

# Question-led DLT System Design Framework

|  |  |   |  |   |
|--|--|---|--|---|
| <b>System Goal:</b><br>What is the stated purpose of the DLT system?<br>How does the stated purpose support social trust?<br>What problem(s) should this system solve?<br>What use cases is the system designed to support?<br><b>System Constraints:</b><br>What behaviors must the system be designed not to tolerate?<br>What is the system's space of permissible actions?<br><b>System Capabilities:</b><br>What capabilities must the system possess in order to achieve its goal within prescribed constraints?   |  |   |  |   |
|  | <b>Social Sub-System</b>   | <b>Informational Sub-System</b>   | <b>Technical Sub-System</b>  | <b>Governance Sub-System</b>  |
| <b>Environment:</b><br>Is the environment in which the DLT system operates relatively homogeneous or is it more heterogeneous?<br><br>What assumptions about the environment does the DLT system make in its design/operation?<br><br>What aspects of the environmental does the system rely upon? At what points and for what purposes are these relied upon?<br><br>How aligned with all aspects of the environment is the DLT system?<br><br>What elements from the environment influence or constrain designers of the DLT system?<br><br>What elements from the environment influence or constraint system actors or actants? | Who are the social actors in the DLT? How are they identified/represented? How are their identities regulated?<br><br>How does the DLT system empower or constrain their agency? What types of actions of social actors are forbidden, encouraged, or tolerated?<br><br>Where is power located among social actors?<br><br>What values are important to the social actors in this system?<br><br>What expectations do we have of the behaviour of the social actors?<br><br>What actions will or might they take? How are these actions expected to impact upon others?<br><br>When is the consent, permission, and authority of social actors needed, granted, or assumed?<br><br>Will some social actors act on behalf of others? On what (moral, legal?) ground do they implement the will of others? Which others?<br><br>How do social actors need to exercise or do they exercise discretion when conflict arises? | How does the ledger serve to support social trust in the context of the DLT system?<br><br>What data is captured/flows through the system to support the system goal? What records are generated to support the system goal, either on ledger or off ledger?<br><br>What data is captured/flows through the system to support the interaction of the actants?<br>What records are generated to support the interaction of the actants, either on ledger or off ledger?<br><br>How are the data/records actants in the system identified and how are their identities regulated?<br><br>What data and/or records must the system store? (What are the legal or regulatory obligations?)<br><br>What data and/or records must not be stored in the system? (For purposes of privacy, financial risk management, or corporate policy.)<br><br>Are there data and/or records that require special consideration? For example, are there data and/or records containing personally identifiable information that requires special treatment under law?<br><br>Are there data and/or records that must not be kept indefinitely?<br><br>Where are records stored?<br>How are they propagated across networks?<br>How are the intellectual components of the record assembled? | What are physical actants in the DLT system (e.g., sensors, vehicles)?<br><br>How are the technical actants in the system identified and how are their identities regulated?<br><br>How do the physical actants serve to support social trust in the context of the DLT system? What capabilities and properties do they require to support the system goal?<br><br>What is the system architecture?<br><br>What is the network architecture/topography?<br><br>What social actors control the physical actants in the DLT system? How does do these social actors empower or constrain the activity of physical actants?<br><br>What level of authority/authorization do the physical actants have? | How much reliance will there will be on internal or self-regulating governance versus external governance under normal operating conditions? Under abnormal operating conditions?<br><br>How will consensus decisions made among technical, information and social actants/actors?<br><br>What incentives are or will need to be put in place so that the consensus mechanism operates in a manner that supports the goal of the system?<br><br>How should decision management rights and decision control rights will be allocated among various interacting components (whether social, informational or technical)?<br><br>How will disagreement about those decisions will be resolved? |
| <b>Temporality:</b><br>What known future changes will the system have to be able to respond to?<br>What mechanisms need to be put in place to assure the longevity of the system?<br>Could future events bring about consequences where the platform ought to be completely replace or cease operation?<br>How will the governance sub-system address actors/actants' changing relationships to the system over time?<br>How will risk factors be addressed, including those that lie unknown in the future and that may present existential or systematic risk?<br>How has/does power shift among social actors over time?        |  |   |  |   |