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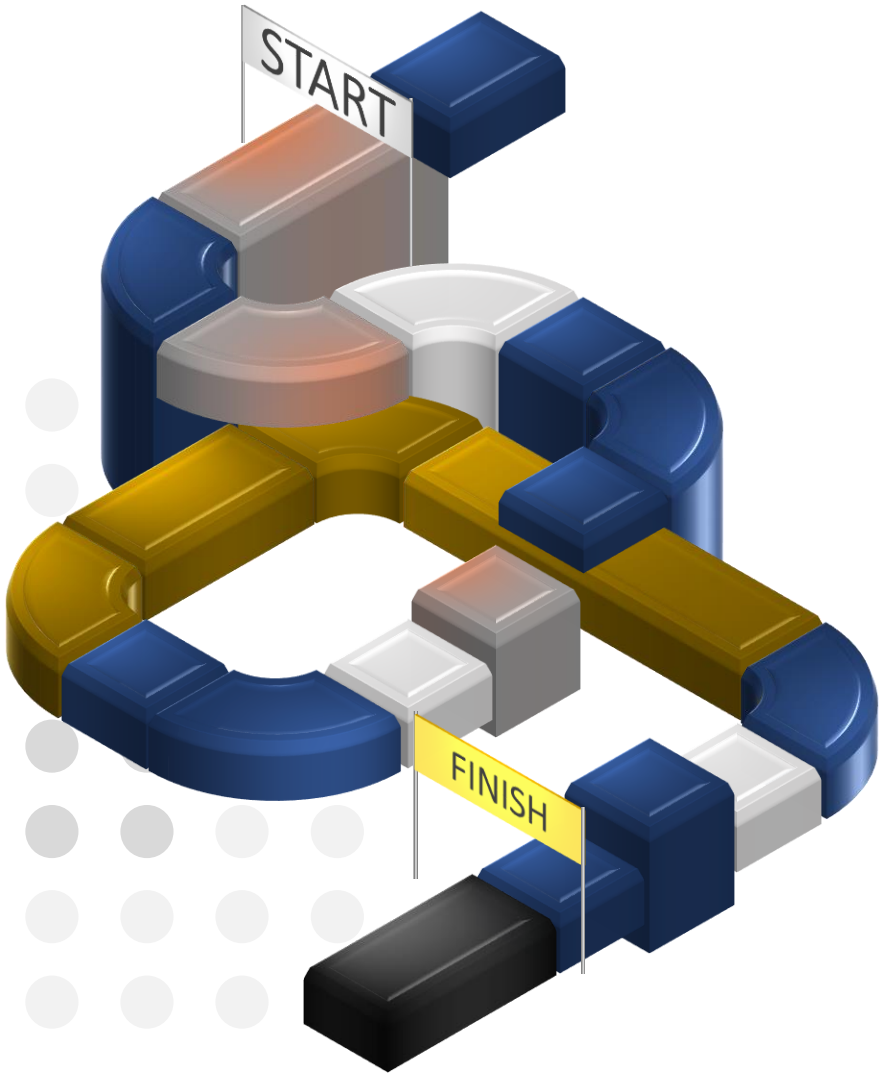


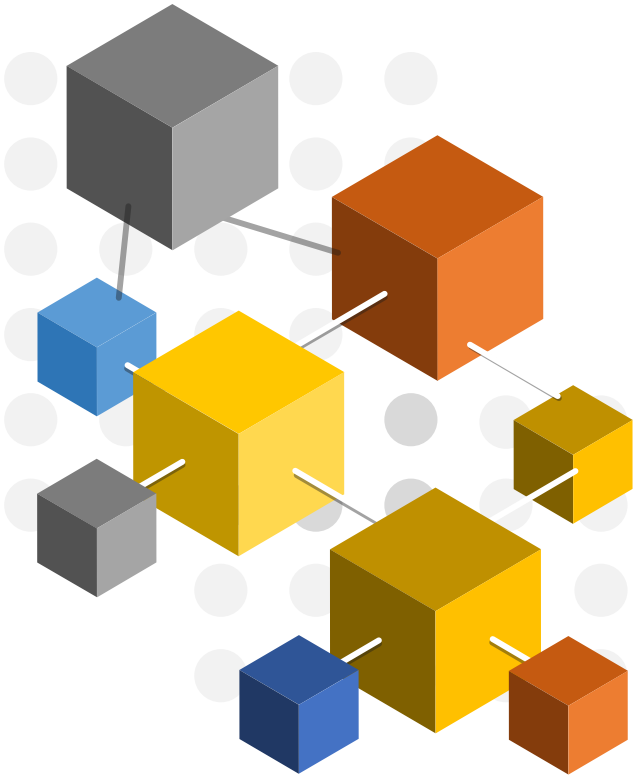
Blockchain guide

Major global outputs of the project

I. Introduction

- Implementing blockchain technology for international trade purposes is a major initiative that involves multiple stakeholders and encompasses several steps.
- Implementation requires careful planning, design, and deployment to meet multiple stakeholder needs, specific use case requirements, international best practices, and compliance standards ensure interoperability with existing legacy systems and make room for future technical reforms of the trade infrastructure.
- This guide is a multi-stakeholder document for governments who have an interest in developing their own blockchain for trade facilitation purposes.

Objectives



- Give governments a framework for the successful and sustainable implementation of blockchain-supported trade facilitation ecosystems.
- Present the implementation steps, stakeholder dynamics, and technical and regulatory requirements for the implementation of blockchain for trade facilitation purposes.
- Outlines the technical implementation options available for governments as well as the technical and regulatory trade-offs of all implementation considerations.

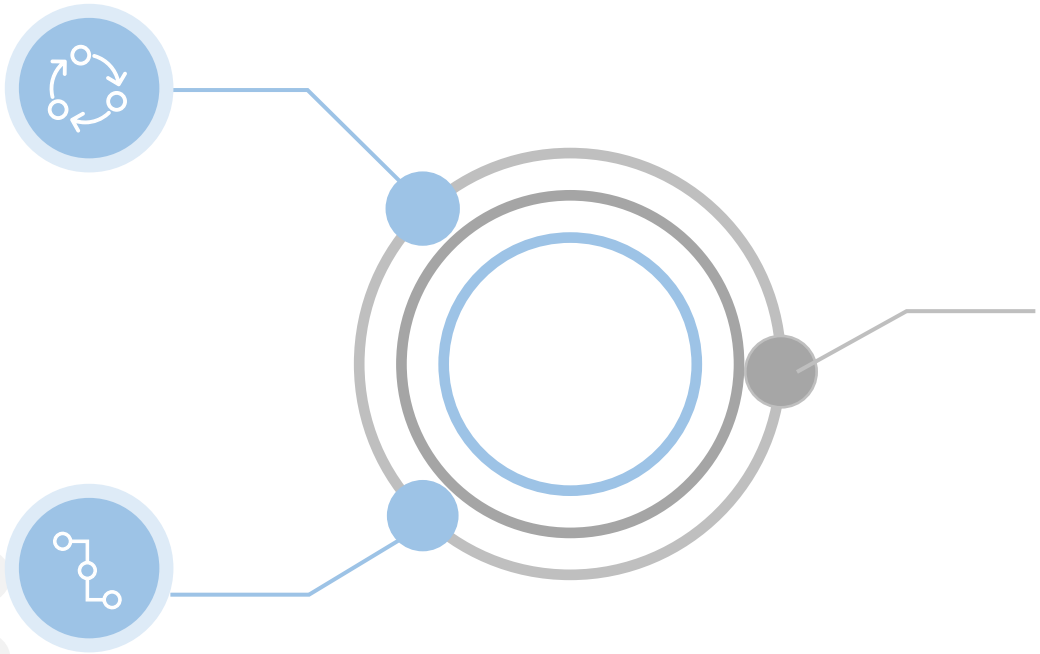
Key features of blockchain and their use-case suitability in trade facilitation

Data encryption

- Trade data exchange among key stakeholders
- User Data and identity protection
- Compliance and audits of key authorizations
- Fraud detection, forgery prevention and counterfeit elimination
- Prevention of unauthorized stakeholder activities

Time-stamps & hash functions

- Creation, verification and acceptance of originals and electronic copies of trade documents.
- Detection of intellectual property theft and substandard goods
- Preservation of data integrity
- Detection of damaged goods or expired of goods
- Track and trace of supply chains and goods' lifecycle



Multiple storage of data and records

- Resilience of digital trade infrastructure
- Preservation of critical trade data in extreme cases of natural disasters
- Business continuity during system outages, cyber-attacks or data breaches

Stakeholder Coordination

Trade data reporting and planning

Payment Processing

Traceability of value chains

Customs Clearance

- Certificate of origin
- Risk Management
- Authorized Economic Operat

II. GUIDELINES FOR BLOCKCHAIN NEEDS AND READINESS ASSESSMENTS

ASCERTAINING THE COUNTRY'S PREPAREDNESS FOR BLOCKCHAIN

Legal Frameworks	A deep and broad overview of the suitability and applicability of existing laws of the country around such new technical concepts such as digital signatures, digital identifiers, user privacy, and data governance, as well as the legal gaps that need to be filled either with new laws or amendment to old laws.
Technical Infrastructure	Blockchain as real-time machines with unique data management set-ups require two critical pieces of infrastructure to function reliably and efficiently in a country setting; reliable electricity and stable high-speed internet.
Talent and Expertise	Governments need to ascertain that it has the pool of skilled professionals who can design, develop, and maintain a blockchain-based system covering areas of expertise such as cryptography, distributed systems, and cybersecurity.
Technicalities on forward and backward integration	Establishing the government's readiness to both transform the existing infrastructure that allow the integration of a blockchain ecosystem as well as prepare the environment for future infrastructure integration to meet future needs is important for the successful implementation of the technology.
Governance, leadership, and stakeholder preparedness	The implementation oversight will require high level authority and the day-to-day operational steps will require a knowledgeable, capacitated, and well-educated middle-level workforce who are both willing and able to support the implementation and use of the technology

III. Technical implementation guidelines

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Getting The Infrastructure Right: The Ten Key Technical Steps

1 Identify the need, define requirements, and scope the use case

Define the use case on the identified needs and level of readiness discovered during the assessment

2 Choose blockchain protocol and platform

Design choices are influence by the identified use-case and trade-offs around speed, sovereignty and security

3 Design and implement the architecture

Design network architecture. Consensus mechanism, node configuration, emergency restoration and recovery processes

4 Testing

Test functionality on real-world scenarios around security use experience, performance and integration.

5 Develop Smart Contracts

Design smart contracts on process logic, accessibility, credentials, authorization, tights, and privileges.

6 Deploy the Blockchain.

Configuration of network, synchronization of cloud-based nodes or sovereign servers.

7 Design security protocols

On key management, access controls, activity logs, procedures on emergency updates, security patches, network hats, reorganization & restarts.

8 Design and integrate portals and user interfaces

User facing portals and interfaces allow the average user to interact with the blockchain and allow the business logic and process glow of the use case.

9 Integrate with existing infrastructure

Integrate with existing trade facilitation infrastructure and make room for integration with future infrastructure

10 Monitor, evaluate and maintain the blockchain and digital infrastructure

Regular maintenance tasks, network upgrades, and software updates are done both as preventative and as mitigative measures.

VI. Policy Implementation Guidelines: Towards a Successful and Sustainable Stakeholder-Centred Approach

Key policy steps for a successful stakeholder engagement

1

Identify key stakeholders and define key roles

It involves identifying stakeholders who will be critical to the implementation process and defining their roles at the four key levels comprising the sectoral, inter-agency, intra-agency and core implementing team domains.

Key policy steps for a successful stakeholder engagement

2

Understand stakeholder needs and communicate benefits of the blockchain tools

Involves understanding the trade facilitation needs, concerns, and expectations of the stakeholders and tailoring engagement process towards addressing these expectations, concerns, and needs.

Key policy steps for a successful stakeholder engagement

3

Ascertain stakeholder readiness and preparedness for the technology

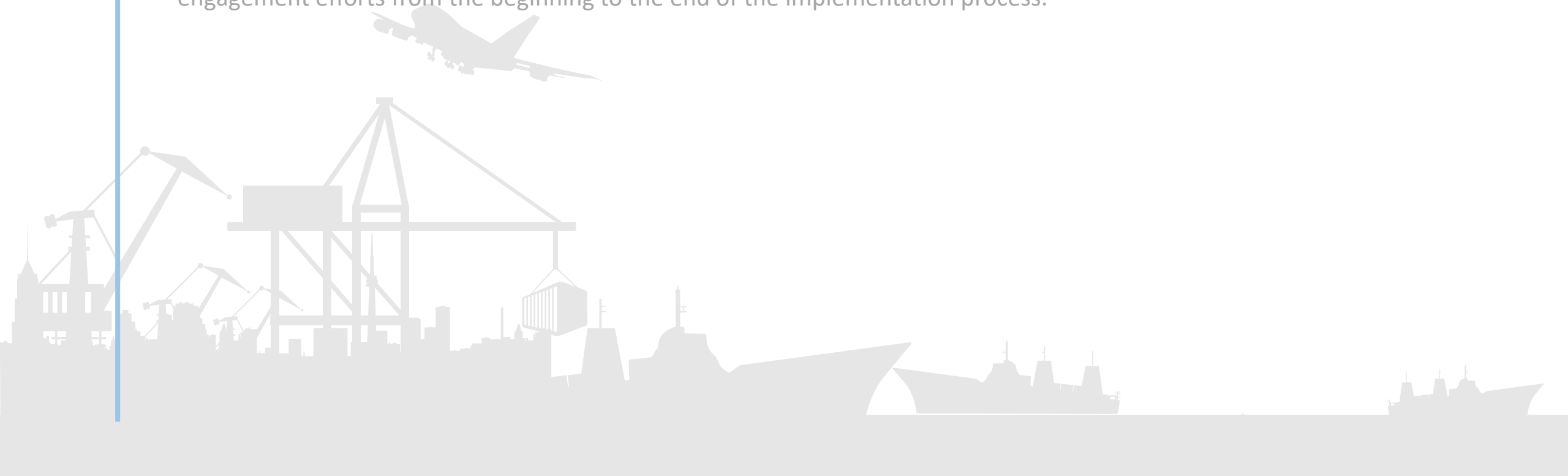
It involves understanding the concerns of stakeholders regarding the implementation, such as cost, complexity, user protection, and security risks, and addressing these concerns in order to build trust and support for the implementation process.

Key policy steps for a successful stakeholder engagement

4

Develop stakeholder engagement implementation plan

Developing a clear implementation plan that outlines the objectives, timelines, resources, and expected outcomes for all stakeholder engagements will ensure success, efficiency, and sustainability of the engagement efforts from the beginning to the end of the implementation process.



Key policy steps for a successful stakeholder engagement

5

Organize key stakeholders before commencement of the implementation process

Stakeholder coordination meetings, workshops and multi-agency engagement forums that bring every key agency and stakeholder groups onboard will be crucial to the successful implementation and sustainability of blockchain infrastructure and accompanying solutions.

Key policy steps for a successful stakeholder engagement

6

Training, education, research, and support for stakeholders

Geared towards multiple goals, such as helping stakeholders understand the key benefits and utility of the technology and helping increase their preparedness, ability, and interest in the technology, while encouraging the maximum utilization of the solutions.

Key policy steps for a successful stakeholder engagement

7

Implement stakeholder feedback loops, monitoring, and evaluation

Continuous review of the stakeholder dynamics gives the overall implementation and utilization of the solutions an up-to-date perspective of stakeholder needs as well as expectations.

V. Regulatory Implementation Guidelines: Meeting International Standards with Compliance

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Meeting International Standards: Key Steps

VI. Challenges

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key challenges in the blockchain implementation process

Regulatory and legal frameworks

Government agencies must find ways to navigate complex regulatory and legal frameworks or deign new ones to ensure compliance with contracts, digital signatures, data protection, privacy, and intellectual property.

Incompatibilities with legacy infrastructure

Integrating blockchain solutions with legacy systems can be complex and may require significant modifications, overhauling, data migration or complete restructuring with significant cost implications

Capacity and scalability limitations

Storage capacity, throughout and performance of most blockchain networks are still inadequate for most trade facilitation purposes

Architecture and design difficulties

Deciding on technical specifications around speed, security, level of decentralization, consensus algorithms, and governance structures that will drive efficiency, transparency, authority, and accountability can be a difficulty in designing a blockchain for multiple trade facilitation needs.

Data privacy and security concerns

Trade documents and data are proprietary, confidential, and non-public. This makes blockchain features such as data encryption very useful. But the user facing applications and smart contract logic can still present critical vulnerabilities in the protection of such data.

Talent and expertise deficits

Shortage of skilled professionals with expertise in development, architecture, consensus mechanisms, distributed systems, and cryptography

Adoption and user acceptance challenges

Limited understanding of blockchain technology, negative opinions high scepticism can affect user acceptance.

Resource constraints and cost concerns

Cost of infrastructure development, system integration, and ongoing maintenance, as well as stakeholder empowerment and user support

VII. Overview of use cases and implementation considerations

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Thank you