Digital Transformation and sustainable business models

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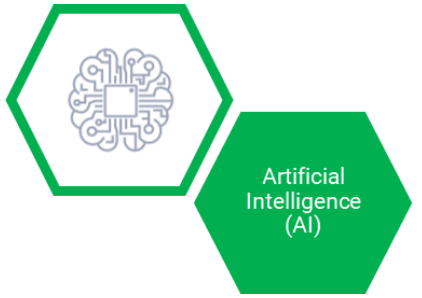
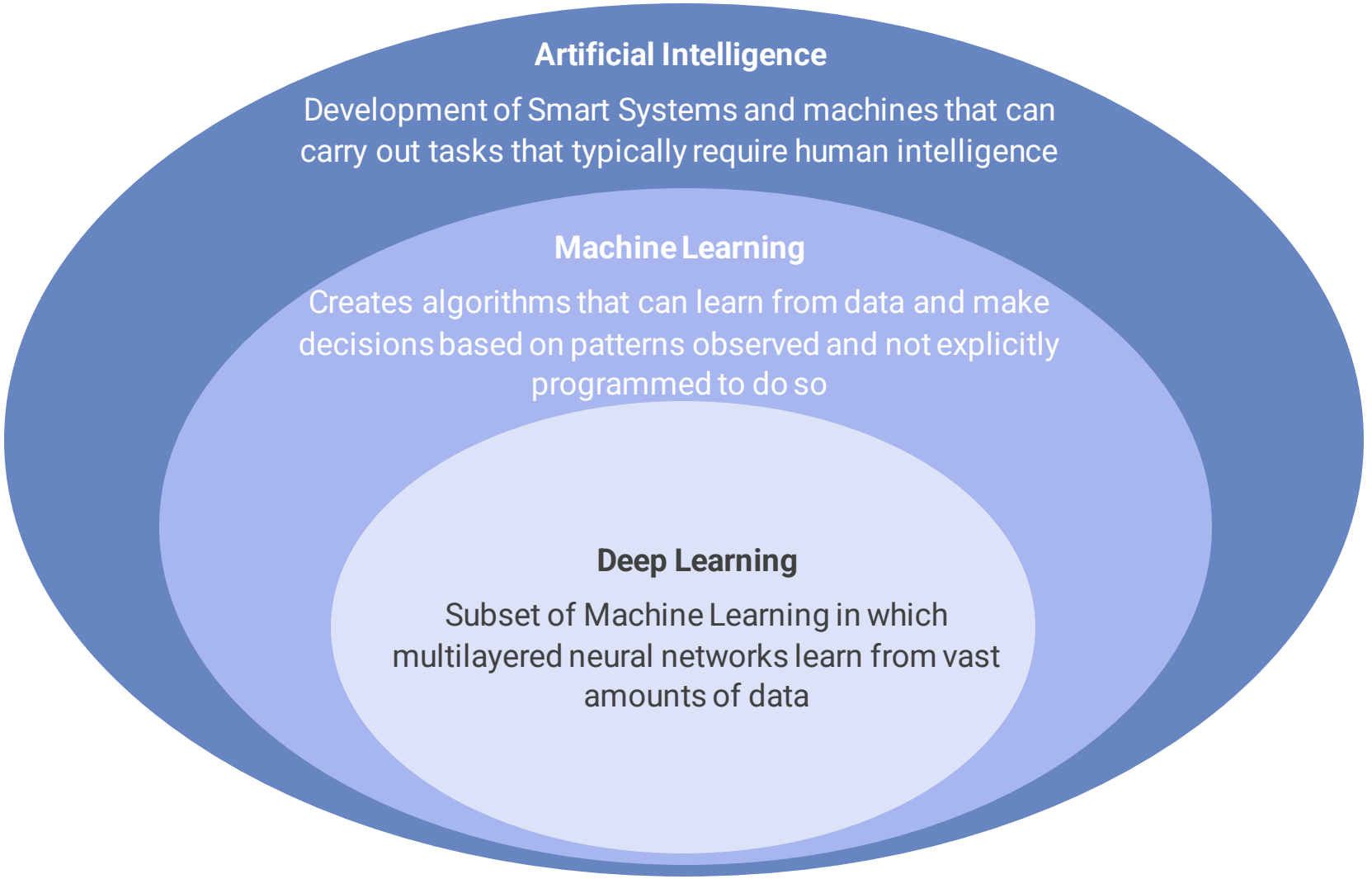
CHAPTER 1 „New sustainable business models“	**CHAPTER 2** „Enablement of Business Models through technologies“	**CHAPTER 3** „Enablement of Business Models through technologies“	**CHAPTER 4** Execution of business models by people and processes“	**EXAM** „New business model marketplace“
▪ Overview & Administrative Things ▪ Digital Transformation ▪ Business Model Canvas & Value Proposition Canvas ▪ Exam Introduction ▪ Sustainability & Technology	▪ Recap ▪ Cloud Computing ▪ Persona Creation & Design Thinking ▪ Analytics & Big Data ▪ Customer Journey Method	▪ Recap ▪ Artificial Intelligence & Machine Learning ▪ Internet of Things ▪ Ecosystems & Platforms ▪ Digital Twin Concept	▪ Recap ▪ Agile Development ▪ Management of Change ▪ Mindset & Culture ▪ Digital Talent	Exam – presentation of each group work (business model created) with active discussion among all students

Recap

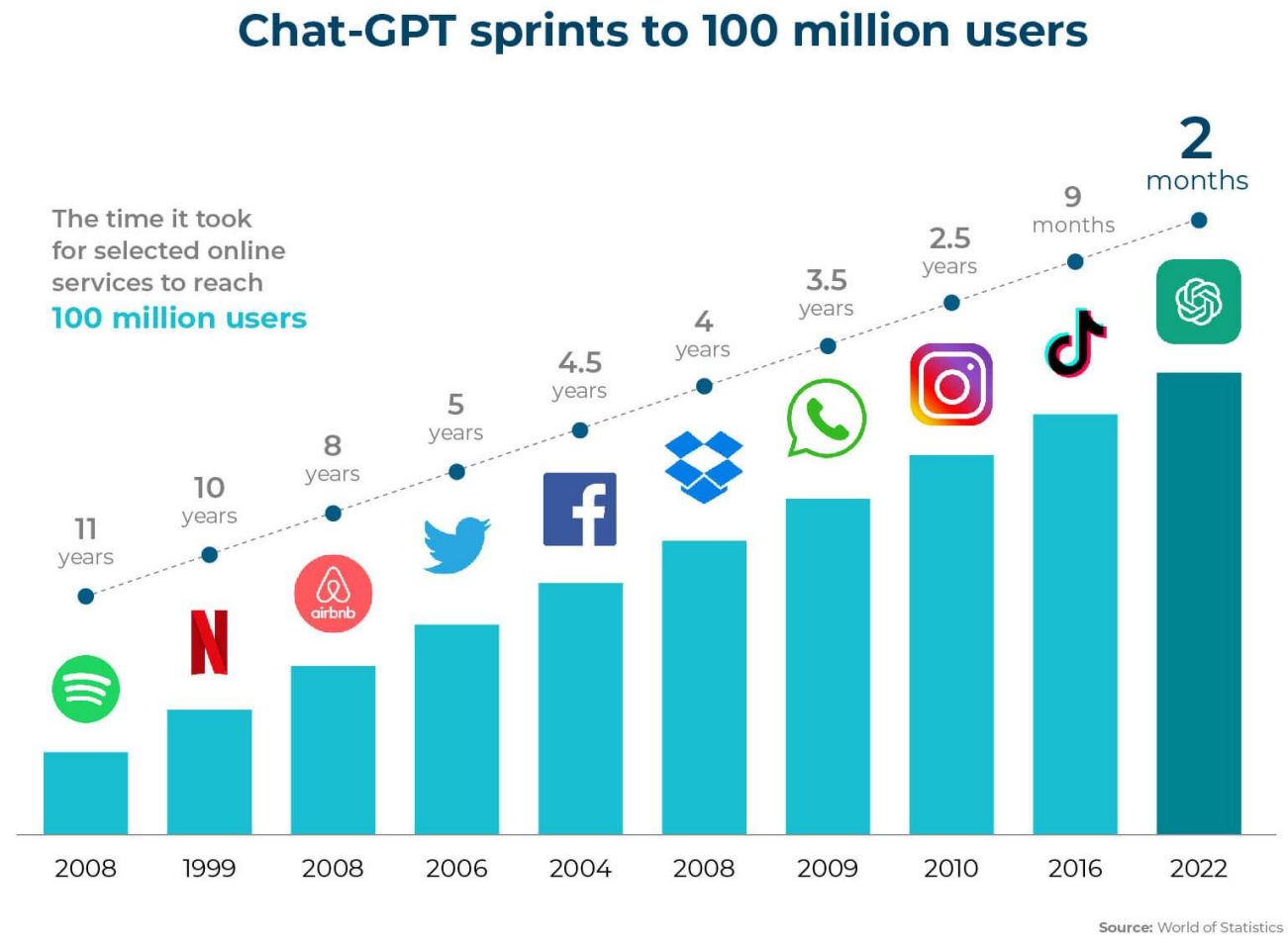
Connection between Artificial Intelligence, Machine Learning and Deep Learning



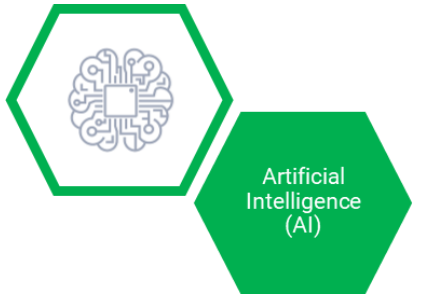


Quelle: https://www.scs.org.sg/articles/machine-learning-vs-deep-learning

“Gen-AI is the biggest game changer since the introduction of the smartphone”



The EU Artificial Intelligence Act



EU-weite Regulierung des Einsatz und Entwicklung Künstlicher Intelligenz in allen Lebensbereichen

Regulierung entsprechend der Einteilung in Risikoklassen

Inakzeptables Risiko

Anwendungen mit klarer Bedrohung der Menschenrechte, z.B. Gesichtserkennung im öffentlichen Raum oder Sozialkreditsysteme (China), grundsätzlich verboten

Hohes Risiko

Gefährdung der Gesundheit, Sicherheit und Grundrechte von EU-Bürgern, z.B. biometrische Systeme, Betrieb kritischer Infrastrukturen, Personalsoftware (Bewerbungen)

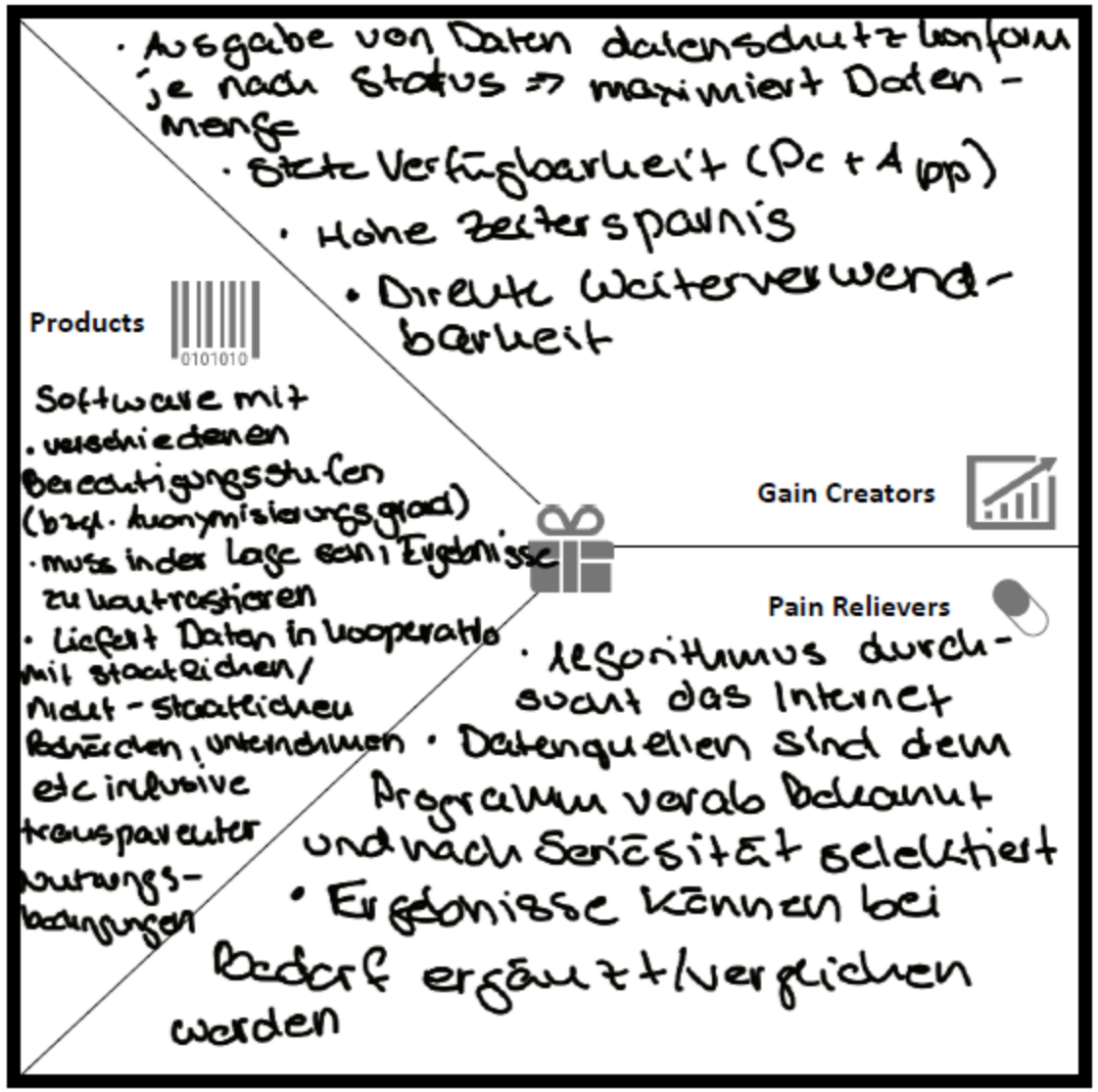
Begrenztes Risiko

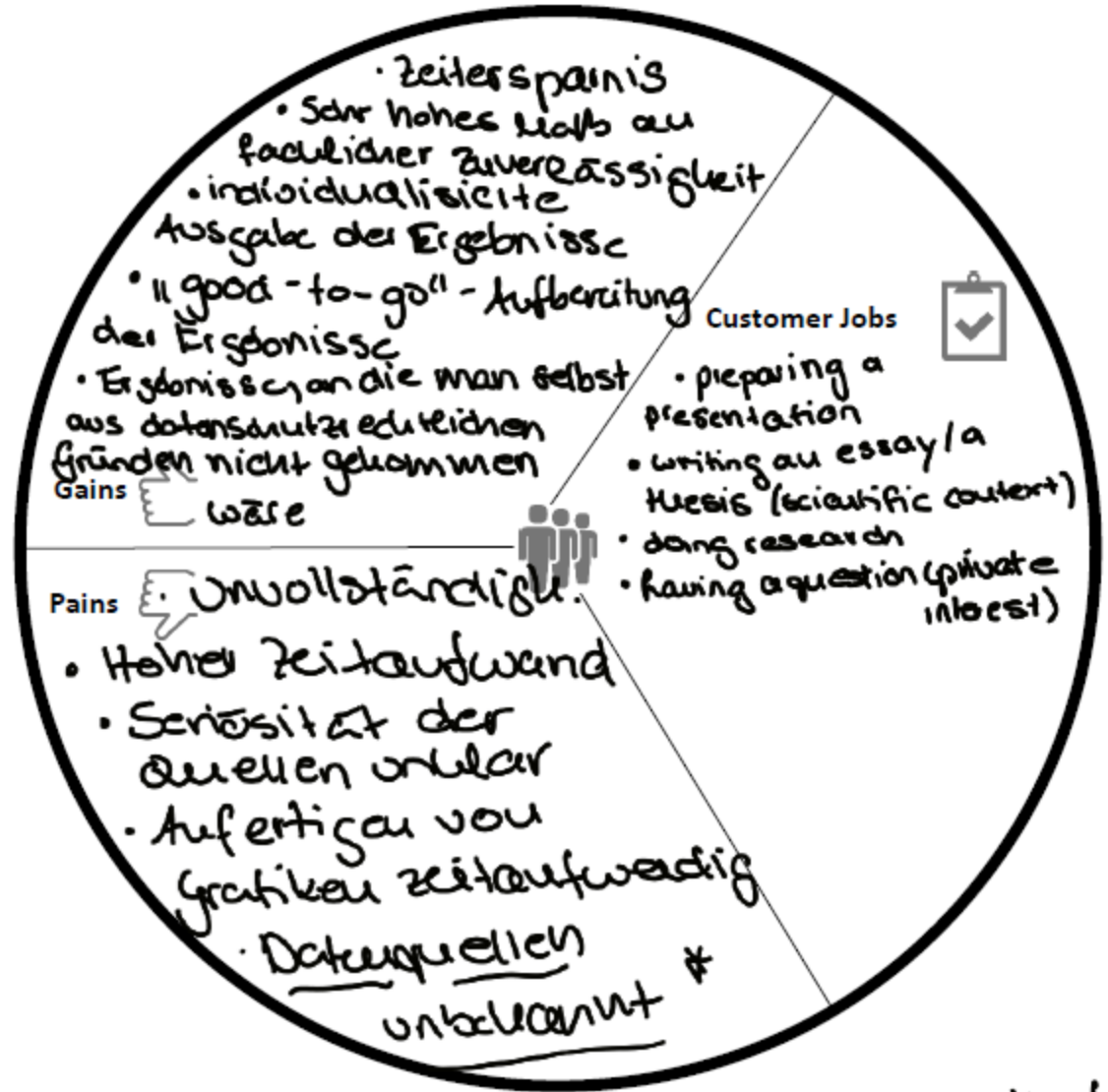
Anwendungen in unkritischen Bereichen, z.B. Chatbots, unterliegen Transparenzpflicht → Nutzer sollen, wissen, dass sie mit einem System interagieren

Minimales Risiko

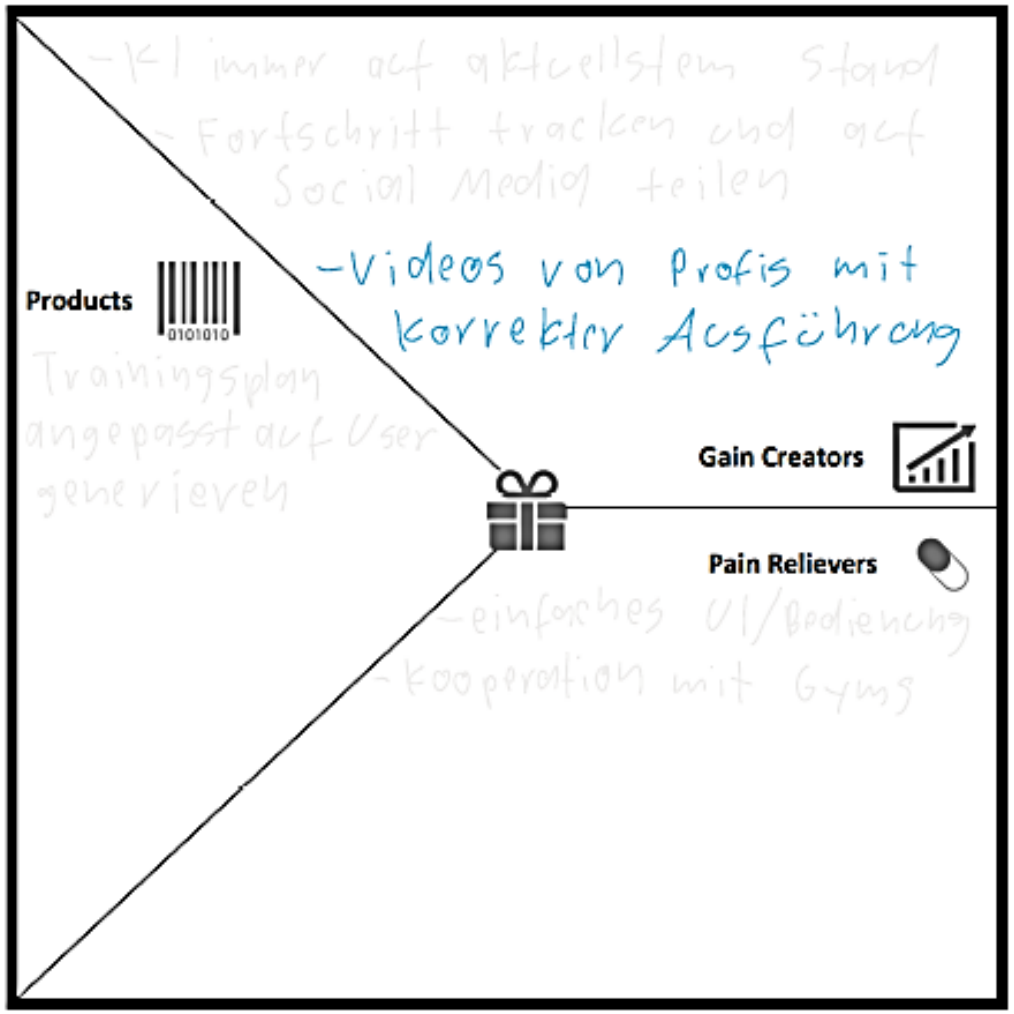
Anwendung mit sehr geringem Risiko, z.B. Computerspiele, Filmempfehlungen, Spamfilter, keine Einschränkung durch Verordnung

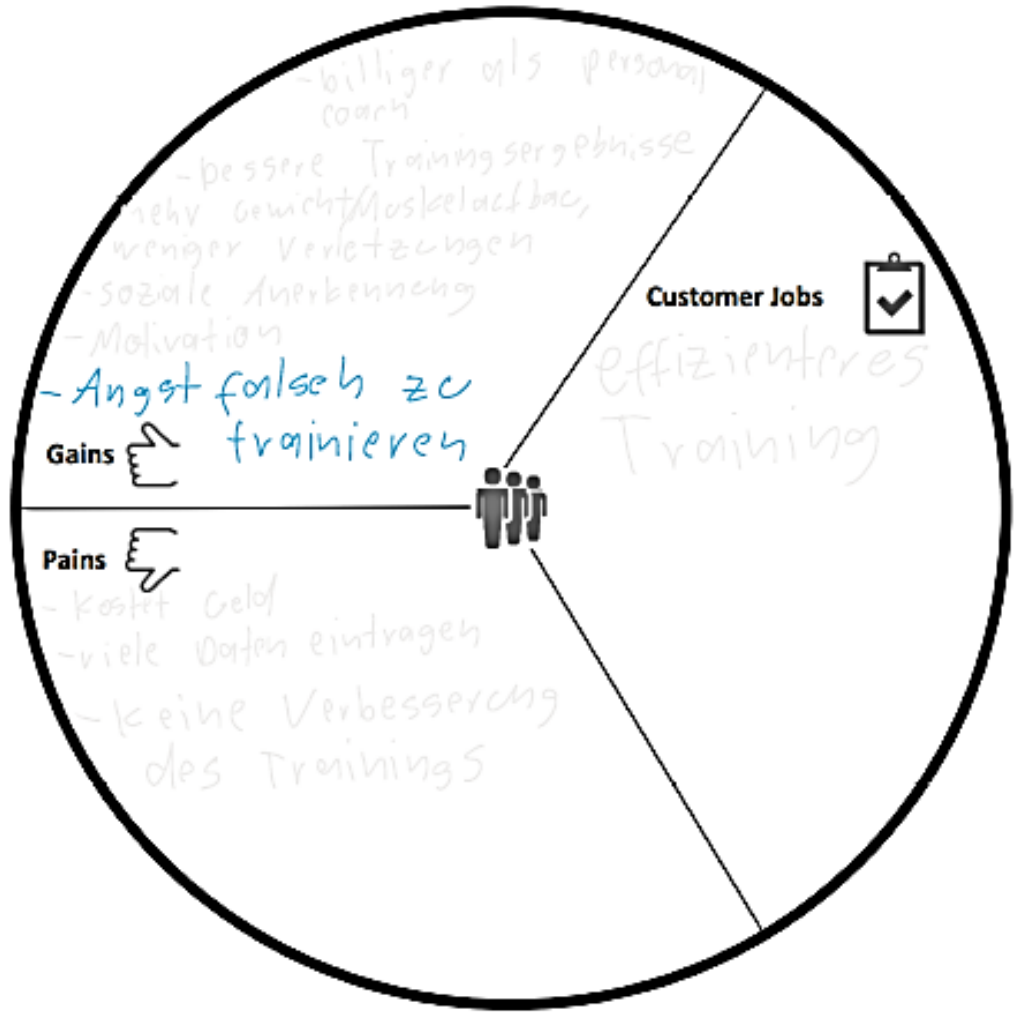
Quelle: https://www.handelsblatt.com/technik/it-internet/eu-regulierung-kuenstliche-intelligenz-wirtschaft-warnt-vor-massiven-einschraenkungen-durch-ai-act/28850684.html





* was darf man mit den Daten machen?


Products
Gain Creators
Pain Relievers


Customer Jobs
Gains
Pains

Key Partners

- Bildungseinrichtungen
- (Natur-)Forschungsinstitute
- Datensammler
  - wie Google

Key Activities

Revenue Streams:
- Abo-Einnahmen
- Stete Erreichbarkeit bereitstellen
- aquieren Partnerschaften aufbauen
- Algorithmen (weiter-)entw. für z.B. Seriösität

Key Resources

- Cloud-basiert
- Programmierer
- Qualitätssicherung / Datenauswertung (Kundenzufriedenheit)

Value Proposition

- Bearbeitete Daten
- Datenauswertungen
- Grafiken
- Datenvergleiche

Values:
- Zuverlässigkeit
- Seriösität
- Neutralität

Probleme:
- zu viele Quellen verfügbar
- Fehlende Statistikkenntnisse
- Datenschutzrechtliches

Customer Relationships

- Abomodell: Grund v. Kostenlos
- Kundenbindung variabel

Werbekanäle:
Social Media
Werbung an Schulen und Hochschulen inkl. spezieller Angebote

Channels

- Website im Fokus
- App
- Ziel: Kunden speichern die Seite als Lesezeichen

Customer Segments

- Bildungswesen:
  (Hoch-) Schulen, VHS, ...
- Informations- / Dienstleistungssektor → Berufstätige
- Forschende
- Privat Interessierte

Cost Structure

- (Forschung) & Entwicklung
- Personalkosten
- Storage von Daten

Revenue Stream

Zuverlässigkeit, Seriösität, Zeitersparnis

Eco-Social Costs

- CO2-Ausstoß für Speicher und Nutzung => Neutralisationskonzept einbinden

Eco-Social Benefits

- Weniger physische Medien notwendig
- Suchzeit verkürzt
- „Analysezeit" verkürzt
- gesparte Wege

=> geringer CO2-Ausstoß

Key Partners (8)

- Studios
- Lebensmittelunternehmen
- Marktforschungsinstitute & Unternehmen
- Hersteller von IoT (Smart Watches, ...)

Key Activities (7)

- App Entwicklung
- KI-Training
- Produkt bewerben
  - Kontaktaufbau mit potentiellen Partnern

Key Resources (6)

- Userdaten
- Trainiertes KI-Modell
- App
- Mitarbeiter (Entwickler)
- Partnerunternehmen

Value Proposition (2)

- Effizienteres Training
- Grundlegende Einführung und weiterführende Unterstützung beim Erreichen von persönlichen Zielen
- Verbesserung von körperlicher Gesundheit
- Ersparnis von Geld & Zeit
- Verletzungsprävention

Customer Relationships (4)

- Abo-Modell
- Push-Benachrichtigungen
- Freunde einladen (Vorteile für beide)
- Kooperationen mit Studios

Channels (3)

- App
- Kooperationen mit Fitnessstudios und Marken (Essen)
- Print / Onlinewerbung

Customer Segments (1)

- Sport- und Gesundheitsinteressierte Personen
- Alter 18 - 50
- Technische Affinität

Cost Structure (5)

- Softwareentwicklung (KI-Training)
- Mitarbeiter (Verwaltung, Vermarktung)
- Datenankauf
- Cloud Dienstleistungen (Rechenzentren)
- Werbekosten

Revenue Stream (5)

- Abonnements
- Premium Version (Tracking der Übungsverbesserung)
- Partner (Kooperation (Ware Bringerie))

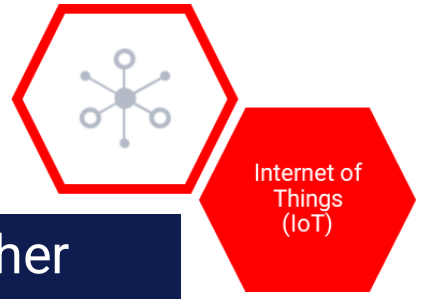
Eco-Social Costs (10)

- Disruptive Wirkung auf Personal Training
- CO_2 Ausstoß durch Rechenzentren

Eco-Social Benefits (11)

- Gesparte Zeit vermeidet
- Weniger CO2 Ausstoß durch empfohlene Partner, die saisonale Produkte anbieten (Umwelt Bundesamt)
- Verbesserung der Gesundheit

Internet of Things - Key aspects



Network of physical objects which are equipped with sensors, software and other technologies to connect them with other devices and systems via internet with the goal to exchange data.

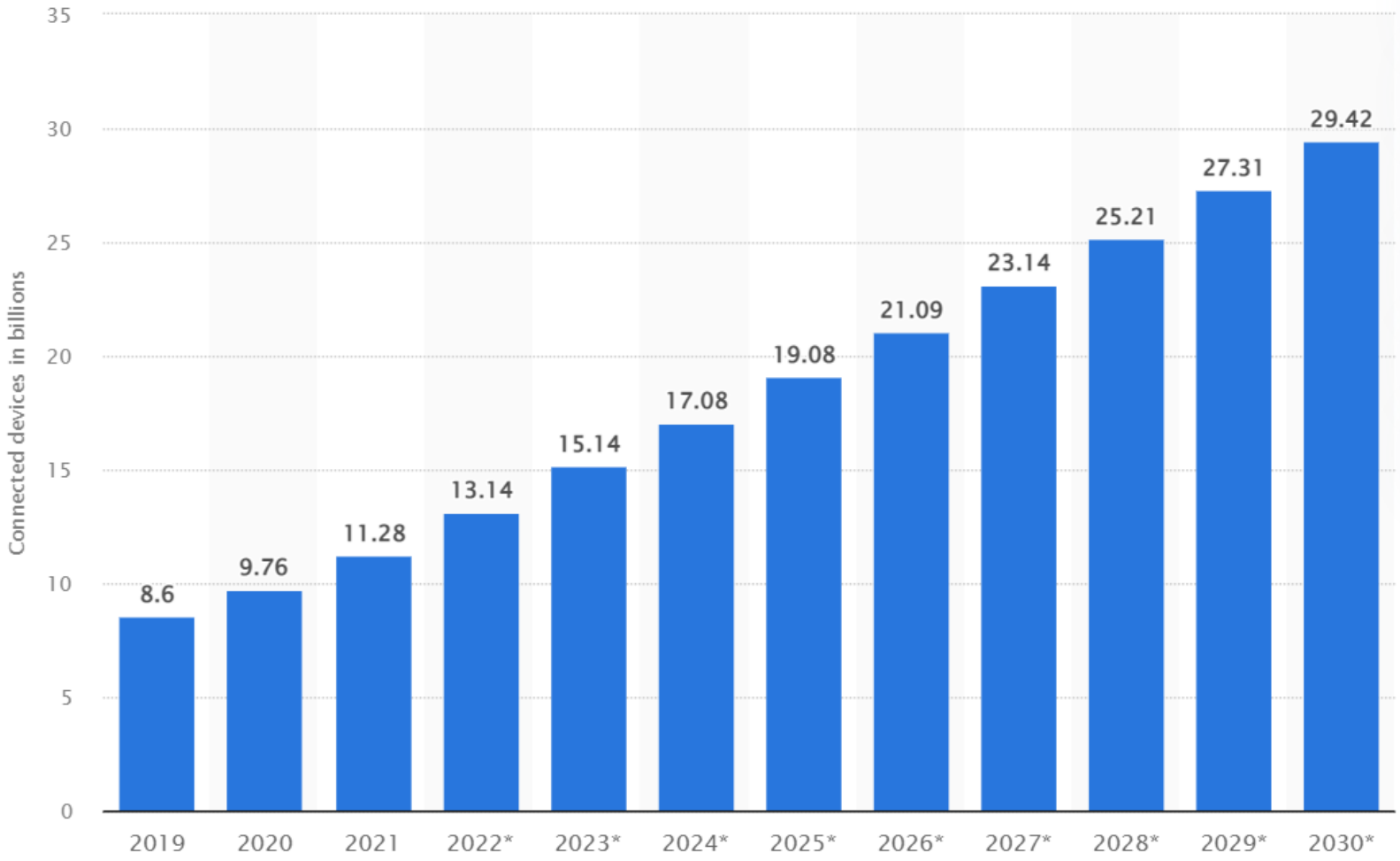
IoT is enabled by and complementary to:

- Cheap Sensor Technology with low energy consumption
- Connectivity – Network protocols for internet enable connection of sensors with cloud
- Cloud Computing – Easy and cheap access to needed infrastructure
- Machine Learning & Analytics – Enables even more possibilities for IoT and IoT itself generates massive amount of data to be used for analysis
- Artificial Intelligence for Voice Recognition/Functions: - Processing of natural language by IoT devices

Source: https://www.oracle.com/de/internet-of-things/what-is-iot/#why-is-iot-important

Number of Internet of Things (IoT) connected devices worldwide from 2019 to 2021, with forecasts from 2022 to 2030

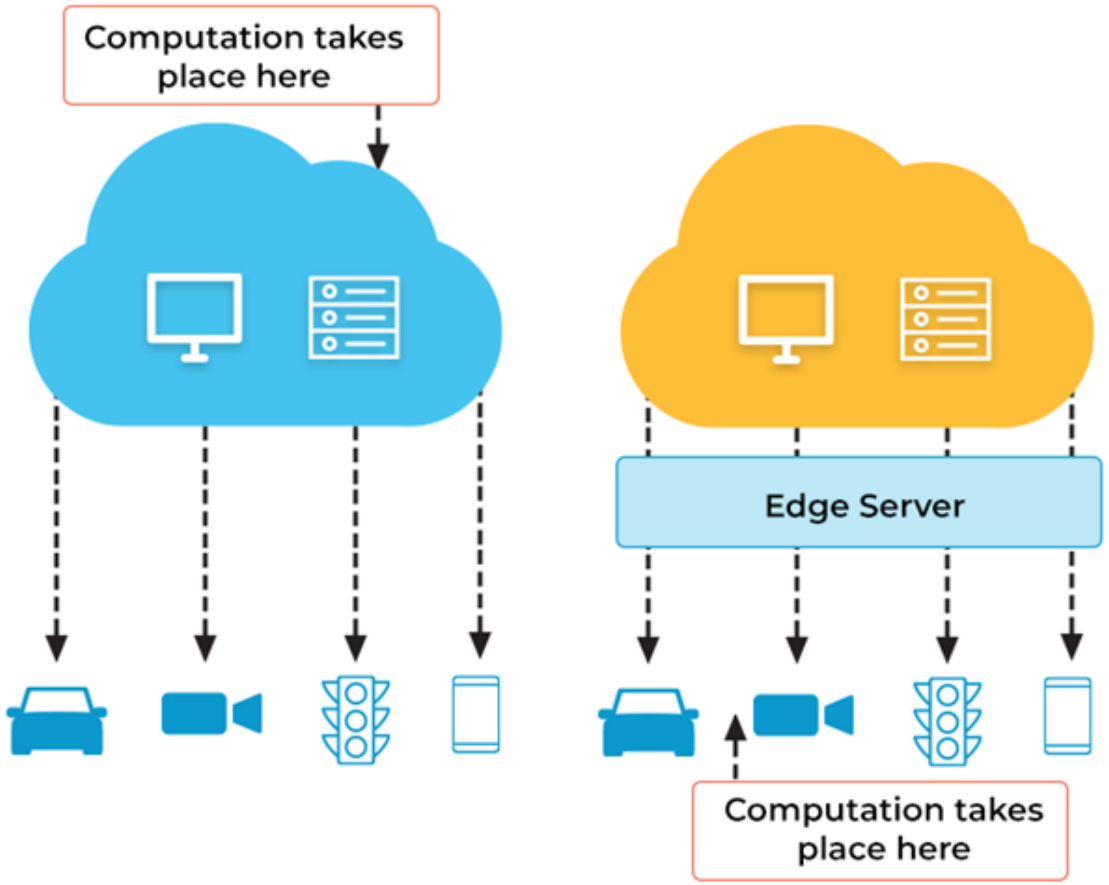
Internet of Things (IoT)



Source: https://www.statista.com/statistics/1183457/iot-connected-devices-worldwide/

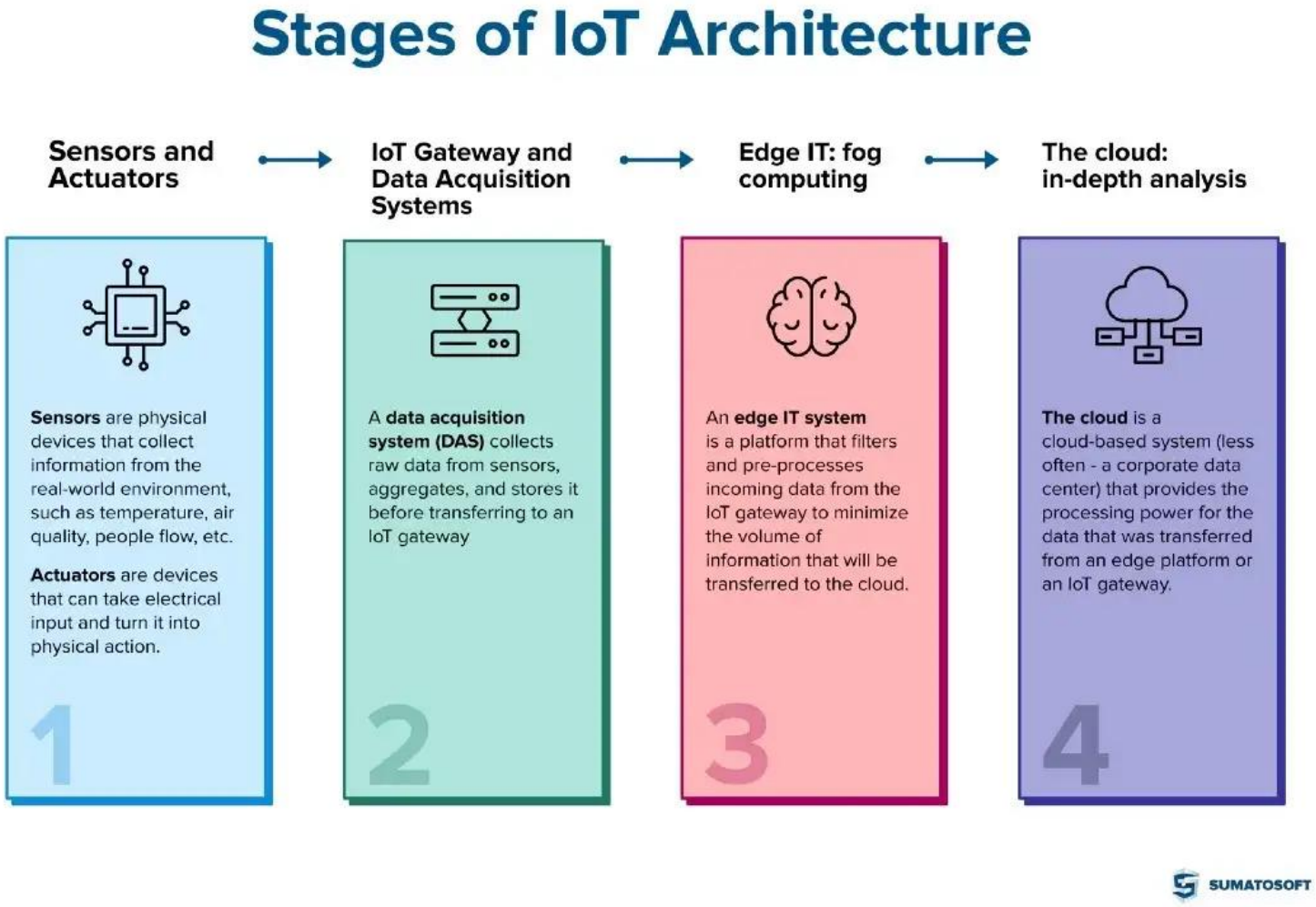
Edge Computing – Enabler for IoT use cases

Distributed IT architecture in which data is processed at the periphery of the network, as close to the originating source as possible



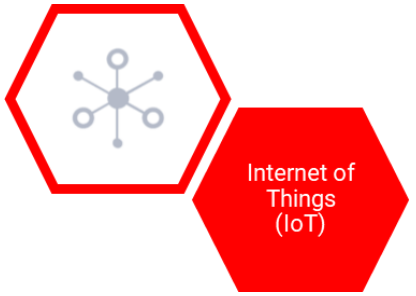
IoT & Ecosystems

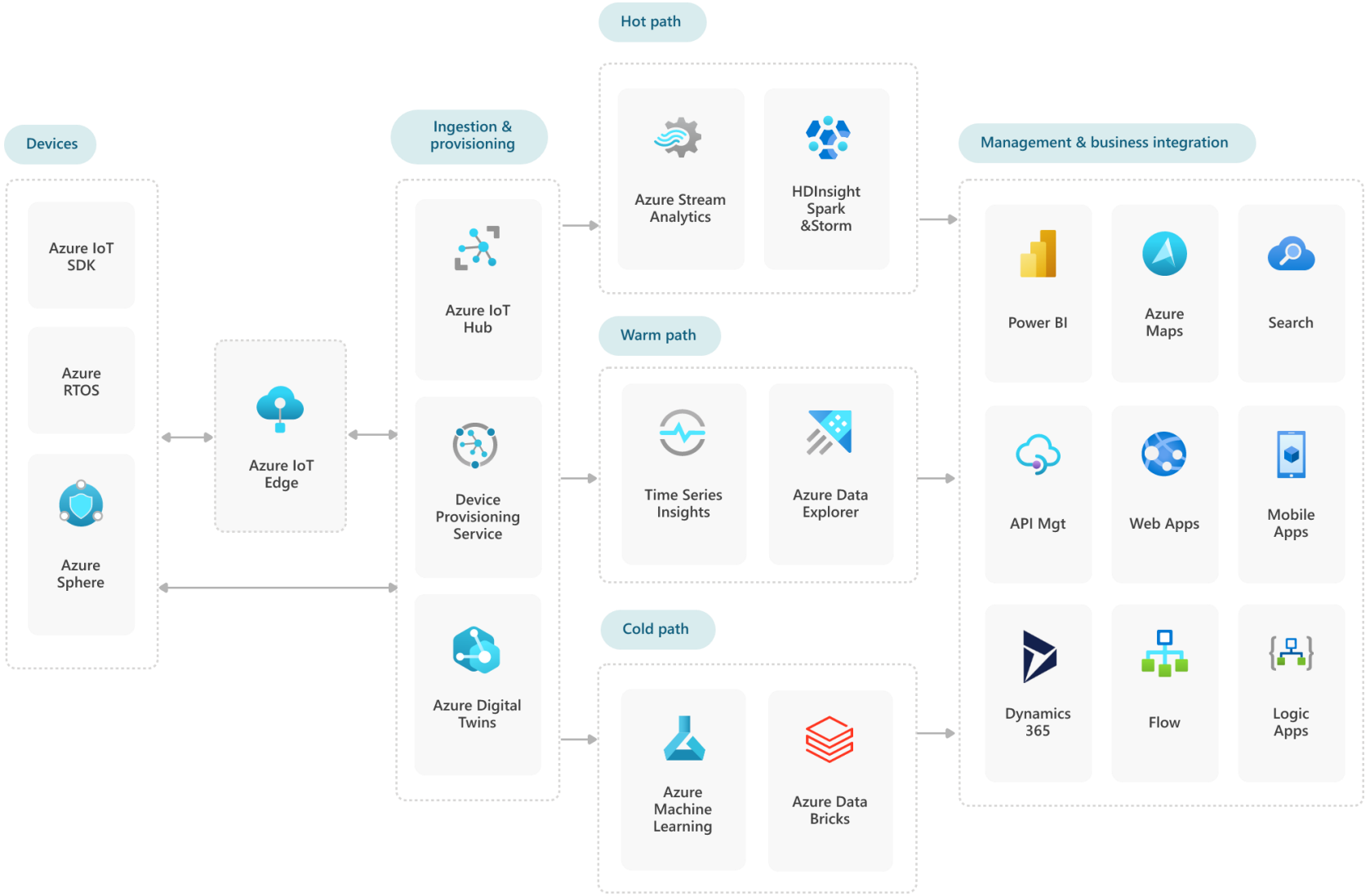
IoT Architecture model



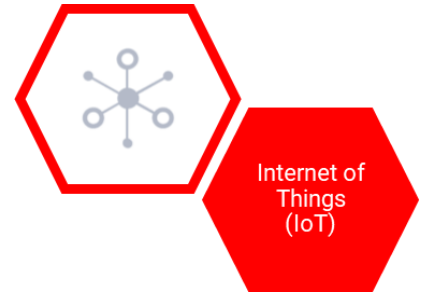
Source: https://www.altexsoft.com/blog/iot-architecture-layers-components/

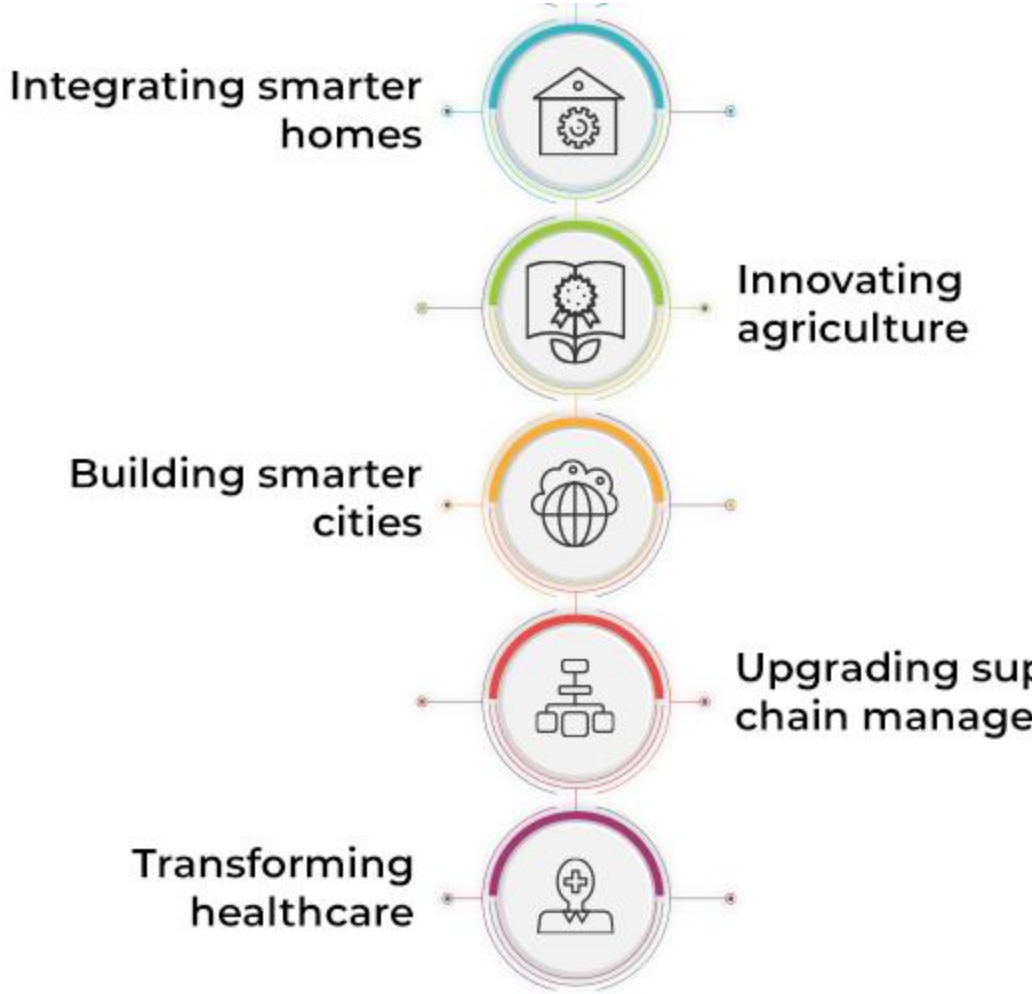
Azure IoT-Refrenzarchitektur



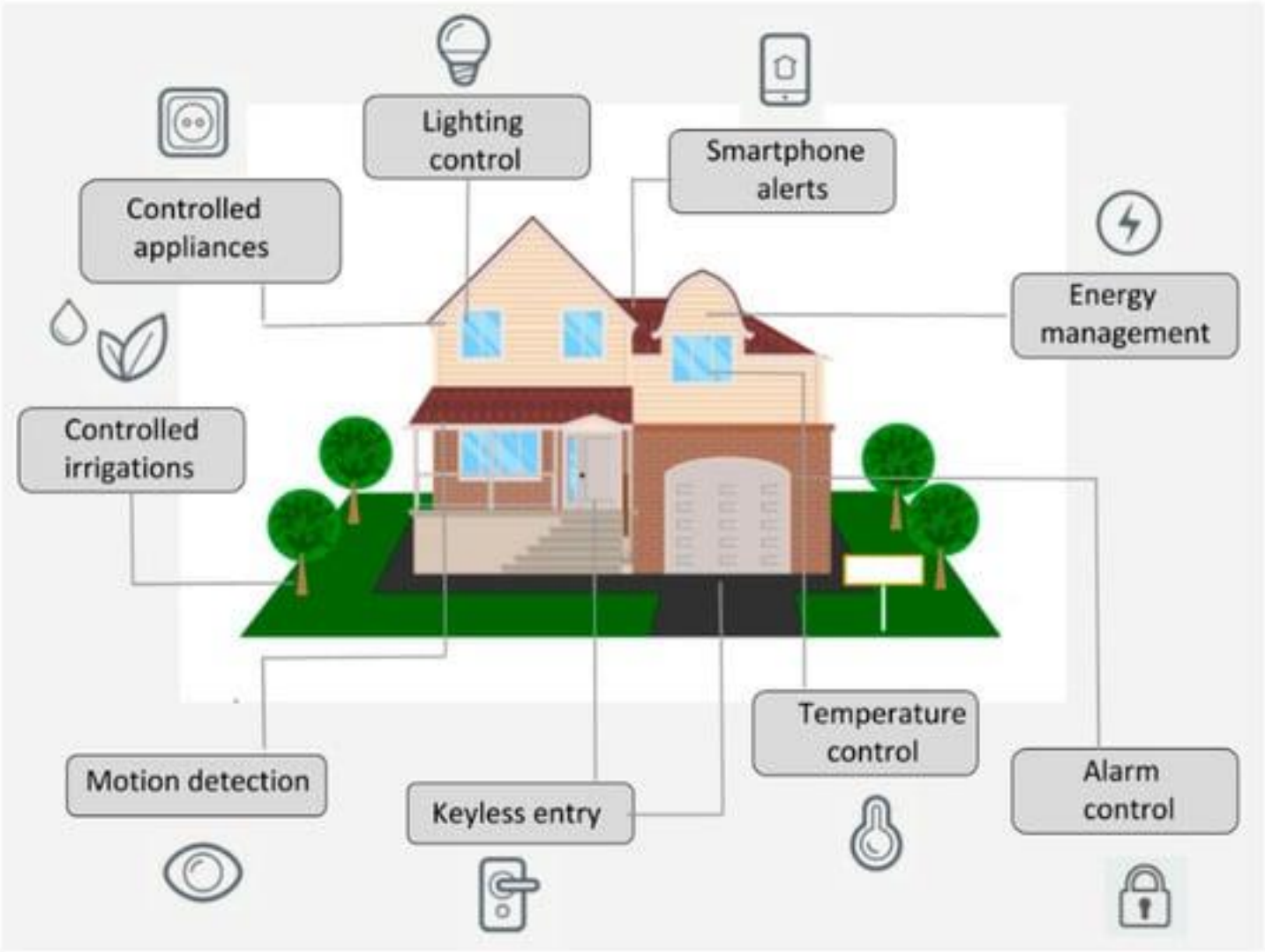


IoT Applications revolutionize different industries





IoT@Smart Home

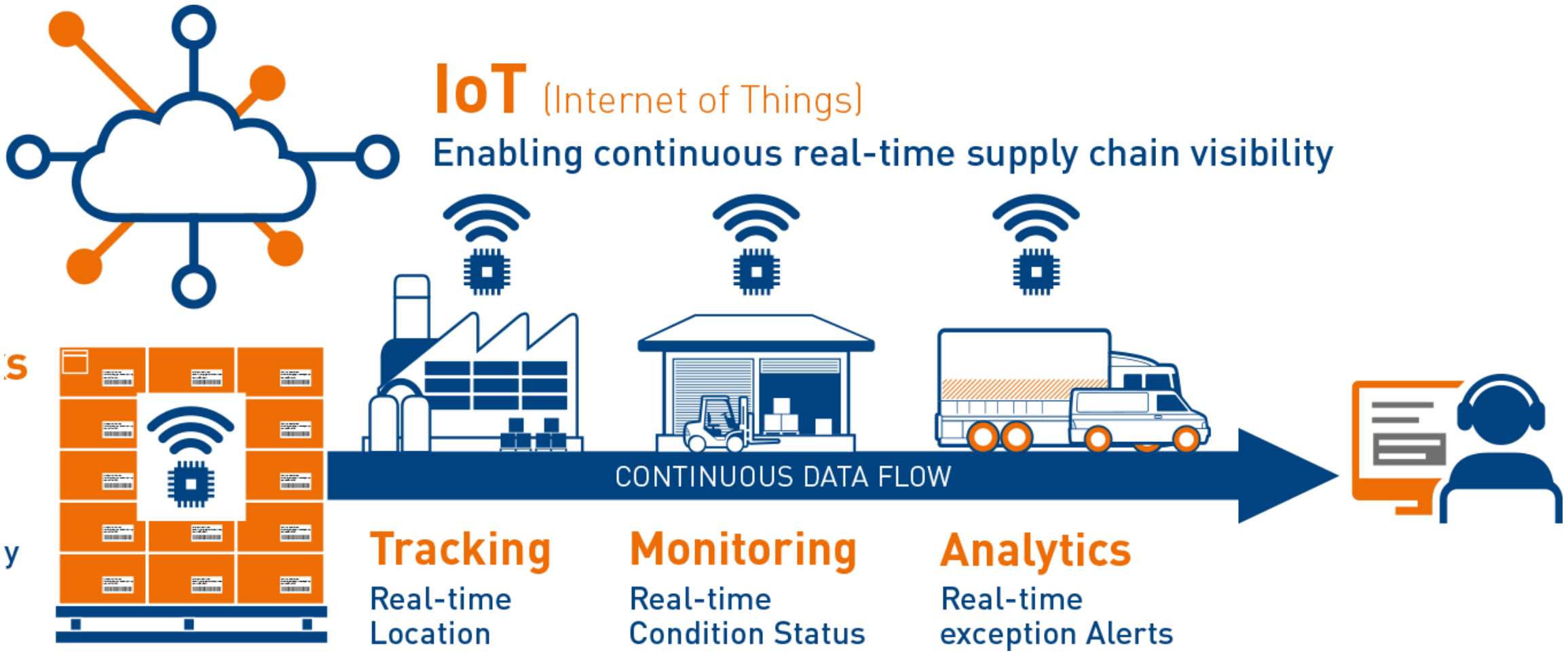


IoT@Farming

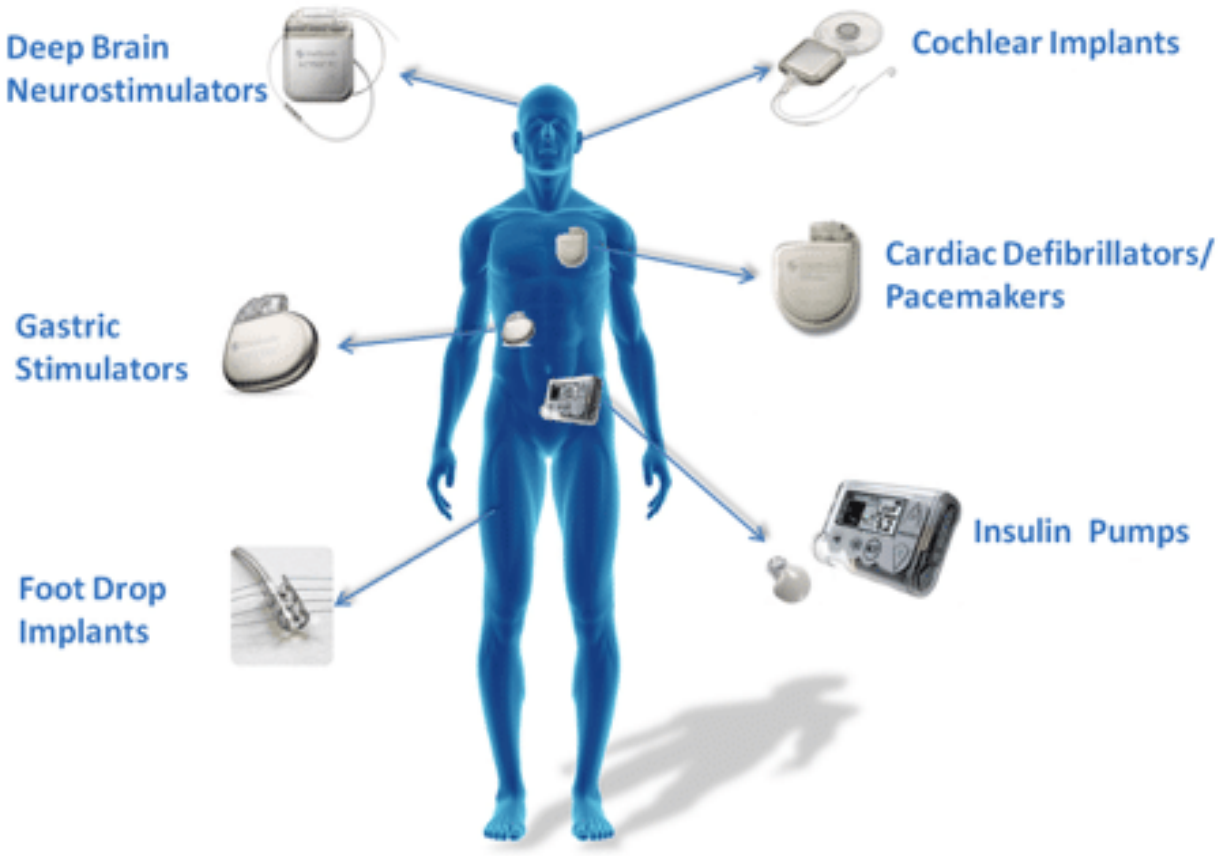
https://www.youtube.com/watch?v=pY_9TxAg95M

IoT@Smart City

IoT@Supply Chain Management



Internet of Things (IoT) – Medical Devices



Source: https://publications.eai.eu/index.php/phat/article/view/1290

Digital Transformation of the Smart Grid

Internet of Things (IoT)

Customer Operations

- Digital Customer Experience
- Customer 360
- Energy Management Analytics
- Customer Segmentation & Targeting

Advanced Metering Infrastructure (AMI)

- AMI Operations
- Revenue Protection
- Outage ETRs

Distribution & Transmission

- Predictive Maintenance for T&D
- Grid Investment Planning
- Demand Side Management
- Grid Cybersecurity

Generation

- Predictive Maintenance for Generation
- Renewables Integration & Optimization

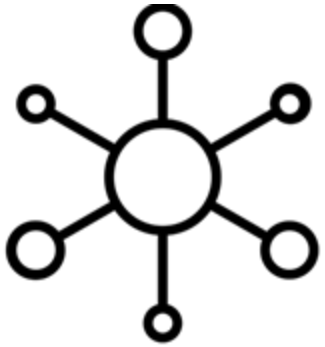
CUSTOMER | SMART METERS | DISTRIBUTION | TRANSMISSION | GENERATION

IoT for Sustainability

"IoT technologies are an essential tool in the global fight against climate change," said Jeff Merritt, head of Urban Transformation at the World Economic Forum. *"We know what actions are needed to build a more sustainable future and have a robust suite of technologies available to help deliver this impact.*

An IoT Appliance allows to measure:

- Energy consumption of each system
- Water consumption of each system (cooling/ancillary systems)
- Coolant usage (cooling/anchillary systems)
- Fuel usage for the supporting generators
- Any recovered energy



Data from sensors will be enhanced with:

- Real-time data on CO2eq associated with energy consumption from the grid (e.g., via CO2 Signal)
- Static data on the physical structure of the data center
- Real-time data on energy cost, if available
- Real-time data on datacenter internet traffic, if available
- Real-time data on the use of IT resources (e.g. CPU), if available

Digital Twin

- Virtual model reflecting a physical object
- Equipped with sensors
- Sensor produce data of physical objective‘s performance, transported to processing system and applied to this digital copy
- Run simulations, study performance issues, apply (predictive) analytics, generate improvements

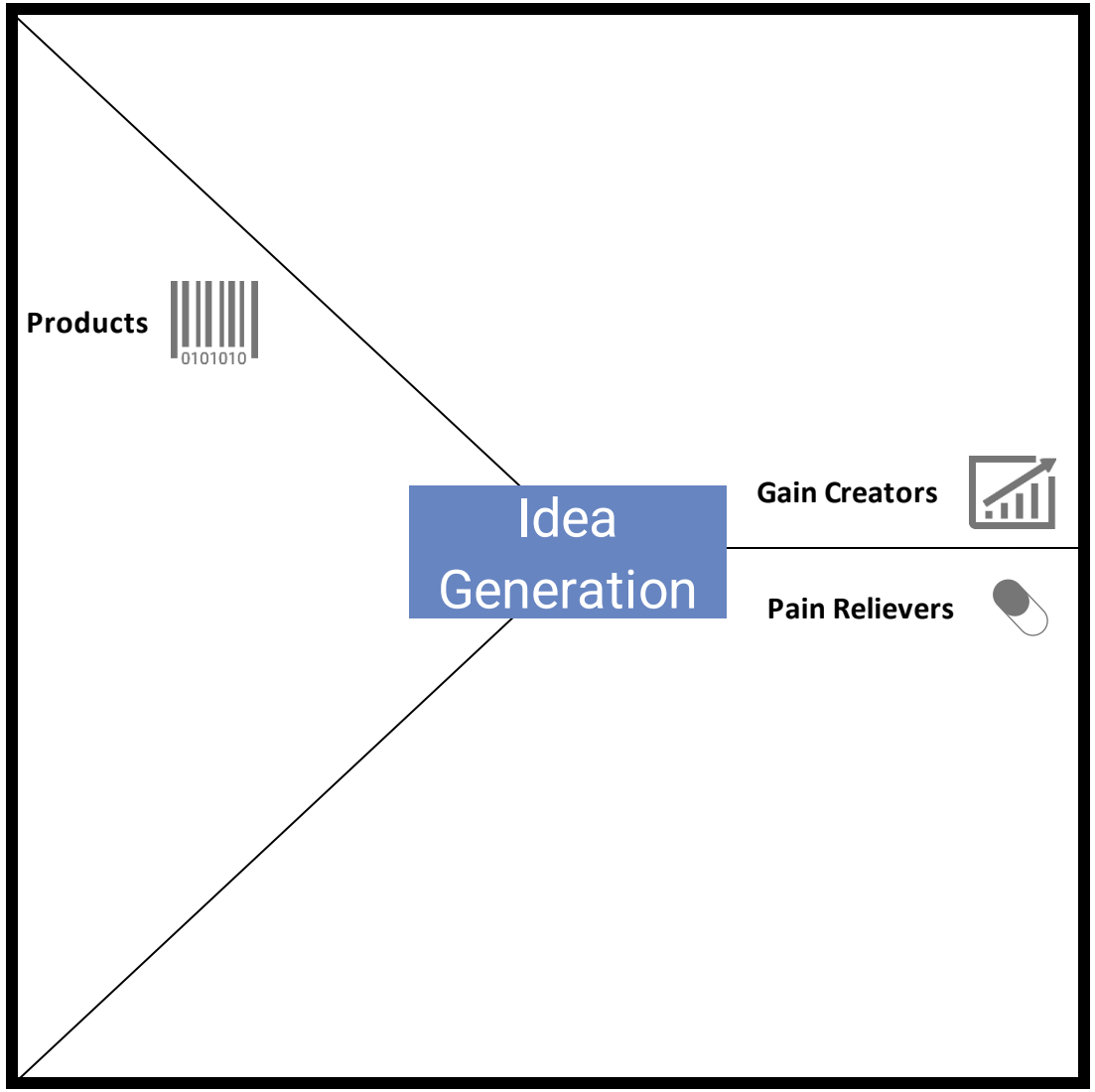
  = Valuable insights to be applied back to physical object

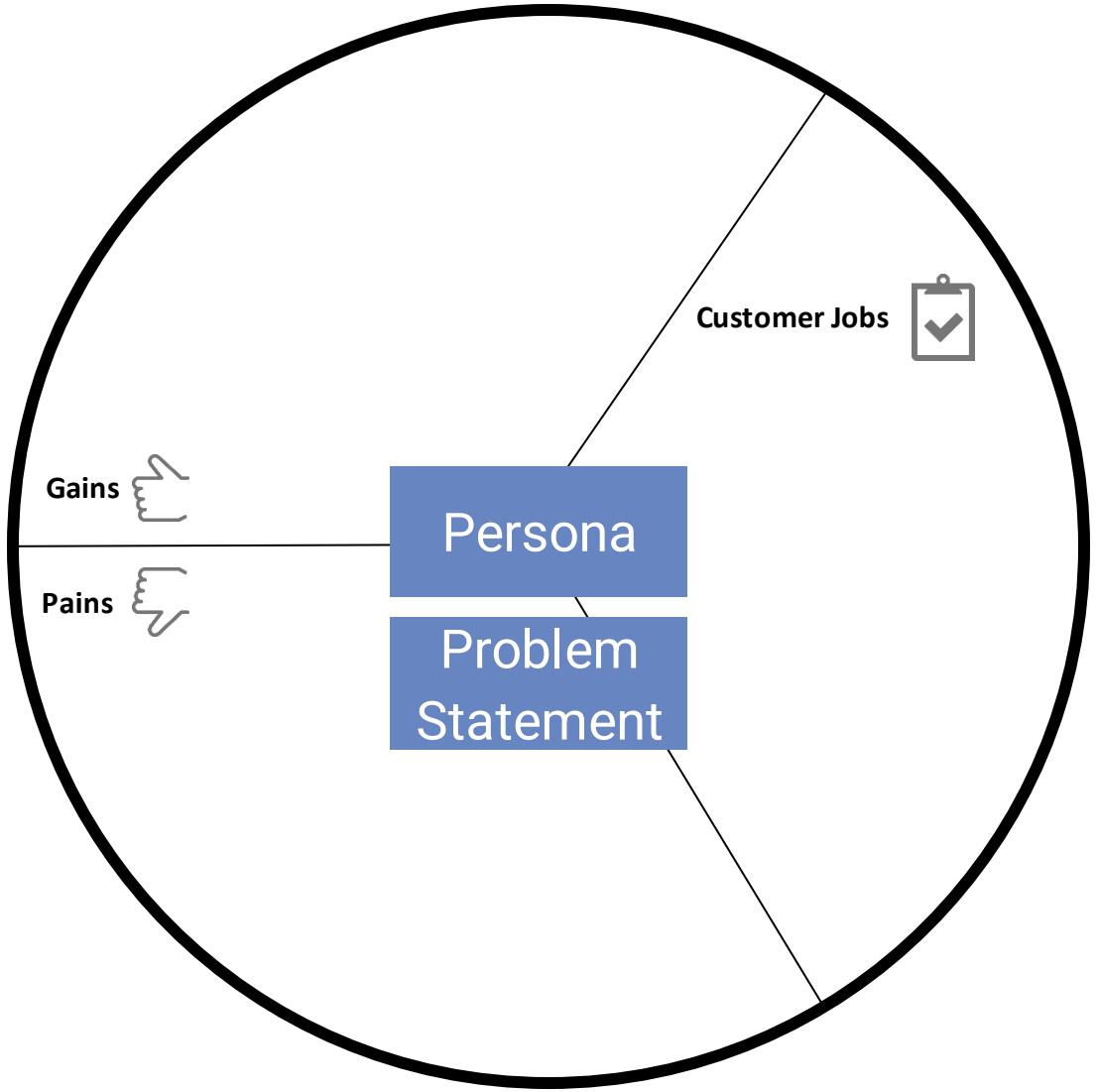
https://www.youtube.com/watch?v=60eCpw0Toy4

Group Work

- Think about IoT use cases applicable for your idea

Value Proposition Canvas





Recap - Business Model Canvas

Key Partners

Key Activities

Key Resources

Value Proposition

- Persona
- Problem Statement
- Idea Generation
- Customer Journey

Customer Relationships

- Persona
- Customer Journey

Channels

- Persona
- Customer Journey

Customer Segments

- Persona
- Customer Journey

Cost Structure

Revenue Stream

- Customer Journey

Eco-Social Costs

Eco-Social Benefits

- Customer Journey