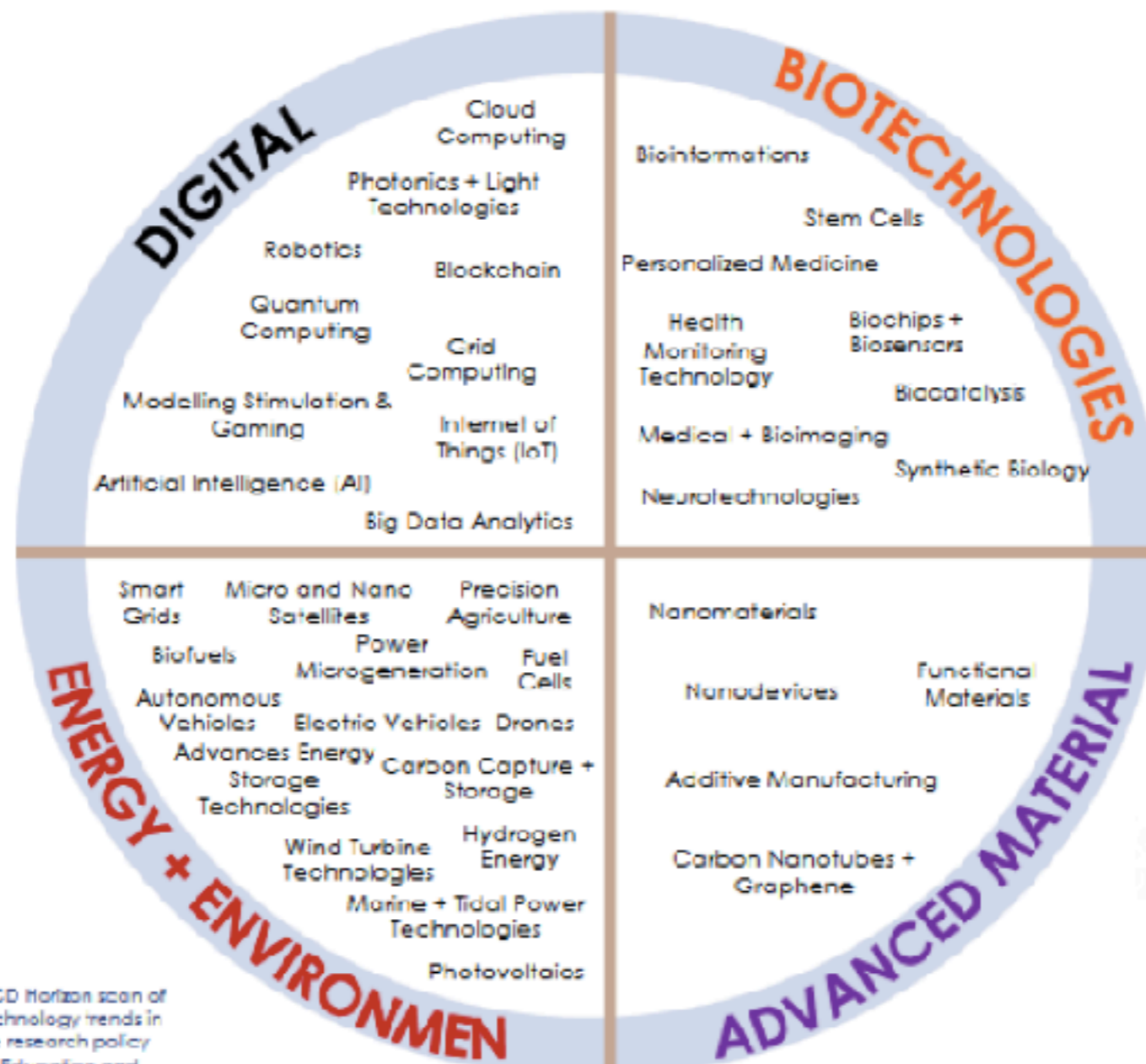


RISING OF SMART ELECTRONICS, OPPORTUNITIES OR THREATS



DISRUPTIVE TREND OF TECHNOLOGIES THAT TRANSFORM ELECTRONIC INDUSTRY

Key Technology Trend for the Future : Disruptive Technology



Source: 2016 an OECD Horizon scan of megatrends and technology trends in the context of future research policy by Ministry of Higher Education and

HISTORY OF DISRUPTION

- ICE MAKING MACHINE**
- AC/DC (BATTLE OF CURRENTS)**
- LIVRARIA LELLO BOOK SHOP**

HISTORY OF ICE INDUSTRY



Ice harvesting in 1780
Boston , USA

HISTORY OF ICE INDUSTRY



From Ice harvesting
developed
to be Ice factory

THE END OF ICE AGE



We still need Ice but
Business has changed
and Ice factory is gone.

WAR ON CURRENTS (AC/DC)

- ▶ 1884 Edison created Edison General Electric to generate electricity for its light bulbs based on Direct Current (DC) technology to Home.
- ▶ 1887 Tesla and Westinghouse created Westinghouse, company that generated electrical power over Alternate Current (AC) and won the big contract at Niagara fall power plant with same Vision.
- ▶ Edison's resistance on new technology (AC) led him to his downfall and removed from the companies that he created because the board of his company decided to adapt AC later on and consolidated several Edison's companies to as we know today as "General Electric"

LIVRARIA LELLO BOOK SHOP



This bookstore in Porto inspired the story of Harry Potter which make million of tourists come to visit this store for their experience every year but it cannot generate any revenue from selling books losing a lot of money and business later was sold.

LIVRARIA LELLO BOOK SHOP BUSINESS MODEL

Business Model Canvas of Livraria Lello

Key activities

- Selling books
- Being a tourist destination
- Being an exhibition center for cultural events

Key partners

- Book publishers
- Travel agencies
- Event organizers

Key resources

- Library's design
- Library's relation to Harry Potter novels

Value propositions

- Availability and variety of books
- Aesthetic and historical design
- Library's influence on Harry Potter novels

Customer segments

- Local book readers
- Harry Potter fans
- Tourists in Portugal

Channels

- In store (books)
- Online (tickets)

Customer relationships

- Short term/online for tourists
- Community building for local cultural event organizers

Revenue streams

- Book sales
- Souvenir sales
- Entry fees
- Event fees

Cost structure

- COGS of books
- Maintenance fees
- Marketing cost (For promoting the bookstore as a travel destination)



The new owner came up with new business model to charge each tourist 5.5 Euro to visit the scene but redeemable if purchase any books.

This model makes business substantial Revenue.

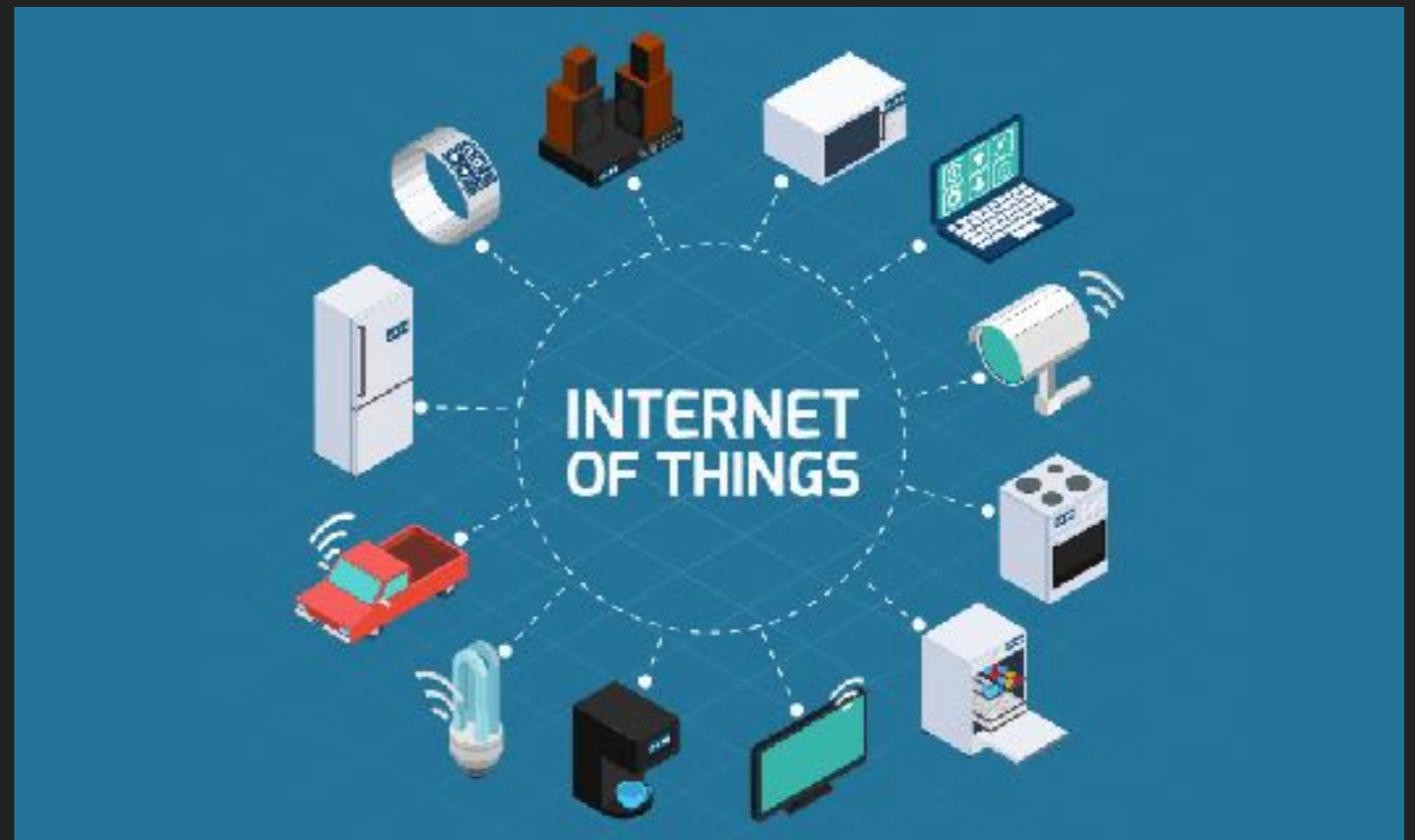
EVOLUTION OF TECHNOLOGIES THAT WILL DISRUPT ELECTRONIC INDUSTRY

AC/DC —> ELECTRICAL —> ELECTRONICS —> MICRO ELECTRONICS —>

IOT —> MACHINE LEARNING —> SMART ELECTRONIC DEVICES

THE RISING OF INTERNET OF THINGS LEAD TO NEW BUSINESS ERA

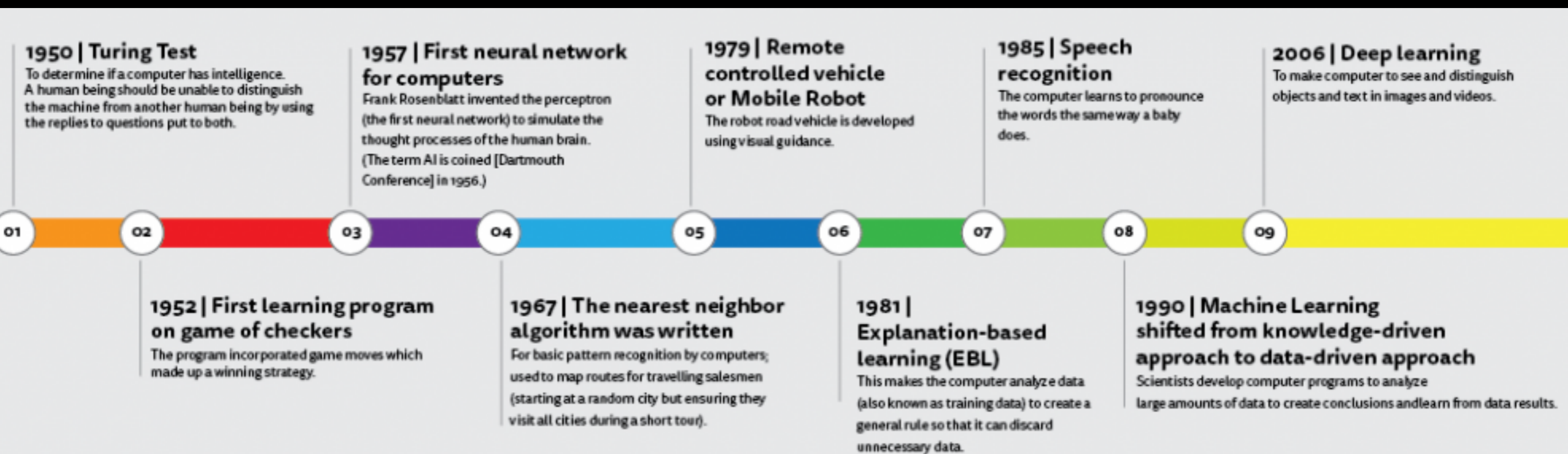
- ▶ With the advancement of embedded sensors, internet and connectivity devices, all electronics products are able to link and generate huge amount of data



- ▶ This leads to the new era of electronics product called
 - ▶ ***SMART ELECTRONICS***

EVOLUTION OF COMPUTER ALGORITHM FROM BASIC TO SELF LEARNING ABILITY

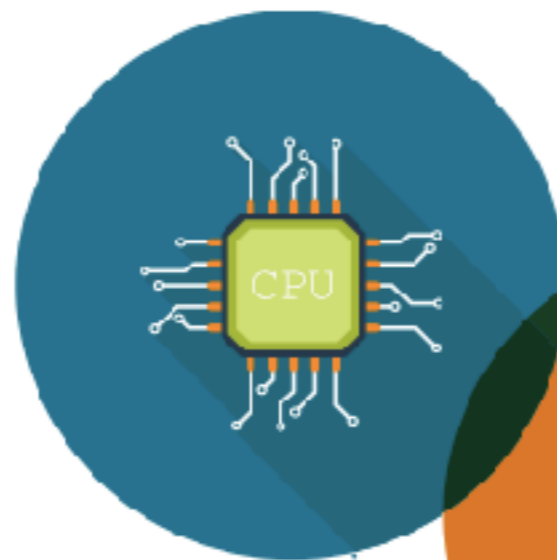
The Euclid's basic Math Algorithm was the most ancient Algorithm.
(Lease common multiple and greatest common factor)



1963 Bubble Sorting and then Merge Sorting

1998 Google 'PageRank' Search engine

SMART ELECTRONICS HAS 3 CORE COMPONENTS



Smart Component

Hardware and software that give products a virtual identity, including sensors and processors, data storage, controls and software. The software is typically embedded in an operating system and accessed through an enhanced user interface or via a remote dashboard or simple app.



Connectivity

Ports, antennae and software protocols enabling a wired or wireless connection with the product whatever its situation: installed, in a workflow, in the hands of a customer or at a customer site.



Physical Component

Physical and electrical parts of a product. Changes in the design of an established product and its physical and electrical parts focus on the incremental use of new materials, components or the processes involved in its manufacture.

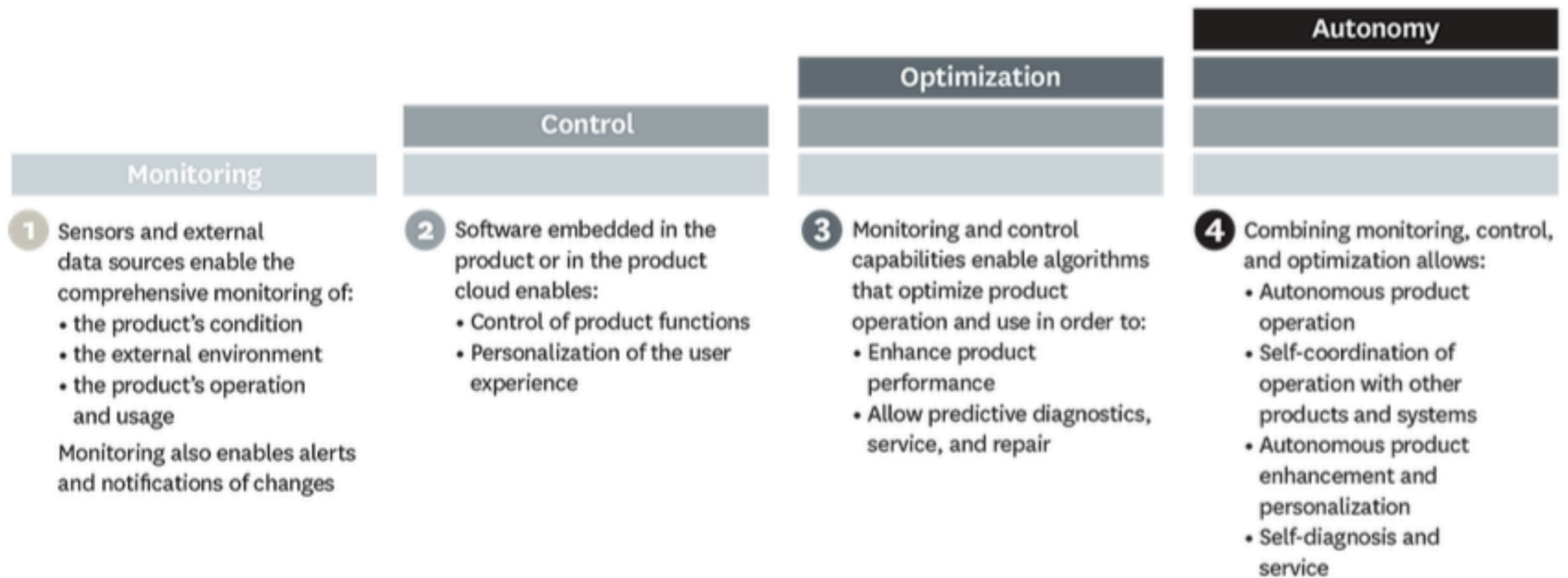
CONVENTIONAL ELECTRONICS

- ▶ Physical components such as mechanical, electrical, and electronics parts

SMART ELECTRONICS

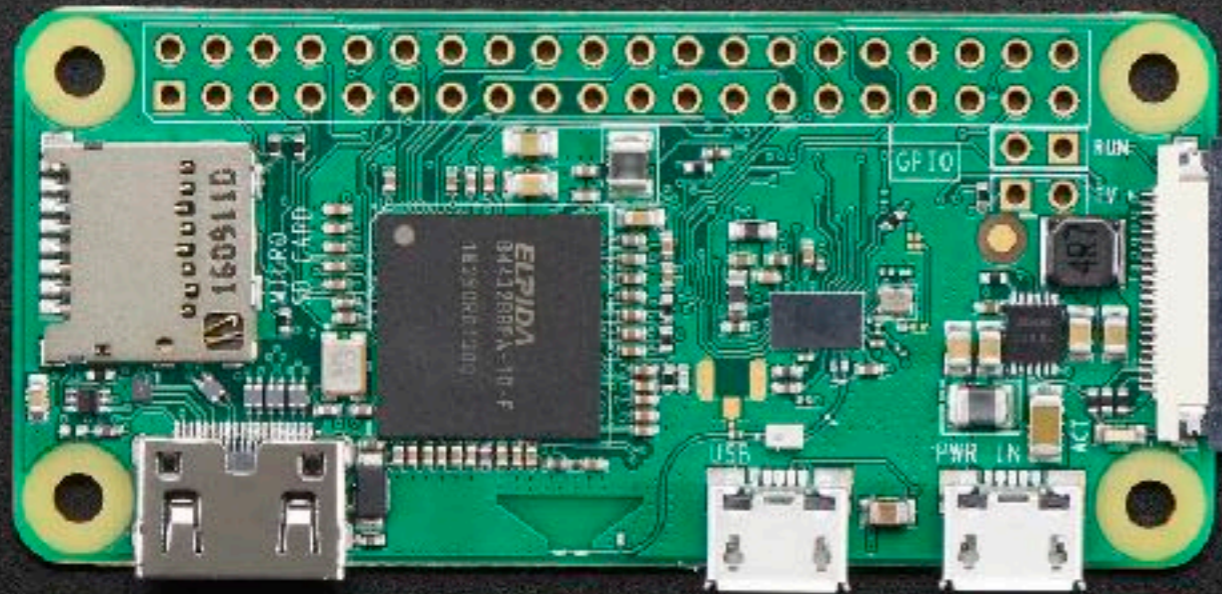
- ▶ Physical components such as mechanical, electrical, and electronics parts
- ▶ Smart components such as sensors, microprocessors, controllers, software, embedded operating system
- ▶ Connectivity components such as ports, antenna , network devices for digital communication ability to each other

SMART ELECTRONICS APPLICATIONS



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HOW SMART ELECTRONIC APPLIES TO PRODUCT: EXAMPLES



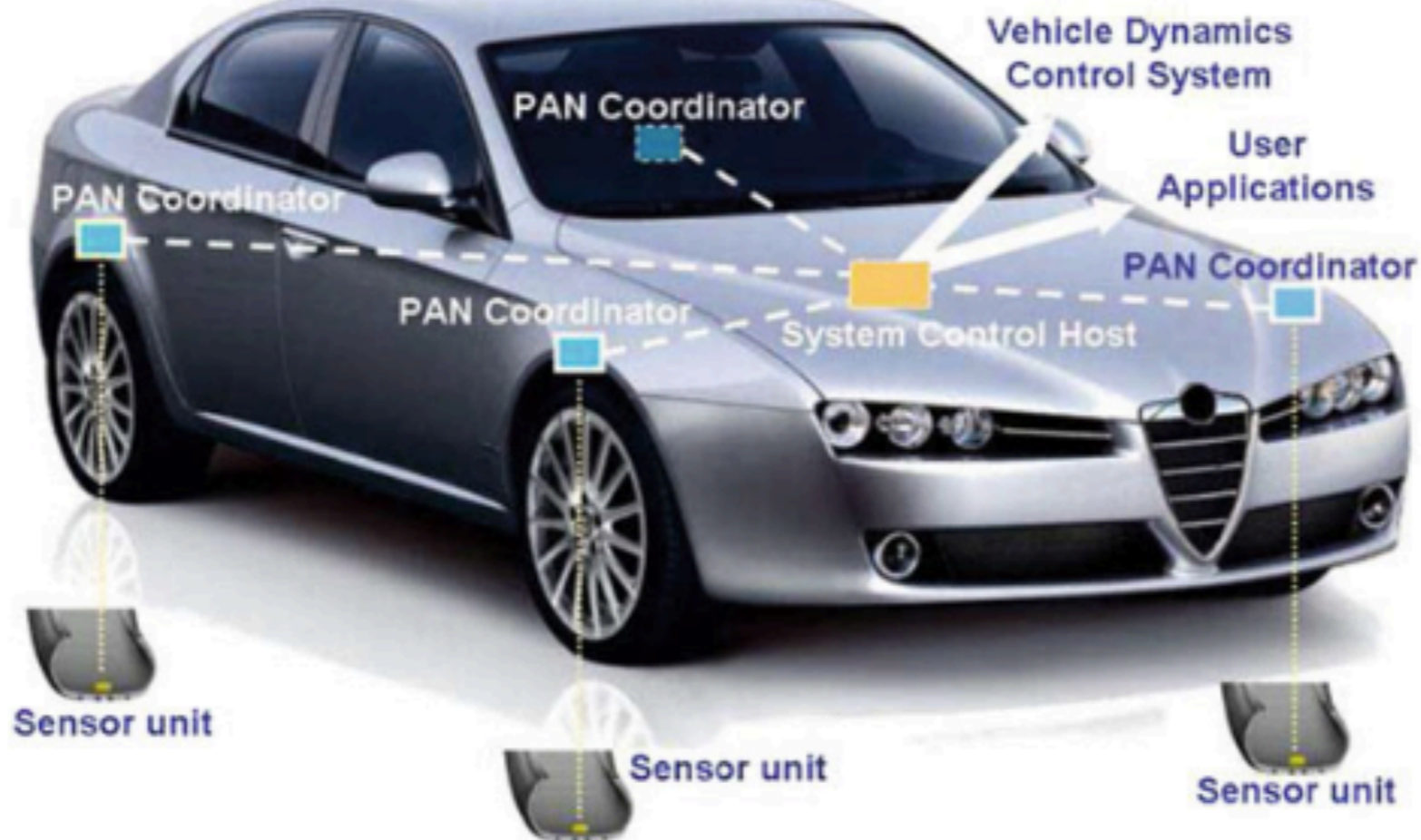
Raspberry Pi control board



HOW SMART ELECTRONIC APPLIES TO PRODUCT: EXAMPLES

▶ Smart vehicles

a

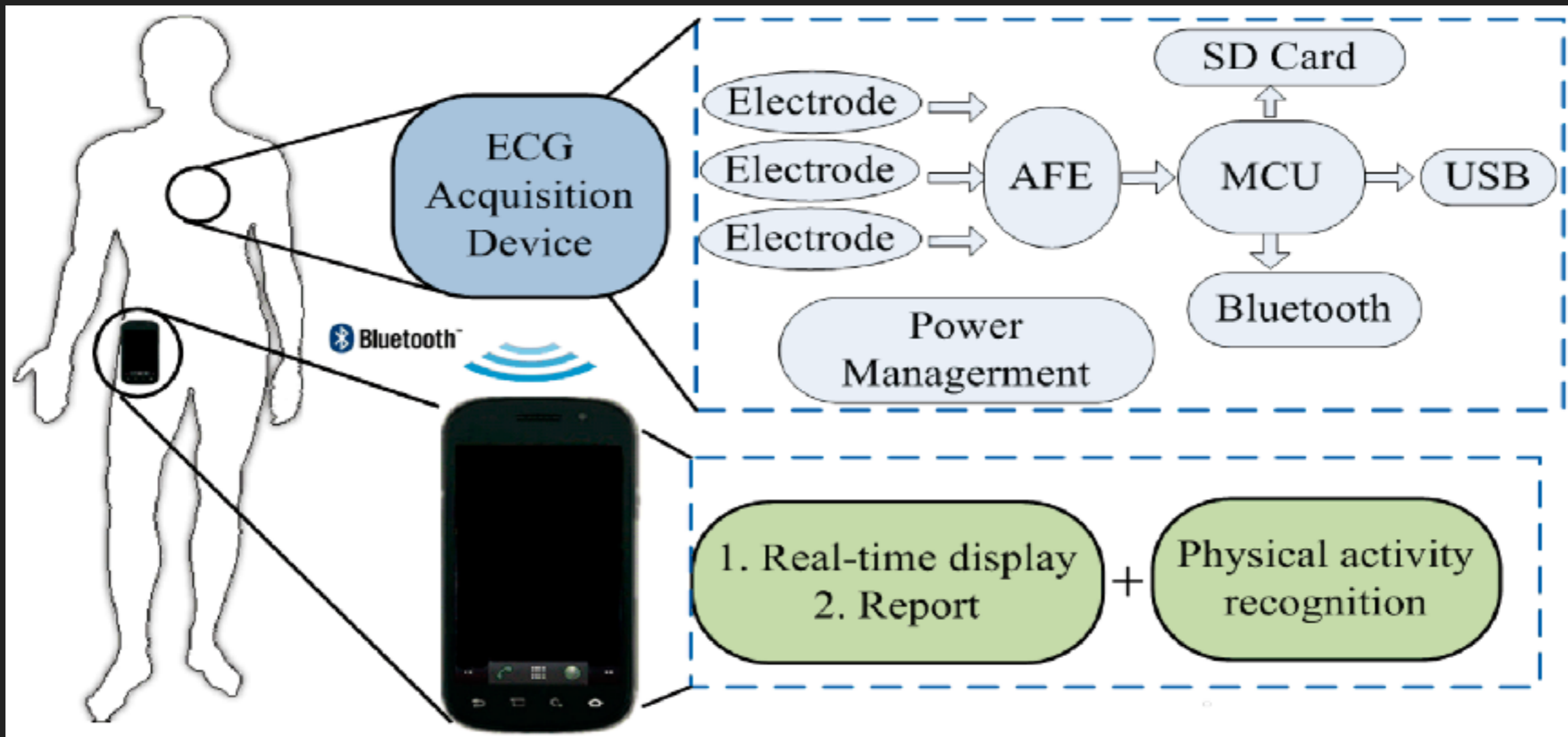


HOW SMART ELECTRONIC APPLIES TO PRODUCT: EXAMPLES

ECG = electrocardiogram

▶ Healthcare & wearable gadgets

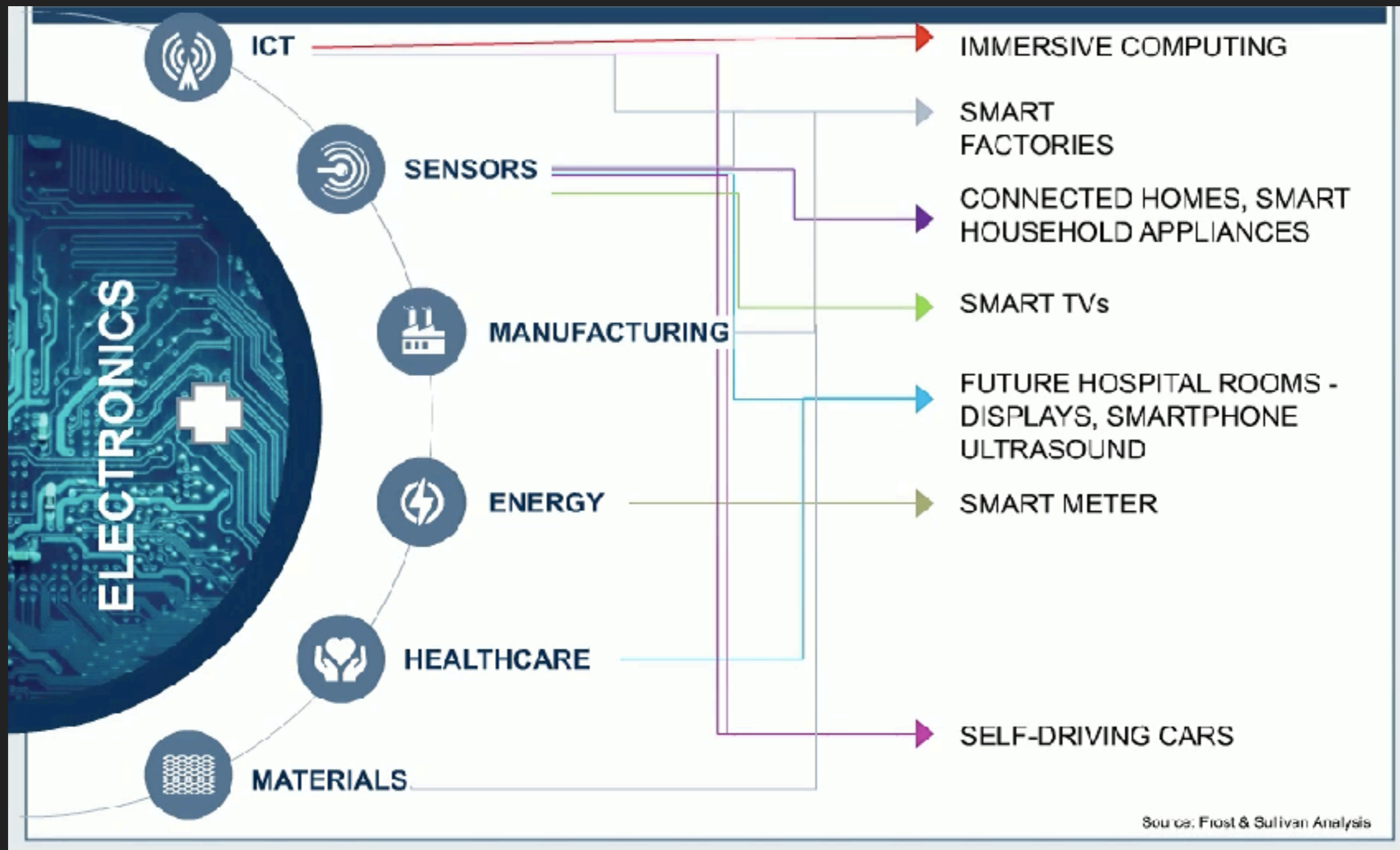
AFE = Analog Front End



END OF PART I

PART II:
FROM TECHNOLOGY EVOLUTION
TO NEW BUSINESS MODEL

TECHNOLOGIES RESHAPE INDUSTRY FROM STAND ALONE TO CONNECTED INDUSTRY



VALUE PROPOSITION CHANGED: FROM CONVENTIONAL THINKING TO NEW FRONTIER

- ▶ Disruptive trend changes the way we offer value to our customers
- ▶ Legacy Functional Based
 - ▶ **VALUE = FUNCTION / COST**
- ▶ Modern Business Based
 - ▶ **VALUE = (FUNCTION + CUSTOMER EXPERIENCE) / COST**
- ▶ The company value proposition is delivered through **customer experiences** together with their products functions, processes, location, and communication altogether.

DISRUPTIVE TECHNOLOGIES AFFECTS ELECTRONICS INDUSTRY

Advancement of technologies leads to new applications, new functions,
etc

IMPACT OF DISRUPTIVE TECHNOLOGY TO ELECTRONICS INDUSTRY

Advancement of technologies leads to new applications, new functions,
etc



Accelerate users demand (better service, faster response, etc)

IMPACT OF DISRUPTIVE TECHNOLOGY TO ELECTRONICS INDUSTRY

Digitalization of every devices leads to new applications, new functions, etc



Accelerate users demand (better service, faster response, etc)



New paradigm of business model “Enhancement of Product with data analytic service”

IMPACT OF DISRUPTIVE TECHNOLOGY TO ELECTRONICS INDUSTRY

Digitalization of every devices leads to new applications, new functions, etc



Accelerate users demand (better service, faster response, etc)



New paradigm of business model “Enhancement of Product with data analytic service”



Great understanding of customer insight and “VALUABLE CUSTOMER EXPERIENCE” is achieved.

DIFFERENTIATION OF BUSINESS MODELS CHANGED (BEFORE)

Normal Electronic device business model

Key Partners 1. Universities/Academic 2. Production factories 3. Suppliers	Key Activities 1. Research and Development 2. Marketing 3. Product/Services production	Value Proposition Product/service functionals	Customer Relationships Account management	Customer Segments Global
	Key Resources 1. Staffs 2. Engineers 3. Knowledge of technology		Channels 1. Distributor channels 2. Retail stores	
Cost Structure 1. Salaries 2. Sales and Marketing 3. Materials 4. Technology R&D			Revenue Streams 1. Sales from products	

DIFFERENTIATION OF BUSINESS MODELS CHANGED (NEW)

Smart Electronic business model

Key Partners 1. Universities/Academic 2. Production factories 3. Suppliers 4. Users communication	Key Activities 1. Research and Development 2. Marketing 3. Product/Services production 4. Co-creation partnership	Value Proposition 1. Product/service functionals 2. Customer experiences throughout business process	Customer Relationships 1. Account management 2. Semi or Automated service contact 3. CRM data analytic	Customer Segments 1. Global 2. Online customers
	Key Resources 1. Staffs 2. Engineers 3. Knowledge of technology 4. Knowledge of customer behaviors		Channels 1. Distributor channels 2. Retail stores 3. Online media	
Cost Structure 1. Salaries 2. Sales and Marketing 3. Materials 4. Technology R&D 5. Customer insight analytic research			Revenue Streams 1. Sales from products 2. Service fees	

IMPACT OF DISRUPTIVE TECHNOLOGY TO ELECTRONICS INDUSTRY

OPPORTUNITIES

(DISRUPTOR)

- ▶ Emerging of new materials (Graphene) , new manufacturing process (3D printer, Augmented reality , Simulation software)
- ▶ Data as an asset
- ▶ Combination of cross industries leads to new business model as connected industry

THREATS

(DISRUPTEE)

- ▶ Stand alone physical factory risks become obsolete
- ▶ Mis-management from lack of good data analytics
- ▶ Rely on Physical assets
- ▶ Industry need to focus more on customer experiences rather than normal product functions

CASE STUDIES

CASE 1: GE ENGINE “PAY PER USE” ENGINE WITH AIRLINE



- ▶ Technologies combination: ECU + IoT + data analytics
- ▶ GE, the engine maker for faced challenge on costing deduction to stay competitive in airplane engine business.
- ▶ The company decided to combine the IoT technologies to make its ECU engine become data portal, sending real time data to the main control.
- ▶ GE offer to its airline customers that they can use the engine on “pay per use” basis with premium fee on more advanced analytic features.
- ▶ Utilizing advanced data analytic technologies, GE is able to provide optimization service on fuels consumption to its customer. **(Engine as a service model)**

CASE 2 FETCH ROBOTIC (WAREHOUSE ROBOT AS A SERVICE)



- ▶ Unique business model combine robot, cloud computing and data analytic together
- ▶ Customer can rent robot and subscribe to the shared software license pay per use.
- ▶ Offer data analytic to enhance material handling in the warehouse as well as connect to the incoming orders from e commerce front end.
- ▶ “On demand automation” concept



ENDING NOTE:

- ▶ From legacy CAPEX : OPEX model
- ▶ To OPEX + Customer experiences value

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THANK YOU

Q & A

-
- ▶ With electronic industry in Thailand does not own the brand, some doing OEM, how can this model apply to them?
 - ▶ Can this product as analytic model apply to business in the middle of supply chain?