



## Use of Distributed Ledgers

We lose control of data when we share it. We have seen how valuable data is, but we do not have an effective way to protect it. And once it is out (and it is out if you use the web) you can be sure that often quite detailed data is spreading on servers around the world owned by companies you cannot name. It is hard to collaborate with data because there is no straightforward way to simultaneously share it and protect it. DataGuard has an innovative patented technology which is designed to close these gaps to fix these problems. This is blockchain technology using distributed ledgers.

When information is kept on a blockchain distributed ledger, there is not one organization that is keeping that register. Instead, there is a distributed network of computers, owned by many people and organizations, often all over the world. Each has a copy of the blockchain. All the computers on the network must agree that a transaction is legitimate before they write it to the distributed ledger. But why is it called a blockchain? Those transactions are all wrapped up in blocks, and they are permanently chained through cryptography to all the blocks before them. That is how we get the name blockchain. To tamper with a particular transaction, someone would need to take over most computers in the network and change not just that single transaction, but the entire history of the blockchain. So, once it is recorded, it is tamper proof. So, with this blockchain version of a ledger that is shared and decentralized, we do not have to go through anyone else to check what is true.

DataGuard makes it possible for each person, or organization, which is writing to the distributed ledger to have a unique identifier and then giving every piece of data that goes on the distributed ledger, a unique identifier which is called a cryptographic hash. Blockchains track these unique identifiers. So, we know if someone is trying to introduce a duplicate and anyone in the community can use the ledger, the blockchain can verify the authenticity of an asset that they obtain that has been tracked on a blockchain.

Today's supply chains are dispersed in diverse and global locations and that means it is easy for things to go wrong. Even small problems deep in the supply chain like incorrect material used by a supplier can become massive after that material has been molded, welded, and enrolled in the assembly line of the finished product. Blockchains can give us transparency and make it possible for us to see all kinds of data about a component as it moves through a tangled supply chain. They can help us verify the unique identity of each component or organization or person involved in a process. Then this identity and how it interacts with other identities can be tracked through the entire lifetime of a good. We can see the source and track every time it changes hands or crosses a border and blockchain can even help us track the conditions under which a product travels as it moves through a supply chain.