



UNIVERSITY *of* NICOSIA

MSc in Digital Currency

Introduction to Digital Currencies

Session 11

# Digital Currency and Innovation

Introduction to Digital Currencies



UNIVERSITY *of*  
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# Session Objectives

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- ▼ Understand the core principles of innovation at an introductory level
- ▼ Understand the impact of innovation in today's world and gain a better perspective through the introduction of models and frameworks
- ▼ As an example evaluate the innovation path from Traditional Crowdfunding to ICOs to STOs
- ▼ Apply the concepts of innovation to the development of Bitcoin and other Cryptocurrencies

# Agenda

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1. Innovation - Basic Principles
2. Diffusion of innovation
3. Why Bitcoin/Blockchain is an innovation
4. Creating space for more Innovation
5. Conclusions
6. Further Reading

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## Innovation - Basic Principles

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# What is innovation?

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- ▼ ***“Innovation is the creation of a new viable offering” (Keely, L. et al, 2013)***
  - ▼ Innovation, not invention, has to create and return value
  - ▼ By new offerings one should think beyond products
- ▼ The determinants for creativity and innovation include people/culture, resources, capabilities and processes in an organization, systems and structure.
- ▼ It can be the result of embedding new and existing knowledge, along with activating and challenging latent knowledge.
- ▼ **Open innovation**
  - ▼ Not all valuable resources are or should be employed within an organization, but external ideas, research results can and should be integrated
  - ▼ Focus of value for our customers and their needs, rather than on internal capabilities and ideas
  - ▼ The winning competitive advantage is hidden on the business model, not always on the offering itself

# Forms of innovation

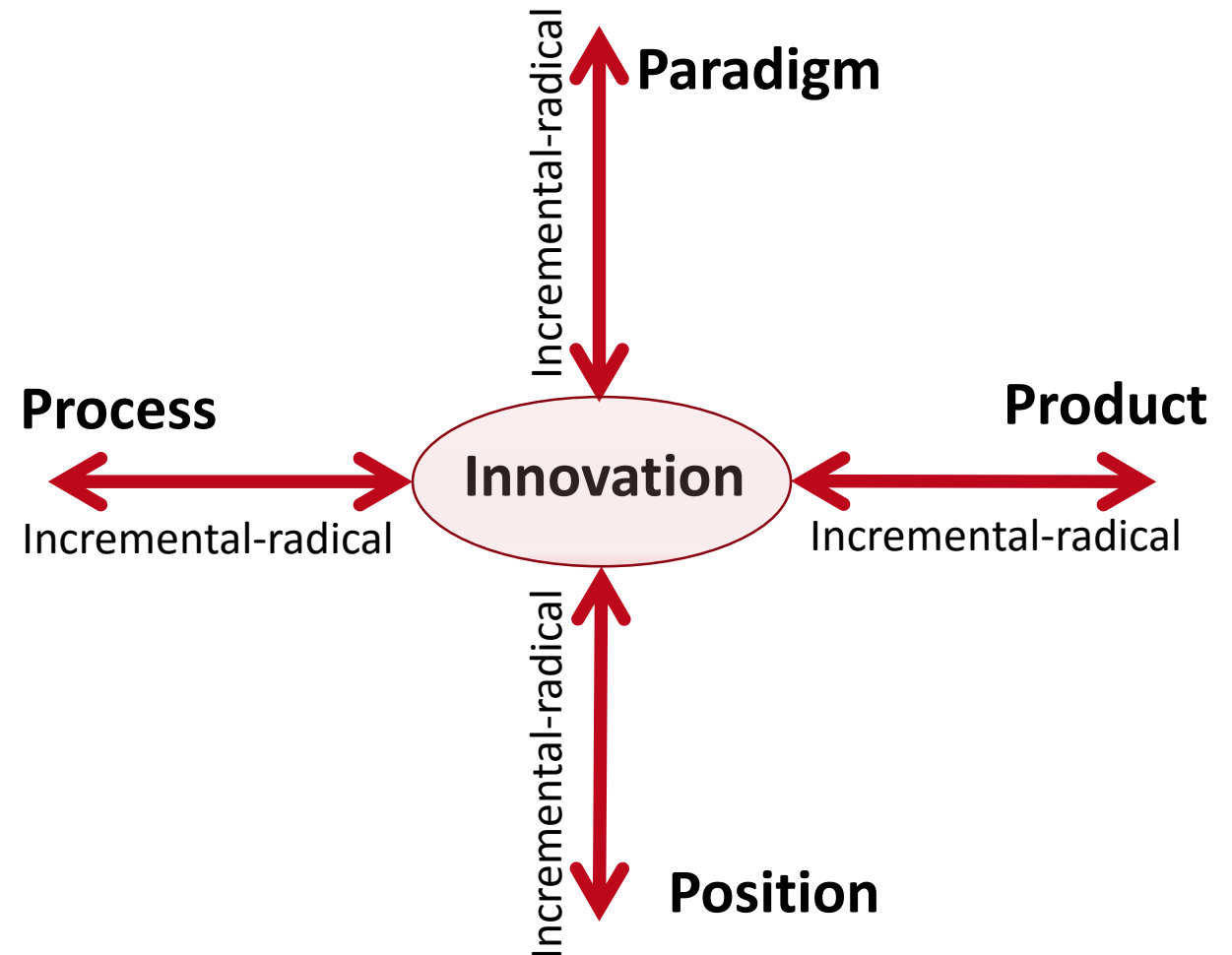
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- ▼ Innovation can be built up systematically. Here are different forms of innovation, for instance:
- ▼ **Radical vs. Incremental innovation**
  - ▼ Radical innovation refers to new offerings that are based on totally new ideas and provide a solution with new competencies and capabilities, whereas incremental innovation is based on enhancing and improving existing knowledge base and competencies
- ▼ **Architecture vs. Component innovation**
  - ▼ Changing the overall architecture and design of a system or the interaction of different parts within it is different from designing a new component or module of it , without completely altering the way it is originally “built”

# Types of innovation, the “4Ps”

According to the “4Ps” framework, developed by Bessant and Tidd (2005), the four dimensions of innovation are described as follows:

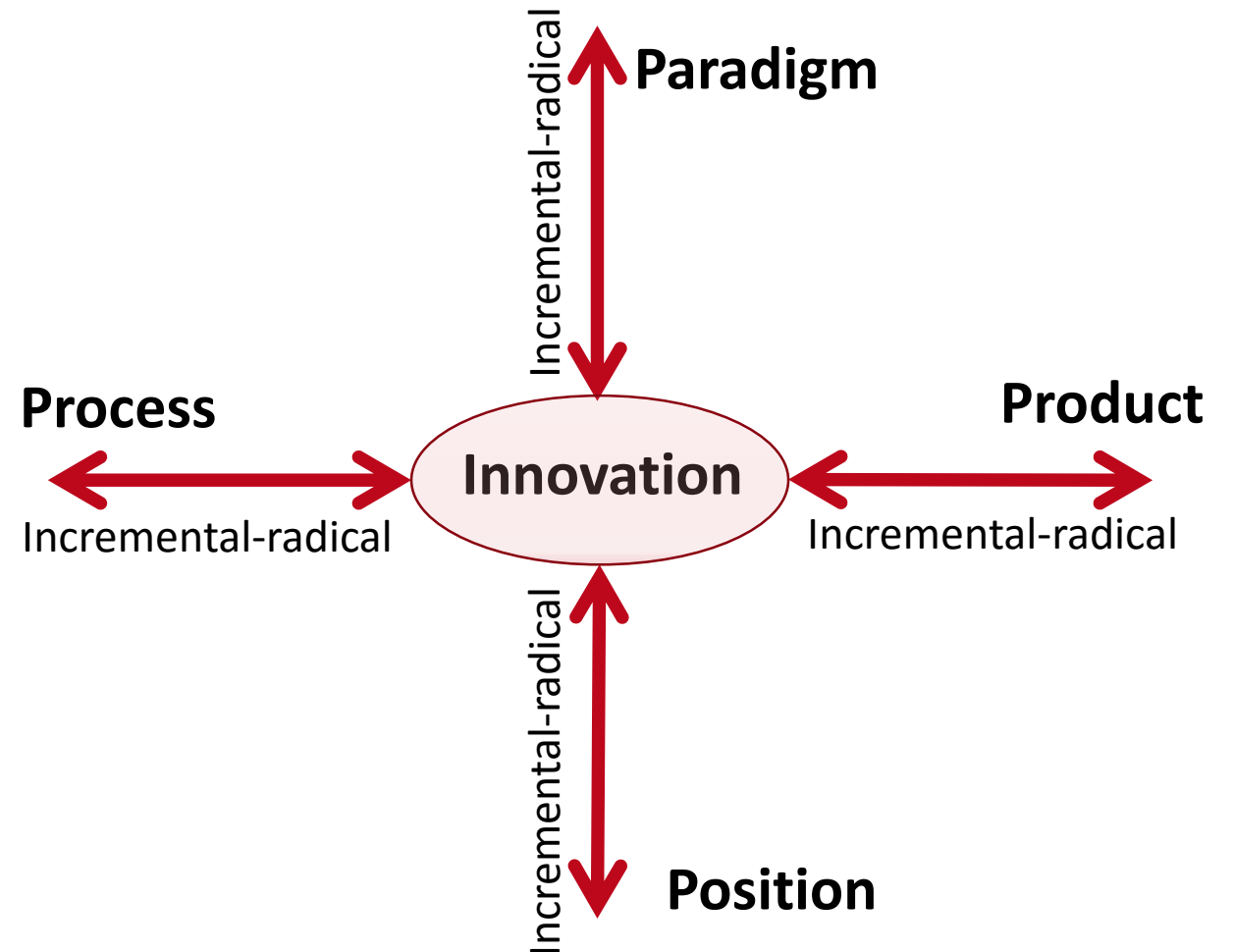
- ▼ **Product innovation:** Changes, updates and improvements to the products or services offered to the consumer; the most commonly perceived type of innovation
- ▼ **Process innovation:** Changes in the way the products or services are built or delivered to the customer. Refers to new ways of accomplishing things





# Types of innovation, the “4Ps”

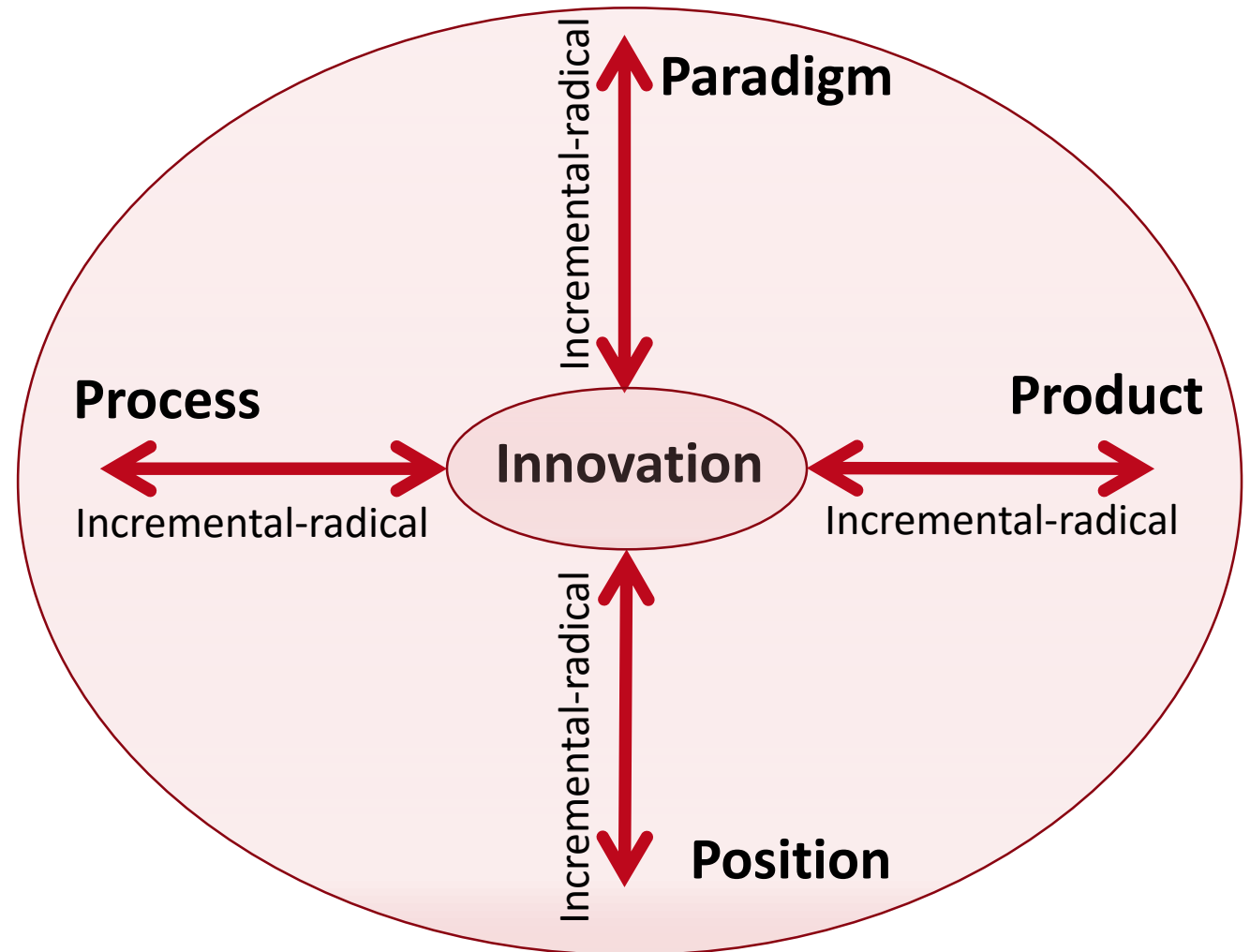
- ▼ **Position innovation:** When changes in the way and the environment in which products or services are offered or communicated. Refers to new markets, new opportunities
- ▼ **Paradigm innovation:** Referring to the business model employed and/or competitive advantages and the values/needs on top of which they are based, the ones that differentiate a solution from the competition.



# Types of innovation, the “4Ps” and DCs

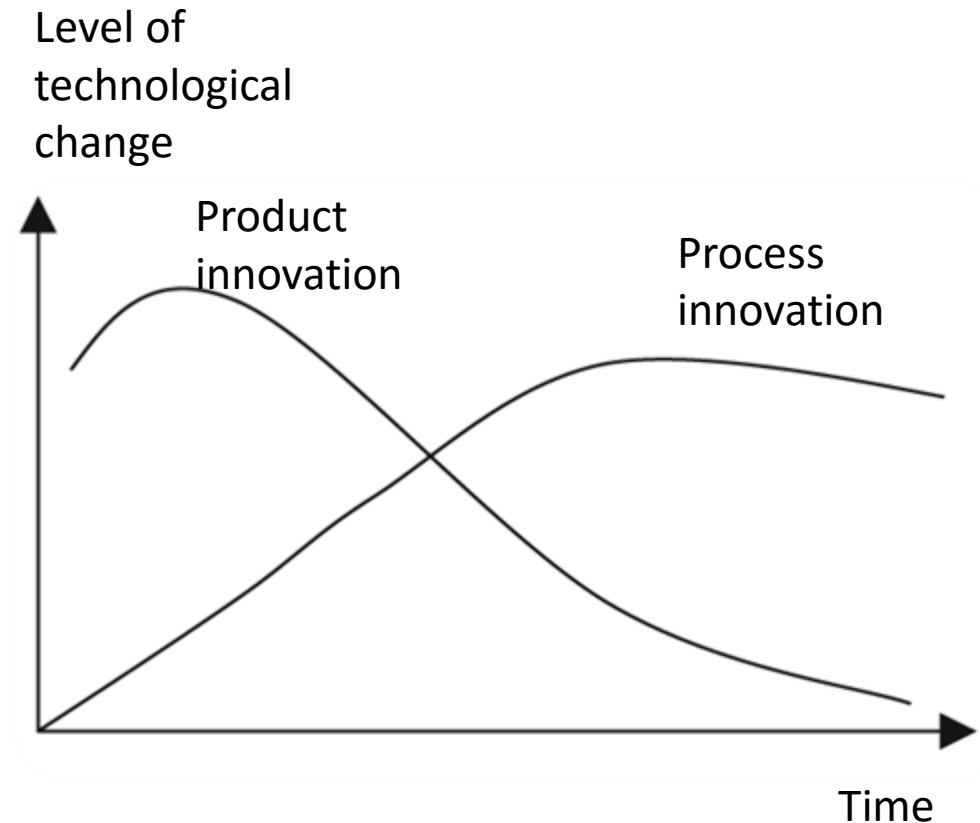
In relation to digital currencies, one can make the following comments for each pillar of the model:

- ▶ New **paradigm**: Currency with no central Issuer, decentralized and transparent operation
- ▶ New **process**: distributed consensus ledger updated globally, decentralized clearing
- ▶ New **product**: Disintermediated transactions at a distance (service)
- ▶ New **position**: The Internet as a means of disintermediated financial communication between parties



# The innovation lifecycle

- ▼ The innovation lifecycle illustrates the level of technological change over time for a new innovation. A new product often leads to new processes. This is the typical pattern, it is representative of most but not all innovations.
- ▼ As Bitcoin for instance is beginning to solidify as an innovation, we are seeing complementary processes being built on top of it, to make it more diverse (Ethereum, Counterparty,, etc.), more secure (HD wallets, multi-signature transactions, Bitcoin Improvement Proposals, etc.), and more easy to use (Coinbase, BitPay, Circle etc.).



Everett Rogers Diffusion of Innovations, Model (1962)

# Top 10 Innovative Countries

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▼ Source: <https://www.globalinnovationindex.org/gii-2018-report>

1. Switzerland
2. Netherlands
3. Sweden
4. United Kingdom
5. Singapore
6. United States of America
7. Finland
8. Denmark
9. Germany
10. Ireland

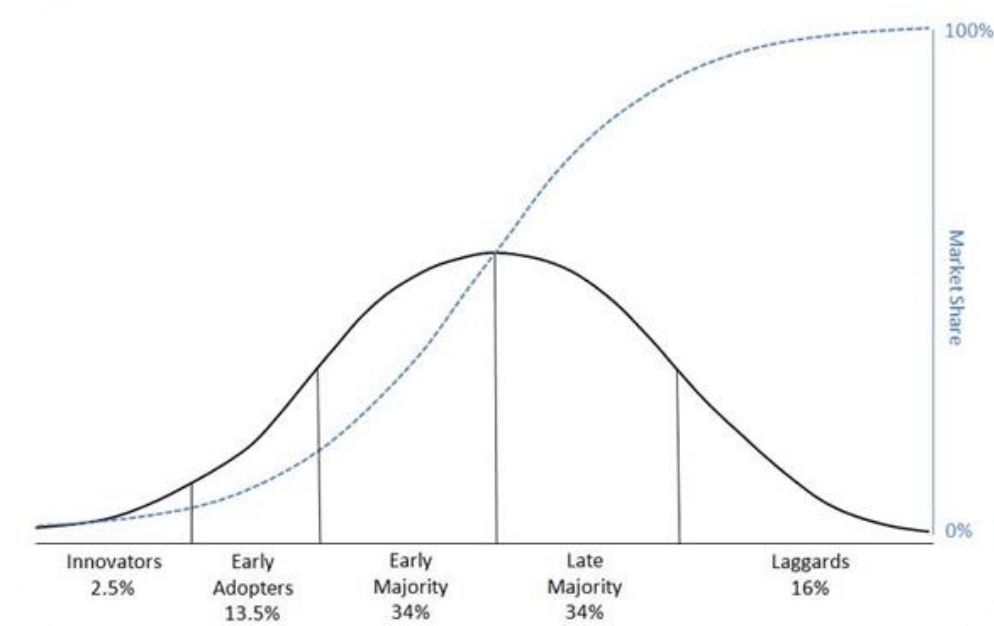
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## Diffusion of Innovation

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# Diffusion of Innovation

- ▼ The first graph captures two of the most central concepts in innovation. The first is the diffusion of innovation in terms of the people adopting it. There are five distinct groups and as you can see it generally follows a bell shaped curve, also known as a “normal” distribution.
- ▼ Not all innovations have this exact trajectory but for most successful innovations there is a slow start then a high degree of interest and then at some point the interest decreases either because everyone now has one or because something new took its place.
- ▼ Are we now in the “early adopters” phase?

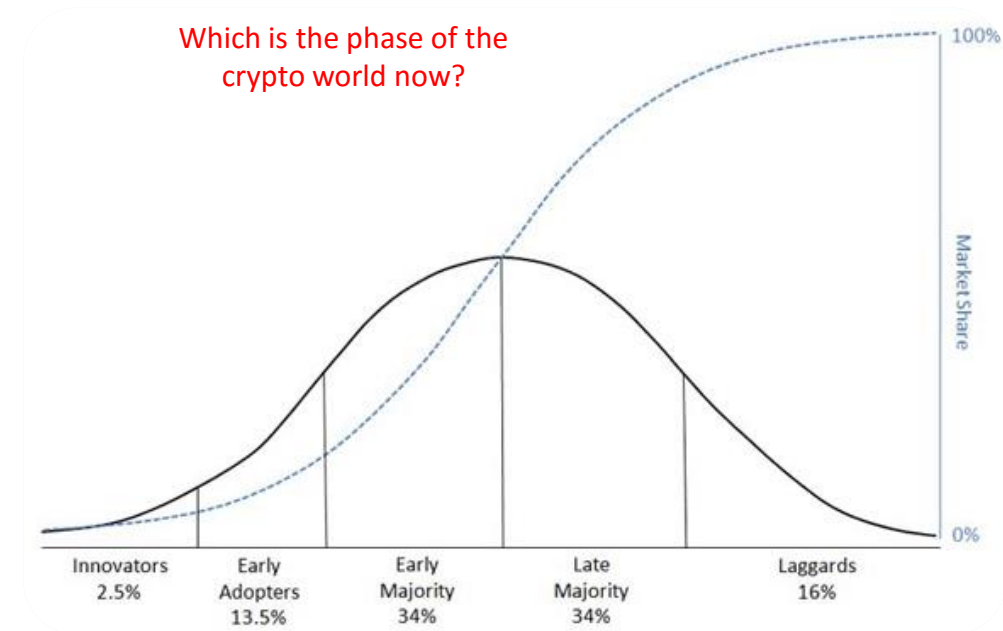


Everett Rogers Diffusion of Innovations, Model (1962)

# Diffusion of Innovation

Each of these categories have distinctive characteristics:

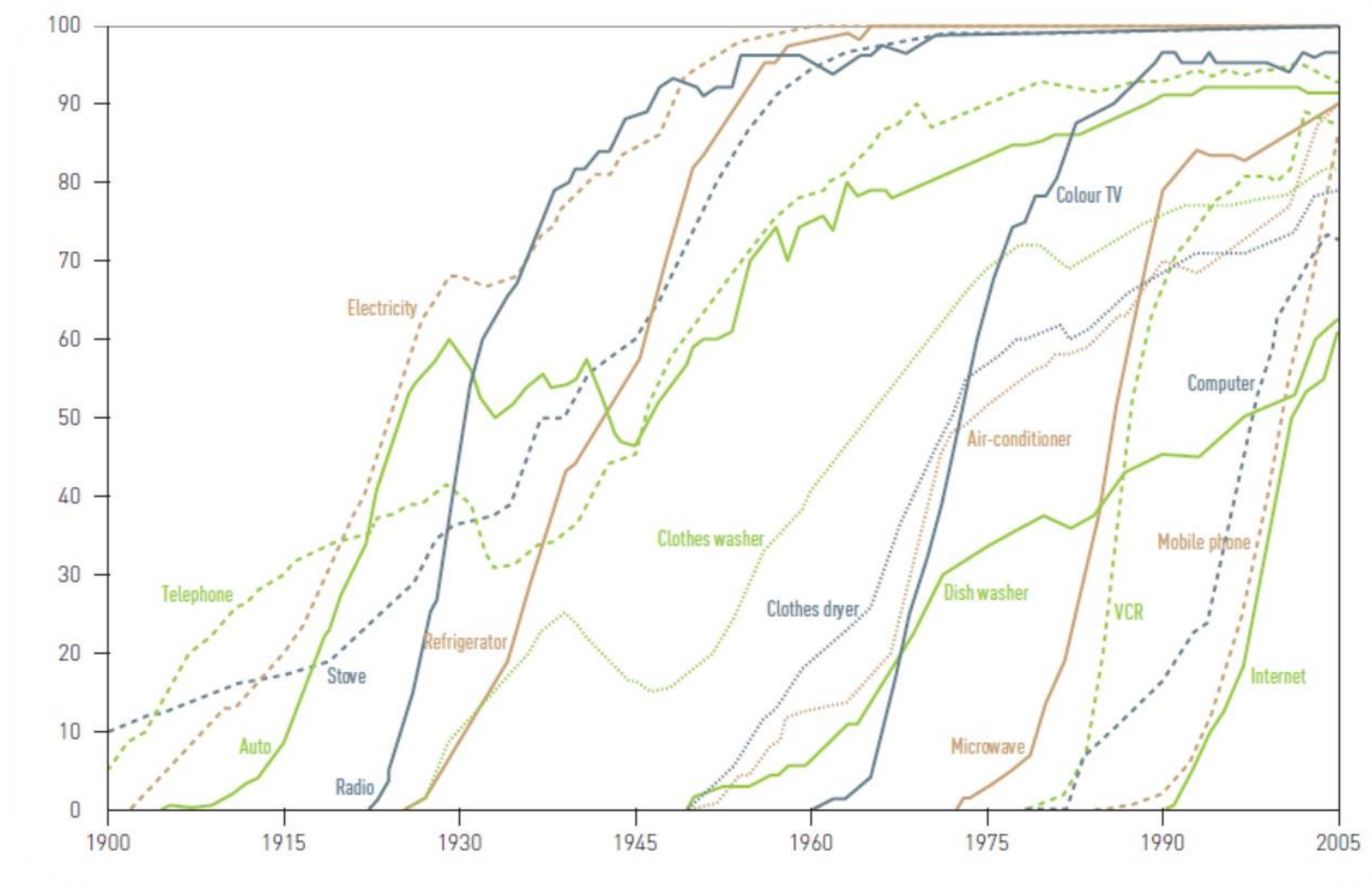
- ▼ **Innovators:** Seek new ideas, can cope with uncertainty and increased risk, broader perspectives.
- ▼ **Early adopters:** More localized and less global perspective, their opinion is more respected than innovators, often leaders, tend to back “winners”.
- ▼ **Early majority:** Less familiar and aware than innovators and early adopters, but willing to test a new product/technology.
- ▼ **Late majority:** May adopt only when they feel pressure to do so by peers. Will only join once uncertainty is reduced.
- ▼ **Laggards:** Not opinion leaders, less sociable, focus on the past, innovators may have moved to a replacement by the time the laggards adopt.



Everett Rogers Diffusion of Innovations, Model (1962)

# Diffusion of Innovation

- ▼ The second graph on the previous diagram, superimposed on the first, is the “S-curve” of market share. This refers to the cumulative market share that a successful innovation would follow finally reaching 100% saturation. The graph on the right is depicting some examples of the adoption rate of everyday consumer products.

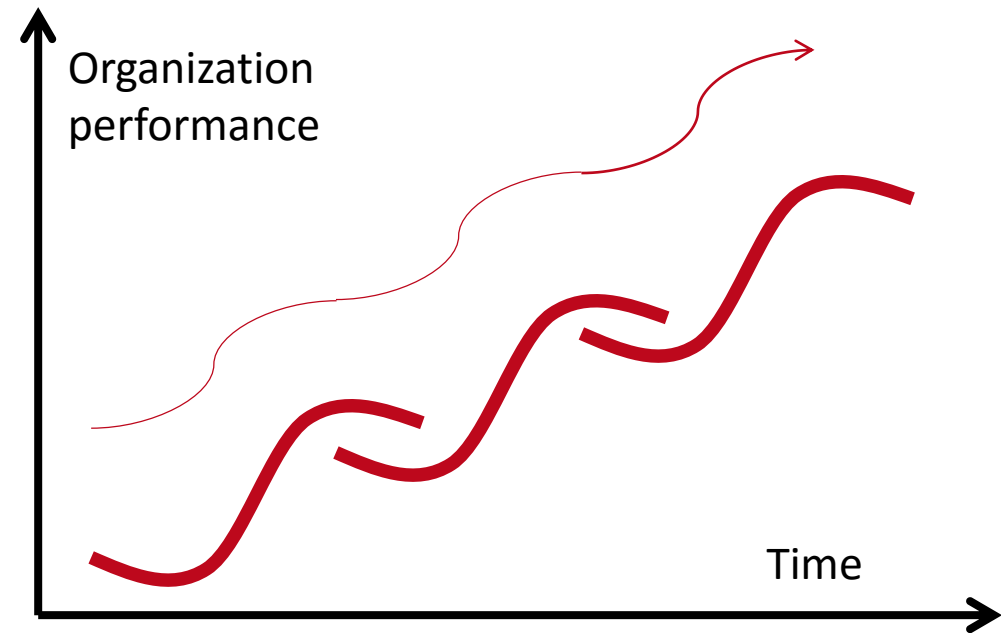




# Diffusion of Innovation

- ▼ As most successful innovations follow an S-curve of adoption, organizations try to promote the next successful innovation at the right time in order to maximize the overall performance. Too soon and they will “*cannibalize*” the previous innovations market share, too late and something else will “*steal*” the initiative.
- ▼ If the new product or service needs to be ready at a specific period then the preparation needs to start earlier, possibly half way through the previous S-curve. This period is referred to as the innovation window. Using the word window further suggests it is an opportunity that can be missed if the timing is not right.

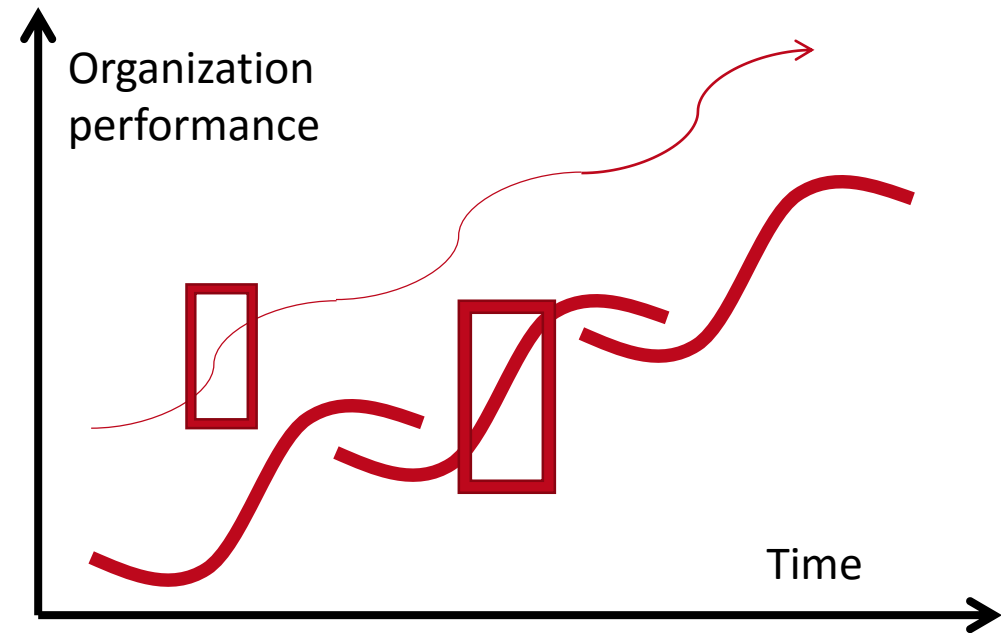
## Climbing and jumping S-curves



Everett Rogers Diffusion of Innovations, Model (1962)

# Diffusion of Innovation

- ▼ Usually, S-curves are not that smooth as the ones depicted in the diagram; the actual curves are full of ups and downs, highlighting major events that affect the adoption or negative view of a new product or service by the market.
- ▼ There is this part of the S-curve, known as the “*vertical*” part, that is depicting the point in time that major adoption of a new idea or business venture takes place. At this point, increase of users / adoption is expected to be exponential.

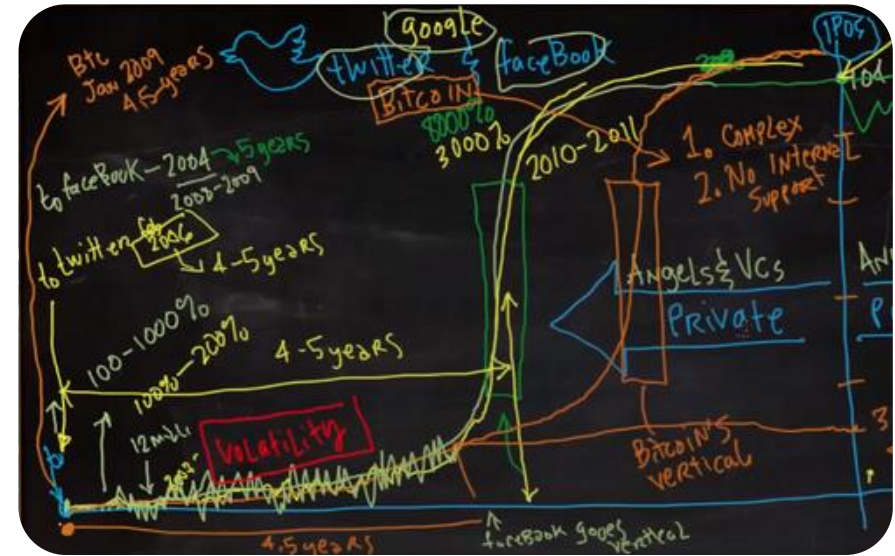


Everett Rogers Diffusion of Innovations, Model (1962)

# More on the S-curve

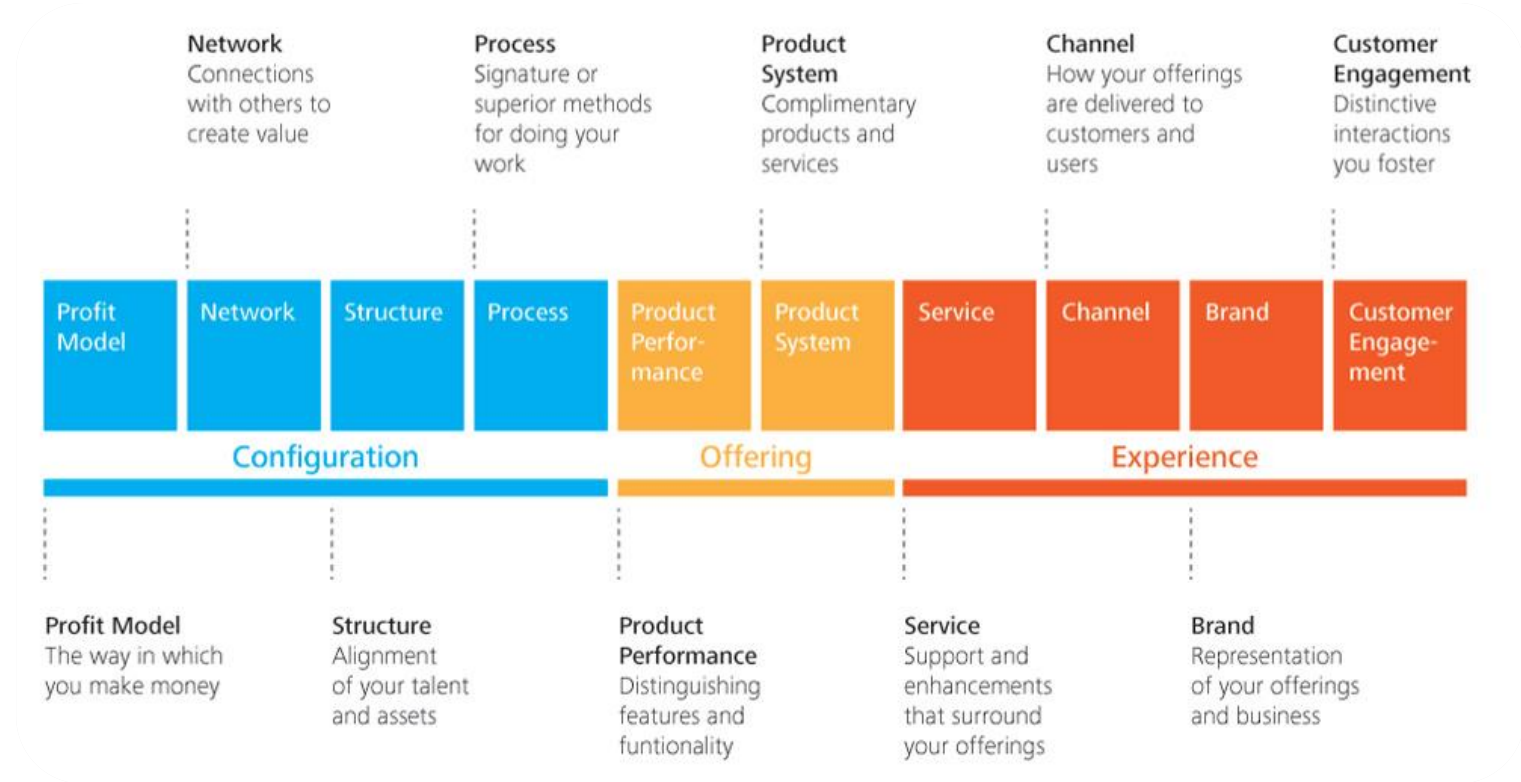
- Briefly, Bitcoin adoption is observed to be closely related to the adoption rate and pace ideas like the Internet, Facebook Twitter etc. in their first 6 or 7 years of development. However there are some key differences:
  - Bitcoin/Cryptocurrencies is a much more complex idea and technology, disrupting more than one fields of operation whereas Facebook and Twitter are, at the end of the day means of communication.
  - Crypto technology is yet accompanied with a high degree of volatility

The aforementioned factors are expected to “delay” the vertical part of the Bitcoin S-curve.



# The ten types of innovation

- Keely et al proposed a new definition of innovation, looking at ten pillars – aspects around an offering that can bring and incorporate disruption and innovation.
- According to Keely, successful innovators analyze the patterns and insights that can emerge from their industry, which can lead their choosing the right path to innovate, consciously, systematically and methodically.



Source: Ten Types of Innovation (Doblin, Chicago Institute of Design, Deloitte Development LLC, 2014)

# The network effect

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- ▼ Innovation that connects users to each other to build a network have an additional element as the value of the network largely depends on how many people are using it.
- ▼ As in the case of the telephone, where the more people using it, the more people could be connected by it , leading to a feedback loop where the innovation itself became more valuable thus bringing in more users, and so on, the network effect is very important for Blockchain, Bitcoin or other cryptocurrencies as well.
- ▼ Metcalfe's law describes the value of such a network as being proportional to the square of the number of the participants of the network. This is especially valid as the number of connections possible to the network increase exponentially with the number of participants.
  - ▼ What other innovations beyond the telephone and Bitcoin can you think that take advantage of the network effect?
  - ▼ Does Bitcoin perhaps take advantage of the existing network effect provided by the Internet to achieve a meta-network effect?

More on network effects and how important they are: <http://a16z.com/2016/03/07/all-about-network-effects/>

# Disruptive innovation

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- ▼ The term coined by Clayton Christensen. Certain characteristics are usually present regardless of the period or nature of the technology.
  - ▼ Eventually 'destroys' the previous technology through a process that may take years.
  - ▼ May focus on unstated or future needs as opposed to current needs.
  - ▼ Best firms focus on customers' current or near future needs and may miss needs further in the future.
  - ▼ Takes the market and value network of the previous technology.
  - ▼ May start as a simple application at the bottom of the market (Christensen 1997).
  - ▼ May start as a less sophisticated cheaper alternative.
  - ▼ The innovators dilemma: Focus on customers or the future?
- ▼ Even though Christensen has attempted to generalize the coined term, we should keep in mind that not all these elements need to be present at the same time for an innovation to be classified as *"disruptive"*.

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## Why Bitcoin/Blockchain is an Innovation

# Why Bitcoin/Blockchain is an Innovation

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- ▼ Cryptocurrencies and blockchain technology are gaining momentum in multiple marketplaces, bringing in **benefits** for both **companies** (lower transaction fees, instant transactions, no chargebacks, simplified payment processes) and **consumers** (lower or no fees to transfer value / send funds globally, 24/7 services, pseudonymous transactions, no intermediary i.e. financial institution, controlling currency).
- ▼ Bitcoin was proposed 10 years ago as **an open source monetary system**, based on open standard security protocols. It is backed by a transparent core infrastructure (protocol and mining power), using incentivized participants (miners) to provide transaction consensus between all users of the peer to peer network, so they can objectively transact without intermediaries, with the currency of the network (bitcoins).
- ▼ Enabling companies to skip the “middle man” of centralized parties and fees imposed is one big innovation in this aspect. Thus, Bitcoin’s value proposition brings banks, governments, payment processors and payment gateways in front of interesting challenges.
- ▼ However, we should not forget that the most prevailing innovation lays at the foundation of the Bitcoin currency application, the Bitcoin protocol and the blockchain technology.



# Why Bitcoin/Blockchain is an Innovation

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- ▼ The Bitcoin protocol, addresses and provides a probabilistic solution to the Byzantine General's Problem, a problem of how to achieve consensus among peers in the same network that has not been successfully addressed in the last decades of research.
- ▼ It enables dis-intermediated financial communication with lower fees than other, more conventional means.
- ▼ It provides the opportunity for increased privacy.
- ▼ The blockchain is a public transaction ledger, maintained at every full node of the network; meaning that it can act as redundant backup of transactions, in many distributed copies, making it significantly more resilient than centrally stored ledgers.
- ▼ It is highly portable, with the use of brain, paper and hardware wallets and it is accessible wherever there is internet connection.
- ▼ Bitcoin as a currency is the first application of this innovation, with ramifications that can be applied to nearly any ledger system (asset, ownership, activity) to make them more transparent and increasingly robust/fault tolerant.

# Innovation in the Crypto and Blockchain Space

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- ▼ New opportunities, uses, areas of development
  - ▼ Examples: Bitcoin, Ether, Ripple, Coinbase (think of any cryptocurrency or blockchain or distributed ledger based company you consider innovative)
- ▼ Opening up of new markets
  - ▼ Examples: Bitstamp, Poloniex, Ethereum, Hyperledger, Coinomi (think of cryptocurrency exchanges/wallets, smart contract platforms, enterprise blockchains etc.)
- ▼ New ways of serving established services
  - ▼ Examples: Coinbase, BitPay, OpenBazaar (think of payment processors and distributed marketplaces)
  - ▼ Traditional Crowdfunding to ICOs to STOs

# Stepping on the Shoulders of Giants

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- ▼ Bitcoin as an innovation is based on a number of technological achievements of the last decades, successfully combining and taking them a step forward:
  - ▼ The open network of the Internet
  - ▼ Open source development, enabling transparency and open innovation; in the same framework as the Linux operating system
  - ▼ Asymmetric Cryptography, used to generate private/public keypairs
  - ▼ The Hash Function, as a process to “translate” inputs, independently of their size, to outputs of specific size, named “hashes”
  - ▼ The Proof of Work concept, i.e the provable expenditure of computational resources towards a commonly agreed-upon goal.
  - ▼ The use of Peer to Peer networks, on which innovations like Bit Torrent are based, especially combined with the requirement of consensus of the majority of the network for a transaction to be verified or a change or improvement to be implemented
  - ▼ How about extended developments which are based on the blockchain concept; Ethereum, Bitcoin Cash, Sharding, Hashgraph, Sidechains, Payment Channels...The list goes on and on
  - ▼ Is Ethereum a platform innovation?

# Elements working synergistically

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- ▼ Beyond the innovations that already made Cryptocurrencies and the blockchain technology possible, a large set of added elements and factors could be considered to be helpful for the easier and more widespread adoption of these and affiliated technologies.
  - ▼ Increasing Internet adoption
    - ▼ By 2020, 4.1 billion people are expected to be online.
    - ▼ More internet world stats: <http://www.internetworldstats.com/stats.htm>
  - ▼ Moore's "law" for scaling
    - ▼ Moore's law is more of an observation than a law; processing power and with it implicitly, storage capacity and bandwidth develop at an ever increasing pace, following the rough outlines of an exponential function.
  - ▼ Increasing Mobile adoption
    - ▼ More people progressively have access to mobile phones and the internet than to conventional banking services.
    - ▼ <http://www.pewinternet.org/fact-sheet/mobile/>
  - ▼ Increasing centralization/systemization of conventional financial services
    - ▼ Satoshi famously quoted a newspaper headline in the Genesis Block : "The Times 03/Jan/2009 Chancellor on brink of second bailout for banks"

# Socio/political leverages

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- ▼ Notwithstanding the technological elements of innovation, a few other elements aid towards adoption by giving incentives to users. While a technology or innovation may have enough merits to stand on its own in the market, these incentives are an added push that aims towards a more viral adoption of an innovation that is not always possible with conventional innovations. In this case monetary, speculative and political underpinnings come into play to augment the nurturing and spreading of an already innovative technology.
  - ▼ Increased appreciation by groups sensitive to privacy (Cypherpunks)
  - ▼ Increased appreciation by Libertarian, Agorist and Anarcho-capitalist movements (separation of State and economic Activity)
  - ▼ Transparency of monetary basis, issuance rules, provable compliance to the rules (PoW)
  - ▼ Voluntary Participation
  - ▼ Early adopters that initially assume more risk have higher incentives to work towards wider adoption. Latecomers enjoy less risk and less rewards as reward rates/issuance decreases
  - ▼ Network protection and transaction processing directly linked to monetary rewards (mining)

# Democratized and Permission-less Innovation

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- ▼ Innovative technologies many times emerge as a solution to a known market or unsolved research problem, or as a means to perform something in an incrementally better, more time and/or cost effective manner. Innovation can therefore be reactive to existing technologies. When these innovations are “open-sourced” (not patented or under conventional IP protection schemes), anyone is mostly free to work on them, and consequently improve them. This allows their faster dissemination and propagation as well as the decentralization of the innovative process which occurs directly from the users. Notable examples are:

- ▼ **3D printing**

- response to conventional manufacturing processes and supply chains

- ▼ **Bit Torrent**

- response to aggressive control of digital content distribution rights

- ▼ **Bitcoin**

- response to centralization and inefficiencies of financial services

- ▼ **Open genetic engineering**

- response to aggressive IP protectionism of major GMO companies (Monsanto, etc.)

# Bitcoin and Anti Fragility

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- ▼ Anti-Fragile systems are not only resilient to external attacks, but adapt beyond them to prepare for the next interventions
- ▼ Bitcoin has displayed Anti-Fragility through software bugs, hard forks, regulatory pressures (China and various smaller states), and support for other decentralized applications. It is not unlikely that it will remain flexible, but there is the risk of the protocol itself ossifying and becoming harder to adapt.
- ▼ Consensually driven by those that have interest in its survival, minimizes the risk of hostile take-overs
- ▼ Actors in the system that could act against it are incentivized to work in its favor

As we saw in the 51% control of the hashing power by Ghash.io in 2014, miners or pools did not perform attempts to double spend or fork the network. Such an act would seriously undermine the network's value, the exchange rate of bitcoins mined, and therefore their investment in mining equipment.

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Creating space for more Innovation

A decorative geometric pattern consisting of several red triangles of different sizes, some pointing upwards and some downwards, located in the bottom right corner of the slide.



# Traditional Ways of Crowdfunding

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- ▼ **Crowdfunding:** Ways for a large group/organization to raise money
  - ▼ Selling shares (selling ownership of the company and receive cash)
  - ▼ Issuing debt (receive cash and pay back the amount borrowed with interest)
  - ▼ Pre-selling of goods and services (receive cash before the delivery of the product/service)
- ▼ It is the task of the regulatory authorities to monitor and prevent dishonest and fraudulent people from attracting investments.
- ▼ ICOs did not have their risk addressed by regulatory authorities during the initial hype but several ICO regulations have emerged to address tax and AML/KYC issues.

# Initial Coin Offerings (ICOs)

- ▼ ICO is a method of raising funds used by cryptocurrency/blockchain-based startups. The new cryptocurrency created by the startup is sold to parties willing to invest in the project, in exchange usually for Bitcoin or Ethereum
- ▼ A Bitcoin/Ethereum address is usually displayed to the project's website for receiving funds. The new cryptocurrency is expected to be used in the applications of startups, to fund the project, pay employees etc. If the project succeeds, the investors gain accordingly as the new cryptocurrency appreciates in value
- ▼ ICOs could bypass complex regulatory requirements required by banks and official authorities in traditional capital raising processes e.g. IPOs. "Donations" and "presale tokens" are some of the terms used to avoid investment related legislation
- ▼ Investors actually receive tokens which are then listed and traded on private exchanges (the equivalent of NASDAQ for tokens)
- ▼ Ethereum is an example of a successful ICO project
- ▼ Ethereum's crowdsale bitcoin address:
  - ▼ <https://blockchain.info/address/36PrZ1KHYMpqSyAQXSG8VwbUiq2EogxLo2>



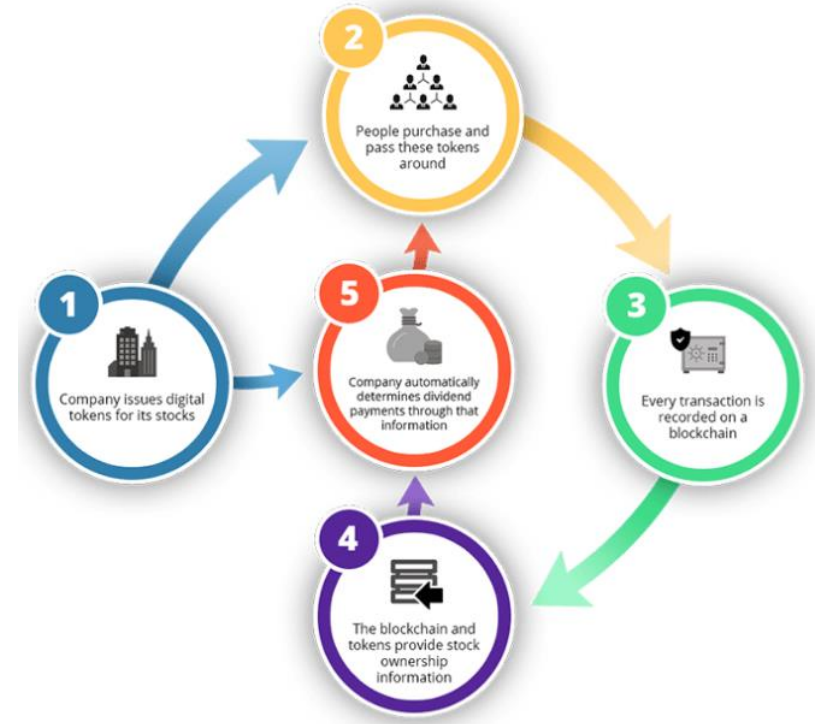
# The ICO Process

- Startup companies publish a whitepaper stating what the project is about, the goal of the project, the amount of funds needed to kick start the venture and how many tokens the pioneers of the project will keep in their possession
- Additional provided information include the cryptocurrency accepted and for how long the ICO campaign will run for
- Believers of the startup's project buy an amount of the tokens offered usually in Bitcoin or Ether, similar to shares of a company sold to investors in an Initial Public Offering (IPO)
- There is a possibility that the funds raised do not meet the minimum target funds set beforehand. In such a case, the funds are returned to the investors and the ICO is considered unsuccessful
- TokenMarket is a website you may want to visit regularly in order to stay up to date regarding upcoming ICOs
- Anyone who wants to participate should evaluate the project beforehand in order to draw a fair conclusion regarding its potential.



# From ICOs to STOs (Security Token Offerings)

- ▼ We have defined securities during the previous session - An investment product which can be exchanged for value, involves risk and whose profits/losses are derived from the efforts of a third party. Typically, when a security was purchased the agreement is signed on paper. A security token can now serve on the place of the signed paper plus it can confirm ownership and make transactions more efficient/fast through blockchain technology
- ▼ Such tokens can offer typical rights to the investors such as equity, voting rights, dividends, profit shares etc.
- ▼ The issue with ICOs is that the concept gave birth to a lot of scams and false promises
- ▼ This risk is eliminated with STOs as the tokens sold to investors are actual stakes on the assets of the project and represent proprietary rights. In ICOs, the tokens were mostly for utility purposes and served as a crowdfunding technique with no real rights on the assets/equity of a project. STOs are forced to comply with regulation and are considered of lower risk



<https://hackernoon.com/will-stos-security-token-offerings-rule-over-icos-in-2019-8feda7bcf562>

# STOs

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- ▼ STOs are usually constructed as ERC20 tokens
- ▼ **Polymath** is among the leaders promoting the concept of STOs by enabling companies to issue tokens as equity issuance
- ▼ The question is whether the removal of middlemen on issuing and managing securities on the blockchain is beneficial. Would actions like underwriting, preparation of marketing materials, solicitation of investor interest, insurance of high level securities, and compliance regulation be successfully executed by code with only the participation of the buyer and the seller?
- ▼ Another disadvantage is that the process is considered expensive compared to ICOs, as costs typically exceed \$50,000. Another potential risk is the lack of liquidity which exceeds on certain security token platforms.

*“Companies have already started the ball rolling. A total of 18 companies—including Gab and Blockchain Capital—have raised \$380 million through STOs, according to venture crypto fund Evercity and Security Token Club. The largest STO was Overstock’s tZero, which raised \$134 million. Other notable STOs include Nexo—a platform for crypto-backed loans—which raised \$52.4 million in its offering last April. In addition, LDCC by Lottery.com came close with an STO of \$47 million. It intends to host global raffle events.”*

<https://decryptmedia.com/5311/security-token-offerings-advantages>

# Future Giants on Top of Bitcoin

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- ▼ Beyond the blueprint and the first applications of an innovation, almost always, new innovations strive to improve, replace and complement it. Especially when the source code of such an innovation is freely available to all, this is an invitation for further development and experimentation. The concept has already been used in efforts to decentralize the internet, smart contracts, distributed ownership and much more is sure to come.
  - ▼ The concept of the blockchain for distributed consensus aiming towards decentralizing the internet
  - ▼ A large number of alternative approaches that can exist in parallel without being directly competitive in the short term ([Ethereum](#), [Monero](#), [Zcash](#) etc.)
  - ▼ An unlimited amount of sandbox/testbed currencies that can be issued by anyone, without permission, to test other approaches
  - ▼ Sidechains could eventually allow for highly varied alternative blockchains that are intrinsically connected with Bitcoin as a funding mechanism and provide an avenue of ingress/egress of value in them
  - ▼ The power of the network against tampering, used for smart contracts and any other digital ownership ledgers, and decentralized trading thereof ([Colored Coins](#), [Omni](#), [Counterparty](#), [ERC20 tokens](#))



## Digital Currency and Innovation – A preview of MGT-523 (MSc)

# A preview of MGT-523 (MSc)

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- ▼ There's much more to cover with regards to digital currency and innovation – like how innovation is related to management and how it has historically affected it, and much more:
  - ▼ **Theory & Diffusion of Innovation** – Theory, characteristics and case studies in technological and disruptive innovation, the nature of innovation, sources of innovation, and digital currencies as products of innovation
  - ▼ **Management of Innovation** – Strategy and business models for innovation, avoiding obsolescence, sources and networks of innovation, introduction to new technologies that are transforming business, and how to finance innovation
  - ▼ **Implementation of Innovation** – Creating new products/services/processes, open innovation and collaborations
  - ▼ **Application of Innovation** – Incorporating innovation into the organization and reaping the benefits/learning outcomes, application of innovation to digital currencies and study of risks and challenges
  
- ▼ All of the above are covered by MGT-523 Principles of Disruptive Innovation from the MSc.



# MGT-523 (MSc) – Theory & Diffusion of Innovation

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Key topics explored are:

- ▼ What is innovation and why it matters to any modern organization
- ▼ In detail view of the Dimensions for innovation, such as:
  - ▼ Product
  - ▼ Service
  - ▼ Position
  - ▼ Paradigm
- ▼ Creating and capturing value: mature vs. dynamic approach
- ▼ The process of how innovation happens – searching & scanning the environment, filtering & selecting opportunities, implementation & development, post-review and learning
- ▼ Building innovation into the organization, and the three capabilities – creative climate, deliberate process, inclusive leadership
- ▼ Styles of leadership and effects – e.g. visionary, transactional, or participative
- ▼ Organizational climate vs. culture characteristics and limitations
- ▼ Innovation assessment and opportunity gaps

# MGT-523 (MSc) – Management of Innovation

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Key topics explored are:

- ▼ Innovation strategy development and factors influencing value delivery – e.g.:
  - ▼ current systems of innovation,
  - ▼ power and market position,
  - ▼ capabilities and processes of the firm, and
  - ▼ the exploitation of external sources
- ▼ Strategic management:
  - ▼ Rational/planning and its limitations, or
  - ▼ Resource-/Capabilities- based and its limitations
- ▼ Geographic factors influencing innovation, such as: input prices, natural resources, tastes, etc.
- ▼ Strategies for idea/concept generation, such as: research, imitation, aspiration, etc.
- ▼ Characteristics and attributes of creativity and creative problem solving
- ▼ Innovation networks and their types, such as: entrepreneur-based, internal team, communities of practice, open innovation, lead user innovation, etc.

# MGT-523 (MSc) – Implementation of Innovation

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Key topics explored are:

- ▼ Identifying opportunities for innovation, patents as indicators of innovation, forecasting and its disadvantages, the contrast with open source innovation
- ▼ Anticipation of trends –quantitative/normative forecasting, scenario development, the Delphi method, etc.
- ▼ Characteristics of disruptive innovations, and looking deeper on why Digital Currencies are a disruptive innovation
- ▼ New product/service development, and factors affecting their success, dimensions of product advantage (e.g. unique benefits for customers)

# MGT-523 (MSc) – Implementation of Blockchain Applications in various industries

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Most importantly, MGT-523 evaluates the latest developments of blockchain applications and technology in various sectors. This is linked to the fundamentals of innovations learned in the first phase of the course. Key use cases explored are:

- ▼ Storage/Authentication
- ▼ Academic Records
- ▼ Land Registry
- ▼ HealthCare
- ▼ Digital Identity
- ▼ Music Industry
- ▼ Solar Energy Management
- ▼ Initial Coin Offerings

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## Conclusions

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# Conclusions

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- ▼ Innovation may be an industry push or a market pull activity.
- ▼ Innovation is generally distributed in the model of an S-curve.
- ▼ The process of crowdfunding and capital raising has been disrupted by the launch of ICOs and STOs
- ▼ Bitcoin/Blockchain:
  - ▼ is an innovation that leverages, and is based on, many innovations before it.
  - ▼ will itself be the fulcrum and crucible for a large number of innovations to be built upon it.
  - ▼ takes advantages of several other elements beyond technological innovation.
  - ▼ has some properties of being Anti-Fragile.
  - ▼ applications are constantly being developed with the aim to disrupt the majority of the industries within the market



## Further Reading



# Further Reading

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## ▼ Disruptive innovation

<http://www.claytonchristensen.com/key-concepts/>

## ▼ Innovation Definitions and Fundamentals

<https://www.innovationpolicyplatform.org/content/innovation-definitions-and-fundamentals>

## ▼ So you want to use a blockchain for that?, CoinDesk

<https://www.coindesk.com/want-use-blockchain/>

## ▼ STOs: The New Fundraising Standard to Replace ICOs

<https://www.financemagnates.com/cryptocurrency/icos/stos-the-new-fundraising-standard-to-replace-icos/>

## ▼ STOs explained

<https://cointelegraph.com/explained/what-is-an-sto-explained>

## ▼ The Truth about Blockchain

<https://hbr.org/2017/01/the-truth-about-blockchain>





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