ATTORNEYS AT LAW

SCHELLENBERG WITTMER

MAY 2017

Newsletter

Authors:
Roland Mathys
Samuel Klaus

ICT / NEW TECHNOLOGIES

Blockchain - Myths, Facts and Legal Issues

Blockchain is the *buzzword* of the day. But the myths around blockchain do not always live up to the facts. This newsletter sheds some light on important terms and statements and identifies the related legal issues. Rather than on the technical details, we'll take a look at the open questions regarding implementation - and their legal consequences.

1 BLOCKCHAIN TECHNOLOGY

1.1 BLOCKCHAIN AS ENABLING TECHNOLOGY

"*The* blockchain" does not exist, just like "*the* car" does not exist. "Blockchain" stands for an enabling technology that can be used to implement a number of products. Just like there are delivery vans, sports cars, familiy vans or SUVs.

1.2 FUNCTIONALITY AND CHARACTERISTICS

Blockchain technology stands for a database, or rather a **register** (**ledger**), listing the holders of certain rights. This ledger may (but does not have to) be administered **decentrally** (**distributed**). The expert term is thus **Distributed Ledger Technology** ("**DLT**").

Blockchain applications are simple **registers of rightholders**. A comparable counterpart from the non-digital world would, for example, be the land register. In a blockchain register, the right holders are (usually) not registered by name, but anonymized (by use of cryptographic means). The corresponding cryptographic key (the so called *private key*) then serves as legitimizing evidence. Changes in the register (e.g. when rights are transferred) can thus only be initiated by the holder of the private key – similar to changes in the land register which can only be initiated by the property owner upon presentation of his identity card. In the register (i.e. in the blockchain), the whole change log (i.e. the transaction history) is being recorded and can at all times be evidenced (just as in the land register, where all prior transactions can also be looked up).

The advantage of a blockchain based register is its character as an **efficient and cost-effective transaction instrument**. In the traditional land register it can take a

couple of days until a transaction is recorded, whereas changes in a blockchain register can take place in seconds. It is of little relevance what kind of rights are being managed by use of a blockchain (cf. section 1.3). It is only relevant that the **transactions are more efficient** compared to the traditional registers – just like every content of a letter can also be sent by email, only faster and cheaper.

> "Blockchain-/DLT-applications are highly efficient and cost-effective transaction instruments."

Since the whole transaction process takes places electronically, blockchain registers do not necessarily have to be under central management (by a controlling body) anymore. Rather, they can be managed **decentrally** (so called **distributed ledger**). In such case, a number of identical copies of the register (i.e. of the blockchain) are being stored simultaneously on a multitude of computers on which the corresponding application software is running (so called ***nodes***). A special mechanism implemented in the application software is used to synchronize the nodes. This mechanism ensures that after every change in the register all nodes are updated to reflect the most recent version of the blockchain (just like a backup-solution that always creates a number of backups 'in the cloud').

1.3 SCOPE OF APPLICATION

DLT applications can be implemented **in all fields where transactions of rights of any nature need to be carried out fast, cost efficiently and with reliable evidence**. This includes digital versions of already existing 'paper registers' (e.g. such as a blockchain version of the land register or of a share register) as well as new registers which could not be implemented up to now because it would have been either too costly or too complex. For example, such could include a register of paintings, diamonds or spare parts, in order to provide a record of the chain of title to prevent looted art, blood diamonds or counterfeit products. The majority of today's blockchain applications, however, is made up of **crypto currencies** (such as, for example, Bitcoin).

2 MYTHS AND FACTS

Blockchain and DLT based applications in general are often advertised with claims that blockchains are **safe**, that the entries registered in a blockchain **cannot be changed** and that the use of a blockchain application **does not require trust in a central entity**, because such applications are **fully decentralized**. However, when looked at closely, these myths do not quite live up to the facts.

2.1 SAFE?

In general, the **cryptographic processes** implemented in a DLT based application are **safe** (if implemented correctly). But this only covers the DLT as the enabling technology on which the actual application is based. **Just because an application is based on a blockchain does not make the application safe**. To use the car example again: Just because the technology of the combustion engine can today be considered "safe" does not mean that each and every car with a combustion engine is automatically "a safe car".

2.2 UNCHANGEABLE?

The claim that **blockchains are unchangeable** does also not quite reflect the facts, at least not in such generality. The integrity of a blockchain is based on multiple factors and, depending on how the DLT technology is implemented, **(subsequent) changes** are possible.

One doorway offering far-reaching possibilities for manipulation is the **application software** running on the nodes for the administration of a decentralized DLT application. This was impressively demonstrated in the summer of 2016, when the application software for the DLT based investment vehicle 'The DAO' was altered in order to reverse certain transactions (of a value of USD 50 Mio. at the time) against the will of the beneficiary of the transactions (Keyword: *Ethereum Hard Fork*).

But there can also be other ways to manipulate the blockchain, depending on the **mechanism used to synchronize the different *nodes***. If, for example, the nodes' computing power is a relevant factor of such synchronizing mechanism (as is the case with some crypto currencies), then this can open up the blockchain to manipulation as well, as has been brought to the attention of users of the Bitcoin blockchain in 2014 (Keyword: *GHash.io 51% attack*).

2.3 NO TRUST REQUIRED?

The DLT has been developed, *inter alia*, in order to establish a transfer system that is not under control of a central entity (such as e.g. a bank as central payment processor regarding currency transactions) and would thus **not require trust in such a central entity**. However, **DLT applications still pre-suppose a fair amount of trust - just in other entities**: While traditional systems require trust in the central processor, trust in the developers of the application's software is necessary for DLT applications (for example regarding intentional changes (see section 2.2 [*Ethereum*]), erroneous implementation, faulty code, etc.). Furthermore, a decentrally administered DLT system requires trust in the (in most cases anonymous) operators of the nodes, since coordinated measures by a majority of them can lead to manipulations of a blockchain (see section 2.2 [*GHash.io*]).

2.4 DECENTRAL?

In theory, fully **decentral DLT applications** are possible (such as for example Bitcoin). But even such DLT applications can be **subject to centralizing tendencies** (in the sense of central influence/control) through influence over the application software or through market driven concentration effects, for example when different nodes cooperate in so called *mining pools*, in order to benefit from economies of scale by combining their computing power (regarding the consequences thereof see section 2.2 [*GHash.io*]).

But centralizing tendencies are not necessarily a bad thing! **Control by a central entity** may rather help to build trust in such central authority and thereby **trust in the transaction system as a whole** (see section 2.3), provided that an appropriate legal framework has been put in place (see section 3.2). A central controlling entity also enables DLT applications in industries where **regulatory requirements** would not allow for fully decentralized and uncontrolled systems (such as e.g. the banking industry, securities trading, etc.).

3 CONSEQUENCES AND LEGAL ISSUES

What are the consequences of these considerations and what legal issues have to be addressed?

3.1 IMPLEMENTATION IS CRUCIAL

DLT is an enabling technology - and not a specific product. The features, characteristics and qualities of a blockchain based product are a direct result of its implementation. **The determining factor is always the technical and legal implementation**.

> "DLT is not the sole success factor – it is the technical and legal implementation that is crucial."

The relevance of the **technical implementation** can be illustrated with the success of electric cars: Automobiles with electric engines have been around for a long time - but they only started becoming popular once they were designed for technical excellence and appeal to the mass markets. There are many blockchain based applications around already, but **DLT as such will not suffice to make any of them a success – their actual implementation is the crucial factor**.

Even though DLT applications function electronically, in the 'virtual' realm so to speak, they never operate fully detached from the real economy. At least not if they shall be used for economically interesting applications, because then they require **interfaces to the real economy**, and at this point the **legal design and setup of a DLT application becomes relevant**. It is the legal framework, design and setup determining the trust in the system and how the system can handle errors (e.g. in the implementation), problems (e.g. regarding technical processes) and controversies (e.g. in case of disputes, for example regarding the permissibility of certain actions, see section 2.2 [*Ethereum*]).

3.2 LEGAL ISSUES

Regarding the legal design and setup, the following issues in particular raise questions from a contract law perspective (regarding the regulatory aspects see the April 2017 newsletter):

Of utmost importance is the clarification of legal relationships, i.e. the question **who, in the context of a DLT application, contracts with whom** (and thus undertakes which **obligations** and incurs what **liabilities**). Depending on the nature and setup of a DLT application it can be the users that are directly contracting with other users or – e.g. in the case of a DLT application with a controlling entity (see section 2.4) – rather with the system operator or the controlling entity. Clarification is essential, also regarding the so called ***Smart Contracts***: This term is used to refer to conditioned transaction instructions with automated execution mechanisms in the context of a DLT application. The denomination as *Smart 'Contract'* is misleading, because these are **not contracts in a legal sense**, but rather mechanisms for the automated execution of predetermined transaction instructions. Once put in place, they offer – depending on their implementation – little to no possibilities to change or influence them later, which can lead to unforeseen (and unintended) results. ***Smart Contracts* will thus not reduce, but rather require more, legal provisions**.

One possibility to address the pertinent legal issues, in particular regarding DLT applications with a central controlling entity, could be conditions for the use of the respective DLT system – "**Blockchain Terms of Use**", so to speak. Depending on the implementation and design of the DLT application in question (purpose, rights administered, anonymity, coordination and synchronization mechanism, etc.), such terms of use will have to address a variety of different aspects.

If a DLT application is not operated by a central entity, but rather by a **self-organizing system**, then the coordination is usually taken care of through coordination and decision making processes implemented in the DLT application, e.g. by use of voting rights of the participants. In such case, not only contractual issues have to be addressed, but **corporation law aspects** as well, in particular when users, operators of the nodes or 'members' of the 'corporation' are subject to different jurisdictions.

Even if the DLT principles might in theory be implemented flawlessly, in real life applications there will always be errors, ambiguity and conflicts. So, a fair amount of attention should be paid to **claims enforcement** and **dispute resolution** related to DLT applications. One of our next newsletters will focus on this topic.

4 CONCLUSION

Some of the much heard statements on blockchain do belong to the realm of 'myths and marketing'. Nevertheless, the facts are clear: **DLT is a promising enabling technology for efficient communication and transaction processing**. Its implementation will further the digitalization in many areas that have remained relatively unaffected far.

However, the terminology is heavily saturated by technical "infallibility beliefs", thus leading to wrong expectations and losing sight of actual problems. A successful implementation of DLT applications therefore not only requires its technically correct implementation, but also the **setup of appropriate legal provisions** addressing the pertinent questions that blockchain based systems and products raise.

> "Implementation of blockchain / DLT applications does not just require a technically correct design, but an appropriate legal setup as well."

Contacts

The content of this Newsletter does not constitute legal or tax advice and may not be relied upon as such. Should you seek advice with regard to your specific circumstances, please contact your Schellenberg Wittmer liaison or any of the following persons:

In Zurich:

Roland Mathys
Partner
roland.mathys@swlegal.ch

Samuel Klaus
Associate
samuel.klaus@swlegal.ch

In Geneva:

Olivier Hari
Of Counsel
olivier.hari@swlegal.ch

Louis Burrus
Partner
louis.burrus@swlegal.ch

SCHELLENBERG WITTMER LTD / Attorneys at Law

ZURICH / Löwenstrasse 19 / P. O. Box 2201 / 8021 Zurich / Switzerland / T +41 44 215 5252
GENEVA / 15bis, rue des Alpes / P. O. Box 2088 / 1211 Geneva 1 / Switzerland / T +41 22 707 8000
SINGAPORE / Schellenberg Wittmer Pte Ltd / 6 Battery Road, #37-02 / Singapore 049909 / www.swlegal.sg

www.swlegal.ch

This Newsletter is available on our website www.swlegal.ch in English, German and French.