Blockchain

Guide for Trade Unionists 4.0

The role of employee involvement
for a blockchain in the service of quality jobs

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Digitalisation is currently one of the main drivers of change in the world of work. Alongside artificial intelligence, blockchain technology has the potential to revolutionise the way we work. For example, blockchain technology is often associated with the promise of creating more equality in the way people work together or have business relationships because it is based on decentralisation. But is this really the case? In order to leverage the opportunities of these technology for social progress, one must first address the question of what positive and negative impacts digital technologies have on key areas of life, work and politics. On this basis, it can be deduced under which conditions and with which political framework the use of this digital technology also leads to social progress. In the process, a system of coordinates must be found for a European path in dealing with blockchain: the advantages and gains from blockchain must be felt by as many people as possible – the improvement of participation opportunities, data protection, better working conditions and the reduction of social inequality, for example, are important indicators of this.

Apart from cryptocurrencies, trade unions have so far only dealt with this new technology in isolated

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[*] European Trade Union Confederation (Etuc).

cases. This report provides a comprehensive overview of the impact of blockchain on the world of work in general and broken down to specific aspects. Among others, answers are given to the exciting questions of how trade unions are successfully using this technology and how workers can protect their own data. Against this background, this project makes an important contribution to further developing the trade union debate on the European level.

Introduction
A project aimed at exploring
the role of unions in making blockchain
a driver of decent work
Stefania Radici[*]

Blockchain for decent work is a project co-financed by the European Union, led by the Filcams-Cgil national union in cooperation with a consortium of national, European and global trade union organizations and with technical and scientific support from research and training institutions.

Why did the union launch a transnational cooperation project on the topic of Blockchains?

It did so because blockchain technology as well as other technologies (Cloud Computing, Internet of Things, Big Data & Analytics, Artificial Intelligence, Augmented Reality & Virtual Reality, Advanced robotics & 3D printing, and 5G) are a tool that determines a new development paradigm, which while automating processes and products, impact employment, both in quantitative and qualitative terms.

Here, we will not discuss the quantitative effect of technology on the labor market, but focus on the current and potential effect of technology, and in this case blockchain, on the quality of work.

However, before delving into the application fields of blockchain in the job market, we need to make a premise. The blockchain records data; information is extracted from the data. While it is irrefutable that the data itself is objective, the information extracted is not.

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[*] Filcams-Cgil Sicilia, project coordinator.

In fact, the way in which the data is collected, processed, evaluated, which refers to the instructions given *a priori* by a subject, falls into a subjective dimension. The result of the structuring and algorithmic processing of the data can only reflect the interests, objectives and values of the person who instructs the process.

No technological application is neutral because it meets the purposes for which it is used. The same technology can have positive or negative purposes. Artificial intelligence can, for example, be used to define the trajectory of missiles in war, but it can also be used to enable people with limitations in communication to be able to express themselves in an understandable way.

When faced with technology that is not neutral, one cannot be neutral. This does not mean that one must side with the apologists or the apocalyptics. It does mean that one cannot stand by and watch, but must intervene in the process to ensure that there is a fair balancing of the interests at stake, that is, the interests of all those who are in some way impacted by the application of technology. If technology captures and processes data, the one who is the subject of data must exercise the right to be informed and involved.

Hence the need for there to be transparency, involvement, shared rules and control mechanisms, and a benefit or advantage in the hands of all stakeholders in technological innovation processes.

When we talk about blockchain, we are referring to a sequential chain of blocks. It is an encrypted digital information system and a way to identify, store, manage and certify information through a decentralized and database distributed in a peer-to-peer network of interconnected and synchronized nodes. Each actor, each

for his or her part, has a copy of the registry and helps record, verify and validate the information in a block. Once certified, that information is immutable and enables the execution of transactions or operations between parties.

Blockchain is being applied in a variety of areas, public and private. It, for example, is being used by companies to make information inherent their supply chain traceable: from the sourcing of raw materials to the processes of product transformation and distribution. It is also used to certify the quality and regularity of working conditions, the implementation of health and safety measures, the effectiveness of gender policies or anti-discrimination actions, to collect and evaluate productivity indicators. At the moment, these are corporate experiences and experiments that pertain to the sphere of social responsibility, but like any "autonomous" process, in which the controlled is the controller, it leaves unresolved some knots about the actual transparency and reliability of the data.

There is nothing to prevent the blockchain from registering and certifying information inherent in the quality of labor conditions in companies or their supply chains, but the accuracy of this information is closely related to the composition of the individuals called upon to detect, enter and validate the data and the manner in which the information is extracted from that data, thus the algorithm that instructs the process.

In a process that actually wants to shed light on employment quality, the involvement of workers' representatives is inevitable, and they need to be trained, informed and equipped with useful tools to play a monitoring role and representing the needs and the interests of the workforce, to protect directly and indirectly employed workers, that is, those who in various

capacities operate in the company's supply chain: contracts and supplies.

Blockchain as a certification system is also used to certify the individual's training processes and professional experience, so as to facilitate processes of job placement, mobility or reintegration, or even for access to active and passive labor policies.

These are processes on which the union must have a say, because in a context of great change such as the one we are experiencing as a result of the crisis from Covid-19, in a phase characterized by restructuring and reorganization aimed at a digital and ecological transition, accompanying the worker in the process of retraining and certification of skills or in the access to services and well-being is of key importance so that the most fragile and vulnerable in the labor market are not expelled, discriminated against or left to their own devices.

In the course of this guidance tool we will see what the risks and opportunities are for the worker of applying blockchain technologies in the labor market, as well as the role of the workers' representatives.

Blockchain can be a cosmetic, social responsibility façade cloaked in apparent objectivity, but it can also be a tool through which to effectively pursue democratic processes aimed at the development of a sustainable, equitable economic model that respects the rights of women and men workers now and in the future and where the technology is functional for the well-being of all and not some.

This guide aims at promoting the participation of workers and their representatives in blockchain management systems, public and private, to ensure that they are indeed bearers of good employment, the fair application of individual and collective contracts, com-

pliance with hard and soft law standards to protect labor, recognition and promotion of the skills of the individual but also sounding the alarm and activating remedial actions if regulatory or contractual provisions are disregarded.

I hope to provide you with some food for thought in your present and future activities and prompt the opening of new avenues for discussion, dialogue and negotiation with our public and private interlocutors. I wish you to enjoy the read.

1.
Blockchain and the labor market.
Areas for action and new rights

1.1.

Blockchain and smart contracts:
what they are and how they work
Gian Luca Comandini[*]

Over the past few years, the word blockchain has been increasingly sought after by users online. In the beginning, knowledge of and attention to this technology was confined only in the world of developers and those who sensed its great potential.

One of the reasons why the blockchain has begun to attract the interest of a growing audience is surely the connection with Bitcoin, the open source protocol launched by Satoshi Nakamoto for the use of the first cryptocurrency.

The blockchain is much more than a payment infrastructure since as we shall see it is used in many areas.

According to research by the Blockchain and Distributed Ledger Observatory of the School of Management of the Politecnico di Milano, by 2021 there will be 370 blockchain-based initiatives among companies and public administrations worldwide. A growth of 39 percent over the previous year.

To understand its functionality and fields of application, let's start with the meaning.

The term blockchain literally means a "chain made out of blocks". More precisely, it is a decentralized, encrypted database or ledger shared and distributed among multiple nodes in a network. This ledger can

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[*] Blockchain Core.

be read by anyone but can only be modified with the consent of the majority of participants.

Before delving in, let us explain some key words: a block is nothing more than a repository containing multiple immutable transactions.

A node, on the other hand, is a server connected to the Internet network, corresponding to each individual participant in the blockchain and is responsible for checking and validating all transactions made on the blockchain.

In computer language, data decentralization means the absence of a single server where all information is stored. Data are distributed across multiple servers or nodes. Each node in the chain contains the same information and is therefore distributed. This feature places blockchain as a real alternative to centralized financial intermediaries such as banks, insurance companies and some public institutions. In fact, it is called disintermediation because in the traditional system, authorities ensure the reliability of transactions between two or more parties.

Since there is no longer a central body to check the validity of transactions, transactions will be validated when half plus one of the operational nodes approve, after technical verification, the sequence of blocks. Once that transaction is verified, it cannot be changed and is an important guarantee for those who decide to rely on such technology.

To understand it better, let's take a step back in time. In the 1400s on the tiny island of Yap in Micronesia, the inhabitants used stones as coins. To prevent theft, they adopted an ingenious system: each inhabitant kept a public register in which they recorded the ownership and trade of each stone. So only the real owner of the stone could spend it even without having

to carry it with him. Basically, it was a primitive form of blockchain.

Today, a blockchain transaction for the purchase or sale of a particular asset goes like this: let's assume that Luke wants to sell one of his properties to Anna. In this case, the transaction includes information about the property, the sale price, the buyer's financial readiness, the seller's actual certification of ownership, and other useful information to validate the transaction.

If the information is considered correct, the transaction is authorized, validated and executed, and a new block with all the data is created. The block, which also includes other transactions, is submitted for verification and approval by blockchain participants. Once it has been approved by the network the new block is added to the other blocks and becomes permanent and immutable.

The element that makes the transaction secure, non-manipulable and precludes the presence of a central authority is cryptography. This is the real break from traditional systems. Cryptography means the development of methods for converting data from a readable format to an encrypted format that can be read or processed only after being decrypted. Encryption is the basis of data security and is the simplest and most important way to prevent a computer's information from being stolen and read by those who want to use it for malicious purposes (kaspersky.com).

After listing the most important features, let us analyze the various types of blockchain. Blockchain belongs to the macrocategory of Dlts (Distributed Ledgers Technology). The elements of differentiation between the various types of Dlts are primarily in the ways in which they "govern" the control and verification of the actions of writing to the ledger, the manner

and type of consensus required to validate these actions, and the structure of the distributed ledger itself. For this reason, there are different types of blockchain that differ based on the number of actors who may or may not make decisions within the network and the form of consensus in which they are updated.

Therefore, we can identify: public (permissionless) blockchains, which are so called because they do not require permissions to access the network, perform transactions or participate in the verification and creation of a new block. The most famous are certainly Bitcoin and Ethereum, where there are no restrictions or conditions for access. Anyone can take part in them.

It is a completely decentralized structure, in that there is no central entity that manages access permissions. These are shared among all nodes equally. No user on the network has privileges over others, no one can control the information that is stored on it, modify it or delete it, and no one can alter the protocol that determines how this technology works.

Private (permissioned) Blockchains, on the other hand, are subject to a central authority that determines who can access them. In addition to defining who is authorized to be part of the network, this authority defines what roles a user can play within it and also defines rules on the visibility of recorded data.

These types of blockchain thus introduce the concept of governance and centralization into a network that began as absolutely decentralized and distributed. Instead of allowing any person with an Internet connection to participate in the verification of the transaction process, it entrusts the task to a select few nodes deemed trustworthy. The characteristics of permissioned Blockchains make them more attractive in

the eyes of large companies and by institutions as they are considered more secure than public ones and allow for the required level of secrecy, controlling who can access and who can view the recorded data. As the best known examples we have Ripple and Hyperledger Fabric.

An explanatory example of this type of network can be a consortium of 10 companies, each of them connected to the Blockchain through a computer. If company "7" has working relationships only with "1", "3", and "6" it will share invoices only with these three without needing to authorize the other companies to read the data shared among them.

Finally, we have private Blockchains that share many features with permissioned ones. These are private, non-visible networks that sacrifice decentralization, security and immutability in exchange for storage space, speed of execution and cost reduction. This type of Blockchain is controlled by an organization, deemed highly trusted by users, which determines who can and cannot access the network and read the data recorded on it. The organization that owns the network also has the power to change the rules of operation of the Blockchain itself, rejecting certain transactions based on established rules and regulations. The fact that it is necessary to be invited and authorized to access it ensures a higher level of privacy for users and determines the secrecy of the information it contains.

Private Blockchains can be considered the fastest and the cheapest, as transactions are verified by a limited number of nodes thus reducing timeframes; therefore, transaction fees are significantly lower than those of public Blockchains. As examples we have Chain and Bankchain.

As anticipated, blockchain does not only find its

application in the payments system and in the economic-financial world. Bitcoin was the first revolutionary application that changed the concept of payment. Finding a place within this ecosystem are smart contracts. Smart contracts were already theorized in the 1990s by computer scientist Nick Szabo but only found their usefulness in the blockchain world in 2014, when Vitalik Buterin published the Ethereum white paper.

The smart contract is nothing more than a codified transposition of a contract. The goal of a smart contract is to fulfill the terms of the contract automatically while minimizing the possibility of malicious actions and the need for trust of intermediaries. To understand how it works, let us imagine a vending machine: only when we insert the coin of the weight, size and value required by the vending machine will the latter activate and release the product we have selected.

With a smart contract, two or more parties can interact without knowing or trusting each other. Blockchain technology ensures that the data is accurate by making the code immutable. Each smart contract can be programmed in various ways and cannot be changed once implemented. They can be deleted only and only if a particular function has been added previously.

It should be noted, however, that blockchain and smart contracts were not born to be able to communicate independently with the outside world. For many contractual arrangements, it is essential to have relevant information from the outside world to execute the agreement. When data from outside the blockchain is entered, the problem of the first piece of data takes over. If the data is false, it can no longer be changed. Two approaches are used to overcome this problem: the Rfid tag and oracles.

Radio frequency technology is capable of autonomously storing data and information about real people and objects, using Rfid (electronic tags that are inserted into the object, person etc.) and fixed or portable devices (readers, which read precisely the data in the Rfid and then automatically store it in memory. This technology accurately tracks the condition of a product throughout the production chain and records changes in real time. Any changes that the product undergoes will be recorded on the blockchain to which the Rfid tag is attached.

The oracle, on the other hand, is the contact between the self-referential world of the blockchain with the external cyber reality. More specifically, it is that entity responsible for accessing external data such as public databases without violating the integrity of the blockchain.

The best known example is the executable auto insurance policy that protects against airplane delays or bad weather. In practice, the smart contract queries APIs (application programming interfaces) for information about departure times and, if the flight guaranteed by the policy is delayed, automatically triggers reimbursement, without the need for any "human" intervention.

Another example may be the case of a cash-on-delivery shipment: the smart contract collects the sums of the sold good, continuously checking its status, and automatically transfers the sum to the seller when the good is found to be "delivered" and in the stipulated condition.

The spread of smart contracts will be realized with the rise of Internet of Things (IoT) devices. This term was first introduced in 1999 by British engineer Kevin Ahston, co-founder of the Auto-ID Center in Massa-

chusetts. The acronym IoT denotes any system of physical devices that receive and transfer data over wireless networks, with limited manual intervention. This is achieved by integrating processing devices into the objects. For example, a smart thermostat can receive data on the user's location while the user is traveling, and use it to adjust the home temperature before the user arrives. There is no need for the user to intervene, and the result is better than manually adjusting the thermostat.

Take the case of automobiles, which today leave factories already equipped with on-board connectivity. One example comes from automobile insurance companies, which based on data collected through Internet of Things equipment in the vehicle can modulate insurance policies based on drivers' driving behavior. If two cars collide due to the offense of one of them, the motorist who is the victim of the collision will be compensated according to the damage his or her car has suffered. Insurance companies thanks to Internet of Things systems built into cars will be able to communicate automatically, and time wasted due to bureaucracy will be avoided.

The real change will come when entire sectors and ecosystems are interconnected as entirely smart cities. We have the example of the first blockchain-based smart city in Tokyo's Daimaruyu district. It includes a 120-hectare area owned by Mitsubishi that has been reclaimed and transformed into a smart city through a combination of blockchain and the Internet of Things. 106 skyscrapers, 4,300 offices, 40,000 restaurants, 90,000 stores, 13 train and subway stations have been built, and 16 of the country's largest companies have chosen to relocate their headquarters here.

The technology infrastructure, in this vast number

of buildings and transportation, allows sharing of business-related information coming from Mitsubishi-owned buildings, IoT sensors on buses, from product availability in stores to free tables in restaurant, or available rooms in a hotel. Everything is connected. You can see real-time trends in rents and house prices (https://www.01building.it/smart-city/citta-smart-blockchain/).

How does a blockchain work

❶ A transaction is a digital file composed of data representing the exchange value between two or more parties.

❷ The transaction is represented online as a block. A block comprises multiple transactions that are joined together to be verified, approved, and then stored by blockchain participants.

❸ The transaction is transmitted to each participant in the network. They are called nodes and are physically represented by servers.

❻ The transaction once executed is transferred from the sender to the receiver.

❺ The block can be added to the chain and provides an indelible and immutable record of transactions.

❹ The network nodes approve and validate the transaction.

Blockchain implementations in the labor market

Blockchain is applicable in all areas of professional life, from recruitment to retirement.

Active labor policies
Blockchain is functional to interconnect the databases of public administrations involved in active and passive labor policies in order to create an electronic worker's file, a tool containing information on educational and training paths, work periods, use of public benefits and contribution payments, including the use of social security benefits. The file, which can be accessed through telematic reading methods by individual stakeholders, facilitates job placement paths for the unemployed and unemployable.

Corporate recruitment management
Blockchain provides workers who wish to apply for a job position with the ability to deliver their resumes in a transparent but protected digital environment, and employers with the assurance that the data provided on education, certificates and work experience will be automatically confirmed by monitoring tools.

Employment relationship management
Through blockchain, a contract can be managed, i.e., administrative, social security and tax obligations related to the employer's compulsory reporting of data to employment centers, social security agencies and the financial administration, the disbursement of economic and regulatory treatment to the employee in compliance with the provisions of regulatory and contractual sources, and information obligations to workers and labor unions.

Countering abuses

If the employment relationship is managed through a blockchain, fulfillments related to regulatory and contractual obligations are subject to registration and certification. Trade unions and public bodies are placed in a position to monitor, in a constant and timely manner, the correct application of the relevant collective agreement, the regular payment of wages to employees, the payment of insurance premiums and social security contributions, and so on, and if necessary, intervene.

Countering gender inequality

The blockchain is functional in detecting gender discrimination in the workplace and activating corrective measures established beforehand. It detects and certifies objective data on the staff situation, composition, careers, pay, use of leaves, absences, parental leave, early retirement, retirements, welfare benefits, and layoffs; detects data inherent in the need for services and measures that allow an optimal time management; detects and reports anomalies between genders; and activates tools aimed at fostering organizational well-being, starting with the organization of work time and working arrangements and ending with the definition of measures to promote work-life balance.

Performance measurement

The blockchain guarantees transparency in the detection of indicators to measure and evaluate organizational and individual performance according to the expected results. In this way, it can inform processes aimed at improving the quality of production processes as well as the enhancement and growth of professional skills.

Remote work

Blockchain experiments (see, for example, the Municipality of Bari) are made to manage remote work and adapt performance measurement and evaluation systems, so as to be able to verify the impact of this mode of work on the quality of services, the effectiveness and efficiency of administrative/business action, the ways of reconciling employees' working and living times, the security of organizational processes and workers, and the safeguarding of data.

Certification of training

Through a digital training record, the training activities in which the individual participates and the qualifications obtained are recorded and certified, so as to be quickly available in case of participation in public and private competitions and applications, mobility, specialization courses etc.

Tracking the supply chain

Blockchain is widely used to trace the history of a product, from raw material sourcing to processing, distribution and sale. Companies are using it to provide consumers via QR codes with information on the quality of materials used, to guarantee organic cultivation or farming for food goods (e.g. CoopItalia), to certify that raw materials for industrial products are not extracted in places affected by conflict or exploitative labor (Volkswagen, Ford, Tiffany), to ensure that processing takes place in healthy and safe work environments (Levi Strauss), or to certify that luxury goods or art products are authentic and not counterfeit (Lvmh, Bulgari, Cartier).

Health and safety conditions

Blockchain is used to record and certify the adoption and proper implementation of health and safety measures in the workplace (see for example the experience of Levi Strauss in the States or De Cecco in Italy).

Access to public welfare

With the European Blockchain Service Infrastructure (EBSI), the European Union has set itself the goal of implementing Europe-wide public services based on blockchain technologies, characterized by high levels of security and privacy. Through the interconnection of databases, it accelerates and facilitates the recognition in the head of the person's right to access public welfare services, as well as the delivery of those services. Relevant is the Dutch experience in the practical application of this technology to the national welfare system and to a local level project for resident care.

Corporate Welfare

Corporate welfare providers adopting blockchain technology offer companies digital portals for the secure and traceable management of services and benefits to employees: ranging from interventions to support education (babysitting, daycare, schools of all levels, textbooks, canteens, educational vacations etc.) and care for family members, the elderly and dependent (caregivers, medical and nursing services, nursing homes and RSAs etc.), to interest reimbursements on mortgages and loans, supplementary pension and supplementary health care. There is also the possibility of using the welfare budget provided by the company to purchase shopping vouchers and other services related to the leisure sphere, such as gyms, sports activities, movie or theater passes, exhibitions, travel and vacations, language courses, and others. Further possible applications would include needs tracking, employee profiling, and certification of access to welfare measures.

Social economy

Blockchain can be a tool for democratic participation and control, particularly in tertiary sector organizations and cooperative enterprises, starting with social cooperatives. It improves and makes secure, identifiable, transparent, and tracked association governance operations, such as member consultation and voting operations, including remote voting; it makes donations and fundraising secure, traceable, and identifiable, as well as their management, enabling, for example, a donor funding an NGO or the members themselves to track the flow and destination of donated resources.

Public procurement management

The blockchain can be applied in all phases of public procurement: the requirements discovery phase; the economic operators' requirements verification and award phase; and the contract execution phase. In the execution phase, the use of a distributed and participated registry is of particular importance as a function of identifying data to be recorded and certified, particularly data pertaining to the quality of working conditions, but also as a function of putting in place measures to restore proper management of human resources if noncompliance occurs, such as the activation of responsibilities (including joint and several liability) of the client, contractor, subcontractor in relation to wage credits, social security contributions and insurance premiums, as well as all the bodies delegated to control and supervise the regularity of work or health and safety in the workplace.

1.2.
Bargaining the blockchain.
Negotiating the algorithm
and exercising control over the data
Cinzia Maiolini[*]

Implementations of digital technologies impact both process and product transformations in manufacturing.

There are some that have a higher or more immediate impact than others, and of these, blockchain technology is certainly to be considered among the most high-performing and impactful in the organizational sphere.

As we know, blockchain is an infrastructure that enables the certain transmission of data and information.

Its application within companies changes the business organization allowing in fact the cryptographic transmission of information and data, with an access control and certainty of content.

It is evident that this what we can call "distributed database" can be used in the organizational sphere for various certification practices: from working hours to the occurrence of training, and the sectors that could benefit organizationally are many. The PA itself, in its relationship with citizens or in the relationship between PAs, can benefit from the use of blockchain infrastructure numerous advantages in terms of efficiency and certainty in the delivery of services and also enabling a more transparent relationship.

But, like all technologies, it brings with it possible risks and, as far as the union is concerned, it necessarily has contractual implications that require a union role, both in the arena of national collective bargaining agreement renewals and in that of company-level bargaining.

In fact, the organizational issue cannot be separated from an informational, consultative and bargaining act with workers' representatives.

The use of particular technological solutions in fact, among them for example AI technologies, which are capable of employing such a large amount of data in such a short time that they are a candidate to be working tools that make it possible to significantly reduce production time and make work organization more efficient, have consequences in many areas.

If, for example, the use of AI can lead to discriminatory situations already in the pre-hiring phase, where the use of AI allows a pre-selection of resumes based on the settings provided to the algorithm, in the organizational phase also the use of blockchain for the control of production activity (or service delivery), working hours, for individual productivity assessment from which then can descend the algorithmic assignment to shifts and tasks, career paths etc., needs a union role of verification and control.

In all cases in which the technological tool certifies (think worker-certified training), implements (see smart contracts) or exercises a decision-making capacity and defines the organization of work (e.g., indicating which sector/worker should perform a certain task and in what terms and timeframe this should take place) workers must be aware of the algorithmic mechanisms, the technologies adopted, the data used, the expected and possible consequences.

That is, they must be able to know and bargain about the purposes for which new technologies are introduced and the ways in which they are implemented.

After all, the employer's directive and disciplinary power, the rights related to privacy, the limits related to the issue of performance control, the rights of information and consultation already present in collective bargaining agreements, and the right to have bargaining spaces are at stake.

It is quite clear, therefore, that given the areas of application of technology, the expected and foreseeable consequences, and the central role of data, it becomes absolutely relevant to understand what technological applications are introduced and how and for what purpose the employer has used the data acquired in the company's activity.

Likewise, if the blockchain infrastructure is used to certify certain elements pertaining to labor performance, the union wants to be a node in that chain.

This would allow it both to validate the "transaction" and to be aware of it.

It is in this logic that the union first proposes to strengthen the sections of the National Collective Bargaining Agreement where the rights and obligations of the signatory parties are regulated. In particular, it is necessary to strengthen the rights of information and consultation:

- *ex ante*, where new technologies are being adopted, to establish their objectives, correct algorithm setting, ongoing verification of machine learning developments, data sets used etc.;
- *ex post*, to assess the correspondence of algorithmic processes to contractual and regulatory principles.

The application of blockchain infrastructure precisely because it is based on a peer-to-peer architecture

in which all participants collaborate in its operation on an essentially equal basis requires a union presence.

After all, as we have already mentioned, no technological application can ignore the presence of regulations governing the labor relationship.

Think in particular of the exercise of data control (set in many national legal systems) or the protection of privacy (Gdpr).

These two "limits" alone imply control intervention of a trade union nature as well so that the employer's exercise of managerial power does not, due to the pervasive use of technologies, conflict with these regulations.

This applies in general to any form of "algorithmization" of labor relations.

After all, we know that among the major risks associated with the use of data analytics and machine learning algorithms and techniques is the ability of the algorithm to learn on its own and perform certain tasks/decisions autonomously, beyond the scope of orders underlying its programming. After all, most algorithms work through multiple exchange systems and use huge amounts of data. This creates an interdependent network of algorithms that can escape the control of the programmers themselves.

What we want to avoid are the consequences of possible algorithmic discrimination, the risk of strong implementation of invasive forms of control and surveillance, the lack of transparency and traceability of applied technologies, and the exclusion of the union from objective validation of signed agreements or shared norms.

The jurisprudence in this sense has already expressed rather clear concepts: for example, in Italy the Supreme Court ruling No. 14381/2021 obliges the em-

ployer, in the case of creating an algorithm through which it monitors the employee (geo-location, to evaluate his performance etc.), to give a precise and not general information regarding the use of data.

There is recognition of the need for algorithmic non-opacity and specific attention to the issue of data, the engine of digital technology.

Stating that whenever technological tools are used to enforce labor organization arrangements that are the result of bargaining or to certify compliance with agreements to which the union is a contracting party or mandatory fulfillments on the part of the employer, the union itself must be a node of certification and validation (an example is the certification of training, contracted or mandatory, through blockchain) implies the same logic.

So, aware of the important role that technologies such as those covered in this work can play in the certification of "best practices", in the transparency of mandatory compliance or training processes, in the detection of the hours of work actually performed, and in the integrity and non-infringement of the supply chain, the union claims a leading role for workers involved in these innovation processes.

2.
Focus on implementation areas of union interest

2.1.
Certifying training. The experience of collective bargaining in Italy
Stefania Radici

"*Sapere aude!*", meaning "have the courage to be wise", do not be afraid to know. This is the motto of the Enlightenment, argued by Immanuel Kant, who urged mankind to come out of its state of minority, not to be afraid to know, to have the courage to use its own intellect without being guided by others.

Although one agrees with the need to acquire critical tools to decode, understand, interpret reality without being influenced by others, to impute the cause of the inability to do so and thus "the blame" to man himself is quite unmotivated.

If training is a right, there are those who must construct the conditions to put the individual in a position to exercise this right.

The formation of the "child", to recall the United Nations Convention, up to and including secondary education, is a right enshrined in a range of national and international normative instruments and is related to the full development of human personality and dignity.

But training is fundamental throughout the lifespan. Having skills, updating them, qualifying and retraining is necessary to access and remain in an ever-changing labor market, to cope with the negative externalities arising from technological progress, such as job fragmentation, obsolescence of traditional and repetitive jobs and skills misalignment.

For this reason, trade unions have always promoted vocational training, either directly, through the establishment of their own bodies, or indirectly, through the establishment of ad hoc funds such as, for example, in Italy, the Interprofessional Funds or the Funds of Bilateral Institutions, both managed in cooperation with employers' associations, or again through tripartite social dialogue at the regional, national and European levels to put vocational qualification and retraining at the center of the political agenda.

In the contractual sphere, in Italy for the first time in 2016 lifelong learning was recognized as a subjective right within the November 26, 2016 Ccnl for workers in the private metalworking and plant installation industry. Specifically, in Article 7, Fourth Section, Title VI, provision is made for the definition of individual educational pathways with a total duration of 24 hours over the three-year period 2017-2019 for both long term, short term and part-time workers to be carried out during working hours and by accredited bodies. Similar provisions were also introduced in the renewal of the national collective bargaining agreement for the electricity sector, which for the 2019-2022 period guarantees each permanent employee not less than 28 hours of continuous training to be paid for by the employer and affirms, accordingly, the recognition of the individual right to continuous training.

With the 2021 renewal of the Ccnl, Federmeccanica, Assistal, Fim, Fiom, and Uilm, i.e., the social partners of the metalworking industry, have taken a step forward: they have set up MetApprendo, a nonprofit association, managed bilaterally by the parties stipulating the Ccnl, to which metalworking, mechatronics, and plant installation companies have committed to pay a one-time contribution of 1.50 euros per employee in

order to manage workers' continuing education. Met-Apprendo uses blockchain technology: companies that register on www.metapprendo.it access a platform that promotes and facilitates the definition of training needs, organization, planning and registration of training for their employees. Each employee has his or her own digital dossier, in which all training is certified and which will continue to be valid even if he or she changes jobs.

Building a platform for accessing training and certifying skills acquired through blockchain means equipping workers with a system that links to the identity of their person certain, valid and unchangeable information about their training path.

In the union sphere, this is the first experimentation, from which other productive categories are drawing inspiration in view of contract renewals. But in the world of training, the application of blockchain is nothing new. The digital training record, certified through blockchain technology, is used by schools, universities and various accredited bodies to digitally represent the skills attained by individuals through the digital credential system. Open badges, already adopted in Italy by various universities (the University of Milan Bicocca being the first) are a system of digital micro-attestations capable of testifying – securely and verifiably (through blockchain technology) – that a competence has been acquired by an individual: they contain information about the competence to which the badge refers, the way in which the competence was verified and the identity of the verified and verifier. This is an international standard, based on open source principles, designed to enhance the value of acquired competencies and to match employers with candidates on a basis of transparency and recognizability

of competence. In June 2018, the Crui (Conference of Italian University Rectors), as part of its "Digital University" initiative, pointed to Open badges and the Bestr platform (by Cineca) as national benchmarks for the representation and certification of competencies.

From the unions' perspective, participating in the process of detecting training needs and certifying skills through blockchain means moving from recognizing the right to training in the head of the person to building the conditions to enable the person to exercise that right, to receive recognized, accredited and certified training through a digital dossier, and it also means being an actor called to verify that the right to training is actually exercised by everyone without anyone being excluded.

2.2.
Public service contracts.
Ensuring protections and rights for workers
Stefania Radici

Every year, public authorities in the EU spend about 14 percent of their Gdp (about 2 trillion euros per year) on purchasing services, working activities and supplies. In many sectors such as energy, transport, waste management, social welfare, and the provision of health or educational services, public authorities are the main purchasers.

European and national legislative interventions have tried to balance two principles and safeguards: the principle of freedom of enterprise, to encourage the participation of companies, especially Smes, in the procurement market, and the principle, "duty", of increasing transparency to counteract illegal phenomena and ensure quality products and services that are economically, socially and environmentally sustainable.

The current European legislative framework on public contracts, starting with Directive 2014/24/EU, promotes the so-called e-procurement, i.e., the digitization of the procurement processes of public administrations' goods and services as one of the main objectives to which all member States must strive in order to «greatly simplify the publication of contracts and increase the effectiveness and transparency of procurement procedures».

Digitizing procedures means managing the entire lifecycle of public procurement, supporting contrac-

ting stations and economic operators in managing all phases of the bidding process, from the drafting of documents to the management of the IT file, from the exchange of communications, to access to documents.

By way of example, e-procurement platforms must support the following functionalities: drafting of the contracting determination; drafting and publication of the call for tenders and tender documents; compilation and submission of bids; conducting communications related to the constitution of the tender committee; conducting the activities of the selection committee; conducting public sessions in telematic mode; drafting or acquiring minutes of the sessions; calculation of technical and economic scores, as well as anomaly thresholds; drafting, acquisition and notification of exclusion orders of competitors; verification of participation requirements; formation of the final ranking list, acquisition of the award decision and fulfillment of post-information obligations; drafting and acquisition of the contract; business continuity management; fulfillment of contractual obligations.

In recent years, there has been no shortage of difficulties in implementing the digitization obligation arising from EU legislation, especially in smaller contracting stations with inadequate organizational, legal, economic and IT expertise.

However, having overcome the difficulties, digitization of procedures for awarding and managing public services would allow all stakeholders to benefit: the contracting authority, tender operators, workers and end consumers.

In this section, we will try to understand the role of blockchain in the digitization of public procurement and what positive spin-offs there may be for workers.

Blockchain is one of the tools that allows for the

digitization and thus automation of some tender procedures: it is particularly used in the pre-adjudication and adjudication phase because it allows for the management of the steps in total transparency, protecting the confidentiality and authenticity of the bids and making the evaluation process transparent.

In this sense, one benefit relates to combating the phenomena of corruption and undue influence on the bidding process both through the recording of each step in the network according to a chronological and traceable order guaranteeing the immutability of the data (for example, dossiers once submitted and recorded can no longer be tampered with), and through the increase in the audience that can fulfill a peer-to-peer control role on the regularity of operations and the integrity of administrative documentation, including the unchangeability of bids.

Every transaction initiated within the blockchain (organized into interconnected blocks) must be recognized and verified by the network itself. Each block in this chain must first be verified and validated by participants in the blockchain, thus creating a network that ensures widespread traceability and verification of all transactions/passages.

It also results in an acceleration of the tender process, as automated steps limit the arbitrariness of the awarding committee. In the U.S., for example, the General Services Administration (Gsa) has begun studying blockchain to speed up the contracting process under the FASt Lane program and achieve an adjudication within 34 days.

Another element that should not be underestimated is its contribution to reducing information asymmetry between government and economic operators. In fact, blockchain, by cross-referencing and interconnecting

databases and registers, facilitates the mechanism of verification of competitors regarding data and documents related to the general, technical-professional and economic and financial requirements necessary to participate in the tender and perform the service.

Nor should the ability to immediately identify anomalous bids be underestimated, through the triangulation of data useful for assessing the congruity, seriousness, sustainability and feasibility of the bid (for example, in terms of the incidence of labor on the contract).

Automating the award phases protects contracting stations from exposure to the risk of litigation, which is why it is precisely this phase that has been the focus of public decision makers.

But a blockchain can and should also be applied to the pre-award and post-award phases.

For example, blockchains can be used in the phase of needs assessment, which is often overlooked and underestimated with the inevitable repercussions on the budget allocated to the management of the service/work, as well as it can be used in the phase of drafting the tender notice, to ensure the application of all regulatory or covenant derived clauses established *a priori* (see for example the memoranda of understanding signed by trade unions with contracting stations to guarantee additional protections for workers compared to regulatory provisions).

Crucially, it would also be applied at later stages, and in particular during the execution of the service itself, where the blockchain can serve a certification function to protect the application of regulatory and contractual provisions and the fulfillment of obligations arising from the contract (for example, with regard to the proper application of the safeguard clause to guarantee the continuity of employment of personnel previously

employed in the contract; the adoption of appropriate health and safety measures; the adoption of anti-discrimination and anti-violence measures; the implementation of mandatory training; the fulfillment of wage and contribution obligations; and so on).

In the execution phase, it can also serve a remedial function for the violation of these obligations to the detriment of the workers involved. Indeed, it could constitute a wake-up call that activates all responsibilities on the part of the contracting authority, the awarding body and the subcontractor, if any, as well as all public bodies in charge of control and supervision (welfare and social security institutions, bodies for the prevention and contrast of illegal practices, unregistered labor etc.).

How? Through so-called "smart contracts", which are agreements transposed into computer code and embedded in a blockchain. The smart contract is a self-executing agreement, written in a code that defines how certain tasks are to be performed and the consequences of doing or not doing certain things: it makes use of an algorithm that gives "IF-THEN" instructions, i.e. IF a condition occurs, THEN a certain action is taken.

Smart contracts contain both the clauses and the operational actions to be implemented if the conditions in them are met. They are capable of verifying the occurrence of certain contractual conditions and automatically executing the resulting intended actions.

They can, for example, release payments if the contractor meets obligations and deadlines, or they can blockchain it to the point of intimating termination of the contract if conditions are not met, or again, they can trigger joint and several liability on the part of the client if the contractor fails to meet payment deadlines

to employees or on the part of the contractor if the subcontractor fails to meet its obligations.

The blockchain can in this sense give visibility to a process, but it is good to keep in mind that it executes the instructions assigned to it by the party programming it. So the issue of who participates in the process of building the algorithm and the process of collecting, validating and processing the data is not neutral or irrelevant. Computer scientists say "garbage in, garbage out" to mean that it is the input that determines the quality of the outcome: poor quality input produces poor quality outcomes. The blockchain itself does not guarantee the quality of the data: it is a machine that detects what you tell it to detect and acts on the commands you give it. It is the purpose we intend and according to which we program the technology that determines the results.

For the data to take into consideration the rights of workers, the participation of those who represent their interests is not indifferent. The union, guarantor of the rights and protections of those employed in procurement, is an entity that must be involved to ensure that the quality of working conditions is the subject of data collection (and possible remedial action), and that the qualitative and quantitative data collected can truly offer accurate and reliable information.

Digitizing a process means establishing in advance, in advance, the rules of the game and making sure that they are followed, failing which corrective actions are automatically triggered. And by rules of the game we must also mean that set of regulatory and contractual provisions to protect labor, including union agreements with contracting stations aimed at promoting labor sustainability through the identification of rewarding criteria, robust and cogent safeguard clauses

in management changes, countering contractual dumping, definite timeframes and accountability for the payment of wages and contributions, clear measures against bullying and violence in the workplace, provision of continuous training, tools aimed at countering contractual dumping and irregular labor (e.g., the IT tools for automatic monitoring and recording of authorized attendance at construction sites); countering the speculative use of subcontracting, and so on.

If one of the inherent characteristics of blockchain is its ability to activate broad, participatory, decentralized and democratic control processes, the potential it can express in terms of labor protection is enormous and needs to be explored.

It can have a social function, countering corruption and protecting quality work and rights in the head of the individual, but for it to translate into action what is now a potential, there needs to be an intervention by which the nodes of the blockchain, that is, the participants in the blockchain, are identified and regulated, and participatory processes are activated in the decision-making and management mechanisms inherent in the identification, detection, validation, monitoring and evaluation of data.

2.3.
Sustainability of corporate supply chains. Protections and rights for outsourced and tertiarized workers
Stefania Radici

When we talk about supply chains, we know that there is no unitary ownership: there is no single company that controls all stages of the production process. In the supply chain there are several economic entities that have business transactions with each other. However, there is organizational unity or linkage of the production process, and the multiple labor relations, although traceable to different employers, constitute a single organizational substrate on which the supply chain stands.

A supply chain is socially sustainable to the extent that those who work in it operate in decent conditions: this means that they have the right to a fair wage, the right to join a trade union, the right to collective bargaining, the right not to be discriminated against because of the color of their skin, sexual orientation and gender identity, age, religion, political orientation, the right to a safe and healthy workplace, the right to adequate protection and social assistance in case of illness or injury, and the right to parental protection.

The lead or contracting enterprise is the entity called upon to prevent violations from occurring along its supply chain and to take action to restore sustainable working conditions. Outsourcing the stage of a production cannot mean, in fact, for the enterprise to outsource responsibility for how a good or service is

performed only because it is performed by others. Nonetheless, the exercise of this responsibility is not in fact free of loopholes and shady practices.

There are 320,000 multinational groups in the world (United Nations Conference on Trade and Development data) with a total of 1,116,000 subsidiaries employing some 130 million workers, and controlling 80 percent of international trade.

The top 200 alone contribute 14 percent of the turnover of all multinational corporations.

According to elaborations by the New Development Model Center, over the past 15 years (from 2005 to 2020) the turnover of the top 200 has grown by 60 percent. Employees have also increased, but by 42 percent. This is a differentiated trend that has already been seen since before 2005 and is due to the fact that while companies used to tend to integrate vertically, so as to control all stages of production, today they prefer to outsource as much as possible, possibly to countries with low wages and more permissive legislation, in order to reduce their production costs.

For several years we have witnessed relocation processes, in recent years outsourcing has increased. Processes, aimed at lowering production costs. It thus happens that workers in the core business are better protected than workers on the margins of the supply chain.

The 2021 Human Rights Report of the International Trade Union Confederation yielded some alarming data: 87% of countries violate the right to strike, 73% in Europe; 79% violate the right to collective bargaining, 54% of which in Europe; 74% denies the right to form or join a union, with repeated intimidation when not harassment, 41% of these countries are in Europe; 65% restricts access to justice for workers,

34% in Europe; increasing number of countries denying or restricting freedom of speech and assembly (64 worldwide; 22% in Europe).

The countries where the greatest violations occur are Bangladesh, Belarus, Brazil, Colombia, Egypt, Honduras, Myanmar, the Philippines, Turkey, and Zimbabwe. But this by no means implies that in other countries where more advanced labor protection laws are in place there are no violations to the detriment of workers in the supply, contracting or subcontracting supply chains.

In Italy, for example, between Bergamo and Brescia, in the so-called Rubber Valley, where gaskets for cars are produced, many women, migrants, receive work to be done at home, with materials that are harmful to their health and without protective equipment, by firms that subcontract (despite the fact that there is a union agreement prohibiting this) for contracting firms. Seals that then end up in luxury and very expensive cars. Also in Italy, we record from north to south several episodes of illegal recruitment (*caporalato*) in the harvesting fields, the weak link in a supply chain that from the field to the supermarket shelf sees processing firms and organized distribution get rich.

Therefore, the problem is not so much "where" production takes place, because there are no immune places, but "how" production takes place, based on what rules, on what models the supply chain is governed, and what kind of responsibility companies that use third parties to produce put in place, what kind of due diligence on human rights they exercise.

Mere corporate social responsibility, understood as a set of policies or practices that are voluntary, unilateral and self-managed acts of the company, is not enough. The company cannot decide to bestow responsibility or

not: responsibility cannot be "octroyee", that is, granted from above. The accountability of a business is bound by, and thus is determined by, the rights, freedoms, and interests of those individuals who are impacted by the actions of the business itself-the workers, including those in the supply chain, the surrounding community, the community to come. They are the ones who are entitled to the responsibility of the enterprise. The enterprise has a duty to be accountable.

However, even when it is exercised, the risk that it responds more to the logic of aesthetics or social cosmetics than to actual willingness and consequent commitment to prevent and counter violations on workers' rights is high, and the effectiveness of certain actions reveals this.

When in 2013 there was the collapse of Rana Plaza in Bangladesh (1,134 casualties) or the year before the Ali enterprises fire in Pakistan (250 deaths), not only did what everyone already knew emerge, namely that in the fashion supply chain those who produce clothes often operate in undignified working conditions, but those massacres showed in a plastic way the vacuity of certain corporate social responsibility policies. We are talking about textile factories certified as safe by auditing firms, whose work had been commissioned by the big brands that produced there. Even today, no brand or auditing firm has been held responsible for the loss of those lives.

What is needed is what is known as due diligence, i.e., action to identify, cease, prevent, mitigate, remedy, monitor, and account for the adverse impact that one's operations or those of its business partners may have on human rights (including social and labor rights) or the environment.

The United Nations, as well as the International

Labor Organization and the Organization for Economic Cooperation and Development), have for some years been committed to promoting due diligence by multinational enterprises:

- The Ilo's Tripartite Declaration of Principles on Multinational Enterprises and Social Policy of November 16, 1977, as amended in 2017, provides social policy guidelines for governments, social partners and enterprises to foster a climate that leads to decent work, inclusive economic growth and sustainable development;

- The UN Guiding Principles on Business and Human Rights (2011) provide an international standard for states and companies to refer to when managing the risk of adverse human rights consequences related to business activity;

- The UN Global Compact (2011) is an initiative to which companies and entities that comply with international labor standards are invited to adhere: freedom of association (Ilo no. 87) and the right to collective bargaining (Ilo no. 98); elimination of all forms of forced or compulsory labor (Ilo no. 29 and 105); elimination of child labor (Ilo no. 138 and 182); and elimination of discrimination (Ilo no. 100 and 111). In addition, the GC incorporates the Sdgs of the 2030 Agenda.

- The Oecd's Guidelines for Multinational Enterprises (2011) are recommendations endorsed by 48 governments (non-Oecd governments have also joined) for responsible business conduct, including in relation to supply chain entities on issues related to human rights (including social and labor rights), the environment, anti-corruption, consumer protection, competition, taxation etc.

However, these are invitations, recommendations,

voluntary guidelines, soft law actions addressed to businesses. These are not sufficient either, because they do not bind, but invite.

European and international trade union federations have tried, where conditions were right, to redirect discretionary forms of Csr toward industrial relations in a way that makes them more binding. Transnational Company Agreements, while lacking a legal statute to make them directly enforceable (in fact, they require a national implementing company agreement), have in many cases served to bind multinational groups to verify compliance with international labor standards throughout their supply chains and even in countries that have not ratified the relevant conventions. The Ilo-EC database (https://ec.europa.eu/social/main.jsp?catId=978&langId=en) has some 350 agreements.

Meanwhile, within the UN since 2014 there has been discussion of a binding treaty on multinational enterprises and human rights (as of August 2021, the third draft has been reached) and within the Ilo of a convention on decent work in supply chains on input from the resolution adopted in 2016 by the International Labor Conference.

At European level, following the adoption on March 10, 2021, by the European Parliament of a resolution calling for the Union to urgently adopt binding requirements for companies to identify, assess, prevent, cease, mitigate, monitor, report, account for address and correct potential and/or actual negative impacts on human rights, the environment, and good governance in their value chain, the legislative process has begun, leading the European Commission to publish a proposal for a Directive on Corporate Sustainability Due Diligence on February 23, 2022. The Commission's proposal requires companies to identify risks

and, where necessary, avoid, stop or mitigate the negative effects of their activities on human rights, such as child labor and worker exploitation, and on the environment, such as pollution and biodiversity loss. The subjective scope is delimited as follows: a) EU companies: large companies (more than 500 employees and a worldwide net turnover exceeding 150 million euros); other companies operating in certain high-impact sectors (e.g., mining, textiles, etc.), which, while not meeting the thresholds of Group 1, have more than 250 employees and a worldwide net turnover of 40 million euros or more; b) third-country companies active in the EU with a threshold of turnover generated in the EU in line with the above requirements. The proposal applies to the operations of the companies themselves, their subsidiaries and their value chains (consolidated direct and indirect business relationships). In the facts, the directive has disappointed expectations, not only because of the very narrow range of companies to which it would apply, but also because the focus resides on obligations of means (e.g., establishment of plans, code of conduct) and not on an obligation of results (e.g., stopping negative impacts in all circumstances), and it provides little support for victims to access justice.

As this is not the place to explore this topic in depth, let us focus on blockchain and how it can support Responsible Business Conduct.

The European Commission itself, in publishing the results of its study on "Due diligence requirements through the supply chain", referred to blockchain as a technology that can give visibility to the supply chain. It is self-evident to say that the longer, more fragmented and more complex a supply chain is, the greater the risk of grey areas where violations lurk. Blockchain

can illuminate the shadowy areas because it can track every step.

The blockchain is a chain of blocks. It is a public, decentralized, distributed ledger that leverages peer-to-peer technology to validate transactions between two parties in a secure, verifiable and permanent way that is immutable. Underlying this is a consensus protocol shared between the parties, which determines how each transaction is validated. A validated operation is a block that is added to the chain. Each node is called upon to see, check and approve all transactions, creating a network that allows traceability and immutability of all transactions that are recorded and become part of the "chain".

More and more companies are using it in supply chain management, particularly for the purpose of tracing the history of a product. Its application allows the tracking of products, from raw material sourcing to processing, packaging and distribution: see, for example, the initiatives of the Responsible Sourcing Blockchain Network joined by companies such as Volkswagen or Ford or Tiffany's Diamond Source Initiative, which through blockchain certifies that it does not use raw materials extracted in places besieged by civil conflict or with the use of child or slave labor, or even Foodchain, which offers a tool for the food industry to track food goods that end up on supermarket shelves, or even other initiatives aimed at certifying product quality (e.g., Nastro Azzurro's homegrown corn or CoopItalia's organic eggs); still, fashion and luxury goods companies are using it to combat counterfeiting or certify transfers of ownership. There are also those who go so far as to use blockchain to witness the quality of working conditions in a production process: for example, Levi's has carried out a project with Harvard

to detect information on health and safety conditions in its factories; De Cecco has applied the blockchain-based MyCare system that provides verification of the actions put in place to manage and mitigate the risk of Covid-19 infection in business processes.

More than experiences they are experiments and if you go to analyze you find gaps and flaws, because it is true that blockchain can give visibility to the steps of a chain, of a supply chain, but it gives visibility are to what it is asked to give visibility to.

This is where the union steps in or should step in: because if data on workers is being collected and processed, their representatives must not only be given all the necessary information about who collects, what they collect, how they collect, when they collect and how they use/handle/process the collected data etc., also to safeguard the protection of workers' data enshrined in the Gdpr, and be put in a position to discuss any anomalies or critical issues (which at present is not being done but should be done), but even more, they need to be able to play a stronger role, to protect a company's direct and indirect workers, operating at the same site as the company, in smaller and poorly unionized entities and/or in countries far away and marked by legal systems that are not very attentive to workers' rights. And this they can only do if they participate in the process from start to finish.

Participating in the process means:

a) EX ANTE: negotiating so-called smart contracts. A smart contract is a self-executing agreement written in computer code that defines how certain tasks are to be performed and the consequences of doing or not doing certain things (applies "if-then" algorithmic instructions). Legal scholars define them as agreements whose execution can be automated and enforced wi-

thout human control: once a smart contract has been initiated, it must be executed. And then a company's relationships with its suppliers, distributors, contractors could be subject to the conditions inscribed in the algorithm of a smart contract. The moment those conditions are met, the transaction is automatically authorized. Otherwise, an alarm bell is rung and remedial/corrective solutions initiated. Conditions placed on the signing of a business partnership with an entity operating in countries with high human rights violations could be the application of Ilo Conventions pertaining to core labor standards even if the foreign country in which the partner operates has not ratified them; stable employment with fair remuneration and recognition of welfare and social security benefits; compliance with occupational health and safety measures; and so on; conditions placed on the signing of a supply or private contract in the same country in which the company is based could be compliance with regulatory and contractual provisions attributable to the relevant sector, compliance with a safeguard clause to protect workers in the case of successive contracts; the provision of continuous and certified training; as well as reward systems related to additional measures over and above regulatory requirements, aimed at improving the quality of working conditions. Negotiating the contents of smart contracts in advance with labor representative organizations would ensure the identification and acquisition of evaluation parameters, i.e., objectively verifiable indicators inherent in the quality of working conditions as a *conditio sine qua non* for the execution of a transaction with a business partner.

b) IN ITINERE: exercise the right to information and consultation and participate in the data validation process, to ensure that data are reliable and are read,

handled and processed for the sole purpose of the survey and not for any other purpose, to protect the worker's right to confidentiality. Proving the quality of working conditions is never an easy task, and not because there are no qualitative or quantitative elements/indicators that can prove it, but because if the party providing the data is the employer, it is unlikely that he or she will report irregular work or non-compliance with legal or contractual obligations; if the party providing the data is the worker himself or herself, we cannot fail to take into account that in an employment relationship there is no equal relationship and that certain workers are particularly vulnerable (e.g. precarious; undocumented; migrants; workers operating in at-risk areas etc.). This is why worker representative structures, which hold information, must be involved and be nodes in the chain (as well as other individuals inside or outside the company, such as whistleblowers or human rights associations).

c) EX POST: Participate in the process of data processing and evaluation and, if necessary, share and negotiate appropriate measures to restore a framework of legality in compliance with applicable regulatory and contractual provisions. There can be no participation without recognizing the worker's right to express his or her position in decision-making processes and without putting him or her in a position to do so. This means not only conferring the right to negotiate economic and normative treatment, but including the worker's perspective in the development and implementation of any strategy that may impact employment, direct and indirect, to guarantee the social sustainability of processes.

It is true that blockchain can give visibility to complex supply chains, local and global process transitions,

but it is good to be aware that it shines a spotlight where someone determines it should shine. It has the potential to identify risks to human rights, including labor rights, it has the potential to promote responsible and sustainable business conduct, it has the potential to promote social rights due diligence within a company and in the network of its business relationships, but to do that there has to be the will of those who program it and above all there has to be the will to prevent risks: it is not enough to give ex post visibility to a production cycle but to put in place all the necessary actions *ex ante* and *in itinere* so that that production cycle is socially and environmentally sustainable.

And the quality and quantity of the entities in charge of monitoring and certifying the data, as well as the space and timeframe for participation and involvement of workers' views in companies' decision-making processes, are key elements in making blockchain a driver of quality work and a tool for workplace democracy: worker representation structures in the company, trade unions, European Works Councils-everyone must play a role.

The union's goal is to protect labor, to represent, that is, according to the etymology of the term, to make present what is unseen, the labor hidden in the ganglia of certain multisectoral and multinational supply chains, to include fragilities within a system of rights and protections, to promote sustainable development models that do not dump the costs of unscrupulous and unregulated competition on the workforce. If blockchain can be a tool to do this, then it is worth understanding how it works and exploring its capabilities, aware, however, that a tool to protect labor can only include the involvement of workers and those who represent them.

If there is the will of the company and the involvement of workers, blockchain can really become an effective and efficient tool for due diligence and responsible business conduct, a tool to counter labor exploitation, illegality or irregularity in labor relations, and social and environmental sustainability. It can have a social function, because it can strengthen democratic mechanisms, participation, and widespread control, but in order for it to translate into action what it is in power, it is necessary that: a)there be control over the quality and accuracy of the information fed into the system (taking into account the position of power of some and the position of vulnerability of certain others); there be participatory and democratic spaces and mechanisms useful for sharing the criteria for identifying, detecting, validating, monitoring and evaluating data.

Transparency is preparatory to social accountability, an accountability that is effective, that is not downstream, but upstream, in sharing objectives in line with a sustainable development model. And in democratizing the governance of the industrial system, blockchain technology has or can have a strategic role, provided that the instructions given to it are functional to that outcome.

2.4.
Public welfare tool
Stefania Radici

Although in the exploration and experimentation phase, blockchain is a digital innovation that can have countless social applications, also in the public sector.

Many public administrations in Europe, with input from the European Commission's European blockchain service infrastructure (Ebsi) project, are launching experiments to manage public services to citizens. The goal of the European Union is to interconnect the databases of all institutions responsible for the provision of public services so that the worker, who moves around Europe, can have easy and fast access to the services he or she is entitled to.

We are far from Estonia, where almost all operations related to the use of public services are accessible through a single digital platform. Citizens, whose data are stored in distributed and interconnected records, equipped with a digital identity and digital signature, can remotely access most public services. The only acts that cannot be carried out digitally are marriage, divorce and buying and selling real estate.

More and more countries are asking themselves how to adapt their regulatory and organizational frameworks to the management of digital public services, starting with the management of public welfare. The main applications concern the field of health and education.

In healthcare, public administrations are working on the electronic medical record, to collect health data, accessible only to authorized figures, able to keep track of the patient's clinical history, monitor his vital signs in real time, transmit information securely and avoid fraud or manipulation.

In the field of education, we have already talked about the digital training dossier, to register and certify the acquisition of qualifications and skills.

Debates and experimentations involve the provision of social security or welfare benefits: for example, to register and manage the preparatory steps of the allocation of disability allowance; to check the accrual of pension requirements in the hands of the individual worker, even if at different social security institutions; to verify the requirements for access to unemployment benefits or any other social safety nets etc.

Also in the field of active labor policies (but we will see it in a dedicated paragraph) there are different analyzes and experiences: the so-called curricular file of the worker with the work history, training and skills, employment status, any disadvantage factors, the receipt of income support treatments is a based tool on blockchain technology that can be used for the matchmaking operations between job supply and demand.

Little or nothing in the field of social policies, of which, as usual, value is underestimated in the context of an overall growth of the economy, of social inclusion and of employment in particular of women.

In all the aforementioned areas, the blockchain, by interconnecting the databases of different institutions, allows the rapid acquisition of information necessary for the provision of services.

It is in particular, in the context of the provision of services for passive and active labor policies, that the

trade union organization and/or workers' represent-atives at company level must be a node in the chain, both because in many countries they are called to exercise a role in examining situations of company difficulty and sharing paths for activating social safety nets to protect employment, both because these in-come support processes are increasingly accompa-nied by the definition of paths for the professional retraining of workers, functional to avoid obsolescence or oversubscription.

Being a node of a blockchain chain allows us to de-fine in advance the rules for how to access services and to ensure that these services are provided in an appro-priate manner.

2.5.
Corporate and bilateral welfare tool
Stefania Radici

Blockchain is not only used for public welfare. There are applications for private welfare as well. In this context, it is not a tool to interconnect databases, but is used by companies to disburse wallets or portfolios containing cryptocurrencies to employees to purchase goods and services.

This is a very different use, one that recalls one of the more traditional applications of blockchain, namely transaction payments, but does not actually exploit the full potential it could express in this area.

Let's proceed in an orderly fashion.

More and more private welfare services are being provided alongside public welfare. While the latter are intended to enable citizens to exercise their rights, the former are provided for the purpose of improving the worker's living conditions, and thus complement without ever replacing public welfare.

The issue of welfare and a new balance between work and private has become increasingly central with the pandemic and the adoption of remote work. In this context, the importance has grown for companies to leverage welfare plans capable of taking into account the new needs of workers, fostering greater satisfaction and productivity. A path that has already been taken for several years, favored by tax incentives put in place by national legislators.

According to the Censis-Eudaimon report, in Italy, 82.3 percent of employees involved in the survey believe they deserve more in their jobs; 6 out of 10 say their pay is not adequate for the work they do. Workers are demanding more income and more welfare, particularly for health and childcare services.

The 2021 Sme Welfare Index report notes that during the pandemic, there have been numerous company initiatives in the areas of health care (diagnostic services for Covid-19; medical consultation services including remote, new health insurance), work-life balance (more flexible hours, remote training activities, help with child and elderly care), support for workers and families (temporary pay increases and bonuses), and/or support for children's schooling.

Increasingly, companies are providing employee benefits and services, and increasingly the union is claiming bargaining spaces for corporate welfare institutions.

The Di Vittorio Foundation, Cgil's research center, in an interesting report on company-level bargaining in Italy during Covid, mapped and analyzed worker welfare agreements and work-family reconciliation measures. Among the most interesting agreements that provide for welfare, the report points out that of the Poste Group, which prepares an audit of workers' needs, or the Swedish company Ikea, which provides for the advance payment of thirteenth and fourteenth month salary, and Vodafone's supplementary agreement, which establishes arrangements with daycare centers to facilitate the reconciliation of male and female workers with their young children.

Supplementary agreements also include clauses dealing with leaves of absence and special leaves for workers with minors, other parental leave tools (such as

the "solidarity hour fund"), and experimental forms of solidarity leave. These mechanisms allow workers to donate a portion of their accrued and unused leave (or vacation) to colleagues unable to work due to organizational reasons caused by the pandemic. Additional contracts provide for the extension of smart working for pregnant women, parents with young children or on remote schooling, and frail workers. Among the most active companies in this field are Gucci, Barilla, Ubi Banca, Luxottica, Enel, Whirlpool Emea, Philip Morris, Electrolux, Olivetti, Terna Group, Mediatica, and Telecom.

Companies have the option to introduce welfare measures for their employees even without the involvement of the social partners, through instruments such as company regulations or unilateral act. Having an accurate estimate of the numbers and content of these regulations is quite complex, as there is still no database that aggregates the information, which is often limited to specific local areas and/or individual sectors/departments.

In the field of welfare, a strategic role during the 2020s was played by bilateral bodies and supplementary health funds, which very often introduced additional treatments in the event of Covid infection, hospitalization or quarantine, and which cover a broader range of a company's workers, i.e., workers in companies belonging to an entire sector.

In this context, what role can the blockchain play?

A blockchain can support corporate and contractual welfare by fostering the participation and involvement of workers at all stages: a) in the design phase of welfare interventions and thus the collection of data useful for defining needs; b) in the phase of worker profiling and personalization of the welfare intervention;

and c) in the operational phase of the very management of access to services.

How to combine this use of blockchain technologies for participatory purposes with the union's representative role?

Once again, objectivity lies in the data but not in the interpretation of the data, so the role of the union, as an actor participating in the blockchain and a node in the chain, is to ensure not only that the data collected is not used for improper purposes, not only to prevent benefits and services to the worker from being disbursed in a discriminatory manner, denied in order to punish or harass, and awarded in order to reward and distinguish, but also to ensure that data collection can be the element that inspires tailor-made, customized services to be shared with workers' representative structures, in content and in application/management methods.

In short, combining the blockchain's cognitive and participatory capacity with the union's role in representing and protecting its interests is or can be the way through which to "democratize" corporate welfare tools, encourage their negotiation, verify the fulfillment of what is shared through agreements, and assess their impact on employee satisfaction and well-being.

2.6.
Blockchain to counter gender inequality
Stefania Radici

According to the World Economic Forum's Global Gender Gap report, to close the gap between men and women in the workplace – worldwide – at the pace we are marching at will take just over 267 years. By 2021, only 43.2 percent of working-age women globally are employed, in contrast to 68.6 percent of men; trapped in low-skilled jobs, underrepresented in management roles (only 27 percent of managers are women), often employed in discontinuous and part-time jobs, paid less than men, with the resulting repercussions on retirement outcomes.

The pandemic has affected women more than men, and certainly not because the virus "discriminates", but because the social and economic system had done so, causing inequalities that the crisis has only exacerbated. First and foremost, because of the sectors to which they are most relegated: in particular, the hospitality services sector, such as tourism, and personal care, traditionally with a high concentration of female employment and by their nature deliverable exclusively in close proximity, were immediately and for a long time inhibited by measures to contain the contagion, leading to the expulsion of women from the labor market. Other sectors have been able to benefit from remote work, and have retained pre-pandemic levels of employment and income.

Widespread phenomena of horizontal segregation, confining a large portion of women's employment to low-skilled, low-paid sectors with a high concentration of part-time and fixed-term employment relationships (see 2021 Report on gender equality in the EU), has particularly exposed women to the effects of the crisis. This was compounded by the fact that in pandemic times, the increased family responsibilities resulting from the suspension of school activities and the contraction of family and home care services derived from the adoption of social distancing measures increased the level of women's inactivity in the labor market.

And women, who as a result of the emergency measures have been able to continue to work remotely, have been forced to perform household management tasks and child and elderly care tasks to a greater extent than men, due to the unequal distribution of family responsibilities, with the result that reconciling family and work time has become even more complicated than it was.

In April 2021, the European Parliament and the Council published a proposal for a Directive to strengthen the application of the principle of equal pay for men and women for equal work. Article 4 requires all States in the Union to take necessary measures to ensure that employers have pay structures consistent with the principle of equality. Chapter II contains rules on pay transparency, which is essential to prevent or identify possible discrimination, and regulates the obligation to inform about pay levels even before employment and to provide information to their male and female workers on: the criteria used to determine pay levels and career advancement (Article 6); their own (individual) pay level; and the average pay levels of those doing the same or equally valuable tasks (Article 7).

Additional disclosure requirements, concerning the wage gap between male and female workers, are provided for employers with 250 or more employees (Article 8). Most significantly, Article 11, concerns dialogue with the social partners and states, «Member States shall ensure that the rights and obligations arising from this Directive are discussed with the social partners». Trade unions may be entrusted with «the implementation of this Directive, where the social partners jointly request it, and provided that the Member States take all necessary steps to ensure that they are always in a position to guarantee the prescribed results».

Positive that the Directive's area of application covers all workers, not just those with permanent employment contracts: «This Directive should apply to all workers, including part-time workers, fixed-term workers or persons who have a contract of employment or an employment relationship with a temporary agency, who have a contract of employment or an employment relationship as defined by law, collective agreements and/or practices in force in each Member State, taking into account the case law of the Court of Justice of the European Union».

The issue of gender inequality also has to do with stereotypes that lead to discrimination and result in horizontal and vertical segregation in employment.

So, beyond regulatory provisions and the fact that labor equality between genders is recognized and protected by the legal system, union action has tried through collective bargaining, and in particular company-level bargaining to reduce gender inequalities and identify shared tools of work-life balance that would make labor equality viable, starting with the retention in the labor market of female workers who

have more discontinuous careers due to care work, poor sharing and devaluation of care activities.

What can blockchain do to address gender inequality in the workplace?

In academic literature, there are many studies examining the role of blockchain technology in supporting gender equality and social inclusion. All of them assume that such technology ensures transparent and traceable procedures and therefore through it it is possible to prevent, detect and eventually resolve gender discrimination.

Let us be clear, however, on one point: technology itself does not eliminate discrimination. It can also exacerbate them. Technology can counter gender disparities only if it is carefully programmed to do so. It has the potential to counter all inequalities, regardless of the factor from which it originates, as even the United Nations noted in 2018 (Blockchain and Sustainable Growth, United Nations).

With smart contracts, rules for measuring existing gender biases in the workplace can be easily outlined so that the blockchain can detect them, acquiring and exchanging data transparently and securely.

However, if there is a lack of awareness of the problem, no technology can bring it out and counter it; rather, the risk is to institutionalize discrimination and exacerbate inequality.

That is why it is not possible to leave it in the hands of the company to check itself, it is not possible to think that diversity is an issue of social responsibility in the hands of the company, it is not possible to think that it is a prerogative of the company to be managed unilaterally and with an almost paternalistic approach. Diversity is a necessary policy that pertains to the quality of working conditions, which must be discussed

and shared with those who represent the interests of female workers.

In defining the algorithm of a blockchain, worker representative structures can only take on a negotiating role to establish *a priori* what the criteria are for the collection and processing of data that will inform gender equality. Just as they cannot but be nodes in the chain, called upon to certify the data collected and be actors involved in the evaluation of that data and in the planning of appropriate policies to counter any gender gap phenomena.

An algorithm that intends to detect gender discrimination in the workplace should, for example: detect and certify objective data on staffing situation, composition, employment levels, careers, remuneration, equal pay for equal jobs, working hours, recognition of productivity bonuses, use of permits, leaves of absence, parental leaves, early retirements, retirements, social safety nets, and layoffs; detect and report anomalies between genders in order to remedy them; detect and process data relating to the need of female workers for services and measures that allow optimal time management and activate tools aimed at promoting organizational well-being, starting with the organization of work time and working arrangements, the enhancement of human resources, work-life balance and promotion of a culture of sharing and equitable distribution of family workloads between genders.

On all this, it is not a machine that decides, but stakeholders sitting at the negotiating table. A machine acquires data, points out anomalies, and activates remedial actions, executing in computer language, codified, what has been decided elsewhere.

2.7.
Human resource management in business: the use of blockchain from recruitment to retirement
Monica Ceremigna[*]

We have seen so far how the transversal nature of the blockchain tool makes it increasingly applicable and usable in human resources and labor relations.

The potential for this technological application is, in theory, to speed up and simplify the validation and certification of personal data (CVs, professional and educational training, skills and experience) in order to easily and quickly carry out all steps related to personnel selection, career advancements, competitive examinations, to match labor supply and demand in real time, to activate training, qualification and retraining programs throughout working life by recording and validating each and every process, and to orient active labor policies and related interventions based on objectively verified needs and requirements.

The constantly and rapidly changing labor market requires not only the possibility of being able to securely and transparently certify qualifications, the stratification of skills and experience useful for matching labor supply and demand, but also information also useful in the transition phases from one occupation to another or for access to welfare or social support safeguards, unemployment benefits, all the way to the recognition of retirement requirements.

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[*] Cgil.

The distribution of information along the supply chain and transparency of records could even ensure its neutrality, eliminating discrimination related to gender, racial background, sexual identity, religious choices, etc. This potential is defined conditionally, since data feed the algorithms underlying information processing also through artificial intelligence systems, but the latter, like the algorithms, suffers from more or less conscious bias, since its development is mediated by human intervention.

A prerequisite is that the enormous amount of data that is transmitted, exchanged, and recorded be secure, traceable, transparent, and incontrovertible. This is where the so-called smart contracts come into play, i.e., agreements that are enforceable for all intents and purposes and that reside and are validated within the distribution chain in encrypted code, therefore not modifiable, which nonetheless allows for the monitoring of compliance with contractual conditions and the execution of transactions for the fulfillment of obligations arising from them. In Italy, Article 8ter of Law 12/2019 regulates "Technologies based on distributed ledgers and smart contracts" to implement Article 41 of Regulation (EU) No. 910/2014 of the European Parliament and of the Council of July 23, 2014.

It seems evident the scope of the possible use, even partial, of this tool, as well as the implications related to the impact it could determine in different areas (confidentiality, exigibility, verification of the identity of the parties, compliance with regulations, etc.) and precisely to study the topic more in depth, since 2018 the Italian Observatory on blockchain policies has been established at Cnel, in collaboration with the Roma Tre University.

Several experiences are already in place in which

blockchain technologies play a leading role in the certification of degrees, publications and skills for access to job positions in the academic field (University of Cagliari), as well as pilot projects promoted by Inps on the European Social Security Code, which by means of the registration in the blockchain of citizens' personal information allows them to be recognized in other European States and access social benefits, or on the use of blockchain in the context of the recognition of legal disability, as well as the platform of benefits for the welfare of casual workers (gig workers) based on blockchain technology.

However, in order to extend such practices, an agreement between the parties involved, i.e., public and private actors, is necessary, and it is therefore urgent for the social partners to be involved in the bargaining of the inclusion of this tool and its practical application in its entirety. As far as the union is concerned, early bargaining, based on the right to information and consultation of workers and their representatives, which is rarely acted upon in this area, becomes decisive for the future development of industrial relations.

This requires a significant investment in training in technological literacy aimed at achieving an awareness and knowledge of the tools and their use, the challenges and opportunities they bring about in daily life, and their importance now and in the future.

Technology can help improve or even correct imbalances and inequalities, thereby advancing people's working and living conditions, provided that the data, algorithms and artificial intelligence systems that power it are impartial, neutral, fair, and transparent.

Innovation in policies, institutions, management models, finance, science and technology can change

history. Digital transformation, if properly governed, can provide unprecedented solutions to address and provide answers to the basic needs of workers, the most marginalized, and the most vulnerable.

2.8.
Labour market activation:
blockchain and new policies
Alessandro Smilari[*]

One of the clearest facts of this decade is that technology is running at a much faster pace than humans. The law must therefore not limit this progress (because that would mean limiting part of human progress) but accompany it in its development. This applies to labour law, which is among the rights most affected (now, but especially in the future) by these technological changes that are taking place this decade. It is not the technologist who has to adapt to labour law (this would be limiting, and perhaps impossible) but it is labour law that has to study every implication, to understand in advance what are the possible developments and advantages of the new technologies, trying to adapt to them to its own advantage.

One of the most important and distruptive technologies that have been gaining ground in recent years is blockchain, best known for its development in the fintech sphere, but with significant impacts in several areas (digital government, public administration, public sector etc.). Starting from the assumption specified above and on how important it is to understand in advance the potential development of new technologies not to be affected, but rather to benefit from them, a question raised in this article is whether the labour

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[*] Fondazione Brodolini.

market, and in particular the management of active and passive policies, can be significantly improved by the implementation of blockchain technology.

To answer this question efficiently, it is essential to have a good understanding of the two main topics of study, labour law on one hand, and technology and its developments on the other. In today's fast-paced and technological world, where everything has to be flexible, it is impossible to think of a labour sector in which passive and active policies are disconnected from each other. The individual has to be supported during the period of inactivity in the labour market, but it is necessary for him/her to engage in training and in finding a new job.

This objective is sought in the so-called "conditionality principle" that bind together active and passive policies.

An objective commonly sought by legislators is to try to reduce technology with IT systems. In Italy, for example, this objective is intended to be achieved by implementing Siupol (Unified Information System of Labour Policies), in collaboration with the Ministry of Labour, the Regions (and the autonomous provinces), Inps, that is the National Social Security Institute in Italy, and Isfol, which is the Institute for the Development of Professional Training for Workers in Italy (Alaimo, 2016). The information contained in the Siupol should then be used as the basis for releasing of a new IT tool, the Worker's Electronic File (Fel), which will contain all the information relating to the worker's training, work experience and use of public benefits (Alaimo, 2016). The file will be «freely accessible, free of charge, through thematic reading methods to all interested parties» (Art. 14, para. 1 of Act n. 150 of 14 September 2015).

The electronic file is considered «an indispensable tool for the usability of the new generation rights of workers and in particular for the recognition of the digital professional identity of the worker» (Ciucciovino, Toscano, Faioli, 2021). However, six years have now passed, and the provision regarding Fel has never been made effective and implemented.

At European level, the potential and development of blockchain technology is increasingly being considered. The Blockchain Institute of Technology defines blockchain as a «constantly growing ledger that keeps a permanent record of all the transactions that have taken place, in a secure, chronological and immutable way». It is called blockchain because each information or record on the ledger is stored in a block linked to the other block through cryptography, creating a chain of information. The information contained in a blockchain is secure because there are thousands of copies of that identical blockchain in various computers, and is immutable, which means that once it is recorded inside, no one can change it at will (you can always trust the accuracy of the ledger).

Many blockchain platforms allow the use of smart contracts within them. A smart contract is a computer application that automatically performs specific actions if one or more predetermined conditions are met (Zheng, Xie, Dai, Chen, Chen, Weng, Imran, 2019). The blockchain itself (and the correctness of the programming code) ensures that what is encoded within the smart contract is respected. Many of the characteristics the blockchain possesses could solve some of the problems that slow down and diminish the effectiveness of the mechanisms of public administration and at the same time «reduce costs and strengthen the trust, traceability and security of the legal, economic

and social relations with the citizen/worker» (Faioli, 2018), thanks to the possibility of eliminating or minimising the intervention of intermediaries acting between the public administration and the worker himself.

In Italy, to assist the intervention of the European institutions, and to research and study the possible applications of Blockchain technology within the Italian labour market (Ziviello, 2019), the Cnel (National Council for Economy and Labour) has set up, in collaboration with the Roma Tre University, the "Italian Blockchain Observatory", with the aim of accelerating the implementation of a unitary information system for labour policies.

A very interesting idea of blockchain applied to the context of public administration is the proposal of social security by professors Michele Faioli, Silvia Ciucciovino and Alessandro Toscano. It is based on the application of blockchain technology to better implement the Fel, introduced by Act No. 150/2015.

Professional identity of the worker is not a static right, but a dynamic one since it varies during the worker's life; for this reason, professional identity must be «evident, reliable, traceable, transparent and unambiguously identified with the person. In the absence of these qualities, portability would be jeopardised, with the same ownership and legal certainty being compromised» (Ciucciovino, Toscano, Faioli, 2021. For these reasons, the Fel becomes a necessary tool to make the worker the owner of his professional identity in the world of work and to obtain, in this way, rights and protections (and more job opportunities due to greater personal clarity).

The blockchain proposal provided is a closed system in which the main labour institutions such as

Anpal (National Agency for Active Employment Policies), Ministry of Labour, Inps, Inail (National Institute for Insurance against Accidents at Work), autonomous regions and provinces, employment centres and Mur (Ministry of University and Research) participate.

The idea is to put inside the blockchain all the documents held by these institutions to allow the creation of a Fel that is as complete and clear as possible, with all the data of the worker in a correct way. In fact, all the educational and training paths, the social security benefits obtained, the social safety nets, the skills and everything related to a correct profiling of the worker will be inserted inside it. In addition, all information will be stored chronologically, respecting the blockchain methodology and thus preventing it from being tampered with by outsiders and giving back the individual's history in the labour market (Ciucciovino, Toscano, Faioli, 2021).

This type of blockchain has a complete social purpose, for this reason it can be nicknamed "social blockchain".

Discussing how important flexibility is, and above all, how fundamental it is that this flexibility should be accompanied by a high degree of security for the worker, we must mention the work carried out by two researchers from the University of Cagliari, Andrea Pinna and Silvia Dibba, who have proposed a blockchain system, called "Decentralised Employment System" (henceforth Des), which seeks to simplify recruitment and job-seeking activities and at the same time to clarify the stages of the employment relationship, discouraging undeclared work (Pinna, Dibba, 2017). On the blockchain both job offers by companies and job applications by candidates can be

published. The blockchain would therefore act as a match between job supply and demand. Before being published, however, the blockchain checks that all job offers comply with current legislation, preventing the possibility of entering into employment contracts that are contrary to the law (Russo, 2021). Through a smart contract, in case of a positive outcome of the selection process, the entire recruitment process would be simplified, providing the relevant bodies with the mandatory communications.

As specified, therefore, blockchain could become the object that allows, first of all, for greater deregulation of the system, secondly, to make it possible to better link active and passive policies, since on the one hand they allow (as seen for Des) a faster placement of the unemployed person in the world of work, on the other hand (as seen for Fel), these blockchains guarantee greater knowledge of one's own know-how and skills and, consequently, of one's rights, also guaranteeing greater job security.

Afterword
The Future is already here!
Taking action through participation in technological innovation processes
Tania Scacchetti[*]

We have been struggling for a long time against a narrative of the union as an old subject, inadequate for the present time, let alone the future one.

A narrative that is certainly not the result of accident, the offspring of a logic geared toward leaving workers to move individually in their relationship with their employer and above all to disentangle themselves from the transformations, rapid and in some cases violent, that this time puts before us.

Instead, the reality is fortunately different than how it is told.

This guide might therefore surprise many observers, if they had the patience and curiosity to research the activities that the union, which has long been questioning the future of labor, actually carries out.

Underlying this guide are questions, studies, and research that are driven by the conviction that either the union and workers, collectively, are able to stand with awareness and participation in the processes of technological innovation or they risk being simply overwhelmed by them. The different perspective lies in considering whether we want to be a subject that has to manage the fallout of transformations or a subject that tries to govern them.

[*] Cgil National Secretary.

Cgil has chosen the second path, which is complex and treacherous but at the same time fascinating and challenging.

Digital technology, software, the algorithm are and will increasingly be tools of intermediation between the worker and the company and at the same time they condition in a decisive way the organization of work, production processes, the system of relationships.

We have learned in recent years that the traditional levels of union activity (national and corporate) are giving way to more global dynamics; that not only the boundaries of physical space are changing but also those of organization; that self-employment and subordinate work are increasingly overlapping; that digitization allows for stronger monitoring of work performance.

If technological intermediation becomes a structural element of the employment relationship, significant issues arise in terms of transparency, privacy rights, bargaining spaces, and the need to counter new forms of control and pressure.

Qualified and strengthened information rights, making algorithmic practices transparent in order to substantiate the right to consultation and informed participation are the keys, the tools of our bargaining action.

The blockchain discussed in this guide is one of the many technologies we are examining. And it is particularly significant and challenging for the union because it is relatable to very different sectors but also to the labor market and contract rules.

It lends itself to certifying in an unalterable and transparent way the validity of different transitions, it can be a tool to combat counterfeiting in industrial supply chains, for traceability in agri-food supply

chains, for certifying workers' education and training patterns, for building the unitary information backbone in the system of matching supply and demand, for certifying qualifying aspects of the worker's contractual status, such as working hours, compulsory training.

It is right then to reflect on its possible use in the procurement chain.

Certainly, especially with reference to the relationship with privacy there remain many questions and possible critical issues to reflect on.

What will be increasingly important is the ability to reduce power asymmetries between workers and businesses, even when a "master" is less identifiable, but instead technology determines processes and relationships. That technology, however, will never be neutral, therefore equipping workers with tools to understand, verify and guide its use is the challenge facing the union.

In the dispute between the doomers who think that technology is inevitably a source of impoverishment of the role of workers and paves the way for a new cyber-proletariat and the hyperliberalists who credit technology with liberation from all constraints and see it as liberation, Cgil has always thought that in the face of transformations it is necessary to build a "union way" forward, one that continues to keep the value of labor, bargaining and social dialogue at the center.

This is why we are also called upon with tools like this, which I hope will be widely disseminated and successful with respect to their importance, to strengthen our trade union practices, to modify them or at least to complement them with traditional ones by acting not only inside companies but also in the physical and digital territory.

Appendix
To know more

Please read the QR code with the camera of your smartphone or with a reading application to view the following research material:

- Blockchain, supply chains and trade union alliances
  Gabriele Guglielmi (Filcams-Cgil)
- The global trade union map to strengthen the trade union alliances
  Davide Dazzi (Ires Cgil Er)
- Blockchain: policy/regulatory framework and confidentiality protection
  Giorgio Verrecchia (Labor lawyer)
- Blockchain in finance
  Alessandra Cialdani, Claudio Cornelli, Anna Maria Romano, Roberto Grosso (Fisac-Cgil)
- Corporate experiences on blockchain applications
  By the project staff

Further materials will be added with a view to creating a digital space that is always updated on the topic of blockchain, the impact on the world of work, challenges and opportunities for workers, the new rights to be obtained and/or exercised and the tools available.

Brief glossary

BLOCKCHAIN: A blockchain is an encrypted digital information system. It is a ledger through which to store, validate and certify information necessary to carry out a transaction between actors. It is a decentralized and distributed database in a peer-to-peer network of interconnected and synchronized nodes: each actor, each for his or her own part, owns a copy of the ledger and contributes to the construction of a blockchain that is temporally and logically connected to each other. Data records are transparent, traceable, unchangeable, and obtainable in a fast, secure, and convenient manner.

NETWORK NODES: participants who have a copy of the register in their computer and help introduce and validate information and data.

PEER TO PEER: also abbreviated P2P or parity/equal network, it is a computer network in which the computers of the connected users act at the same time as client and server. In this way, users are able to directly access each other's computer, viewing and retrieving the files present in the mass memories and in turn making the files they wish to share available.

PERMISSIONLESS BLOCKCHAIN: access to the chain is free and does not require authorization. These are public blockchains, in which anyone can be a node in the network and can participate in the transaction validation process.

PERMISSIONED BLOCKCHAIN: access to the chain is limited to authorized parties. Permissioned in turn is divided into private and public. In the former, reading the log and submitting transactions are actions which are subject to permissions. In the second, all nodes can read data and submit transactions.

SMART CONTRACT: is the transposition of a contract into a code so as to automatically check whether certain conditions are fulfilled and, consequently, automatically execute planned and pre-agreed actions.

ALGORITHM: Finite sequence of operations, also called instructions, aimed at solving a problem. It is a scheme with a finite number of rules that leads to the result after a finite number of operations, that is, applications of the rules. Encoding an algorithm allows a process to be automated.

HASH: mathematical algorithm that transforms any string of information (such as a text into an alphanumeric of arbitrary length). It is irreversible and unique, the same code (hash) will always come out of the same information, but the code cannot be traced back to the information. It therefore serves as a double verification.

CRYPTOGRAPHY: This is the conversion of data from a readable format to an encoded format that can be read or processed only after it has been decrypted.

Bibliography

Please read the QR code to view a constantly updated bibliography: