Blocks, hashes and immutability

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Transactions are grouped into blocks. Each block carries a cryptographic hash of the preceding block, which is a fixed-length fingerprint computed from the block's entire content. Change one character in an old block and every subsequent hash changes, which every participant will detect at once. That chaining is why the record is said to be immutable. The word deserves scepticism from a lawyer. The record is immutable only in the sense that altering it requires the agreement of enough participants to rewrite history from the altered point forward. On a large public network that agreement is practically unobtainable. On a small permissioned network run by five banks it is a matter of a conference call.

Practice note

When a client describes a ledger as "immutable", ask three questions before relying on the word. Who runs the nodes, how many are there, and what would it take for them to agree to rewrite a block? A Swiss ledger-based security must give the creditor "the power of disposal" and protect the register's integrity against unauthorised change under Art. 973d para. 2 CO. A permissioned ledger controlled by the issuer may fail that test if the issuer can unilaterally reverse entries. The question is one of fact and you should document the answer in the registration agreement.

The Swiss Federal Council, in its report of 14 December 2018 that launched the DLT legislation, described this quality as "integrity" and treated it as a property to be secured through technical and organisational measures. The report expressly refused to privilege any particular architecture.[1] Singapore's MAS has taken the same technology-neutral stance in every guidance document since 2017 and has never conditioned a licence on a ledger's degree of decentralisation.

Notes

1. Federal Council, Legal framework for distributed ledger technology and blockchain in Switzerland, report of 14 December 2018 (Federal Council media release of the same date, admin.ch msg-id 73398).

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