

```
procedure FormCreate(Sender: TObject);
procedure TreeViewChange(Sender: TObject; Node: TTreeNode);
procedure EditChange(Sender: TObject);
procedure TreeViewChanging(Sender: TObject; Node: TTreeNode;
  var AllowClose: Boolean);
procedure TreeViewQuery(Sender: TObject; var CanClose: Boolean);
procedure TreeViewMouseDown(Sender: TObject; var Key: Word;
  Shift: TShiftState);
procedure TreeViewMouseUp(Sender: TObject; Button: TMouseButton;
  Shift: TShiftState; X: Integer);
procedure TreeViewSelected(Sender: TObject; Node: TTreeNode;
  var S: String);
procedure TreeViewDragOver(Sender, Source: TObject; X, Y: Integer;
  State: TDragState; var Accept: Boolean);
procedure FormResize(Sender: TObject);
procedure FormKeyDown(Sender: TObject; var Key: Word;
  Shift: TShiftState);
procedure TreeViewKeyPress(Sender: TObject; var Key: Char);
procedure FormClose(Sender: TObject; var Action: TAction);
procedure FormActivate(Sender: TObject);
procedure FormD23Click(Sender: TObject);
procedure FormPropClick(Sender: TObject);
procedure FormClick(Sender: TObject);

procedure GetWorkFormMessage(var Message: TMessage); message MWWorkFormMakeUP;
procedure GetActiveFormMessage(var Message: TMessage); message MWWorkFormACTIVATEAPP;
procedure GetMYNOTIFYMessage(var Message: TMessage); message MWWorkFormNOTIFY;

procedure mipExitClick(Sender: TObject);
procedure mipRestoreClick(Sender: TObject);
procedure StatusBarDrawPanel(StatusBar: TStatusBar;
  Panel: TStatusPanel; const Rect: TRect);
procedure TreeViewDragDrop(Sender, Source: TObject; X, Y: Integer);
procedure TreeViewEndDrag(Sender Target: TObject; X, Y: Integer);
```

## Blockchain technology and its potential in taxes

December 2017

# Table of Contents

<b>Introduction</b>	<b>5</b>
<b>Understanding the world of Blockchain</b>	<b>6</b>
How does Blockchain work?	7
Key characteristics of Blockchain	7
Blockchain step-by-step	8
How is consensus reached?	9
What are smart contracts?	10
<b>Blockchain implications for tax</b>	<b>11</b>
General overview: The government's perspective	11
Payroll tax	11
Transfer Pricing	11
VAT	12
Missing Trader Fraud	14
VATCoin	17
<b>Summary</b>	<b>18</b>
<b>Contacts</b>	<b>19</b>

# Introduction

The digital roadmap is constantly evolving, as IT technology embeds itself in both business and everyday life. The invention of the Internet has redefined the way we communicate on all levels, making everything easier, faster and less costly. The same goes for telephones. Twenty, thirty years ago when someone was out of the office or not at home, they were absent, because telephones were tied to a place. Now, our mobile is not just a device for making calls or messaging, but holds a variety of other possibilities and accompanies us wherever we go. The invention of disruptive technologies works in a very similar way, pinpointing weaknesses and changing old and well-worn business models most companies and national authorities have grown accustomed to. However, it is also true that not everyone presents an enthusiastic approach to the path new technology has taken. In Buzz Aldrin's opinion, the focus of our time has shifted from sending man on Mars to providing services (and he was not positive on these) such as Facebook or Instagram. On the other hand, we can quote Dean Kamen: "Every once in a while, a new technology, an old problem, and a big idea turn into an innovation."<sup>1</sup>

In November 2008, the Internet quietly welcomed a mysterious white paper, written by a person or persons under the pseudonym Satoshi Nakamoto. The publication described a new, digital currency based on the idea of cryptographically chaining blocks of data, designed to rely solely on computer technology, detached from any intermediaries. That was the dawn of Bitcoin. For years, Bitcoin grew in popularity and value, but the underlying technology, Blockchain, remained largely unnoticed or associated strictly with Bitcoin. Today, Blockchain has evolved from being a quiet presence behind Bitcoin to a technology that could potentially revolutionize the way we conduct payments, store data and perform transactions.

The digital age is also molding taxes into an entirely different shape, by not only changing the relationship between taxpayers and tax authorities, but also altering the way we pay taxes or submit and store information. The potential of digitizing taxes has been noticed by many countries, and new solutions arise, such as SAF-T in Europe or real-time electronic invoicing in South America, such as Brazil. Propelled by a desire for greater efficiency and better compliance, tax authorities seek to gather and analyze information digitally, providing a better environment for creating foolproof solutions and software. On the other hand, taxpayers also expect that the process of taxpaying will become easier and less time-consuming. Blockchain is without doubt one of the most promising technologies because of its ability to deliver reliable real-time information from many layers to a large audience, as is the case with taxation, especially on an international level. At the World Economic Forum in Davos in 2016, 816 observers and technology specialists were asked when Governments would begin to collect taxes using Blockchain, showing that on average the expectation is that it will happen in 2023 or 2025.<sup>2</sup>

<sup>1</sup> Dean L. Kamen is an American engineer, inventor, and businessperson. He is best known for his invention of the Segway.

<sup>2</sup> <https://www.coindesk.com/world-economic-forum-governments-blockchain/>

# Understanding the world of Blockchain

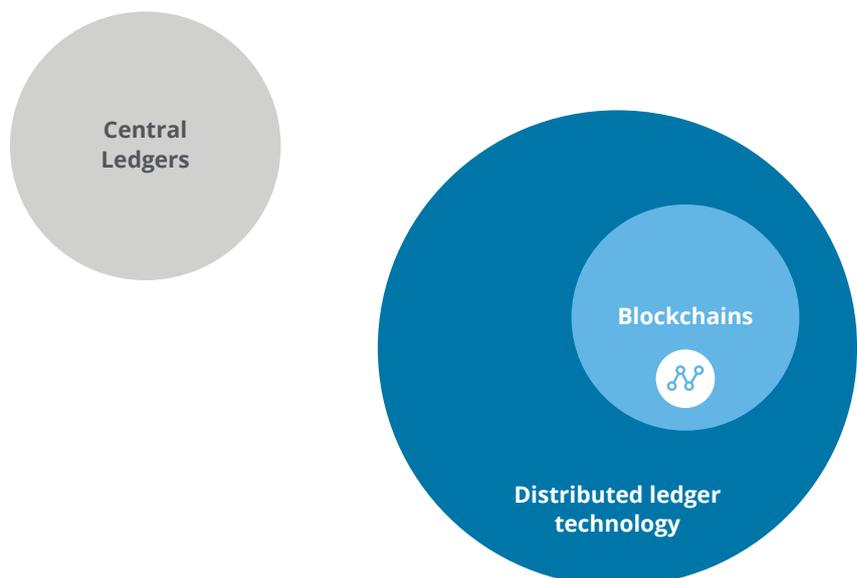
“The practical consequence [...] for the first time, a way for one Internet user to transfer a unique piece of digital property to another Internet user, such that the transfer is guaranteed to be safe and secure, everyone knows that the transfer has taken place, and nobody can challenge the legitimacy of the transfer. The consequences of this breakthrough are hard to overstate.”<sup>3</sup>

- Marc Andreessen

At first, Blockchain was mentioned (if it was even mentioned) in the same breath as Bitcoin. Possibly the biggest question is, where does Bitcoin end and Blockchain begin (or rather where does Blockchain end and Bitcoin begin)? Perhaps the simplest statement would be that Bitcoin would not exist without Blockchain, but Blockchain without Bitcoin still has a wide range of uses, outreaching cryptocurrencies. Whereas Bitcoin is a cryptocurrency like (but not alike) Ethereum or Ripple, Blockchain is the underlying technology whose main underlying goal is very similar to an operating system installed on any computer. The basic term for understanding how a Blockchain works is grasping the definition of what **P2P**, or **Peer-to-Peer** networks are. **P2P** refers to computer networks that use dispersed and distributed architecture, meaning that all computers and devices have a certain share in the network. Each device (referred to as a peer) is equal to other peers, and no central administrator of the network exists. In general, this means that every resource and data available in a P2P network is shared between peers, skipping the need for a central server. The main goal of this network is to enable for the computers and devices within to work collaboratively. Peer-to-Peer networks are most commonly used for sharing various files on the internet,

allowing the peers in the network to receive and send files simultaneously. Therefore, what is the essential difference between a P2P and a classic server? If you open a website and download a file, for example a tax return form, the website acts as a gateway to a remote server and your computer as a client receiving it. The whole process works like a one way street where information travels from only one point to another. In the case of a P2P network, the file is downloaded from pieces that come from other peers in the network, already possessing the file. Simultaneously, it is also sent from your computer to other peers that request it.

Yet another problem is understanding what is **distributed ledger technology (DLT)**. A distributed ledger is a record of information, or a database that is spread across a network. Access to a distributed ledger can be unrestricted, meaning that anyone can access the information stored on it, or limited to a group of users. Blockchain is just one type of distributed ledger.



<sup>3</sup> Marc Andreessen is an American entrepreneur and software engineer and co-author of the website browser Mosaic, and sits on the board of directors of Facebook, eBay and Hewlett Packard.

### How does Blockchain work?

In general terms, a Blockchain is a ledger of information that is replicated across computers that are joined in a **Peer-to-Peer** network. As mentioned before, Blockchain is not Bitcoin, so the information stored is not necessarily money or currency, but may also be a variety of other data types as well. The communication inside the network uses cryptography to provide secure identification of who sends the information and who receives it. When a peer wants to add a piece of data to the ledger, other peers must confirm the correctness of the information, which in turn is added to a block. Each block contains a unique hash (acting as a digital fingerprint) of the previous block, linking them together to create a chain of blocks. The technology eliminates the need of centralization through an intermediary, allowing parties to share information and transact directly with each other in a secure manner. Moreover, using Blockchain technology allows for complete immutability of the ledger, as altering the information stored on a block is not possible without altering its hash. However, this definition is quite shallow and leaves the reader with more questions than answers. Perhaps the best way to see how the technology works is to see it in motion.

### Key characteristics of Blockchain

#### a. Based on consensus

Information can be added onto a Blockchain only if all, or a defined number of participants in the network agree on the correctness of information.

#### b. Sealed with cryptography

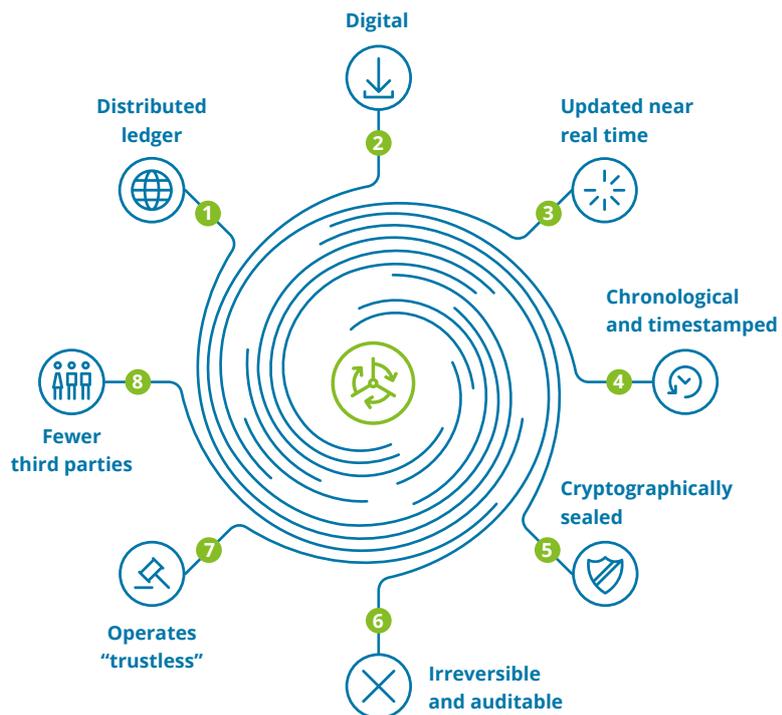
The created Blocks are cryptographically locked into the chain, meaning that the Blockchain record is immutable – it is impossible to delete or alter the information stored in the block. Furthermore, Blockchain eliminates the single point of failure: If a part of the network fails, Blockchain continues to function.

#### c. Chronological and time-stamped

Blockchain is a chain of blocks, each one storing data on a wide range of information. Each one is linked to the previous block, forming a chronological chain of the data uploaded onto the Blockchain.

#### d. Digital

Every information stored on Blockchains is digital, eliminating the need for paper documentation



# Blockchain step-by-step

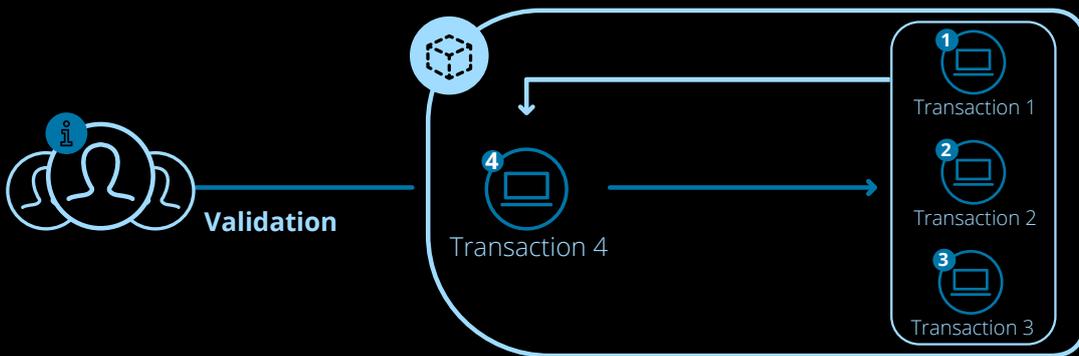
## 1. The transaction is carried out



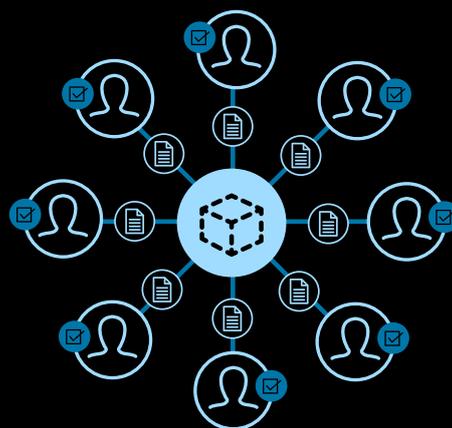
## 2. All members of the Blockchain are informed



## 3. Community members check all information on the operation



## 4. The network of users confirms each new block



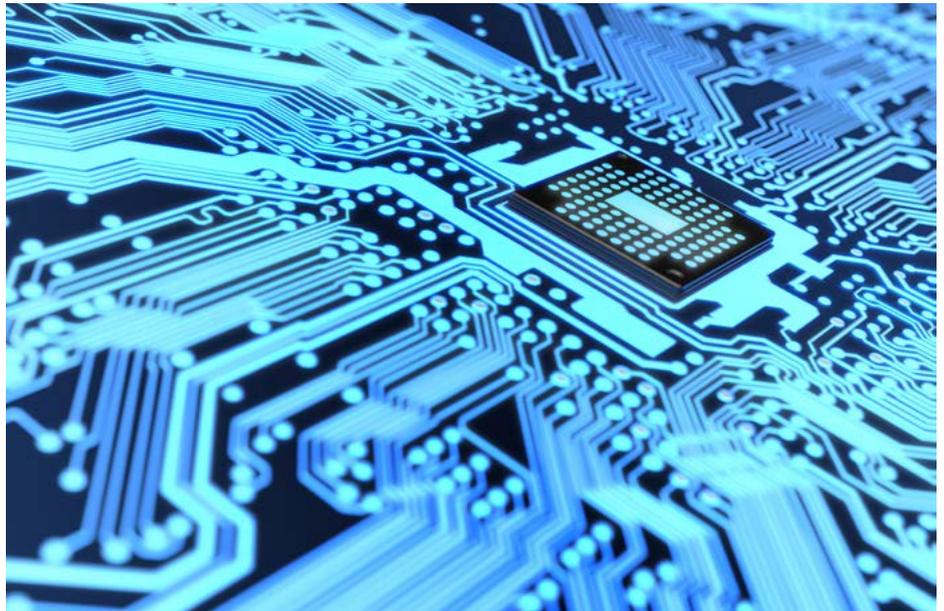
## 5. The block is added to the chain

Each block has its own unique „signature“, called a hash, which is a string of numbers and letters that act as a “digital fingerprint” of the block.



### How is consensus reached?

The crucial part of the Blockchain mechanism is reaching consensus among the users to add information to the block. This technology breaks down the paradigm of centralized consensus, where a centralized system is used to rule on validity. For many, Blockchain is viewed as a technology governed by a set of rules. This is only a part of the picture, as Blockchain can also be modified to fit different businesses and industries. This is visible when we talk about reaching consensus on the Blockchain. A consensus mechanism ensures that the added block contains truthful information. The most popular consensus method on the Blockchain is PoW (Proof of Work), used by Bitcoin. In **PoW**, miners (members of the Bitcoin network) compete to add the next block of information (a list of transactions) by solving a cryptographic puzzle. The first miner to solve it wins and receives 12.5 new bitcoins plus a transaction fee.<sup>4</sup> However, the PoW has several serious flaws that prevent it from being used in a business Blockchain. It requires large amounts of energy (consuming a lot of electricity) and computational power. Thus, transaction confirmation is a long process, taking up to 60 minutes to confirm. For these reasons, PoW is not considered an efficient solution in a business environment. Another consensus solution is referred to as Proof of Stake (PoS).



This works similarly to a joint-stock company, where each shareholder holds a certain stake (a number of shares in the company). In this method, every participant places a bet on its block. The participants that hold the correct block (containing no fraudulent transactions) get their block added to the chain and get rewarded, but the participants whose block turns out to be fraudulent get punished and the amount of bet that they had put get reduced from their balance. The shareholders with a bigger share in the network have a higher chance of being selected.

This is a two way street: on one hand there is risk related to the scope of share a participant possesses in the network, but on the other they have a higher interest in securing the stability of the network. Contrary to PoW, PoS does not require as much computational power and energy and therefore is more effective for Blockchain that is not cryptocurrency-related. However, it is worth noting that these are not the only consensus algorithms available. As Blockchain technology is still new and undeveloped, the process of creating new algorithms, suitable for many types of Blockchains, is an ongoing process.

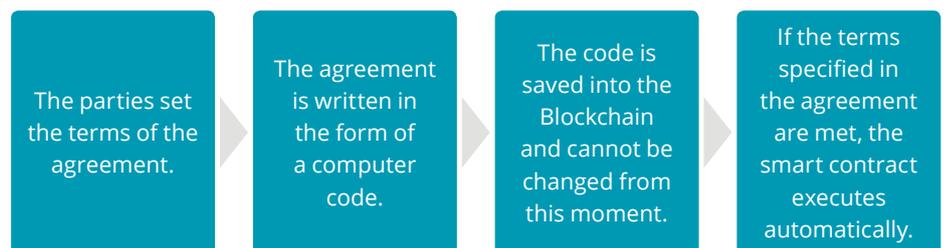
<sup>4</sup> <https://www.coindesk.com/short-guide-blockchain-consensus-protocols/>

### What are smart contracts?

When we hear the word “contract” all types of different ideas come to mind—from employment contracts to the sale of property. Perhaps the best way to imagine what exactly is a smart contract is by using the vending machine example. If we try to imagine buying a soda, the transaction is simply based on the agreement that by putting some change in the machine and pressing a button, we get what we agreed to: a soda, at a defined price. The manner in which our agreement is carried out is fully automated<sup>5</sup>. Of course, this is a simple example of an agreement, but smart contracts operate in a very similar fashion.

Nick Shabo created the term “smart contract” in 1994. Smart contracts (also referred to as digital or Blockchain contracts) are basically agreements in the form of computer programs when the terms&conditions of an agreement can be programmed, designed to self-execute themselves. The main goal of a smart contract is to remove the need for an intermediary and to enable anonymous parties to conduct business over the internet.

### How does a smart contract work?



### Smart Contracts vs. Traditional Contracts

#### Traditional Contracts

- a) Vast amount of printed documents,
- b) Heavily rely on third parties for putting it in motion and enforcement (i.e. banks or national authorities),
- c) In case of lack of enforcement, the need to turn to the judicial system.

#### Smart Contracts

- a) Entirely digital,
- b) Self-executing,
- c) The code itself defines obligations of the Parties.

<sup>5</sup> <https://medium.freecodecamp.org/smart-contracts-for-dummies-a1ba1e0b9575>

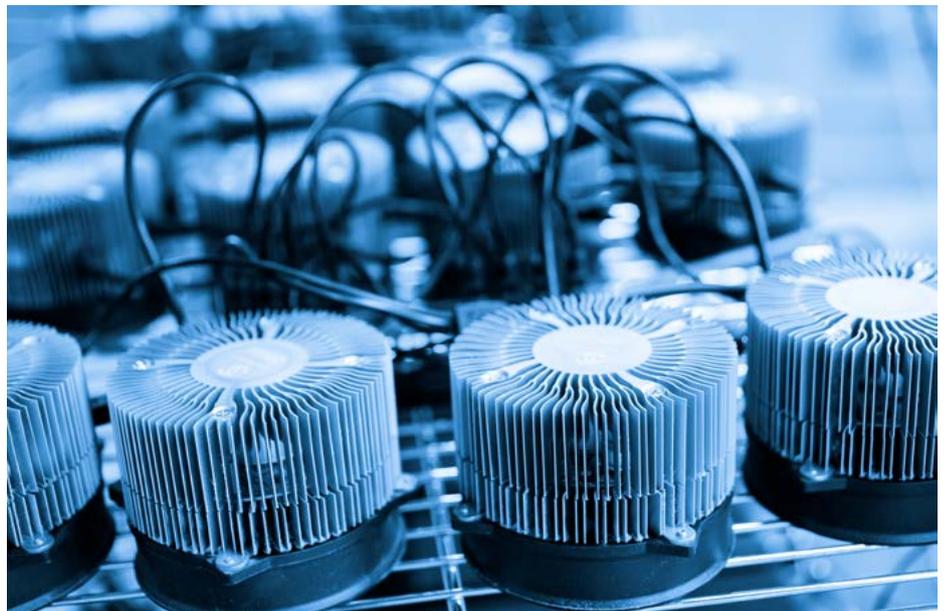
# Blockchain implications for tax

## General overview: The government's perspective

Blockchain has the power to disrupt and strongly reorganize accounting and the way tax payments are processed. As the technology is still in its infancy, introducing Blockchain to the tax authorities would require a revolution in both governmental databases and network systems. The effective implementation of Blockchain for taxes is not only limited to this area and requires considering every area of governmental activity. Besides from integrating IT systems on many levels, it is clear that implementing Blockchain would also require far-reaching changes to the legal system, reforming laws on databases, intellectual property and legal identity. However, the benefits of Blockchain technology on a governmental level are hard to overlook. In the long run, Blockchain can be a driving factor in implementing real-time, automated tax processes for both small and large enterprises.

## Payroll tax

In the majority of developed countries, matters related to payroll are mostly digitalized. However, the systems for payroll taxes have a significant flaw: there are many government institutions involved and each one holds their own register, *de facto* duplicating data held by other institutions. Implementing a Blockchain - based to a situation where employers will not need to act as intermediaries, responsible for calculating and transferring tax and social security payments from employee salaries to relevant institutions.



This can be done for example by embedding smart contracts that fully automate the process, which could be done in the following steps:

1. The employer inserts the gross amount of salary into the system,
2. Within the Blockchain system (limited only to the tax administration, banks and the other necessary parties), tax data is matched with the payment by smart contract technology and calculates the correct tax and social security amounts,
3. The net salary is automatically transferred to the employee's account and the calculated tax to the government,
4. As a result, the payroll tax process is faster and less costly and cash-flow is more efficient.

## Transfer Pricing

According to United Nations data, intra firm trade makes up around 30% of global trade altogether. The laws regulating transfer pricing are different for each country, requiring that cross border transactions between related parties comply with arm's length price. Simply put, this price should mirror the proposed or applied price between non-related parties in an open market.

### How could Blockchain benefit transfer pricing regimes?

Traditional transfer pricing	Blockchain based transfer pricing
Heavily reliant on intra-firm documents and correspondence to define the role of each involved party.	A Blockchain distributed ledger that makes it easy to track the flow of transactions and identity of all involved parties.
The intra-firm agreements are executed manually.	The agreements are written into a self-executing smart contract.
High risk of falsification of transaction documents.	All movements on the Blockchain are time-stamped and cryptographically sealed, eliminating the possibility of tampering.
The entire system is heavily reliant on paper documents and data stored on many servers to track the supply chain.	Each information is stored on the Blockchain and visible to parties that have access to the Blockchain.
Tracking of payments is ERP- based.	The payments are executed by a smart-contract if they meet the specified conditions.

#### VAT

Currently VAT is the key driving factor of tax administrations and the largest contribution to governmental budgets. For these reasons tax authorities search for ways of more effective VAT collection in order to gain more revenue and shorten the budget gap. The most advanced solutions are present in Brazil, where electronic invoices are mandatory and received by tax authorities in real time. European countries such as Hungary are also planning to implement real-time reporting solutions (Hungary from 1 July 2018). Next in line is Poland, where the Ministry of Finance is working on everyday reporting of JPK\_VAT (electronic reporting based on the OECD's SAF-T). On a European Union level, VAT is also the center of attention with the proposed large reform of the EU VAT system in the upcoming years. In the current state of VAT - on both national and international level, the system is fraught with a variety of problems. It is highly reliant on businesses themselves

to correctly calculate the amount of VAT due and submit it to the tax authorities, which is a burden especially to SMEs. There are two main reasons for this: tax returns and settlements are calculated over a fixed period, for example monthly or quarterly, and the calculations are not based on actual transactions, but rather on arbitrary dates (for example invoice dates).<sup>6</sup> In addition, the system makes it difficult for governments (if not impossible) to track VAT payments, resulting in MTIC, MTEC and carousel fraud.

In an international context, controlling VAT data is troublesome as each country maintains their own ledgers, making it difficult to obtain wholesome data on VAT movements.

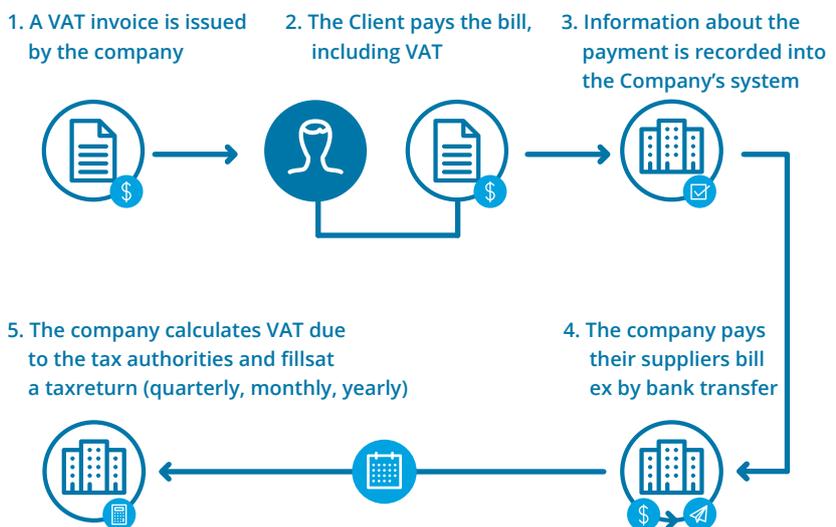
<sup>6</sup> <https://www.darwinrecruitment.com/blog/2017/08/blockchain-real-time-tax-is-this-the-future>

### How can Blockchain benefit everyday VAT transactions?

**Benefits:**

- a) The administrative burden of companies is significantly reduced, saving time and the cost of accounting services,
- b) All of the transactions are conducted in real-time,
- c) All the transactions executed by smart contracts are tamper proof and transparent,
- d) Reduced risk of fraud and mistakes,
- e) Immediate insight into a company's finances,
- f) High speed of money transfers between businesses and the government,
- g) Taxpayers get the burden of VAT amount calculations on invoice level and VAT amount due on tax return level taken away,
- h) Room for VAT frauds is drastically reduced because the same system allowing for processing VAT from transactional point of view, allows at the very same time for multi-dimension checks and verifications of the transaction, parties of the transactions and legal and business context of the transaction.

### How a VAT transaction is processed without Blockchain



### How could VAT be processed using Blockchain

- 1. The client pays the invoice to the company
- 2. The company pays the suppliers invoice



- At the same time, Blockchain smart contracts calculate the invoice VAT and divides it into the non-VAT and VAT part.
- The VAT is paid directly to the tax authority by smart contract.
- The non-VAT part is transferred to the company's account using a smart contract.

**This is done via a smart contract:**

- The company fills in the needed amount and the smart contract performs the payments.

**Simultaneously:**

- The amount due is sent to the supplier.
- The smart contract calculates VAT and sends it to the tax authorities

### Missing Trader Fraud

There are two types of MT fraud: MTIC, which stands for Missing Trader Intra-Community Fraud, and MTEC-Missing Trader Extra-Community Fraud. The first one is usually carried out on the back of ordinary goods, making it difficult to separate legitimate transactions from fraud in real-time and wrongdoing is always discovered after the fact.<sup>7</sup>

#### MTIC

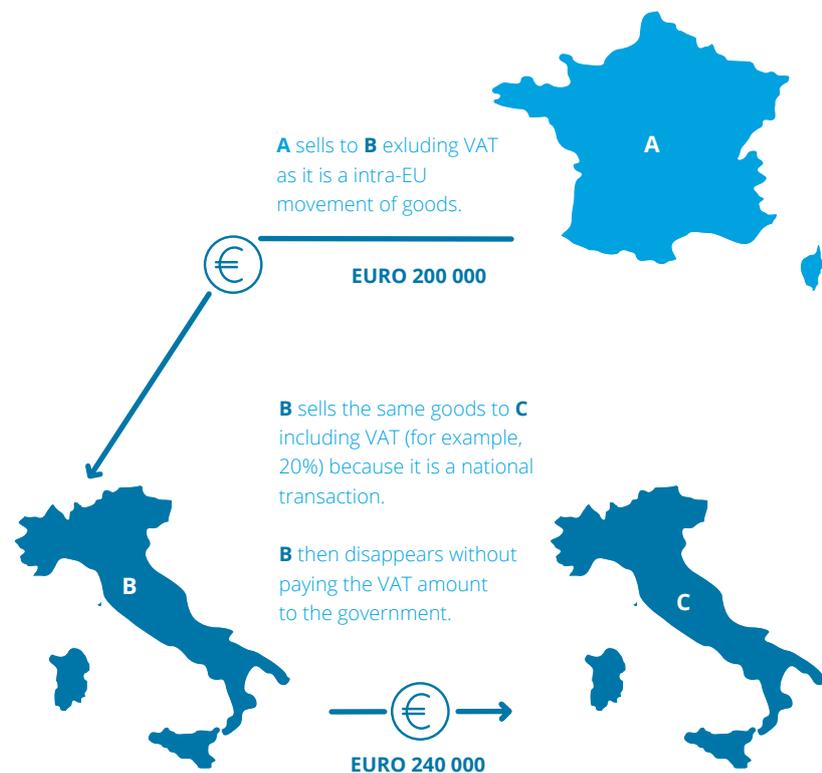
MTIC is an “EU only” fraud that happens when a business makes an intra-community purchase without paying VAT, then collects VAT on an onward sale, disappearing with the VAT money instead of remitting it to the tax authorities.<sup>8</sup>

#### MTEC

MTEC is based on a situation where a business makes an extra-jurisdictional importation of services without paying VAT, then collects VAT on an onward sale of the service, then disappears with the VAT instead of remitting it to the tax authorities.<sup>9</sup> The main difference between MTIC and MTEC is that the first one occurs when an intra-community transaction in goods or services takes place. MTEC however, is based on extra-community transactions between Member States and Third Countries and only occurs in tradable services.

### MISSING TRADER INTRA-COMMUNITY FRAUD

Missing trader intra-community (MTIC) fraud causes multi-billion euro losses across EU Member States.



Also known as ‘carousel fraud’, the fraud takes advantage of legislation which allows trading across Member State borders to be VAT free; VAT is only applied to sales within a Member State at the applicable domestic rate.

Any VAT charged on sales should be declared and paid to the Member State’s revenue authority. In cases of fraud, the first company in the chain charges VAT to a customer, but does not pay this to the government, becoming what is known as a ‘missing trader’.

<sup>7</sup> „Blockchain, Bitcoin, and VAT in the GCC: The Missing Trader Example”, Richard Ainsworth, Musaad Alwohaibi. Access at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2919056](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2919056)

<sup>8</sup> „Blockchain, Bitcoin, and VAT in the GCC: The Missing Trader Example”, Richard Ainsworth, Musaad Alwohaibi. Access at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2919056](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2919056)

<sup>9</sup> „Blockchain, Bitcoin, and VAT in the GCC: The Missing Trader Example”, Richard Ainsworth, Musaad Alwohaibi. Access at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2919056](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2919056)

Source: Europol, <https://www.europol.europa.eu/crime-areas-and-trends/crime-areas/economic-crime/mtic-missing-trader-intra-community-fraud>

### Solving MTIC/MTEC fraud

#### Digital Invoice Customs Exchange (DICE)

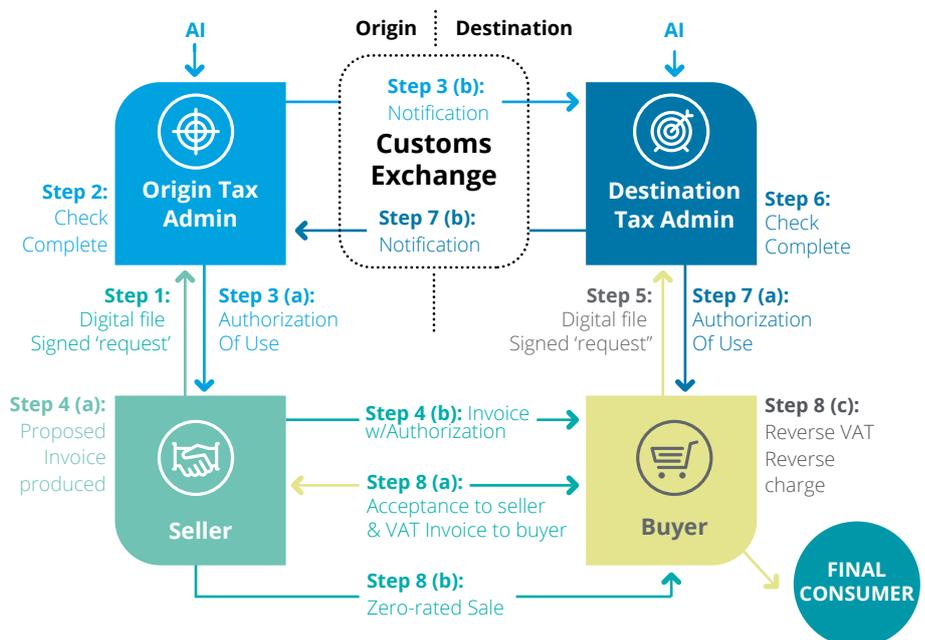
DICE was originally designed for the European Union, stemming from efforts to modernize VIES (VAT Information Exchange System) by creating a solution that would provide a more automated and immediate exchange of invoice data. In general, DICE is based on the idea of placing digital signatures on invoices, then submitting the encrypted invoice data into databases that match transactions and perform risk assessments across the single market.<sup>10</sup> The system is consisted of two elements: the digital invoice and the customs exchange, and the invoices must be submitted electronically. A good example for e-invoicing is Brazil, where the tax authorities require electronic invoices for them to be enforceable and the paper form serves only as a supplement (Brazil does not have DICE). The system allows the tax administrations to immediately invalidate any fraudulent transactions.

The steps in a DICE system are as follows:<sup>11</sup>

1. The seller generates a pro-forma digital invoice containing all necessary transaction information and digitally signs it.
2. The file is electronically transmitted to the tax administration. This action serves as a request for authorization to use a digital invoice.

3. The tax administration authorizes using a digital invoice - the entire process is done automatically, on a 24/7 basis.
4. If all the data provided in the e-invoice is correct, the tax administration signs it electronically and the invoice is retransmitted back to the seller. This signature acts as an access key to information about the invoice, stored electronically. On a paper invoice, it would be visible as a QR code: Scanning it would enable accessing information about the entire supply chain.
5. The seller proposes the proposed invoice, containing all of the data with the access key and transmit this invoice to the buyer.
6. The buyer can use the access key to check the validity of the data: Then, the buyer digitally signs the file and transmits it to the Destination tax administration.
7. The tax administration then verifies the invoice sent by the buyer, sign it and create a second access key. The data from the buyer and seller should match. Then, the invoice data is transferred to the origin tax administration with the second access key.
8. The buyer saves a copy of the file and transfers acceptance to the seller, attaching both keys, then a VAT invoice is issued containing both access keys.<sup>12</sup>

#### Digital Invoice Customs Exchange (DICE)



<sup>10</sup> "Blockchain Technology Might Solve VAT Fraud", Richard Ainsworth, Andrew Shact. Access at: <https://www.law.upenn.edu/live/files/5954-83-tni-1165-september-26-2016pdf>  
<sup>11</sup> „Blockchain, Bitcoin, and VAT in the GCC: The Missing Trader Example“, Richard Ainsworth, Musaad Alwohaibi. Access at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2919056](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2919056)  
<sup>12</sup> „Blockchain, Bitcoin, and VAT in the GCC: The Missing Trader Example“, Richard Ainsworth, Musaad Alwohaibi. Access at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2919056](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2919056)

Source: Blockchain, Bitcoin, and VAT in the GCC: The Missing Trader Example“, Richard Ainsworth, Musaad Alwohaibi. Access at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2919056](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2919056)

### Blockchain based DICE

Taxes are mostly reliant on centrally based ledgers, on both domestic and EU level. As VAT is particularly prone to fraud, Blockchain could be the solution to many VAT problems. Consensus is the key difference between DICE and tax applications based on Blockchain. DICE secures transactional data in real-time, but it is stored in a centralized ledger by tax administrations. Blockchain on the other hand performs risk analysis in real-time and the consensus mechanism is the last step before issuing the formal VAT invoice. There would be a ledger for every traded good and service, displaying the original owners, intermediaries and current owners. Every verified transaction would act as a new block added to the blockchain, irrevocably tying all the information in one, immutable chain.

### The role of the VAT invoice

In VAT transaction, invoices play the most important role, and its role would not change on a Blockchain-based system. This way, every valid VAT invoice would show a digital fingerprint, derived through the blockchain consensus process, acting as confirmation that Block 3 is linked to Block 2 and so on.

The system would allow us to see the entire history of the transaction. It is worth noting that if this system were to be implemented in a governmental system, the participants would gain access to large volumes of data, which would also require creating a checklist of potential risk areas for analysis, such as:

1. Is the buyer or seller newly registered and engages in large transactions?
2. Does the company have a sufficient number of employees to carry out the declared transactions?
3. Does the number of performed transactions fit into the typical pattern of similar companies?

### Who has access to the data?

Although it may seem that in this type of system the data is accessible to all of the involved parties (restaurants) and the tax authorities, there are limits set in place to ensure that one business cannot gain information on a competitor's financials. At the same time, the system allows for a large efficiency gain: the cost of controlling a restaurant has decreased from 4,410 dollars to 190, and instead of taking 70 hours to complete, it now takes 3.<sup>14</sup>



Are transactions of high value executed by newly established suppliers? The beginning of solutions to solve MTIC/MTEC fraud are visible in actions taken by the Canadian Revenue Quebec in controlling the restaurant sector, where each restaurant uses the Quebec SRM (Sales Recording Module) and reports sales in the following steps:<sup>13</sup>

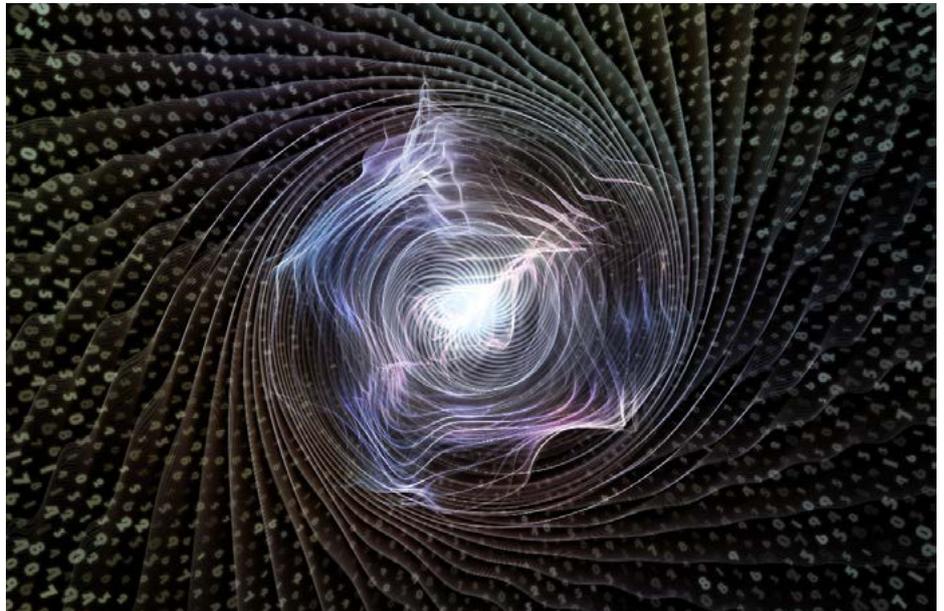
1. The restaurants' sale is recorded in secure memory.
2. Sales information is transmitted in the form of a bar code, placed with a secure digital signature on every receipt.
3. The SRM aggregates accounting records received.
4. Each month, the SRM produces a summary that is submitted to Revenue Quebec.
5. All of the data is stored in a central database, analyzed by AI.

<sup>13</sup> „Blockchain, Bitcoin, and VAT in the GCC: The Missing Trader Example”, Richard Ainsworth, Musaad Alwohaibi. Access at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2919056](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2919056)

<sup>14</sup> „Blockchain, Bitcoin, and VAT in the GCC: The Missing Trader Example”, Richard Ainsworth, Musaad Alwohaibi. Access at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2919056](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2919056)

### VATCoin

In a world slowly recovering from a lengthy financial crisis, it is clear that cryptocurrencies are gaining momentum, with Bitcoin's worth growing in value. The most appealing feature of cryptocurrencies is marginalizing the role of trust, by detaching it from banks and other institutions. Four years ago an interesting question popped up on a cryptocurrency forum: Can the idea and mechanism of Bitcoin be used for VAT payments?<sup>15</sup> The concept is explained in Richard Ainsworth's, Musaad Alwohaibi's and Mike Cheetham's paper "VATCoin: The GCC's Cryptotaxcurrency"<sup>16</sup>. It was designed as a proposal for the Gulf Cooperation Council.<sup>17</sup> VATCoins are designed to be similar to Bitcoins. They are also a digital currency, but meant only for VAT payments and contrary to Bitcoin - are not susceptible to changes in value, but have a fixed rate. Also, in a VATCoin network transaction will not be verified by the members of the community in the Bitcoin sense, but by government participants. The concept is interesting: The number of nodes would be proportional to each jurisdiction's GDP, relative to the aggregate GDP. As for availability of the network, each enterprise involved in a VATCoin transaction would have access to the transaction records of all the VATCoins it was involved in.



For the GCC, the authors based this proposal on four provisions:

1. In all the countries that incorporate the VATCoin, the VAT payments will be made only by using VATCoin, by smart contracts written into invoice documentation.
2. As a rule, VATCoins cannot be exchanged into cash or any other currency, the exception being exchange into cash by governments.
3. VATCoins paid in bout input and output taxes will be recorded on a real-time basis and added to the Blockchain.
4. After a defined waiting period, a smart contract will issue refunds on a daily basis when a company's account shows a negative balance due.

<sup>15</sup> <https://bitcointalk.org/index.php?topic=195693.0>

<sup>16</sup> „VATCOIN: THE GCC'S CRYPTOTAXCURRENCY“, Richard Ainsworth, Musaad Alwohaibi, Mike Cheetham. Access at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2916321](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2916321)

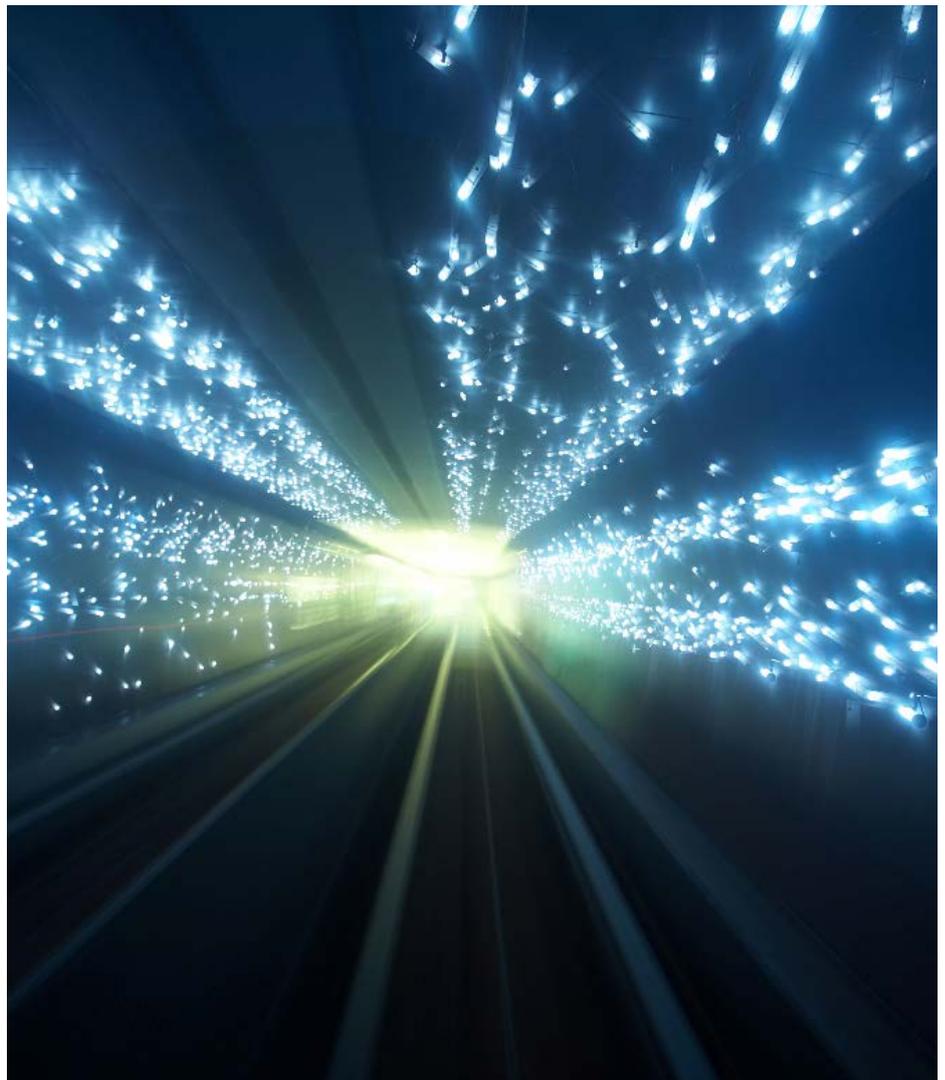
<sup>17</sup> The GCC is a regional intergovernmental political and economic union consisting of all Arab states of the Persian Gulf, except for Iraq. Its member states are Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates. [https://en.wikipedia.org/wiki/Gulf\\_Cooperation\\_Council](https://en.wikipedia.org/wiki/Gulf_Cooperation_Council)

# Summary

The development of Blockchain is still at a very early stage and many issues have yet to be resolved. It is an undisputable fact that eight years after the introduction of Bitcoin, cryptocurrencies remain the sole example of a common Blockchain system. The main issues Blockchain has yet to overcome are the complexity of the system and a deficient number of IT specialists with the ability to create a business Blockchain. Moreover, as common Blockchain technology is used in cryptocurrencies, the issue of transferring it onto a more complex system, i.e. taxes, is still a work in progress. Technology development is an ongoing process, and revolutionary inventions like the Internet would not be what they are today without considerable development and brainstorming. Still, Blockchain is already showing many benefits and while the main hype and buzz is concentrated around financial services and banking, in a long time perspective it is also promising in the world of taxation. Digitalization of tax is gaining speed, with not only superbly developed countries adopting various electronic tax reporting, but those just developing as well. It is only a matter of time until the revolution of Blockchain reaches taxation on all levels.

“We always overestimate the change that will occur in the next two years and underestimate the change that will occur in the next ten. Don’t let yourself be lulled into inaction.”<sup>18</sup>

- Bill Gates, *The Road Ahead*



<sup>18</sup> Quoted in: "The Future of Blockchain: Applications and implications of distributed ledger technology", access at: <http://charteredaccountantsnz.com/futureinc>

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