



DIGITALISATION IN LEGAL PRACTICE



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We live in a time where digitalization is a decisive driver for innovation, competitiveness and resource optimisation. In this context, many reports talk about the Distributed Ledger Technology (DLT) and blockchain technology – both opening new development potential for so-called Smart Contracts.

Smart Contracts, with the help of a suitable software, can enable an automatic contract fulfilment process. Moreover, the jurisprudence in Switzerland is also looking into the potential anchoring of Smart Contracts into Swiss private law, since the legal framework of the general contract law through the use of software algorithms is extended.¹

The present article gives an overview introduction to the topic and addresses the contract law aspects to briefly indicate whether a regulatory need for action on the part of the national legislator does exist.

Definition of Smart Contracts

The basic idea of Smart Contracts is basically not a modern phenomenon. Nick Szabo, an American lawyer, computer scientist and cryptographer, published already in the year 1994 a report about contracts, where a software transaction log could independently implement the predefined contract terms. He illustrated his terminology by using the example of a vending machine, that automatically casts a product when a coin is inserted. On the other hand and in a more complex way, a smart contract can autonomously verify the contractual terms, ensure their fulfilment and guarantee the enforcement of the contract.²

In the international context, there is currently no uniform definition of the Smart Contract.³ In the national context, Switzerland's Federal Council defines the Smart Contract as "a computer protocol, usually based on a decentralized block chain system, that allows the automated fulfilment of the contract between two or more Parties with prior coded information".⁴ The key function of Smart Contracts is therefore twofold: the record of party agreements on a block chain and the automatic execution of the necessary operations as soon as certain pre-fixed conditions are fulfilled. Due to the existing block chain, the content of the Smart Contract can basically no longer be modified. Another decisive function is the independent enforcement of the contract. The immutability on the one hand and the independent enforcement of the contract on the other hand, complement the traditional forms of contract and enable the possibility of entering markets where it has so far been virtually impossible to conclude contracts in any form due to a lack of trust or distance.

Smart Contract with Escrow functions as application example

The main function of an Escrow Agreement is to safeguard a creditor's claim and to enforce the main business. By combining the main function of an Escrow Agreement with the key function of Smart Contracts, different possibilities of use arise.

A Smart Contract can on the one hand be used as a substitute for an escrow agent or, on the other hand, serve as an instrument for the execution of an escrow transaction.⁵

In the first case, the contracting parties use a Smart Contract for the **tying of assets**, without a natural or legal person as a third party. The contracting parties define the payment triggering event into a block chain by using a corresponding software. The Smart Contract then autonomously processes the determinable data on the block chain and executes corresponding transactions.

In the second case, the Smart Contract needs information outside the block chain to trigger the defined transaction. Such Smart Contracts are used for those cases where transaction-triggering events depend from the discretion of a third party or information of technical components, such as – for example – sensors.

Legal challenges

Smart Contracts will never completely displace and replace the classic contracts or contract law as a whole.⁶ They serve more as a supplement or simplification of complex transactions. However, the use of Smart Contracts is also linked to risks. The immutability and autonomous contract enforcement requires an previous error-free programming of

the Smart Contracts. With the increasing complexity of the intended contents of the contract, this is difficult to achieve since the complex transactions require a larger amount of program code and faulty elements will creep in.⁷

This raises the question of whether and which default rights apply, if a programming error occurs.

Therefore, a distinction must be made between autonomous Smart Contracts that replace a third party and Smart Contracts that are used as an instrument for transaction settlement. The non-autonomous Smart Contracts are always dependent of information outside of the block chain.

In the case of the autonomous Smart Contract there is only the possibility of an inadequate performance because of programming errors. A programming error leads to an undesired act of the Smart Contract and thus to a difference between the result and actually intended fulfilment of performance. The question now is, who bears the risk for a programming error. One solution would be that the party with more experience with Smart Contracts or who offered them for the corresponding contractual relationship bears the risk solely.⁸

If a Smart Contract with Escrow function makes a payment - even though the actual desired contract term had been another -, the party would bear the risk, which suggested the contractual relationship based on the Smart Contract. However, it could be objected that the other party has given its consent to the use of the Smart Contract and it would be disproportionate to shift the risk to only one contracting party. In order to make the risk bearing resulting from programming errors more proportionate, a written agreement between the parties is recommended.

Furthermore, it is conceivable that autonomous Smart Contracts may not be able to perform, for example, if, from the outset, reference is made to digital data that does not exist or that is not available. But also, if data is subsequently lost due to a technical malfunction and the block chain is no longer functional. Even in such cases, the parties should jointly assume the risk, as

both parties cannot interfere in the actions of the Smart Contract as an autonomous construct.

Delay problems, in contrast, are largely excluded, because an autonomous Smart Contract guarantees precisely the automated fulfilment of the contract.

As soon as the Smart Contract – used as an instrument for the settlement of a business - all sorts of performance problems reappear. Be it because the third party has misinterpreted the situation and forwarded incorrect information, or because a sensor is malfunctioning. In such cases, it is recommended to proceed according to the default rights of the Swiss Code of Obligations, because the source of the interference is outside the block chain.

Conclusion

Especially with regard to Smart Contracts programming errors, the existing default rights under the Swiss Code of Obligations are at their limits. In particular, if the Smart Contract only holds digital data and should function independently of actions or transactions from the physical world, tailored solution modalities would be advantageous. In our view, a legal adaptation is needed to integrate the Smart Contract into the existing legal system. In the meantime, the parties are recommended to conclude an additional written agreement on risk bearing in case of programming errors.

6 FLORIAN MÖSLEIN, Smart Contracts im Zivil- und Handelsrecht, in: ZHR 183 (2019), S. 254 ff.

7 ROLF H. WEBER, Smart Contracts: Vertrag- und verfügungsrechtlicher Regelungsbedarf, in: sic! 2018, S. 291 ff.

8 MÜLLER / SEILER, Smart Contracts aus Sicht des Vertragsrechts, in: AJP 2019, S. 317 ff.

1 See CHRISTOPH MÜLLER, Die Smart Contracts aus Sicht des Schweizerischen Obligationenrechts, in: ZBJV 155/2019, S. 330 ff.; ANDREAS FURRER, Die Einbettung von Smart Contracts in das schweizerische Privatrecht, in: Anwaltsrevue 2018 S. 103 ff.; MEYER / SCHUPPLI, «Smart Contracts» und deren Einordnung in das schweizerische Privatrecht, in: Recht 2017, S. 204 ff.

2 NICK SZABO, Formalizing and Securing Relationships on Public Networks, 1997.

3 Vgl. FRANCESCO A. SCHURR, Anbahnung, Abschluss und Durchführung von Smart Contracts im Rechtsvergleich, in: ZVGIRWiss 2019, S. 257ff.

4 Bericht des Bundesrates vom 14.12.2018, Rechtliche Grundlagen für Distributed Ledger-Technologie und Blockchain in der Schweiz.

5 Vgl. GLARNER / MEYER, Smart Contracts in Escrow-Verhältnissen, in: Jusletter vom 4. 12. 2017.