



Blockchain and the future of finance

**A potential new world for
CFOs—and how to prepare**

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Imagine a world with no out-of-sync ledgers. No need for reconciliations. No fragmented or hidden data that create multiple versions of the truth.

In this world, you would have just one version of a ledger, with simultaneous settlements that are seen by all parties. You could get instant visibility on the status of accounts receivable, supply chain movements, and other transactions. You would have a transparent, chronological history of events for a single source of truth.

This world is coming, and its name is blockchain. As a revolutionary technology for recordkeeping, it is poised to change the future of finance—in accounting, asset registers, payments, trading, collateral management, and more.

How should you prepare for this wave of disruption? What are the implications for your finance organization? Inside, we explore the principles of blockchain through a finance lens, including a framework for projecting the impact on core processes and our hypotheses for a blockchain world.

What is a blockchain?

Traditional financial systems operate with a centralized database, usually with a single point of authority. Blockchain technology, on the other hand, allows for a *distributed* database that holds a growing number of records. Instead of existing in one place, the ledger is continually updated and synchronized across multiple computers in a network. Therefore, any participant in the network with the proper authorization can view the entire ledger—without relying on an intermediary or any one authority.

As each transaction occurs, it is stored chronologically in a block, and each block is connected to the one before and after it. To ensure data integrity and security, all parties in the network must validate each transaction—using agreed mathematical formulas called consensus mechanisms—and each block is secured by cryptography.

As such, the blocks form a permanent, chronological chain of transactions that cannot be changed without the approval of other participants. It is as if a notary is present at every transaction, and the blockchain leaves a public audit trail of all activities, accessible to those with the proper permissions. As a result, all authorized parties in the network have access to a single, shared source of truth, which may foster trust across multiple sites or geographies.

Another key feature of blockchain technology is a “smart contract,” which is a self-executing protocol that enforces a

Getting ready for a blockchain world

VC investment in blockchain achieved a record high of **\$512 million** in 2017, up from \$15 million in 2013.¹

By 2021, **at least 25% of the Global 2000** will use blockchain as a foundation for digital trust at scale.²

The business value added by blockchain will surpass **\$176 billion** by 2025 and **\$3.1 trillion** by 2030.³

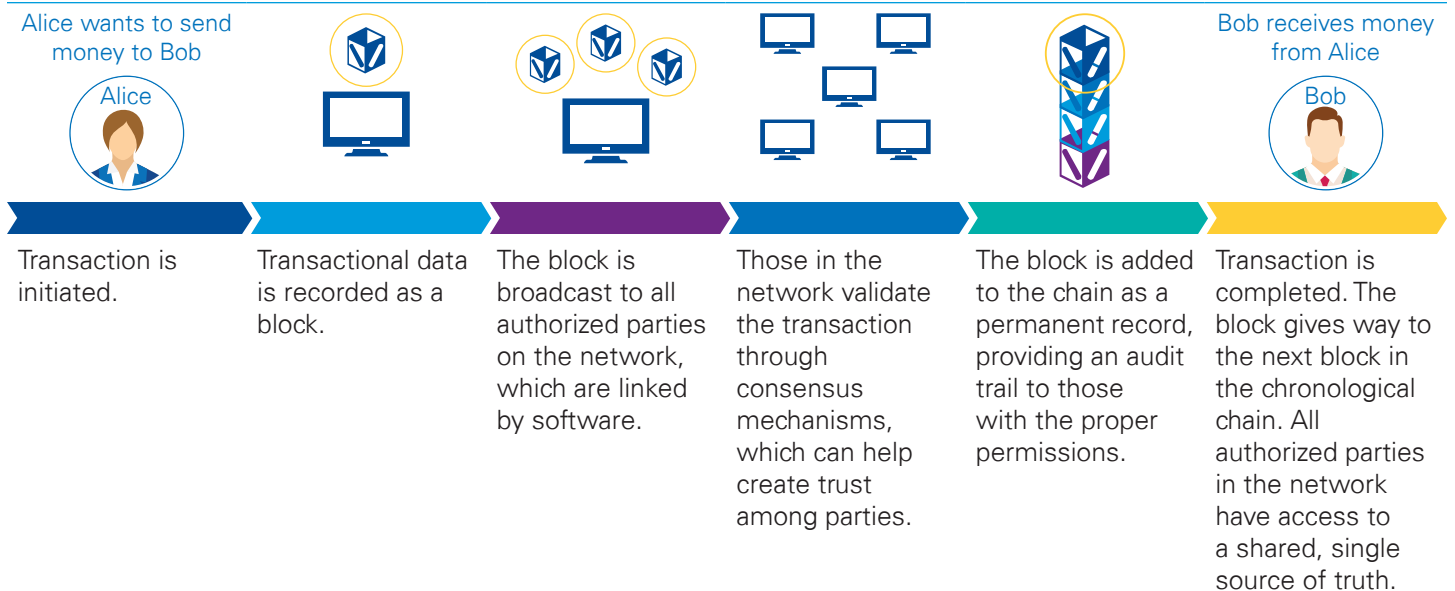
¹ KPMG International (data provided by PitchBook), *The Pulse of Fintech Q4 2017: Global Analysis of Investment in Fintech* (February 2018).

² International Data Corporation (IDC), *FutureScape: Worldwide IT Industry 2018 Predictions* (October 2017).

³ Gartner, Inc., *Practical Blockchain: A Gartner Trend Insight Report* (March 2017).

previously agreed arrangement. For example, a smart contract could trigger an automatic refund under certain conditions or the automatic payment of an agreed commission after a sale. These smart contracts can eliminate delays in traditional finance processes, while increasing transparency and reducing reliance on middlemen to follow through on their commitments. Moreover, like other parts of a blockchain, smart contracts are immutable, so they can enhance accuracy in the financial statements.

How it works: blockchain basics



Implications for finance

These principles of blockchain technology hold great promise for finance organizations, including quantitative and qualitative benefits. Among them:

- **Increased efficiency from transparent records and a single source of truth.** By creating one version of a ledger that is synchronized across computers, blockchain can help eliminate out-of-sync ledgers and, therefore, the need for reconciliations. Transparency may also lead to other benefits. In trade finance, for example, all parties will be able to see when goods have shipped and review all steps of the transaction, which may significantly reduce the settlement time.
- **Enhanced data integrity to reduce loss.** With immutable records that are visible to everyone involved, blockchain may improve data accuracy and security, help reduce the risk of fraud, and show compliance through an audit trail. For example, when supply chain information is put on a blockchain, companies can potentially reduce fraud and errors, improve inventory management, identify issues more quickly, reduce delays from paperwork, and increase trust among all parties. Blockchain also offers the potential to create a single source of information around customer identity, reducing costs and risk related to Know-Your-Customer regulations.
- **Improved customer experience through faster processing.** By using blockchain to share information with clients and vendors, companies may be able to tap sales opportunities and serve customers far more quickly than with traditional systems for setting up new relationships. Blockchain can also enable consolidated, accurate repositories of customer information that can be accessed by all parties in the network.
- **Higher availability of capital and lower cost of business.** Thanks to consensus mechanisms and smart contracts, blockchain can minimize the time that capital is tied up for a transaction, instead triggering an automatic transfer of funds upon an agreed set of conditions. Blockchain will also eliminate some transaction fees by reducing reliance on third parties, and it will likely free up capital flows as the purchase of managed funds moves to real time.

Potential benefits of blockchain*

Up to 95% reduction in reconciliations and errors

Up to 40% increased efficiency of data and digitization from single source of truth

Up to 25% revenue enhancement as a result of better customer experience and new markets

* Estimates based on KPMG client blockchain projects, 2016–2017. Indicative benefits are not guaranteed and will depend on a number of factors including the change between the current state and the envisaged theoretical future state.



The impact on core processes

How will these kinds of benefits manifest in core finance processes? To project the impact and determine which processes are best suited for blockchain, KPMG developed a framework that evaluates each core process on four key factors:

- 1. Is it rule-based?** The more standardized a process is, the better suited it is for smart contracts in a blockchain.
- 2. Is the data fragmented, with multiple versions of the truth?** Blockchain brings a clear benefit to fragmented data: a single source of truth that is synchronized across stakeholders.

- 3. Does a process require manual intervention?** The greater the need for reconciliations, the greater the opportunity for blockchain to obviate them—by enabling all parties to view all transactions at their source.
- 4. How many stakeholders are involved?** When a process involves many parties, blockchain can bring value through distributed ledgers and transparent records that give all stakeholders access to the same data at the same time.

These four criteria can be applied to all core processes, helping finance organizations contemplate the impact of blockchain on their service delivery.

Blockchain's projected impact on core finance processes

| Process: | Acquire-to-retire | Source-to-pay | Quote-to-cash | Record-to-report | Payroll | Plan-to-perform |
|-------------------|-------------------|---------------|---------------|------------------|---------|-----------------|
| Projected impact: | HIGH | | | MODERATE | | LOW |

For example, consider the quote-to-cash process. With activities like credit history analysis, product/service management, and accounts receivable, the process is highly standardized and rule-based—without a lot of judgment or individual discretion. And while most companies are working to centralize their data, many still have it housed in several enterprise resource planning (ERP) systems.

Accordingly, manual effort is often required to update data from one system to the next or correct associated errors, such as inaccurate information on invoices, which can slow down the receivables process. Finally, quote-to-cash clearly involves numerous stakeholders—from customer qualification through to collections—and there is often a lack of transparency between entities.

Based on these process characteristics, blockchain technology may bring significant improvements throughout quote-to-cash:

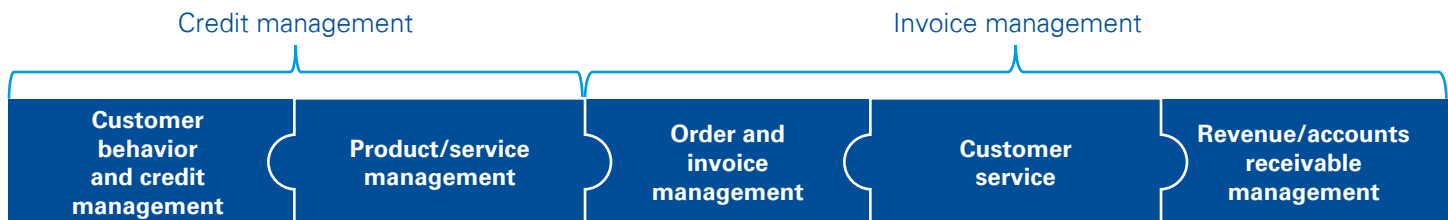
- **Customer behavior and credit management.** A blockchain can serve as a master file of customer data—including contact information, transactions, third-party credit ratings, and more—for real-time clarity and accuracy on each customer.

- **Product/service management.** Blockchain can enable a continually updated master file of products and services, allowing participants throughout the supply chain to work from the same source of truth. For example, as retailers offer more options for personalized products, blockchain is being leveraged in order to provide reliable, accurate visibility to an increasingly complex inventory. This visibility may also improve SKU forecasting, helping companies reduce lost sales due to out-of-stock products, while minimizing write-offs due to over-ordering.
- **Order and invoice management.** A blockchain for omnichannel order management could provide each participant in the supply chain with an always-up-to-date ledger of inventory, orders, and fulfillment status. Such a distributed ledger would allow for automated payments and reporting.
- **Customer service.** Smart contracts can help address exceptions and reduce the number of disputes. For instance, if a customer orders five products and receives only three, transparency in the blockchain would make the situation known to all parties, and a smart contract could trigger automatic payment in the right amount.

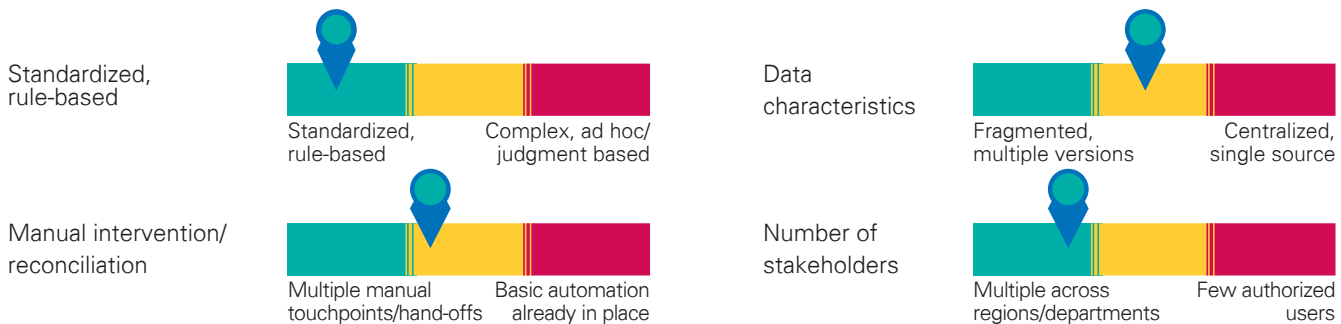
— **Revenue/accounts receivable management.** Finally, the transparency of a blockchain will provide companies with real-time visibility on the precise status of open invoices, which will reduce manual effort and lags in payment processing.

While quote-to-cash is a great candidate for blockchain, with a potential for high impact, other core processes are less well suited, as everything in finance is not necessarily made better by blockchain. Some processes will be better served by conventional databases and a digital overhaul.

Impact analysis: Quote-to-cash Process decomposition



Evaluation of the four factors



Projected impact: HIGH

Part of a new future for finance

Blockchain clearly will have significant impacts on the finance function, and most organizations will gradually adopt the technology as they envision a new operating model for finance. We anticipate the following key trends:

- **Blockchains will connect to existing financial systems.** Despite the benefits of blockchain, it will not replace traditional ERP systems overnight. Rather, distributed ledgers initially will supplement the systems of record, specifically in cases where balances are frequently recalculated as transactions occur. And while blockchain enables a real-time view of data, the integration with legacy systems may cause a delay in harnessing the ultimate value of the distributed ledgers.
- **Blockchains will be a hybrid of private and public ledgers.** As blockchain technology evolves, we expect

finance organizations to start with private blockchains—such as a ledger shared within a company or shared by a company and a vendor—which will enable them to retain sensitive data while gradually embracing more public ledgers. These could include permissioned blockchains for industry consortia and other entities, as well as truly public blockchains that operate in an open marketplace.

- **The regulatory environment will remain in flux.** As blockchain decentralizes financial activities, governments will continue striving to understand and regulate the technology. And those that do so effectively will have an opportunity to attract global investment and become frontrunners in a blockchain economy.

From a new level of data transparency to extreme efficiency gains, blockchain opens finance organizations to a world of new possibilities. But it also opens them to new questions, such as:

- What kinds of business transactions and pain points are best suited for blockchain, and which are better addressed by other technologies?
- What kind of infrastructure will be required, and how will it be funded?
- Who will be in charge of managing a blockchain and admitting new participants? How will this impact talent management strategies?
- How can blockchain impact the finance function's role as an enterprise data steward, as well as the CFO's approach to innovation and investment?
- How can blockchain improve risk management?

The answers to these kinds of questions will pave the way to the blockchain world, helping CFOs embrace a new future for finance.

Taking action

A global custodian bank wanted to understand how its transaction banking unit could leapfrog competitors by providing a real-time, transparent, and seamless global payment experience to clients without making a large investment in a new global payment system.

The custodian engaged KPMG to help develop a case for change to efficiently and effectively achieve this goal. Working with both the client and a payment protocol and exchange network developer, KPMG developed a distributed ledger overview document highlighting benefits, capabilities, and use cases to share with key stakeholders. This featured a conceptual design of a distributed ledger cross-border, cross-currency payment system focused on optimizing clients' global remittance capabilities. Opportunities to increase efficiency and rationalization in the custodian's global operations unit were also identified.

Once equipped with the conceptual design and pertinent information, the custodian was able to further its blockchain and global payment strategy.



How KPMG can help

KPMG's Finance Transformation practice along with our Digital Ledger Services team can help your organization seize the potential of blockchain. Our suite of services provides full support at every stage of development—from proof of concept to designing relevant use cases, integrating systems and operations, through to ongoing management support.

Embracing a rapidly-advancing new technology that disrupts business as usual is not always easy. KPMG will help keep you educated on the growing blockchain ecosystem, informed of new blockchain developments, and aware of the evolving regulatory landscape. Our tailored approach incorporates strategy, security, cost, privacy, performance, risk management, and more.

About KPMG

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To learn more about KPMG's digital ledger services, visit: read.kpmg.us/digitalledgerservices.

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