GLOBAL ECONOMIC NETWORK

Its Transformative Impact on Financial Services

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INTRODUCTION

Blockchain technology has been around since 2009 when the bitcoin network went live. Distributed ledger technology (DLT), of which blockchains are merely the best-known example, has since been put to a variety of uses in financial services, such as securities trading and processing, syndicated lending, insurance and payments. But its transformative potential has not yet been realized. This is because its applications are too tightly connected to its underlying technology, requiring internal and external participants within a DLT application to invest in the same technology, or risk encountering more silos and disparate platforms. Only businesses that can build, buy, or form a consortium for the DLT infrastructure will gain the benefits — the speed, accuracy, immutability and the consequent efficiency. Even then, these businesses create access barriers for others who are unable or unwilling to invest in blockchain.

But this obstacle is being overcome. New technology that separates the application layer from the underlying DLT infrastructure allows previously incompatible DLT networks across companies to exchange information seamlessly across ledger infrastructures. In other words, it creates a network-of-networks — potentially, a Global Economic Network. This will surely benefit the consumers of financial services, by way of better products and lower prices. But it will also challenge the business models of financial institutions, just as products made possible by the internet have shaken up the payments business.

This paper explains the coming Global Economic Network and the technology behind it. And it considers the strategic implications for segments within financial services, such as incumbent wholesale banks, which are likely to be profound. Parts of the wholesale banking value chain may need to be given up to more agile non-bank competitors. But, in this process of "opening up", the successful financial services firms will dramatically extend their customer reach in the parts of the value chain they maintain.

WHAT IS THE GLOBAL ECONOMIC NETWORK?

Distributed ledger technology (DLT) has revolutionized the way contracts are executed and assets are exchanged. It is not only quicker and more secure than the traditional message-based approach but cheaper, because it eliminates the need for complex reconciliations and data aggregators. It is no surprise that financial services firms have been keen to adopt it. We recently counted more than 100 blockchain protocols with potential applications in financial services.

But there is a problem. Each of these protocols is a "walled garden", with its own narrow function (such as payments) and its own governance rules, levels of privacy, smart contracts, and users with varying "data rights". This isolation of blockchain protocols from each other means that the massive potential gains from DLT and Web3 are yet to be realised.

The situation is similar to the early days of computer networking. Universities and research institutions developed Wide Area Networks to connect their growing clusters of machines together. Because they worked separately, however, incompatible protocols emerged, each serving the specific needs of its network. The solution to this was the Internet: a network-of-networks that stitched the research networks together.

Similarly, what's needed to unlock the potential of DLT is a network-of-networks linking blockchains and traditional databases. This would create what we call the Global Economic Network. Multi-party applications that run seamlessly across previously incompatible infrastructures will revolutionize the way enterprises conduct business with each other. Each participant could use shared business logic and processing software components, extending these through their own enterprises and their customers'.

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For example, enterprises along a supply chain could integrate their processes and information flows (while maintaining their chosen level of privacy) to achieve more flexibility and accuracy. And they could invite providers of supply chain finance to access information directly, thereby securing cheaper secured funding. As more suppliers and funders adopt the software, a network spontaneously forms.

Supply chains are merely a familiar example. Financial institutions will be able to deploy a wide range of innovative products and services to the network. Gaining access to these products will draw more participants into the network which thereby becomes more valuable to product developers, creating a virtuous circle of expansion — in participants, offerings and economic value.

Creating such a Global Economic Network requires two technological innovations:
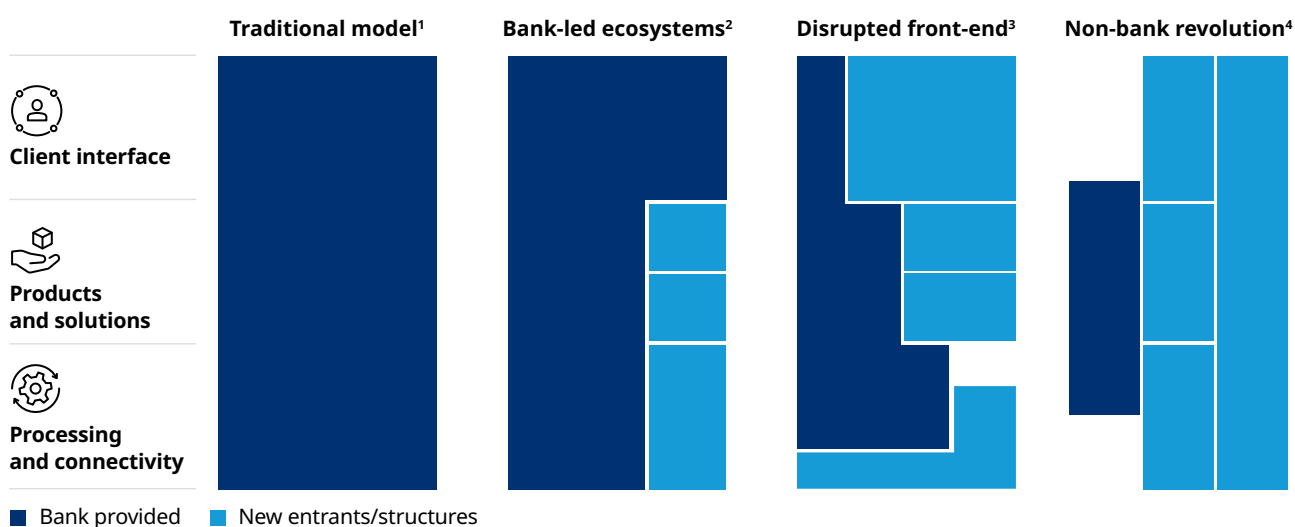
- An abstraction model that separates the application layer from the underlying blockchain or database
- A privacy-preserving protocol for "distributed commits" to enable transactions that connect across ledgers.

Digital Asset, a software and services provider, fulfills these requirements by building interconnected networks for global enterprises. The company designs and delivers technology that reshapes legacy systems and workflows into efficient, secure, and interconnected applications. Daml, its core technology, is a platform for building multi-party applications. It extracts and simplifies business processes to make data accessible and optimizes workflows using smart contracts.

STRATEGIC IMPLICATIONS

Just as the introduction of the Internet resulted in new business models and technology choices that rapidly disrupted incumbents, the Global Economic Network will require organizations to adapt. If anything, the change could be more rapid as the disrupters of the previous decade had to establish their own networks. Such barriers will be immaterial when Global Economic Networks powered by DLT have become the norm. In this context, we have identified three competitive scenarios which are relevant for wholesale banks and their ecosystem.

Exhibit 1: Competitive scenarios for wholesale banks

| | Traditional model[1] | Bank-led ecosystems[2] | Disrupted front-end[3] | Non-bank revolution[4] |

Client interface

Products and solutions

Processing and connectivity

■ Bank provided   ■ New entrants/structures

Source: Oliver Wyman analysis

Bank-led ecosystems

Banks adopt the new technology and leverage their significant distribution assets to provide clients with the full benefits of economic networks. Banks reduce their own and their client's participation costs by streamlining processes and reducing risk capital. To avoid disintermediation of the customer interface, banks develop customer centric product offers that can seamlessly integrate within their customer's business processes. This allows them to broaden their fee revenues from new information and data services.

Disrupted front-end

Banks struggle to adopt the new technology and well-funded FinTech's and technology players, such as ERP systems or Treasury hub providers, harness the new technologies to create economic networks around corporate or investor business processes. Banks lose control of many of their customer interfaces and client information but remain providers of regulated products such as loans. Competing on unregulated or lightly regulated products

is more challenging. Banks' product economics deteriorate as it becomes more difficult to earn supplementary fee income.

Non-bank revolution

Bank products and services are fully disrupted. Alternatives to bank financing develop rapidly through securitization, decentralized finance (DeFi) and central bank digital currency (CBDC) substitution of commercial bank money. (Given the current development of DeFi and CDBC, we regard this scenario as unlikely without active and concerted policy intervention of central banks and supervisors.)

Even within the bank-led scenario, wholesale banks will need to adapt their business models to the Global Economic Network. We have identified seven areas for reform:

1) Market strategy

Develop strong co-creation capabilities with your clients who will buy functionality and product components rather than packaged solutions. But make sure you leave your customers in control of their data, assets and rules. Trust will encourage use.

2) Technical strategy

"Open Business" is the strategic framework businesses must adopt to achieve the Global Economic Network where information and value flow freely. An Open Business strategy means anyone can take a node within a network while still managing their infrastructure with strict data permissions granted to external entities.

3) Operating model

Think greenfield. There will be significant changes across the operating model that will be difficult to incorporate into business-as-usual, such as governance, sourcing, people and culture.

4) Processes

Characterize processes in line with intrinsic asset and services value. Understand the value of assets and services across all processes end-to-end (including your clients') and how your clients use these. Assets and services across an economic network can be shared and processed near real-time.

5) Technology and operations

Segregate business processes from system functionality and simplify your technology architecture. Invest in a granular understanding of business processes and re-imagine them in a world of shared business processes. Re- think your outsourcing model in this context.

6) Customer engagement & sourcing

Identify modular or standard business processes across the network and share reusable components. Make it easier for your customers to join the network and for innovators to offer new solutions. Sandboxes should become standard components of your business.

7) Sales & distribution

Your customers have relationships with many other enterprises who might not yet be your customers. As with the Internet, make sure you are discoverable and participants can request to join your app through the network. Design for an API-first shared and self-managed ecosystem.

GLOBAL PAYMENTS

Technological disruption of financial services is nothing new. For example, the payments business has been transformed by the Internet and, especially, by mobile access to it. This revolution in consumer convenience was initially harmless for incumbent banks, adding new revenue streams rather than cannibalizing the old ones.

Twenty years after the launch of PayPal, however, banks' payments revenues are being significantly eroded by non-bank entrants. In 2020, non-banks captured 20 per cent of the $1.4TN of revenues delivered by the broader payments ecosystem. The P/E multiples of non-bank payments companies are on average 35 times higher than the multiples of banks, and the market cap of the top 10 non-bank payments players is now 400 BN USD more than the top 10 banks.

Regulators have responded by regulating non-bank payment institutions to ensure key standards are met, insisting that customers control their data and can share it through API ecosystems. And regulators have supported instant payment applications, sometimes by running the core infrastructure.

The payments story holds three important lessons for incumbent banks facing the emergence of a Global Economic Network:

1. Think as a network and cooperate where possible but innovate as a greenfield. Zelle is a payments network launched by a consortium of U.S. banks a decade after Venmo. It is a successful example of banks tackling the innovative pressure of instant payments.

2. Ecosystem solutions are key. You cannot compete head-to-head with the thousands of new companies raising money and addressing specific use cases. But you can include them in your greater ecosystem to leverage more open collaboration between firms.

3. Network "protection" can evaporate rapidly when regulators recognize the potential of new technologies for giving increased control of data and assets to their ultimate beneficial owners.

LESSONS FROM EARLY ADOPTERS

The Australian Securities Exchange — extending workflows into your customers

The Australian Securities Exchange (ASX) is replacing CHESS, its clearing and settlement system, with a new platform incorporating distributed ledger and smart contract technology. ASX has also recently launched Synfini, a "DLT as a Service" platform that allows customers to build their own enterprise DLT applications and solutions on the same VMware Blockchain and Daml technology that the ASX is using for its CHESS Replacement project.

The "DLT as a Service" solution include three elements:

1) The ledger and associated infrastructure, including the databases, which write, hold and save transactions among participants.

2) The customer nodes and access to the provider's ecosystem, which includes secure networks and connectivity.

3) A sandbox for common libraries, applications, data rights and developer community-built tools.

According to Dan Chesterman, the Chief Information Officer at the ASX, Synfini has the power to "eliminate the need for organizations to build, run, and support their own environment, reducing cost, complexity, and risk". He added that "Synfini has the potential to open up a new world of opportunity for companies, both in and outside financial markets, to design and build innovative, digital, multi-party solutions on ASX's world-class ledger".

Initial adoption of the service has been encouraging across various sectors of the Australian economy. For example, the NSW Government is developing an application built on Synfini to track the provenance and quality of building materials and contractors, and to distinguish between resilient and problematic buildings.

Other applications have been closer to the capital markets, such as ownership registrars for private companies, tracking off-market transactions and related-party trading. Early adopters of the platform include Broadridge, which is developing an application to eliminate paper-based processes and automate off-market transfers, and DigitalX for its Drawbridge RegTech application that provides compliance and governance for internal securities trading policies.

Hong Kong Exchange and Clearing (HKEX) — optimizing workflows across firms

Time zone challenges mean that, for European and US-based investors, operations teams work through the night to support settlement with the Hong Kong Stock Exchange. Current industry processes are organized sequentially, limiting visibility of settlement issues for players downstream, compounding costs from trade breaks and creating time pressure.

Counterparties cannot see what is happening in previous process steps and must therefore wait to see if a problem occurs in the transaction chain. Asset managers, brokers, global custodians, local custodians and clearing brokers all struggle to process trades in time, and sequential communication lines add additional complexities for exception management.

The new Synapse service adopted by HKEX solves this problem by using APIs to connect all participants to a virtual distributed ledger. Parties can see and act upon all the relevant information simultaneously, based on a single source of truth for the entire post-trade lifecycle. This provides users with significant efficiency gains and reduces costly errors.

Exhibit 2: Synapse settlements
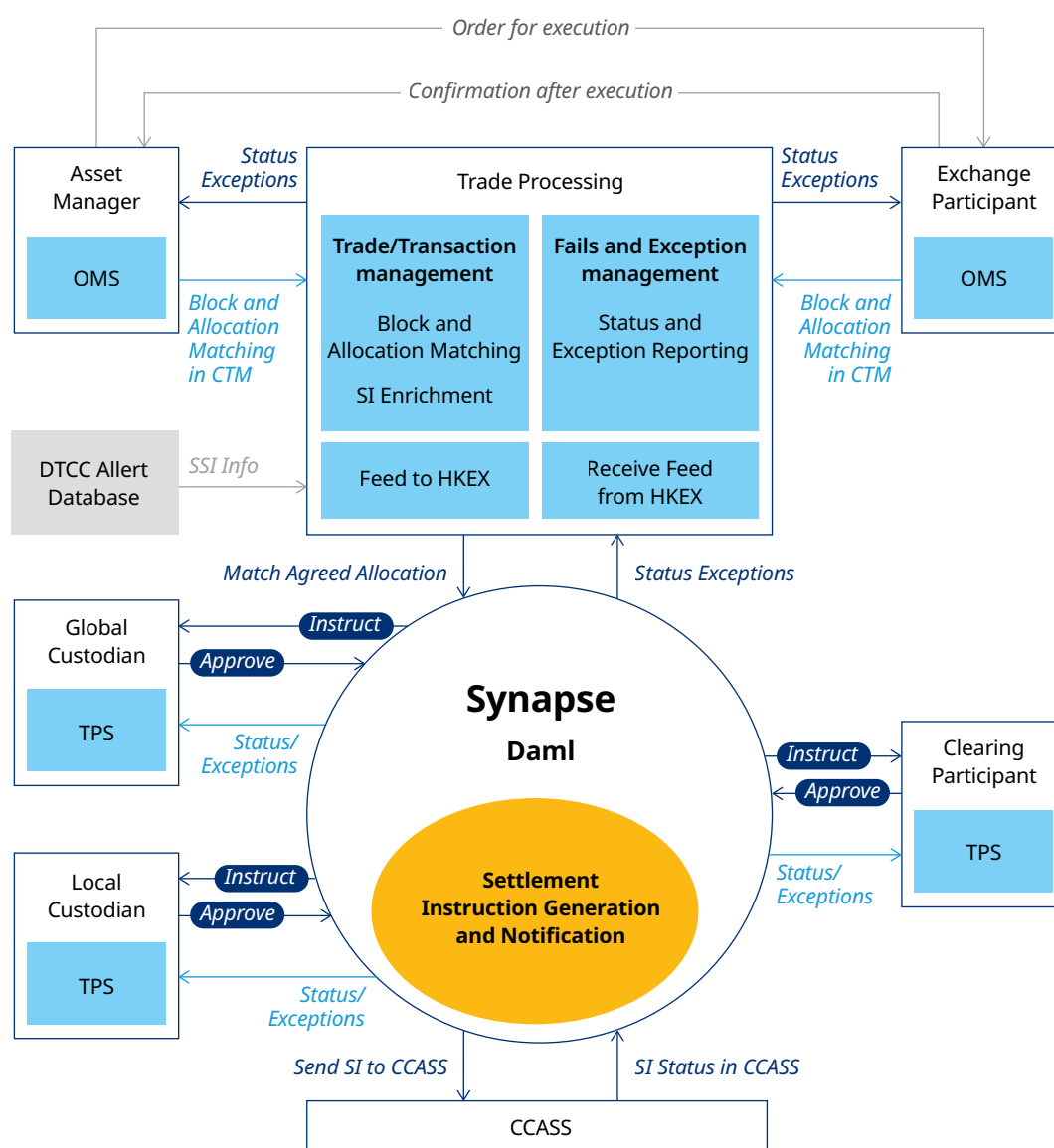
Source: Oliver Wyman analysis

Synapse shows how an Open Business strategy can bring material benefits by optimizing complex data flows across a business ecosystem. The greatest benefits are likely to be found in high-volume chained processes that today depend on complex and sequential communication between businesses. Examples include stock borrowing and lending, OTC derivative margin and lifecycle management, repo processing and tri-party collateral management services, cross-border payments, and supply chain financing.

Banks have tried to achieve efficiency gains in such processes through harmonization of market rules and practices (most of which failed) and, more recently, through fintech investments aimed at aggregating information across processes to provide participants with greater visibility. The new Open Business technologies will allow banks to achieve these process improvements faster, at lower cost and with greater control of their data.

Better risk and compliance outcomes at lower cost

Wholesale bank credit processes are notoriously bespoke, manual and complex. While some banks redesigned their processes using off-the-shelf workflow solutions, their integration was often costly and put adjustments to the process out of reach for mid-sized institutions. The COVID-19 crisis has placed the credit processes of banks under severe stress and made deficiencies painfully obvious:

- Books cannot be revalued rapidly because the process is not built for quickly incorporating new information
- Access to up-to-date behavioural and transactional data is limited because credit systems are not connected to transactional systems
- Risk appetite cannot be changed dynamically for individual sectors, particularly where credit decisioning is expert-based and portfolio valuations are manual bottom-up processes
- A centralized view of risk is impaired by reliance on manual ad hoc efforts to gather data on impacted sectors
- Products and infrastructure are insufficiently flexible to respond to unexpected events, for example, by offering payment holidays
- Client monitoring is overly reliant on payment delinquency, resulting in "flying blind" during payment holidays
- Restructuring and collections operating models are not scalable because they are expert-based, requiring large increases in FTEs and creating challenges to ensure consistency in client treatment to manage conduct risk

A multi-party application running on a DLT platform can address many of these issues. By calling up the current state of the ledger, it can be used to re-value portfolios instantaneously. It improves compliance at lower cost because each action of permissioned parties is recorded on the ledger. It allows for much cheaper and bespoke workflow-design than traditional workflow tools because the new technologies interface more readily with legacy databases. And it frees up relationship manager time by integrating customers into the workflow.

We estimate that, depending on the starting point and current efficiency of a bank's processes, the new approach can reduce the loan processing time by 40-50 per cent while reducing processing costs by 30-40 per cent. The increased visibility of the portfolio can also be used to improve risk controls and decrease NPL through earlier intervention. And faster turnaround times and increased visibility of the process improve the customer experience.

Xpansiv — Improved productivity for technology and operations teams

Smart contract programming languages improve the productivity of technology teams because they remove the need for solution-specific coding of underlying infrastructure and decrease time-to-market for collaborative internal and external customer solutions. Traditional software systems require the coding of product characteristics and workflow elements, resulting in code that is not part of the core but is required to link workflows. Each improvement or addition of new products results in complex update procedures that result in product release queues, glacial change processes and slow innovation.

In Retail banking, modern micro service-oriented processes have brought some relief by disaggregating certain services. But they still require complex cooperation for changes across the entire workflow process that can result in a loss of competitive advantage. In contrast, the new smart contract programming approach is process centric: that is, developers write the code and develop applications based on actions in a process. This puts the workflow process, rather than systems, at the core, resulting in more intuitive designs. Addressing each step of the workflow as a smart contract, where actions are triggered by defined inputs, also makes it easier to change processes. Only the affected steps need to be addressed and not the entire workflow, as is often required with traditional system designs.

For example, Xpansiv, the global marketplace for ESG-inclusive commodities, is using Daml to underpin its differentiated commodities registry and portfolio management infrastructure. This architecture ensures an immutable record of ESG data for the entire lifecycle of a digital commodity, from asset creation to trading. Xpansiv launched its Digital Fuels Program in 2021 with Digital Natural Gas and is expanding to other fuels assets (e.g., crude oil and Sustainable Aviation Fuel) in 2022. Daml allows Xpansiv to rapidly scale its ecosystem by enabling rapid implementation of business logic secured by enterprise level transaction integrity that ensures trust and accountability at every phase in the digital commodity lifecycle.

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Broadening capital markets by lowering access costs

While the excitement of crypto investments is capturing the headlines, three of the core benefits have yet to be recognized and realised in distributed finance (DeFi):

1) While many DeFi innovations rely on permissionless designs, a permissioned but open system can bring many additional benefits because on-ledger transactions are traceable and transparent.

2) The cost for implementing ledger-based systems is significantly lower than the traditional cost for establishing message-based exchange mechanisms.

3) Ledger-based systems can significantly reduce or even eliminate clearing and settlement risks or allow participants to choose their preferred mechanism of risk aggregation and management. Counterparties can choose if they wish to settle in DVP (for example, when trading with a high-risk counterparty) or aggregate trades.

Many assets where trading and exchange costs are now too high will move to exchange-type mechanisms with efficient price discovery over time, especially relatively homogeneous smaller ticket assets where self-certification is feasible: for example, receivables of rated corporate entities or of municipalities. Deploying these solutions to the Global Economic Network means that they can rapidly reach any existing network participant who will be free to combine and extend solutions to maximise their value.

CONCLUSION

Extending business processes across traditional enterprise boundaries benefits both financial services suppliers and the consumers. Consumers get cheaper, quicker and more secure access to services and products. Suppliers get more information and better control of how their services are consumed. And the network effect gives them low-cost access to potential customers who, once "plugged in", become sticky. To make the most of the nascent Global Economic Network, however, firms will need to rethink how they deliver value to their customers. More specifically, they will need to:

- Understand the end-to-end value chain of their businesses own and their customers' and determine where value is shifting in an open and fully digital environment
- Determine where central utility constructs, such as data sharing, will provide higher value and migrate or centralize accordingly
- Start greenfield Open Business experimentations and co-create solutions with targeted customer segments to build capabilities
- Build and maintain a set of service partners to provide customers with relevant ready-to-go service options
- Monitor their network and ensure they are part of "early experiments" — successes in early innovation may not occur in a firm's core markets.

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Digital Asset is a software and services provider that helps enterprises build economic value through interconnected networks. The company designs and delivers technology that reshapes legacy systems and workflows into efficient, secure, and interconnected applications. Daml, our core technology, is a platform for building multi-party applications. It extracts and simplifies business processes to make data accessible and optimizes workflows using smart contracts. Leading organizations across financial services, insurance and healthcare partner with Digital Asset to create new multi-party solutions that transform disparate silos into synchronized networks.