Public Vs Private Blockchain

A Public Blockchain is a permissionless blockchain. Anyone can join the blockchain network, meaning that they can read, write, or participate with a public blockchain. Public blockchains are decentralized, no one has control over the network, and they are secure in that the data can not be changed once validated on the blockchain. Public blockchains like Bitcoin, Ethereum, or EOS for example, by design, increase and protect the user's anonymity. If one doesn´t know who a user is, there is no way of creating permissions, role-based access and controlling what data they can read or write. In public blockchains, there are economic incentive for good behavior as we don't know who a user is. It is relied on economics and game theory incentives to ensure that everybody in the system behaves honestly and according to the rules via a consensus algorithm, through which honest participants are economically rewarded.

A Private Blockchain is a permissioned blockchain. Permissioned networks place restrictions on who can participate in the network and in what transactions. Private blockchains like Corda, Hyperledger or Hashgraph want to control who can write data to their blockchain as well as control who can read data from their blockchain and in order to do that the first step is identity. They need to know who is part of the blockchain network. If they don't know who a user is, it becomes difficult, if not impossible, to define rules about what data they can commit to the ledger and what data they can consume from the ledger. Most of the time, private blockchains tend to come with identity management tools or a modular architecture where you can plug in your own identity management solution. All starts with understanding who a user is, because once that is understood, one can determine what role they're in, and what information should they and should they not have access to.

There is another important difference to distinguish, open versus closed blockchains.

The open versus closed brings in to consideration who's able to read that data.

A lot of people get the impression that they compete with one another, but they really don't. They just serve to provide different types of solutions.

Some of the benefits of public blockchains are:

- Open Read and Write
- Anyone can participate by submitting transactions to the blockchain
- Ledger Is Distributed
- The database is not centralized like in a client-server approach
- Immutable
- Secure Due to Mining (51% rule)

Some of the benefits of private blockchains are:

- Enterprise Permissioned
- Better Scalability
- Compliance Support
- Consensus More Efficient (less nodes)

To conclude, they serve different purposes and you will realize that a lot of real-world use cases one is going to find make use of both types of blockchain integrated seamlessly.