



Operational finance with **business blockchains**

February 2020

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The finance factory

*In the future, transactions will be touchless as automation and blockchains reach deeper into finance operations.**

The last fifty years, innovation in technology has enabled the finance function to evolve from hindsight to insight. While it took thirty years for the technology of the twentieth century to capture and distribute data, a shift in half that time has empowered people to leverage data through performance tracking, mobile devices, and robotic process automation. These insights are key factors for the modern CFO, they enable the CFO to act as a strategist and catalyst. Blockchain technology enables transparency throughout the business processes.

Traditional processes—and the silos around them— will change as the focus of the finance function shifts to design, configuration, and maintenance of systems. The finance function will excel in translating business practices and governance models into automated processes. The workforce in the finance function will change, and its reach into the business will expand. Leading organizations will implement finance command centers, where small groups of professionals can monitor the full array of processes using dashboards. One result will be new levels of agility, especially for supporting M&A and divestment activities, and when information becomes available instantly to those who need it, traditional cycles become unnecessary. That frees people to focus on discovering new insights and acting on them.

None of us know for certain what the future will hold, but we all have a responsibility to be thinking about what is likely to happen and to prepare for it. In the finance function, this means working now to get the right people and technology in place to take advantage of the inevitable disruption ahead. That is not likely to happen without a clear vision and strategy for the finance function in a digital world.

Some find it interesting to speculate about the finance function disappearing under the crush of digital disruption, but we do not see that happening. Yes, the finance function will likely be leaner, but that will mostly be a function of headcount in the operational finance function (order-to-cash, procure-to-pay, transactional accounting, etc.). In the meanwhile, expectations for support from the business finance function (business partnering, reporting, planning, budgeting, forecasting, etc.) and the specialized finance function (tax, treasury, IR, etc.) will continue to grow. We see blockchains as enablers for this finance factory and a way to enhance processes. In this booklet, we will make a deep-dive into, how blockchain technology can assist in operational finance. (See figure 2 on page 4).

* Deloitte. (2018). *Crunch time V - Finance 2025 (Our predictions)*

Figure 1. Finance factory



Introduction to business blockchains

Market trends

Deloitte currently sees a strong trend in the attitude towards the use of blockchain based applications. Deloitte global blockchain 2019 survey showed that more businesses see compelling use cases with blockchain as an enabler. Furthermore, the survey showed that:

- 91 percent of the respondents believe that they would achieve measurable, verifiable return on blockchain investments within five years.
- The respondents' overall attitude toward blockchain has strengthened significantly with 83 percent seeing compelling use cases.
- 86 percent of the respondents agreed with each of the following statements:
 - “Blockchain can enhance our integration toward more “touchless” business processes”.
 - “Blockchain will enable new business functionalities and revenue streams in my industry”.
 - “Blockchain technology is broadly scalable and will eventually achieve mainstream adoption”.

All that said, blockchain is a new and nascent technology. No one has put it all together yet. There is time to explore your options. Here, we make a deep dive into three use cases of blockchains in the finance function: the procure-to-pay process; the order-to-cash process; and the close, consolidate and report process.

What is a blockchain?

Blockchain is a distributed ledger technology that enables digital assets to be transacted and traded in real time. The record it keeps is permanent and irreversible. To read more about the fundamentals of blockchain technology. See Deloitte CFO insights, 2019.

How business blockchains can structure the close, consolidate and report process

How business blockchains can align communication in the procure-to-pay process

How business blockchains can help streamline the order-to-cash process

How blockchains can assist the CFO

Deloitte's finance wheel

In Deloitte, we classify finance activities within finance functions into three high-level areas: operational, business and specialized finance.

Business blockchains

The best known application of blockchain technology involves trading and managing cryptocurrencies. However, from a traditional business point of view, the use of blockchain technology is for managing transactions related to trade and commerce, including finance processes like payables, receivables, and compliance. We think of these as business blockchains.

Business blockchains are being used today to help reinvent how transactions are managed. They can take time and cost out of almost any process, enabling near real-time operations. Furthermore, they deliver a high degree of accuracy and control, involving much less risk than many alternatives. Blockchains perform record keeping using automated, low-cost mechanisms if implemented with care. They enable asset transfer through secure, real-time methods, and they enable automation of business logic through smart contracts. Smart contracts enforce contract terms, such as payment, and thus enable greater trust in the record keeping and reduction of transaction cost.

Common finance applications for blockchains include procure-to-pay, order-to-cash, trade finance, intercompany transactions, and reconciliation processes. Processes that extend beyond the finance, function such as supply chain management, asset tracking, warranty service, and regulatory compliance, can also be streamlined using blockchain technology. Business blockchains are combined with the ecosystem of current systems in the finance functions to source and verify data and then enrich the data from the use of emerging technologies such as machine learning and the internet of things to reimagine end-to-end process.

Figure 2. Deloitte's finance wheel



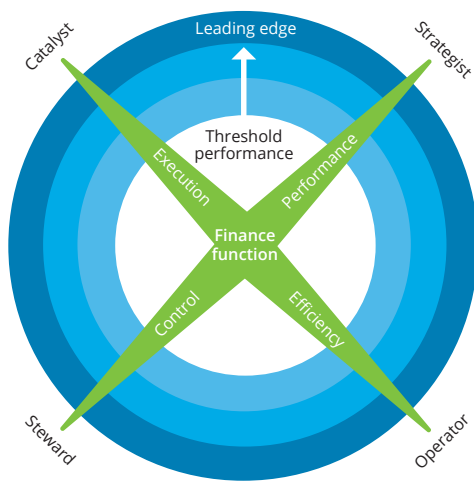
Case

Blockchain
and the four faces of
the CFO

Blockchain and the four faces of the CFO

In the future, finance processes will be more automated, leaving more time for the CFO to focus on strategic initiatives. At Deloitte, we see blockchain as an enabler for this change.

Figur 3. The four faces of the CFO



At Deloitte, we divide the focus of the CFO into four so-called faces. Every CFO will most likely be a mix of all of them. However, the CFO might change face depending on the task at hand:

- The operator focuses on efficiency and effectiveness of operations, including overall risk management of the finance operations and adding value for the owners.
- The steward focuses on accountability, controlling, risk management, and preserving assets.
- The catalyst focuses on the disciplined execution of strategic choices, changing organization behavior, and establishing a value attitude.
- Lastly, the strategist focuses on helping setting the future direction of the company to enhance business performance and shareholder value.

The impact of blockchain on finance functions

In Deloitte's 2019 global blockchain survey, more than two thirds of the respondents answered that their companies will lose a competitive advantage if they do not adopt blockchain technology. Blockchain can be used to remake a wide range of finance processes: intercompany transactions, the procure-to-pay process, the order-to-cash process, as well as the close, consolidate, and report process. Any place where paper piles up presents an opportunity for blockchain technology to move in and knock it down (Deloitte, 2019b).

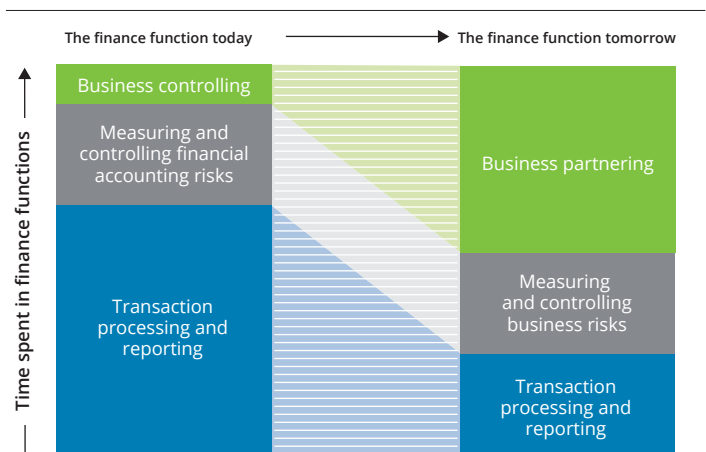
In today's turbulent and highly regulated environment, the role of the CFO has expanded and become more complex. Many CFOs spend their time on tasks related to being either an operator or a steward, when they would really like to be a catalyst or a strategist. In fact, only a minority of CFOs spent their time on tasks related to being either a catalyst or a strategist. In the future, we believe, CFO's will spend more time on tasks related to being either a catalyst or a strategist (Deloitte, 2018). At Deloitte, we see blockchain technology as an enabler for that change by:

- Relieving the burden of transactions from the operator
- Mitigating risks for the steward
- Freeing up time for the catalyst and the strategist.

Relieving the burden of transactions from the operator

The back-and-forth transactions conducted between parties on a shared platform could conceivably be completed in just hours, compared to the usual five days that a paper-based system devours (Deloitte, 2019b). Blockchain technology lays the foundation for a reduction in cost and friction involved in repetitive finance tasks, cutting both errors and delays. In a typical accounts payable or receivable function, an inordinate amount of time can be wasted reconciling the supplier's data with the data of the buyer. Having both parties share access to a single source of truth can eliminate such inefficiencies. By providing a single source of truth – verified by all parties involved in the network – blockchain technology eliminates the need to continuously confirm that the transaction record on one CFO's screen matches that of his or her counterparts on the other side

Figure 4. The finance function today and tomorrow



of a deal. By giving CFO's and finance leaders a real-time picture of a given financial situation, blockchain technology equips them to improve their decision-making, thereby relieving the burden of the operator.

Mitigating risks for the steward

The steward is concerned with mitigating financial risks within the company and upholding regulatory requirements such as the IFRS rules. Many reports in modern companies are still prepared manually. Implementing a blockchain solution for transaction management can effectively improve data quality and thereby enrich the information drawn from the data. Since data are typically reconciled with external stakeholders and are readily available on the blockchain, the steward can deliver information to regulators in near real-time if they are connected to the blockchain network. Furthermore, blockchain solutions can be used to monitor credit exposure to clients and uphold corporate policies. When data are shared and reconciled with clients on a blockchain, it becomes easier for finance professionals to engage in a negotiation with clients and that way mitigate credit risks.

Freeing up time for the catalyst and the strategist

In the coming years, due to technical advancements within the finance field, many processes will most likely have a higher level of automation than today. We see a trend toward more digitalized finance functions. In the recent global Deloitte CFO Survey spring 2019, the respondents answered as follows (Deloitte, 2019a):

- 78 percent answered: "My finance function focuses on automating manual processes through digitalization".
- 49 percent answered: "Due to automation of my finance function, we now focus on developing my company's business model and increasing cross-functional cooperation".
- 20 percent answered: "My finance function reduces the number of classic finance employees to make room for new roles (for example, data scientists and story-tellers)".

Thus, we see an ongoing tendency toward transaction processing and reporting being more and more automated. In the future, with operations automated, finance functions will double down on business insights and services. With less time needed to perform tasks related to measuring and controlling financial risks as well as transactions processing and reporting, more time will be available to perform tasks that enhance business performance and shareholder value – tasks that are a key focus for the catalyst and the strategist, (see figure 4).



Case

Aligning communication in the procure-to-pay process

Aligning communication in the procure-to-pay process

Business blockchains can create transparency in communication between entities and align data

At Deloitte, we typically see procure-to-pay (P2P) process improvements as a project within companies themselves and with little focus on cooperation with external stakeholders (for example, vendors, subvendors, and banks). In theory, the communication between stakeholders during the process should be simple with existing tools provided in today's world.

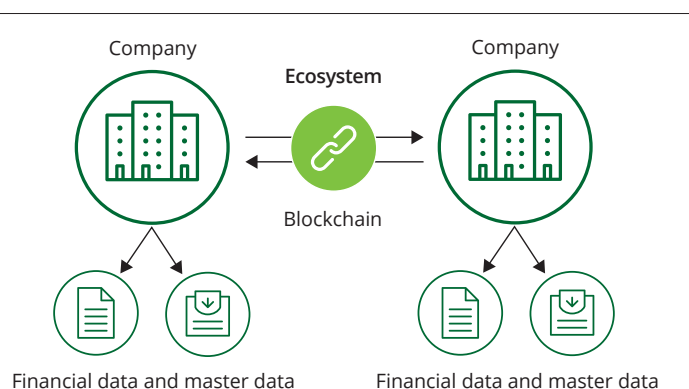
In reality, the process is often troublesome and time-consuming. Issues often occur because the buyer and the seller operate with different sources of the same truth – one in each of their individual ERP system. This can lead to inconsistent information between stakeholders and their systems, resulting in increased cost or wasted time on controlling and reconciliation.

We see business blockchain, for the finance functions as an enabler for creating a transparent communication platform with verified and aligned data across entities. A distributed database that provides a unique single source of truth between the buyer and the seller (and others), which can help overcome communication challenges.

One single source of truth between the buyer and the seller enabled by a shared and distributed platform and an enclosed record of transactions.

In a corporate world where information is **decentralised** across companies, it is unavoidable that information is sometimes not aligned. Inconsistency between databases can occur because of manual registrations of information from emails or because of missing updates of master data.

Figure 5. Blockchain, align data between companies



Business blockchains, on the other hand, are **distributed** databases shared by participants. Since blockchains only append data, not changes, consent materializes across the network. As a result, it provides a full and verified record of transactions in a chronological format, shared in realtime.

If we were to use **blockchain on our own P2P process at Deloitte**, we would enter the number of hours worked on the client for the month on the blockchain as a proposal for an invoice. When the client accepts the number of hours, the hours will be posted to the blockchain, and the smart contract (explained in the following) will execute the invoice creation based on the agreed hours and prices.

Review and detection of mismatches between the purchase order and the sales confirmation before or upon delivery of goods is a known issue in the P2P process. Depending on when the errors are detected, miscommunication between the two entities could result in increased cost or delayed production as wrong goods are sent or have already been delivered before the sales confirmation has been read. Using a business blockchain to agree on the details of the order (quantity, place and time of delivery, etc.), the confirmation is created automatically on the blockchain based on the agreed data, this removing the risk of a misaligned confirmation.

Moreover, a business blockchain provides the **opportunity to use smart contracts**. Smart contracts can minimize manual errors by automating actions and validation and can execute data transfers



to the stakeholders' ERP systems. In essence, smart contracts are macros running on the blockchain that perform a process when certain conditions are met, for example, payment after 30 days.

Execution of data transfer to the ERP systems happens via smart contracts when the buyer and the seller agree on, for instance, price and payment terms. The entities will now have the correct, updated master data in their systems to base their orders and pricing on, removing the risk of errors originating from master data that are either poor or have not been updated. This also optimises the reconciliation process afterwards.

What are the current challenges that we face? There are two main groups of challenges: human and technical. The human challenges revolve around trust, governance, and change. Close cooperation and trust between two or more entities are needed to work on the project together and share data. As some of the data in the blockchain could reveal business models or close partners, the stakeholders must trust the encryption and security built into the blockchain. We see that the technology provides us with new opportunities, but it requires a change in our mindset regarding sharing and cooperation.

Agreement in relation to governance and engagement rules between participants is also still a hurdle that needs overcoming. We see that engagement rules are difficult to agree on when the number of participants increases. However, the possibility of using blockchain technology is now fuelling the discussion of what the joint governance models could look like. For employees involved in the P2P process, there is also a significant change involved as their ways of working will change.

At a technical level, integration between the blockchain and ERP platforms should also be addressed, as the connection needs to be able to function with a variety of ERP versions as well as being able to handle the potential volume of transactions.

Case

Streamlining the order-to-cash process

Streamlining the order-to-cash process

Integrating business blockchains can reduce the effort and cost of the order-to-cash process.

The order-to-cash (OTC) process is time-consuming for many companies. According to the recent Deloitte CFO Survey, cost optimization and reducing error rates were the first and third highest priority in financial functions' digitalization strategies (Deloitte, 2019). An efficient OTC process starts with excellence in customer master data; yet companies across industries struggle within this area. Information mismatch with customers can often lead to disputes, and it increases the time needed to process an invoice. Misalignment has an impact on the free cash flow velocity, it affects credit risk, and it erodes the OTC cycle time. Furthermore, errors in the process can lead to decreased customer satisfaction, which may dampen future sales. These issues stem from fragmented and non-integrated system environments creating excessive manual handoffs (Gartner, 2017) (see figure 6 below).

Blockchain technology offers the ability to solve the issues of fragmented systems and enables further automation beyond internal processes by increasing cooperation with customers. There are several advantages of utilizing blockchain technology in the OTC process, which we will cover in this post:

- A well-defined master data environment
- Change in orders is reflected instantly
- Data can be shared privately

A well-defined master data environment

Saving master data, such as products, contracts, or other corporate commercial policies, on the blockchain has several benefits. When trading, invoices and associated information, such as the quantity of sold units, payment terms, time of delivery, etc., are saved on the blockchain. The properties of the blockchain technology ensure that data are always aligned with the customer before being stored as validation takes place through digital signatures and consensus mechanisms. As data are validated by the customer and saved on the blockchain, it also allows the finance function department and the logistics department access to see the agreement on the blockchain, while the sales department saves communication time with the rest of the company.

To ensure that corporate commercial policies are upheld in relation to the customers, smart contracts can be deployed. For example, to ensure that the buyer of goods pays within the agreed timeframe, a smart contract can be coded to automatically settle the invoice or reserve funds after the invoice has been approved by the finance function and accepted by the customer. Furthermore, the smart contract can be used to automate bookkeeping of the invoice by posting it in the ERP system. Depending on when the income is realized, the invoice will represent an asset, whereas after the income has been realized, the invoice will represent a liability.

Figure 6. Miscommunication happens between the finance function and key stakeholders

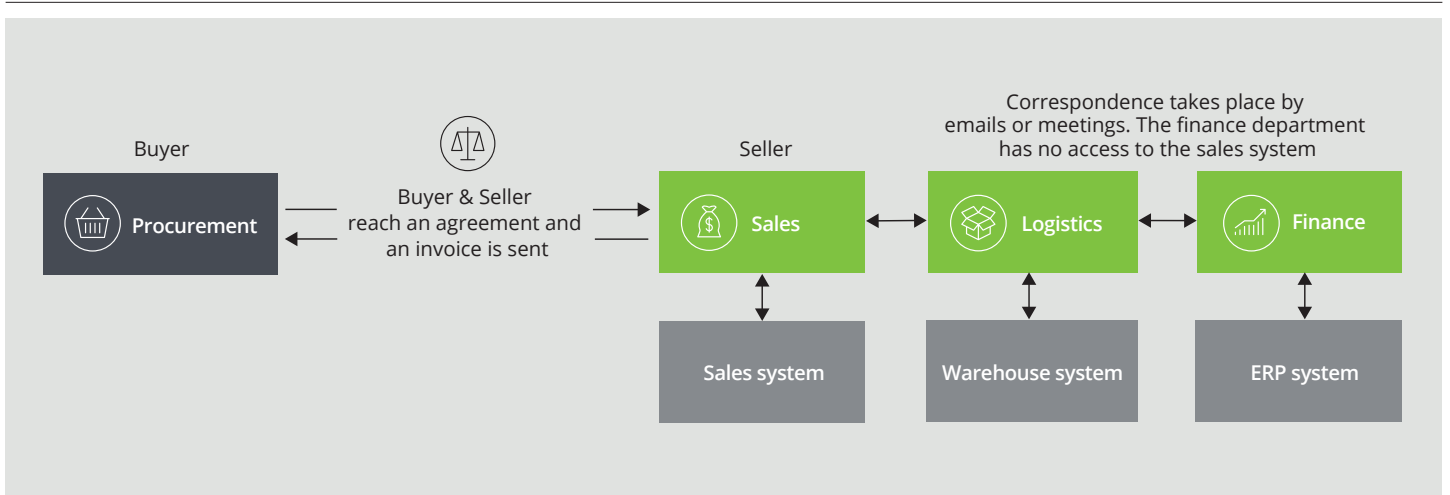
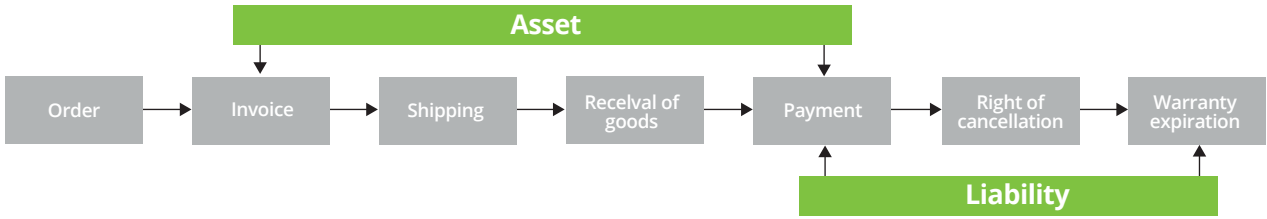


Figure 7. Invoices and booking status can be managed by smart contracts



Integrating this information from the blockchain with modern ERP systems can automate much of the bookkeeping for the finance function, thus reducing the effort and cost related to the OTC process as illustrated below (figure 7).

Change in orders is reflected instantly

Blockchain technology has the potential to drastically change the OTC process. Instead of finance professionals spending time on collecting information from the sales department, they can utilize the data available on the blockchain for analysis and optimization of their process, for example, through minimizing data reconciliation. Most tasks associated with the OTC process move from inside the company on to the blockchain, providing product owners with an overview of their end-to-end process. Instead of the finance functions creating invoices, invoices are managed by smart contracts, and all that the finance professionals must do is to approve the invoice (see the order-to-cash blockchain framework in figure 8 below). As the tasks move from inside the company on to the blockchain, the process becomes more transparent to customers. An overview of what the process might look like can be found below.

As an example, should a customer need a change in the order before shipment, the customer can submit a request for change.

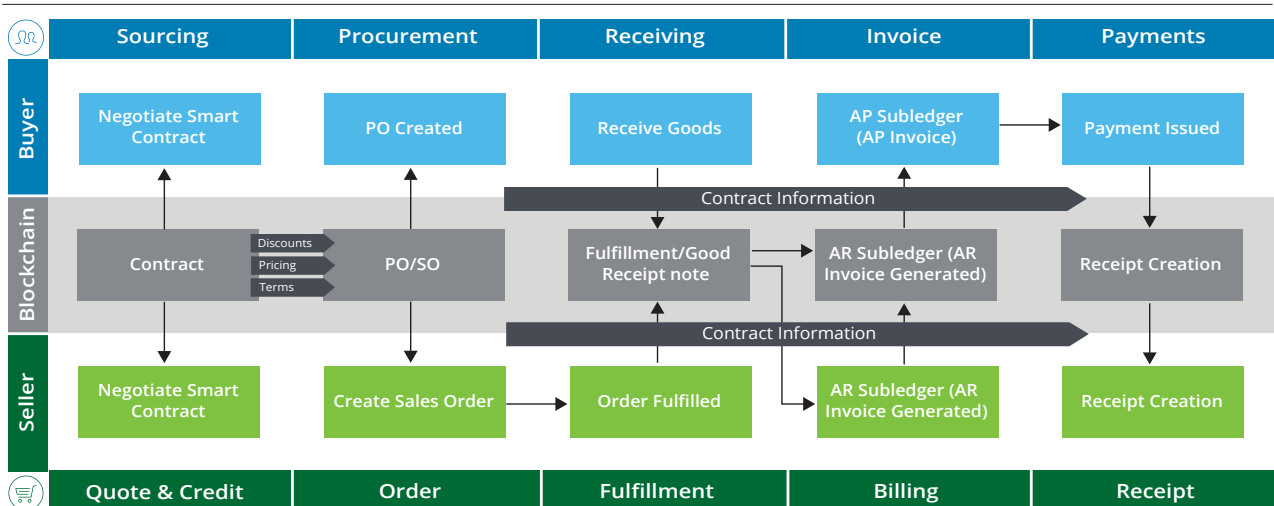
Once accepted by the supplier, the shared record on the blockchain will be updated and inform all parties automatically. The finance function can automatically adjust the invoice on the blockchain platform, and the warehouse will alter the order with full traceability and immutable audit trail. If the item breaks during shipment, the incomplete delivery will automatically result in an adjusted invoice, and the customer can optionally reorder the missing goods right away. Other benefits could be improved customer satisfaction, on improved working capital position, and a reduced number of reconciliation errors.

Data can be shared privately

A common misconception about blockchains is that stored data become public. While it is possible to establish data visibility permissions on a blockchain network, most companies would prefer not to share their sensitive data in the first place. Within blockchain architecture, the literature operates with two locations of data: data are either stored on the actual blockchain (on-chain data), or data can be stored in a database within a company with a cryptographic hash reference to the blockchain (off-chain data) (Xu et al, 2019).

A common architecture pattern for privacy-preserving a hash is blockchains is to only store a hash of the transaction data.

Figure 8. Order to cash blockchain framework





a digital fingerprint that is easy to check but practically impossible to recreate without the real data. With cryptography advancing, new opportunities emerge, for example, zero-knowledge proofs.

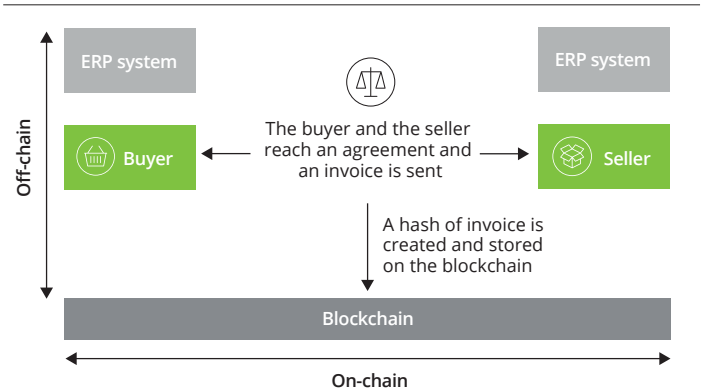
These proofs allow companies to share knowledge without actually sharing data. For example, an invoice can be shared without exposing any details of the invoice. This allows companies to trace and exchange information with blockchain technology without exposing any data as the data are kept safely off-chain within the company's ERP system (Wang & Kogan, 2018) (see figure 9).

Paving the way

While there are several benefits from blockchain technology in the OTC process, the first steps toward implementation are still to be taken. No one has put it all together yet. For example, it is still unclear how best to align incentives and connect IT systems with the data on the blockchain. However, several important milestones have already been achieved:

- Connectors to most common ERP vendors have already been built, enabling data to flow from ERP systems to and from the blockchain.
- To store data on a blockchain, a fixed format for invoice data is needed. The EU has already agreed on a common invoice standard that can be used for storing data on a blockchain. Most EU countries have implemented the PEPPOL standard, which complies with the regulations from the fall 2018.
- Several blockchain platforms have been launched with the intent of making it easier for companies to trade. Thus, it would be a matter of scaling these solutions to international companies.

Figure 9. Data is kept safely off-chain



Case

Structuring the
close, consolidate,
and report process

Structuring the close, consolidate and report process

Companies struggle with inefficient close, consolidate, and report (CCR) processes creating doubt about the validity of the end result. Blockchain technology could change that.

Companies struggle with a manual and inefficient CCR process

Companies are faced with an increasing number of demands and regulatory restrictions from national and international agencies, demanding more documentation, greater transparency, and better governance around financial processes that affect the close (Deloitte, 2018).

A range of close activities are yet to be supported or enabled by our clients' existing solutions. This results in a CCR process that is supported mainly through manual exchange of information and calculations in separate spreadsheets. This can lead to a fragmented, manual, and inefficient close process as well as to inefficient processes throughout the accounting period.

Blockchains can increase the transparency in transactions via a distributed ledger and by increasing the speed of exchange of information between entities. Furthermore using blockchains can reduce the cost associated with accelerating data consolidation and reporting as well as allowing governments transparency in the CCR process. In this post, we will focus on how blockchains can enable:

- An easier close process
- A structured consolidation of statements
- One truth in reporting.

An easier close process

In our experience, companies struggle with an inefficient account reconciliation process, timely close of their books, and lack of coordination around order of reconciliation of subledgers when closing the books. Tasks such as transaction matching, journal entering, and reconciliations, within accounts payable and receivable are a good fit for blockchains. Furthermore, blockchains can facilitate intercompany reconciliation. With the procure-to-pay, order-to-cash, and intercompany transactions enabled by blockchains, companies can save time and money within these processes.

However, the close process must be coordinated between all entities within the company, and the close calendar needs to

be planned and maintained. When it comes to performing these tasks, other technologies and solutions than blockchain technology may be more beneficial. Fast-close software for financial services has excelled at managing and coordinating the close process across entities as the software ensures that no entity within the company continues to the next process without the other entities having completed the prior process. Furthermore, the close process includes subprocesses, such as preparing the balance sheet or producing preliminary reports, where the blockchain is redundant.

A structured consolidation of statements

In many cases, consolidation of financial statements is currently carried out **decentralized** in Excel spreadsheets in different formats, which are manually merged. This process on average, takes nearly seven days across industries (APQC, 2019). The risk is that something goes wrong in the process, and consequently, a reconciliation of the spreadsheets is required all the way down to company level to correct a small mistake.

Instead, blockchains allow for data integration and reduction of the process cycle time in a **distributed** manner. By mapping data in a **fixed format** from the blockchain to the business' organization, data can flow seamlessly into reports and dashboards. That being said, a blockchain is not in itself a tool that is suitable for reporting; a blockchain provides a data structure, but other reporting tools must be in place to utilize the data.

One truth in reporting

In many cases, reports are created manually, which can be an iterative process; data are manually corrected multiple times to reflect events that have not been captured. Moreover, when the report finally reaches the management, they waste time discussing if the data are valid instead of acting on them using them to set the direction for the company.

Instead, a blockchain can ensure validity in reporting. Since data are derived from transactions that have been agreed upon in the network, the management can rest assured that the data are correct and have not been manipulated. Besides setting the

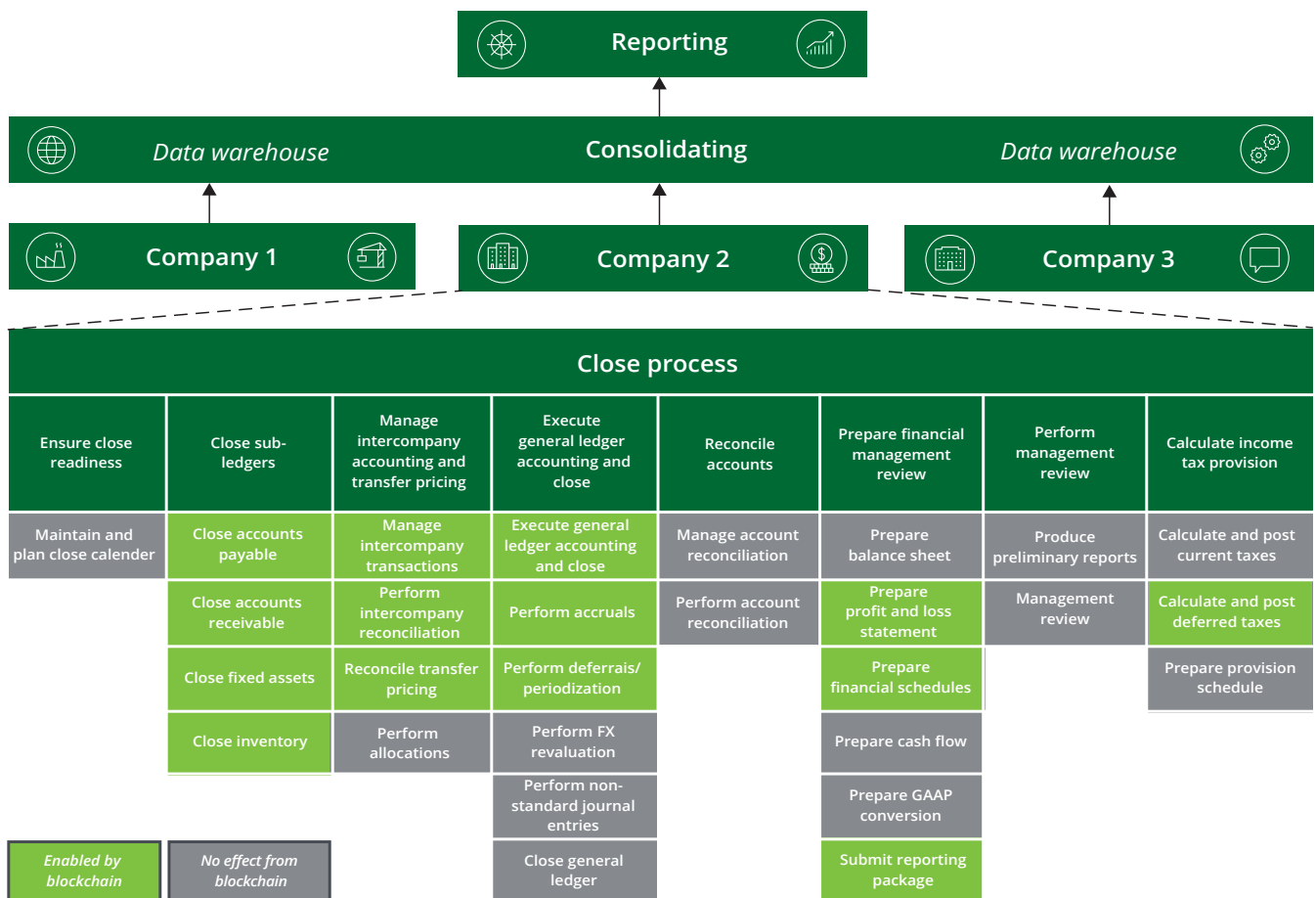
foundation for good management decisions, blockchains enable a transparent CCR process and allow governments and regulators validated insight into corporate operations.

The future of operational finance

On average, nearly 42 percent of finance professionals' time is spent on processing transactions, and very little time is spent on supporting management activities (APQC, 2017). Blockchain and other technologies could shift finance into an era of more integrated-processes, where more time is available for planning and managing the business as well as creating management insight.

At Deloitte, we predict that, in the future, finance functions will operate as a factory; transactions will be touchless and automated, and blockchains will have a deep reach into finance operations. With operations being largely automated, finance functions will double down on business insights and services. Periodic reporting will no longer drive operations and decisions. Instead, finance functions will become a self-service center for the management, who can tap in and collect the reports and insights they need. With periodic reporting diminishing in favor of ongoing finance cycles during the month, we see blockchains as enablers for a faster close process assisting in key areas of the process.

Figure 10. Where blockchains can assist in the close, consolidate, and report process



Get more insights Reach out to Deloitte Consulting

At Deloitte Denmark, we have a dedicated group of finance consultants exploring how business blockchains can be used to improve finance functions. For links to additional information, for example academic papers, blogs, and podcasts, feel free to reach out to us:

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