The Top Strategic Technology Trends in Banking and Investment Services for 2022

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Initiatives: Financial Services Technology Modernization and Transformation

The Gartner cross-industry trends of TX, hyperautomation and composable applications are impacting technology investments at banking firms in 2022. In this research, CIOs can learn how these trends — and generative AI, privacy-enhancing computation and autonomic systems — will impact the business.

Overview

Opportunities

- As bank and investment CEOs seek to gain or maintain growth, CIOs have an opportunity to deliver on innovations that will accelerate momentum and help CEOs meet those business goals.
- Digital business in retail banking, commercial banking and wealth/investment management has been propelled over the last two years for both customers and employees. 2022 brings the opportunity to scale digital technologies and to implement the next wave of digitalization.
- While growth in banking and investments is the top priority, the need to do so efficiently through cost optimization and risk management also requires new technology innovations.

Recommendations

Bank and investment CIOs responsible for financial services technology modernization and transformation should:

- Include total experience, hyperautomation and composable applications into your technology roadmap, whether you're just getting started or you are scaling digital business.

- Plan for the future by exploring the potential of generative AI to propel your research and development efforts in fraud detection, lending, business intelligence and scenario planning.
- Scale your IT competencies by experimenting with autonomic systems capabilities.
- Investigate privacy-enhancing computation to be prepared as privacy rules are implemented around the world.

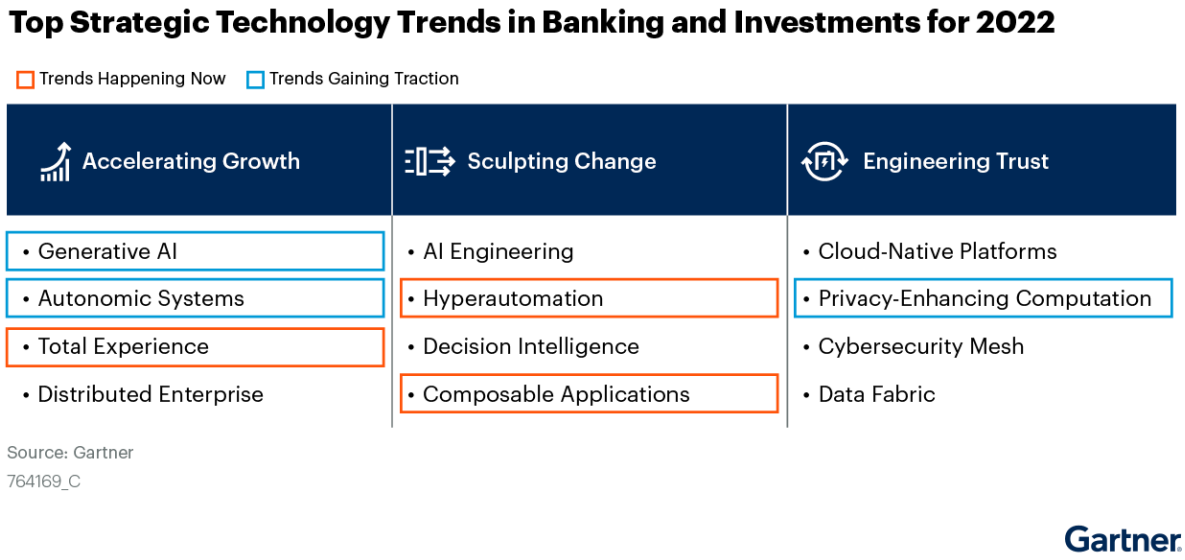
Strategic Planning Assumptions

- By 2024, diffuse hyperautomation spending will drive up the total cost of ownership fortyfold, making adaptive governance a differentiating factor in corporate performance.
- By 2024, the design mantra for new SaaS and custom applications will be "composable API-first or API-only," rendering traditional SaaS and custom applications "legacy."
- By 2025, 20% of all test data for consumer-facing use cases will be synthetically generated.
- By 2026, 40% of banks and investment firms will create an organizational structure based on customer journeys to achieve total experience success.
- By 2024, 20% of organizations that sell autonomic systems or devices will require customers to waive indemnity provisions related to their products' learned behavior.
- By 2025, 60% of large organizations will use one or more privacy-enhancing computation techniques in analytics, business intelligence or cloud computing.

What You Need to Know

Each year, Gartner identifies the top strategic technology trends that apply across all industries. In each industry, a subset of those trends will be prominent. We have identified six trends affecting banking and investment services — three already happening today and three that will gain traction over time. These trends are being highlighted because they collectively contribute to financial services firms' goals to run, grow and transform the business, and have demonstrated use cases in the banking and investment industry (see Figure 1). It is important to note that there are also industry-specific trends not mentioned here, such as the usage of cloud and artificial intelligence (AI), and environmental, social and governance (ESG) and fintechs affecting the technology decisions that firms are making. This note is intended to provide the context of the cross-industry trends identified by Gartner for the banking industry.

Figure 1: Top Strategic Technology Trends in Banking and Investments for 2022



Those trends identified as "happening now" address top objectives for CIOs immediately in 2022 and into 2023. In Gartner's 3Q21 Financial Services Business Priority Survey, the top business priorities at the start of 2022 align directly to the three trends we see happening now — total experience (TX), hyperautomation and composable applications. [1] According to the survey, evolving products and channels to meet customer needs (TX), accelerating investments in new technological capabilities (composable applications) and improving automation processes (hyperautomation) are top priorities.

In addition to these immediate trends in banking, there are three trends that Gartner believes will continue to grow over the next two to three years, contributing to growth and transformation of organizations. Generative AI, autonomic systems and privacy-enhancing computation are all likely to play a role in bank technology strategy and investment because of the practical use cases identified.

In summary, composable applications and hyperautomation help CIOs run their business more efficiently and effectively, while TX and generative AI contribute to the growth strategy. Privacy-enhancing computation and autonomic systems are longer-term, transformational technologies.

For each of the six trends, the implications and use cases in banking and investment organizations are described in detail below. To jump to a specific trend, use the hyperlinks in this table.

Trend Profiles: Click links to jump to profiles

Run	Grow	Transform
Hyperautomation	Generative AI	Autonomic Systems
Composable Applications	Total Experience	Privacy-Enhancing Computation

Run the Bank or Investment Firm

The following strategic technology trends — hyperautomation and composable applications — will help CIOs with foundational running of their bank or firm. Both of these trends can be applied across the enterprise, with the leadership of IT.

Hyperautomation

Back to top

Analysis by Nicole Sturgill

SPA: By 2024, diffuse hyperautomation spending will drive up the total cost of ownership fortyfold, making adaptive governance a differentiating factor in corporate performance.

Description: Hyperautomation has two objectives in an organization. One is more tactical — the combination of automation technologies like robotic process automation (RPA), low-code/no-code, AI and natural language processing to automate processes end-to-end. The other is strategic — to automate the organization in every possible way using a scalable approach across the enterprise. Financial services organizations are at varying stages for each of these objectives. While some organizations are still using a single tool like RPA to automate a single task in a process, leading firms are starting to create automation centralization with multiple tools available for operations, product and functional teams to access.

Why Trending: The shift from automation to hyperautomation has been building over the last few years, culminating in 2022 as the requirement to scale across the organization, rather than just automate specific tasks and processes. In a recent Gartner webinar, 40% of attendees said they were managing four or more concurrent projects and 16% said they were managing 15 or more projects at the same time. [2] As banks and investment firms are building their hyperautomation capabilities, funding moves from specific applications and tools to focus on skills and resources, both internally and through outsourcing. The mindset shift from acquiring resources to address specific business problems, like speeding up loan origination or enabling first contact resolution in the contact center, to scaling those resources throughout the enterprise is what makes hyperautomation a continuing trend.

Implications: Gartner inquiries have shown that banks and investment firms that started with single solutions and then attempted to scale hyperautomation efforts have found that they face a multitude of issues. In some organizations (especially large firms), there are multiple instances of the same tool. Perhaps operations invested in an RPA tool but so did compliance, finance and IT. This creates significant overhead at the enterprise level — in cost, skills, maintenance and processes. Additionally, some firms are having a hard time getting buy-in from affected groups, are struggling with project prioritization, are experiencing a resource shortage and aren't clear on who is making the automation decisions.

Actions:

- Identify all stakeholders as part of any automation project and involve them in the decision-making process.
- Build a governance structure to guide technology selection, process implementation and algorithm definition for any automation project.

- Prioritize automation initiatives that deliver clear quantifiable business outcomes and for which the resources already exist within the organization.

Further Reading:

How Automation Will Change the Future of Work in Financial Services

Tool: Banking and Insurance Use Cases to Drive Hyperautomation

How CIOs Can Choose the Right Metrics to Quantify the Benefits of Financial Services Automation Investments

Composable Applications

Back to top

Analysis by Nicole Sturgill

SPA: By 2024, the design mantra for new SaaS and custom applications will be "composable API-first or API-only," rendering traditional SaaS and custom applications "legacy."

Description: Composable applications have been developed to serve the dispersal of IT services throughout the enterprise. As the business technologist role grows, fusion teams are being created that need access to business-centric services without having the deep technical knowledge needed to create them.

The composable application experience is made up of four actors — creators, curators, composers and consumers. **Creators** design and create the building blocks that are made available to curators. Building blocks would, for example, be APIs that calculate a borrower risk rating or collect electronic signatures. **Curators** manage the marketplace of all the building blocks, making sure that all of the components needed across the enterprise are available. **Composers** then use those building blocks to compose applications — such as mortgage loan origination or auto loan origination — to be made available to consumers. These **consumers** use the applications to pursue and achieve their business goals. It's important to note here that consumers in this context refers to consumers of the applications, either internal or external, and does not refer exclusively to consumers who are customers of the bank. In this context, a consumer may be someone who works on digital loan origination or on credit policy.

Why Trending: Three factors are driving banks and investment firms to begin to reorganize for composable applications:

1. The use of APIs is now pervasive in application design within firms and when working with vendor applications. In fact, in the 2022 Gartner CIO and Technology Executive Survey, 54% of senior technology leaders from banking enterprises indicate that they are increasing their investment in APIs and API architecture. [3]

2. Low-code technology makes it possible to develop functionality at the granular level needed to create the building blocks that can then be used throughout the organization.

3. The pace of change, which we all thought was rapid before the pandemic struck in 2020, has only quickened since then. Many financial firms had to quickly create new products and processes to address remote work and new or increasing customer needs, like small business loans or payment holidays. Rather than return to a slow pace, many firms realized what they were capable of achieving and are now using agile methodologies and APIs to enact faster change processes.

Implications: For banks and investment firms with significant technical debt and monolithic legacy applications, the shift from IT project-based implementations and maintenance to a granular infrastructure requires significant changes. The 2022 Gartner CIO and Technology Executive Survey found only 7% of banks and investment firms were following the practices of a highly composable organization. [3] On top of technology changes, factors such as organizational structure, project management and the relationship between IT and the business make this trend, however attractive, a slow one for financial services. For now, changes in vendor requirements for an API-based architecture, hiring and training resources on API development, the creation of fusion teams, agile methodologies and decentralizing decision making are precursors.

Actions:

- Take tactical steps to convert from legacy infrastructure and build out your API infrastructure. All new applications should be API-based and firms should convert and supplement existing applications where possible.

- Leverage non-IT resources to democratize IT throughout the organization. Traditional firms will often have a “command and control” approach in which IT develops and maintains all infrastructure. CIOs should begin to leverage non-IT resources, taking more of an oversight approach to ensure compliance with governance policies.
- Build a composability roadmap. Focus on opportunities for competitive differentiation, like speeding up loan approvals processes or expanding the product set by building out your partner ecosystem.

Further Reading:

Emerging Use Cases That Validate the Business Value of Open Banking

Embrace Banking as a Service and Help Unlock New Revenue Streams

Top Strategic Technology Trends for 2022: Composable Applications

Grow the Bank or Investment Firm

While growth strategy is typically driven by the business, execution cannot happen without CIOs and their teams. The following strategic technology trends — generative AI and TX — will enable CIOs to offer technology solutions to the business in pursuit of enterprise revenue growth.

Generative AI

Back to top

Analysis by Moutusi Sau

SPA: By 2025, 20% of all test data for consumer-facing use cases will be synthetically generated.

Description: Generative AI is a form of AI that learns a digital representation of artifacts from sample data and uses it to generate new, original, realistic artifacts that retain a likeness to the training data but don't repeat it. The input artifacts can be content (such as data, text, code, context data for market conditions), while the output can be in the same form as the input or in a new mode (such as simulated market data information). In financial services, there is application of generative adversarial networks (GANs) and natural language generation (NLG) in most scenarios for fraud detection, trading prediction, synthetic data generation and risk factor modeling.

Why Trending: Generative AI and the technologies like GANs and NLG have potential in banking and investment services because of the ability to take personalization to new heights. Generative AI has been trending lately due to its wider applications in creation of synthetic data using GANs that can be used to create fairer and less biased AI because they can represent different dimensions in training data. NLG can be applied for data storytelling methods that are gaining popularity in this space.

Implications: Generative AI will come to reshape many areas of the enterprise, from product, content and customer experience to analytics, software engineering and AI learning methods. An example of an immediate application in banking and investment services is applying synthetic data to expand fraud patterns and detect financial frauds and money laundering strategies. Deep neural networks are commonly applied in cases where synthetic data is also used as new rules can be found by this technique. GANs can understand new patterns which are correlated with an anomaly score. NLG is applied for report generation, end of the day commentaries, summaries or customized insights for portfolio generations across retail banks, commercial banks or investment services.

Actions:

- Create a first-mover advantage in the use of generative AI by applying GANs in a creative way in areas such as training data, test data, code or creating context data.
- Explore external ecosystems and vendors who are creating innovative applications and have demonstrable examples in financial services. For more detail on how generative AI can be used, see Top Strategic Technology Trends for 2022: Generative AI.
- Continue to build your AI expertise to create a foundation. Then work with the data scientists or center of excellence in your organization to bring in use cases where GANs or NLG could be applied innovatively to different parts of the business.

Further Reading:

Predicts 2022: Generative AI Is Poised to Revolutionize Digital Product Development

Analytics and Business Intelligence Vendors Are Acquiring Augmented Analytics Vendors

Cool Vendors in Conversational and NLT Widen Use Cases, Domain Knowledge and Dialect Support

Total Experience

Back to top

Analysis by Nicole Sturgill

SPA: By 2026, 40% of banks and investment firms will create an organizational structure based on customer journeys to achieve TX success.

Description: TX is a business strategy for creating superior shared customer and employee experiences by interlinking customer experience (CX), employee experience (EX), user experience (UX) and multiexperience (MX) disciplines. In financial services, that means:

- Focusing on financial empowerment support for consumers and businesses (CX)
- Providing the tools and resources for employees to easily engage with customers (EX)
- Designing individual channel user experiences to meet financial empowerment support needs (UX)
- Aligning those experiences across channels (MX)

Why Trending: Less than half of banks (48%) are confident that they can effectively execute when it comes to evolving products and channels to meet changing customer needs. [1] This is after decades of investment to add new channels while adding functionality to existing channels. The siloed product and channel approach isn't working. TX provides a new way of thinking and organizing based on customer journeys. It is enabled by technologies for design, development, content, automation and analytics, and is centered around customer journeys like unexpected events (a medical emergency), significant life events (getting married) and day-to-day financial management (paying bills).

Implications: Taking a TX view requires that an organization apply composable business principles, creating multidisciplinary teams across IT, operations, channel delivery and lines of business. In order for TX to succeed, business processes must be designed in parallel with technology capabilities (including dynamic integration capabilities connecting data), analytics and application components must be created, and accountability for the TX must be distributed across the organization.

Actions:

- Ensure that the organization has multiple methodologies and technologies for understanding the context of customer financial situations. For example, convert bank-focused journeys like "opening a new checking/current account" to customer-focused journeys like "opening my first checking account" or "opening a joint account because we're getting married."
- Coordinate with stakeholders to map these customer journeys across products and channels, uncovering missing products and services.
- Structure your IT organization to enable employees to be a part of and support multidisciplinary teams created to respond to customer journeys.

Further Reading:

Top Strategic Technology Trends for 2022: Total Experience

Customer Experience Drives Retail Banking Investment in Mobile and Digital Payment Technology

Enhanced Hybrid Roboadvisor: Meet Wealth Client Segment Needs While Creating a Cyborg Advisor

Transform the Bank or Investment Firm

Transforming the firm — actually changing the business model — is a risky proposition for most organizations, one that takes time to research, plan and incrementally implement. These strategic technology trends — autonomic systems and privacy-enhancing computation — while a long-term solution, will someday offer CIOs new options for business transformation.

Autonomic Systems

Back to top

Analysis by Moutusi Sau

SPA: By 2024, 20% of organizations that sell autonomic systems or devices will require customers to waive indemnity provisions related to their products' learned behavior.

Description: Autonomic systems exploit continuous learning and dynamic adaptation to provide superior automation of tasks and business processes in complex and dynamic environments. Autonomic systems learn from experience and can modify their behavior in real time and deem their internal operations as necessary. This makes them valuable in unknown or unpredictable operating environments, as well as when remote real-time monitoring and control aren't practical. Autonomic systems (like humans) will operate within a framework of what's permissible and practical, given their capabilities and constraints. What differentiates them, however, from simpler automated systems that might be designed or trained for a specific task is their ability to dynamically learn and adapt their own behaviors.

Why Trending: Autonomous systems go beyond simple automation that can exhibit adaptable behavior through learning and self-modifying algorithms. Autonomic systems currently are mostly software-based in the banking context. However, we are seeing the emergence of humanoid robots in smart branches that are examples of hardware-based autonomous systems that cater to clients and customers. We differentiate autonomic systems from their ability to be aware. However, there are three pieces to autonomic systems — automation, learning and awareness. In the banking and investment services context, we can already find examples of automation and learning.

Implications: Autonomous systems have a time horizon of five years and above. However, within banking and investment services, we can already start thinking of this concept as an end-to-end value chain where the building pieces of an autonomous bank are already starting to come together. Autonomic systems could be applied in autonomous debt management, personal finance assistants and automated lending. Roboadvisors are essentially low-level autonomic systems. However, there are still concerns about trusting roboadvisors because of their high level of automation.

Actions:

- Pilot autonomic systems in situations that require complex and rapidly changing environments, like stock markets, where early adoption will teach the system to maneuver and develop agility.
- Start small and think about any process within the banks as an end to end, and find opportunities to automate small steps that might ultimately make the process automated. One example to assess is credit underwriting where a high degree of analysis is still required.
- Manage unpredictability of autonomic systems by analyzing business, legal and ethical factors that go into decision making by creating a multidisciplinary center of excellence.

Further Reading:

Top Strategic Technology Trends for 2022: Autonomic Systems

Infographic: Artificial Intelligence Use-Case Prism for the Banking Industry

Tool: Artificial Intelligence Use Cases for Banking and Investment Services

Privacy-Enhancing Computation

Back to top

Analysis by Moutusi Sau

SPA: By 2025, 60% of large organizations will use one or more privacy-enhancing computation techniques in analytics, business intelligence or cloud computing.

Description: Privacy-enhancing computation (PEC) techniques allow protection of data in use and also allows processing of data confidentiality in AI modeling, cross-border transfers, analytics and business intelligence that were not possible in earlier scenarios. "PEC" is an umbrella term for various forward-looking and emerging techniques — each with different security and privacy guarantees. They can be used individually, but may also be combined for greater assurance.

Why Trending: Data has an inherent role in any analytics, computing and data monetization efforts within financial services. However, due to regulatory requirements, compliance risk, trust in brand or to retain customer's trust, there are confidentiality requirements regarding how or which data can be used within the organizations. Compliance risk and cybersecurity remain the top risks to banking and investment services firms. PEC techniques aid in protection of privacy and confidentiality, which also makes the data useful when applying it in business activities and analytical methods. PEC provides robust, sustainable measures to gain, pool, process or share information while data remains protected in use.

Implications: The three methods that are more pervasive in the banking and investment services context are as follows:

1. **Synthetic Data Methods:** Synthetic data is created using generative AI where it has helped:

- Augment training data to build AI models when insufficient data is available
- Protect privacy as it resembles real data but can't be traced back to an actual client or transaction
- Reduce bias by using generated data to balance training data

Synthetic data is being used in banking use cases like fraud detection, anti-money-laundering (AML) and know-your-customer to preserve privacy as it cannot be traced back to the real person.

2. **Secure Multiparty Computation (SMPC):** SMPC has been applied in user and device authorization in fintech services, including payments. It is applied for biometric authentication. SMPC makes it effective to analyze discrete combined data without disclosing the underlying data to underlying parties, such as when assessing creditworthiness. [4]

3. **Zero-knowledge Proof (ZKP):** ZKP is a privacy-preserving messaging protocol. It allows two organizations to verify whether information assumed to be available to both of them is correct, without sending that exact information multiple times to the same party. ZKP has applicability in use cases including payments, custody, AML, know your customer (KYC), identity access management (IAM), and mergers and acquisitions, which shows broad applicability across corporate banking and investment services. [5] This has also been successfully applied for blockchain privacy. [6]

Actions:

- Apply synthetic data in situations where there is a lack of training data and there is a need to preserve privacy and protect identifiable data.
- Use a combination of many techniques, including synthetic data, SMPC and ZKP to secure data during computing and analytics — including AI. External facing use cases might require deeper expertise and capabilities.

Further Reading:

Top Strategic Technology Trends for 2022: Privacy-Enhancing Computation

Three Critical Use Cases for Privacy-Enhancing Computation Techniques

Evidence

[1] **3Q21 Gartner Financial Services Business Priority Survey:** The financial services research team fielded the 2021 Gartner Financial Services Business Priority Survey from September through October 2021, primarily targeting senior-level and C-suite executives. Leaders in the United States constitute 49% of the respondents, and those in Europe 16%. Canadian, Latin American, Asia/Pacific, Middle Eastern and African leaders make up the remainder of the sample.

[2] Polling data from November 2020 webinar titled: The Gartner 2021 Predictions: Accelerate Results Beyond RPA to Hyperautomation from the question, “How many hyperautomation initiatives are taking place within your organization?”. The number of respondents ranged from 184 to 399, depending on the question they chose to answer.

[3] The **2022 Gartner CIO and Technology Executive Survey.** This survey was conducted to help CIOs and technology executives adopt business composability as a means to thrive during periods of volatility and uncertainty. It was conducted online from 3 May 2021 through 19 July 2021 among Gartner Executive Programs members and other technology executives. Qualified respondents are each the most senior IT leader (CIO) for their overall organization or a part of their organization (for example, a business unit or region). The total sample is 2,387, with representation from all geographies and industry sectors (public and private), including 287 from the Banking and Investment Services industry. The survey was developed collaboratively by a team of Gartner analysts and Gartner's Research Data, Analytics and Tools team.

Disclaimer: Results do not represent global findings or the market as a whole, but reflect sentiment of the respondents and companies surveyed.

[4] Enhancing FinTech Security With Secure Multi-Party Computation Technology, NEC.

[5] Zero Knowledge Proof: How to Maintain Privacy in a Data-Based World, BBVA.

[6] ING Bank Launches Zero-Knowledge Tech for Blockchain Privacy, CoinDesk.

Run	Grow	Transform
Hyperautomation	Generative AI	Autonomic Systems
Composable Applications	Total Experience	Privacy-Enhancing Computation

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