

Future of Business and Finance

Sean Stein Smith

Blockchain, Artificial Intelligence, and Financial Services

Applications for Finance and Accounting
Professionals, including the Cryptoasset
Ecosystem

Second Edition

 Springer

Future of Business and Finance

The Future of Business and Finance book series features professional works aimed at defining, analyzing, and charting the future trends in these fields. The focus is mainly on strategic directions, technological advances, challenges and solutions which may affect the way we do business tomorrow, including the future of sustainability and governance practices. Mainly written by practitioners, consultants and academic thinkers, the books are intended to spark and inform further discussions and developments.

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Part I

Definitions, Overview & Information for Practitioners



Foreword and Introductory Information

1

There has been a large amount written and spoken about artificial intelligence, blockchain technology, and the implications that these technology tools will have on the accounting profession in both the near and long term. Even since the publication of the first edition of this book in 2020, the cryptoasset marketplace and blockchain adoption have continued to evolve at a breakneck pace. In addition, the entire field and conversation around artificial intelligence—nascent at best in 2020—has become a recurring topic on earnings calls across industry lines. Some might speculate that AI has replaced the excitement that once dominated the blockchain and cryptoasset space that could not be furthered from the case. Bitcoin, even in the aftermath of the scandal, collapse, and fraud at FTX, has traded at new all-time highs in 2024, buoyed by the long-awaited approval of spot Bitcoin ETFs. Additionally, and something that will be expanded upon in further chapters, the institutional adoption and onboarding of cryptoassets continue to accelerate.

As the institutional adoption of blockchain, cryptoassets, and AI has continued to accelerate ahead, the following reality has proven abundantly clear. Finance and accounting, far from lagging in the adoption and utilization of these tools, have moved to first-mover positions across the board. Audits, tax returns, financial reporting and disclosure, trading, market research, the credit creation process, issuance of new financial instruments, and the entire wealth management industry have been radically altered by these tools. Even accounting standard-setters, long perceived as beyond the proverbial curve as it related to crypto-specific standards and rulemaking, have moved more quickly to address gaps in the financial reporting landscape. As the volatility of these tools has continued to increase and spread across asset classes, the importance of communicating the effects of these changes has also increased in importance. Since regulation continues to lag in the United States, the private sector and nonprofit organizations have an even more important role to play in how information is disseminated.

Lastly, one of the core purposes of putting this text together was to not only discuss these wide ranging implications and technologies but to provide readers

suggestions and guidelines moving forward. This purpose has only been amplified in the second edition, as the radical changes across employment, markets, and individual firms are reaching the levels of mainstream conversation. Taking a broader view of the accounting and finance industry, however, the implications for improved communication, data management, and data encryption become clearer. Suggestions, recommendations, and insights connecting these technological forces with the current status of the accounting and finance fields form some of the key takeaways of this book. Regardless of what niche of finance or accounting readers you find yourself employed within, there are going to be applications and suggestions you will find helpful contained herein.

Technology is coming for the profession, will have a tremendous impact, and lies with us to be ready. Consider this book a great way to not only keep yourself informed but to help you get started addressing these important topics.

A Splash of Cold Water

This book focuses on blockchain, artificial intelligence, and the applications that these technologies will have for the financial services profession and the individuals employed therein. With billions invested, and thousands of very smart and motivated people working on these solutions, there will invariably be products and services that succeed in the marketplace, but there will also—without a doubt—have many false starts. One of the most prominent examples of crypto falling victim to criminal and other bad actors is the rise, fall, and fraud that occurred at FTX.

Lessons from the Rise and Fall of FTX

In the volatile landscape that has categorized blockchain and cryptoassets almost since inception, there have been numerous players and organizations that have sought to assume a leadership position in the marketplace. Some, such as Coinbase, have managed to achieve a significant share of trading and custodial services provided to US investors, whereas other traditional institutions such as BNY Mellon have recently launched crypto related products and custodial service offerings. On the other side of the spectrum, firms such as Gemini have not only introduced proprietary stablecoin offerings but have also launched exchanges and partnered with established payment processors to facilitate crypto-based transactions. Others more, such as Tether, have perpetually existed under a regulatory cloud due to the lack of visibility and transparency with regard to the books and records of the firm. Even so, entities that have had to contend with doubts about financial stability have been able to capture large shares of the market for whatever activities they were seeking to participate in. No single entity exemplified how quickly fortunes can be made and lost in the cryptoasset space than FTX, and the implications of the spectacular collapse of this firm will be documented, examined, and hopefully learned from for

years to come. Let's quickly take a recap at just what happened at FTX, how the firm rose to such global prominence, and how it lost so much of its success so quickly.

FTX was founded in 2019 by Samuel-Bankman-Fried, otherwise known as SBF, and was headquartered in the Bahamas, both due to the friendlier regulatory framework in place there and the lack of effective rulemaking in the United States, EU, and many other jurisdictions. Mirroring the rise in cryptoasset prices and investor interest in crypto during 2021–2022, FTX quickly rose to prominence, attracting billions in customer deposits, establishing partnerships with celebrities and sports franchises, and even acquiring the naming rights to a major sports stadium in the United States. Under the surface, however, there were problems brewing almost from the very beginning, and these potential red flags represent items that potential investors, credits, policymakers, and other interested parties should have been aware of from the very beginning.

First, and perhaps most importantly, is that while FTX had rapidly gained a following, social media presence, and high level of customer awareness, the platform itself was still relatively small when compared to rivals such as Coinbase or Binance. These three exchanges were, at their peak, the three largest crypto exchanges in the world in terms of trading volume, customer utilization, and other such metrics. Delving a little deeper, however, the difference in scale between FTX and its two main rivals becomes readily apparent. Whereas Coinbase, sticking with that example for now, has attracted major institutional partners such as Blackrock, operates under the oversight of the SEC, and is generally considered to be a well-regulated entity, FTX has none of those characteristics —being domiciled in the Bahamas.

Secondly, and something that should attract the eyes and attention of any regulatory or policymaker, is the reality that FTX and Alameda were both cofounded, co-run, and co-operated by the same small team of individuals. Close-knit teams are, of course, a norm at many startup organizations, but that is no excuse for the apparent complete lack of governance that was exhibited by FTX, Alameda, and the web of over 130 business entities that made up the sprawling network of firms run by Samuel Bankman-Fried and his team. Setting aside the potentially illegal transfer of customer deposits from FTX to Alameda to shore up losses incurred from aggressive trading strategies, this shared governance was not communicated to the investing public. From an external perspective, FTX and Alameda were, and operated as, completely separate entities that did not share information even as the two of them operated closely together. The reality, however, was not as cut-and-dry, with operations, information, and client data being shared back and forth between the organizations to maximize the benefits attainable from leveraging access to said client data.

Thirdly, the complete lack of transparency surrounding the assets on the balance sheet of FTX should have proven to be an insurmountable red flag to the firm seeking to operate as a regulated entity in an extremely regulated space. Put simply, the level of opaqueness exhibited by FTX around its finances and financial operations would not have been tolerated among virtually any other entity or firm in the marketplace. As was ultimately discovered, this lack of transparency and visibility into the assets and balance sheet of the organization allows potentially fraudulent

activity with the network of firms that surrounded and operated around FTX. Assets on the balance sheet should be audited, which raises an entirely separate yet equally important issue.

The auditability and transparency of assets on a balance sheet should always be able to be examined, attested to, audited, or otherwise confirmed. In the case of FTX, the token that has—in the aftermath of its bankruptcy—caused the most headaches and anxiety is the FTT token. A native token to the FTX exchange, or otherwise an internally created intangible asset, this token formed the bases for collateralizing loans received denominated in other cryptoassets and fiat currencies. In addition, it was revealed that approximately 40% of total assets held by Alameda were comprised of this FTT token, which immediately raised questions connected to the valuation and reportability of these issues. When news furthest broke that Binance, a previous investor into FTX, was planning on selling over 500 million FTT, this caused a renewed focus and attention to be leveled against both the valuation of the token itself and the other loans and operations that this token underpinned. Building on that point, it was a relatively short process from the question being asked to the organization filing for bankruptcy. Yet again, the reality that reserve assets are not widely trusted or verifiable proved to be the downfall of an organization that relied on them.

Lessons Learned from FTX

In the aftermath of the failure of FTX, and the associated collateral damage that continues to wreak havoc as a result of the wider financial marketplace, there are multiple lessons that can—and should—be gleaned from this incident. Let's take a look at these lessons, as well as some of the accounting and financial reporting implications of these incidents.

1. Corporate governance cannot be overlooked. Even for organizations in such a fast moving space, such as crypto, the importance and prioritization of corporate governance cannot be relegated to the back burner. While FTX might be an unusual example of especially poor governance, the rules and processes that help organize how a firm is operated and managed need to be a priority for entities moving forward. The lack of clear and transparent rulemaking in US markets has played a major role in the sending of these firms overseas, which only further exacerbates the issues around reporting, disclosures, and how the governance structures of these firms should be set up.
2. Opaqueness and trade secrets are no excuse for poor risk management. One of the issues that pertained to FTX, and numerous other firms operating in the crypto space, was the lack of access and transparency around the books and records of the firm. The fact that a series of tweets around the FTT token positions held by some outside investors was enough to start a run on the institution is a clear indication that having the records be that opaque is not sustainable in any way. Even more telling, that the financial records and statements of FTX

only became available to the public—in any material way—during the bankruptcy filing process shows that even though FTX was audited, this did not result in any better reporting and/or disclosure processes.

Audits must improve. Speaking of the audit process, even though FTX had full financial audits conducted partially by two of the largest accounting and audit firms in the United States, the reality is that the quality of these audits has now been called into questions. Put simply, if these audits did indeed occur and were completed by firms whose market positioning rested in large part on expertise around blockchain and cryptoassets, how did the organization fail so spectacularly?

From Hype to Proof

Be it taking the form of continued institutional adoption, the fact that state pensions (in the United States) and even entire nations are investing funds into Bitcoin and other cryptoassets, the transition from is just the latest indication that tokenized assets are rapidly achieving mainstream status and accelerated out of the hype cycle stage of investment.

Cryptocurrency may have launched the initial interest and enthusiasm for blockchain technology itself, and the recent recovery in prices is validation to investors and advocates that took a longer-term perspective on the asset class, even during past bear markets. This book mentions and discusses cryptocurrencies, obviously, as they have (and will continue to have) an impact on the financial services space. That said, an appropriate way to think about the complicated relationship between cryptocurrencies, blockchain, and other enterprise applications is to imagine cryptocurrencies as one tool in the proverbial toolkit used by practitioners. Instead of focusing on the price action linked to different cryptocurrencies, the focus has continued to shift toward the enterprise applications for the technology itself. Interest and investment into differentiated blockchain technology solutions are already entering the marketplace, so it appears to merely be a matter of time before the broad-based enterprise adoption already occurring leads to a near ubiquitous state of blockchain onboarding.

Figure 1.1 breaks down and summarizes some of the core concepts related to blockchain, without focusing too much on the technical side of things and instead highlighting the practical components that professionals need to be aware of going forward.

Being Future Ready

Now, following the previous conversation that examines the state of crypto, still learning the lessons from FTX but in the midst of a broad-based bull market, there is more left to discuss. There is another fact that must be acknowledged before we dive headfirst into this rapidly moving and changing technology landscape. In order

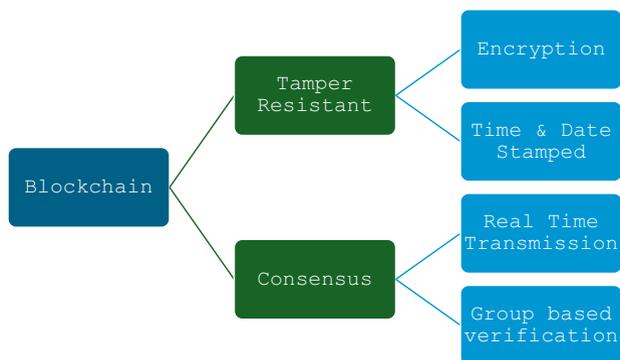


Fig. 1.1 Blockchain basics

for financial services professionals to evolve and develop into the strategic advisor and business partner so often cited as the end goal for the profession, the current level of technological integration is simply not enough. As the broader business landscape continues to evolve and shift at an accelerating pace, it is increasingly obvious a bifurcation is occurring. Within the financial services landscape, which includes everyone from CPAs to investment bankers, there are practitioners and firms who appear to be proactively moving toward where the landscape is shifting, and there appear to be practitioners who are not doing so. Although the transition may be challenging and difficult for some organizations and individuals, becoming future ready or future proof is not something that can be perceived or evaluated as an optional task or something that can be delegated to a chief technology officer.

Rather, the shift toward being future ready or future proof is one that may have been initiated by technology but is much broader in scope. From Amazon to Tesla, customers and consumers are increasingly comfortable with technology, customized data, and real time analytics based on this information. Financial data, by contrast, especially the types of information that is reported to investors and the marketplace, has not changed with the rest of the business landscape. In the financial space, institutions such as JP Morgan, TD Ameritrade, and BNY Mellon have invested tremendous amounts of human and financial capital into successfully leveraging emerging technologies. What remains to be seen is how quickly employees, customer, and regulators can adapt to this new business paradigm. This would be a problem in any event but is compounded by the following reality that has been enabled by the rapid technological integration of business at large. In many situations, especially as software and platforms become easier to use and more readily accessible in terms of cost, the necessity of employing a traditionally certified financial professional may be dropping. Of course, there are specific legal, reporting, and compliance based work that only a certified professional can perform (such as a CPA signing off on an audit), but analytics and forecasting can be, and increasingly is, done by non-CPA, non-CFP, and non-CFA holding practitioners and firms.

Blockchain and artificial intelligence represent powerful technologies that have the potential to launch a paradigm shift in the financial services professional landscape, but they are merely symptoms of a much more radical and comprehensive change. Financial services professionals are, almost without exception, going to have become more adept, forward thinking, and able to use technology in the course of doing business and serving clients. Pushed to the forefront by the rollout of blockchain and artificial intelligence, the financial services landscape, including both the individuals and practitioners therein, must evolve and keep pace with the rest of the changes in the broader business landscape. There are already signs of this transition accelerating within the accounting and financial services profession, with virtually every accounting firm investing in developing blockchain-adjacent services as well as integrating AI within existing service lines.

Even these developments are not without impact from the collapse of FTX, however, with two prominent firms—Prager Metis and Armanino—going through lawsuits and having to withdraw from the tokenized asset attestation field, respectively. While adoption continues to grow and accelerate, the risks for practitioners seeking to provide services and guidance around these technologies are not going away. Rather, it represents yet another balancing act that firms and practitioners need to perform.

The Technology Landscape

While it may seem like technology has emerged rather recently as a disruptive and powerful technology force, the reality is that technology has, over the history of the accounting profession, played an integral role. Put simply, the modern accounting function and marketplace as it currently exists would not exist as it currently is constituted without the integration and implementation of various technology tools. That said, the integration and implementation of tools and platforms such as blockchain options and artificial intelligence represent a fundamental change in how accounting practitioners interact with the broader business landscape. While technology has been a part of the business environment since the development of computer options, the actual implementation of these tools has primarily been focused on automating and increasing efficiency of current processes. Process improvement, achieving increased efficiencies through technological augmentation of existing methods, and driving increased profitability as result are recognized as standard business practices across industry lines. That said, even as technology becomes increasingly integrated into how businesses operate and are evaluated by the marketplace, accounting firms and professionals appear to be playing the proverbial catch-up game with regard to technology.

ChatGPT seemingly changed the game when it was launched by OpenAI in December 2022 as an easy-to-use, intuitive, and interactive AI chatbot that could be used for virtually every and any question area. There were, and still are, components and op-eds that ChatGPT represented the “killer app” for AI that blockchain and tokenized assets still have yet to achieve. The speed and process improvements

associated with technology tools are also evident across different industry lines and geographic regions. Market leading organizations (in the nonfinancial space), including but not limited to Amazon, Google, Tesla, Tencent, Alibaba, and Netflix, have implemented AI tools and platforms to assist with increasing both customer satisfaction and operational performance. With every technology firm, highlighted by the strategic investment and partnership between OpenAI and Microsoft, allocating increasing amounts of time and capital to AI projects, the trend toward broader AI adoption is clear. Gathering information, making effective utilization of different sources of information, and being able to leverage this data to make better business decisions form the basis for possibly a sustainable competitive advantage. Information has been cited, in both practitioner and academic publications, as a potential source of competitive advantage moving forward in terms of both profitability and operational effectiveness. Simply making use of information, however, appears to be insufficient to successfully compete and thrive in an increasingly global and digital business landscape.

Blockchain, regardless of the accounting specific implications of this technology platform, is already being adopted and implemented across different industry lines, including some of the largest multinational organizations across the globe. Examples of organizations that have already implemented blockchain and/or tokenized asset technology include, but are not limited, to JP Morgan, BNY Mellon, Citi, SocGen, PayPal, Mastercard, Visa, and other organizations with supply chains that span different geographic and industrial lines. While this text will be diving into the specific characteristics of blockchain technology, including differentiating factors distinguishing this technology, the overarching theme of decentralized and encrypted information is essential to understand the impact blockchain may very well have on the business landscape at large. The underlying theme, however, is not related to anyone technology, but the growing importance of data as a strategic asset and piece of information.

Data as an Asset

Since the digitization of technology across industry lines, the information produced, analyzed, and communicated by different organizations has been extremely valuable both to management professionals and the external users of said information. That said, the importance of effective data collection, reporting, and analysis appears to only have increased in value as increasing percentages of organizational value are tied up in intangible assets. Going by many names and iterations, including but not limited to intellectual property, intangible assets, and other data driven assets, it appears clear that the information produced by organizations can and should be leveraged to achieve business objectives. Drilling down, and reflecting on just how leading organizations operate and sustain leadership positions in the marketplace, the intersection between data and emerging technologies becomes clearer. Information, both quantitative and qualitative in nature at the inception of data generation, is coordinated, analyzed, and reported as a matter of business practice in

any case. Extending this relationship, and focusing on the importance of using information to make decisions, both blockchain and artificial intelligence can assist management in more efficiently making use of organizational information.

That said, it is not enough to simply harness to technology to make better use of existing information and data; management teams must also be able to protect, filter, and report these varieties of data flows to the marketplace. In a business environment and landscape that increasingly depends on information, both quantitative and qualitative in nature, it is also important that management professionals safeguard and protect these different sources of data. At this point, and prior to diving directly into both an in-depth analysis of technology options and a review of applications for the financial services industry as a whole, a brief overview and introduction of the different technology tools in marketplace appear to be appropriate. While it is true that each technology or trend introduced and listed here will be examined in much more depth throughout this text, a preliminary introduction makes sense for several reasons.

First, an introduction of various ideas, concepts, and applications at an early stage in the text allows the creation and establishment of a working definition to be used not only within this specific text but also in general marketplace conversation. Working off a common set of terminology and concepts is important, but especially important when discussing and examining relatively advanced and amorphous technology trends that include ideas like blockchain, cryptocurrencies, artificial intelligence, and the increased digitization of the accounting function. Second, laying the groundwork for the more advanced and in-depth conversation and analysis that will be a component of this text will help in reducing the hype, buzz, and subsequent confusion present all too often within the discussion surrounding rapid technological advancement. Drilling down and understanding both the components of technology tools and the ramifications of these tools in a logical manner allow for a more substantive conversation focused on real world applications versus speculation.

Third, and arguably the most important part of performing an introductory summary and overview of what will be discussed in this book, is that, by doing so, readers and users of this text will have a roadmap and framework through which to absorb the content contained therein. While, ideally, every reader of this text would focus equally on every chapter and piece of information within this book, if you are more interested in one section over another section of this text, establishing working definitions and guidelines up front provides an opportunity to focus on which areas are most specifically interesting. With that said, and not meaning to represent a comprehensive review of either the topics to covered nor a final definition, the following information can be provided.

Topics and Themes

Technology as a Tool The theme of this book is not to speculate nor offer wild predictions as to the future of the profession nor to launch the discussion of the future of the profession in some other direction toward a future in which practitio-

ners are disrupted out of primary roles and responsibilities. Like many other truths and facts, however, the reality on the ground is far more complicated than either one of those scenarios. Some practitioners and commentators speculate that the future is one of virtually unlimited opportunity and growth for the financial services profession, spurred on and driven by technology tools and adoptions. Anyone who has dealt with financial services practitioners or institutions in real life will be aware of just how many obstacles remain on the path toward full technology integration. Paperwork, in either physical or electronic form, is one of the most prominent pain points between clients, institutions, and brokers.

On the other end of the perspective is the opposite perspective and point of view that is put forth by some in the financial services space. Automation, disruption of current roles, and responsibilities are forces already underway in the marketplace and have both created new jobs and roles and already eliminating other ones during the process. Even as some roles and tasks are automated, however, it is important to weigh the learning curve and obstacles that can hamstring and prevent the full-on implementation and adoption of different emerging technologies. Budgets, the complexity of technology tools itself, and the difficulty of mapping and connecting new technology systems to current enterprise platforms all represent possible stumbling blocks that might slow the adoption and integration of technology overall. That said, and what this book attempts to cover and discuss, are both the technology tools themselves and the implications these tools will have on different aspects of the financial infrastructure.

To kick things off, let's level-set some topics that we will discuss throughout this book.

Blockchain Perhaps one of the most discussed and analyzed technology trends, especially among accounting professionals, of the last several decades, the potential and ramifications of blockchain technology is maturing as larger and more varied firms adopt and implement blockchain-based tools. At the core of the idea, blockchain is *not* a financial services tool, platform, or application by nature. The utilization of terms such a ledger can confuse the issue, but blockchain in and of itself is not by default an accounting platform. Rather, blockchain, no matter if it is operated as a public blockchain, a private blockchain, or an enterprise model that is jointly managed, is a decentralized database that allows users access to encrypted information in real time. Individual components of blockchain technology, such as public/private keys, encryption, and inclusion in a cloud based network, may not represent innovative ideas on a standalone basis but when combined are a potential game changer for the profession, as has been seen via the rapid uptick in adoption by firms both in the United States and abroad.

Artificial Intelligence Turbocharged by the launch and continued refinement of ChatGPT, AI has burst into virtually every accounting and financial services conversations, but it is imperative that professionals maintain a level-headed view of the technology. At the core of the idea, and ignoring the often breathless commentary in

the marketplace, AI represents a program or suite of programs that can augment, replicate, or eventually replace human oversight and interaction with business issues. At this time, and especially appropriate for accounting and finance professionals, is that AI has not yet progressed to the point where it can entirely replace human interaction. What it can do, however, is certainly worthy of additional analysis, specifically in the context of accounting and finance work, especially given the fact that chatbots are already making inroads into almost every aspect of accounting and financial services.

Robotic Process Automation The phrase and concepts that underpin RPA are not necessarily new or innovative in nature. Rather, they have been around in the technology marketplace for several decades, as various types of automation, efficiency oriented projects, and streamlining enabling tools have entered into the marketplace. What RPA does is a twofold change from prior activities and initiatives in this area. First, RPA enables the development and implementation of bots to enter the workforce and, more importantly, for bots and other automaton software to engage in financial and accounting activities. Second, and a core focus of the analysis conducted as a part of this book, is the reality that, for all intents and purposes, RPA can and often is viewed as a realistic stepping stone toward full blown artificial intelligence. A good analogy is to present RPA as a bridge or midpoint between current systems and technology and full blown artificial intelligence platforms. Pointedly, it has seemingly become more apparent that often “AI” implementations are just process automation projects that have been augmented with an interactive chatbot. In addition to being something professionals need to look out for, these projects can also lead to malinvestment and disillusionment with what otherwise is a rapidly growing sector.

Cryptocurrencies Arguably the most high profile example of rapid technological change and adoption by market participants, cryptocurrencies attracted large amounts of coverage for several reasons. First, some believe that they represent an eventual alternative to traditional fiat currency and an option for those not wishing to remain a part of the current financial infrastructure. Second, as a decentralized application, especially in the case of Bitcoin which operates on a completely decentralized model, there is no single entity in charge of regulation, oversight, or enforcement. Put another way, there is no one or nothing in charge of resolving Bitcoin based disputes. Third, and lastly, the uncertainty surrounding both the implementation and taxation of Bitcoin and other cryptocurrencies continues to create anxiety and feelings of stress within the professional landscape. Such uncertainty continues to exist despite the rapid adoption of cryptoassets by TradFi institutions and recent progress made both in terms of court cases and regulatory standards.

Automation Automation and the improved productivity that often comes along with increased efficiency and technological integration can be viewed as both a positive and negative trend for the profession. Viewed from a negative perspective, the increase in automation can, and most likely will, lead to job dislocation and

losses, displacement of some professionals in the workforce, and a redefining of how accounting professionals are educated in the future. Examined from a more positive point of view, however, automation and the increases in efficiency that will be generated will most likely unlock opportunities for the profession associated with both current and future revenue opportunities. Akin to how other technologies have changed the face of accounting and financial services, it seems unlikely that trends such as blockchain, tokenized assets, and artificial intelligence will completely render accountants and auditors obsolete.

Continuous Reporting One of the most common complaints and issues associated with financial reporting and accounting processes in the current marketplace is that, despite improvements in technology throughout the process, the information reported to the marketplace can easily be between 3 and 6 months out of date. Compounding this time delay factor is the reality that, in virtually every situation, the current status of financial reporting is only of interest applicable to a rather narrow set of end users. Regardless of whether the organization is publicly traded/owned, or privately managed, most traditional financial reporting is only applicable or of interest to creditors of equity shareholders. As stakeholders increasingly expect and require a broader array of information, including both financial and nonfinancial information, current accounting processes will have to be automated with technology and transitioned to a more continuous process.

What This Means for Financial Services This entire text is dedicated to an in-depth review and analysis of these technological forces, and just what these forces may mean for the financial services landscape moving forward, but it appears logical to frame the analysis up front to focus the conversation and attention of the users of this text. Put simply, and regardless of what subset an individual practitioner finds themselves within, it is increasingly clear that current practices and processes will be insufficient moving forward. Automation, technological integration, and increasing competition from nontraditional areas are combining to create an environment in which financial services must adapt to keep pace and thrive moving forward. Financial services, including but not limited to accounting, financial analysis, and banking related activities, will need to evolve and change in the face of technological disruption.

The COVID pandemic is often cited as the force that—among other things—brought forward technology and technology trends by between 5 and 7 years. Looking around the financial services landscape, this seems potentially like an understatement; financial markets and professionals are in the midst of a transformation that will have implications for years and decades to come. Blockchain and tokenized assets have moved rapidly from fringe ideas and topics to instruments utilized by even the largest financial institutions and accounting firms in the world. AI, despite justifiable concerns related to its future development and impact on jobs and society, is racing forward with both dollars and intellectual capital pouring into projects. Change has arrived for the financial services world, and this book is an

attempt to—at the very least—contextualize and explain these trends with actionable business intelligence.

While these core areas form the foundation of this book, they are by no means the only subjects to be discussed, nor do they represent the totality of forces driving change within the profession. That said, and important to acknowledge at the beginning of this conversation, is that technology tools and platforms are enabling disruption and change at a pace unlike other disruptive trends that have previously occurred within the profession. Change, of course, is an inevitable part of business and of sector specific development, but the pace of change appears to be accelerating at a rate difficult to contend with using traditional tools and processes.

Summary

This chapter forms the introduction and overview of the terminology and topics that lie at the center of this text, including not only the terminology and technical concepts but also how these topics will connect to the financial services profession. Specifically, this chapter breaks down the technical topics and concepts—ranging from robotic process automation, to artificial intelligence, to blockchain and cryptocurrencies. Reinforcing the appropriate definitions and terminologies associated with emerging technology is especially important for practitioners seeking to have intelligent conversations and debates around these topics moving forward. Bad information can cause even the most promising project to fail, and professionals must be able to objectively assess the viability and legitimacy of projects from both an operational and financial basis. On top of introducing the topics themselves, this chapter also analyzes the topics and content in ways that are understandable and applicable for corporate practitioners. Instead of just focusing on technical or jargon fueled definitions that focus on too much detail, this chapter lays the groundwork for the rest of the text by presenting these concepts in a manner that is understandable and useful for readers of this text. Technology will change and already is changing the face of the financial services professional landscape and is a topic that every professional must understand and apply in order to service clients effectively.

Reflection Questions

1. What is your current comfort level, at an organizational and individual level, with these emerging technology tools?
2. Do clients seem to be knowledgeable or interested in emerging technologies such as blockchain, artificial intelligence, robotic process automation, and cryptocurrencies?
3. Have you or your firm dealt with any regulatory or legal issues associated with these technology tools?



It should come as no small surprise, especially to those of you reading this book, that the business landscape at large is in the midst of a technological paradigm shift. That phrase may appear to be excessive or perhaps a little buzzworthy, but it is difficult to think of a word or phrase that would be equally appropriate. In addition to the underlying trends that are redefining society and business at large, namely, demographic changes, the machinations of global trade, and the increased digitization of information, there are new areas of business and science being developed as we speak. Even with the new technology tools that are the focus of this text, however, it is important to note that the evolution, iterations, and developments of accounting and financial services are not necessarily new; the tools have continued to change rather than the goal of the tools themselves. With every new development, however, comes the proverbial push and pull of innovation and regulation; blockchain, cryptoassets, and artificial intelligence are not exempt from this market reality. These dynamics, specifically as they relate to the accounting profession, represent forces and changes that must be acknowledged and addressed in a proactive manner. Accounting professionals seem to be aware of, from the number of articles and discussions focused around the emerging technology space itself, but action steps still seem to be a work in progress. Even with the legislative and regulatory steps taken by the AICPA, the FASB, and even the SEC (via approval of ETFs), there is substantial work yet to be performed for practitioners to keep abreast and in pace with these technological changes (Fig. 2.1).

Regulation

Put simply, accounting and financial services are a highly regulated set of industries, with regulations and oversight vying with other tightly regulated fields such as healthcare and regulated power transmission and distribution. Taking the political winds out of

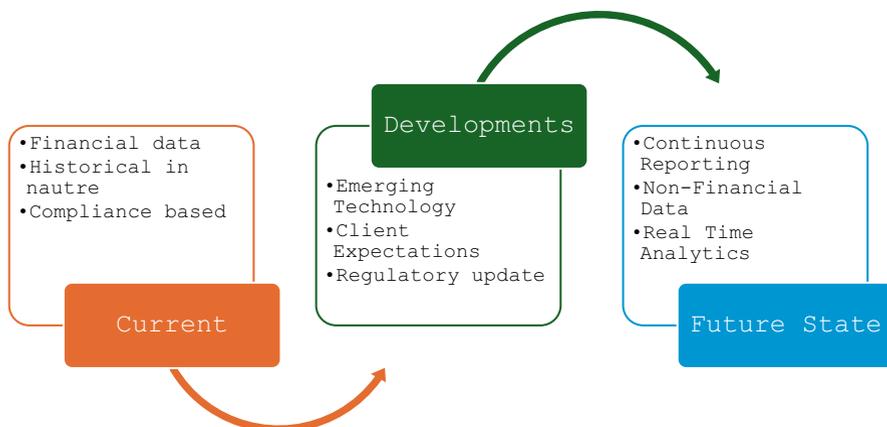


Fig. 2.1 The changing accounting landscape

the equation for the purposes of this conversation, it is reasonable to conclude that regulation has, continues to, and will be a powerful force in the fields of financial services. Traditionally the scope of regulation has been limited to the reporting and communication of financial information to a relatively narrow set of stakeholder groups—creditors and equity owners. Additionally, the guidance and frameworks promulgated by the FASB and IASB form the guidelines and standards by which much of financial information is compiled and distributed. In addition to all of these existing guidelines, however, the rise of the both blockchain and artificial intelligence leads to the following question. As financial services become increasingly integrated with technology tools, will technology style regulation begin to intrude on the profession?

The GDPR, passed in 2018 in the European Union, might have been the first legislation directly influenced by greater digitization of information and business practices, but was not the last. In the United States, following years of advocacy and persistence by the cryptoasset and blockchain investors and advocates, regulators and policymakers have seemingly finally caught on to the importance of frameworks and guardrails for these emerging technology classes. Although the IRS continues to treat cryptoassets as property and therefore classifies every transaction as taxable in nature, and the SEC has maintained its antagonistic approach toward cryptoassets, there has been progress made at the federal level for regulation.

Despite the forward progress made on the multitude of issues facing the blockchain and tokenized assets, there has been progress made on a state-by-state basis, which follows how innovation and technological progress have advanced previously. Let's take a look at how some states have advanced policy debates, business adoption, and investor conversations in the United States, even as federal policy debates have continued to move forward in a haphazard manner.

State-by-State Regulations

Wyoming, beginning in 2018 and continuing in 2019, has taken a rather progressive and forward looking approach to the regulation and fields connected to cryptocurrency and blockchain overall. Mirroring a previously successful attempt to lead financial technologies like those utilized by Dakota and Utah with the credit card processing industries in the 1970s and 1980s, this may not as unusual as it may appear. Wyoming may not be the first place that comes to mind with the idea of a financial technology hub or center of excellence, but it is important to keep track of developments regardless of where they geographically occur. Spearheaded by a Wall Street veteran with decades of experience, and with bipartisan support across the legislative political lines, it seems that these concepts have received an enthusiastic reception. While legislation and the ripple impact of these legislative actions may still have effects that are difficult to understand at this point in time, the ramifications for financial services professionals can be forecasted with some degree of certainty. Drilling down into some of the changes and actions undertaken, there are a few items and pieces of information that should be taken into account.

First, and perhaps most importantly for the treatment of cryptocurrencies and other cryptoassets, a bill, SF0125, has put forth several different classifications for these assets. This may seem like a minor development or change but is significant in ways that are—as of yet—ultimately unable to be forecasted. Drilling down, this legislation breaks out different cryptoassets into three separate categories and also grants cryptocurrencies the same legal status as currencies such as the dollars used to pay and settle other obligations within the state. Again, this legislation is sponsored and supported at a state level but represents the most significant development and progress on these issues to date. In addition to granting Bitcoin and other cryptocurrencies the same legal status as cash within the state, this legislation also seeks to grant banks the ability to manage cryptoassets and cryptocurrencies as assets under administration.

Despite these successes and earlier legislative accomplishments, there have seen setbacks and obstacles that have occurred with the efforts to pass and enact state-by-state legislation. Specifically, the efforts in Wyoming to build on the laws that were passed, creating special purpose depository institutions, have encountered pushback and limitations placed upon them by both the Federal Reserve and the Office of the Comptroller of the Currency. A Wyoming founded crypto-native banking institution seeks to gain access to the Federal Reserve banking system via a Fed Master Account. Even in the face of these obstacles, the state has recently (2023) launched a Stable Token Commission, with the express goal to create and issue a state-backed cryptoasset that will trade at parity with the US dollar. Acknowledging both the progress already made and the work that remains to be done, Wyoming remains a leader in the business of blockchain integration and cryptoasset development.

Second, and building on that last sentence, the ability of banks to manage cryptocurrencies marks a departure and differentiation from the previously dominant legislation in the space—the New York BitLicense. Currently the only financial institutions that are able to offer custody services around different classes of

cryptocurrencies are trust institutions although this continues to change as more TradFi institutions enter the landscape, which complicates matters from a financial services and legislative perspective. Trust companies, or organizations that are offering services via a trust vehicle, must register with the individual 50 states in order to do business across state lines. From a compliance and cost perspective, this also means that the complexity and cost associated with offering these services are such that only the largest and most well-established players—to date—have been able to do so.

In addition, the SEC has come publicly and stated that the trust business model is not the preferred model of offering cryptocurrency services. Banks offer two distinct benefits versus trust organizations that are important for a financial services perspective. The ability to (1) operate across state lines with an operating model that does (2) not require individual regulation or licensure in each state is simpler from a cost and operational perspective than doing so via a trust or trust based model of business. With the SEC also launching multiple lawsuits against crypto exchanges—including Coinbase, Kraken, and Binance—as well as the commentary from Chairperson Gensler, it is safe to say that legal advice for crypto start-ups is equally as important and valuable as technical expertise!

Legalese might not always be an area where financial services professionals feel interested or able to establish a robust dialog or engagement with other professionals but is something that must be factored into any advisory service offerings moving forward. Whether it is something that has been established in different states or changing regulatory models and frameworks being put forth at a national level, the implications of these changes are going to have a profound impact on the operations of businesses both within financial services and in other industries. Offering advisory services and robust client advice to both internal partners and external clients means that professionals need to understand both the financial effects of cryptocurrencies and other cryptoassets and what they mean for the interactions currently underway between different business entities. In addition to these regulations and responsibilities, practitioners also need to be aware and kept abreast of what these mean for how blockchain is evolving alongside other business process improvements.

Changing Accounting Standards

Accounting is often viewed as a traditionally oriented profession that is, at least partially, protected from the winds of disruption and change that tend to dominate headlines and stories, but the reality is far more nuanced. Regardless of which subset of the profession individual practitioners are employed within, there are substantial changes coming in terms of accounting regulation that are having a dramatic impact on both the profession and the clients that they serve. Specifically, the changes to leasing standards, revenue recognition standards, and the classifications of how nonprofit entities report assets and other classes of information are already having effects on how information and data are reported and on how accounting professionals are perceived and interact with colleagues and external partners.

While the justifications for these changes and updates to regulatory standards, postulated by the FASB and being implemented through the 2018–2020 timeframe, differ, the underlying trend is the same; stakeholder groups and users of organizational information are increasingly expecting more up-to-date and relevant data. These changes, and the impact that will be felt by various organizations in different industries, do not appear to be insignificant nor appear to be a passing trend within the broader business landscape. Accounting and financial professionals are, increasingly, expected to be able to render both quantitative information and the implications of this information for business decision-makers. Especially in the context of personalized and customized reporting and customer service from other organizations, accounting firms and the practitioners employed therein must be able to provide equal levels of service and information to customers and clients. The primary focus of these reporting changes was, in theory, to assist with the understanding and interpretation of information that can otherwise be difficult to interpret and analyze for individuals who are not financial experts. That said, and understanding this as the underlying goal of these modified reporting requirements, accounting professionals can, and should, leverage technology to meet the expectations of stakeholder groups.

In March 2023, the FASB, the authoritative accounting standard setter for US GAAP accounting rules, finally made moves toward instituting crypto-specific accounting standards, albeit on a narrow basis. That said, the reality that these issues were being discussed at all should be viewed in a positive light, as it is a clear indication of the seriousness with which these crypto accounting issues are being evaluated. As the number of firms that own cryptoassets continues to increase, and as the balances held by these firms also continue to increase, it makes sense that the accounting rules and standard setters will need to keep pace. While not a perfect solution by any stretch of the imagination, the fact that these best practices are being codified at all should be viewed as a positive development. While the accounting standards continue to evolve, it will also create a period of time where there is more volatility, as companies want to establish better standards but need to do so in a rapidly changing marketplace. Codified in December 2023, this ASU remains the only authoritative accounting standard or rule that has been put forward by US accounting regulators to date, although future efforts are expected.

As stated above, there is certainly enough changing regulation and guidance entering the accounting and financial services space to certainly keep practitioners busy. Revenue recognition, the reporting of nonprofit financial information, and the changing of how leases are reported (moving from off balance sheet to on balance sheet) are significant issues to grapple with even without technology forces driving disruption. Emerging technologies and forces, including both blockchain and artificial intelligence, are going to have a substantial impact on the financial services landscape; regulation and guidance will have to keep pace. Now, it is important to recognize the reality that the guidance may not originate from the United States either—several international markets have already issued guidance and begun to utilize blockchain for business purposes. In any case, professionals will need to

keep pace with the changing regulatory landscape and be able to issue meaningful advice to clients regardless of location.

Especially as it connects to the enterprise applications and payments that can be facilitated via blockchain based platforms, perhaps the most appropriate place to begin this analysis is with international payment and remittances. These transfers, even under the current model utilizing the most sophisticated payment structures and channels, can take days to settle and even longer to reconcile between the different institutions involved. A credit card payment, for example, or a simple remittance of funds from a family member to other family members can take an extremely long time to settle and become finalized. Blockchain, especially the platform utilizing R3's technology—developed and tested for enterprise applications—means that these current pain points and obstacles can be addressed in a comprehensive manner from start to finish. Although the application and development of these technology platforms are still a work in progress at this time, it does point to how integrated blockchain can and might become full meshed within the global financial system.

Technology

Speaking of technology, and linking back to the central theme of this book, it is undeniable that technology and technological innovation are having a profound impact on the accounting profession. Blockchain and artificial intelligence, including the application of cryptocurrencies in the media landscape, have certainly received large amounts of attention and media coverage, but this is merely the most high profile application of blockchain technology in the broader business landscape. Blockchain, at the core of the idea, is a decentralized ledger system that allows encrypted information to be communicated in nearly real time to everyone who is part of the network, with significant implications for accounting systems and information (Surana & Bhanawat, 2022). These dual forces, the encryption and real time dissemination of the information itself, represent a paradigm shift for how information is created, transmitted, and communicated both within organizations and to external stakeholders. While it is true that technology integration is not necessarily a new force or trend within the accounting profession, the embedded nature of new and emerging tools has the potential to change the profession from the top to bottom.

Something that both financial and accounting professionals need to take into account is that, while the technical terminology, acronyms, and jargon may have evolved and changed, the underlying drive and push toward greater technology integration has remained consistent. Automation, digitization, and the increased utilization of technology to handle the decision-making process are forces that have been in existence for several decades. From the beginning of the Internet and computer revolution, technology has been leveraged and utilized by the financial services profession to achieve two goals. First, an overarching goal is to drive down the cost that financial services provided to end users, which mirrors the drive toward lower costs that consumers have come to expect from other areas of the market. Second, and building on the drive toward lower costs and increased service, the ability of

financial professionals to take advantage of technology advances to expand and offer additional services forms a core of how many institutions have thrived following the financial crises. Applying the insights and information already in possession of the organization to new areas and additional products is a substantive way to add value.

Financial services professionals across the different subsets of the industry landscape have dealt with a variety of disruptive forces that have originated both as result of regulatory pushback and oversight and changes within the industries itself. Automation, which has been present in the financial services landscape for decades, would be an unstoppable force in the business landscape by itself, but it has been amplified by recent developments and iterations of technology tools. Blockchain, a decentralized and distributed ledger system, is positioned to—at least to a certain extent—completely reinvent and overhaul how records and other types of information are kept. From a market perspective, it is also evident that decentralizing the transfer of information and recordkeeping will redefine the role of brokerages and market makers, including the role of major financial institutions. These changes and changing definitions and role are already underway as virtually every major TradFi institution continues to allocate resources and intellectual capital to decentralized applications, artificial intelligence, and cryptoassets.

Accounting professionals, already using technology to help automate, improve, and streamline processes within the organization, appear to be uniquely well positioned to deal with the coming technological shift already underway in other professions. An important point to remember, however, is that while the terminology and specifics of certain technologies may have changed during the last several years, the underlying point and purpose of technology for accounting purposes has not changed. While it is true that technology will automate and streamline processes, which will eliminate certain lower level jobs, tasks, and processes, it is important to remember that with every process that is automated, there will be additional opportunities. As lower level tasks become automated, delegated, and outsourced to other professionals, accounting professionals will have to keep pace, evolve, and evolve alongside the broader business forces impacting organizations at large. Technology, certainly, holds potential for the profession and accounting practitioners at large, but it is arguably more important for accounting professionals to have the ability to understand how these tools functions and can improve the profession rather than technical specifics.

Redefining the Profession by Technology

The accounting profession, put simply, has traditionally been a profession and subset of the workforce that has not radically embraced technology nor usually been at the forefront of innovation. Such a resistance to change, innovation, and disruptive forces is not terribly surprising when taken in the context of accounting and the services performed by accounting professionals. Whenever accounting has been up front with experimenting with innovation, such as the creative or innovative