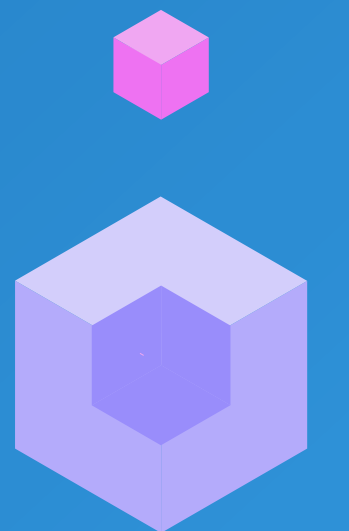


# Cronica

A Digital Document Authentication  
Solution For Banks

v1.0 2019



# What Is Cronica?

Cronica is a blockchain-based platform that enables banks and their customers to securely generate, authenticate, and retrieve programmable documents. It replaces an imperfect system – of physical authentication, susceptible to fraud and misuse – with a secure and scalable platform.

# What Does Cronica Do?

Cronica strengthens the relationship between banks, their customers, and other institutions by making document authentication more efficient, convenient, and secure. It securely digitizes document generation, authentication, and retrieval; the need of manual input is minimized and there is no requirement of physical authentication.

Cronica aims to automate the authentication of documents and introduce real-time verification and the concept of ‘live’, programmable documents. Documents stored and verified through Cronica reflect the status at the time of verification rather than at the time of issuance.

# Why Banks Need Cronica

Cronica provides the assurance and security of physical authentication and the convenience and real-time processing of digital authentication. By alleviating - or eliminating - reliance on manual intervention (human intermediaries), Cronica provides a level of security, reliability, and convenience unmatched by existing solutions. More specifically, Cronica:

- ◊ Reduces operational risks associated with the issuance and authentication of documents
- ◊ Increases security and privacy
- ◊ Virtually eliminates the possibility of document forgery and identity fraud
- ◊ Reduces document processing time
- ◊ Reduce the handling TAT of attaining physical signatures
- ◊ Introduces real-time verification and insight (status checking, etc.) through programmable documents
- ◊ Offers an unprecedented level of control over the document authentication process



# Why A New Solution Is Required

Banks transitioning to digital systems require a digital document authentication solution that does not compromise security. Cronica replaces physical authentication – slow, inefficient, vulnerable – with a secure and scalable authentication platform that can be integrated into existing infrastructure.

Document authentication is critical to the successful operation of your bank, and in protecting bank-customer relationships. Cronica is the first sufficiently secure digital authentication solution able to not only replace, but improve existing authentication processes. It addresses the critical vulnerability in document authentication: manual intervention and the handling and potential misuse of critical documents.

# How It Works: An Overview



- ◇ Cronica separates document data and document representation. Document data is stored on the blockchain, while the document representation (i.e., the template used to create, for example, the PDF document) is stored locally.
- ◇ Each Cronica document exists as a smart contract on the Cronica blockchain, is programmable, and can be searched by its attributes. Blockchain-stored documents can be securely verified using digital signifiers (QR code or document ID).



# How It Works: **Step-by-Step**

- 1** A customer requests a specific document. Depending on the document type, the document can either be created by the system or, in certain cases, will require input from the bank branch.
- 2** Once the document is created, it is considered issued. All documents are issued by the bank (the issuer)
- 3** Issued documents are then uploaded and securely stored on the blockchain through the Cronica platform
- 4** Each document is digitally signed and timestamped at the precise time of creation, and permanently recorded on the blockchain in an encrypted format
- 5** The blockchain is a peer-to-peer network that cannot be tampered with. Document data stored on the blockchain is immutable
- 6** Once stored, a document's data can be retrieved at any time and from any location using a document's digital signifier (QR code or document URL)
- 7** A verified either scans the QR code or opens the URL to verify the document's authenticity. Data is encrypted until retrieved by the verifier.

# The Result

Now, anybody with access to the blockchain and a document's identifiers can verify its authenticity. Significantly, this is achieved without relying on a paper format of the document.

Document accessibility is assured with convenient search and retrieval, and the security of document data guaranteed.





# Programmable Documents

Every Cronica document is stored as a smart contract and is programmable. This means documents exist as 'live' representations. Among other things, this makes it possible to:



- ◇ Update and check the status of a certificate in real-time
- ◇ Revoke a certificate and have its revoked status immediately reflected in the non-verifiability of the document data
- ◇ Introduce agreements into documents that execute once pre-specified conditions are met
- ◇ Improve the accuracy and consistency of documents, and reduce fraud. Each Cronica document reflects the conditions at the time of verification rather than at the time of issuance



# Prior-And-Post Cronica (Scenario 1)



## Prior to Cronica

A customer visits a branch to issue and submit a balance certificate to a governmental institution. The certificate will only reflect the balances at the time of issuance. It will not be a real-time representation of balances.

As a result, if the customer withdraws money after issuance of the certificate, the institution cannot verify the content of the certificate at the time it is received, which decreases the reliability of the data.



## Post (With) Cronica

The customer requests a balance certificate either by visiting a branch or the bank's website. The certificate's content is updated, and is verifiable, in real-time. Any change to the balances is immediately reflected in the document, based on pre-set conditions and triggers.

This ensures higher levels of reliability and eliminates internal and external manipulation, including fraud. If money is withdrawn after the certificate is issued, the new balance will be immediately reflected.

# Prior-And-Post Cronica (Scenario 2)



## Prior to Cronica

A customer visits a branch to issue and submit a clearance certificate to a governmental institution. The certificate of clearance reflects the status at the time of issuance. It cannot be updated or have its status changed in real-time. As a result, a bank is unable to withdraw the clearance certificate if they decide to do so, which increases operational risk and vulnerability. Issuing clearance certificates in this way is also time consuming and requires a lot of manual input.



## Post (With) Cronica

The customer requests a clearance certificate either by visiting a branch or the bank's website. Post issuance, any change to the status of the certificate is immediately reflected in the certificate document, based on pre-set conditions and triggers.

This ensures higher levels of reliability and eliminates internal and external manipulation, including fraud. In the case of a revoked certificate, the content of the document does not change; only the validity and authenticity of the data.

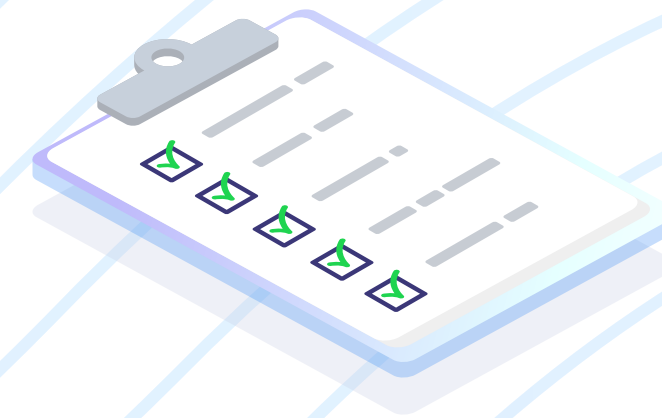


# Strategy and Growth Enabler

Cronica helps you meet your strategy goals. Integration of Cronica leads to:



Decrease in operational risks associated with document authentication



Evident increase in employees productivity



Quantifiable increase in revenue growth & business opportunities



Enhanced customer experience and an increase in quality of services



**Cronica is able to scale to need and, once integrated with, can serve as a complete or partial solution for the issuance and authentication of all critical documents.**



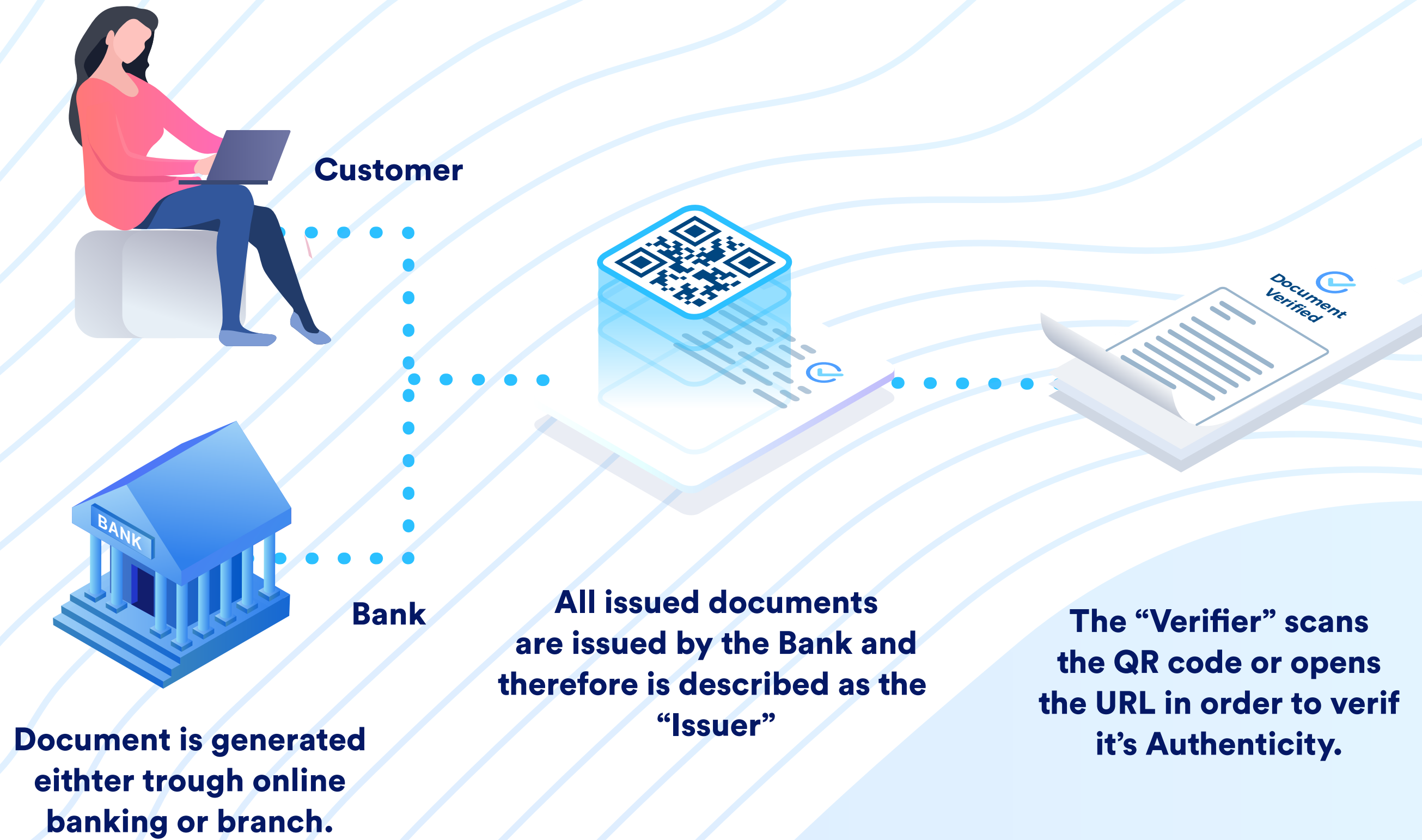
# Types of Documents (Use Cases)



# Parties Impacted By Cronica

There are three main parties impacted by the implementation of or integration with Cronica. These are:

- ◇ The Customer
- ◇ The Issuer (the bank)
- ◇ The Verifier (other banks or governmental organizations)





# Cronica Implementation Benefits

Cronica leads to numerous operational benefits. These include the reduction of costs, operational risks, enhanced customer experience, and increased efficiency and employee productivity. More specific benefits are highlighted here, divided into three categories: operational, legal and scalability.

- ◆ Authentication of documents may be revoked by the issuer at any point, to help reduce operational errors
- ◆ Documents are permission-based and access to documents can be controlled
- ◆ Documents exist in perpetuity and can be accessed at any point and at any time
- ◆ Documents are easily accessed and securely stored
- ◆ Digital signing and timestamping eliminates the possibility of human errors for more accurate documentation
- ◆ Reduces the overall handling TAT for customers - improving their experience - and encourages better utilization of employees and resources

# Legal and Risk-Level Benefits

- ◆ Increases a bank's control over the documentation authentication process, providing full insight and reducing fraud
- ◆ Provides higher levels of security and better data protection, with access controlled through conditions embedded into documents – which are stored as smart contracts – in the form of self-executing programs
- ◆ With Cronica, the need for manual intervention is greatly reduced, helping to eliminate the possibility of human error

# Growth and Scalability Benefits

- ◆ Enables technical innovation through the adoption of blockchain technology
- ◆ Increases reach to customers through the use of electronic requests that do not require manual intervention
- ◆ Encourages migration to online platforms and apps
- ◆ Cronica documents are standardized, helping to ensure document accuracy, consistency, and compliance
- ◆ Improves cross-institutional cooperation



# Summary of Benefits

## REDUCE OPERATIONAL RISKS

Digital signature and timestamp with infinite life-time and easier access

Blockchain technology encourages technological advancements

Increase customer empowerment, encourage migration to online banking and enhance customer experience

Permission-based and reliable. Real-time verification enables revoking and eliminates errors

Reduces operational risks and time and effort required to authenticate documents

Improves cross-institutional cooperation

## ELIMINATE FRAUD

Increase data protection and security

## PRIVACY & SECURITY

Improves cross-institutional cooperation

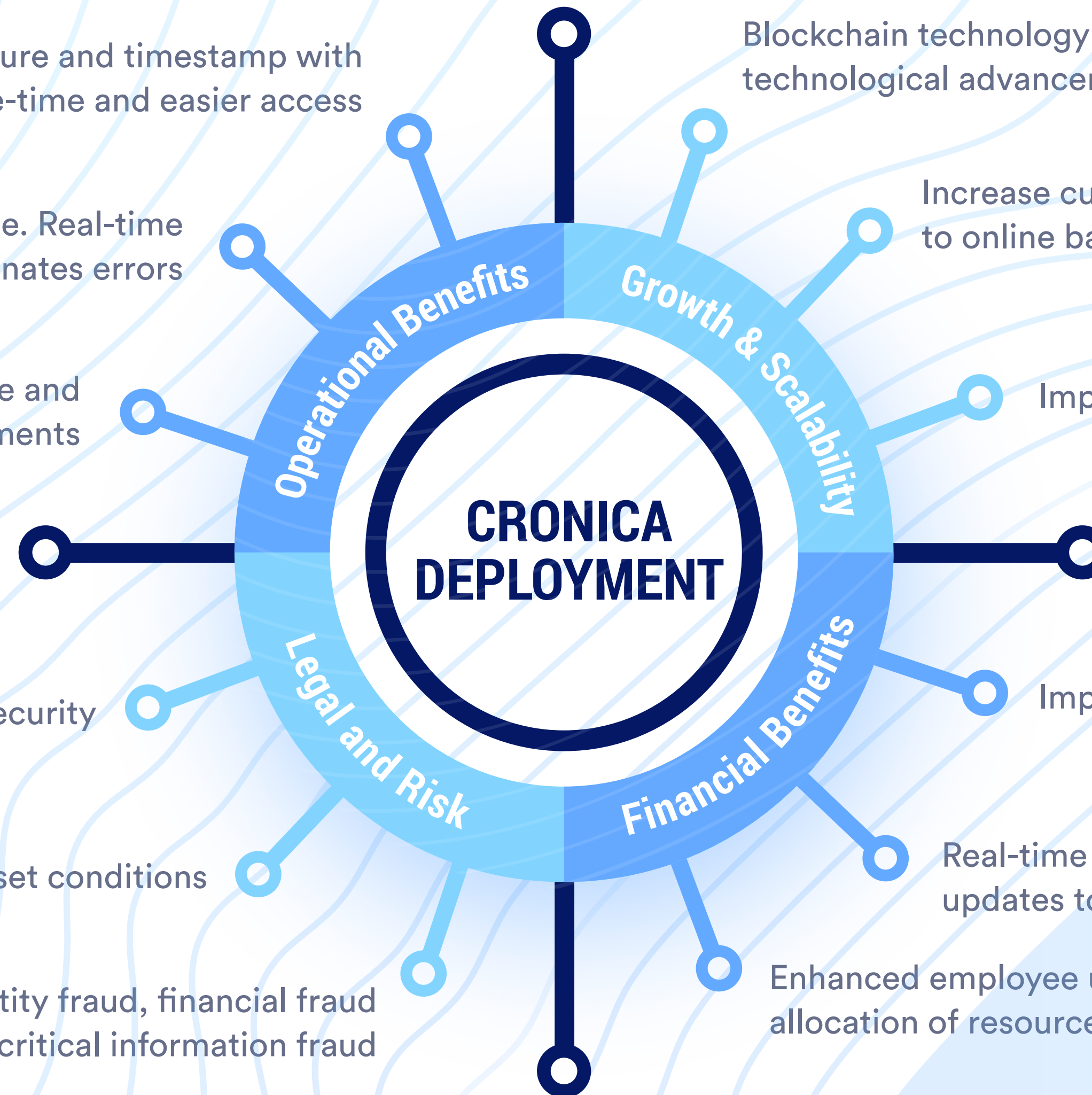
Control access through pre-set conditions

Real-time status and verification with instant updates to status (depending on conditions)

Reduce fraud; identity fraud, financial fraud and critical information fraud

Enhanced employee utilization better allocation of resources

## REDUCE RESOURCES REQUIRED



# Real-World Cost Saving Examples

By increasing security, maximise resource efficiency, and reducing fraud, Cronica ultimately helps to significantly reduce operational costs.

| Document Type                      | Prior to Cronica  | With Cronica   | Post-Cronica Implementation   |
|------------------------------------|---|--|---|
| <b>General documents</b>           | 80% of documents required manual intervention and validation                            | <b>20%</b> of documents require manual intervention                                    | <b>70%</b> of document authentication automated with zero manual intervention |
| <b>Account statement</b>           | 2,500 employee hours saved each month in issuing account statements across all branches | <b>10x</b> reduction in time required to issue an account statement in-branch          | <b>100%</b> reduction in time required to issue a statement                   |
| <b>Credit or debit certificate</b> | 2,720 employee hours saved across all branches  | <b>12x</b> reduction in time required to issue a credit or debit certificate in-branch | <b>100%</b> reduction in time required to issue a certificate                 |

Data shown is based on a bank's real-world data



# Thank You

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