# DUBAI BLOCKCHAIN POLICY

مجالـس دبـي للمستقبـل
DUBAI FUTURE COUNCILS
التعاملات الرقمية
Blockchain

# CONTEXT OF THE DUBAI BLOCKCHAIN POLICY

## Dubai Blockchain Strategy Pillars

### GOVERNMENT EFFICIENCY

- Use cases
- Blockchain Platform
- Blockchain Policy

### INDUSTRY CREATION

- Global Blockchain Challenge
- Start ups Accelerators

### INTERNATIONAL LEADERSHIP

- Global Recognition
- Events

## Blockchain Use Cases

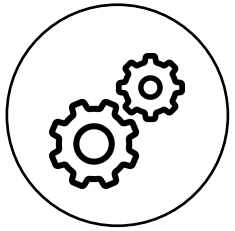
- Payment Reconciliation and Settlement
- Buying and Renting Property
- EV Registration & Charging
- The Business Ledger
- Unified Academia Registry
- Managing the Lifecycle of a Vehicle
- Tourism 2.0
- Licensing Medical Professionals

*Non-Exhaustive*

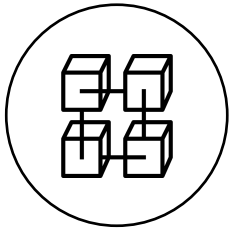
## Implementation Challenges

- Collaboration & Communication
- Investment & Business Model
- Blockchain Platform Selection
- Data Privacy & Confidentiality
- Supporting Shared Services
- Supporting Laws & Regulations
- System Integration & Data Sync
- System & Software Security
- Operating Model & Consensus
- Blockchain Skills and Capabilities

# Objectives behind developing the Dubai Blockchain Policy



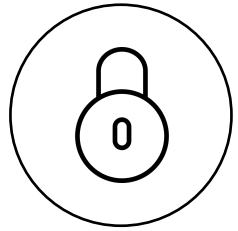
Facilitate the resolution of Blockchain implementation challenges through guidance and policy directives



Govern the creation, management, and expansion of value-creating Blockchain networks across Dubai and the UAE

Support and drive the adoption of Blockchain technology especially for government entities

Minimize security and privacy risks associated with Blockchain implementation and distributed ledger



Provide a legal foundation for supporting digital services and dispute resolution

# Blockchain policy focus areas

## Blockchain Policy Focus Areas

### Network Governance

- Network Ownership & Membership
- Intellectual Property
- Funding & Monetization
- Network Expansion

### Network Operations

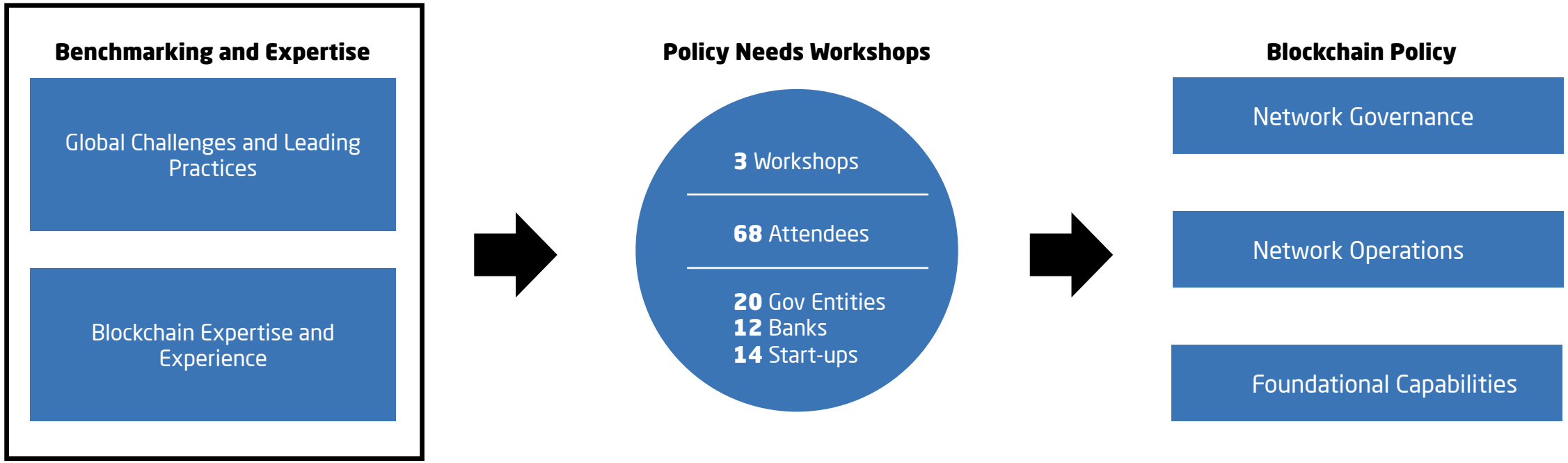
- Data Formats & Interoperability
- Data Privacy & Confidentiality
- Node & Network Security
- Audit & Compliance
- Communication & Adoption

### Foundational Capabilities

- Technology Platform & Services
- Architecture & Standards
- Shared Network Services
- Legal Support

# Approach For Drafting the Dubai Blockchain Policy

# Approach For Drafting the Dubai Blockchain Policy



# Takeaways from Blockchain Policy Benchmarking

Regulation of Blockchain and DLT through technology certification via a system auditor that reviews and assesses the technology arrangement and provides assurance on the solution's quality and characteristics.

Regulation of the token economy by focusing on the creation, storage, and transfer of tokens, along with the security for enforcement of the rights associated with every token.

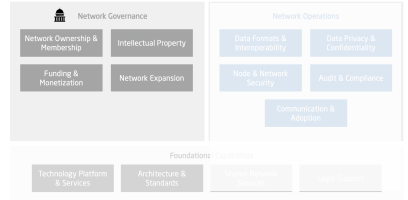
Taking the approach of removing the legal barriers for the adoption of Blockchain by developing Blockchain-friendly legislation and supporting the use of Blockchain for conducting business.

Highlighting the role of competent authorities and their responsibility of providing further guidance and working with international organizations on the development of technical standards.

# TAKEAWAYS FROM BLOCKCHAIN POLICY BENCHMARKING

Governments around the world have taken different steps with regards to Blockchain regulations, but none of them have yet issued a policy. Dubai's Blockchain policy is the first of its kind globally

| |  Malta |  Liechtenstein |  European Union |  United States of America |
|---|---|---|---|---|
| **Policies / Regulations** | 3 Cryptocurrency & Blockchain related laws, enabling the technologies | Proposed Blockchain Act enabling a "token economy" | Urging the EU Authorities to take steps to maximize the use of Blockchain<br>Initiated use case research | No Federal Legislation<br>States are passing legislation enabling Blockchain Technology |
| **Key Action Taken** | • MDIA Act: Established the Malta Digital Innovation Authority<br>• Partners with technology providers to certify Blockchain Platforms and enforce their Blockchain framework | • Legally recognize transactions made on virtual token systems (Blockchain)<br>• Financial Market Authority to be given authority to regulate and approve virtual token system suppliers | • Issued non-legislative resolution urging EU Authorities to promote Blockchain<br>• Initiated study into EU-wide Blockchain Policies and use cases to improve cross-border European services | • States are exploring and implementing Blockchain-friendly legislation enabling and legalizing Blockchain contracts and transactions<br>• However, several States have yet to even explore the technology |

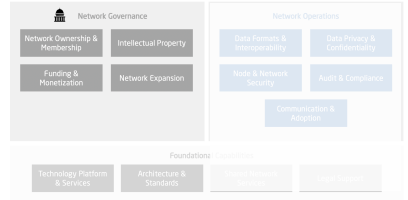



# GLOBAL TAKEAWAYS ON NETWORK GOVERNANCE (1/2)

| | | |
|---|---|---|
| Network Ownership & Membership | Estonian entities own their Blockchain Networks, and the Information Systems Authority (RIA) is responsible for providing implementation support, updates, and maintenance to maintain X-Road integration compatibility | Both Australia's ANB and ASX Platforms are tackling Data and Network ownership with a "centralized" approach, and both have plans to support potential members by providing integration tools and APIs |
| | IBM and Maersk own the TradeLens IP and platform, and market their solution by promoting industry collaboration and overall efficiencies in the global supply chain industry | Alastria consortium owns the Network and has a board of directors making membership decisions by executing a voting procedure |
| Funding & Monetization | Governments have utilized two main ways to fund Blockchain projects and development, single entity funding or consortium based grants, however no details have emerged on how and if they aim to monetize the data | The most common approach for start ups has been funding through ICO's, however Consortium based projects and Joint Ventures are the more common approach for larger technology industry leaders |
| | Venture Capitalists have been increasing their Blockchain technology investments, highlighted by a year-on-year increase of 280% so far in 2018 | By requesting annual fees, global consortiums MOBI and we.trade, approach funding in a more traditional manner, both aimed at increasing efficiency and collaboration in their respective industries |

Government

Industry




# GLOBAL TAKEAWAYS ON NETWORK GOVERNANCE (2/2)

## Intellectual Property

The EU and other leading governing bodies are tackling IP in Blockchain technology by applying existing laws and regulations

While the general approach to Blockchain development has been open source, companies and consortiums, like IBM and TradeLens, have been applying for IP protection for their use case specific Platforms

Blockchain technology will require a portfolio of Intellectual Property protections to properly cover the different elements of the technology, including ledgers, algorithms, and network design

Open Source licensing will accelerate innovation in Blockchain technology, but closed source development can protect specific implementations

## Network Expansion

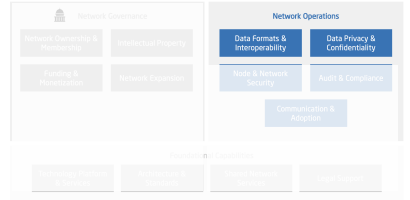
Estonia has collaborated with Finland to extend their integration platform, X-Road, across borders and provide Digital Services overseas, however there are currently no cross-border government Blockchain Networks

Blockchain companies and Platforms, such as Ripple's xCurrent Platform, have been adopted by several international banks to make their cross-border payments more efficient

TradeLens is attempting to adopt international standards, create APIs, and factor stakeholder feedback to encourage ports and global companies to adopt the platform internationally

Government

Industry




# GLOBAL TAKEAWAYS ON NETWORK OPERATIONS (1/3)

## Data Formats & Interoperability

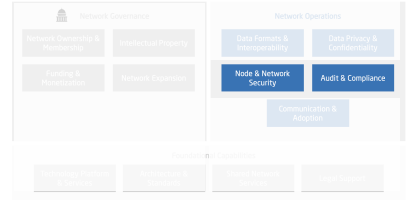
- Estonia's X-Road Integration Solution operates on defined data formats that entities are required to comply with when implementing their Blockchain solutions, while ASX have collaborated with ISO to standardize their messaging Protocol format
- ISO and W3C are leading the development in Blockchain technology standards to increase global cross-network and cross-protocol interoperability, while industry leader, Ripple, has defined their Platform's data formats to eliminate implementation variation
- Companies such as Cosmos and Polkadot are developing solutions for cross platform interoperability, however the technology is still in its early stages and requires further development before large scare utilization
- The Blockchain Interoperability Alliance are building solutions to eliminate the reliance on centralized intermediaries by tackling the challenges of Network congestion, and bridging the gap between private and public Blockchains

## Data Privacy & Confidentiality

- Estonia, Singapore, and Australia have developed solutions and implemented policies to protect Data Privacy and Confidentiality, focusing on limiting the distribution of data to only what is necessary
- The EU's GDPR standing on data in Blockchain Networks is unclear, however, GDPR does not apply to government Blockchain networks in the UAE
- Dubai and the UAE are leading the way with their robust Data Protection laws and Classification Standards
- Industry leaders have tackled Data Privacy and Confidentiality by mainly designing a single validation source and strict Data Access Rights, like Ripple with xCurrent, or by providing API database shielding functionality, like TradeLens

Government

Industry

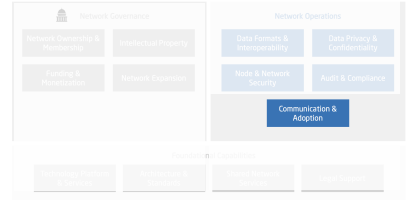


# GLOBAL TAKEAWAYS ON NETWORK OPERATIONS (2/3)

| | | |
|---|---|---|
| Network Security | Estonia and KSI utilize autonomous data anomaly detection functionality to protect its Networks and the RIA have been given Network Security responsibilities | ASX has engaged with PKI consultants to make use of Digital Certificates for secure authentication, encryption, and signing, and have announced that Digital Asset will assist in node implementation to ensure security standards compliance |
| | Industry leaders mainly use standard node implementation methods, however utilize different methods in verifying node integrity, with xCurrent having a single source of truth auditing ledgers, while Ethereum relies on consensus to detect anomalies | Blockchain Network Security faces six main challenges, however, they can be addressed by implementing a combination of best practices from leading Platforms and Protocols |
| Audit & Compliance | Blockchain policy compliance audit can be conducted in different ways, leveraging the technology itself to enable oversight | Regulation through certification typically applied where a sector or technology in this context is currently lacking standards and measures |
| | Setting standards and control measures may hinder innovation and result in restricted application to a yet emerging technology and experimental use case. The certification approach enables creativity and innovation with proper testing and oversight | Where blockchain technology has a regulated sector applications built or deployed on top of it, then these actions will fall under the current regulatory framework applied by such sector/industry regulator including audit and compliance |

Government

Industry



# GLOBAL TAKEAWAYS ON NETWORK OPERATIONS (3/3)

| | | |
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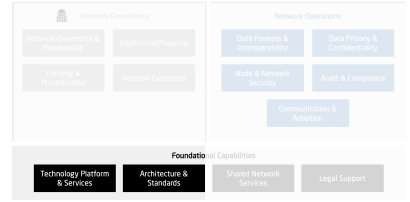
| Communication & Adoption | Estonia has incentivized the adoption of KSI mainly through entity funding, grants in the form of "Tokens", and by creating the RIA to provide implementation, integration, and maintenance support | Australia and South Korea, have established initiatives to better educate and engage the community on Distributed Ledger Technology |
| | Ripple and other Blockchain platforms are driving the adoption of their solutions by marketing advantages over existing systems and traditional means of money transfer | Stakeholder engagement and standardization are being utilized as a key method to encouraging adoption, like TradeLens who is utilizing a combination of both techniques |

Government

Industry



# GLOBAL TAKEAWAYS ON FUNDAMENTAL CAPABILITIES (1/2)

## Technology Platform & Services

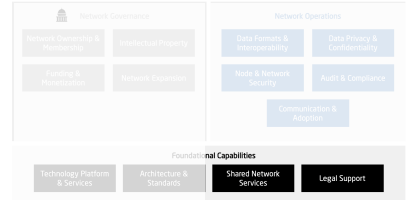
- Governments have taken different approaches to developing their Blockchain ecosystems, with Malta creating a Digital Innovation Authority to enforce a Blockchain technology approval process certifying platforms with the goal of enhancing trust
- Blockchain implementation has emerged as a priority for several Governments to innovate their technology and Digital Service landscape, starting with Digital Identity Blockchain implementation
- The industry is forming consortiums, like The Linux Foundation, to develop Blockchain protocols and platforms, and their general approach is open source
- Guardtime, the Estonian company, have emerged as a key leader and developer in Enterprise Blockchain solutions by developing a Keyless Signature Infrastructure (KSI) Platform

## Architecture & Standards

- Estonia set technology and use-case feasibility compliance requirements when evaluating and selecting the nation's Blockchain ecosystem solution
- Australia & ASX have defined standards & implementation methods to aid user adoption and compliance
- Leading standardization entities, like ISO and W3C, are developing global Blockchain standards initiatives to aid in the continuous development of the technology in their respective fields

Government

Industry




# GLOBAL TAKEAWAYS ON FUNDAMENTAL CAPABILITIES (2/2)

## Shared Network Services

- Estonia has developed a government-wide, cross service, Smart Identity solution, while Switzerland and Canada are in the development / pilot stage of rolling out their systems
- Leading governments, such as Estonia, have a good digital infrastructure to support Blockchain, including Digital ID and National PKI
- The UK has an outdated cross-government Digital Service Single Trusted Login system that will be transformed into a Blockchain based solution for increased efficiency, security, and utilization

## Legal Support

- Several USA States are working to provide a solid legal foundation to support Blockchain implementation including enforcing Smart Contracts and Digital Signatures on Blockchain
- UAE has a robust legal foundation to support Blockchain technology and with further Blockchain-specific regulations and dispute resolution forums it can pave the way for its adoption
- The EU recognizes the need to have a legal support system for Blockchain and is working towards establishing this foundation across its member states

Government

Industry

# Approach For Drafting the Dubai Blockchain Policy

**Benchmarking and Expertise**

Global Challenges and Leading Practices

Blockchain Expertise and Experience

**Policy Needs Workshops**

**3** Workshops

**68** Attendees

**20** Gov Entities
**12** Banks
**14** Start-ups

**Blockchain Policy**

Network Governance

Network Operations

Foundational Capabilities

# Policy workshops activities

The Workshops Constituted of Six Main Activities

1 **Welcome and Registration**

Welcoming representatives of key stakeholders to discuss the Dubai Blockchain Policy needs and their options

2 **Introduction to Dubai Blockchain Policy Development**

Introductory session to introduce the project's objectives and roadmap, and present the aims and objectives of the workshop

3 **Introduction to the Policy Focus Areas**

Presenting the Blockchain Policy main focus areas, which address: Foundational Capabilities, Network Governance and Network Operations

4 **Live Polls**

Engaging with the stakeholders in a live poll exercise, where participants were asked about challenges, their position and stance, and opinions on Blockchain in their respective field

5 **Policy Needs and Options Identification**

Breaking out into focus groups to engage in an interactive and lively session, discussing Blockchain Policy needs, and possible policy options

6 **Closing Note and Next Steps**

Closing the session by recapping formulated discussion points, and the upcoming roadmap and timeline for the Dubai Blockchain Policy

# Policy workshops objectives

The Objectives Of The Workshop Were To Capture The Challenges They Are Currently Facing, Identify Their Policy Needs, And Discussing Possible Options To Address Their Needs

## Summarize and Confirm the Key Blockchain Implementation Challenges

Understand and confirm the current challenges that government entities, banks, and start-ups are facing in their Blockchain implementation journey

## Identify Blockchain Policy Needs

Identify the current gaps and needs in the Blockchain ecosystem and implementation in Dubai from the perspectives of government entities, banks, and start-ups

## Brainstorm Dubai Blockchain Policy Options

Work with the participants to identify possible policy options from their perspectives to answer their identified needs and provide the required support for Blockchain adoption.

# Policy Workshops identified Challenges

Several challenges were Identified by participants from blockchain use-case Development And Implementation

**Collaboration & Communication**

Entities and business partners are reluctant to collaborate and share data

**Investment & Business Model**

Funding and monetization structure, policies, and framework

**Supporting Shared Services**

Cross network compatibilities and reluctance to share services

**System Integration & Data Sync**

On-chain and off-chain data and service synchronization

**Supporting Laws & Regulations**

Unclear and undefined legal landscape

**Data Privacy & Confidentiality**

Data ownership, data access restrictions, and policies

**Blockchain Platform Selection**

Which platform to select for a Platform's specific use case or functionality needs

**System & Software Security**

On-chain node security and off-chain data & network security

**Operating Model & Consensus**

Lack of a defined structure for network members' roles and responsibilities

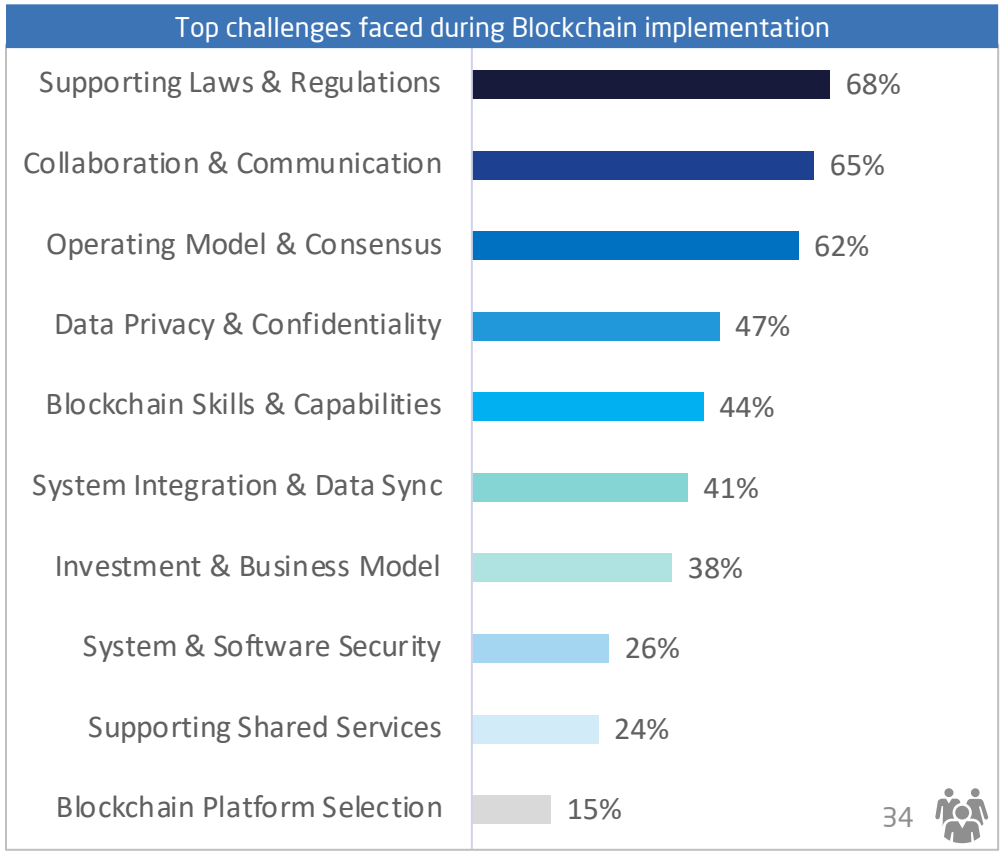
**Blockchain Skills and Capabilities**

Lack of Blockchain experts & skills required to implement and support Networks

# GOVERNMENT ENTITIES

## Policy Workshops identified Challenges

Top Challenges Government Entities Are Facing During Their Blockchain Implementation Journey Focused Around Supporting Laws & Regulations, Collaboration & Communication, and Operating Model & Consensus




**Analysis:**

**Supporting Laws & Regulations**

Concerns over the supporting laws & regulations for nascent technology as well as the regulations related to the rapid changes in the ecosystem

These concerns encompass the laws that will support private sector services and their alignment with other federal or government entities on the network, including the regulations within free zones in the UAE

**Collaboration & Communication**

Lack of collaboration and communication is feared to lead to a silo model, defeating the purpose of collaboration through Blockchain

A lack of collaboration and willingness from other entities to join networks has lead to a bottleneck, stifling use-case development and government-wide adoption

**Operating Model & Consensus**

A defined operating Model has been identified as a main challenge considering how the network fundamentals will operate, including participating entity roles and responsibilities, and interaction policies and guidelines

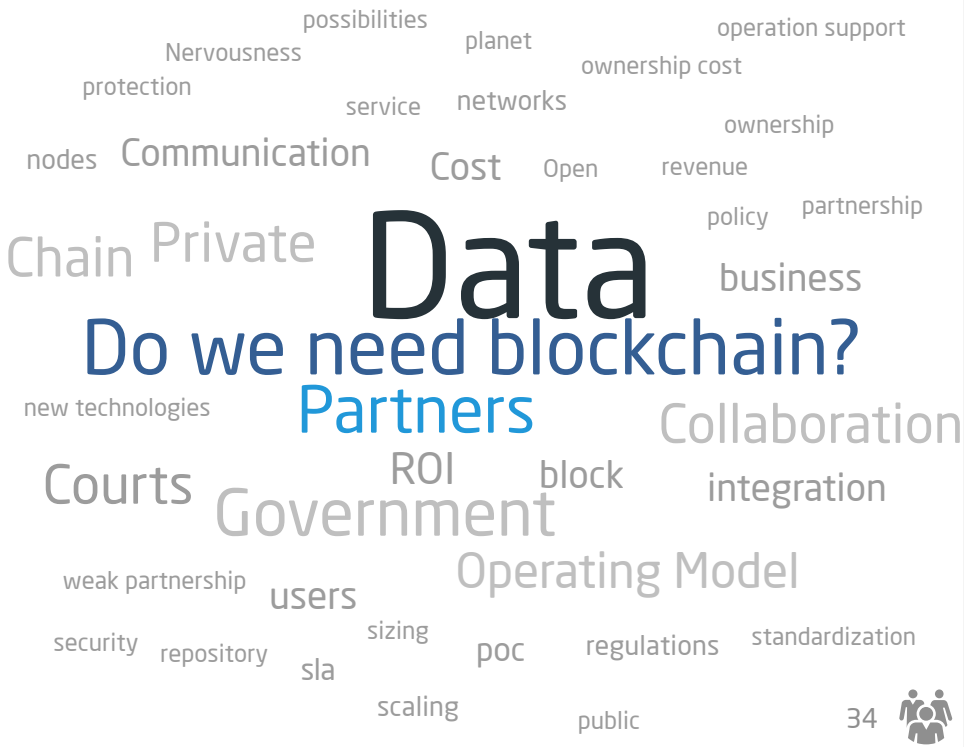
Consensus concerns encompass protocol, and platform selection, consensus on collective vs individual nodes incentives, and finding an ownership mechanism where ultimate power is not given to one entity

# GOVERNMENT ENTITIES

## Policy Workshops identified Challenges

Other Key Challenges Government Entities Are Facing During Their Blockchain Journey Focused Around Data, And A Lack Of Resources Needed For Efficient Implementation

Other concerns or challenges expressed by government entities




**Analysis:**

**Data**

Data privacy, confidentiality, security, sharing, access, format, and classification have emerged as leading concerns for government entities due to the lack of clarity with regards to Blockchain data classification and access privileges for each class.

**Do we need Blockchain?**

Entities expressed a lack of guidance on when to utilize Blockchain over more traditional technologies. Ensuring Blockchain is ideal to the intended use-case has been a major concern for entities who require seeking government funding for technology developments.

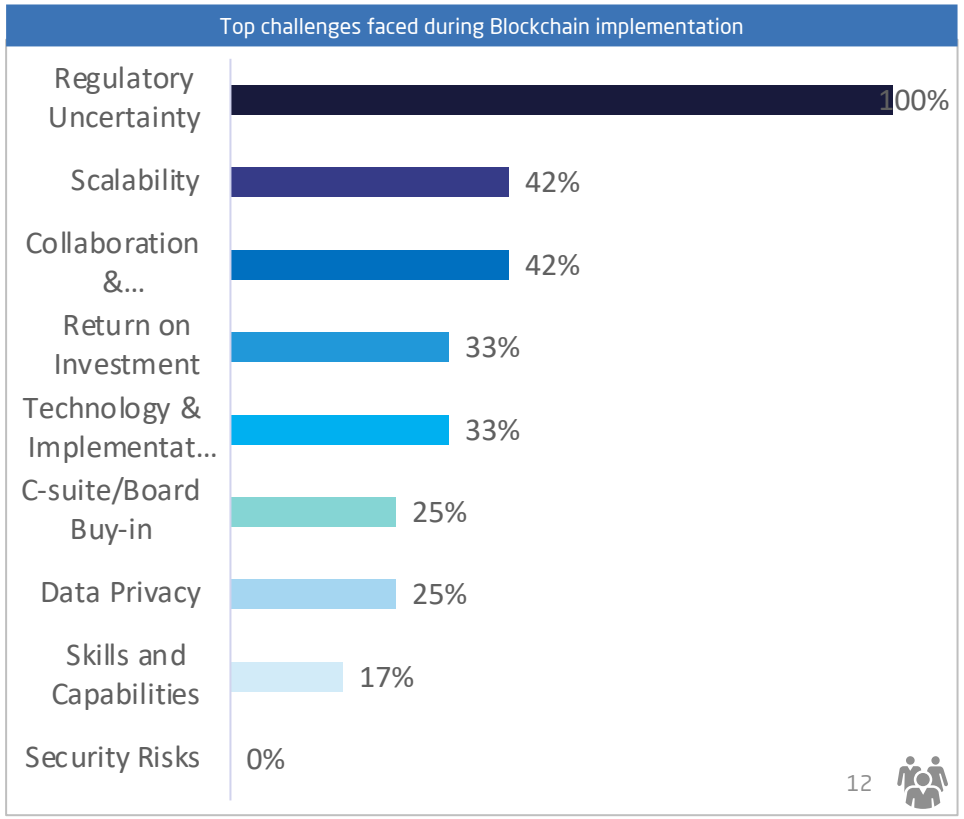
**Partners**

Finding the right implementation partner and platform has been a major concern for entities who seek to on-board other authorities, as the technology is still developing, and ensuring that they are investing in a future proof partner that will continuously develop their solution has caused adoption hesitation.

# BANKING WORKGROUP

## Policy Workshops identified Challenges

All Banks Have Classified Regulatory Uncertainty As The Leading Challenge In Their Blockchain Implementation Journey




**Analysis:**

**Regulatory Uncertainty**

Regulatory uncertainty is a broad umbrella as it encompasses the regulation of technology platform and services, liability, data sharing, compliance with the Central Bank's requirements, trademarks, IP, and ledger auditing/audit trail

The uncertain legal implications of data and contracts stored and transferred on Blockchain networks has delayed deployment of use-cases as ensuring compliance is a key element in banking operations

**Scalability**

Ensuring scalability, not just with other banks, but with government entities that enable a large amount of use-cases, including KYC verification has emerged as a key challenge for banks

A future-proof concept has also concerned banks as Blockchain implementation is still in its development phase, thus making it expensive, and leaving room for future, non-backward compatible infrastructure developments

**Collaboration & Interoperability**

Concerns include defining platform and data interoperability, mandating roles within entities, and maintaining collaboration between different entities and networks

Collaboration concerns align with government entity challenges. Communicating the benefits of a network and answering the challenging question of "what is in it for me" has repeatedly hindered platform and use-case development

# BANKING WORKGROUP

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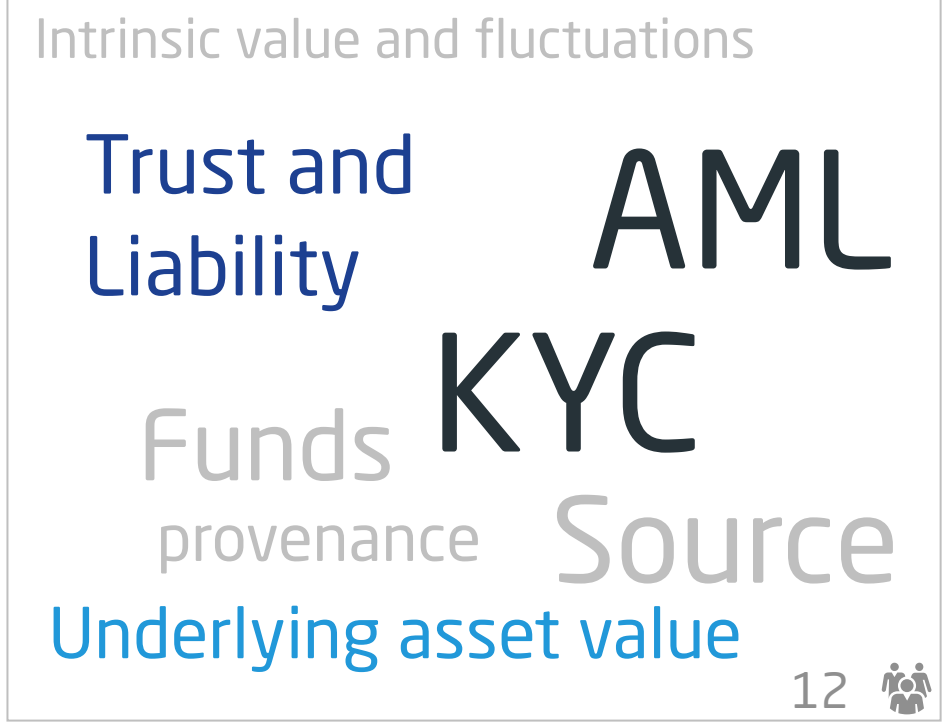
All Banks Have Classified Regulatory Uncertainty As The Leading Challenge In Their Blockchain Implementation Journey

Other concerns or challenges expressed by banks




**Analysis:**

**KYC & AML**

Banks mostly fear the repercussions of the lack of KYC & AML functionality and implementation in the Blockchain and Crypto industry. While many banks detailed they are mainly developing KYC use-cases, this requires government entity integration and a legal framework that enables digital verification.

**Trust and Liability**

Liability ownership was a repeated concern amongst bank representatives with many reluctant to accept the adoption of both Blockchain and Crypto if the liability falls on them.

**Underlying asset value**

The underlying value of the platform is concerning as the technology is still developing, thus leading to continuous updates and a high risk of redundancy. The risk of having an old technology in the near future, paired with a high initial investment has lead to concerns amongst banks and upper management.

# Policy Workshops identified Challenges

Similar To The Government Entities And Banks, Start-ups Have Mainly Faced Issues With Current Laws And Regulations In Dubai And The UAE

## START-UPS

**Laws and Regulations**

- Alignment with regulators on the best-in-class policies and regulations
- Lack of consistency amongst government regulators in terms of views on ICOs and Distributed Ledger Technologies
- Lack of definition consistency and clarity
- Lack of consistency and views at an Emirate, Federal and global scale
- Global scalability and regulatory compliance, paired with the cost of innovation in the UAE makes it difficult to expand and infeasible to develop on a local scale

**Cost**

The high cost of regulatory compliance is too high for emerging companies who are stiff on funding, which discourages further innovation and use-case rollout

**ICO & DSO**

Having clear distinction and definition of ICOs and DSOs (digital securities / assets / tokenization) is key for start-ups who seek to implement solutions in the UAE and worldwide, since DSOs follows the regulations of the countries and already exist

**Language**

Lack of Arabic educational and reference material stifles technological innovation, awareness, and education on a regional scale

**Intellectual Property and Protection**

Unclear Intellectual Property framework and protection does not protect use-case creation, but encourages innovation as IP can limit innovation. Start ups expressed they do not want IP laws restricting idea development and having larger industry players dominating the market

**Transparency**

Lack of transparency at a government level makes developing use-cases skeptical due to the unclear developments within government entities that could render their solutions invalid in the future

# Approach For Drafting the Dubai Blockchain Policy

# Blockchain policy focus areas

## Blockchain Policy Focus Areas

### Network Governance

- Network Ownership & Membership
- Intellectual Property
- Funding & Monetization
- Network Expansion

### Network Operations

- Data Formats & Interoperability
- Data Privacy & Confidentiality
- Node & Network Security
- Audit & Compliance
- Communication & Adoption

### Foundational Capabilities

- Technology Platform & Services
- Architecture & Standards
- Shared Network Services
- Legal Support

# Blockchain policy focus areas

The Blockchain policy focus areas cover the complete lifecycle of Blockchain adoption and implementation

| Network Governance | |
|---|---|
| **Network Ownership & Membership** | Ownership of a Blockchain network, joining a network, leaving a network, permissions... |
| **Funding & Monetization** | Network investment and funding approach, accounting, monetization... |
| **Intellectual Property** | Data, ledger, network design and solutions ownership and licensing... |
| **Network Expansion** | Connecting to external networks including UAE, GCC, and international networks... |

| Network Operations | |
|---|---|
| **Data Formats & Interoperability** | Standardization of data formats across the network and interoperability between its members... |
| **Data Privacy & Confidentiality** | Privacy, data classification, confidentiality and sharing standards, GDPR... |
| **Network Security** | Ledger security, network security, data encryption, network access, vulnerability and breach management... |
| **Communication & Adoption** | Approach for communication and spurring adoption, enhancing uptake and collaboration... |
| **Audit & Compliance** | Audit and inspection for compliance to the set guidelines and standards, reporting... |

| Foundational Capabilities | |
|---|---|
| **Technology Platform & Services** | Selection of technology platform and its enabling services, supply chain security... |
| **Architecture & Standards** | Overall Blockchain implementation architecture and standards adoption... |
| **Shared Network Services** | Services including digital identity, digital signatures, node certification, payments and settlements... |
| **Legal Support** | Legal standing with respect to smart contracts, digital signature, including dispute resolution... |

# Addressing the blockchain policy needs

The collated policy needs and how they have been addressed in the Dubai Blockchain Policy have been summarized and analysed below.

| | Policy Needs |
|---|---|
| **Network Ownership & Membership** | Driving collaboration across government entities and addressing duplication of Blockchain networks. |
| | Guidance on network on-boarding and off-boarding procedures. |
| | Guidance on viable Blockchain networks operating model including different roles and responsibilities. |
| | Guidance on consortium formation, whether to be driven by a sector leader or driven by joint-ventures. |
| | Guidance on fair and secure consensus and transaction validation mechanisms. |
| **Funding and Monetization** | Guidance on funding models for Blockchain networks, including CAPEX and OPEX costs. |
| | Guidance on monetization and business models that are applicable to government entities. |
| | Guidance on cost sharing for common network services, including legal and court fees, across the Blockchain network. |

| | Policy Needs |
|---|---|
| **Intellectual Property** | Guidance on what can be covered under IP in Blockchain networks and the associated services. |
| | Guidance on how to handle, protect, and license IP rights. |
| | Clarity on data ownership rights when data is shared between entities and becomes part of the distributed ledger. |
| | Guidance on contractual agreements and IP when forming consortiums and joint-ventures. |
| **Network Expansion** | Guidance on approaching and joining GCC and international Blockchain networks. |
| | Guidance on cross-sector expansion of Blockchain networks. |
| | Guidance on how network members can reach agreement on expanding the network beyond its current boundaries. |

# Addressing the blockchain policy needs

The collated policy needs and how they have been addressed in the Dubai Blockchain Policy have been summarized and analysed below.

| | Policy Needs | How it is addressed in the Policy | Associated Article(s) |
|---|---|---|---|
| Network Ownership & Membership | Driving collaboration across government entities and addressing duplication of Blockchain networks. | Smart Dubai has taken responsibility of approving Blockchain networks, ensuring value-creating and mutually exclusive use-cases | 5 |
| | Guidance on network on-boarding and off-boarding procedures. | Government Blockchain networks shall have clear procedures and requirements, in compliance with Smart Dubai & other relevant guidelines | 6 |
| | Guidance on viable Blockchain networks operating model including different roles and responsibilities. | The policy requires Blockchain networks to develop and share operating models, which should detail roles and responsibilities of all stakeholders | 7 |
| | Guidance on consortium formation, whether to be driven by a sector leader or driven by joint-ventures. | The policy requires Blockchain networks to develop and share operating models, including voting & consensus mechanisms and network decisions | 5/7 |
| | Guidance on fair and secure consensus and transaction validation mechanisms. | The policy requires Blockchain networks to develop and share operating models, including voting & consensus mechanisms and network decisions | 7 |

# Addressing the blockchain policy needs

The collated policy needs and how they have been addressed in the Dubai Blockchain Policy have been summarized and analysed below.

| | Policy Needs | How it is addressed in the Policy | Associated Article(s) |
|---|---|---|---|
| Funding and Monetization | Guidance on funding models for Blockchain networks, including CAPEX and OPEX costs. | The policy requires Blockchain networks to develop and share funding and revenue generation models, in compliance with relevant laws, regulations, and guidelines | 7 |
| | Guidance on monetization and business models that are applicable to government entities. | The policy requires Blockchain networks to develop and share funding and revenue generation models, in compliance with relevant laws, regulations, and guidelines | 7 |
| | Guidance on cost sharing for common network services, including legal and court fees, across the Blockchain network. | The policy requires Blockchain networks to develop and share funding and revenue generation models, in compliance with relevant laws, regulations, and guidelines | 7 |

# Addressing the blockchain policy needs

The collated policy needs and how they have been addressed in the Dubai Blockchain Policy have been summarized and analysed below.

| | Policy Needs | How it is addressed in the Policy | Associated Article(s) |
|---|---|---|---|
| Intellectual Property | Guidance on what can be covered under IP in Blockchain networks and the associated services. | The policy details that entities are encouraged to register Blockchain use-case Intellectual Property rights in accordance with applicable IP laws in the UAE | 8 |
| | Guidance on how to handle, protect, and license IP rights. | The policy references applicable IP laws in the UAE, where entities can register their Blockchain network use-cases | 8 |
| | Clarity on data ownership rights when data is shared between entities and becomes part of the distributed ledger. | The policy references Dubai Data Law, Dubai Data Policies and other applicable laws in the UAE that entities must adhere to | 8 |
| | Guidance on contractual agreements and IP when forming consortiums and joint-ventures. | The policy details that entities are encouraged to register Blockchain use-case Intellectual Property rights in accordance with applicable IP laws in the UAE | 8 |
| Network Expansion | Guidance on approaching and joining GCC and international Blockchain networks. | The policy gives Smart Dubai the role of approving the formation of Blockchain networks and their members | 5 |
| | Guidance on cross-sector expansion of Blockchain networks. | The policy gives Smart Dubai the role of approving the formation of Blockchain networks and their members | 5 |
| | Guidance on how network members can reach agreement on expanding the network beyond its current boundaries. | The policy requires Blockchain networks to develop and share operating models, including voting & consensus mechanisms and network decisions | 7 |

# Addressing the blockchain policy needs

The collated policy needs and how they have been addressed in the Dubai Blockchain Policy have been summarized and analysed below.

| Policy Needs | |
|---|---|
| **Data Formats and Interoperability** | Guidance on the transformation of data from existing systems to Blockchain. |
| | Guidance on setting and agreeing on shared data formats across the Blockchain network. |
| | Guidance on ensuring interoperability within the platform and across multiple networks potentially. |
| | Guidance on enforcing data accuracy and quality from network participants. |
| **Data Privacy & Confidentiality** | Guidance on protecting private and confidential data on the ledger. |
| | Guidance on classifying data with respect to privacy and confidentiality before publishing it to the ledger. |
| | Guidance on getting consent from customers before sharing their data with other entities. |
| | Guidance on applicability of GDPR and similar data privacy regulations. |
| | Guidance on protecting data privacy and confidentiality with sidechains (data taken to another ledger). |

| Policy Needs | |
|---|---|
| **Network Security** | Guidance on maintaining secure Blockchain platforms and protocols |
| | Guidance on minimum security requirements including encryption levels. |
| | Guidance on risk management requirements and governance. |
| | Guidance on breach management and requirements in case of a breach. |
| | Guidance on maintaining proper key management & HSM. |
| **Audit & Compliance** | Guidance on performing audits efficiently. |
| | Guidance on enforcing and auditing for compliance across nodes. |
| | Incentivizing entities to comply to the set standards, policies, and regulations and self-correction of non-compliance. |
| | Clarity on the standards and regulations to comply with. |
| **Communication & Adoption** | Guidance on spurring adoption. |
| | Lack of proper support on the qualification of Blockchain use-cases. |
| | Guidance on building capacity and skilled resources within government. |
| | Engaging the whole ecosystem. |
| | Guidance on setting the right expectations, success measures, and timelines. |
| | Expanding the Dubai Blockchain Policy to federal level. |

# Addressing the blockchain policy needs

The collated policy needs and how they have been addressed in the Dubai Blockchain Policy have been summarized and analysed below.

| | Policy Needs | Policy Needs | Associated Article(s) |
|---|---|---|---|
| Data Formats and Interoperability | Guidance on the transformation of data from existing systems to Blockchain. | The policy references guidelines, architectures, and standards that can guide entities and aid in the transformation process | 15 |
| | Guidance on setting and agreeing on shared data formats across the Blockchain network. | The policy details that networks shall publish their standardized data formats across the network, in line with Dubai Data Standards and guidelines published by DDE | 9 |
| | Guidance on ensuring interoperability within the platform and across multiple networks potentially. | The policy details that networks shall publish their standardized data formats in line with Dubai Data Standards and guidelines published by DDE, ensuring interoperability | 9 |
| | Guidance on enforcing data accuracy and quality from network participants. | Smart Dubai shall review member roles & responsibilities, in the network's operating model, ensuring data formats and standards specified by the network are maintained | 7/9 |

# Addressing the blockchain policy needs

The collated policy needs and how they have been addressed in the Dubai Blockchain Policy have been summarized and analysed below.

| | Policy Needs | Policy Needs | Associated Article(s) |
|---|---|---|---|
| Data Privacy & Confidentiality | Guidance on protecting private and confidential data on the ledger. | The policy references Dubai Data Law, Dubai Data Standards, and other guidelines published by DDE or a relevant authority | 10 |
| | Guidance on classifying data with respect to privacy and confidentiality before publishing it to the ledger. | The policy references Dubai Data Law, Dubai Data Standards, and other guidelines published by DDE or a relevant authority | 10 |
| | Guidance on getting consent from customers before sharing their data with other entities. | The policy references Dubai Data Policies and details that entities shall seek the consent of individuals and Private Entities | 10 |
| | Guidance on applicability of GDPR and similar data privacy regulations. | The policy references Dubai Data Law, Dubai Data Standards, and other guidelines published by DDE or a relevant authority | 10 |
| | Guidance on protecting data privacy and confidentiality with sidechains (data taken to another ledger). | The policy references Dubai Data Law, Dubai Data Standards, and other guidelines published by DDE or a relevant authority | 10 |

# Addressing the blockchain policy needs

The collated policy needs and how they have been addressed in the Dubai Blockchain Policy have been summarized and analysed below.

| | Policy Needs | Policy Needs | Associated Article(s) |
|---|---|---|---|
| Network Security | Guidance on maintaining secure Blockchain platforms and protocols including security patching. | The policy references ISR & other relevant guidelines, policies, standards & regulations published or endorsed by DESC, and Smart Dubai shall approve protocols & platforms | 11/ 14/ 15 |
| | Guidance on minimum security requirements including encryption levels. | The policy references ISR & other relevant guidelines, policies, standards & regulations published or endorsed by DESC | 11/ 15 |
| | Guidance on risk management requirements and governance. | The policy references ISR & other relevant guidelines, policies, standards & regulations published or endorsed by DESC. Smart Dubai shall approve network operating models | 11/ 15 |
| | Guidance on breach management and requirements in case of a breach to a specific node. | The policy references ISR & other relevant guidelines, policies, standards & regulations published or endorsed by DESC | 11/ 15 |
| | Guidance on maintaining proper key management and Hardware Secure Modules (HSM). | The policy references ISR & other relevant guidelines, policies, standards & regulations published or endorsed by DESC. Smart Dubai shall endorse supporting technologies | 11/ 14 |

# Addressing the blockchain policy needs

The collated policy needs and how they have been addressed in the Dubai Blockchain Policy have been summarized and analysed below.

| | Policy Needs | Policy Needs | Associated Article(s) |
|---|---|---|---|
| Audit & Compliance | Guidance on performing audits efficiently and leveraging systems for automated auditing. | Smart Dubai may conduct audits on networks ensuring their compliance with the policies, at their discretion, directly or in collaboration with a third party | 12 |
| | Guidance on enforcing and auditing for compliance across the participating nodes. | Network operators shall ensure the compliance of the networks and its participants, in addition to Smart Dubai's ability to conduct audits on networks directly or in collaboration with a third party | 12 |
| | Incentivizing entities to comply to the set standards, policies, and regulations and self-correction of non-compliance. | The policy details non-compliant entities shall be subject to regulatory actions, in addition to potential consequences that Smart Dubai may enforce | 12 |
| | Clarity on the standards and regulations to comply with. | The policy references the existing standards and regulations where applicable, in addition to future ones that can be issued. | ALL |

# Addressing the blockchain policy needs

The collated policy needs and how they have been addressed in the Dubai Blockchain Policy have been summarized and analysed below.

| | Policy Needs | Policy Needs | Associated Article(s) |
|---|---|---|---|
| Communication & Adoption | Guidance on spurring adoption, especially entities that are required to join a network but have no direct value in joining. | Smart Dubai shall play a central role in promoting the benefits of the technology, and networks are required to publish & maintain a communication plan to drive adoption | 13 |
| | Lack of proper support on the qualification of Blockchain use-cases and validation of POCs. | Smart Dubai has taken responsibility of approving Blockchain networks and supporting entities with their use-case development | 5 |
| | Guidance on building capacity and skilled resources within government entities. | Smart Dubai shall provide entities with guidance on their Blockchain implementations and the policy encourages entities to build internal capacity and skill-set | 13 |
| | Engaging the whole ecosystem including government entities, private sector, regulators, and overseeing councils. | The policy involves different entities and stakeholders including DDE, DESC, competent entities, and sector regulators where applicable. | ALL |
| | Guidance on setting the right expectations, success measures, and timelines with management. | The policy details that networks are required to publish and maintain a communication plan including roadmaps, future plans, and regular updates | 13 |
| | Expanding the Dubai Blockchain Policy to federal level as many use-cases require federal entities to join. | The policy gives Smart Dubai the role of approving the formation of Blockchain networks and their members | 5 |

# Addressing the blockchain policy needs

The collated policy needs and how they have been addressed in the Dubai Blockchain Policy have been summarized and analysed below.

| | Policy Needs |
|---|---|
| **Technology Platform & Services** | Guidance on technology platform and protocol selection. |
| | Efficient adoption of Blockchain platform in terms of time and government spending. |
| | Standardization of viable Blockchain platforms and protocols while maintaining flexibility. |
| | Ensuring backward compatibility across platform versions as technology evolves. |
| | Guidance when evaluating Blockchain vendors. |
| **Architecture & Standards** | Guidance on Blockchain design including on-chain and off-chain data architecture. |
| | Guidance on designing scalable Blockchain networks. |
| | Standardization and consistency across different Blockchain implementations. |
| | Guidance on the Blockchain standards to adopt and comply with, especially security standards. |
| | Guidance with building blocks and patterns for faster and more efficient implementation of Blockchain platforms. |

| | Policy Needs |
|---|---|
| **Shared Network Services** | Having supporting shared services at a Federal level, such as Digital ID, to allow for UAE-wide networks. |
| | Guidance on usage of shared services provided by the private sector. |
| | Guidance on available shared services for digital identity, payment and settlement, and other shared services |
| | Having data storage and hosting offered as a shared service for government entities, facilitating access using APIs. |
| | Guidance on how Blockchain networks will operate with the Government Information Network and outside. |
| **Legal Support** | Guidance on dispute resolution and litigation in UAE and internationally, including the courts |
| | Guidance on creating, reviewing, and auditing Smart Contracts that are legally supported and enforced. |
| | Creation of a legal support transactions, including Digital Signature, Smart Contracts, and Digital Cheques. |
| | Guidance on responsibilities in Blockchain networks between the different nodes and the network as a whole. |
| | Federal coverage of the laws supporting Blockchain technology. |

# Addressing the blockchain policy needs

The collated policy needs and how they have been addressed in the Dubai Blockchain Policy have been summarized and analysed below.

| | Policy Needs | How it is addressed in the Policy | Associated Article(s) |
|---|---|---|---|
| Technology Platform & Services | Guidance on technology platform and protocol selection. | Smart Dubai has taken the responsibility to endorse Blockchain platforms and protocols | 14 |
| | Efficient adoption of Blockchain platform in terms of time and government spending. | Smart Dubai has taken responsibility of approving Blockchain networks, ensuring value-creating use cases, and efficient investing in the Dubai Blockchain Platform | 6 |
| | Standardization of viable Blockchain platforms and protocols while maintaining flexibility. | The policy gives Smart Dubai control over the Blockchain platforms and protocols, which it can then standardize | 14 |
| | Ensuring backward compatibility across platform versions as technology evolves. | The policy assigns Smart Dubai to endorse platforms and technologies, ensuring backwards and cross-platform compatibility | 14 |
| | Guidance when evaluating Blockchain vendors. | Smart Dubai shall endorse select platforms and technologies, guiding entities with their vendor selection if needed | 14 |

# Addressing the blockchain policy needs

The collated policy needs and how they have been addressed in the Dubai Blockchain Policy have been summarized and analysed below.

| | Policy Needs | How it is addressed in the Policy | Associated Article(s) |
|---|---|---|---|
| Architecture & Standards | Guidance on Blockchain design including on-chain and off-chain data architecture. | The policy references ISR, Dubai Data Standards, and any other guidelines, architectures, and standards to be published by DESC, DDE, or Smart Dubai | 15 |
| | Guidance on designing scalable Blockchain networks. | Smart Dubai will be in charge of approving Blockchain networks formation in addition to referencing and working on architectures and standards to promote scalability | 6/ 15 |
| | Standardization and consistency across different Blockchain implementations. | The policy gives Smart Dubai control over the Blockchain platforms and protocols, which it can then standardize | 14/ 15 |
| | Guidance on the Blockchain standards to adopt and comply with, especially security standards. | The policy references ISR, Dubai Data Standards, and any other standards to be published by DESC, DDE, or Smart Dubai | 15 |
| | Guidance with building blocks and patterns for faster and more efficient implementation of Blockchain platforms. | Smart Dubai will offer Blockchain Platform as a Service which comes with building blocks and patterns, in addition to referencing and working on architecture & patterns | 14/ 15 |

# Addressing the blockchain policy needs

The collated policy needs and how they have been addressed in the Dubai Blockchain Policy have been summarized and analysed below.

| | Policy Needs | How it is addressed in the Policy | Associated Article(s) |
|---|---|---|---|
| Shared Network Services | Having supporting shared services at a Federal level, such as Digital ID, to allow for UAE-wide networks. | Smart Dubai shall approve and endorse Digital Identity and signature services, like UAE Pass, that may be used in Dubai Government Blockchain implementations | 16 |
| | Guidance on usage of shared services provided by the private sector. | The policy positions Smart Dubai as the entity to endorse shared services that may be used in Blockchain networks | 16 |
| | Guidance on available shared services for digital identity, payment and settlement, and other shared services | Smart Dubai shall approve and endorse Digital Identity and signature services, like UAE Pass, that may be used in Dubai Government Blockchain implementations | 16 |
| | Having data storage and hosting offered as a shared service for government entities, facilitating access using APIs. | While the policy does not specify data storage as a shared service, Smart Dubai shall approve and endorse services that are to be used in Government Blockchain solutions | 16 |
| | Guidance on how Blockchain networks will operate with the Government Information Network and outside. | The policy references ISR, Dubai Data Standards, and any other guidelines, architectures, and standards to be published by DESC, DDE, or Smart Dubai | 15 |

# Addressing the blockchain policy needs

The collated policy needs and how they have been addressed in the Dubai Blockchain Policy have been summarized and analysed below.

| | Policy Needs | How it is addressed in the Policy | Associated Article(s) |
|---|---|---|---|
| Legal Support | Guidance on dispute resolution and litigation in UAE and internationally, including the courts | The policy defines the legal implications of Smart Contracts and other data transferred utilizing Blockchain technology, including dispute resolution | 7/17 |
| | Guidance on creating, reviewing, and auditing Smart Contracts that are legally supported and enforced. | The policy defines the legal implications of Smart Contracts and references any guidelines issued by Smart Dubai or other relevant stakeholders | 17 |
| | Creation of a legal support transactions, including Digital Signature, Smart Contracts, and Digital Cheques. | The policy defines the legal implications of Smart Contracts, Digital Signatures, and other services on Blockchain networks | 17 |
| | Guidance on responsibilities in Blockchain networks between the different nodes and the network as a whole. | Smart Dubai shall review operating models, including, roles & responsibilities, and Terms & Conditions, which shall be developed by the network | 7 |
| | Federal coverage of the laws supporting Blockchain technology. | The policy supports Federal networks, and while other specifications are network specific, Dubai Government entities shall comply with the policy, where applicable | 3 |

# Thank you