

## Blockchain, an Evolving Digital Ecosystem

We are all familiar with natural ecosystems. The largest ecosystem we know well is our planet, where all kinds of living beings, including animals, plants, and other organisms interact with each other and depend on life-support components such as air, water bodies, land (mountains and valleys), sunlight, etc.

Besides natural ecosystems, nowadays we hear about digital ecosystems in view of the digitalization process that is transforming the way of life of people everywhere. For the purpose of this writing, I will borrow the definition of a digital ecosystem from Frank Diana from Tata Consulting Services and Simon Torrance from FACTOR10.io, pointing out that *“A digital ecosystem is a complex network of stakeholders that connects online and interacts digitally in ways that create value for all”*.

Indeed, digital ecosystems were born out of the Internet, which created a global communication network, connecting people from every corner of the planet. An example of an early and very successful digital ecosystem is Amazon, which started in retail and e-commerce selling books online and then evolved to Amazon Web Services (AWS), with a wide range of information technology products and services.

As of 2020, Amazon had created 47 subsidiaries in areas such as logistics, cloud computing, healthcare, entertainment, music, social media, gaming, foods, and most recently, space travel. Its company, Blue Origin, carried out a successful mission, boosting the space tourism industry.

With AWS at its core, Amazon’s ecosystem not only provides products and services to companies and individuals all over the world, it also develops new technologies, which in turn generate new products and services to further enhance its ecosystem.

This type of ecosystem reminds me of the Japanese keiretsu (former zaibatsu), a conglomerate or group of companies, operating in several sectors of economic activity, nationally and internationally, but interconnected among themselves, and financed by a major bank of the group. In this system, there is a cooperative relationship, where member companies exchange their know-how to be more competitive in the marketplace.

In addition to Amazon, Microsoft, Apple, Alphabet and Facebook are also examples of digital ecosystems, which have changed the interactions among individual and corporate customers, suppliers, developers, and other stakeholders, who are looking for some sort of value within their systems.

However, these ecosystems are managed in a hierarchical manner, and often tend to exercise a monopolistic control in the marketplace. And some of them, if unchecked, can pose a significant challenge to countries’ governance and stability as well as people’s mental health and privacy.

Not without reason, US regulators are trying to break these ecosystems' excessive control on society by setting new rules for their oversight and operation.

Parallel to these powerful ecosystems, we observe the emergence of a new type of ecosystem, which might not only redefine the relationship of every government, economic and societal stakeholders, and level the playing field, but also introduce a more democratic and decentralized structure for national and global economies, in the context of a growing digital economy. This new ecosystem is supported by the technology known as blockchain.

The first real application of blockchain was in the area of finance, with the creation of Bitcoin. According to freelancer technology writer, Robert Sheldon, blockchain was first introduced in 2008 as the distributed ledger behind Bitcoin. In simple terms, it was born as a digital accounting register to buy and sell Bitcoin, which became the first digitally traded currency. Nowadays, blockchain technology is moving beyond finance to new areas of the economy, directly connecting sellers and buyers.

Robert Sheldon defines blockchain as follows: *“Blockchain is a type of database that is a public ledger for recording transactions without needing a third-party to validate each one. The blockchain is distributed across a peer-to-peer (P2P) network. It is made up of data blocks that are linked together to form a continuous chain of immutable records. Each computer in the network maintains a copy of the ledger to avoid a single point of failure. Blocks are added in sequential order and are permanent and tamperproof.”*

The above definition shows the following characteristics:

- It is a database. Just imagine the many computer servers in a big room receiving, sending and storing information for governments, organizations, companies and individuals for different purposes.
- It is a public accounting ledger to record transactions. Selling and purchasing is recorded with the date of the transactions.
- No need for a third party to validate the transaction, that is, no certifiers or intermediaries.
- The transaction occurs in a geographically distributed computer network of peer-to-peer.
- Each participant in the network keeps a copy of every registered transaction, therefore, all eyes are looking at what is happening in their ecosystem, keeping the track (traceability).
- All transactions are registered in blocks (data blocks). These blocks are connected in an alphanumerical orderly sequence, in a permanent manner, which prevent the tampering of the system.

- The blocks form a continuous chain of immutable records, making a digital ledger practically impossible to modify.

So far, from the definition, I observe a linear or horizontal relationship among participants in the blockchain. To figure out the operation of this platform let's undertake a mental exercise of a transaction in the tourism industry.

The scenario shows a tourist in Panama wishing to travel to Japan to experience several aspects of this ancient country. The tourist registers in the tourism blockchain ecosystem, paying a minimum registration fee to use the platform.

The tourist enters his/her basic information such as name, age, gender, country, language, address, payment information and any other relevant data required by the platform. The system verifies and confirms the legitimacy of his/her data, granting the tourist a digital signature to carry out the transaction while protecting his/her privacy. This digital signature identifies each participant and will be used for future transactions in the platform as recognized by all stakeholders.

Once in the platform, the tourist searches the country Japan and introduces his requirements and budget. The system then provides the tourist with several packages based on his requirements and budget. It connects all services requested by the tourist, from a bilingual tour guide to air and land transportation, accommodation, places to visit, etc. All these services are supplied by tourism-related companies already registered in the system.

A smart contract will regulate the relationship between the tourist and each supplier, ensuring that services are executed faithfully at each stage as agreed in the contract and payment is rendered in the scheduled time. Payment will be automatically deducted from the tourist's digital wallet upon delivery of service. Failure to deliver any service will halt payment, and automatically reprogram the service provider in the system following the terms agreed in the contract. Failure to comply by any party will be registered in the system.

Delivery of services and payments are guaranteed by a smart contract as it executes all terms, conditions and payments in time sequence.

The system can develop its own digital currency, exchangeable with the currency of the jurisdictions involved in the transaction, in the same manner as the currency exchange between the US dollar and the digital currency Ethereum. Eventually, as the system builds trust, it might generate its own means of payment (digital currency) for all stakeholders.

To keep a level playing field in the ecosystem, a non-for-profit organization should manage the platform, funded by income from users registrations. This organization will perform as an impartial umpire on the field, guaranteeing transparency in all transactions being executed in the system.

Although it is a simple exercise in the field of tourism, we should start becoming familiar with blockchain technology, its terminology and processes, as many applications are currently being developed in areas such as logistics, healthcare, voting systems, land registration, real estate, food traceability and others.

It is my belief that by 2030, if not earlier, we will observe several ecosystems in different economic sectors running on the blockchain technology. And most of them will be operating in a decentralized manner. I have no doubt that we are witnessing an enormous economic transformation.

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Tokyo, October 28, 2021.

**Sources:**

*“Defining Your Digital Ecosystem: The First Step in a Machine First™ Transformation”*, Frank Diana, Managing Partner, Tata Consulting Services, & Simon Torrance, Managing Director, FACTOR10.io, accessed on October 25, 2021.

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