

Digital Age Architecture Modernization - A Business Accelerator



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Introduction

As colossal buildings are built on a solid foundation, so are software systems of great businesses built on a solid architecture. Most of the modern businesses rely on a software system in place to scale newer heights. This is not only true for meeting their internal needs but for customer facing needs too.

FinTech is one such area where great software architecture forms the backbone of business. The whole idea that financial services could be delivered through digital channels has completely revamped the landscape of financial services across the world. Right from solutions that take your thumbprint and pay for your daily groceries, to targeting customers with their financial products based on spending pattern, FinTech companies today could provide services that were unimaginable even a decade back.

Weaving the modern architecture that enables such advances is a necessity today. FinTech companies that fail to do so will only be left behind in the growing market.

What facets of software architecture have to be handled better for this trailblazing industry? This is the question in the minds of every FinTech company stalwart. And this is the question this artefact attempts to answer.

Use Layered Architecture

An important – but most often overlooked – aspect of FinTech software is layered architecture. Called by various other names like n-tier / multi-tier architecture, layered architecture helps in building a software product that is truly scalable. Typically, consultants talk about 3-tier (presentation, application and database) architecture, but layered architecture is more than that.

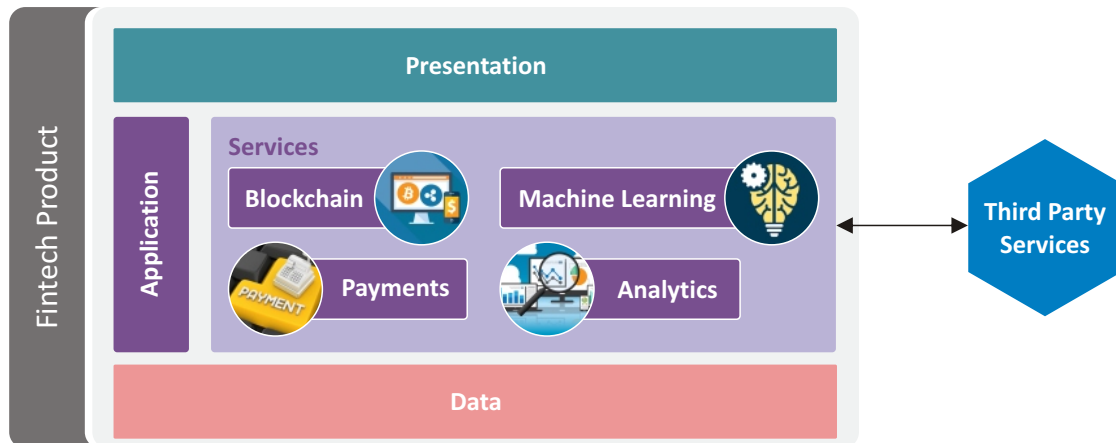
Assume a FinTech product that is built with a 3-tier architecture and serves its customers well. With a growing business, the product has now come to a stage where it has to integrate with 3rd party services and applications – where it should both consume as well as provide data. With a 3-tier architecture, usually the middle-tier will be tied to a platform (e.g. web, desktop) and hence would not be able to meet the needs. Add to this the necessity of providing an API for mobile apps, things only get complicated from here.

This is solved by splitting the middle layer – “application” – into two: application and services. The Application layer would still handle most of the stuff handled in the middle-tier related to the underlying platform, whereas the Service layer will be the one that exposes the functionality as services. This could enable easier integration of 3rd party services or applications, or building a mobile app.

The most important aspect a FinTech product should consider here is what to split. Any core domain functionality related to FinTech should be split as services. For example, blockchain, payments and analytics related to financial aspects could all be developed as services in the service layer. Ideally, such domain functionality that is truly independent could be developed as microservices. Refer to our following artefacts on microservices for further details.

1. <http://www.aspiresys.com/articles/microservice-adaption-for-fintech.pdf?pdf=microservice-article>
2. <http://blog.aspiresys.com/software-product-engineering/your-microservices-are-at-risk-act-now/>
3. <http://blog.aspiresys.com/software-product-engineering/fintech-companies-can-reduce-monolith-risks-exposure-microservices/>

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Think Platform

What is the one word that describes the success behind massive social networking sites like Facebook, Twitter or a highly scalable solution like AWS? **Platform!** Building a FinTech product means a long-term commitment to its success. So, why not firm it up by making the product a platform?

Simply put, a platform is a software product that enables 3rd party vendors to build apps on it. For example, if a micro-lending product is built, one would do well to build it as a platform so that 3rd party software vendors could create apps for personal finance, wallet, financial analytics and so on.

Not only that – a platform enables seamless experience to customers who are users of multiple options across a product spectrum. For example, **banks currently have different accounts for savings, loan and investments. With a platform approach, it would be easier to onboard a customer across these options with a single account and present a unified interface to them.**

A well-defined FinTech platform should at least meet the following fundamental requirements:



Security

The platform should be secure not just from the traditional security practices but should take additional precautions to handle user specific financial details such as payments, balances, account numbers, and so on. Ideally such data should be encrypted in order to prevent it from being misused even if the physical database itself is compromised.



Compliance

Related to security, compliance is fast becoming de-jure in many places across the world. Many customers and even the regulatory bodies look for compliance such as PCI-DSS and SOC-2 in the software.



Published API

The platform should obviously have the ability to integrate into its core API in order to enable third-party developers to develop apps. Needless to say that the API should provide right amount of exposure to data through its ACL-based authorization.



Flexibility

The ability to handle a new kind of scenario should be a cinch and shouldn't take development effort. Beyond the core of the product, customers should be able to pick and choose the modules and configure it in a way they would want.

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Adopt Machine Learning

Everybody and his cousin has experience of receiving messages or emails that sell various kinds of financial products including loans, investments, insurance and so on. But in most cases, they are going down the drain since they are not relevant to the target users.

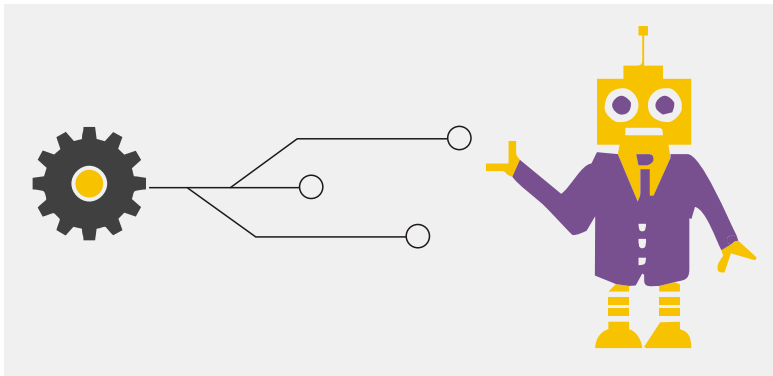
As much as users hate such irrelevant messages, they would also love messages that serve their needs. Machine learning is an effective tool to achieve that goal. People get onto various services across the web and leave a huge trail of data about their needs, behaviours, social standing and much more. This is waiting to be tapped, but could happen only with a good technology strategy in machine learning.

For example, users express their concerns or opinions on social media platforms and ecommerce sites about various products. When a proper machine learning strategy is put in place, these user data would be mined efficiently and converted to valuable information that could be used to do targeted selling.

Robo-Advisory

One of the major use-cases of machine learning in FinTech is robo-advisory. It helps in providing portfolio management services with very less human intervention.

A major aspect of robo-advisory is its applicability at small sums of investment amount. Typical human-based portfolio management services expect the investor to have a significant sum as minimum investment in the portfolio, which does not fly well with most salaried people. With the advent of robo-advisory, portfolio management services could be provided for amounts that are less than a thousand dollars too. Due to its algorithmic nature and reduction of human intervention, the providers could also see significant margins for their services.



Build a Blockchain

According to Deloitte, blockchain will gain significant traction by the year 2020. Several use cases are served by blockchain. Most of them are ideal candidates within the FinTech ecosystem. Some of the important use cases of blockchain are:

- ➔ Smart Contracts
- ➔ Crypto-currencies
- ➔ Digital Assets
- ➔ Identity Management

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Smart Contracts

Many businesses are currently inundated with a huge number of manual processes that are triggered by various user activities. Mobile plans are a classic example of such tedious processes.

Today, a mobile service provider has blanket plans that apply to all customers based on what they sign-up for. With smart contracts, better plans could be offered dynamically based on usage patterns that would make customers happy and result in larger customer retention rates.

Crypto-currencies

Bitcoin is a classic example of crypto-currency that is implemented as a blockchain. FinTech companies could innovate by creating their own currencies for particular use cases like managing reward points. A blockchain based currency could be created and established as the foundation for reward points. Users would then be able to transfer, share, earn and spend those points within the network.

Digital Assets

Blockchain could be helpful in maintaining a record of digital assets. Organizations that provide portfolio management solutions would have to deal with various kinds of financial instruments including stocks, bonds, ETFs and much more. These instruments could be represented as digital assets and stored in blockchain. There are two significant benefits to managing digital assets in blockchain:

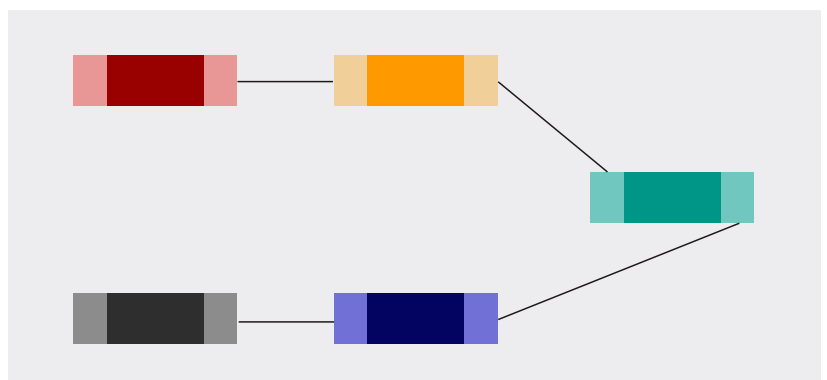
- ➡ The assets couldn't be manipulated easily due to the non-central nature of blockchain. With enough nodes agreeing on the validity of assets, it is difficult for an attacker to manipulate / steal a digital asset.
- ➡ They could participate in other blockchain use cases in a smooth manner. For example, a smart contract which has to be executed based on a certain stock price could now be easily implemented in a blockchain.

Identity Management

For FinTech products that have to deal with a large number of users, blockchain is best suited for identify management. In the absence of a central server, blockchain relies on its distributed trust model to make sure the identity of a particular entity is true and consistent.

Banks with multiple identity management products would do well to adopt a blockchain based strategy. The identities of

users across different product lines could now be managed through a block chain instead of multiple identities mapped through SSO (single sign-on) mechanism across systems. When a newer product/system is provisioned, it becomes far easier to onboard the users. Of course, such newer products should also abide to the principles of blockchain and work in tandem with the existing implementation, but that is a best practice which could produce better gains in long term.



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Conclusion

Architecture is driven mostly by business needs. Digital age FinTech companies are in a position to take advantage of many modern architectural approaches and practices as described above which will accelerate their business and propel them towards the top of their field. At Aspire, we are happy to work with FinTech companies right from the ideation stage and walk along with you in the journey of your product.



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