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B-Skills - Upskilling adults learners with Blockchain basic skills

B-Skills Toolkit

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R1 – B-Skills Toolkit

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Introduction

B-Skills

Upskilling adults learners with Blockchain basic skills

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Aim

This Toolkit is a product of the B-Skills project, an Erasmus Plus Cooperation Partnership Project aiming at upskilling adults learners with Blockchain basic skills.

This document can be used by organisations, trainers or educators in need of planning and implementing a basic training course on Blockchain for adult learners. You can be an expert in adult education methodologies aiming at finding specific resources on how to improve your training offer or you can be a professional working in Blockchain technology that wants to understand how to train adults on this topic.

The B-Skills toolkit gives you specific tools and resources supporting the design and implementation of a training course for adult learners on blockchain. It is designed for giving you a very short and practical overview of the main principles for every section and some resources for going in deep on the different topics.
All the contents are designed having in mind, as final beneficiaries, adult learners with basic IT skills and no experience in Blockchain technology.

It is designed for supporting the creation of contents and activities implementable in face to face, online or blended learning environments.

The Toolkit includes 3 main blocks.

01 The first one describes some General Information you should have in mind before planning such a course like Pre-requisites of the trainers and Pros and cons of blockchain.

02 The second part will give you the main elements for designing and managing a training course for adults on Blockchain from the didactical point of view suggesting methodologies and models to be used.

03 The third block will give you practical sheets on how adult people can take advantage by Blockchain in various sectors of their life and work (banking and finance, healthcare, media, education, energy, Public bodies, Cybersecurity).

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Pre-requisites of the trainer

What competencies should adult trainers have when addressing (non-expert) adults?

Competencies in adult education a trainer should have when delivering a blockchain course for adults.

Based on the ETS (European Training Strategy) Competence Model for Trainers, we can extract the following required main competencies required for trainers and educators, organised into seven main competence areas:

- Understanding and facilitating individual and group learning processes;
- Learning to learn;
- Designing educational programmes;
- Cooperating successfully in teams;
- Communicating meaningfully with others;
- Intercultural competence; and
- Being civically engaged.

Moreover, the SALTO-YOUTH network also offers a self-assessment tool covering these seven competencies. This tool, mainly based on an excel document and forms, allows trainers and educators to use them to evaluate their competencies from a guided and autonomous perspective.

If we focus on adult learners, it is most relevant to be able to:

- Present and transmit ideas in a structured and straightforward way
- Motivate students with different activities and methodologies, fostering discussion and personal thinking
- Show the path of the course before the teaching, make the goals clear to the learner and help them understand why each concept is relevant in the course
- Design educational programmes and adapt the concepts to the different backgrounds and levels of expertise
- Focus on (and use) images, diagrams, and illustrations rather than extensive amounts of text while explaining Blockchain's more complex concepts and terms
- Be patient: Blockchain is a complex subject to understand for even tech-savvy individuals. When teaching non-expert adults, you might repeat the same concept more than once
- Be curious and committed to learning: Blockchain is a relatively new field in constant development. It is essential to keep an open mind and be willing to develop your knowledge further.

What competencies should adult trainers have when addressing (non-expert) adults?

Competencies in Blockchain, the trainer should have when delivering a course for adults

- To have the technical knowledge and basic programming skills
- Understand the essential principles and concepts of blockchain technologies
- Understand the underlying security services and mechanisms required by blockchain technologies, such as hashes, digital signatures and consensus
- Know and understand the advantages and disadvantages of existing consensus mechanisms, such as proof-of-work and proof-of-stake
- Know and understand the differences between public and private blockchain networks.
- Understand the technological challenges of blockchain, particularly regarding money laundering, the cost involved in traceability and scalability of data, and individual privacy
- Have a basic understanding of Cybersecurity and Cryptography
- Understand when using a blockchain makes sense and its most prominent use cases, assessing its feasibility and impact on the application scenario(s), their business model(s) and the sector in general
- Know the Industry: it is essential to stay up to date by reading new articles, blogs from peers, industry experts, blockchain discussions and Q&A sessions.

How can one acquire these competencies?

Earning a university degree with a bachelor's or a master's in computer science is one of the many ways to learn about Blockchain and Cryptocurrency technologies and enter the industry. However, there are other ways of learning beyond the traditional university route. Many Blockchain courses continuously increase in non-formal education in online and offline settings. One can find a basic understanding of the subject in free and paid online courses; for example,

Coursera lists almost 200 courses on Blockchain covering different levels of detail. In addition, other blockchain-related companies offer various free resources to understand the main principles of blockchain and new projects that emerge in this area.

Also, books are a highly recommended source of knowledge since they present information in a structured and knowledgeable way. Some of these books are open access, as well as an online network for practitioners.

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Pros and Cons of Blockchain technology

Why present the pros and cons of Blockchain to adult learners?

Blockchain Technology is a domain developed in recent years that shows potential in many fields, from finance to biology. There are few educational resources around basic blockchain knowledge, yet experts use many coding languages and blockchain ecosystems in different implementation areas, making things even more complicated and challenging.

Due to the complexity of Blockchain function itself and the impact of its implementation on many different levels, people who start to learn about Blockchain should be introduced to an overview and a roadmap of the Blockchain world and its implementations. Furthermore, a roadmap's pros and cons of the Blockchain should also be presented.

How can we present the pros and cons?

01 Using simple examples from nature/society as parallelism

The Greek Blockchain community has created a video explaining how Blockchain works through examples from nature that are more familiar and less complex. The same methodology with simple examples from nature or society can be used for the blockchain's complexity of pros and cons. Also, the visual elements could be a game changer for the presentation. Some suggested tools that can be used to create visual elements could be: Canva, Pictochart, Venngage, Vimeo

Examples: A simple explanation on how blockchain works (You Tube video), Blockchain: Massively Simplified (You Tube video)

02 Comparing case studies using Blockchain and not using blockchain

The educator can prepare case study cards and create a discussion comparing how the problem can be solved with and without blockchain. The students are called to discuss and write in groups the pros and cons of the solution with and without blockchain. In the end, the educator will present the ones that were not mentioned by the groups

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How to design a course

Adult learning Theory

The design of a training course for adult learners on a new and not so common topic as blockchain should be led by 4 main elements:

- To support adult learners' motivation
- To provide simple and practical information on how to access and use blockchain that adults can easily put into practice
- To provide much more practical sessions than theory
- To adapt the training to the practical needs of adult learners

Among the different instructional design models available, the adult learning theory also known as andragogy, seems to help us more than others to achieve these objectives.

This theory, developed by Malcolm Shepherd Knowles in the 1970's and still relevant today, focuses on the differences between adult and children's way of learning, highlighting the main elements make the adult learning paths relevant and effective.

The Adult Learning Theory is based on 5 main principles that can be translated in actions for creating an effective and engaging course for adult learners on blockchain technology.

The Adult learning Theory's main principles

01

Readiness

Adult learners want to know how learning will help them better their lives and work.

They learn best when they know that the knowledge has immediate value for them.

It is important to demonstrate the advantages of acquiring knowledge, skills and competences on blockchain technology for an improvement of the quality of learners' life and work performances.
It will help develop realistic expectations and motivation on the training.

The main strategy here is to make connections between blockchain and adult learners' life and work visible.

To do this you can implement simple activities or training sessions:

1. Ask your learners to talk about their work or interests taking notes of the sectors emerged by the discussion.
2. Based on the different sectors and activities highlighted in discussions you can make some example of the benefits of blockchain application at the workplace and daily life
3. Furthermore you can find the benefits based on concrete elements such as:
   - case studies
   - Success stories of previous learners
   - data or statistics on blockchain diffusion and opportunities
   - news on newspapers or official media
4. To invite Guest speakers confirming the benefits of the knowledge, skills and competences learner will acquire is a powerful strategy for improving the readiness of adult learners.

The Adult learning Theory's main principles

02

Foundation on Experience

Adult training can reach better results if lies on previous experiences knowledge and competences.

You should highlight learners' experiences on the everyday activities or sectors impacted by blockchain technology. This will help them make connections, perceive relevance, and derive inspiration from the training.

It is also important to provide customised programs in terms of strategies and modalities.

It is much easier to do if you have a homogeneous target group (learners working in the same sector, experiencing the same condition, etc...). On the contrary, you can also find some common everyday activities (to use bank services, to sign a contract, etc...) everybody are experienced of.

You can apply a scenario-based instructional design model that link the training with the real context experienced by the learners. Scenario-based learning (SBL) uses interactive scenarios to support active learning strategies such as problem-based or case-based learning. It normally involves students working their way through a storyline, usually based around an ill-structured or complex problem, which they are required to solve. In the process, students must apply their subject knowledge, and critical thinking and problem solving skills in a safe, real-world context.

The Adult learning Theory's main principles

03

Motivation

Intrinsic motivations are in any case stronger than external ones, such as prizes and incentives.

You should act as a facilitator and let the adult learners motivate himself supporting the autonomous definition of a value for the learning on blockchain.

Intrinsic motivation in adult learners is improved a lot by the connections they can do with their own life and work environments and the perceived advantages that the training can have for them. This process is transversal to all the principles listed here and can be facilitated by applying some techniques:

1. When you have one specific topic to work on the Me-We-Us Framework can help create a common understanding of the topic.

2. If you foresee discussion sessions can be useful to apply the Group memory technique to record conversations on a flipchart, post-its or whiteboard. Writing down what people say is important, writing it down on a wall so that everyone can see it, is motivating. It helps empty our minds and make space for new thoughts.

3. If you have multiple topics and you want to discuss them collaboratively, you can use the World Café Model.

The Adult learning Theory's main principles

04

Self-direction

Adults learners want to take charge of the learning path.

It is crucial to give adult learners the possibility to make choices in relation to the learning process, based on the sector where they want to apply blockchain technology or the service they need.

The learners can need to use blockchain for a specific activity or in a specific working context. They will certainly prioritize those contents that are closer to their immediate needs.
To do this you can apply different strategies or actions:

1. You can involved learners in the definition of the training programme, deciding collaboratively the more relevant contents. This is something not so easy to do from the organisational point of view and requires a certain degree of previous competences owned by the learners.

2. A modularised training structure allows learners to focus on the modules they consider relevant based on their needs and skip the others. Each module should be a stand alone set of contents.

3. Using mind maps for making the entire training structure clear can help learners making their choices.

4. To create short contents can be very appreciated by adult learners who usually have a limited amount of time to be spent on training. Some techniques such as Nano learning or Micro learning can help you to create short contents for adult people.

The Adult learning Theory's main principles

05

Task-oriented learning

Adults learn best when they "do." They want to applicate the knowledge received.

It is fundamental to give adult learners the possibility to practice blockchain technology. The training course should be massively based on practical task-oriented sessions.

Most of the training courses on blockchain are actually structured with a lot of theoretical sessions and only few hours dedicated to the practice. Adult learners need to immediately put into practice the knowledge received being able to access blockchain services and actively operate with this technology.

The strategies you can use are different:

1. You should implement simulators or real tools in order to give adult learners the possibility to have practical sessions. Keep in mind that the learners should practice different blockchain-based applications or services focused on different sectors.

2. Problem-based learning approach can be a powerful strategy for combining problem solving with practical learning. This methodology can be very effective with adult learners helping them to solve practical problems in using blockchain technology.

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Areas of Application

Cryptocurrencies, banking and finance

How/Where access the services

If you decide buying cryptocurrency, you will need to answer the following questions:

- 1. Which cryptocurrency will you buy?
- 2. Where will you buy it?
- 3. How will you pay for it?
- 4. Where will you store it?

Advantages for companies and organisations

1. Improved KYC
2. Direct Payments and Lendings
3. Global Trade Finance
4. Clearance and Settlements
5. Fundraising
6. Eliminated insufficient funds: Blockchain-based payments give merchants the confidence of knowing that the transaction is good within a few seconds or minutes and therefore bad cheques or credit/debit card transactions are eliminated.

Practical Exercise

As a practical exercise you could demonstrate how to buy a cryptocurrency

Blockchains are best known for their crucial role in cryptocurrency systems, such as Bitcoin.
The usage of these cryptocurrencies nowadays spans many fields and use cases, from online shopping to investing.

A growing number of online retailers are now accepting cryptocurrency as a form of payment and the rise in popularity of crypto debit cards allow users to spend their cryptocurrency just like they would with regular debit cards. From the other hand crypto investments are not subject to government regulation or inflation, many investors who are looking for high-risk, high-reward investments are more attracted nowadays to invest in that field.

However Blockchains are also known for maintaining a secure and decentralized record of transactions. This makes money transfers secure so that records of transactions cannot be altered, deleted, or destroyed.

Advantages at personal level

The benefits of blockchain-based transfers at personal level include a reduction of costs for payments and and improvement of safety and traceability of transactions

Healthcare

How/Where access the services

Blockchain has a wide range of applications and uses in healthcare. Distributed ledger technology facilitates the secure transfer of patient medical records, manages the medicine supply chain and helps healthcare researchers unlock genetic code.

Healthcare is one of the sectors in which the peculiar characteristics of Blockchain could be crucial.
A Blockchain-based network could be useful in the healthcare system to preserve and exchange patient data through hospitals, diagnostic laboratories, pharmacy firms, and physicians. Blockchain applications can also avoid mistakes in the medical field.

Advantages for companies and organisations

Thinking about blockchain, the real question is what could blockchain do for Healthcare sector.
The advantages for companies and organisations in healthcare can involve an improvement of the security of sensitive data, the availability of up to date data in real time, reduction of costs for software, archiving, hardware and training, furthermore it can reduce theneed of thirs parties as intermediaries for data sharing.

Advantages at personal level

As a patient blockchain can ensure many advantages. Blockchain technology already allow to imagine different practical use for blockchain in the development of digital health and important benefits:

- Supply chain transparency
- Patient-centric electronic health records
- Smart contracts for authentication
- Medical staff curriculum verification
- IoT security to ensure remote monitoring

Practical Exercise

At the moment Examples of use of Blockchain in healthcare sector can include Apps for healthcare supply chains or services to make patients in control of their medical data.

Media

How/Where access the services

Currently, the most popular blockchain media companies are as follows:

- Audius, a music streaming platform (https://audius.co/)
- Binded, a company dealing with copyrights (https://binded.com/)
- dTube, a blockhain platform, equivalent to YouTube (https://d.tube/)
- Mirror, a publishing platform for writers (https://mirror.xyz/)
- Rally, artists' created branded cryptocurrency (https://rally.io/)
- Sapien, collective action that supports creators (https://www.sapien.network/)
- Verasity, a digital rights company (https://verasity.io/)

When it comes to blockchain and the media, it's most prominently used in trademarking and rights management, but the applications are numerous.

Take NFTs (non-fungible tokens) - tokens that we can use to represent ownership of single items because, as the name suggests, they are not interchangeable. They allow artists to symbolize things like art, collectables, and even real estate. Property ownership is secured by the Ethereum blockchain - no one can modify the ownership record or copy/paste a new NFT.

Advantages for companies and organisations

A heterogeneous set of actors has established itself in the media value chain: artists as the primary content creator, aggregator and platform provider plus (depending on country and media type) a collection agency that handles royalty payments. These collection agencies are what media companies can be looking at when it comes to evolving into blockchain-based companies.

Advantages at personal level

Recorded distribution of music and movies allows artists to be paid fairly and maintain accurate data on streams and purchases. And the fake news scourge can benefit from blockchain's ability to establish the origin of stories and facts. That is, all nodes unanimously agree on a single source of truth. Additionally, blockchain-produced movies – no Porto needed – open up new revenue streams through cryptocurrency payments.

Media

Practical Exercise

How to create an NFT

Step 1: Decide what your NFT looks like. Make sure it is something unique.

Step 2: Choose a platform to sell it. Good options are OpeanSea (https://opensea.io/) and Rarible (https://rarible.com/).

Step 3: Set up a wallet. If you are unsure how to do that, follow the explanation given on CoinBase: https://www.coinbase.com/learn/crypto-basics/what-is-a-crypto-wallet

Step 4: Connect your wallet to the platform you have chosen in Step 2.

Step 5: List your NFT on the platform. Listing your work varies on different platforms.

Step 6: Patiently wait. After your NFT has been listed, give it time to sell.

Social Media

- Better support by having randomised juries;
- With decentralised social media, meaning no accounts on other social media, a person can interact with accounts there (ex. Mastodon, Minds, D.tube);
- Moving from one social media to another (if you don't like the rules there) without losing your data
- Artists can raise funds for new project through NFTs.

Education

How/Where access the services

Most of the services actually available are addressed citizens, educators, and organizations. There are several Blockchain Educational Companies providing more engaged and incentivizing educational environments, systems for creating blockchain-backed certificates and verifying academic credentials of prospective students and professors.

Advantages for companies and organisations

The main benefits of blockchain in the education sector for companies are:

- To securely and safely store student's records and credentials.
- To make the hiring process easier for employers and employees.
- To reduce risks and costs for educational institutions.
- To organize more effective and personalised lessons and courses
- To manage exams online with smart contracts.
- To use blockchain as a payment method to sell single courses.
- To monitor and facilitate the accreditation of schools, colleges, and universities, protect intellectual property rights, and avoid fake diplomas.

All the information related to educational progressions and achievements must be stored in a way that should not be forget and should be easily accessed when necessary.
Precisely, the features of Blockchain technologies can facilitate the safe storage and management of such information that can be accessed publicly or by authorized entities in a permissioned environment.
Blockchain technologies can now be used to fulfil various education needs such as, for example:
To manage student records. Such as birth certificates, social security cards, diplomas, exams, student loans) and other information, ensuring an easy and secure access to these data.
To develop innovative educational curricula based on Blockchain online platforms able to record activities which can be reviewed not only by humans but also by Artificial Intelligent (AI) agents, facilitating in this way the integration of strategies such as adaptive learning.

Advantages at personal level

The main advantages at personal level will be:

- Ownership of diplomas

- Monitoring of performance

Education

Practical Exercise

Although as of today there are various companies and platforms that provide diplomas, badges, and similar digital achievements, there are no public testing platforms that can be easily used for both teachers and students to provide digital achievements.

Nevertheless, the Blockcerts open standard provide the necessary tools for a computer-savvy educator to create digital achievements for their students and store them for free in a public "testnet" blockchain such as the Bitcoin and Ethereum "testnet".

• For an educator, all the information about creating digital achievements in Blockcerts can be accessed at: https://www.blockcerts.org/guide/quick-start.html.

• For students, it is possible to verify their own digital achievements using either a web interface or a mobile application for iOS or Android (check https://www.blockcerts.org/).

In addition, it is also interesting to note that, beyond the use of Blockchain technology to issue digital achievements, students can use cryptocurrency for tuition payments in certain universities such as Bentley University in the U.S.A. (check https://www.bentley.edu/news/bentley-now-accepting-cryptocurrency-tuition-payments).

Energy

How/Where access the services

Several companies are already providing services in the Energy sector by exploiting blockchain potential. Some projects are related to guarantee that the energy supplied and consumed is 100 % renewable, others are focused on creating new business opportunities and new ecosystems such as a new application that allows users to sell their surplus solar power directly to neighbours and to allocate unused network resources autonomously amongst themselves.

Advantages for companies and organisations

The main benefits of blockchain in the energy sector for companies are:

- Costs reduction by removing middlemen and optimising exchange processes.
- Environmental sustainability of energy commodity trading systems.

Practical exercise

The practical exercise could be based on accessing a tool for programming decarbonization into business and household operations alike.
Energy Web Foundation is an organization focused on decarbonizing energy grids with decentralized technologies. They offer an open-source blockchain for the energy sector, which is being used by several operators and companies, like Zero Labs, to accelerate the zero-carbon economy.

The evolution of blockchain is of primary importance to support European Union towards a more sustainable future.
Blockchain applications for energy systems are numerous. On the contrary Blockchain applications linked to energy systems impacting on power dispatching are less developed but could offer the possibility to securely integrate innovative energy grids generated from smaller-scale and less centralized sources.
Developing these technologies, Blockchain will ensure provenance tracking and innovative solutions for renewable energy distribution.
Traditional energy sectors, will solve numerous process inefficiencies lowering costs and reducing harmful environmental impacts.
Moreover will solve privacy and trade secrets. Blockchain networks will offer a secure, economic and reliable solutions to ensure the necessary privacy features businesses demand.

Advantages at personal level

The main advantages are:

- to enable P2P energy interchanges between distributed energy producers.
- to enable micro-charging applications for electric vehicles.
- Increased transparency and privacy for consumers
- to directly buy and sell energy.

How/Where access the services

The use of these services will be seamless for the citizens, i.e. they will continue using the services in the same way. Public administration should explain to their citizens how to check that the information is protected by the blockchain.

Some countries and governments are already exploring the use of blockchain technology to improve public administration services. For example, Estonia has launched the e-Estonia project that connects all the government services like the judiciary, healthcare, security, and commercial code registries to store sensitive data on the Blockchain ledger in a single digital platform. Denmark has enabled electronic (e-)voting systems using the technology. Similarly, the city of Zug in Switzerland uses digital identities based on blockchain and citizens can use this ID for voting, renting bikes, and many other integral public service works.

Advantages for companies and organisations

A blockchain-based government has the potential to enable several advantages like an improvement of safety and accessibility for the data stored, a simplification of bureaucratic procedures, reduction of costs and corruption and abuse.

Public administrations are centralized in responsibility and services delivery yet decentralized and often disconnected in terms of the way data is shared within and outside their boundaries. Blockchains could be used as a mechanism to increase the efficiency of administrations and facilitate, even automate some public decisions. Moreover, blockchain increase transparency in the way decisions are made thereby reducing corruption and increasing citizens' trust in their governments.

These are some of its use cases where blockchain could have a bigger impact:

1. Identity: Establishing and maintaining identity for citizens and residents. (birth certificates, marriage licenses, visas, death records)
2. Personal records: Interoperable health records, insurance records.
3. Land title registry: Records of real estate and property transactions.
4. Supply chain management, inventorying: tracking an asset from its creation, transportation, purchase and inventory.
5. Benefits, entitlements and aid: Social security, medical benefits, and domestic and international aid payments could be automated through smart contracts.
6. Voting: Enabling new methods of digital voting, ensuring eligibility, accurate counting and auditing.

Advantages at personal level

The use of blockchain will dramatically improve transparency and trust in public administration. Citizen will be able to check everything that is recorded, e.g., how public funds are spent, validity of permits (construction, vehicles, animals, restaurants, etc.), complaints, etc.

Practical exercise

One application is the registration of some documents with the public administration (see example in cybersecurity chapter). Another practical exercise can be based on voting, a basic building block in all democracies, in order to simulate a blockchain based e-voting experience:

How/Where access the services

Although most blockchain-based cybersecurity services are oriented to ICT specialists, at present there are some services that can be accessible to citizens, providing complex services such as self-sovereign identity (where the user credentials, i.e. private keys, are managed by the user), and simple security solutions such as protected calendars.

One of such solutions – and one of the main security use cases – is the notarization of digital documents. With notarization, a citizen can receive a proof of the state of any digital document (e.g. report) at a certain date.

The blockchain is the perfect platform to keep track of sequential events, that can be included in the standard transactions' blocks. There are many available digital notarization services based on blockchain.

Some of the them are freely available to end users, where they just need to drop a document to the web, but some others require a web3 compatible browser or are API based, targeting companies with a high volume of documents.

Within the area of blockchain technology, the field of cybersecurity can be viewed from two different perspectives:

- [VIEW A]: Cybersecurity is part of the Distributed Ledger Technology concept itself; and,
- [VIEW B]: Blockchain can be applied to address specific cybersecurity issues.

As pointed out in, blockchain technology was developed precisely to provide secure transactions in complex ecosystems and applications, whose main functions are based on cryptographic principles, such as digital signatures and hashes. This also means that security aspects are part of the conceptualisation of blockchain technology, as they form the basis of its main functions.

In turn, this characteristic makes it a relevant and key technology for certain security developments in the field of cybersecurity and resilience. Its guarantees of immutability, auditability and traceability support the creation of effective protection solutions, e.g. for: intrusion and anomaly detection and prevention, context awareness and access control, among others.

At all these levels, many authors have already demonstrated their usefulness for multiple types of application scenarios; be it for the protection of systems in the control domain, IoT-based ecosystems, energy, healthcare, manufacturing systems and the supply chain.

Advantages for companies and organisations

Considering the cybersecurity-blockchain relationship and its dual perspective, we highlight the following benefits:

- VIEW A]: Greater control of the value chain, regulated under principles of immutability and auditing, favoring traceability and accountability.
- VIEW B]: Related to auditing, ensuring better control of anomalous events in the system, favoring the tasks of monitoring and follow-up of the system itself.
- [VIEW B]: Enable more efficient and reliable security developments to cope with threatening situations. For example, providing: distributed identity managers and authentication mechanisms; non-repudiation measures for specific applications; more detection measures in distributed systems and malware, etc.
- [VIEW B]: Create trustworthy environments, in which it is possible to share sensitive information within a community in a secure manner or between organizations. For example, for cyberintelligence.
- [VIEW B]: Predict anomalous behaviors by tracing and observing states and actions taken by devices, processes and people.

Advantages at personal level

Considering the cybersecurity-blockchain relationship and its dual perspective, we highlight the following personal benefits:

- [VIEW A]: gain a better understanding of the field of cybersecurity and its application for blockchain technology. This learning process also entails identifying vulnerabilities and threats in the technology, as well as potential security risks in the application context.
- [VIEW B]: extend the knowledge mentioned in the previous point, but this time by understanding how blockchain technology can benefit cybersecurity areas: for detection, for prevention, risk management, access control, situational-awareness, accountability, non-repudiation, etc.

Practical Exercise

Here we provide a step-by-step example on how to use a notarization service for the timestamping and verification of a document. In particular, we focus on the use of Opentimestamps App, but the steps for other notarization services are very similar to the ones presented here.

Conclusion

The present toolkit provides an easy-to-use tool to orient organisations, trainers, or educators in need of planning and implementing a basic training course on Blockchain in Europe. As such, it provides the supporting materials and tools necessary to implement, support, manage and assess effective training on blockchain for adult learners. It has been designed for educators and was created based on the research and development process implemented by B-Skills partnership.

As a technology, Blockchain is valuable as a business tool for entities transacting with one another. In fact, across industries around the world, the Blockchain technology is helping transform business in different sectors such as the supply chain, food distribution, financial services, government, retail, and many more. With distributed ledger technology, permissioned participants can access the same information at the same time to improve efficiency, build trust and remove friction. Blockchain also allows a solution to rapidly size and scale, and many solutions can be adapted to perform multiple tasks across industries.

Despite the need for Blockchain basic literacy, there are no or very few educational paths addressed to adult learners. Until recently, there were no formal education courses on this subject. Blockchain is a complex concept to understand, which requires prior knowledge of aspects such as cryptography and distributed systems. Mainly due to this issue, most courses focusing on this technology are for IT specialists and software developers. As a result, there is still a large gap in consumable and easily accessible resources to learn about this disruptive technology. In addition, there is also some confusion and lack of clarity of how this technology could be beneficial to the wider public.

Meanwhile, companies are aware about the opportunities that the Blockchain technology can bring. Yet one of the main challenges associated with Blockchain is a lack of awareness of the technology, especially in sectors other than banking, and a widespread lack of understanding of how it works, especially within the general public. This is exacerbated by the fact that much of the publicly available information focuses primarily on cryptocurrencies.

B-Skills project wants to address the need for providing assistance to educators and adult learners with training and supporting materials for the achievement of basic digital skills related to Blockchain technology. Such materials take into account the different knowledge levels and competences that adult learners possess, presenting the underlying concepts of the Blockchain technology at various levels of complexity and from various perspectives.

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