Business Blockchain

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BLOCKCHAIN LEARNING MATRIX V1.1 Comparative View		DATABASE	BLOCKCHAIN			
		Allowed actions	Allowed actions		Permissionless	Permissioned
PARTICIPANT	Writer	Any entity which writes state to the database.	• This would correspond to a participant that is involved in the consensus protocol and helps growing the blockchain • Is able to accumulate transactions within a block and append this block to the blockchain • Related work might also denominate a writer as a validator	SINGULARITIES	• Any peer can join and leave the network as reader and writer at any time • There Is no central entity which manages the membership • The written content is readable by any peer • Cryptographic allow hides privacy relevant information	• Only authorize a limited set of readers and writers. • a central entity decides and attributes the right to individual peers to participate in the write or read operations • encapsulation and privacy, reader and writer could also run in separated parallel blockchains that are interconnected
	Reader	Any entity which read state to the database.	• As any entity which is not extending the blockchain, but participating in either the transaction creation process, simply reading and analysing or auditing the blockchain			
PROPERTIES	Public Verifiability	• In a centralized system, different observers may have entirely different views of the state • Not be able to verify that all state transitions were executed correctly. • Instead, observers need to trust the central entity to provide them with the correct state. • Not required for the functioning of the system.	• Any observer, can verify that the state of the ledger was changed according to the protocol- • All observers will eventually have the same view of the ledger, at least up to a certain length. • Distributed ledger can provide public verifiability of its overall state without leaking information about the state of each individual participant			
	Transparency	• Is limited to the actions, data provided to the third party. • Not required for the functioning of the system.	• Is limited to the design of blockchain and the participation of parties. • The amount of information that is transparent to an observer, can differ • The access to every piece of information is limited to their participation in the process			
	Tradeoff: A fully transparent system allows anyone to see any piece of information, i.e. no privacy is provided. Likewise, a fully private system provides no transparency.					

	Privacy	• Easier to achieve in a centralized system because transparency and public verifiability are not required for the functioning of the system.	• Different solutions according to each blockchain solution.
			• Privacy in a public system can be achieved using cryptographic techniques but typically comes at the cost of lower efficiency
			• Ej. Hyperedger Fabric use miniblockchains called channels that have real limitations
			  ○ When add more participants
			  ○ When need to demonstrate ownership of the asset in other channels
			• Ej. Corda R3, use a concept called states that use the stated of the blocks			

	Integrity	Integrity can be ensured if the centralized system is not compromised.	If a system provides public verifiability, anyone can verify the integrity of the data			
	Redundancy	Is generally achieved through replication on different physical servers and through backups	Is inherently provided through replication across the writers			
	Trust Anchor	Only achieved with a centralizing entity	depends on the type of blockchain: permissioned and permissionless			