QUARTZ

Quartz for Blockchain

Today, when we think of a disruptive technology, we often think of blockchain. And when we think of blockchain especially in the context of financial services, we think of real-time processing, transparency and collaboration. Blockchain or distributed ledger technology (DLT) today is fostering partnerships between multiple organizations in a value chain, eliminating redundancies and improving efficiencies. It is being explored in areas as varied as digital identities and registries, payments, clearing and settlement and information exchanges. Financial organizations from all corners of the world are involved in some proof of concept with the aim to integrate blockchain technology into their business processes. Industry consortia and fintechs are actively working together to encourage its adoption, aiming for cost optimization, reduction of redundancies, and improvement of process efficiencies.

Why? The financial services world is replete with siloed, legacy systems and intermediaries that add costs and delays to transaction processing and settlement, while inhibiting transparency. Fragmented IT and data architectures lead to multiple versions of the truth, making costs of reconciliation between firms untenable, along with avoidable processing errors and an unfortunate lack of trust.

Think Blockchain. Think Co-existence. Integration, Interoperability.

Blockchain, with its ability to synchronize data across participating entities, builds trust and encourages firms to collaborate. The need for a truly connected ecosystem with real-time, efficient transaction processing, minus the intervention from intermediaries, is a goal that most organizations are working towards. Firms are therefore adopting "coexistence" as an approach -- of combining the best of their legacy infrastructure with emerging technologies such as blockchain. Reusing existing systems and infrastructure, even while moving parts of the business or operations onto blockchain, can help remove risk and save costs. This would result in a more measured approach as opposed to a big bang adoption of emerging technology.
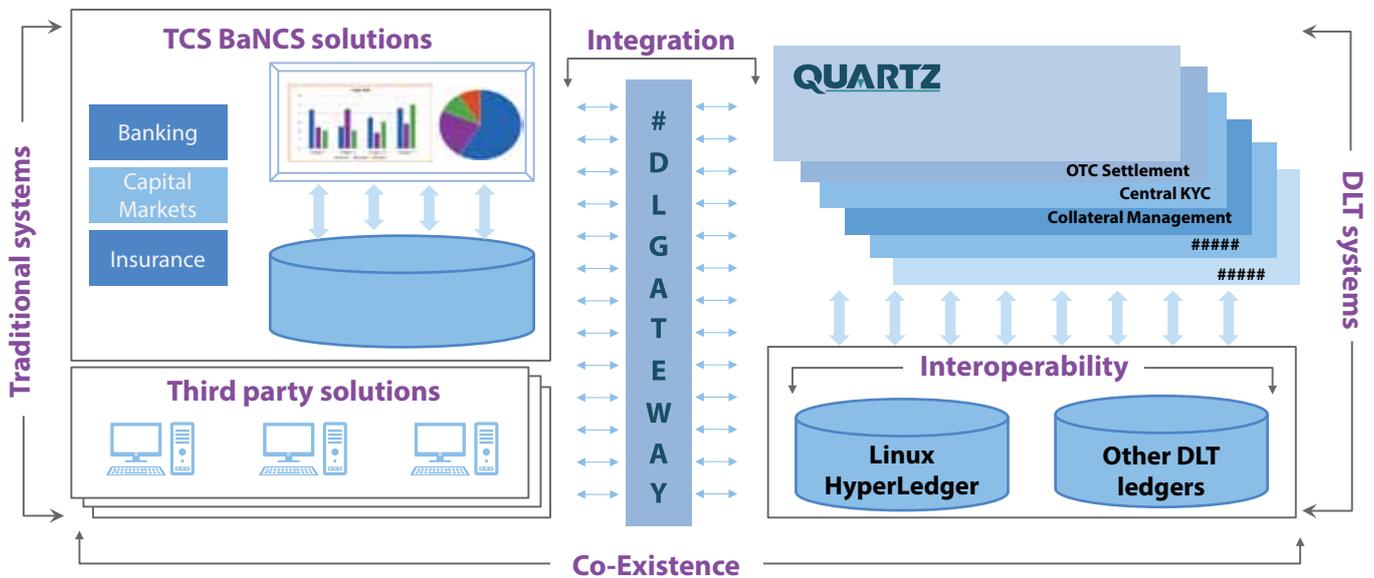
The introduction of DLT into an ecosystem implies that it needs to integrate all connecting systems seamlessly. Strategies that are inclusive, allowing each organization to focus on enhancing its competitive advantage while still maintaining data integrity, privacy and security are being favored. In addition, organizations are likely to explore aspects such as interoperability of technologies—and, even blockchain platforms going forward. The objective is to develop, deploy and deliver real use cases to market participants, who can then tap into the resulting potential to attract new business and clientele. Many blockchain investments today are slowly being directed beyond POCs and moving into real-time implementation for organizations to realize the technology's perceptible business benefits.

The Quartz suite of blockchain solutions from TCS BaNCS — targeted at helping commercial and private banks, market infrastructure institutions, custodians, wealth management firms, brokers, registrars and transfer agents, insurance companies and other institutions managing documentation — can make your organization agile, significantly reduce transaction processing timelines, provide real-time updates to both upstream and downstream participants, and reduce costs related to data exchange. With data masking, privacy and anonymity, the premises on which the solution is designed, your organization can focus on enhancing its core competitive strengths in an environment of utmost security.

TCS BaNCS offers the following products as part of Quartz:

a) **Quartz™: DLT-ready solutions and Smart Contracts**
TCS BaNCS components come embedded with business (domain) aware "Smart Contracts" that help drive processing on the distributed ledger. A Smart contract is 'self-executable' software that is stored in the ledger and triggered either as a result of specific events occurring within the ledger, or a result of pre-configured rules that are programmed into these contracts.

Each Quartz solution supports a specific business function or process across different business entities. For example, OTC settlement, KYC and corporate actions announcements , in the form of business aware Smart Contracts are all working examples.

b) **#DLGateway**
The #DLGateway is a single, smart channel that can help integrate TCS BaNCS as well as third-party solutions with various distributed ledger platforms. Using the #DLGateway solution, organizations can connect to the DL, thereby eliminating the need for large scale and continuous changes to be made to these systems and rapidly adapt to multiple technologies, platforms or ecosystems. The #DLGateway is also interoperable between DLT and messaging standards like ISO and FIX and other existing messaging networks.

c) **Quartz Development Framework**
The Quartz Development framework is designed to help developers who are part of an IT team to introduce DLT into their business processes, and generate, compile, package, and deploy business code on the DL platform. By deploying a combination of the Quartz Development framework and specific business components, you can simplify how DLT is implemented within existing processes in your organization.

Traditional systems | **Integration** | **DLT systems**

TCS BaNCS solutions
- Banking
- Capital Markets
- Insurance

Third party solutions

#DLGATEWAY

QUARTZ
- OTC Settlement
- Central KYC
- Collateral Management
- #####
- #####

Interoperability
- Linux HyperLedger
- Other DLT ledgers

Co-Existence

Quartz – Benefits

The Quartz solution provides end-to-end DLT ready solutions that are designed for different functions and processes, while the #DLGateway enables TCS BaNCS and third party solutions to seamlessly integrate and access the distributed ledger. This is achieved by implementing Quartz as well as #DLGateway solutions on a permissioned network that can host multiple players– for example, in a Capital Markets scenario, Custodians, Banks, Investment firms, CSDs, among others. This effectively reduces the entry barrier for DLT adoption, for all entities in the value chain.

With Quartz, your organization can:

- Process and settle transactions real-time(T+0)
- Automate business processes and functions with Smart Contracts (automatically executable code) on DL
- Eliminate data duplication and associated data integrity concerns
- Ensure data integrity with cryptographic encryption of data, making it immutable
- Restrict access (private permissioned ledger) to ensure greater security
- Help integrate existing/legacy systems with DLT solutions through plug and play
- Allow for co-existence of core systems on traditional databases with the distributed ledger
- Facilitate seamless integration of TCS BaNCS, third party and legacy solutions, with the distributed ledger, using the #DLGateway solution
- Choose from a range of industry standard blockchain platforms

The #DLGateway provides API based connectivity with Quartz as well as third-party distributed ledger platforms, thereby ensuring that connecting systems are insulated from the complexities of the underlying DL technology.

The Quartz Advantage

- **Co-existence:** DLT is widely acknowledged to be a solution that brings about positive disruptive innovation in the way services are delivered; however, we believe that core systems on conventional databases will continue to co-exist with distributed ledger-based solutions, for applications where they are most relevant. Quartz and #DLGateway are built on this philosophy and can integrate with third-party solutions and various distributed ledgers.

- **Integration:** The Quartz set of solutions is designed in the form of simple, lightweight solutions that can seamlessly bring together TCS BaNCS, third party solutions, legacy applications and messaging middleware. Our solutions can therefore reduce entry barriers to DLT adoption by insulating connecting systems from the complexities of the underlying blockchain.

- **Interoperability:** DLT is an evolving technology with different blockchain platforms that are likely to provide varied features. There is a need to interoperate with multiple blockchain technologies, platforms and ecosystems to realize the true benefits of DLT. As the Quartz solutions work on a plug-and-play model, they support this critical need for interoperability.

Blockchain is a disruptive technology and as it evolves, markets are finding newer ways to leverage its benefits. It is therefore critical for a financial institution to adopt a solution, like Quartz, that is designed keeping in mind market dynamics and the TCS BaNCS experience of having deployed solutions across more than 370 financial services institutions worldwide.

Connect with us to know more about how we can help your organization tap into the full potential of blockchain technology.

Why TCS BaNCS

The TCS BaNCS product suite for banking, capital markets and insurance enables business transformation in financial services. Increasing operational efficiency and helping financial institutions stay agile, our solutions deliver a competitive edge with unmatched certainty. We aspire to be better than established benchmarks, which is why we have embedded an Alpha ("α"), representing superior returns delivered to our customers, consciously and prominently within our brand. The plug and play, component-based product suite consistently turns in impressive benchmark results, with a fine-tuned, highly scalable technology architecture that supports financial institutions with the highest capacities for transaction volumes, peak transactions per second, and transaction history size. With such a track record, it is only natural that the TCS BaNCS product suite can help financial institutions of any size gain a distinct, competitive edge.

To know more

Visit the **Banking** page on **sites.tcs.com/tcsbancs/**
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About Tata Consultancy Services Ltd (TCS)
Tata Consultancy Services is an IT services, consulting and business solutions organization that delivers real results to global business, ensuring a level of certainty no other firm can match. TCS offers a consulting-led, integrated portfolio of IT and IT-enabled infrastructure, engineering and assurance services. This is delivered through its unique Global Network Delivery Model™, recognized as the benchmark of excellence in software development. A part of the Tata Group, India's largest industrial conglomerate, TCS has a global footprint and is listed on the National Stock Exchange and Bombay Stock Exchange in India.

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