

# What Is Next-Level Fintech? Data Engineering Experts Chime In

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The financial technology (fintech) landscape comprises a range of categories: personal finance, lending, crypto, investments, stock trading and even real estate. And every single sector of this rapidly-evolving industry depends on data engineering for its success.

Each sector requires varying amounts of data that must be updated at different times. A significant challenge for fintech companies is that their data algorithms are geared largely toward solving technical issues, rather than addressing business solutions. This makes it difficult to leverage data to maximize growth opportunities.

Data engineering provides the architecture to accurately collect, process and analyze financial data at scale. It also ensures useful data is readily accessible for strategic decision-making and forecasting. This is a necessity for developing effective financial technology products and services.

Let's take a deep dive into the role data engineering plays in creating next-level fintech innovations. We'll also look at how fintech companies can leverage data engineering as a competitive advantage to drive growth.

# The Role of Data Engineering in Fintech

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Data engineering is critical to effectively transform large amounts of data into meaningful insights. Consider, for instance, the foreign exchange (Forex) market. Daily transactions amount to almost \$5.1 trillion. Similarly, the New York Stock Exchange's daily market volume average in the first half of 2022 was 38.3 million contracts.

In such a fast-paced and demanding industry, you need efficient data management, processing and integration to ensure that data velocity (processing rate) remains high.

## Efficient Data Management

In the highly data-driven landscape of fintech and healthtech, a solid data management strategy and system are non-negotiable for every business. Data management solutions bridge the gap between big data and business analytics. Data engineering experts develop and build systems that can transform both structured and unstructured data into useful business resources.

The data management process includes:

- Data collection, data cleansing and data warehousing
- Structured and efficient data retrieval
- Governing the use and accessibility of data
- Ensuring data accuracy, consistency and availability
- Implementing strategies and technologies to achieve data governance and regulatory compliance
- Ensuring data protection, privacy and disaster recovery

As organizations upgrade their systems, consolidate databases or merge with other entities, careful data migration is key to managing data effectively and maximizing its value. Otherwise, you'll lag behind competitors and be unable to leverage data insights. Poor data management can also result in data breaches and non-compliance — a sure way to sink your business.

## Seamless Data Integration

Where data management is the entire process of handling data structures and policies, data integration is just one integral component of that process. Data integration refers to the process of combining and merging data from various sources into a unified and coherent format. It involves extracting data from different systems, transforming it to meet the desired structure and quality standards, and loading it into a target system or database.

Data engineers can accomplish data integration using various techniques and technologies, such as:

- Data pipelines
- Extract, transform load (ETL) tools
- Data federation
- Data virtualization

By providing a consolidated view of information, data integration enables organizations to gain valuable operational and market insights. With a more comprehensive view of your business, you can recognize trends, patterns and issues that aren't evident when examining data from a single source.

Improved insights empower improved decision-making. What's more, organizations can deliver enhanced customer experiences through personalization, better communication and innovative problem-solving. In addition, by integrating data from multiple sources, businesses can streamline their processes and minimize manual data entry. This can lead to noteworthy time and cost savings.

A thorough technology assessment can help you determine whether your current system is helping or hindering your organization as it works to achieve business outcomes. Your data engineering [application assessments](#) partner can also propose upgrades to improve data integration in line with your goals and industry developments.

## Streamlined Data Processing

Data processing involves applying innovative technology solutions to convert raw data into useful information. Data stored in data lakes is often unstructured and unformatted, requiring processing before an organization can derive any value from it.

By extracting, cleaning and formatting data, data engineering makes datasets easier and faster to read and understand. As information moves through the data pipeline, it's frequently transformed, enhanced and condensed. Additionally, data engineering teams design and implement critical process automation features to keep up with the continuous and consistent creation of new data.

There are different types of data processing, such as:

- **Batch Processing:** Processes large volumes of data at once
- **Real-Time Processing:** Processes data as it arrives
- **Distributed Processing:** Distributes data processing tasks across multiple computers or servers to speed up the process

## Fintech Innovations Driven by Data Engineering

With the help of data engineering, the fintech sector is transforming the financial world. Innovative companies are utilizing technology to disrupt traditional financial services and drive far-reaching change.

## Risk Models and Predictive Analytics

Financial institutions use risk models to manage portfolio risk, make investment decisions and evaluate loans. Machine learning and data engineering together have advanced predictive analytics significantly, enabling the development of sophisticated risk models.

Machine learning algorithms rely on vast amounts of data to identify patterns and make accurate predictions. However, without proper data engineering, these algorithms would struggle to process and analyze the data efficiently.

Data engineering ensures the data is collected, transformed and stored in a format that's suitable for analysis. This includes cleaning and preprocessing the data, handling missing values and addressing data quality issues.

By leveraging data engineering techniques, risk assessment models can be built with more precise and reliable predictions. This enables businesses to easily identify probable risks and take proactive steps to prevent them.

What's more, data engineering facilitates the scalability and efficiency of risk assessment processes. By optimizing data pipelines and storage systems, organizations can handle larger volumes of data and perform real-time analyses.

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## Customer Analysis and Personalization

Data engineering plays a pivotal role in customer analysis. Specifically, it enables personalized financial services through data-driven insights. Raw data is collected, cleaned and transformed into a structured format that can then be analyzed to gain a deeper understanding of customer behaviors, preferences and needs. It also allows for the identification of patterns and trends institutions can then use to tailor financial services to individual customers.

By leveraging data engineering techniques, businesses can launch targeted marketing campaigns and offer customized financial solutions. This ultimately enhances the overall customer experience and improves customer satisfaction.

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## Embedded Finance and Data Monetization

Data engineering enables embedded finance solutions across various applications. By efficiently managing and processing large volumes of information, data engineering empowers businesses to leverage the value of data and unlock monetization opportunities.

One of the key benefits of data engineering in fintech is its ability to enable the seamless integration of financial services into non-financial platforms. Through effective data engineering practices, businesses can securely collect and analyze user data to provide contextually relevant financial services directly within applications.

Also through data engineering, advanced analytics and machine learning algorithms can be implemented to facilitate the creation of robust data pipelines. By leveraging these capabilities, data engineers can ensure the timely and accurate extraction, transformation, and loading of data from diverse sources at scale. This data consolidation helps businesses gain comprehensive insights and make data-driven decisions.

What's more, data engineering incorporates data quality and governance practices to ensure the accuracy, consistency and integrity of the data.

## The Future of Data Engineering in Fintech

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As advanced technologies and changing customer needs drive fintech to evolve, data engineering will also continue to grow. In fact, here are three key areas that we're watching closely:

### The Integration of Artificial Intelligence and Machine Learning

Cutting-edge technologies such as artificial intelligence (AI), machine learning (ML) and data science continue to drive innovation and enhance efficiency in the fintech industry.

While AI enables computers to perform tasks that would typically require human intelligence, ML algorithms analyze vast amounts of data to identify patterns and make predictions. Data science helps fintech companies interpret complex financial data, leading to better insights and informed business mapping.

In practical terms, these remarkable technologies facilitate fintech data engineering by:

- Developing advanced fraud detection systems
- Analyzing large financial datasets for market trends and investment opportunities
- Securely storing sensitive financial information
- Automating customer support with chatbots
- Improving the customer experience in fintech applications
- Creating tailored financial recommendations and automated investment strategies
- Identifying and preventing money laundering and other financial criminal activity
- Facilitating seamless collaboration and data sharing among fintech stakeholders
- Assessing credit risk and streamlining loan approval processes
- Integrating AI into trading algorithms for faster and more accurate decision-making

## Enhanced Data Governance and Compliance

Data governance ensures the use and handling of data is consistent and controlled, minimizing risks and ensuring compliance with legal and regulatory requirements. Non-compliance can result in hefty legal penalties and severe financial consequences. There's an increasing volume, variety and velocity of sensitive customer information managed by fintech companies. As such, fintech data engineering must prioritize robust data governance frameworks to protect both the company and its customers.

Data engineering facilitates the integration and harmonization of information to ensure it remains consistent and accurate across different systems and applications. This is essential for regulatory reporting, risk management and compliance purposes.

In addition, data engineering supports the implementation of effective quality controls and accurate data lineage tracking. This empowers organizations to demonstrate data provenance and comply with regulatory requirements. By establishing efficient data engineering processes, fintech companies can also enhance their ability to identify and mitigate potential data breaches or security risks.

Data engineering also plays a key role in data governance by establishing clear policies and procedures for data management. This includes defining data retention policies, data ownership and access controls. With proper data governance in place, organizations can ensure data privacy and integrity while complying with data protection regulations.

## Open Banking and Decentralized Finance Data Engineering

Basically, data engineering is what enables and drives the advancements of open banking and decentralized finance (DeFi) ecosystems.

To offer services such as trading, lending and investing without involving a traditional centralized intermediary, DeFi builds on distributed ledger technologies. However, the programmable components of decentralized finance ecosystems are advancing new opportunities for competitive financial markets and efficiency gains.

In open banking, data engineering ensures the interoperability of various banking systems. This enables customers to access their financial data securely and share it with authorized third-party providers. Stable and resilient data pipelines ensure the smooth flow of data between banks, customers and fintech companies.

The growth of open banking and DeFi raises important considerations around data privacy, regulatory compliance and economic impacts. Data engineering is the backbone of designing scalable and reliable data pipelines, while ensuring data quality and security.



# Unlock the Full Potential of Your Data

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By leveraging advanced technologies such as big data frameworks, artificial intelligence, machine learning and cloud computing, data engineering enables fintech and healthtech companies to streamline operations, improve risk management, and deliver innovative products and services. Data management is, however, an extremely complex operation to navigate — especially when it involves massive amounts of sensitive information.

Growth Acceleration Partners (GAP) offers a data engineering service supported by data scientists. Our engineering teams are experts in the technology, software, fintech and healthtech industries, among others. We build and fast-track deployment with ETL accelerators and use Infrastructure-as-Code (IaC) to efficiently deploy your platform in a matter of minutes.

Our data engineering service enables you to build a solid infrastructure, collect reliable data using data layering, and monetize your data quickly and effectively. The best part? Our engineering experts guide you every step of the way. Contact us today to transform and unlock the full potential of your data.

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## ABOUT GROWTH ACCELERATION PARTNERS:

At GAP, we consult, design, build and modernize revenue-generating software and data engineering solutions for clients. With modernization services and AI tools, we help businesses achieve a competitive advantage through technology.

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