

BLOCKCHAIN PROOF-OF-CONCEPT

JOINT COUNCILS MEETING

October 4, 2017



ENGAGEMENT OBJECTIVES

i Background

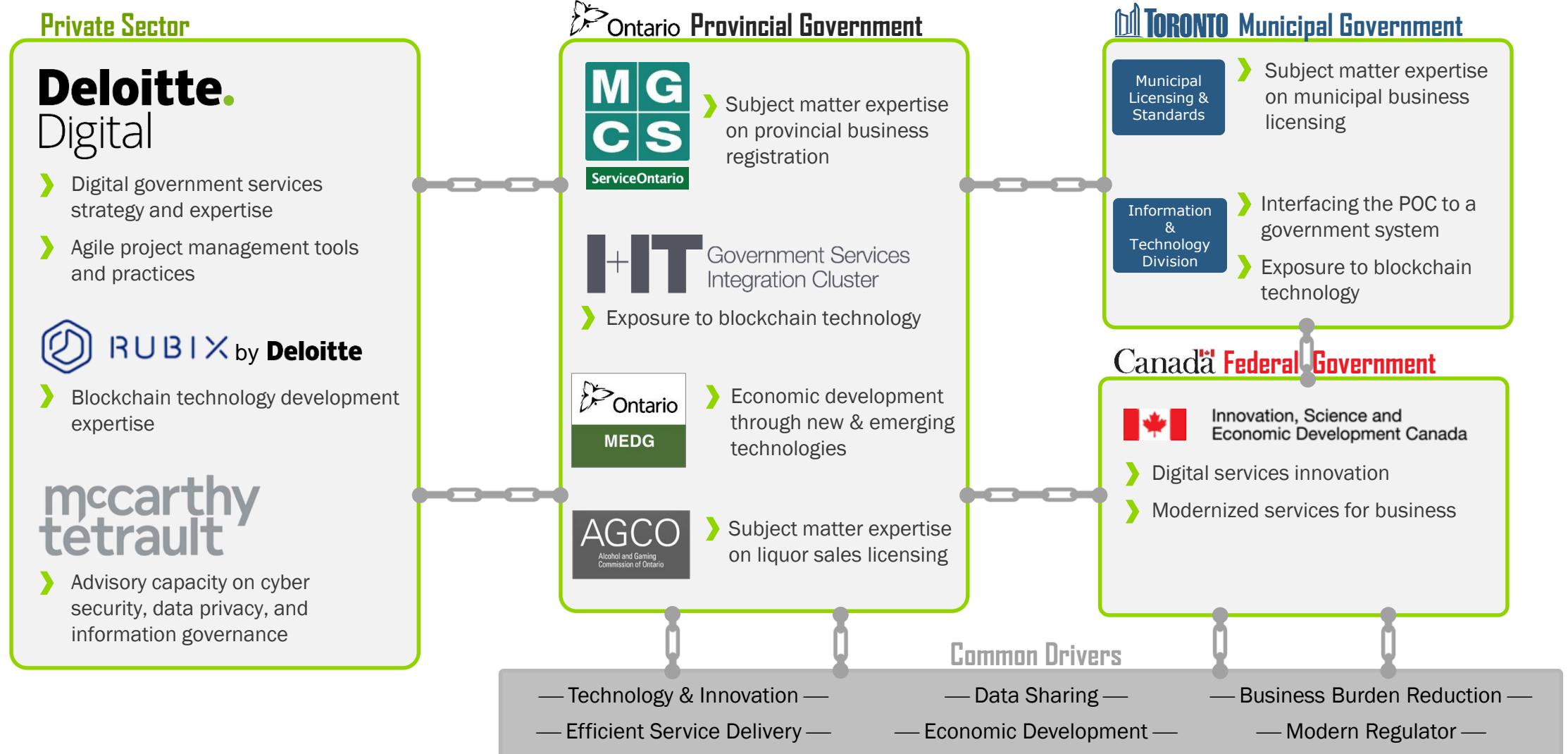
- Food services industry is a heavily regulated sector
 - Average restaurant in Ontario must ensure compliance with **over 25 provincial statutes**
 - Many process interdependencies among the cross-jurisdictional regulatory bodies
 - Burden is on the business start-up to move the process along by proving to one agency completion of activities with another
- Government of Ontario, Federal Government, and City of Toronto have been collaborating to identify opportunities to reduce administrative burden on restaurant businesses in the City using digital services

POC Goals

- Learn about the Distributed Ledger Technology and its fit in government service delivery infrastructure
- Validate the use of blockchain as an enabler for sharing of client data among government agencies and with external 3rd parties
- Evaluate use of blockchain technology in driving process efficiencies through creation of trust mechanisms across agencies resulting in near real time tracking of activities and progress on tasks
- Explore creation of platform for 3 levels of government to collaborate to create a seamless experience for business owners

PUBLIC-PRIVATE COLLABORATION

The project was a collaborative effort between the public and private sectors, with each organization bringing important skills and knowledge to the table.



EXECUTION APPROACH



METHODOLOGY

- Utilized hybrid agile methods for iterative concept refinement, prototyping, testing, and planning
- Regular engagements with technical, policy, and business verticals across the participating agencies to refine the design and manage issues



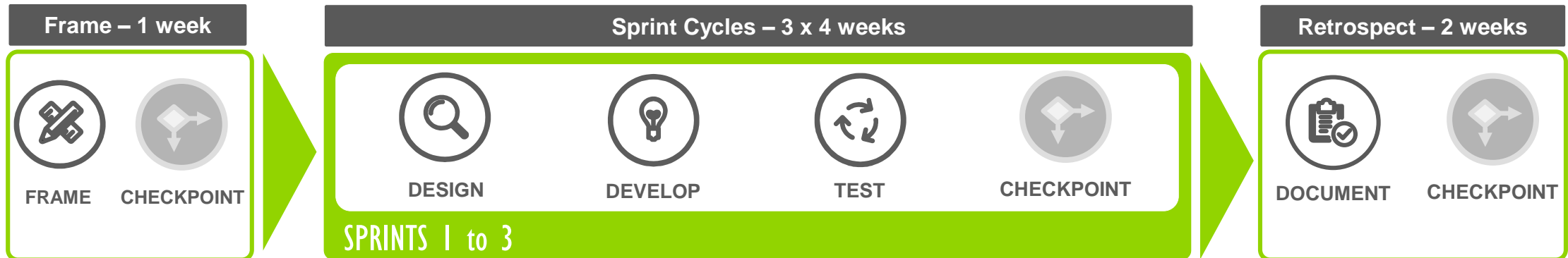
COLLABORATION

- Mobilized expertise from three levels of government and private sector to design and build the platform
- Used online collaboration tools for effective planning, information sharing, and scope management



CADENCE

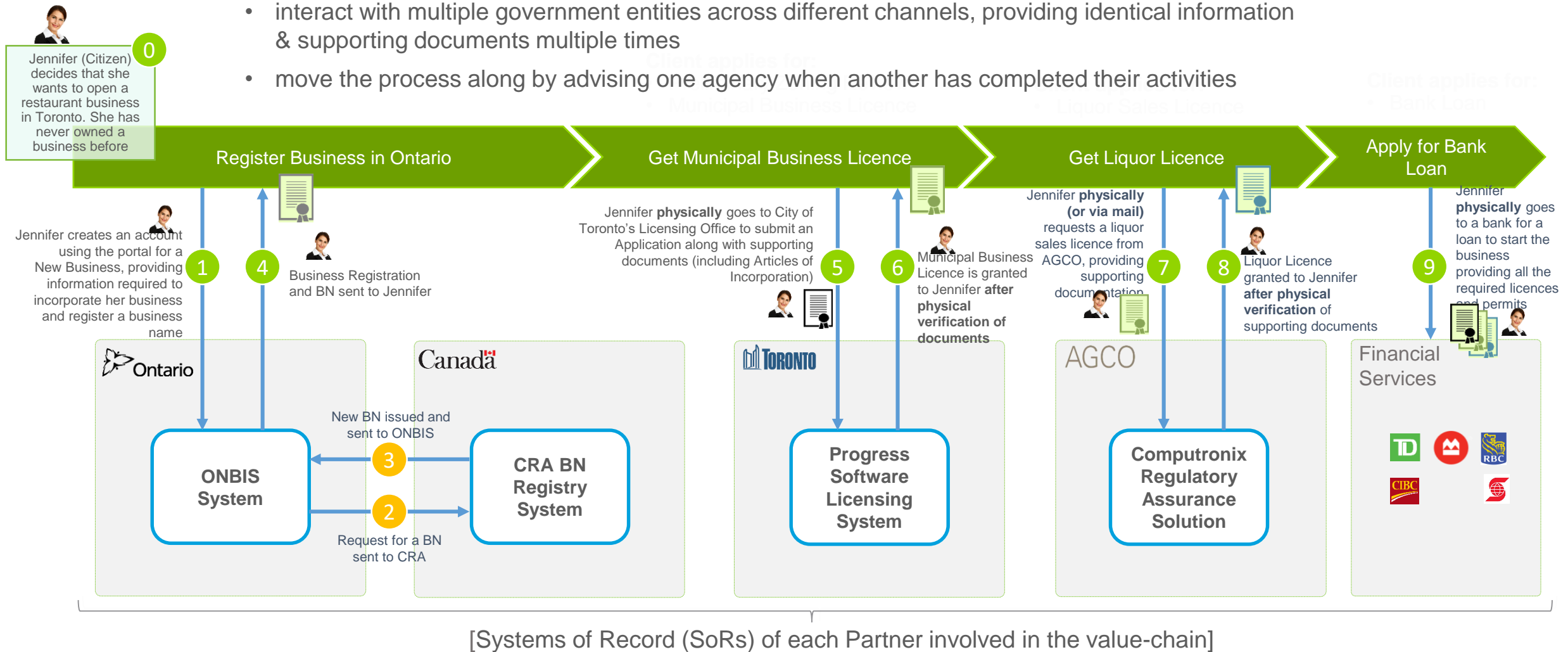
- Daily core team scrums and bi-weekly working team sessions to track progress, demo and test capabilities, and plan & refine scope
- Monthly Steering and Advisory Committee sessions for quick decision-making and gathering of feedback & insights



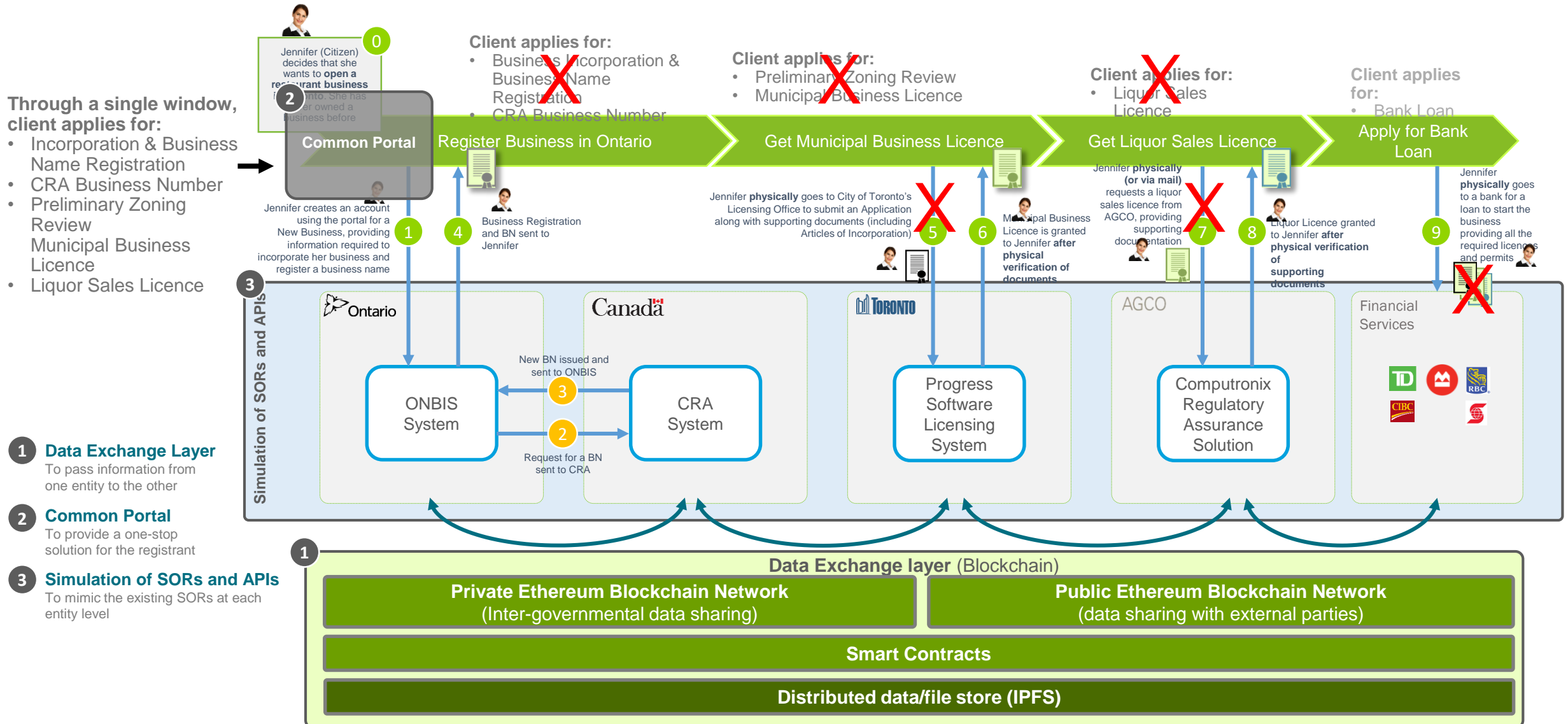
CURRENT STATE USER JOURNEY

Registrant must:

- interact with multiple government entities across different channels, providing identical information & supporting documents multiple times
- move the process along by advising one agency when another has completed their activities



POC CONCEPTUAL SOLUTION



OUTCOME – WHAT WAS ACHIEVED

1

INNOVATIVE TECHNOLOGIES LEVERAGED

- Developed both private and public instances of an Ethereum blockchain network successfully
- Simulated client's and government agents' user experience and interactions through a Salesforce-based portal
- Developed an access control framework to manage data access and encryption
- Interfaced with an internal government system (City of Toronto PPR Intake System) to prove blockchain interconnectivity with line of business systems

2

BLOCKCHAIN CAPABILITIES VALIDATED

- Validated use of blockchain for secured & permissioned data sharing among government entities
- Demonstrated auditable nature of blockchain records and its inherent tamper-proof nature
- Made use of smart contracts to establish trust among partners in the ecosystem
- Confirmed ability to connect blockchain to an API-enabled government system

3

KNOWLEDGE SHARED

- Increased knowledge & technical blockchain competencies with technology teams across participating government agencies
- Guided Ontario GSIC technology teams to setup an Ethereum test node in OPS environment and connect to the POC solution network
- In discovering current state data collection requirements and workflows between programs, generated opportunities for process optimization

4

IMPLEMENTATION CONSIDERATIONS IDENTIFIED

- Identified the need to assess & determine the optimal blockchain platform in order to scale the solution
- Analysis & resolution of legislative and policy impediments, including information privacy, customer consent, and record retention rules is needed
- A robust governance structure along with a Solution Owner accountable for stewarding the sustainment and operations models would need to be in place

LESSONS LEARNED



Technology

- Blockchain is not a replacement (but a supplement) for existing government systems & applications
- Ethereum can keep data tamper-proof and facilitate exchange of private client data through a private blockchain network
- Ethereum blockchain is not:
 - designed to store & manage large amounts of data
 - equipped with native access control functionality (so must be built on top)
- The blockchain technology can integrate as easily as other technologies into an existing API-enabled government system



Consortium

- A robust governance structure is required, including identifying an overall solution owner to address day-to-day operations
- The solution operating model (Private, Public, Hybrid) and its participant requirements needs to be defined
- There is significant potential value by extending the solution beyond government to providers like banks



Operations

- Production support & sustainment models will need to be reassessed and augmented to account for blockchain requirements
- The decentralized nature of blockchain enables a streamlined on-boarding process for varying types of participation and integration (data providers vs consumers)
- As blockchain technology is rapidly changing and evolving, the sustainment model must account for the need to keep up to date with the continuous technological developments

LESSONS LEARNED



Compliance

- Blockchain improves auditability because records are verified in near real-time
- Upon determination of the solution ecosystem, assessment of data sharing requirements will be required
- Reliance on these digital records may require changes and/or updated interpretations of legislation and policies
- The role of personal and corporate privacy and consent is foundational to the solution



Business impact

- Increase in overall speed of exchange of information between agencies and users reduces economic burden
- The real-time, automatic execution of logic in the blockchain solution can reduce costs
- The immutable nature of blockchain reduces the risk of fraud, and invalid transactions from occurring
- Configurable nature of a blockchain opens the potential of adding new capabilities to existing services and processes across the ecosystem in order to better serve the needs of the customers



Talent

- Many of the skills already in government can be supplemented with the skills necessary to support blockchain technologies
- The solution owner's technical resources will require specialized skills
- Specific training needs to be assessed for development of internal talent

CONSIDERATIONS: MOVING PAST THE POC



Business Impact

- Business case to articulate costs & benefits and secure funding for scaling and implementing a blockchain solution is needed
- Educating agencies and the business community on the value of registry, licences and permits powered by blockchain is essential for their solution adoption



Compliance

- Unique requirements for data ownership, access and privacy in a decentralized platform need to be explored
- Legal, policy, and legislative impediments that may prevent the solution from scaling and reaching its potential need to be identified and resolved



Talent

- Assessment of the talent and training needs is required to determine readiness of the agencies to adopt blockchain
- Assessing current organizational maturity of ecosystem participants (digital & technical readiness) will determine the solution roadmap

- A central body to govern the overall solution is required to define core guiding principles & facilitating decisions on data
- Overall operating model and ecosystem partner identification is required to define business and technical requirements
- Engaging with the restaurant industry will be required to create a client-centric approach to co-creating new government services



Consortium

- Assessment of technology platforms needs to be conducted to better understand the right solution as per business needs
- Impacts of blockchain solution from the perspective of cyber security, threat risks and privacy need assessment



Technology

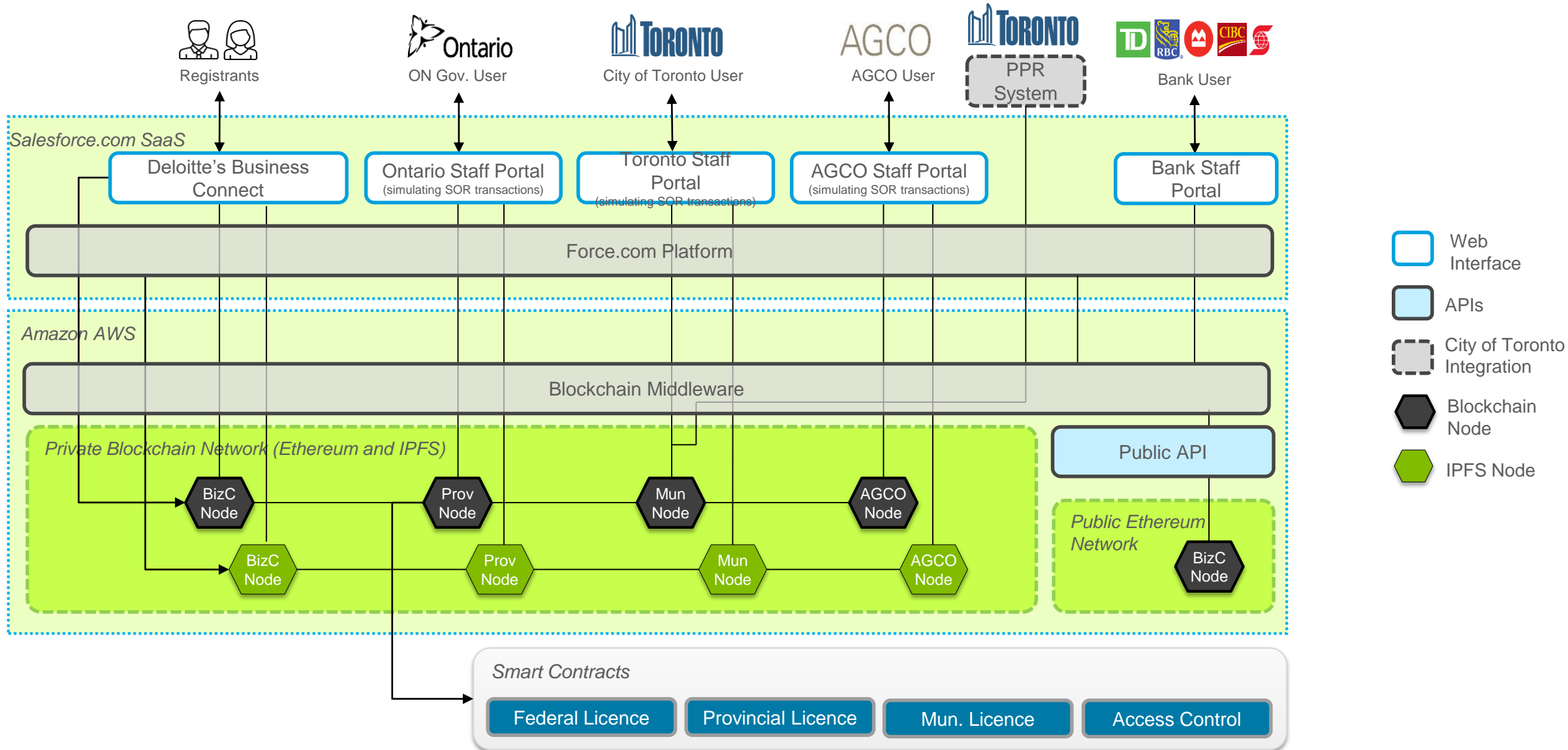
- An onboarding process and package needs to be defined to integrate new members in a seamless manner
- Production support and maintenance model for a decentralized solution like blockchain requires further investigation



Operations

APPENDIX

POC SOLUTION ARCHITECTURE



EXAMPLE DATA FLOW

