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Intellectual Property
Infringement and Enforcement
TECH WATCH

10 November 2020

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Content

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- Expert Group on the Impact of Technology
- Tech Watch Methodology
- Six Selected Technologies
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  - 3D Printing
  - Nanotech
  - Artificial Intelligence (AI)
  - Virtual, Augmented or Enhanced Reality
  - Blockchain and Distributed Ledger Technology (DLT)
- 10 Significant Horizontal Points

Close-up of Robotic Arm Holding a Tomato

What is the Observatory?

What is the Observatory?

What is the Observatory?

The Observatory is a Network

- 27 EU Member States
- 69 European and international private sector associations
- 6 Associations representing consumers and civil society
- 5 Members of the European Parliament (MEPs)
- European Commission (GROWTH, TAXUD, TRADE, CNECT, OLAF, JRC, HOME) and Council of the EU (CCWP)
- EU and International organisations (Europol, Eurojust, EPO, WIPO, CPVO, Interpol, WCO, UNICRI, European Audiovisual Observatory, EFTA)

What is the Observatory?

The Observatory is a Network

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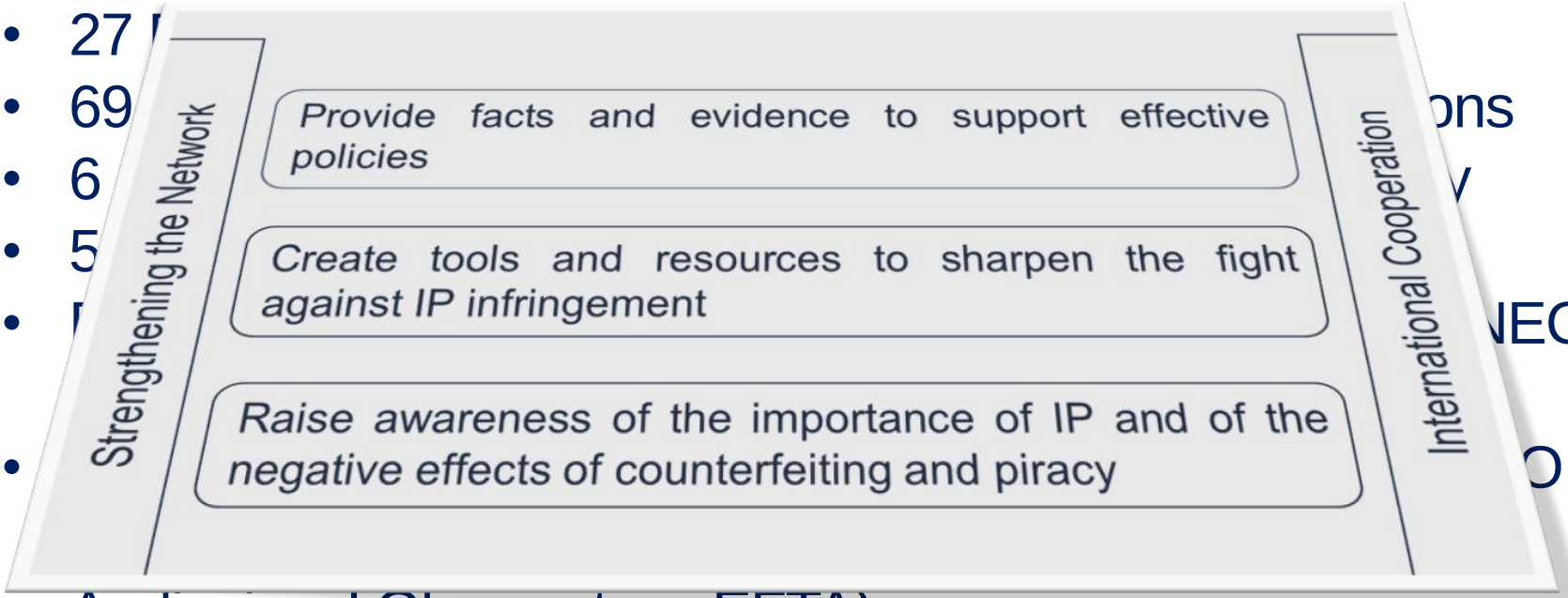

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Audiovisual Observatory, EFTA)

Expert Group on the Impact of Technology

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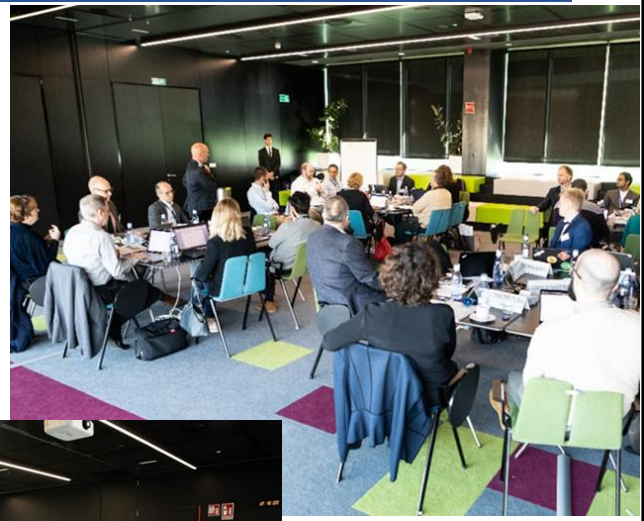
Expert Group on the Impact of Technology

Initial Work of the Expert Group

- 2019, 6 experts groups were established, one specifically looking at emerging tech
- Around 20 experts with expertise within high tech monitoring and investigations
- First meeting April 2019
- 2-day workshop in Jan 2020 (with invited experts)
- VICO planned for Nov 2020
- Next 2-day workshop in 2021



Snapshots from Expert Group Workshop in January 2020

Expert Group on the Impact of Technology

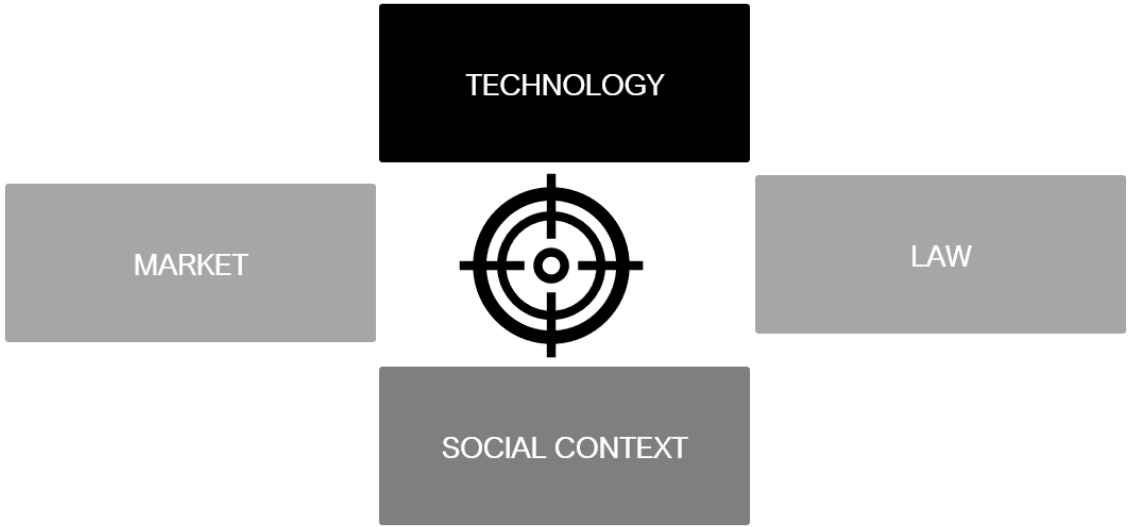
First Tech Watch Discussion Paper, 2020

- Available here: https://euipo.europa.eu/tunnel-web/secure/webdav/guest/document_library/observatory/documents/reports/2020_Tech_Watch_paper/2020_IP_Infringement_and_Enforcement_Tech_Watch_Discussion_Paper_Full_EN.pdf
- Published 17 September 2020
- Relies heavily on pictures and illustrations

Tech Watch Methodology

Tech Watch Methodology

Lawrence Lessig´s Code Theory



Inspired from Lawrence Lessig: ‘Code and Other Laws of Cyberspace’, 1999, Basic Books (and updated in ‘Code Version 2’, 2006, Basic Books).

Tech Watch Methodology

The Yin and Yang Metaphor

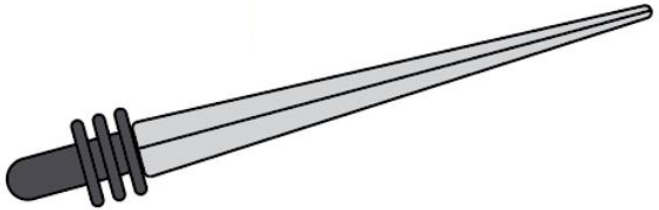
IP INFRINGEMENT

IP PROTECTION AND ENFORCEMENT

Tech Watch Methodology

Any Technology is a Double Edged Sword

IP THREAT



IP OPPORTUNITY

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Tech Watch Methodology

´The Intellectual Property Tech Chain´

IP THREAT

IP OPPORTUNITY

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Tech Watch Methodology

´The Intellectual Property Tech Chain´

IP THREAT

EXPLORATION

IP OPPORTUNITY

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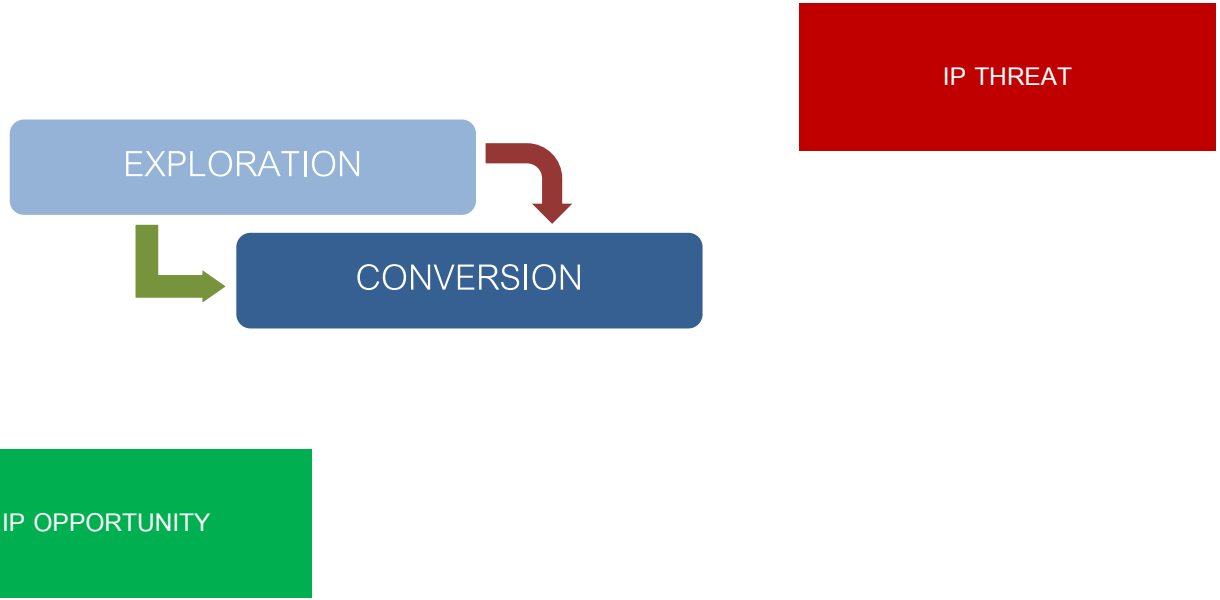
´The Intellectual Property Tech Chain´



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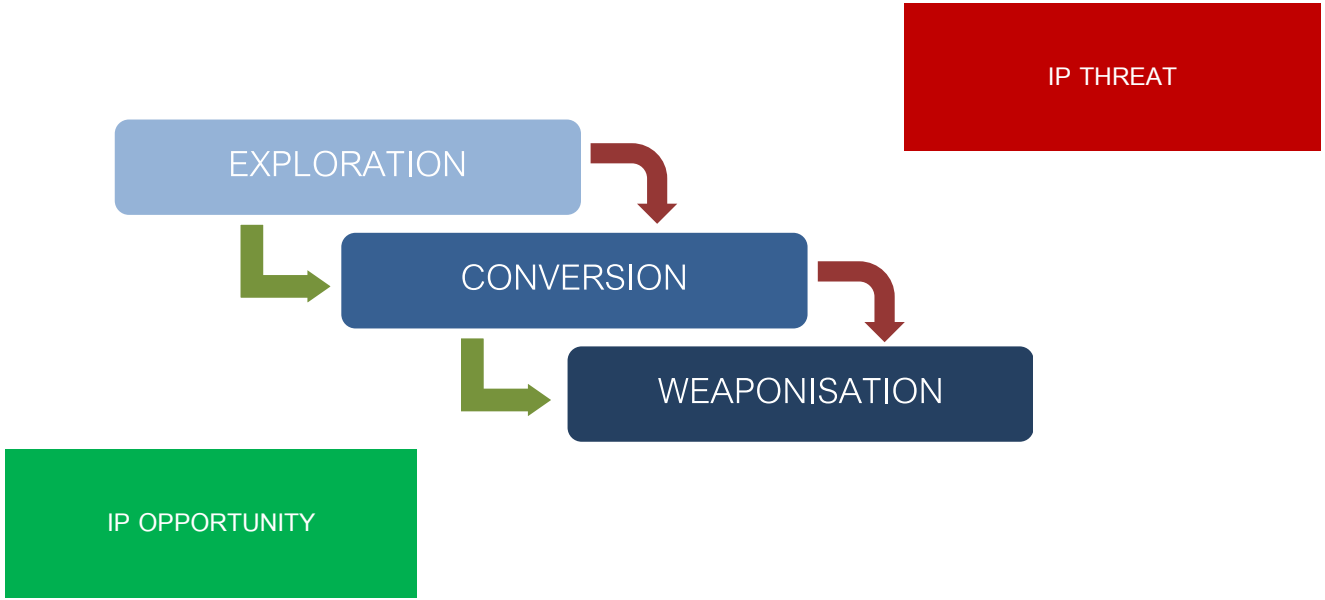
´The Intellectual Property Tech Chain´



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Tech Watch Methodology

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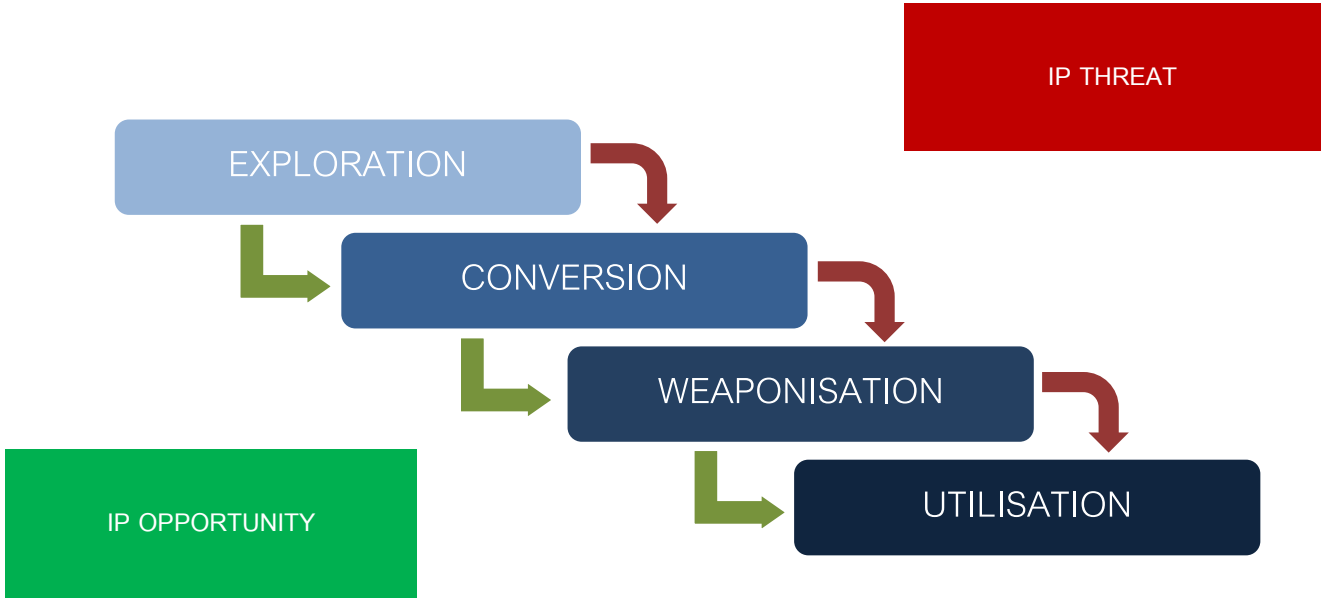

Tech Watch Methodology

Areas of Interest for IP in Regards to Emerging Technologies

TECHNOLOGY

Tech Used in IP Registration or Documentation of Systems

Tech Developers Protection of IP and Prevention of Potential Infringement

Tech Used as a Tool in IP Infringements and IP Crime

Tech Used By Other Right Holders to Protect and Enforce IP

Tech Applied by Law Enforcement to Investigate IP Crime

Six Selected Technologies

Six Selected Technologies

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Six Selected Technologies

MATERIAL TECHNOLOGIES

DATA PROCESSING TECHNOLOGIES

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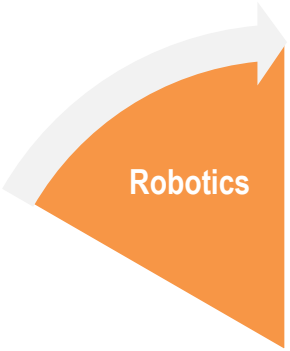
Six Selected Technologies



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DATA PROCESSING TECHNOLOGIES

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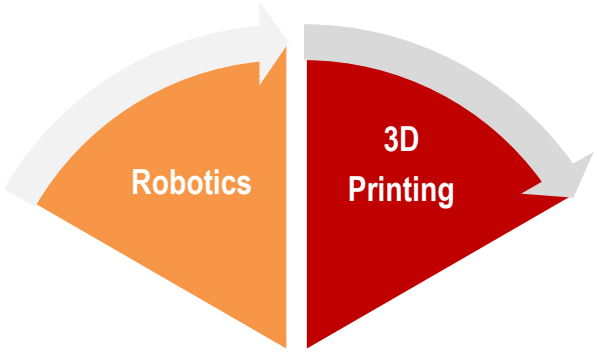

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DATA PROCESSING TECHNOLOGIES

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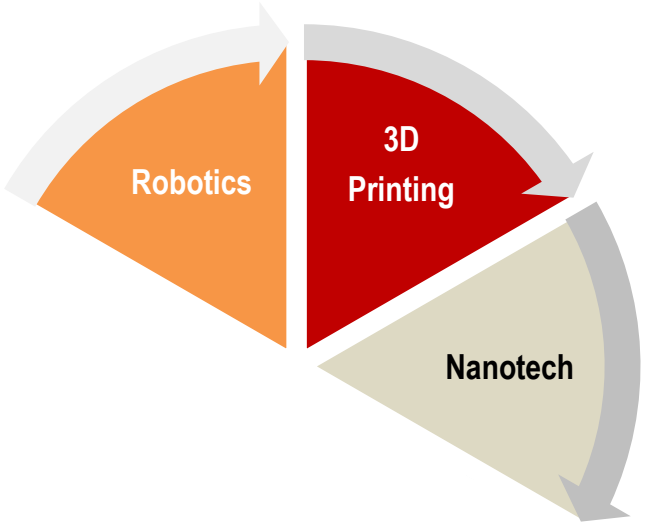

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DATA PROCESSING TECHNOLOGIES

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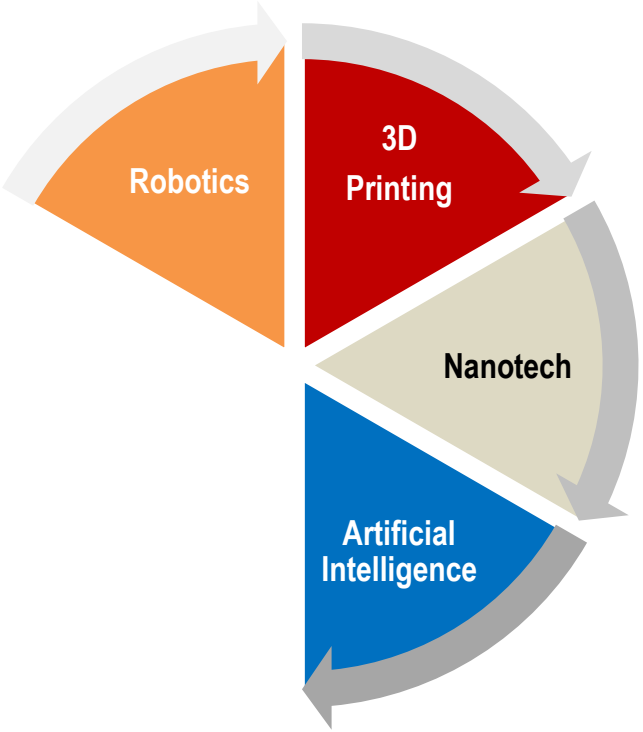

MATERIAL TECHNOLOGIES

DATA PROCESSING TECHNOLOGIES

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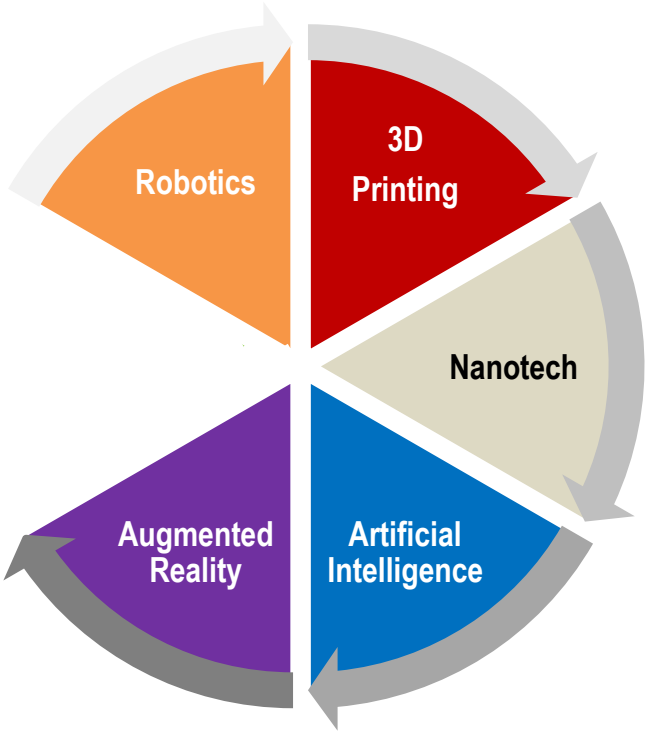

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DATA PROCESSING TECHNOLOGIES

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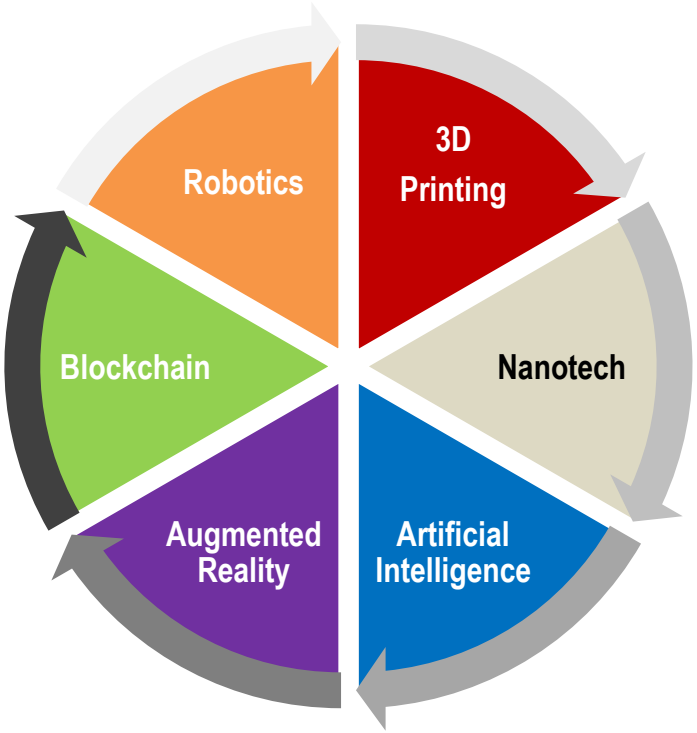


MATERIAL TECHNOLOGIES

DATA PROCESSING TECHNOLOGIES

Six Selected Technologies

Potential Future Technologies for Discussion

- 5G mobile connectivity
- Quantum computing
- Internet of Things (IOT)
- Big data
- Cryptocurrency and smart contract investigative and IT forensic tools
- Open source intelligence (OSINT)

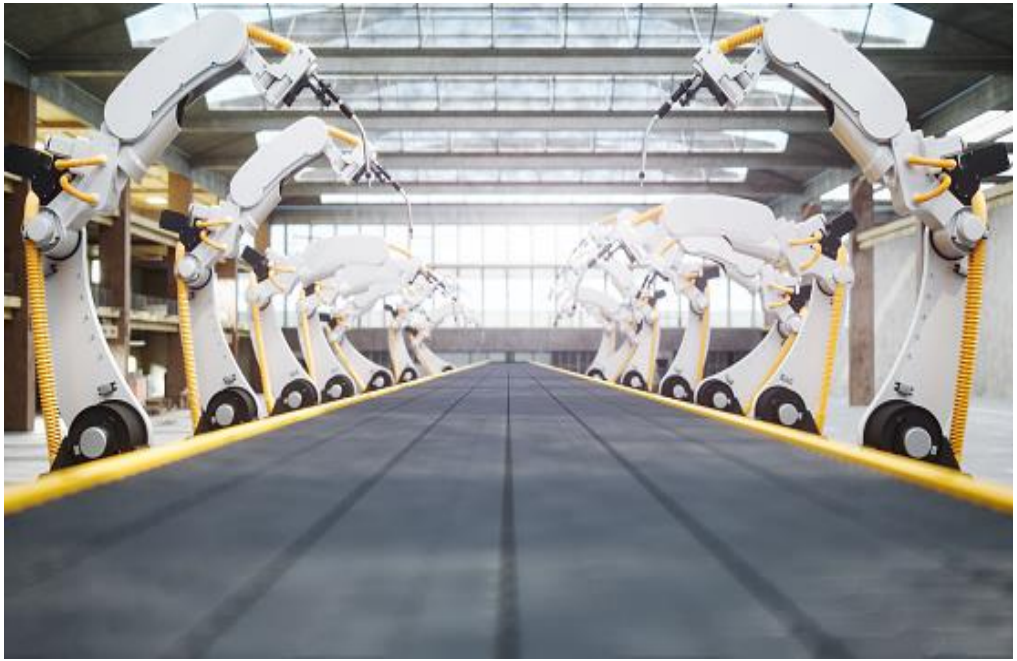
Six Selected Technologies

Robotics

Six Selected Technologies - Robotics

Main Characteristic

- Creation, design, construction, monitoring, control and use of programmable and often intelligent machines
- Medicine, architecture, transport, education, engineering, archaeology and aeronautics, are just some of the areas that benefit from innovation within this technological field

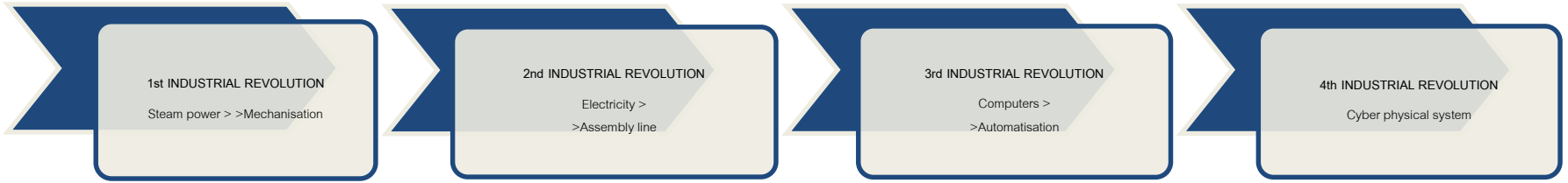


Interior of a Modern Automated Factory with Robotic Arms and Conveyor Belt

Six Selected Technologies - Robotics

History

- It took centuries to initiate the first industrial revolution, only a few decades to start the second and it has been a matter of time to experience a third and fourth, or other subsequent ‘revolutions’ that happen sooner each time and will heavily impact the economy and lives of all human beings



Industrial Revolutions

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Examples of Robots and Androids in Popular Culture

Frankenstein, novel by Mary Shelley. UK: Lackington, Hughes, Harding, Mavor, & Jones, 1818
Metropolis, motion picture directed by Fritz Lang. Germany: Universum Film A.G., 1927
I, Robot, novel by Isaac Asimov, USA: Gnome Press, 1950
Do Androids Dream of Electric Sheep?, novel by Philip K. Dick. USA: Doubleday, 1968
Westworld, motion picture, directed by Michael Crichton. USA: Metro-Goldwyn-Mayer Studios, 1973
We are the Robots, song performed by Kraftwerk. Germany: Kling Klang (EMI), 1978
Hey! Rise of the Robots, song performed by The Stranglers. UK: United Artists, 1978
Blade Runner, motion picture directed by Ridley Scott. USA: Warner Bros, 1982
Terminator, motion picture directed by James Cameron. USA: Orion Pictures, 1984
Transformers, cartoon series. USA: First-run Syndication, 1984
RoboCop, motion picture directed by Paul Verhoeven. USA: Orion Pictures, 1987
Robot Visions, collection of short stories by Isaac Asimov. USA: Byron Preiss Visual Publications, 1990
Ghost in the Shell, anime directed by Mamoru Oshii. UK-Japan: Kodansha, Bandai Visual and Manga Entertainment, Production I.G., 1995
Paranoid Android, song performed by Radiohead. UK: Parlophone Capitol, 1997
Matrix, motion picture directed by the Wachowski Brothers. USA: 1999
Steel Battalion, video game. Japan: Capcom, 2002
Battlestar Galactica, television series. USA: Sci-Fi Network, 2004
Robots (The Humans Are Dead), song performed by Flight of the Conchord. USA: Sub Pop, 2008
Bioshock, USA: 2K Games, 2008
Wall-E, animated motion picture directed by Andrew Stanton. USA: Pixar Animation Studios, 2008
A.I. Artificial Intelligence, motion picture directed by Steven Spielberg. USA: Warner Bros., Dreamworks, Amblin Entertainment, 2011
Westworld, television series. USA: HBO, 2016
Crier's War, novel by Nina Varela. USA: Quill Tree Books, 2019

Six Selected Technologies - Robotics

Impact on Intellectual Property

- Protection issues
  - Protection of robotics hardware and software
  - Protection the final products as the result of the robot's work
- Infringement:
  - Easy replication of items and illegal production of goods
  - Extensive use of protection through trade secrets
- Enforcement:
  - Robotics can be used by law enforcement in collaboration with AI, through the use of drones and IR cameras to identify illicit products
  - Can also be used by customs using small or nanorobots to inspect the goods in a container

Six Selected Technologies

3D Printing

Six Selected Technologies - 3D Printing

Main Characteristic

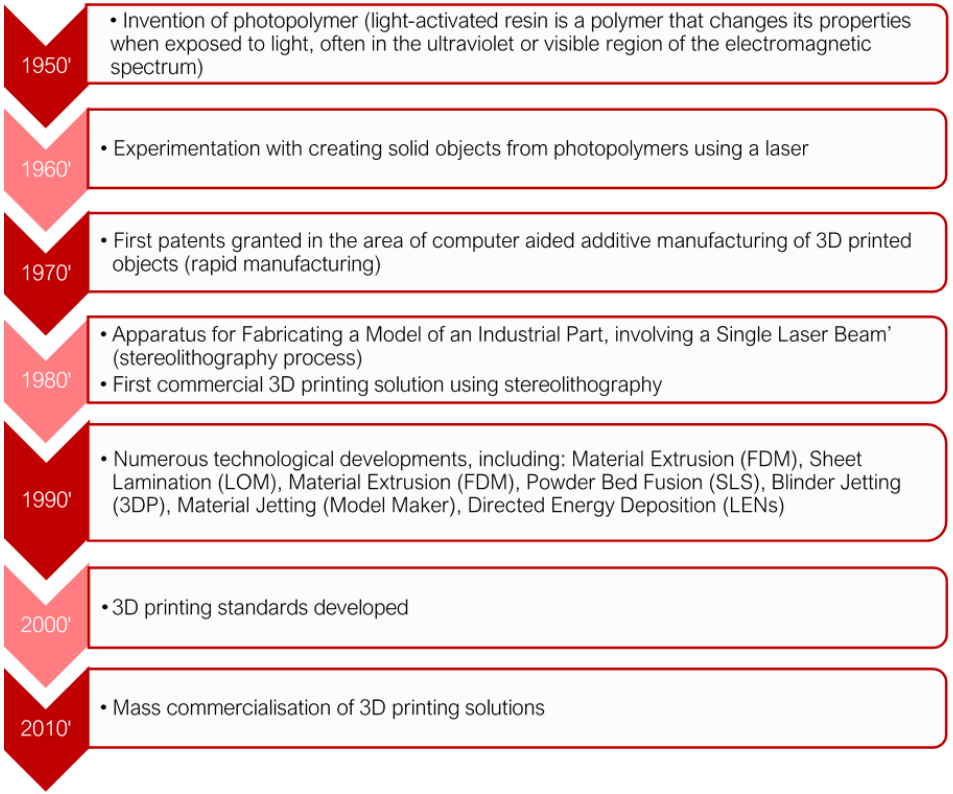
- 3D printing process builds a three-dimensional object from a computer-aided design (CAD) model, usually by successively adding material layer by layer (i.e. additive manufacturing)

3D Printer

Six Selected Technologies - 3D Printing

History

- While in principle a technology that has been around for decades, it has still not reached its full potential
- Medicine, architecture, transport, education, engineering, archaeology and aeronautics, are already benefitting from the technology



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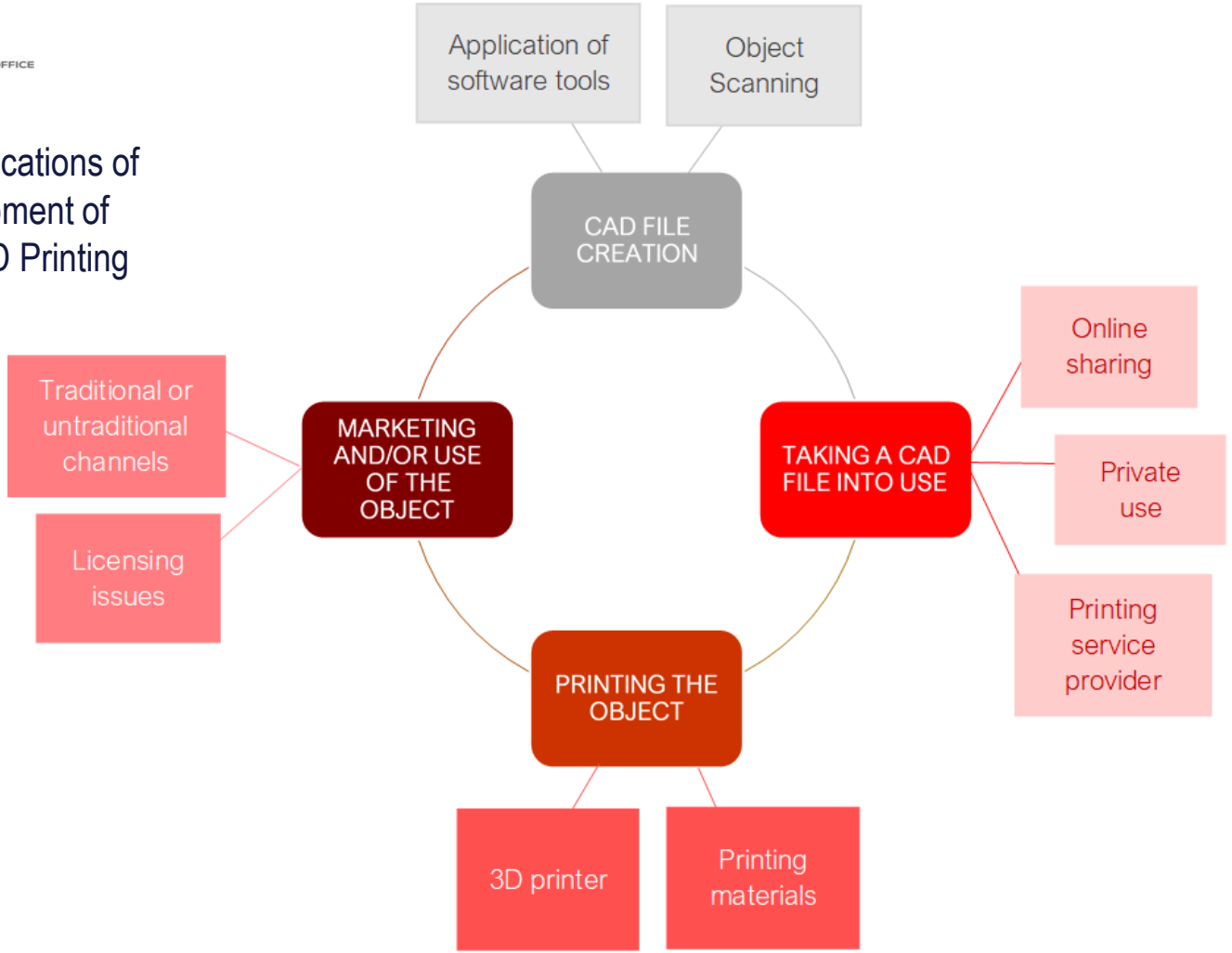
The IP Implications of the Development of Industrial 3D Printing



Six Selected Technologies - 3D Printing

Impact on Intellectual Property

- Protection issues
  - Digital rights management (DRM), fingerprinting, hashing or watermarking used for CAD files that can also be encrypted and reinforced with a licencing system
  - Consumer generated designs and innovations
- Infringement:
  - 3D tech allows the easy replication of items and facilitates the illegal production of goods
  - Infringements related to the CAD files
- Enforcement:
  - Customs' scanning processes could be improved by implementing 3D and penetration scanners adapted to large-scale objects
  - Nanocodes can be integrated into the CAD files and used to track the 3D printed objects

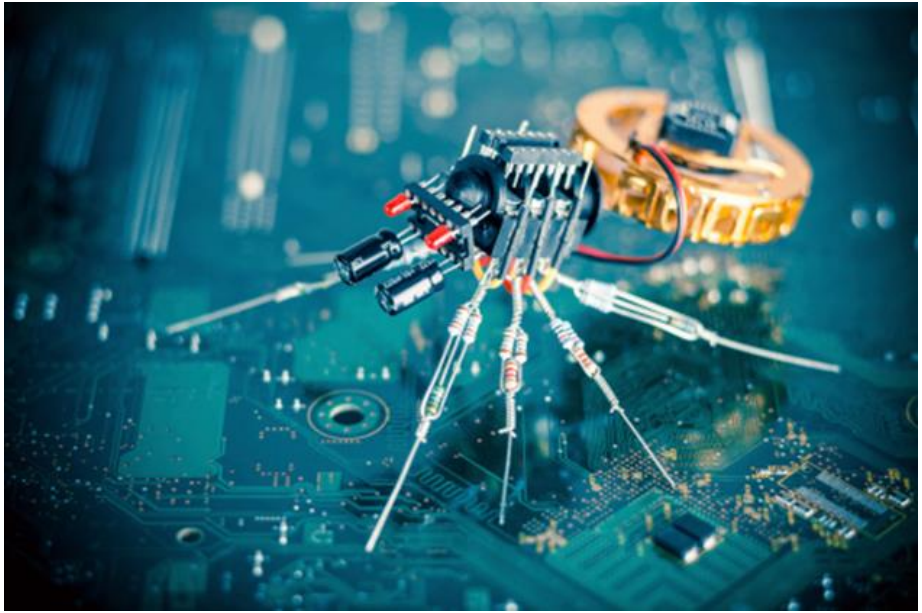
Six Selected Technologies

Nanotech

Six Selected Technologies - Nanotech

Main Characteristic

- Manipulation of matter on an atomic, molecular and supramolecular scale
- Area of scientific and industrial research that deals with the special properties of matter which occur below a given size: surface science, organic chemistry, molecular biology, semiconductor physics, energy storage, micro-fabrication and molecular engineering
- One important application is carbon nanotubes, which are tubes made of carbon with a diameter measured in nanometres (=0.000000001 m)



Electronic Spider Working on a Motherboard

Six Selected Technologies - Nanotech

History

- While having existed for some time nanotech has not yet reached its full potential, the technology is evolving rapidly and successfully and could undoubtedly revolutionise many aspects of our lives and work
- Medicine, architecture, transport, education, engineering, archaeology and aeronautics, are just some areas that benefit from innovation within that as well as other technological fields, including robotics and 3D printing

Colourful Abstract Data Flowing Chromatic Holographic Dynamic Waves

Six Selected Technologies - Nanotech

Impact on Intellectual Property

- Protection issues
  - Potential issues are (1) protection of manufacturing processes; (2) protection of the nanotechnology products; (3) protection of nanodevices, nanomaterials and nanotools; (4) protection of nanobiotechnology to modify human or living beings' genes.
- Infringement:
  - Commercialisation of nanotech-based products has been relatively modest, but current research activities demonstrate extraordinary potential, which raises a question as to whether the infringement of nanomaterials will increase when more widely applied
- Enforcement:
  - Intelligent materials can be used to ensure product authenticity and hold product information
  - In combination with robotics, nanotech can be used by law enforcement and customs

Six Selected Technologies

Artificial Intelligence (AI)

Six Selected Technologies - Artificial Intelligence (AI)

Main Characteristic

- The fundamental AI models represent mathematical descriptions of how input data is going to be processed and what kind of input is expected from the model for given performance evaluation criteria
- Thus, AI systems are primarily advanced learning systems

Futuristic Female Cyborg

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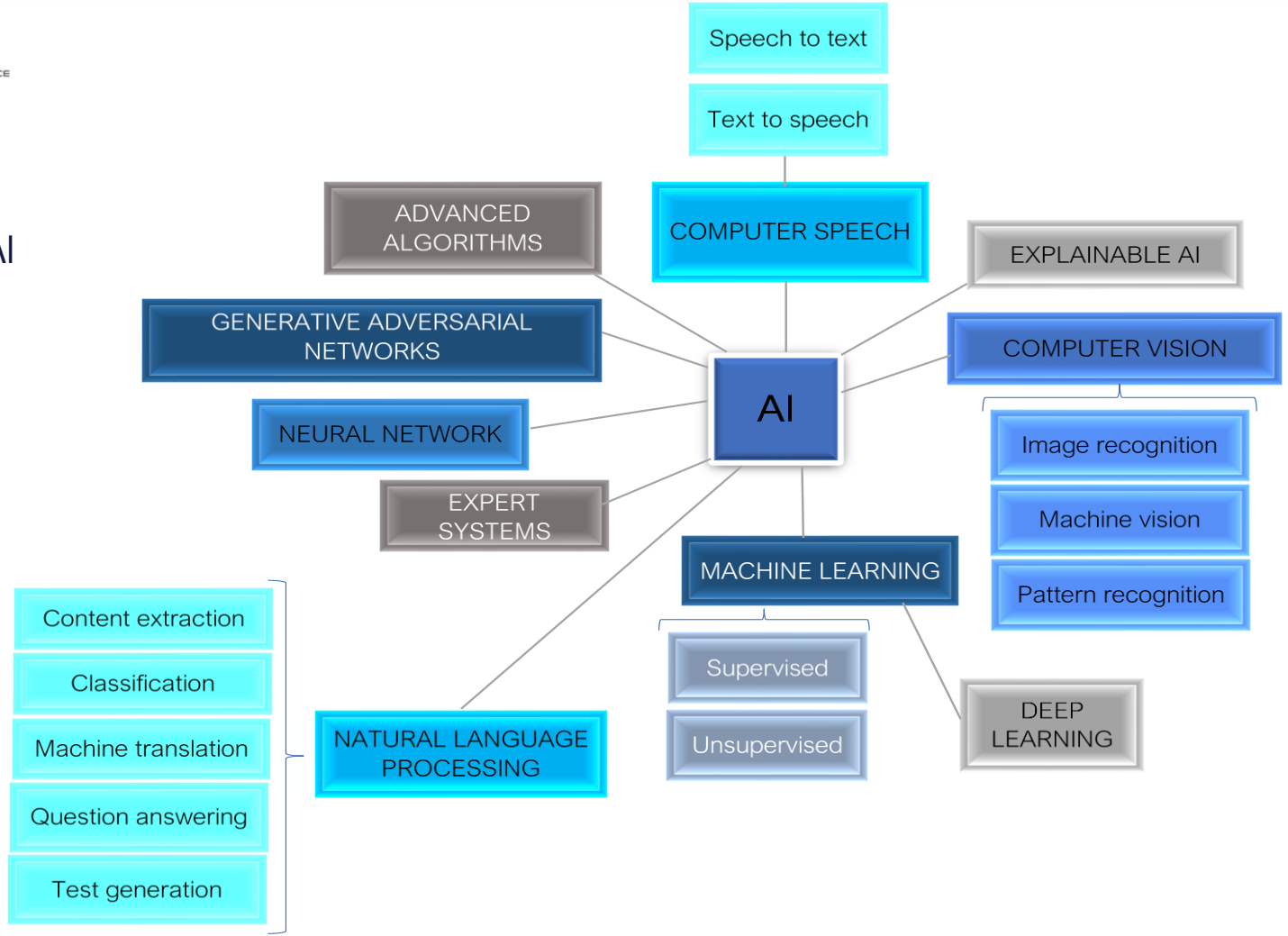
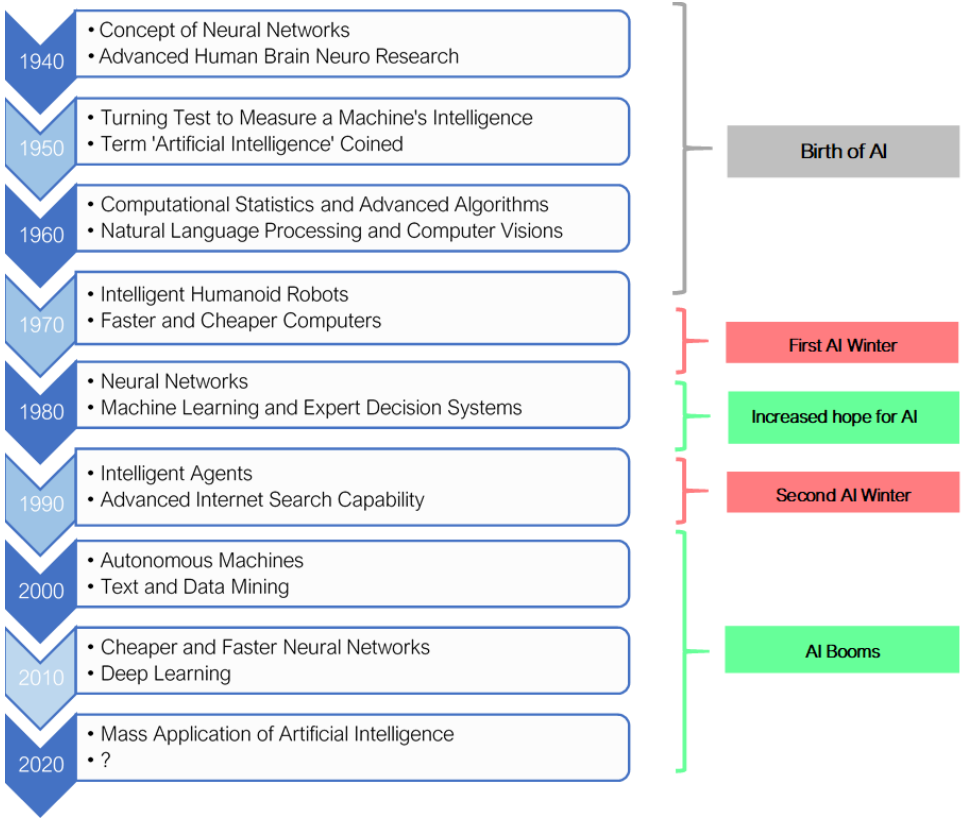
Concepts of AI



Six Selected Technologies - Artificial Intelligence (AI)

History

- Work on AI has been ongoing for decades and been through several ‘AI winters’ but is currently in a veritable boom period



Six Selected Technologies - Artificial Intelligence (AI)

Impact on Intellectual Property

- Protection issues
  - Protection final products and creations made by AI
  - Use of AI in examination of IP applications
- Infringement:
  - Used to counter preventive measures and to predict and circumvent enforcement responses, including preventive measures and responses using AI
- Enforcement:
  - AI can be a powerful tool for detection of infringements, incl. in regards to automated content recognition (ACR)
  - Customs risk analysis and police risk profiling can benefit greatly from AI but there will be numerous other applications of AI that can enhance IP enforcement

Six Selected Technologies

Virtual, Augmented or Enhanced Reality

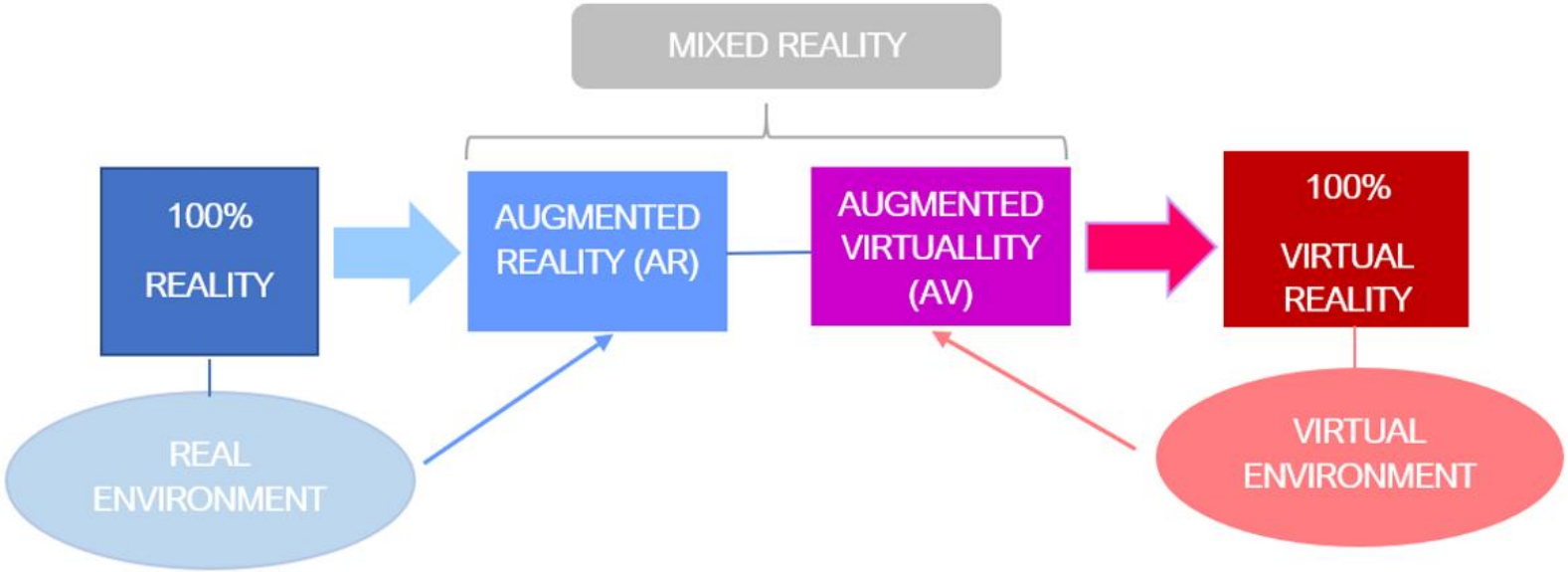
Six Selected Technologies - Virtual, Augmented or Enhanced Reality

Hand Holding Tablet Using AR Application to Check Relevant Information about the Spaces Around a Customer in Tokyo

Six Selected Technologies - Virtual, Augmented or Enhanced Reality

Main Characteristic

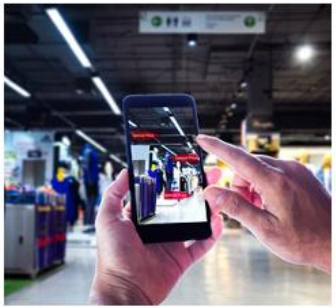
- Virtual, augmented and enhanced reality are already important in many peoples life's but this will drastically increase in the future



Six Selected Technologies - Virtual, Augmented or Enhanced Reality

History

- While having been around for a long time, virtualisation tech are rapidly evolving through innovations in devices but also faster internet connectivity (incl. 5G)



AUGMENTED REALITY		
Combines real and virtual objects in a real environment (graphics and audio)	Runs interactively and in real time (explicit v implicit interaction)	Registers (aligns) real and virtual objects with each other (in 3D space)

Augmented, Mixed Reality Devices

Six Selected Technologies - Virtual, Augmented or Enhanced Reality

Impact on Intellectual Property

- Protection issues
  - Virtualisation can be used in examination of IP applications
  - Brings new opportunities of providing proof of use of trade marks
- Infringement:
  - Virtualisation brings forth a wide area of potential infringing use, especially in the area between reality and virtuality, incl. virtual shopping and deceptive marketing
  - Transformative use of IP and piracy in virtual or mixed worlds pose major challenges
- Enforcement:
  - Virtualisation can be a great tool in training and capacity building and be highly useful as easily comprehendible evidence (e.g. crime scene documentation)
  - Augmented reality can effectively be used to identify infringing goods

Six Selected Technologies

Blockchain and Distributed Ledger Technology (DLT)

Six Selected Technologies - Blockchain and Distributed Ledger Tech (DLT)

Main Characteristic

- A method for decentralised recording of data in an immutable encrypted ledger maintained in a peer-to-peer (P2P) network
- Transactions in a blockchain network can be conducted without the authentication of a central authority while still being trustworthy

Bitcoin ATM

Six Selected Technologies - Blockchain and Distributed Ledger Tech (DLT)

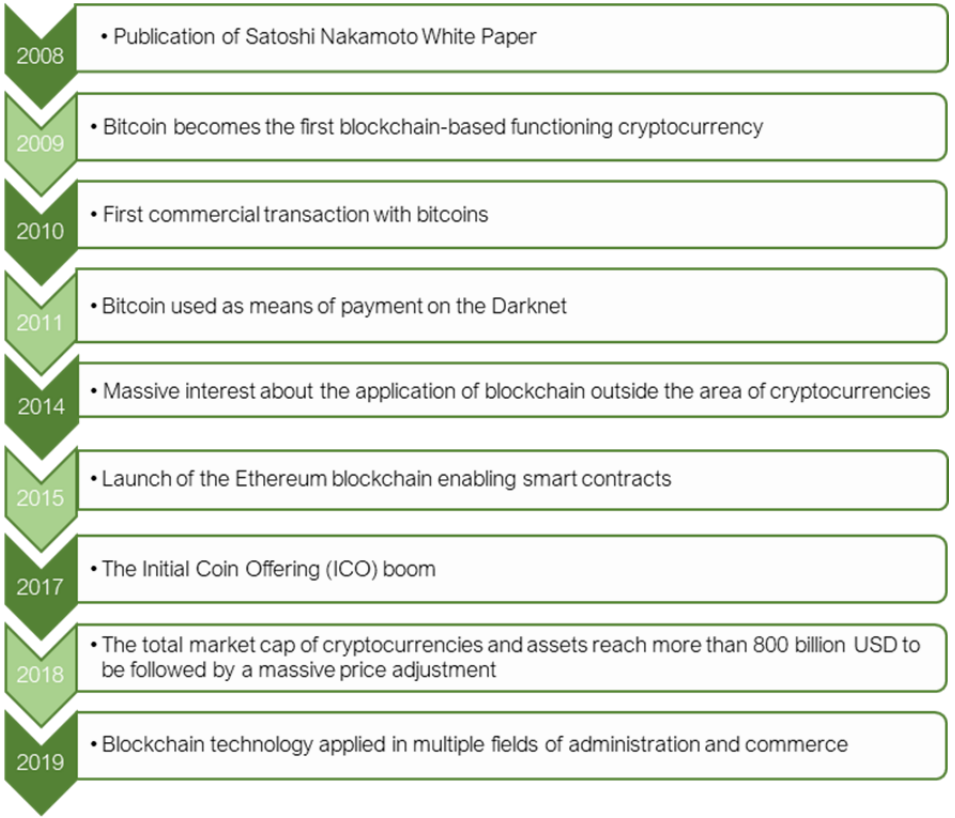
BLOCKCHAIN VARIATIONS	CHARACTERISTICS
Public	No permission is needed to enter the blockchain as a user and no access control is administered for reading and adding data. Public blockchains are not supervised and provide anonymity features for users. However, the speed of public blockchains can be rather slow.
Private	Permission is needed to enter the blockchain as a user and access control to read or add data is administered on an invitation only basis. Private blockchains are supervised by a single entity and anonymity is usually not provided for users. However, the speed of private blockchains are often fast.
Consortium	Permission is needed to enter the blockchain as a user and access control to read or add data is administered on a case-by-case basis. Consortium blockchains are supervised by several entities and anonymity is usually not provided for users. However, the speed of consortium blockchains are often fast.

Differences Between Blockchain Types

Six Selected Technologies - Blockchain and Distributed Ledger Tech (DLT)

History

- Few technologies have gained such widespread attention and application in such a short time as blockchain tech
- From initially being used for fast and secure payments, the technology is now applied in many other areas



Six Selected Technologies - Blockchain and Distributed Ledger Tech (DLT)

Impact on Intellectual Property

- Protection issues
  - Due to the key technical characteristics, blockchain seems well suited for registration of IP
  - Management of IP seems also to be an area of application of blockchain
- Infringement:
  - Decentralised marketplaces for counterfeits, decentralised piracy services and alternative domain name system without dispute resolution available for trade mark holders
  - Use of cryptocurrency as means of payment in IP infringements
- Enforcement:
  - Blockchain can be used to secure supply chains and enhance authenticity
  - Evidence based on blockchain can have a high degree of dependability

10 Significant Horizontal Points

10 Significant Horizontal Points

10 Significant Horizontal Points

- The six techs are rapidly evolving without yet having reached their full potential
- Will have significant impact on labour, the economy and world trade
- Predictions about the application range from potential significant improvement of the living conditions of humanity (e.g. better quality products and services) to major threats and dystopian visions (e.g. unemployment or mass surveillance)

Automatic Robot Mechanical Arm is Working in Temporary Storage in a Distribution Warehouse

10 Significant Horizontal Points

- Potential for the automation of processes, including production, governmental administration and commercial activity
- Raise questions about the protectability of innovation and creativity related to the technologies themselves
- Make the protection of IP more effective and provide higher quality registration and documentation systems (e.g. AI and blockchain)

3D Printing Process

10 Significant Horizontal Points

Person Interacting with Augmented Reality Interface at Home

- Can be applied by IP infringers to either make production, marketing and distribution of counterfeits more effective (e.g. cheaper production with use of robots, use of local 3D printing facilities for production purposes and more appealing presentation of products using AR) or be used in other IP infringing ways (e.g. blockchain-based alternative DNS without the possibility for trade mark owners to enforce their rights or copyright infringement in AR applications)

10 Significant Horizontal Points

- Can be used as tools for IP enforcement (e.g. protection of supply chain integrity, easier product individualisation and identification of counterfeits, improve investigations by law enforcement, make customs risk analysis more effective or enhance effectiveness of notice and takedown procedures)
- Represent new evidential opportunities and challenges for legal systems, due to the complexity of the technologies, the enormous amount of generated data but also due to the high level of reliability of the information

Conceptual Illustration of Medical Nanoparticles

10 Significant Horizontal Points

Graphene Nano Material Processing in Graphene Processing Factory

- OVERALL OBSERVATION: all of the technologies have already shown themselves to be important emerging and disruptive technologies impacting businesses, the economy, government administration and the daily lives of many human beings and have proved to pose potential challenges and/or opportunities for IP.

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Thank you

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