BLOCKCHAIN INSIGHTS

HOW TO NAVIGATE BLOCKCHAIN PROJECT IMPLEMENTATION

AN EXPLORATION OF COMMON CHALLENGES WITH LEARNINGS AND RECOMMENDATIONS FOR SUCCESSFUL EXECUTION

دبي الذكية
SMART DUBAI

Educhain

In partnership with
DUBAI BLOCKCHAIN CENTER

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EXECUTIVE SUMMARY

Blockchain has emerged as an innovation that can change the way we do business, deal with government administration, conduct everyday activities, and establish trust in trustless environments. Yet in the past years, we have seen that despite the hype around blockchain technology very few people understand what it truly is, and the abundance of initiatives and investments poured into projects has not translated into many live implementations beyond Proof-of-Concept.

In reality, blockchain is not a solution that can fix every IT challenge. As blockchain is being examined in multiple aspects, it has predominantly three core applications that can be applied in various forms across all industries: **records and data notarization, value and asset exchange, and smart contracts.**

Through accumulated domain expertise and interviews with leading organizations implementing blockchain, we have identified core challenges that organizations face at every step of exploration. Each project proceeds through three stages: **pre-implementation, implementation and post-implementation.**

Each of these phases reflect the different challenges that decision makers will need to navigate.

- In the **Pre-Implementation** phase when initially establishing a project, organizations face challenges in forming **understanding, engagement and trust.**
- In the **Implementation** phase, as the projects progress, unforeseen complexities may arise around **expectations, collaboration, and capabilities.**
- In the **Post-Implementation** phase, organizations must determine how to ensure survivability of projects and consortia, and continue open dialogue around **regulation, interoperability, and governance.**

With proper planning and flexibility, these challenges can be minimized or avoided so that blockchain projects can realize their true promise. The responsibility of blockchain advancement lies in hands of the decision makers leading the process, and it is up to them to continuously learn from the successes and failures of others to drive their projects to success.

FOREWORD

Over the last 40 years, Dubai has succeeded in transforming into a global city and regional business and innovation hub. It has established an international reputation as an economic and investment center, attracting thousands of international companies to establish their regional headquarters in the Emirate.

Due to the visionary foresight of His Highness Sheikh Mohammed Bin Rashid Al Maktoum, Prime Minister & Vice President of the UAE, and Ruler of Dubai, the city's government sector has embraced technology and been committed to excellence and digital city transformation since 1999 with the announcement of its first city-wide ICT strategy. This was followed by the launch of Dubai Internet City, Dubai e-government, Dubai Smart Government and the Smart Dubai Office.

Today, Dubai is amongst the world's leading smart cities in its adoption of new technology. Understanding the potential impact of blockchain technology on city services, Dubai launched an ambitious city wide blockchain strategy in October 2016 with the objective of becoming the first blockchain powered city by 2020.

Since then, Smart Dubai has overseen the ongoing implementation of over a dozen blockchain use cases in the city, expanded the local blockchain ecosystem by launching the Global Blockchain Challenge, and was also the Official Host of the Future Blockchain Summit, the largest blockchain conference ever held globally. Dubbed as the 'Blockchain Capital of the World' Dubai was also felicitated with the City Project Award at the Barcelona Smart City Expo World Congress 2017, being recognized for its trailblazing efforts in blockchain and beyond.

One of the key pillars of the Dubai Blockchain Strategy is Thought Leadership, which aspires to make Dubai the global hub of blockchain intellectual capital and skill development. Over the past two years, Dubai government and private sector entities have identified and implemented several blockchain applications, encountering several challenges and successes.

Today we are partnering with leading blockchain specialists from Educhain and the Dubai Blockchain Center to share an executive report with insights on how to navigate the complexity of blockchain projects across all stages of implementation.

We hope our combined experience and learnings will help you implement successful solutions and we look forward to you joining the Dubai blockchain ecosystem.

H.E Dr. Aisha Bint Butti Bin Bishr
Director General
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LETTER FROM THE AUTHORS

Blockchain envisions a reality in which individuals and entities can operate and conduct business in a trusted digital environment, holding great promise in process optimization and efficiency, resulting in time and cost reduction. However, organizations have been struggling to effectively implement blockchain projects and bring them beyond a Proof-of-Concept.

Furthermore, although there have been several reports and research papers on the potential of blockchain, we found that there is a lack of valuable content around learnings and recommendations for practical implementation. The natural next step of exploration and testing is implementation, and so we sought to create a report that would transcend beyond hypothetical assumptions about the potential of blockchain to real input from organizations that have went beyond testing and PoCs in closed environments, to live use of blockchain applications.

Educhain launched with the mission to bring blockchain technology from concept to reality, working across all levels of government, academic institutions, and corporates. It focuses on three core areas – technology, consulting, and education. As a result of the successful projects we have conducted, we strive to make our experiences and learnings accessible to all. In this way, we aim to provide a more informed view of the practical challenges and recommendations in blockchain implementation.

Beyond implementation – there is a need to foster an open ecosystem for dialogue and creating new connections. For this purpose, the Dubai Blockchain Center was formed to bring together blockchain thought leaders, developers, investors, and educators, operating across all levels of the private and public sector to facilitate the best approach to the technology, help organizations achieve implementation success, and look towards the future questions and opportunities in the space.

This report builds on the accumulated domain expertise of Educhain, the Smart Dubai Office, and the Dubai Blockchain Center in leading cutting-edge research and practical implementation of blockchain technology in both the private and public sector. It provides an overview of the current and future challenges facing successful implementation and proliferation of the technology, with actionable insights, best practices, and recommendations for implementing successful projects regardless of whether you are just starting to engage, or already engaging.

We hope that this report will provide you with valuable and actionable insights for your blockchain engagements.

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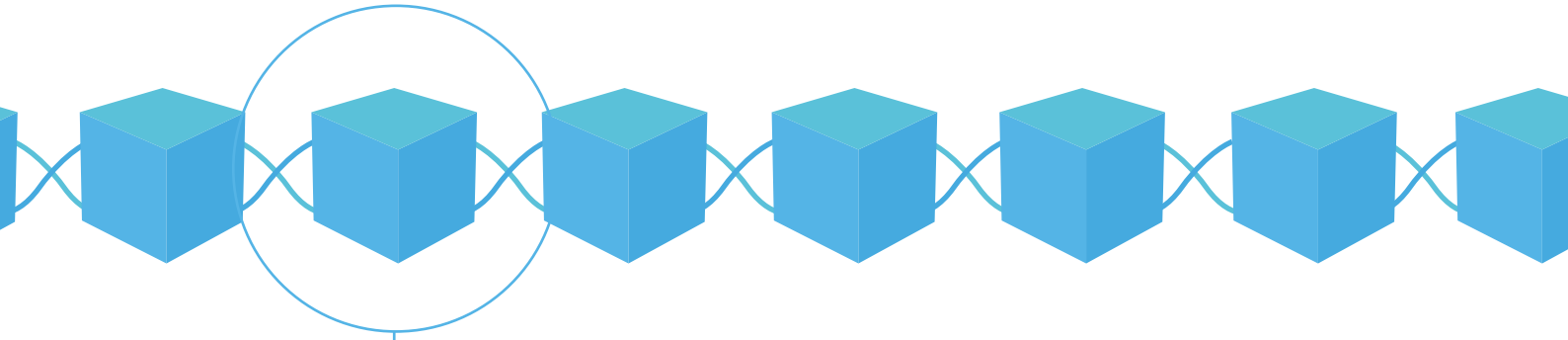
BLOCKCHAIN IN A NUTSHELL

Blockchain in its simplest form is a type of data structure, where data are arranged into groups of "blocks" containing information. Each block stores a reference of the block that came before it, forming a "chain". This chain of data is replicated amongst many participants, thus forming a distributed and resilient shared store of information. As each block references the one before it, it is virtually impossible to make changes in past blocks without changing every following block in the chain, forming an immutable and auditable trail of data.



WHAT BLOCKCHAIN CAN BE USED FOR?

Records & Data Notarization

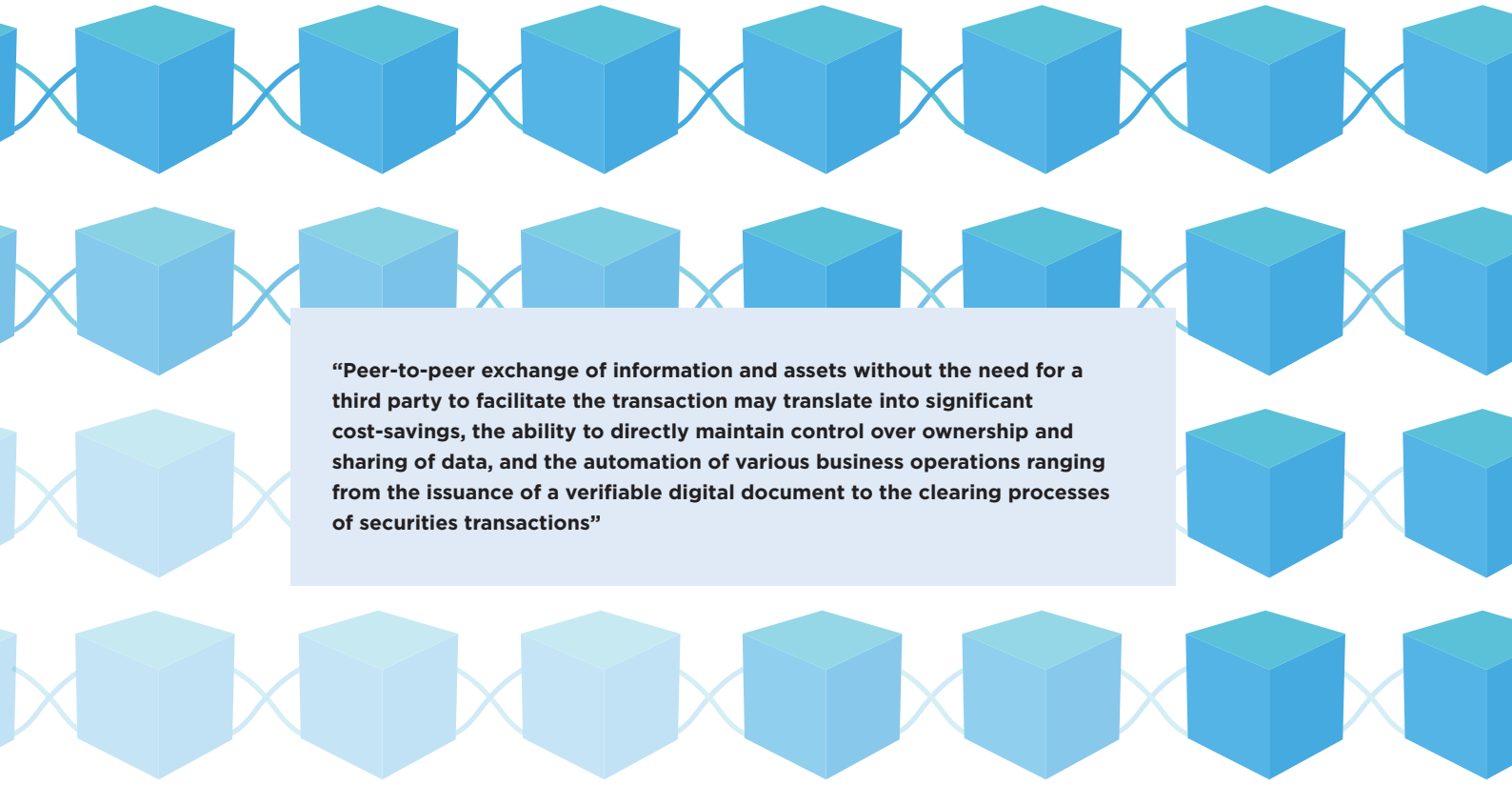
Blocks can be used as decentralized notaries to store the origin and validity of data and claims.

Smart Contracts

Smart Contracts can automate execution of business logic for exchange of data, value, and enforcing rules.

Value Exchange

Transactions occur directly peer-to-peer between transacting entitles, saving time and costs related to intermediaries as well as eliminating data asymmetry and reconciliation.



"Peer-to-peer exchange of information and assets without the need for a third party to facilitate the transaction may translate into significant cost-savings, the ability to directly maintain control over ownership and sharing of data, and the automation of various business operations ranging from the issuance of a verifiable digital document to the clearing processes of securities transactions"

A NUMBER OF BLOCKCHAIN INITIATIVES HAVE EMERGED TO EXPLORE POTENTIAL USES CASES ACROSS INDUSTRIES

The exploration, research, and development of blockchain technology has been rapidly progressing as multiple initiatives have been established across the globe. Vibrant ecosystems of enterprise consortia, startups, innovation hubs, and governments have emerged to investigate and test the potential of blockchain applications across a multitude of sectors. Fundamentally, these use cases link back to the three core paradigms of blockchain – record and data notarization or storage, exchange of value and assets, and usage of smart contracts.

What is the potential of blockchain across the three core paradigms, considering the number of applications per sector, potential impact per use case, and feasibility of implementation?

	Records & Data Notarization	Smart Contracts	Value Exchange
Agriculture	Medium	Medium	Low
Education	High	Medium	Low
Energy & Utilities	Medium	High	High
Financial Services	High	High	High
Government	High	High	Medium
Healthcare	High	Medium	Low
Manufacturing	High	Medium	Low
Media & Entertainment	Medium	Medium	Medium
Real Estate	High	Medium	Medium
Telecommunication	Medium	High	Low
Tourism	Medium	High	High
Transportation & Logistics	High	High	Medium
Retail	High	Medium	High

Source: Educhain Insights

A variety of blockchain paradigms emerged at the domestic and international level, addressing applications across both single and multiple verticals.

	COUNTRY-LEVEL	INTERNATIONAL
SINGLE-VERTICAL	**PRIVATE INITIATIVES** Enterprise projects, startups, and other private initiatives focused on a specific vertical such as healthcare or education.	**CONSORTIUMS** International consortiums formed by stakeholders to collaboratively address and implement use cases in a particular industry.
CROSS-VERTICAL	**GOVERNMENT INITATIVES** Top-down government task forces and initiatives formed to engage blockchain applications across many verticals.	**FRAMEWORKS** Open-source, collaborative groups formed for development of common blockchain frameworks and standards.

Source: Educhain Insights

Startups and enterprise consortia have risen to the challenge with various forms of blockchains, shedding light on the disruptive potential.

Since the early emergence of blockchain, a number of startups and consortia emerged to explore the technology's disruptive potential. Yet, their efforts were quickly eclipsed by the explosion of ICOs in subsequent years, followed by a sharp drop in activity in 2018 while large enterprise solutions providers begun to make major entrances into the ecosystem. In only a few years, the entire blockchain space and its underlying market dynamics have shifted drastically, and there is much more to come. Will radically innovative startups and ICOs disintermediate and disrupt the incumbents, or will incumbents develop their own solutions to attempt to isolate the small-players?

Large enterprises are waking up and driving a large percentage of R&D, process innovation, and Blockchain-as-a-Service (BaaS).

Over time, drivers of blockchain innovation begun emerging in favor of enterprise-driven development as industry leaders such as Microsoft, Oracle, and IBM aim to take the lead towards implementing practical blockchain frameworks and applications, amplified through swiftly growing initiatives such as the Hyperledger Project and Ethereum Enterprise Alliance.

These large incumbents have begun to leverage their significant resources, influence, and connections towards implementing real, groundbreaking enterprise solutions. In particular, greater emphasis is being placed on BaaS, or blockchain-as-a-service, which is rapidly gaining traction as a way to rapidly deploy blockchain applications.

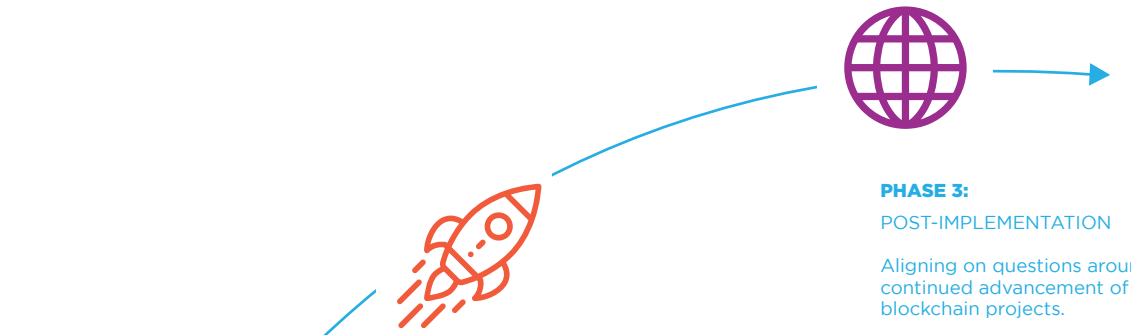
In either case, we have seen a **continued trend of enterprise solutions gravitating towards permissioned systems or a "hybrid" approach** of public and permissioned blockchains. Furthermore, as the ecosystem develops, there will be continued consolidation around leading open source initiatives, and movement towards establishing interoperability between different platforms.

BLOCKCHAIN HOLDS GREAT PROMISE BUT CHALLENGES ARISE ALONG EVERY STAGE OF THE ENGAGEMENT PROCESS

Blockchain truly has the potential to disrupt entire industries. Well-executed projects in blockchain reinforce the ideal that application of the technology can significantly streamline administrative process complexity in legacy environments, while also creating new disruptive business models and paradigms to generate real value.

However, for the present, despite the overwhelming amount of interest in blockchain from both the private and public sector across the globe there are still very few live applications in the world today.

To understand trending developments, we have worked and conducted analyses with CXOs, Project Leaders, and Innovation Managers to identify the most common challenges that appear throughout the 3 stages of the engagement process: **Pre-Implementation, Implementation and Post-Implementation.**



PHASE 1:

PRE-IMPLEMENTATION

Preparation for exploration and defining the blockchain engagement strategy.

Core challenges:

- Understanding
- Engagement
- Trust

PHASE 2:

IMPLEMENTATION

Actively launching and executing selected blockchain initiatives and projects.

Core challenges:

- Expectations
- Collaboration
- Capabilities

PHASE 3:

POST-IMPLEMENTATION

Aligning on questions around continued advancement of blockchain projects.

Core challenges:

- Interoperability
- Governance
- Regulation

PRE-IMPLEMENTATION CHALLENGES

PRE-IMPLEMENTATION PREPARATION IS THE BACKBONE OF THE BLOCKCHAIN PROJECTS

In the beginning of blockchain exploration, many organizations do not know what they are getting into. In reality, blockchain is not a panacea for all business challenges and objectives, and the promised business impact requires a great deal of planning, proper engagement with internal and external stakeholders, high levels of involvement and collaboration, and the relevant technical and financial resources.

In the pre-implementation stage three challenges have the highest impact on starting projects - setting **Understanding, Engagement, and Trust.**

UNDERSTANDING

Blockchain understanding is not detailed or completely missing at organizations.

A large number of institutions face the challenge of engaging with blockchain with very little, fragmented, or even no education in the field. Furthermore, within institutions that have conducted training sessions, many still miss a practical understanding regarding how blockchain can be applied at their organization. Beyond understanding the technology, institutions must understand the potential need for business process re-engineering.

Decision makers armed with a high-level overview and driven by industry pressure jump into the space, expecting assigned teams to deliver promised results. In reality this is extremely challenging with **missing know-how and human resource capabilities** to deliver projects in the frame proposed.

ENGAGEMENT

Definition of a clear engagement strategy is missing.

While organizations respond to global advancements in the blockchain space, they often lack clear vision on what tools and resources are required to engage with the technology, and how this engagement may change over time. As a result, many attempt to fit it into existing processes and frameworks while eliminating many benefits of the technology in the process, leading to slower progress than desired and accumulation of unanswered questions leading to project failure.

Organizations frequently miss the broader scope of blockchain innovation and suffer from a lack of definition, planning, and **misalignment of engagement strategies in both the short-term and long-term.**

TRUST

Organizations fail to set guidelines for internal and external collaboration.

Blockchain is a collaborative solution that can only yield benefits through close collaboration between individuals, departments, and organizations. At the early stage experimentation in government and enterprise, organizations can **struggle to establish clear requirements, communication, alignment, and transparency among participants,** resulting in a lack of understanding or insufficient trust in the group. An absence of principal guidelines in the early stage directly affect the efficiency of the collaboration and derived outcomes.

Paradoxically, blockchain should bring trust to digital channels and trustless environments, while organizations struggle to trust one another to explore it.

PRE-IMPLEMENTATION RECOMMENDATIONS

PRE-IMPLEMENTATION CHALLENGES SHOULD BE ADDRESSED AS QUICKLY AS POSSIBLE TO SET THE RULES OF ENGAGEMENT

Well-grounded understanding comes from a comprehensive approach towards education.

Organizations should **clearly define the training scheme** for all relevant personnel that will be involved in the blockchain technology exploration, moving beyond what is blockchain to focus on practical applications from the business and technical side. Decision makers should understand that rather than having blockchain as a checkmark for reviews and annual results, they should treat it as an investment that can bring tangible results.

Emphasis should also be made on the "why" behind the work – not learning and using blockchain for the sake of blockchain, but for enhancing organizational efficiency, developing new competencies, and so forth. Two simple quick goals to set are to:

- Identify the most relevant and pressing use cases, ideally ones that cannot currently be solved by using existing centralized systems.
- Identify, analyze, and evaluate the most relevant blockchain platforms, benchmarked to the most pressing use cases.

Decision makers need to explore and define a clear blockchain engagement strategy.

Management and project leaders in the initial steps of exploration should **establish clarity on the engagement strategy** early on to create a structure for blockchain initiatives and convert them into actionable plans that can be executed by the organization. A cohesive plan and timeline on how to engage with blockchain serves as a guideline for project leaders to lay the groundwork for the involved teams to explore the technology.

This helps to structure the short-term and long-term approach, supporting decision makers in keeping track of the progress and maturity of the strategy. The following page provides a **Blockchain Technology Exploration Matrix** for further detail.

Clarity and alignment on the rules of collaboration are the first steps to take.

To capture the real potential of blockchain, **creating a clear and transparent environment for collaboration is vital** for future implementation success. It allows for common understanding around exploration and clarity between involved parties, allowing organizations to avoid future project creeps related to misalignment and organizational dynamics as a result.

It is essential to listen, evaluate, and learn from internal and external partners to streamline an exhaustive set of objectives and goals for exploration.

Transparent rules of engagement as well as initial responsibilities should be set in place to move towards future implementations.

BLOCKCHAIN TECHNOLOGY EXPLORATION MATRIX

Assuming an organizational imperative has been identified to move towards exploration of blockchain technology, what are the next steps? How can the organization engage?

What type of options and approaches exist to explore it? What are the resulting resources required?

These and a multitude of other questions are being asked by project leaders and management worldwide. To answer them, we offer an initial exploration matrix for the potential engagement strategies that can help organizations identify the type of involvement required for blockchain technology exploration.

This Blockchain Technology Exploration Matrix is for project leaders and management to **support the decision-making process** on the available forms of engagement, but as well allows to observe and manage the progression and advancement of the involvement over time, and to make decisions around next steps.

COMPLEXITY OF INVOLVEMENT	IN-SOURCING	COMBINED APPROACH	EXTERNAL
LOW	**INTERNAL RESEARCH** Theoretical approach on blockchain, dedicated to understanding and monitoring.	**JOINT RESEARCH** Proof of Concept investigation and application research with external stakeholders.	**CONSULTING SERVICES** Training, education, strategic advisory, and project support on blockchain.
	RESEARCH CENTER Cross-department exploration with Proof of Concepts for limited use cases.	**INDUSTRY CONSORTIUM** Collective collaboration with relevant stakeholders on specific use cases or industries.	**BLOCKCHAIN PROVIDERS** Requesting for the services related to blockchain software development and installation.
HIGH	**DEDICATED PERSONNEL** Initiating, implementing and managing blockchain initiatives. Organizational or business unit-approach with multiple use cases.	**STRATEGIC ALLIANCES** Active involvement in blockchain ecosystem and exploration of live applications through alliances and accelerators.	**INVESTMENT** Active acquisition of blockchain technology or acqui-hiring of blockchain talent.

Source: Educhain Insights

Throughout the decision-making process, the goals and desired outcomes must be closely inspected. By identifying the needs and desired results, organizations can decide up-front on what types of engagement to start with and investigate further.

Naturally, organizations may apply a single stream approach or engage on multiple fronts. This is strongly correlated with the complexity of the industry, use case specificity, and technical advancement of the organization. Governments and corporates are the primary users of a multipronged engagement approach due to the wide range of business units, activities, and relevant use cases.

IMPLEMENTATION CHALLENGES

IMPLEMENTATION IS AN INTERSECTION OF BUSINESS, TECHNICAL, AND ADMINISTRATIVE QUESTIONS

As blockchain exploration progresses towards implementation, the quantity and complexity of challenges grows exponentially as projects begin to encompass multiple departments and entities. As an outcome of our implementations and combining insights from experts across the globe we identified many challenges, of which the ones with the highest impact lay in the fields of **Expectations, Collaboration, and Capabilities.**

EXPECTATIONS

Expectations set by wrong or misguided promises are an obstacle for projects.

These days, there is no shortage of hype around the promise of blockchain. Billions in cost savings are promised, and the revolutionary ideal of decentralizing the world is very much alive and well.

However, recognizing that blockchain does have high potential in many areas of organizational improvement, it will not serve as a solution to fix all issues at the organization. This is still a very common mistake committed by decision makers, where blockchain may even only be a marketing term to usher in long overdue IT upgrades in unrelated areas. The clash between promises and reality is one of the most common obstacles shutting down projects before they get to the stage of realizing their true potential.

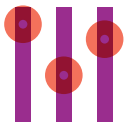
Many decision makers are bombarded with widely exaggerated and overhyped materials that influence them to believe that blockchain can solve several of their KPIs or organizational challenges, while real results may be of smaller effect with a much longer execution time to impact.

COLLABORATION

Blockchain implementation brings a complex matrix of relations between entities.

It is no question that new IT projects can be challenging, particularly when involving legacy systems across multiple departments. It then goes without saying that a blockchain project introduces **exponential levels of complexity,** requiring cohesive collaboration across multiple entities, each with their own departments, systems, and teams.

In such a network, the collective only moves as quickly on implementation as the slowest link in the group, and as additional requirements, approvals, and obstacles arise, projects can slow dramatically or even become gridlocked entirely.



CAPABILITIES

Marginal rates of project survivability often result from insufficient in-house capabilities.

It is notable across various use cases that external partners cannot consistently provide and manage the full lifecycle of a project. It is usually a provision of services, often in the form of a PoC, that the organizations afterward have no clear way to move forward because of the **lack of know-how**. Organizations struggle to maintain, upgrade, and advance with implemented solutions which leads to the lack of continuity that we see in many projects or in the resulting high costs of longer-term dependence on external providers.

IMPLEMENTATION RECOMMENDATIONS

IMPLEMENTATION CHALLENGES REQUIRE CONSTANT INVOLVEMENT AND ITERATION

Expectation management and cutting through to the real potential and need for blockchain is key for successful implementation.

Organizations' management and key stakeholders should be prepared with the relevant knowledge and come to project evaluation with a **steadier approach with realistic expectation.** Focus on the core business problem that the project will solve or the impact it will create, and not just on the technology at hand. As with any other innovation, the efficiencies and added value only comes at a certain time, after certain efforts, which require continuous commitment and understanding.

It would be wise for organizations and their management to acknowledge this and take a more cautionary approach towards the initial promise.

Flexibility and continuous collaboration allow blockchain projects to survive and thrive.

It is critical to ensure that **flexibility and consistency in communication** has commitment from all parties at the outset of the project, in order to maintain c**ontinuous collaboration** throughout the project.

When engaging so many entities, taking opinions of each party into consideration and consensus building is important. Instead of falling into the challenge of high-stakes negotiations and division into sides during heated debates, it is reasonable to divide the project and its component deliverables into smaller pieces and ensure continuous alignment and approvals.

If all entities commit to continuous collaboration, coming to consensus on smaller, lower-stakes decisions more often is more valuable than having the work boil down to sporadic high-level decisions about the direction of the project.

Co-create projects with collaborative groups to foster mutual commitment.

Leverage the buzz around blockchain to kickstart a discussion with your teams and counterparts around how you can expand the pie and develop innovative solutions to benefit the group.

Make sure that you engage all parties equally to **co-create and share ownership** of the cases and projects. Avoid a "mine, mine, mine" mentality where people join your ecosystem, on your platform, with your applications. This is a recipe for unsustainable blockchain development leading to many different blockchains, to each their own, where everyone ends up right where they started. Every participant should have **equity, commitment, and co-ownership in the project.**

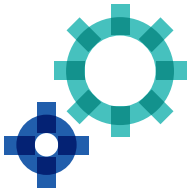
Develop internal expertise to maximize effectiveness and the survivability of projects.

Organizations need to be prepared with internal IT and business resources possessing skillsets to develop, manage, or negotiate blockchain projects.

In-house capabilities are vital for projects to survive in the long-term. Regardless of the engagement strategy and external services provisioned, blockchain implementations can only be effectively executed with the involvement of team members that have a clear understanding of how the project can be advanced and maintained in the future, from a technical and business standpoint.

POST-IMPLEMENTATION CHALLENGES

THE POST-IMPLEMENTATION PERIOD RAISES NEW QUESTIONS ABOUT THE SURVIVABILITY OF PROJECTS



INTEROPERABILITY

Interoperability is even more of a pressing question for successful applications.

Currently, if entities are on different blockchain platforms, they are generally **unable to communicate**. This is an important issue to address as in today's world, no organization, industry, or government functions in a vacuum. There is a constant need for exchange, interpretation, and usage of data between entities.

Therefore, as organizations begin to engage, the crucial question of interoperability arises – how will my blockchain platform and the data, assets, and business logic it envelops communicate with other networks? The following questions are particularly important to address before switching costs leading to blockchain lock-in and integration challenges become a real concern.

- If my organization starts working with one set of blockchain frameworks, how can we migrate or add other frameworks without compromising existing work?
- How can I reconcile the verticalization of blockchains for different sectors with the need for communication and regulatory reporting?

GOVERNANCE

Governance is a challenging undertaking, not only at the outset of blockchain engagement but also throughout the continuation of the project.

Traditional governance, in a nutshell, revolves around the management of an organization or community. Any cohesive network must set rules for how it is governed. This effectively boils down to the action of making decisions - defining what is allowed, what is not allowed, and setting incentives and rules for the effective functioning of the network. Whereas traditional governance may happen in a boardroom, the extra step in blockchain is that the governance structure has to work within the bounds of the software and the network. Voting transparency and enforcement via smart contracts brings a new dynamic to the community.

As a distributed network, once the ball starts rolling, it cannot stop without effectively defeating the purpose of the blockchain. For example, starting over when switching to a new consensus protocol.

- How can we manage and reach consensus on network updates and upgrades?
- How do we set rules for organizations joining and leaving the network?

REGULATION

The regulators and the regulated are coming under increasing pressure to answer questions around regulation.

As projects mature beyond Proof-of-Concept, the question shifts to regulation. Not only do new applications often lack regulatory clarity, the underlying blockchain rails they lie on are also subject to regulatory scrutiny. As blockchain continues to gain traction faster than regulation, the lack of clear regulatory guidance is a clear challenge moving forward. As blockchain is global by nature, scores of jurisdictions implementing varying proactive and reactive policies towards blockchain challenge the consistency of project and consortium implementations. Beyond these networks, answering questions of regulation lies particularly within the realms of data and cryptocurrency.

- How are the activities and rules of the network legally validated and enforced?
- Who regulates the governors, consortiums, and how?

POST-IMPLEMENTATION RECOMMENDATIONS

APPROACHING CHALLENGES POST-IMPLEMENTATION IS MORE DYNAMIC, REQUIRING ENGAGEMENT AND DIALOGUE

It difficult to overstate the importance of **open dialogue** in this stage. Enterprises, governments, and startups must **form closer relationships** to avoid the trap of replicating the same siloed environments blockchain emerged from. After all, if we have 10,000 blockchains in 5 years, have we accomplished anything?

All must aim to communicate and **build communities around common standards, open frameworks, and transparent regulation** around the formation, launch, and management of blockchain projects.

Focusing on the application layer and pursuing open standards and frameworks early on is critical to ensuring survivability of projects.

Based on the use case you are solving, maintain focus on the application layer and an understanding of how it interacts with the blockchain layer. In this way, innovation and development can yield value immediately, while simultaneously leaving the door open for integration of international standards and frameworks as they gradually develop.

Moving forward, decision makers and project leaders have to understand various levels of interoperability. For example, **three levels of interoperability** can be considered which are applicable towards blockchain networks:

TYPE	FOCUS	DESCRIPTION
FOUNDATIONAL	**Transmitting the data.**	Foundational interoperability focuses on the base level of data exchange, enabling data transmitted by one system to be accepted by another without necessitating interpretation.
STRUCTURAL	**Defining the structure and format of the data.**	Structural interoperability focuses on defining the structure and format of the data being exchanged enabling it to be interpreted. Defining syntax, this typically does not focus on usage or higher levels of understanding of data.
SEMANTIC	**Usage and interpretation of the data.**	Semantic interoperability focuses on the exchange and usage of transmitted data. Data normalization is crucial for standardizing and translating data, eliminating ambiguity.

Source: Educhain analysis based on existing definitions and sub-types of interoperability

With this said, following common blockchain standards and frameworks early on is vital, with a focus on open source projects with no vendor lock in. One risk to keep in mind is the continued risk for vendor lock-in with vendors utilizing open source technology stacks, as organizations seek traditional support models. Emphasis must be placed on developing the underlying rails and applications across use cases, from which flexibility in data formats, communication protocols, and business processes are retained.

Governance balances stakeholder needs (horizontal) and business logic (vertical).

The definition of principal rules, frameworks, and institutions allows for efficient decision-making coordination amongst entities in response to various scenarios that arise. Designing an effective blockchain governance system is crucial to ensuring survivability of initiatives, and may vary by structure – permissioned, permissionless, or hybrid. Furthermore, governance can be led by various types of organizations, such as a non-profit foundation, or private entities. Regardless, within both, one has to consider both network and project governance.

TYPE	AREAS OF COVERANGE	OUTCOMES
NETWORK GOVERNANCE	• Participation • Inclusiveness • Consensus • Legitimacy	• Alignment of network incentives • Alignment of network membership rules • Alignment of consensus rules and arbitration
PROJECT GOVERNANCE	• Structure • Information dissemination • Coordination • Flexibility	• Alignment of collective direction and norms • Formation of communication mechanisms • Improving responsiveness to change • Evolution of frameworks

Source: Educhain Insights

With regards to on-chain governance, while it may certainly have potential, it is unlikely to be a strong catalyst in the short to medium term. Instead, it should be a priority to crystalize governance and enforcement off-chain as the ecosystem develops prior to moving on-chain. It is important to start the discussion as early as possible from inception to maturity of projects, as decisions made today will set precedents for tomorrow.

For the regulators and the regulated, a flexible approach and open dialogue is required at the outset, particularly in heavily regulated industries.

In regulation, organizations must make a distinction between the application-level services enabled by blockchain versus the underlying technology. At the application level, functions of the solution and user interface may not differ greatly from existing systems. Certainly, processes enabled by blockchain such as digital notarization and Initial Coin Offerings may not yet be fully regulated, and thus in these areas it is critical to take a cautious approach.

However, within the fundamentals of blockchain compliance must be a given - such as in areas of privacy and the right to be forgotten. Regardless of the applications, it is vital to be compliant in these areas. However, where blockchain introduces new innovations, the regulation may not yet exist.

Depending on the degree of severity in regulation around use cases in sectors such as the financial industry, it is crucial to maintain open dialogue with regulators, take advantage of regulatory sandboxes, and be prepared to pivot quickly. Ultimately, the regulators and the regulated should be aligned to ensure the protection of consumers and the encouragement of innovation.

THE TRUE IMPACT IS YET TO BE SEEN, BUT THE FUTURE REMAINS BRIGHT FOR BLOCKCHAIN TRANSFORMATION

By nature, people tend to discount the future in favor of the present. While we have seen an explosion of interest in blockchain around the world, **much remains to be seen regarding the true impact of technology.** Thus, it will be interesting to see how nascent initiatives will navigate the current trough of disillusionment, and which initiatives will break through and emerge as leaders in the coming years.

To date, sizable impact has been muted, but with the continuously increasing development in the space the ground is set for a rapid disintermediation of the current world as we know it. The active and developing ecosystem we see today is the key to unleash the potential of blockchain.

It's a brave new world, and we're excited to be a part of it.

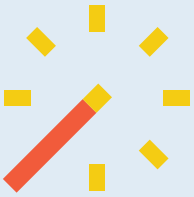
REGULATORS AND POLICYMAKERS

A certain degree of flexibility is required for regulators and policymakers to understand that the "final version" of blockchain is not yet here and will not be for some time. In many ways, the world of blockchain is still the wild west. Many aspects may not align with existing regulation, or the regulation may simply not exist. The onus is on policymakers to not only encourage development and innovation, but to be sure to be **engaged along the way to ensure guidance in line with both existing regulatory requirements and needs, as well as emerging blockchain standards and frameworks.**

GOVERNMENTS AND ENTERPRISE

There is a need for governments and enterprise to **rapidly educate themselves** to fully understand the potential impact of blockchain. As the pace of development accelerates, the time is now to **formulate a cohesive engagement strategy** around blockchain and learn by doing. A measured approach is needed, cutting through the hype to **set clear scope and expectations** as the key to addressing challenges before they arise. Both a short- and long-term vision must be set together with the development of internal capabilities to ensure the survivability of blockchain initiatives.

STARTUPS



There is a need to for startups to avoid getting caught up in the hype of the technology to **pursue a user-centric focus and ensure continuous realignment on the pain points** you are working to solve. With each successful step forward, leverage your accumulated learnings and experiences to build modularized applications for greater efficiency. **Explore the value in creating API-based platforms**, where developers can standardize APIs to plug-and-play, implementing and delivering blockchain value faster.

BLOCKCHAIN INSIGHTS: FUTURE REPORTS AND RELEASES

"How to navigate blockchain project implementation" is the first installment of the "Blockchain Insights" series that will be providing in-depth practical insights and recommendations on blockchain technology, including rare glimpses into the technical and strategic elements of successful implementations across various industries and stages of engagement. Future releases will be enriched with frameworks, expertise, case studies, and tools around how to take advantage of blockchain opportunities and projects.

Upcoming Blockchain Insights issues will cover unique insights in crucial areas of the technology, such as:

- Underlying applications: when and how blockchain can provide value across industries.
- Options and approaches: exploring blockchain frameworks, and engagement strategies.
- How to initiate and manage blockchain engagements within organizations.
- Use case evaluation and blockchain benefit analysis.
- Implementation case studies across industries, evaluating approaches and best practices.
- How to build blockchain capabilities and capacity within organizations.
- Commercialization and new business model paradigms for blockchain solutions.
- Regulatory views and recommendations around blockchain.
- Establishing and managing governance across various blockchain initiatives.
- Addressing interoperability challenges and solutions.

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www.educhain.io
March 2019

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