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# HOW CAN DIGITAL HELP REALIZE VALUE IN CAPITAL MARKETS?

## SPEED READ

- Digital is addressing age-old problems that have obstructed capital markets firms and is helping them to identify and quickly implement operational efficiencies to streamline their businesses.
- Current approaches to digitization are steeped in the agile methodology, development democratization, and the ability to combine a firm's capabilities with digital orchestration - the ability to utilize a firm's resources across disciplines and business lines in an efficient and productive manner.
- Near-future digital solutions that the capital markets industry can pursue include artificial intelligence, machine learning, regulatory technology (regtech), and distributed ledger technology.
- In this paper, we explore how best to approach digitization to help realize value and those near-future opportunities, as well as key considerations for capital markets firms making this journey.

## INTRODUCTION

In today's world, digital has become the go-to answer for capital markets firms looking to solve age-old problems and gain quick efficiencies. The breadth of off-the-shelf solutions that have surfaced in the areas of artificial intelligence (AI), machine learning (ML), robotics, natural language processing (NLP), regulatory technology (regtech) and distributed ledger technology (DLT) show promise of cost optimization and support for revenue growth in a digitally maturing industry.

How firms embark upon their digital transformation journey is as important as the opportunities being pursued. In this paper, we present the key approaches when digitizing capital markets and explore near-future opportunities for financial institutions to differentiate themselves.

# KEY TRENDS FOR APPROACHING DIGITAL TRANSFORMATION

**Rapid Identification**
Rapidly identify opportunities that can improve cost, efficiency, and client experience. Fail fast, fail often, fail forward.

**Democratization of Development**
Bring operations, the process SMEs, into the development lifecycle with Low- or No-Code platforms.

**Digital Orchestration**
Assess your firm's ability to orchestrate change. Even with the most cutting-edge technology, poor orchestration can result in lower ROI.

Creating a user-friendly digital solution that gets the job done requires a clear understanding of its optimal use case and benefits for users. It also requires an inter-disciplinary team composed of, but not limited to, business units, developers, style/design teams, and solution architects. To become efficient and effective at delivering these solutions, financial institutions have explored and looked to evolve ways of working that position these roles to be pillars that support the firm's strategic goals while maintaining a center of excellence on the ground.

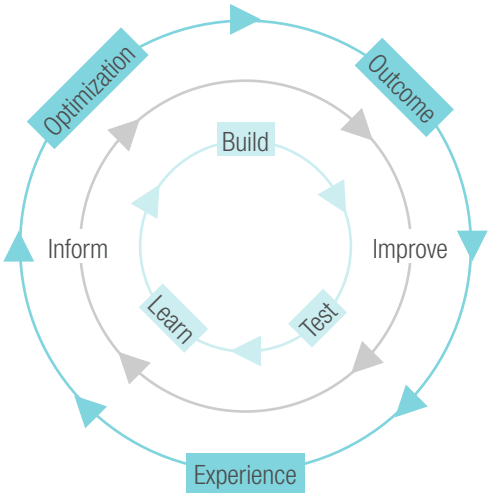
## Trend 1 – Rapid identification and product-driven execution of opportunities

The more iterative, incremental agile methodology has overtaken the traditional sequential 'waterfall' method of software development in financial services: it embraces cross-functional teams, facilitates rapid development, and is conducive to the 'fail fast, fail often, and fail forward' mantra. If implemented correctly, agile is capable of significantly improving time-to-value; projects whose duration would typically be measured in years can be delivered sooner.

Firms should create a way of working that allows the rapid identification and execution of opportunities with the following considerations:

- **Aim to break internal siloes.** Siloed development of digital solutions runs a high risk of accruing technical debt once implemented or of failing to achieve end-user/customer outcomes. Financial institutions should aim to bridge gaps across domains to rally towards common goals and ensure disparate capabilities are developed with the framework of a common product vision.

- **What are current development timelines for minimal viable products (MVPs)?** Financial institutions should embrace a 'fail fast, fail often, and fail forward' mantra that is key to product development. By aiming to develop MVPs in '2-3 week' sprint cycles, financial institutions establish the foundation for creating a culture of rapid execution that can significantly improve a firm's digital transformation timeline.

| | PROJECT MINDSET | PRODUCT MINDSET |
|---|---|---|
| **FOCUS** | Deliver scope on time under budget | Business and customer outcomes |
| **APPROACH** |   |   |
| **RESULT** | Crappy product delivered on time and under budget | Continuously improvising, lovable, product and maximizes budget |

## Trend 2 – Use of a digital platform to gain efficiencies, democratize development, and focus employees on value-add tasks

- **Accelerating digital transformation with low/no-code platforms.** Few financial institutions have the financial and human resources to meet market demand for rapid software development via traditional coding. One key trend to accelerating the transformation process is to democratize the development of digital capabilities through low/no-code platforms – a collection of tools that enable the visual development of applications. As open API solutions, low/no-code platforms allow a firm's employees to build applications to augment any data sets, legacy processes, or even expand on new applications such as RPA with little to no software experience.

- **Retraining vs. replacing the workforce into the Next-Gen workforce.** Firms should consider training and upskilling their current workforce while investing into digital. In tandem with using low/no-code, firms can train their current operations personnel to use these platforms, develop 'citizen developers,' and equip them with the required skill set to assist in simplifying and streamlining the processes they own. A key advantage of this model is that it inspires a new way of working. Upskilling and training operations staff to become a part of the firm's digital culture feeds into one of the most sought-after attributes that current and potential employees look for in the workplace: the opportunity to learn. It ensures individuals feel their skill sets are relevant in what is a fast-evolving industry and allows them to play a key part in the next-gen workforce.

**Trend 3 – Successful digital transformation – that results in growth and cost efficiency – is a function of not just an organization's capabilities, but how well it orchestrates across capabilities and value creation**

$$Tr = C \times O$$

Transformation Capabilities Orchestration

Orchestration is the ability to utilize a firm's resources across disciplines and business lines in an efficient and productive manner. When capabilities of capital markets firms advance faster than orchestration, we often see lower return on investment (ROI) due to the need for rework and the duplication of effort. Firms with higher levels of digital capabilities and, more importantly, orchestration maturity bridge gaps across domains, and ensure that disparate capabilities and entities all move in the same direction. This leads to better user and client outcomes, delivering the promise of growth and efficiency at the same time.

- Capabilities maturity. Firms should have robust methods for benchmarking and modeling customer experience and for driving towards client insights. Combined with the orchestration, a digitally based design can also be tailored to client/user preferences to improve experience and overall stickiness.
- Orchestration maturity. Firms must aspire to become a 'modern' organization - one that has product managers, operational engineers, system architects/engineers, key business stakeholders, and a 'servant leader' to manage the value chain across capital markets. Furthermore, businesses and enterprise capabilities must continue to align and structure themselves to the client/user experiences. Finally, capital markets firms must embrace creative thinking to equip employees from many industries with innovation skills to co-create and spark innovation across functions.

# WHAT ARE KEY DIGITAL OPPORTUNITIES TO PURSUE?

| Artificial Intelligence (AI) / Machine Learning (ML) | |
|---|---|
| Auto Lead Generation | Surveillance |
| Bucketing Transactions | Collateral & Liquidity Management |
| Telemetry | Client Insights |

| Regulatory Technology (regtech) Automation |
|---|
| Name Screening |
| Conduct Risk |

| Distributed Ledger (DL) Technology |
|---|
| Settlement of U.S. Treasury Securities |
| Settlement of Equities |

**1. Artificial intelligence (AI) and machine learning (ML) technologies have numerous applications across the Sales, Data, Operations and Compliance functions. They can provide the power to harness data that the bank generates organically from bankers, traders, and clients, as well as the ability to drive predictive analytics around both internal employee and client behaviors.**

**1.1. Auto lead generation for sales traders/front office:** While it goes without saying that all major investment banks must subscribe to an effective CRM solution, such as Salesforce, it is also imperative that banks adopt more forward-looking ways of engaging clients, such as automated lead generation. Banks can use an AI-powered chatbot to help their clients (e.g. large corporates) learn from existing conversations happening onsite between sales traders and their clients. Companies such as Drift currently provide this service. Information gathered from existing chats enable the bot to answer questions, understand what a good lead looks like, and generate leads organically at scale. Banks can leverage external solutions or create in-house tools to enable more effective lead-generation, based on learnings from prior interactions.

**1.2. AI for surveillance (front office):** Biometrics, employee card swipes, and facial recognition software are already in use across most banks and trading desks. What is more interesting is how employees will be monitored in a distributed working from home fashion, as during the pandemic. Employee monitoring software, such as Microsoft MyAnalytics, can be used to monitor employee behavior, but such tools are nowhere near as effective as the 'on-premise' surveillance technologies implemented at the office. Surveillance will need to continue to evolve as people adapt to a hybrid model of working.

**1.3. AI for bucketing LIBOR fallback categories (operations):** As banks worldwide transition away from LIBOR to alternative reference rates, data relating to thousands of trades must be managed, with an automated solution needed for assigning fallback categories. Data providers such as Bloomberg are making fallback categories available for cash securities such as bonds; however, a more complex solution is required for securitized products. Banks are creating AI-driven bucketing tools to assign fallback categories to trades for products such as ABS, MBS, etc. While the tools are still being refined, and in some cases providing false positives, they help in assigning fallback categories for up to 80% of all trades, leaving only a small fraction to be reviewed manually by legal teams looking to negotiate favorable terms with counterparties.

**1.4. Machine learning for resolving margin calls and collateral management disputes:** Several banks and vendors are investing in ML technologies, which can review and categorize margin calls and collateral disputes as they arise. The number of margin calls and collateral disputes has risen exponentially in recent years due to an increase in regulations such as un-cleared margin rules (UMR). The machine learning algorithm assigns monetary values to each dispute, saving collateral management and data teams the time and manual effort needed to categorize disputes. More sophisticated tools can resolve disputes, eliminating the need for manual intervention entirely.

**1.5. Telemetry for application performance monitoring (APM):** The business and financial impact of unplanned downtime is significant. Application monitoring provides an 'X-ray' into the real time performance of complex systems so organizations can prevent or mitigate outages that affect their customers and bottom line. Firms such as App Dynamics and New Relic are providing distributed, diverse suites of applications so IT organizations can safely and reliably operate their complex solutions in the face of dynamic needs or workloads. Best-in-class APM solutions can:

- Inject detailed tracing information
- Enhance, collect, and harvest telemetry data
- Provide dashboards/ visualizations
- Produce actionable alerts and notifications
- Analyze current behavior against historical trends
- Predict – via statistics and machine learning – the possible failure of components.

# HOW CAN CAPCO HELP YOU?

## 2. Optical character recognition and natural language processing (NLP)

Over the past year, financial institutions have deployed digital onboarding platforms to speed up the collection of know-your-customer (KYC) information. However, many platforms have yet to automate end-to-end onboarding to further reduce their KYC lifecycle and simplify client journeys. Optical character recognition (OCR) and natural language processing (NLP) - two forms of AI together known as document imaging technology can expedite onboarding, cross-utilize existing data and deliver insights into clients' needs and preferences to make onboarding a competitive differentiator.

**Optical character recognition (OCR)** is a digital technology that automates data extraction from typed, printed, or written text, such as a scanned document.

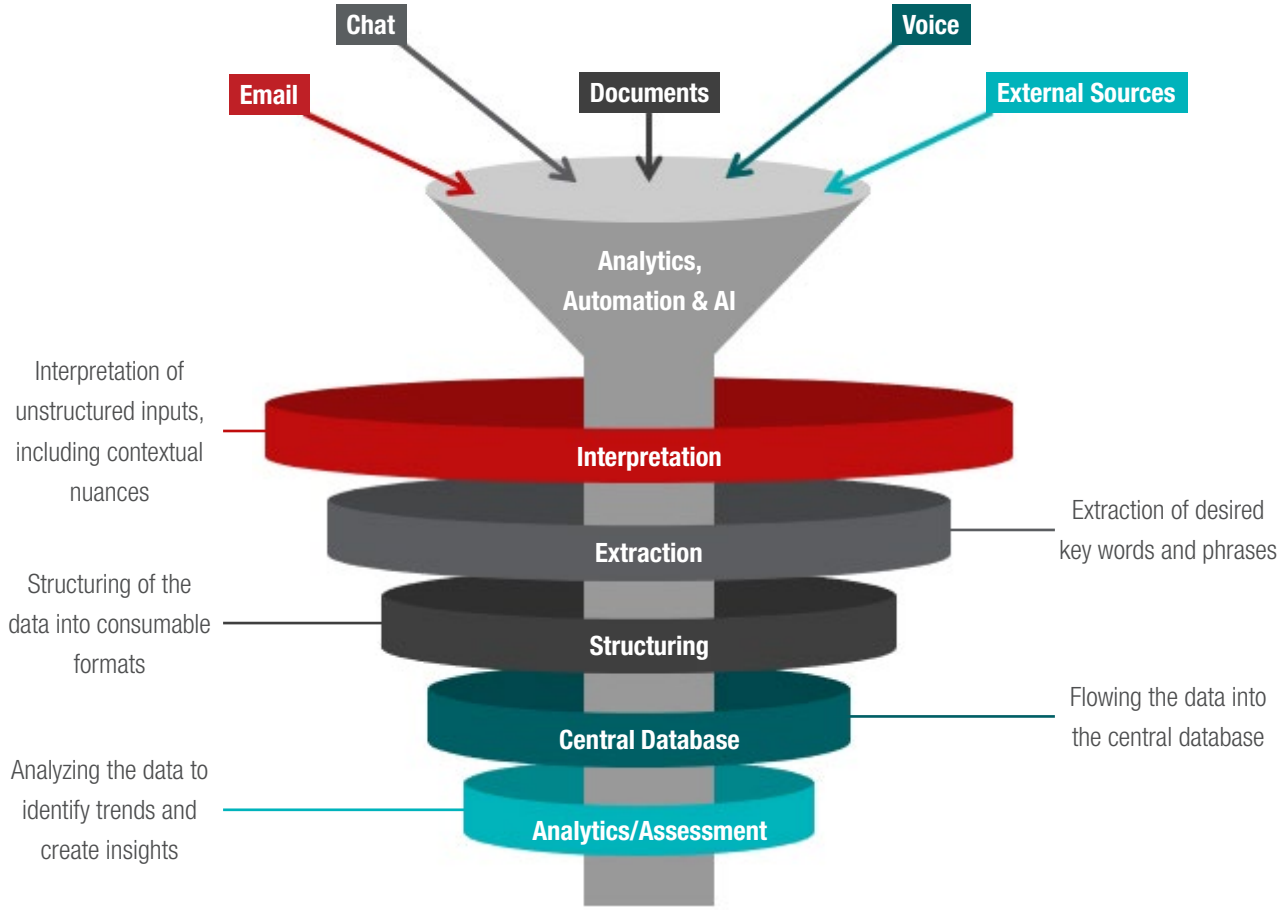
**Natural language processing (NLP)** enriches this process by enabling those systems to recognize the nuances of the human language (such as speech patterns and slang).

**2.1. Optical character recognition (OCR) and natural language processing (NLP) to optimize onboarding.** By using OCR and NLP, financial institutions can reduce this operational burden and improve clients' experience by automating the process of 1) reading scanned documents; 2) extracting key information; and 3) systematically consuming and reusing that information in the underlying IT systems. In one example, a leading US bank implemented an enterprise KYC solution that automated data extraction from various documents (i.e. legal, email, news, etc.) and used that information to conduct automatic risk screenings and checks[1], resulting in a reduction to the KYC lifecycle by 30-50% and client outreach by 30%[2]. From their clients' perspectives, it streamlines a frustratingly lengthy process that can take weeks to months of back-and-forth communication, and, anecdotally, disappear in a 'black box'.

**2.2. Natural language processing to provide insights into client needs.** The application of NLP goes beyond just client onboarding. NLP has the ability to analyze unstructured human speech and organize it into consumable data, a powerful capability that can be used to look into client preferences and needs. In one example, a tier 1 global bank implemented NLP to read Bloomberg chat interactions with clients and mine for key phrases in deals that were completed and deals that were not. By analyzing not just individual instances of failed deals, but every failed and completed deal over a period of time, NLP provides financial institutions the ability to create insights into how business and deal practices can improve.

Given the troves of unstructured data that capital markets firms have yet to rationalize (i.e. emails, chats, legal documents), with the right strategy we view NLP as a powerful tool that can change how financial institutions define their competitive edge.

1. By reaching out to internal and external sources, advanced solutions can ensure completeness of information and create an audit trail
2. https://www.wipro.com/holmes/top-us-bank-uncorks-power-of-cognitive-computing-for-kyc-automat/




## 3. Regtech automation to ease the burden of overly costly regulatory compliance

In 2020, financial institutions paid $10.4 billion in fines for violations relating to AML[3]. It would be an incomplete statement to say that these fines are simply a result of highly manual compliance operations susceptible to missed information, poor audit trails, and inconsistency. Rather, regulation changes regularly and means financial institutions face a very challenging task remaining compliant. Vendors today have created regulatory compliance solutions that leverage a combination of advanced analytics and intelligence that can not only reduce the burden of change efforts but also reduce operational costs.

**3.1. Regtech to manage conduct risk holistically.** There is always ahigh risk of employees potentially gaming the system of conduct risk management, as current methods of managing conduct risks – by identifying irregularities on a rules-bases – are reviewed in individual sets that rarely 'connect the dots'. Regtech solutions leverage NLP, AI and advanced analytics to enable firms to take a more holistic view of their employees' behavior. By sourcing data from several data sets (i.e., chat logs, emails, call recordings, access logs for applications, etc.), regtech allows computers to conduct comprehensive assessments of employee interactions. At a high level, regtech can empower risk management programs by conducting the first round of risk identification, leaving only the high-risk cases to be scrutinized via human review.

3. https://start.workfusion.com/use-case/pep-screening-alert-review/

**3.2. Regtech to reduce costly false positives in customer name screening.** Current methods of compliance to Bank Secrecy Act (BSA)/AML name screening – for sanctions and politically exposed persons (PEPs) – are also an area ripe for potentially vast improvement. In 2020, global financial institutions paid $10B+ for AML violations[4], while spending towards compliance has steadily risen. The fines are often a result of staff manually reviewing thousands of individual false positive name screening alerts on a regular basis, a process susceptible to inaccuracy and inconsistency (as well as material cost). Through a collective network of sourcing data from internal bank KYC database(s) and external (e.g. government information) portals, automation can reduce the rate of false positives by up to 80% .

## 4. Distributed ledger technology capabilities to improve efficiency, security, and speed

Distributed ledger technology – or blockchain technology –refers to the technological infrastructure that allows simultaneous access to an immutable ledger (a database). DLT – or blockchain technology – provides efficient and resilient information transfer that are estimated to save capital markets billions in operating expenses, once adopted in full. The industry is at key juncture in DLT solution development and adoption, making it an imminent opportunity to transform operating models even in present time horizons. Specifically, we consider its application to the post-trade settlement process to be the next trend.

**4.1. Blockchain technologies in the US repo (repurchase agreement) market.** With the US Office of the Comptroller of the Currency (OCC) providing the greenlight to use stablecoins as payment and participate in independent node verification networks, financial institutions are extensively exploring leveraging blockchain technology to provide, speed, security, and cost-savings to their clients. For example, JP Morgan has created a digital currency, JPM Coin, to transact repo market trades with their bank and broker-dealer counterparts . The digital currency leverages blockchain technology and smart contracts which allow cash and treasuries to be returned with minimal cost, risk, and instant execution, gaining interest from competitors such as Goldman Sachs.

The features of blockchain that make it such a valuable technology for post-trade settlement are: 1) a single truth layer of traded data for banks; 2) automatable processes; 3) oracles (secure data feeds into smart contracts from internal and external sources); and 4) signatures showing agreement. While we won't go into these elements in this paper, what is important to understand is that these elements are what make possible instant payment and delivery verification, automatic settlement, and single source of truth records.

**4.2. Blockchain technologies in the equities market.** Beyond instant settlement of cash and treasury transactions, blockchain can also be leveraged for equity and commodity settlement as well, offering benefits in liquidity and credit risk (particularly principal risk) management. The latest development in this space comes in the shape of Bank of America's partnership with Paxos Trust Co, joining Paxos' pilot network to facilitate settlement of equity trades in minutes rather than days .

Blockchain may be the next best solution for the 'age-old' operational challenge of reducing the T+2 settlement timeline to T+0. While current applications of blockchain are limited, as interoperability with current capital markets infrastructure remains a challenge, through the sophistication of blockchain technology, we expect to see its benefit of speed and efficiency to unlock new growth potential for the industry long-term, exponentially favoring early adopters.

4. https://www.fenergo.com/press-releases/global-financial-institution-fines-for-aml-data-privacy-and-mifid-rise-26-in-2020/
5. https://www.occ.treas.gov/news-issuances/news-releases/2021/nr-occ-2021-2.html
6. https://www.bloomberg.com/news/articles/2020-12-10/jpmorgan-using-blockchain-to-move-billions-in-repo-market-trades
7. https://www.bloomberg.com/news/articles/2021-05-17/bank-of-america-joins-paxos-blockchain-stock-settlement-network

# CONCLUSION

As highlighted in the previous sections, capital markets firms must combine their deep subject-matter expertise and digital orchestration (ability to utilize a firm's resources across disciplines) to realize value through digital capabilities. In fact, the process of creating and deploying a new digital tool/capability is quite different from creating new financial products. Financial institutions must have the capacity to apply design thinking, agile, product-focused ways of working to ensure customer-centric design, innovation, and rapid delivery. To begin the journey to implementing a digital ecosystem, financial institutions should consider the following questions:

1. **What is the vision?** Confirm the long-term digital goals and evaluate the multi-year vision for improving your capabilities inside. Only after clarifying the vision, can firms consider some of the harder-hitting strategic decisions.
2. **What are the right digital capabilities?** Identify the core value-add business areas that should be optimized and assess the capability landscape to identify what technology should be implemented where.
3. **What is the target operating model?** Assess how digital applications will communicate to streamline day-to-day tasks such as onboarding, data access, trade processing, and regulatory compliance.
4. **Who are the right partners?** Leverage the current market of innovative vendors to curate partner networks to accelerate delivery.

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## ABOUT CAPCO

Capco is a global technology and management consultancy dedicated to the financial services industry. Our professionals combine innovative thinking with unrivalled industry knowledge to offer our clients consulting expertise, complex technology and package integration, transformation delivery, and managed services, to move their organizations forward.

Through our collaborative and efficient approach, we help our clients successfully innovate, increase revenue, manage risk and regulatory change, reduce costs, and enhance controls. We specialize primarily in banking, capital markets, wealth and asset management and insurance. We also have an energy consulting practice in the US. We serve our clients from offices in leading financial centers across the Americas, Europe, and Asia Pacific.

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