural biases, i.e., the reasons why human beings do not always act rationally or make decisions consistent with their own preferences and needs.

Consumers exhibit behavioural biases when shopping for financial products and services. Their decision making is influenced by their preferences (immediate gratification at the expense of future issues, loss aversion, regret and other emotions), and their beliefs (what they believe to be the facts about their situation and options, overconfidence and projection bias¹⁶⁶).

Cognitive biases also influence how risk is perceived: for example, consumers frequently exhibit availability bias.¹⁶⁷ For example, they are more likely to purchase insurance against natural disasters when they have just experienced a natural disaster.¹⁶⁸ In addition, the combined effect of various biases results in a perception of risk that differs according to age. Optimism and overconfidence, most often exhibited by individuals aged 25 to 34, generally leads consumers to overestimate their knowledge, underestimate the risks and have an exaggerated sense of their ability to control events.¹⁶⁹ Likewise, younger consumers are less worried about the risks associated with digital financial services offered by fintechs.¹⁷⁰

In addition to the various cognitive biases, behavioural research also examines how decision-making is affected by the way information is presented (text framing and salience, default options), persuasive messages, and social influence. Behavioural knowledge is therefore useful in assessing the effectiveness and limitations of disclosures such as those required by the regulatory framework for the financial markets. Generally speaking, an understanding of the behaviours and experiences of individuals can support regulators in the development of effective policies.

164 For example, the right to portability. According to the [website of the Commission d'accès à l'information du Québec](#), effective September 2024, organizations who have collected personal information from a person will be required, at that person's request, to communicate that information to them in a structured, commonly used technological format.

165 For instance, Jean-Bouchard, É. & Cachecho, M. (2021). [La protection des consommateurs de services et produits financiers au Québec : constats tirés de l'analyse économique comportementale du droit](#). *Assurances et gestion des risques / Insurance and Risk Management*, 87(3-4), 233-265.

166 The tendency to confidently assume that others share our way of thinking, attitudes and beliefs.

167 The tendency to evaluate the likelihood of events and the frequency of their occurrence based on the how readily similar situations come to mind.

168 Cachecho, M. & Noreau, P. (2020) [Protection des consommateurs de produits et services financiers: l'incidence des biais cognitifs](#). See also Jean-Bouchard, É. & Cachecho, M. (2021). [La protection des consommateurs de services et produits financiers au Québec : constats tirés de l'analyse économique comportementale du droit](#).

169 Simonsohn, Uri, Karlsson, Niklas, Loewenstein, George and Ariely, Dan. (2006) "[The Tree of Experience in the Forest of Information: Overweighing Experienced Relative to Observed Information](#)"; Kahneman, Daniel and Riepe, Mark W (1998) "[Aspect of Investors Psychology: Beliefs, Preferences and Biases Investment Advisors Should Know About](#)"; Gervais, Simon and Odean, Terrance (2001) "[Learning to Be Overconfident](#)".

170 Cachecho, M. and Prom Tep, S. (2022). [Fintech : Conjuguer innovation éthique et consommation. Pour une utilisation éthique de la gamification en FinTech](#).

3.4.1 Benefits and risks related to digital engagement practices in finance

Marketing practices and, more particularly, **digital engagement practices**—the various engagement techniques used with clients in a digital environment—are heavily influenced by behavioural research. Such practices rely significantly on web users' digital footprints. Digital engagement practices include:

- Targeted marketing, which involves personalizing messages for a given audience;
- Gamification, which involves applying mechanisms used in gaming to marketing practices; and
- Nudging, which involves using various techniques (such as notifications) to draw the consumers' attention to something or encourage them to take a particular action.

Digital engagement practices have both benefits and risks for consumers. Implementing simplified, gameful interfaces to make consumer processes more user-friendly is one example of a responsible practice.¹⁷¹ These practices can also be integrated into tools that help consumers better understand a digital financial service's features and risks, or help them make investment decisions consistent with their risk profile. Lastly, these practices can promote consumers' financial wellness, as in the case of mobile apps designed to incentivize consumers to save for retirement, make a budget, or better manage their finances.

However, digital engagement practices may also be used to consumers' detriment. Abusive practices non-transparent models ("dark patterns") and interfaces that are designed to confuse consumers, make it difficult for them to express their preferences, or manipulate them into taking actions that are not in their best interest, such as disclosing personal information.¹⁷² These practices encourage risky behaviours by exploiting consumers' behavioural biases and low level of consumer financial and digital literacy, often without their knowledge.

Consumer behavioural biases

Consumers are influenced by the way figures are presented. They find absolute numbers easier to evaluate than percentages. Consumers are also influenced by framing and titles, which means that means that poorly designed disclosures and risk warnings (e.g., a large block of highly technical sentences in small print) will be ignored. Elements that may influence the choices consumers make include the number of options presented, the way features are described, and the presence of a "default" option.¹⁷³

Such things as nudging techniques can subconsciously influence decision making, which raises some ethical issues because such influence may undermine their autonomy and lead them to make decisions that are not in their interests. These ethical issues are particularly important amid the advent of big data and AI, which are being used for the identification and large-scale exploitation of the biases or vulnerabilities of specific groups of consumers.¹⁷⁴ It also highlights the importance of responsible design for the consumer's digital journey.¹⁷⁵

Abusive and misleading marketing practices are nothing new; however, digital is greatly expanding their reach. With consumers spending more and more time online, more of them are being exposed, and exposed more often, to such practices. It is therefore becoming increasingly necessary to encourage businesses to develop their interactive offerings using an ethical and responsible design while complying with the terms of use for collected data and requiring greater transparency from themselves in the commercial use of such data, in order to reassure consumers that their autonomy and privacy will be respected.¹⁷⁶

171 [Now teenagers can trade stocks with Fidelity's new youth investing accounts](#) (cnbc.com).

172 Luguri, J. & Strahilevitz, L.J. (2021) [Shining a Light on Dark Patterns](#).

173 In the area of interactive system interfaces, a default option is a type of design intended to make a system easier to use. The user pre-selects the option corresponding to the choice of most people in the targeted group of consumers. A screen accommodating new users then enables the latter to easily continue using the system without having to select anything, while advanced users can still select a different action. An analysis of cookies shows that the default option on some sites is to accept all cookies or configure the cookie settings. Meanwhile, other websites select the minimum cookies required for the operation of the site and give users the option of deciding whether they want more cookies. In the first instance, the default option primarily serves the interests of the website operator; in second instance, the default screen primarily serves the interests of users.

174 Ryan Calo (2014). [Digital Market Manipulation](#).

175 Ren, S. and Liu, D. (2022). [Effects of digital nudging on the adoption of APPs for value co-creation among online consumers](#).

176 Saura, J. R., Palacios-Marqués, D., and Iturricha-Fernández, A. (2021). [Ethical design in social media: Assessing the main performance measurements of user online behavior modification](#).

3.4.2 Digital engagement practices in the financial sector

Digital financial service providers use engagement practices to interact with consumers at various points in their digital journey, drive buy-in from new clients, or increase the use of new products, new functionalities, or services that are related to those already being used. Digital engagement practices are also used to strengthen consumer loyalty and sustain their commitment to the digital financial service being offered.¹⁷⁷

Digital engagement practices observed in the financial sector include service personalization techniques that reinforce the idea that a product or service is tailor-made for them and fits their needs:

- **Networking tools:** Providers make networking tools available directly on their platforms or link their apps to social media. Users can create avatars, follow and chat with other users. Some investment platforms even offer an option to copy the trades of other investors (called “copy trading”), which can provide users with a sense of reassurance in the form of guidance, assistance and support.
- **The use of badges, point systems and ranking tables:** The purpose is to award distinguishing signs reflecting level of use. For example, a “beginner” badge is awarded to new users, while a recurring user or a user who makes a large investment is awarded an “expert” badge. Ranking tables allow users to compare themselves against each other.
- **Membership offer by level or subscription:** More services and options are offered to people who subscribe. For example, many companies offer a free subscription for a few months or after recurring use of the app.
- **Notifications:** Apps send users alerts about features or use reminders.

Other digital engagement practices also help to reinforce the sense of app effectiveness. The idea is to demonstrate to the user that the product or service is appropriate for them by, for example, showing that investments made through a mobile app have earned money for them. The user will then be satisfied and continue using the app. These other practices include:

- **Games, challenges and contests:** Implementing small challenges, games or contests tied to app use or a desired action on the platform, including prizes and advantages, can contribute to a consumer’s sense of satisfaction and accomplishment. For example, a personal banking or personal finance management app may offer savings challenges such as saving a set amount of dollars per day over a given period of time.
- **Virtual celebrations:** Some apps use animations and graphics, such as applause, confetti or colour changes, to highlight, for example, a user having completed a predefined number of trades.

These engagement practices also help guide users so that they feel supported and even coached in the steps they take. This keeps them engaged and enhances their overall satisfaction. Other engagement practices can also show consumers that, even if there is no direct interaction with a professional, they are being guided and supported:

- **Using chat bots:** Multiple apps offer a chat tool allowing user to get help and sometimes even advice. The user does not have to interact with a third party, but chatting is an option should the user need to.
- **Automatically generating suggestions and ideas:** Some apps regularly generate tips or suggestions to optimize or enhance app use. For example, investment apps display an “idea” or a “reminder” as call to action when placing a purchase order.

¹⁷⁷ For example, [Wealthsimple offers rewards to clients](#) who invite their friends to sign up and fund a Wealthsimple Wealthsimple Stocks & ETFs or Crypto trading account. These randomly selected cash rewards have a value between \$5 to \$3,000, with an average of \$10 (except for Québec residents, who receive a fixed amount of \$10). Around 99% of people receive less than \$50.

Finally, creating on-line communities, such as an investor community, is a digital engagement practice designed to bolster consumers' sense of belonging. Such communities can attract new members, drive higher use of digital financial services and contribute to overall user satisfaction.

While the use of digital engagement practices may be beneficial to consumers, such practices may also be harmful or abusive, threatening consumers' autonomy and ability to make informed choices. For instance, ease of access to on-line credit combined with the behavioural bias for immediate gratification can result in over-indebtedness. This is the case with "buy now, pay later" (BNPL) offers, which can induce some consumers to spend beyond their means.¹⁷⁸

Abusive digital engagement practices can also push consumers to make decisions based on emotions rather than rational thinking, such as engaging in financial transactions that are inconsistent with their investment goals or risk tolerance profile, investing a significant portion of their assets in the stock of a single issuer, using risky financial strategies (e.g. margin trading), choosing complex investment products (e.g. leveraged or inverse ETFs), trading in much higher amounts than originally planned, or conducting more trades than necessary.

As well, some on-line trading platforms could use gamification to fuel user activity: progress bars, rewards (cash or non-cash) when meeting certain goals, contests, exclusive offers and discounts have been observed. For example, a platform that offers easy access to complex products combined with functionalities such as falling confetti and emoji-filled notifications could encourage investors to view the investment as a game and take on debt to trade in equity markets. In some cases, investors lost large sums of money, resulting in adverse consequences, including suicide.¹⁷⁹

In addition, copy trading can result in an investor carrying out a large number of transactions unnecessarily or investing in products they do not understand. Copy trading is usually supported by social media posts and closed groups.

In the insurance industry, life and health insurance products have been developed based on the insurer's continuous access to the data collected by a connected watch that the insured is required to wear. Holders of these insurance policies are able to secure discounts on their premium if they meet exercise targets set by the insurer. They also enjoy special prizes, such as gift cards, if they register their workouts and food purchases in a gamified mobile app. Nudging techniques may be seen as paternalistic methods of coercing customers to do what is in the interest of the financial institution, not what is in their own interest.¹⁸⁰

3.4.3 Growing interest from regulators

The rules governing the business conduct of financial intermediaries typically include obligations relating to the client relationship and the statutory duty.¹⁸¹ These obligations specifically relate to fraudulent practices, including providing misinformation regarding a financial product or service.

That being said, some regulators have undertaken consultations to assess whether a review of business conduct obligations is required in light of the emergence of digital engagement practices. In the United States, the Securities and Exchange Commission (SEC) launched a regulatory consultation on digital engagement practices and tools used by dealers and advisors.¹⁸² In its report, the SEC cites, in particular, game-like features, differential marketing and chat bots designed to engage and influence retail investors on digital platforms.

178 [According to a Financial Consumer Agency of Canada study](#), the risk of over-borrowing and over-indebtedness is linked to psychological and behavioural biases that can increase the attractiveness of BNPL products and services to consumers.

179 [Robinhood Has Lured Young Traders, Sometimes With Devastating Results](#), The New York Times, September 2021.

180 [Artificial intelligence in finance – Recommendations for its responsible use](#).

181 The statutory duty of registrants is to act in good faith and with honesty, fairness and loyalty in their dealings with their clients (section 160 of the *Québec Securities Act*).

182 SEC (2021). [Request for Information and Comments on Broker-Dealer and Investment Adviser Digital Engagement Practices](#).

In particular, the SEC asks broker-dealers and investment advisers what types of policies, procedures and controls establish and maintain to ensure that the design, development and use of digital engagement practices comply with existing obligations. It also asks whether additional guidance or modifications to existing regulations would be useful to address investor protection and market efficiency concerns, while preserving companies' ability to innovate or test the use of new technology.

Furthermore, the European Securities and Markets Authority (ESMA) launched a consultation on the effectiveness of regulatory disclosures and communications in a digital age. The consultation also addresses the risks and opportunities of the growing adoption of digital tools in investing and the increasing use of on-line trading platforms and robo-advisors.¹⁸³

3.5 Digital financial services that are not appropriate for their target audience

The introduction of technological innovations in the financial sector has sparked the creation of a broad range of new digital financial services. While many of these services are a source of added value for consumers, others have features and levels of risk that are not appropriate for their target audience.

With a wide choice of digital financial providers and services to choose from, it is sometimes hard for consumers to identify the products and service that are most appropriate for their circumstances. In addition, an incorrect understanding or assessment of these services can increase the risk of errors or bad choices, potentially resulting in financial losses. While this risk exists when fraud, negligent disclosure or abusive digital engagement practices are not present, it is increased when they are present.

3.5.1 Product governance

Recognizing the limitations of financial product or service disclosure and consumer financial literacy, a growing number of regulators are concerned about the quality of financial products and services offered to consumers, beyond the applicable business conduct and disclosure rules. Accordingly, the OECD added a principle to the *G20 High-Level Principles on Financial Consumer Protection* pertaining to the quality of financial products.¹⁸⁴ Under this proposal, financial intermediaries are required to implement **product governance** to ensure that their financial products and services are designed and distributed so as to meet the interests and goals of target consumers and contribute to their financial well-being. This governance is particularly important for digital financial services delivered via on-line platforms or mobile apps. For instance, once admitted to a discount brokerage platform, a consumer may execute trades in a wide range of securities or other products, some of which may be complex, high-risk products that are inappropriate for their circumstances or risk tolerance. The same applies to cryptoasset trading platforms.

This proposal has also been taken up by IOSCO, which clarifies that product governance must guide the design and distribution of financial products and services so that they meet the needs of one or more identifiable target markets, are sold to clients in the target markets by appropriate distribution channels, and deliver appropriate client outcomes.¹⁸⁵

In addition, Australia implemented obligations in 2021 making financial intermediaries accountable for designing, marketing and distributing financial and credit products so that such products and services meet the needs of consumers and are distributed in a more targeted manner. These reforms also empower the Australian regulator to intervene where there is a risk of significant consumer harm.¹⁸⁶

¹⁸³ ESMA (2021). Call for evidence on the European Commission mandate on certain aspects relating to retail investor protection.

¹⁸⁴ OECD (2022) [Public consultation on draft proposed revisions to the Recommendation on G20/OECD High-Level Principles on Financial Consumer Protection](#). The OECD sets out its Principle 8 as follows: "There should be appropriate product oversight and governance by manufacturers, providers and representatives to ensure that financial products and services are designed and distributed to meet the interests and objectives of (target) consumers. This may include requirements for appropriate systems to design, approve, manage and monitor financial products through their life cycle to ensure that they meet the interests and objectives, and aim to contribute to the financial well-being, of consumers that the products are designed for, as well as the relevant regulatory requirements."

¹⁸⁵ (IOSCO, 2022) [Report on Retail Distribution and Digitalisation – Final Report](#).

¹⁸⁶ ASIC website: [Design and distribution obligations](#).

In Europe, ESMA has had powers of intervention since January 2018 to address the risks posed by certain speculative products to investors. ESMA has used these powers on two occasions to prohibit the provision of binary options and restrict the provision of contracts for differences (CFDs) to retail consumers. ESMA's powers of intervention are triggered when a European national competent authority intends to take product intervention measures in its jurisdiction. For example, in Germany, the regulator can intervene to restrict or completely prohibit the marketing of financial products if the products raise investor protection concerns or represent a threat to the stability of the financial system.¹⁸⁷

The case of binary options in Québec

In Québec, the *Derivatives Act* provides that a person who creates or markets a derivative must, before the derivative is offered to the public, must be approved by the AMF and have the derivative authorized for marketing by the AMF. Under the Act, the AMF may also, by regulation, make rules concerning or prohibiting derivatives offers or trades where they present undue risks to consumers.

The AMF used this power of intervention in 2017 to prohibit any advertising, offer or sale to consumers of binary options having a term to maturity of less than 30 days. The implementation of this regulation¹⁸⁸ in Québec and other Canadian provinces was intended to protect consumers and prevent them from becoming victims of binary options fraud and the illegal promotion of very high-risk products.¹⁸⁹

3.6 Access to digital financial services

Digital financial services have the potential to improve financial inclusion as they are accessible to a larger number and more diverse range of consumers. Financial inclusion also involves ensuring that consumers who are currently well served by the financial system are not excluded in the future.

With the large-scale adoption of digital financial services, some financial intermediaries may choose to close physical points of service, which are less frequented by consumers. Such closures, particularly in rural areas, could exclude some households from the financial system if they happen before high-speed Internet access is available in their area. While nearly 100% of households in urban areas have from such access, slightly less than 60% of rural households are currently connected.¹⁹⁰

Also, in a cashless society, it would be difficult for some segments of the population to make purchases or receive funds. If the acceptance of cash becomes limited, it will be necessary to ensure that these disadvantaged groups of people have reasonable access to other methods of payment.¹⁹¹ The trend of closing physical points of service must therefore be assessed based on the needs of more vulnerable consumers, such as the elderly, who may prefer to bank in person and receive a paper statement for their banking transactions.

Moreover, some electronic payment systems are introducing two-factor authentication as a security precaution—a measure that, while enhancing the resiliency of the system, requires users to have two devices instead of one.

¹⁸⁷ [ESMA: Product Intervention](#) and [BaFin: Product Intervention](#).

¹⁸⁸ [Regulation 91-102 respecting Prohibition of Binary Options](#).

¹⁸⁹ [CSA Multilateral Notice of Publication – Regulation 91-102 respecting Prohibition of Binary Options](#).

¹⁹⁰ [Progress toward universal access to high-speed Internet](#). Approximately 90% of Canadian households now have an Internet connection. The federal government's objective is to see this percentage increase to 100% by 2030.

¹⁹¹ Bank of Canada (2020). [Contingency Planning for a Central Bank Digital Currency – Bank of Canada](#)

Having access to digital financial services does not just mean having access to technology hardware (such as smart phones). It also means acquiring the skills required to use the hardware and use it appropriately, and having access to the knowledge required to benefit from it. For example, the older generations, which today represent a large percentage of the population, do not typically have the same ease with technological tools as digital natives. This may be due to a variety of factors, including a lack of trust, preferences, security issues and age-related physical problems.

While the literature at the beginning of this century considered the “digital divide” those with access to technology and those without most researchers now believe the issue to be more complex. According to the Van Dijk model, there are four different types of digital access, all of which are linked to socio-demographic factors:¹⁹²

- L'accès lié à la motivation désigne la ou les raisons pour lesquelles des personnes vont consommer, ou non, des services financiers technologiques.
- L'accès lié au matériel désigne la possession de matériel qui permet de consommer des services financiers numériques, que ce soit un ordinateur ou un téléphone intelligent, une connexion Internet ou encore les moyens financiers pour acheter des applications payantes.
- L'accès lié aux capacités concerne certaines personnes, comme les personnes âgées, qui ne se pensent pas capables de mener des opérations bancaires en ligne et préfèrent se rendre en succursale. Ce type d'accès concerne également les services financiers numériques complexes, davantage consommés par des personnes expertes.
- L'accès lié aux usages fait référence au niveau d'appropriation des services financiers numériques par les consommateurs. Certaines personnes vont utiliser une application bancaire par besoin, par exemple pour consulter leur solde ou faire un paiement, sans chercher à savoir si cette application peut les aider à améliorer leur gestion financière. D'autres personnes vont, au contraire, être capables d'adapter ces outils à leurs besoins.

All four types of digital access should be factored in when designing and distributing digital financial services so as not to exacerbate existing inequalities or create new ones.

3.7 Operational resilience and cybersecurity

With the ever-growing adoption of technological innovations in all aspects of our lives, consumers are becoming increasingly dependent on the operational resilience¹⁹³ of the technological infrastructure of financial intermediaries and telecommunications service providers. A large-scale outage,¹⁹⁴ such as the Rogers July 2022 telecom services outage, could have critical effects for consumers of digital financial services, who would be unable to view their accounts, perform transactions or even make in-store payments. An operational service disruption at a digital financial service provider, such as an on-line service disruption, could have consequences that are similar, though more limited in scope.

For providers, greater use of digital platforms means more technical support calls from consumers. Access to a physical person is still important when consumers are experiencing access or other technical issues on a digital platform.¹⁹⁵

Beyond operational resilience, financial intermediaries are expected to implement the measures required to protect clients' assets against potential security incidents (including cyber attacks), system failures or data theft.

¹⁹² Van Dijk (2006). [Digital divide research, achievements and shortcomings](#).

¹⁹³ Operational resilience is defined by the [Basel Committee on Banking Supervision](#) as the ability of a provider to deliver its critical operations through disruption, such as a pandemic, a cyber incident, a technology failure or a natural disaster.

¹⁹⁴ [According to Radio-Canada](#), a network updating error caused a massive outage that deprived millions of Canadians of their telecom services on July 8, 2022.

¹⁹⁵ The significant rise in self-directed investor inquiries and complaints (270%) [noted by IIROC](#) from March 2020 to January 2021, compared with the same period in 2019–2020, underscores the fact that the increased use of digital platforms may fuel significant growth in client demand, with impacts on the infrastructure of the digital financial service provider.

3.7.1 Cyber risks and cybersecurity

The financial sector is a popular target for fraud because of the large volume of personal information held by financial intermediaries, including credit assessment agents. Cyber threats are constantly evolving, with the emergence of new threats that are increasing financial intermediaries' risk exposure. Traditional threats such as "denial of service" attacks or the installation of "malware" remain a central concern for organizations, as is the steady rise in technology system breaches.¹⁹⁶

Furthermore, new threats targeting human beings, such as MDM and phishing attacks against employees of financial intermediaries, have been on the rise in recent years. Employee adoption of secure practices and investments in cybersecurity continue to be key to protecting client information.

3.7.2 Cyber risks in cryptoasset and DeFi markets

While the integrity and security of blockchains have not yet failed, many cyberattacks in the cryptoasset ecosystem have made the headlines, with some resulting in substantial losses for consumers.

Just as for financial intermediaries, cryptoasset trading platforms are prime targets for hackers. The resiliency, reliability, integrity and security of their technology infrastructure are critical to maintaining clients' access to the platform, securing cryptoassets held in custody and managing the cyberattack risks faced by these platforms.

Furthermore, DeFi apps and smart contracts are prone to coding errors and cyberattacks. Such incidents can result in trading errors, with no option to reverse them or access dispute resolution mechanisms. Cybersecurity attacks on DeFi apps surged in 2021, fuelled by exponential growth of 912% in trading volumes handled by such apps during the same year. The boom has also have been a boon to hackers who steal cryptoassets locked in smart contracts: more than three times more cryptoassets were stolen this way in 2021 than in 2020.¹⁹⁷

¹⁹⁶ Verizon, 2022. [Data Breach Investigation Report](#).

¹⁹⁷ Chainalysis (2022). [Crypto Crime Trends for 2022: Illicit Transaction Activity Reaches All-Time High in Value, All-Time Low in Share of All Cryptocurrency Activity](#). Scamming revenue rose 82% in 2021 to US\$7.8 billion worth of cryptoassets stolen from victims. Over \$2.8 billion of this total—which is nearly equal to the increase over 2020's total—came from rug pulls. In addition, cryptoasset theft grew even more in 2021, with roughly US\$3.2 billion worth of cryptoassets (as of the date of the report) stolen in 2021, a 516% increase compared with 2020. Approximately \$2.3 billion of those funds, 72% of the 2021 total, was stolen from DeFi apps.



4. CONCLUSION



It can be seen in every sector regulated by the AMF: technological innovations are changing the financial industry, from the way products and services are designed to how they are distributed to consumers. More and more, consumers are using digital platforms on a self-directed basis to access a wide range of services for their banking, credit, securities or insurance needs. Ease of access, a broader selection of suppliers and personalized offers are just some of the benefits that technological innovations have brought to consumers. Presumably, this trend will become even more pronounced with the entry of Generation Z into the labour market.

Unfortunately, consumers' appetite for digital financial services has also provided fertile ground for fraud and abusive promotional activities. Self-directed consumers, often alone in front of their screens, are not always able to recognize disinformation and fraudulent offers conveyed over social media. With so many financial products and services available to them, including some that are not adapted to a retail clientele, consumers are having difficulty determining which products and services are appropriate for their goals and risk tolerance and may be influenced by abusive digital engagement practices aimed at exploiting their behavioural biases. Also, digitalization of the information consumers provide when taking actions to purchase products and services is facilitating the duplication and theft of personal information. Often, these risks exist concurrently and are mutually reinforcing, increasing the risk of consumer harm.

In addition, the ever-increasing volume of information circulating on the Internet, the partial or complete disintermediation of certain markets, such as the cryptoasset markets, and digital financial service offerings originating in foreign jurisdictions that are weakly regulated are presenting significant challenges for all regulators.

We have drawn two conclusions from these observations. First, it is more important today than ever before that consumers be vigilant. Consumer vigilance is the first line of defence in the fight against fraud and the various abusive practices prevalent in digital channels. Second, traditional financial literacy is no longer enough. Consumers must also develop the knowledge and skills necessary to securely navigate a digital environment. For example, they must be able to recognize phishing attempts, protect their personal information and give their informed consent to sharing it, tell the difference between reliable information and misleading information on social media, and understand the terms of use of the digital financial services they wish to acquire.

This is a major challenge for the financial industry, which relies heavily on the confidence of Québec consumers. It is essential to act in a concerted manner to increase consumer vigilance against these new risks.

At the AMF, we will continue to carry out financial education efforts, into which we will incorporate a digital literacy component. In addition, we will continue our enforcement efforts while stepping up monitoring and the fight against emerging illegal practices. We will also continue our awareness efforts, including through the broadened dissemination of warnings, in order to empower consumers in a timely manner to deal with the new risks to which they may be exposed. Lastly, because the issues addressed in this document have no geopolitical boundaries, we will continue to work with our national and international peers to develop common approaches to these challenges.

We will continue to work with the academic community, first through the [AMF-Finance Montréal Fintech Research Chair](#), and then—as will be announced in detail shortly—through the AMF's [Strategic Financial Education, Outreach and Research Partnerships Program](#). In the appendix attached to this report, the AMF proposes seven areas of research focused on the use of technological innovations to increase consumers' financial and digital literacy, responsible innovation among digital financial service providers and consideration of emerging issues related to the digital transformation of the financial sector. We wish, among other things, to contribute concretely to the advancement of knowledge about the responsible use of digital engagement practices, including to promote education and the development of sound financial habits among consumers. We also propose a strategy for collecting data on digital adoption in the financial sector in order to promote academic research, policy development, and the responsible design and distribution of financial products and services.

To further enhance these efforts, we are calling on members of the financial industry, who also must to maintain consumer confidence, to incorporate more elements of financial and digital education into their interactions with clients. In our work leading to the release of the Applied Financial Literacy Report, we learned that financial literacy is not acquired theoretically but through experience. Financial intermediaries, whether they are brokers, advisors or deposit institutions, are therefore well positioned to strengthen consumers' financial knowledge or on-line security practices.

Questions and comments

The issues raised in this document are important and affect all financial sector participants and consumers of financial products and services. If you have any questions or comments regarding the elements and issues discussed in this document, we invite you to contact one of the AMF staff members below.

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APPENDIX

Proposed innovative projects and areas of research



In the appendix attached to this document, the AMF proposes seven opportunities related to innovative projects and areas of research focused on the use of technological innovations to increase consumers' financial and digital literacy, responsible innovation among digital financial service providers, and consideration of emerging issues related to the digital transformation of the financial sector.

Opportunity 1: Enhance financial consumers' financial and digital literacy using tools

The AMF wishes to promote financial education, including by encouraging initiatives to heighten consumers' vigilance. What generally differentiates digital tools from more conventional financial education tools is that they are interactive, agile, more adaptive to the learning needs of consumers (in terms of time, pace, format and space), user-friendly and attractive, particularly to younger people.

The use of technological innovations and digital engagement practices can be an effective, gameful way to help consumers of all ages develop the knowledge and skills they need to use digital financial services. For example, they could be used to:

- Inform consumers about how various financial services work and what benefits, risks and costs are associated with them.
- Inform consumers of the fact that certain digital financial services may be offered on-line in a manner that is illegal or unauthorized Québec, and about reliable information sources to use to find out which financial intermediaries hold the necessary authorizations to carry on a regulated activity in Québec.
- Alert consumers to on-line fraud, phishing, social media scams, account hacking and/or data theft. Consumers must be informed of the means to detect these activities and what steps to take to reduce the risks.
- Raise consumers' awareness of the potential consequences of consenting to the on-line sharing of personal information, and help them understand how such information may be stored and used.
- Enhance consumers' knowledge of their privacy protection rights as well as the knowledge they need to properly manage their digital footprint and assess the relevance of the information requested by digital service providers.

Opportunity 2: Use technological innovations and digital engagement practices to promote sound financial behaviours

Technological innovations and digital engagement practices can also be used to promote sound financial behaviours. The habit of putting off decisions, particularly on delicate, difficult or “boring” financial matters (e.g., choosing a life insurance policy, saving up money, or building a retirement plan), is widespread and persistent. By nudging consumers to take actions (e.g., through automated reminders, notifications or alerts concerning the repayment of a loan), digital tools and digital engagement practices may help consumers break their inertia or poor financial habits (e.g., not setting money aside regularly, not setting personal financial targets, or impulse buying). In so doing, these tools can help consumers better manage the stress and emotions that may be associated with financial decisions.

Some organizations have already explored these opportunities:

- FCAC successfully conducted a project in which consumers used a mobile app to develop budgeting habits and skills. Over half of those who began budgeting during the pilot study were still budgeting one and a half years later.¹⁹⁸
- FCAC has also achieved positive results with a mobile app that helps users make behavioural changes leading to financial savings. This experience illustrated just how effective mobile technology can be in influencing behaviour and improving financial literacy.¹⁹⁹
- In the UK, a recent study by the Financial Conduct Authority found that access to an on-line automated debt repayment advice service, particularly if free of charge, would enable borrowers, particularly those with lower levels of financial literacy, to make better repayment decisions.²⁰⁰

Call for projects - Opportunities 1 and 2

The AMF invites the Québec scientific community to propose research (e.g. behavioural research) projects to advance knowledge relevant to the use of technological innovations and digital engagement practices to increase the financial and digital literacy of consumers of financial products and services. We are particularly interested in considering how these innovations may be used to increase overall literacy levels among younger consumers.

The AMF also invites the scientific community to propose initiatives pertaining to the development or creation of mobile apps focused on the adoption of sound financial habits, on the basis of unbiased and non-commercial content.

Lastly, the AMF invites the scientific community and eligible organizations to respond, in accordance with the soon-to-be-announced process, to the first call for projects of the Strategic Financial Education, Outreach and Research Partnerships Program, by submitting a draft proposal to use technological innovations and digital engagement practices to promote financial and digital literacy and sound financial habits.

¹⁹⁸ FCAC, 2019. [Sustained behaviour change through financial education: A budgeting longitudinal study using mobile technology](#). The FCAC partnered with Carrot Rewards, an engagement platform that leverages the use of smart phones and loyalty points to drive changes in health and wellness behaviour.

¹⁹⁹ FCAC, 2018. [Improving financial literacy through mobile technology: Small Change pilot program outcomes](#). Through the Small Change pilot project, the app helped users understand that by making small changes to their spending habits, they could easily save money and reach their financial goals.

²⁰⁰ Financial Conduct Authority, 2022. [Robo-Advice for Borrower Repayment Decisions](#). The FCA concludes by suggesting that regulators encourage the on-line provision of automated debt repayment advice, including by private firms not tied to a lender. However, the study shows that algorithmic aversion, which occurs when a person rejects any advice that does not come from another human being, is more common among less savvy consumers, which may limit the success of such a service among those who potentially need it most.

Opportunity 3: Promote the development of consumer knowledge of cryptoassets and decentralized finance

The cryptoasset markets and DeFi saw explosive growth in 2021. The promise of an easy profit and the gamification techniques used by on-line and mobile apps in this sector are attracting more and more Québec consumers, especially the youngest ones. Cryptoasset price volatility and the often inadequate information put out by social media influencers are creating significant risks for consumers, including potential fraud and theft.

In this context, the AMF wishes to make more factual information about cryptoassets and DeFi available to consumers in order to help further their understanding of this environment and thereby develop prudent (e.g., with respect to cryptoasset volatility) and vigilant (e.g., with respect to fraud and traps to avoid) practices.

Call for projects - Opportunity 3

The AMF invites the Québec scientific community to propose research projects to better understand and prioritize the consumer groups most likely to be interested in cryptoassets, identify their informational needs, and propose the best options for reaching them, raising their awareness and educating them in this matter. Such options may involve digital engagement practices to facilitate learning (e.g., an educational journey in a video game environment), the dissemination of content over social media content and/or in-person interaction component (e.g., presentations in schools, CEGEPs or universities to inform young people interested in cryptoassets).

The project's objective, however, is not to propose various cryptoasset investment practices or strategies to consumers or offer other investment advice.

The AMF also invites the scientific community and eligible organizations to respond, in accordance with the soon-to-be-announced process, to the first call for projects of the Strategic Financial Education, Outreach and Research Partnerships Program, by submitting a draft proposal to develop developing consumers' knowledge of cryptoassets and DeFi .

Opportunity 4: Develop a responsible digital engagement practices guide for digital financial service providers

The AMF intends to continue its study of digital engagement practices to better identify and understand how certain factors influence consumers' behaviour and decision-making. These insights, compiled in the form of a guide, will be useful to digital financial service providers in designing responsible digital engagement practices.

This guide will have to be drafted taking into account existing regulations: the *Regulation respecting Alternative Distribution Methods*, for instance, already imposes certain obligations on registrants who offer insurance products through a digital space.

This guide will present examples of digital engagement practices that are beneficial to consumers, including:

- The adoption of forms of disclosure that favour brief, non-technical language in a digital environment to assist consumers in their decision-making.²⁰¹
- Default options that direct consumers to the option that is generally in their best interest.
- Practices that incentivize consumers to read and understand the terms of consent for the sharing of data.
- The adoption by financial intermediaries of approaches enabling them to test digital engagement practices prior to implementing them and on an ongoing basis, to detect factors that may unintentionally exploit consumers' behavioural biases.

This guide may also address best practices to adopt when distributing digital financial services, including:

- Usage and privacy policies that offer consumers more options, allowing them to choose a level of functionality that they are comfortable with.
- Introducing options that give consumers more time to confirm their decisions in an action to purchase a digital financial service.

Call for projects - Opportunity 4

The AMF invites the Québec scientific community to propose research projects to develop or create a responsible digital engagement practices guide for digital financial service providers.

²⁰¹ Joint report from the Australian Securities & Investments Commission (ASIC) and the Dutch Authority for the Financial Markets (AFM), October 2019. [Disclosure: Why it shouldn't be the default.](#)

Opportunity 5: Develop and implement a digital transformation data strategy for the financial sector

Given the speed with which new financial services (including cryptoassets and DeFi) and new types of fraud are emerging, maintaining ongoing monitoring and surveillance of developments in connection with the digital transformation of the financial sector is essential for the AMF.

We are therefore proposing that a comprehensive strategy for collecting data on the digital transformation of the Québec financial sector and on supply and demand for digital financial services be developed for implementation over the long term. This data will be collected to support (i) the development of consumer protection policies and standards and financial and digital education programs, (ii) behavioural and other related research, and (iii) responsible innovation in digital financial services.

Specifically, this strategy aims to collect data on:

- Socio-demographic changes that have an impact on investment and, more broadly, consumers of financial services;
- Emerging trends and behaviours (e.g., using social media as a source of information about digital financial services);
- The adoption of digital financial services by consumers and consumer attitudes and preferences in relation to such services;
- The offering of digital financial services, particularly with respect to financial products presenting a high level of risk;
- Changes in the profile of self-directed investors, including their motivations, the reasons they choose to leave “with advice” networks, their level of investment knowledge and the information sources they use;
- The level of and changes in Québec consumers’ digital literacy;
- The identification of consumer groups at risk of financial exclusion and, more generally, the terms of access to digital financial services;
- Current types of fraud in digital environments, including scams in the metaverse;
- The channels used by digital financial service providers to promote their products.

Call for projects – Opportunity 5

The AMF invites the Québec scientific community to propose a strategy for collecting and analyzing data on the provision and adoption of digital financial services and on the implications for consumers. The proposed data strategy should complement the efforts already undertaken with the Applied Financial Literacy Research Report, and should rely, if possible, on existing initiatives, such as the *NETendances* report published by the *Académie de la transformation numérique* at *Université Laval*.²⁰²

The AMF also invites the scientific community and eligible organizations to respond, in accordance with the soon-to-be-announced process, to the first call for projects of the Strategic Financial Education, Outreach and Research Partnerships Program, by submitting a draft proposal to contribute to and collaborate on the development and implementation of such a data collection and analysis strategy.

²⁰² [Enquêtes et mesures | Académie de la transformation numérique \(ulaval.ca\)](#)

Opportunity 6: Anticipate potential issues arising from adoption of the metaverse for consumers of financial products and services

The metaverse is in its early stages, and there is still a great deal of uncertainty surrounding its future development and its adoption by consumers of financial products and services. However, it is already possible to anticipate some of the issues arising from the adoption of this virtual world, including:

- The application of the existing statutory framework to financial transactions in the metaverse involving digital assets, or the digital financial services that may be offered in the metaverse.
- The adoption of mechanisms with the capacity to prove a user's identity, particularly with regard to the ownership of virtual assets in the metaverse. Unlike the physical world, where an individual's identity is ascertained through, among other things, facial recognition, a person's avatar can take on any form or appearance. In addition, an individual may use more than one avatar on the same platform.
- Accountability for the acts performed in the metaverse by an avatar, which is artificial intelligence-driven and therefore self-directed and continually "active".
- Fraud, phishing and money laundering in the metaverse, where fraudsters can hide behind one or more avatars.
- Privacy protection issues related to the substantial amount of personal information collected from users by virtual reality devices. The use of multiple identities, such as separate avatars in public and private scenarios, increases the stakes.

Call for projects - Opportunity 6

The AMF invites the scientific community in Québec to explore potential issues arising from metaverse adoption for consumers of financial products and services.

Opportunity 7: Further delve into issues of data ownership in digital financial services

In the digital environment, characterized by the production and collection of big data, but also by the emergence of AI technologies that will process that data on an automated basis, without human validation, the accountability of digital financial service providers for the collection and use of data regarding consumers' personal information and activities is critical. To date, governments and regulators have focused their efforts on responsible business approaches to the collection and use of such data. However, many stakeholders are wondering who the ultimate owners of the data are.

In addition, many digital financial services now rely on consumers sharing personal information in exchange for more personalized service and an optimized client experience. Several stakeholders are also asking whether the use of such data by the service provider is actually beneficial for most consumers.

In response to these questions and challenges, a "self-data" movement has emerged. According to the *Fédération Internet Nouvelle Génération*²⁰³ (FING), self-data refers to the collection, use and sharing of personal data by and for individuals, under their control and for their own purposes. Other similar initiatives exist in Europe and the United States.²⁰⁴ The goal of these initiatives is to allow consumers to have their personal data so they can control how it is used, based on their own interests, not so they can access a service.

This paradigm shift related to data portability is giving rise to some interesting new research questions, including:

- Who are the ultimate owners of the data collected by digital financial service providers? Specifically, who owns the connected object-generated data derived from a consumer's activities (digital footprint)?
- What is the actual value created from the data collected? Which stakeholders should be considered as co-creators of the value chain associated with the data and how are they compensated for their services?
- Should (can) consumers control such data?
- Could (or should) consumers be compensated for allowing a third party to use such data for the purpose of sending them, for example, personalized offers?
- How might the business models of financial service providers change to give consumers more control over how their data is used?

Call for projects - Opportunity 7

The AMF invites the scientific community to explore the issues and challenges related to the control of personal data in digital financial services from a privacy protection and stakeholder accountability perspective. It would be particularly relevant to consider how a shift (or partial shift) in the control of data to consumers of financial products and services might be occur in various situations and for the business models of the various financial service providers, including fintechs.

²⁰³ The concept of self-data was developed by [European association FING](#) as part of the *MesInfos* exploration program. However, the FING ceased operations in 2022.

²⁰⁴ *Labo Société Numérique* (2021). [Self data, portability, "data altruism", personal cloud: new models of personal data management are being sought](#)



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