



# Aspectos Profissionais e Sociais da Engenharia Informática

Informatics ecosystem

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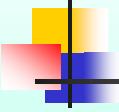
## Objective of this class

- General overview about the profession of an informatics engineer.
- General understanding of Computer and Internet history and trends
- Review of several visions of Informatics
- Understanding of business for people/Companies in the area of Informatics

Note:

typically figures with black background will be from 2021/2. Other pictures will be  
slightly older.

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What is informatics?

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## IEEE - Computer Society

IEEE CS is the trusted organization dedicated to engaging the engineers, scientists, academia, and industry professionals from across the globe **driving continued advancements in computer science and technology.**

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"The objects for which the Society is hereby constituted shall be to promote **the study and practice of Computing** and to advance knowledge and education therein for the benefit of the public. In this Our Charter and the Bye-laws the expressions "Computing" shall include matters concerned with the **furtherance of computer science and technology and the design and development of computing systems and applications; and "computer" shall include any form of computing system."**

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- The original notice for the September 15, 1947, organization meeting stated in part:

"The purpose of this organization would be to advance the **science, development, construction, and application of the new machinery for computing, reasoning, and other handling of information.**"

- The first and subsequent constitutions for the Association have elaborated on this statement, although the essential content remains. The present constitution states:

"The Association is an international scientific and educational organization dedicated to advancing the art, science, engineering, and application of **information technology**, serving both professional and public interests by fostering the open interchange of information and by promoting the highest professional and ethical standards."

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## Ordem dos Engenheiros – Colégio de Informática

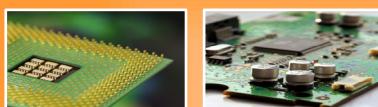
Colégio de Engenharia Informática (CEI) da Ordem dos Engenheiros pugna pela ordenação do exercício da profissão de engenharia informática no território nacional promovendo princípios éticos e dignidade da profissão com respeito pela sociedade, representando a profissão e protegendo os interesses dos consumidores e utilizadores dos serviços prestados pelos profissionais.

O CEI pretende defender a **engenharia informática como profissão e o seu exercício com Qualidade**. Por isso mesmo, promove **o progresso da sociedade da informação e conhecimento e vela pelo cumprimento dos preceitos constitucionais do uso da informática** para garantir honra e intimidade pessoal (e familiar) dos cidadãos no pleno exercício dos seus direitos.

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## Common Features

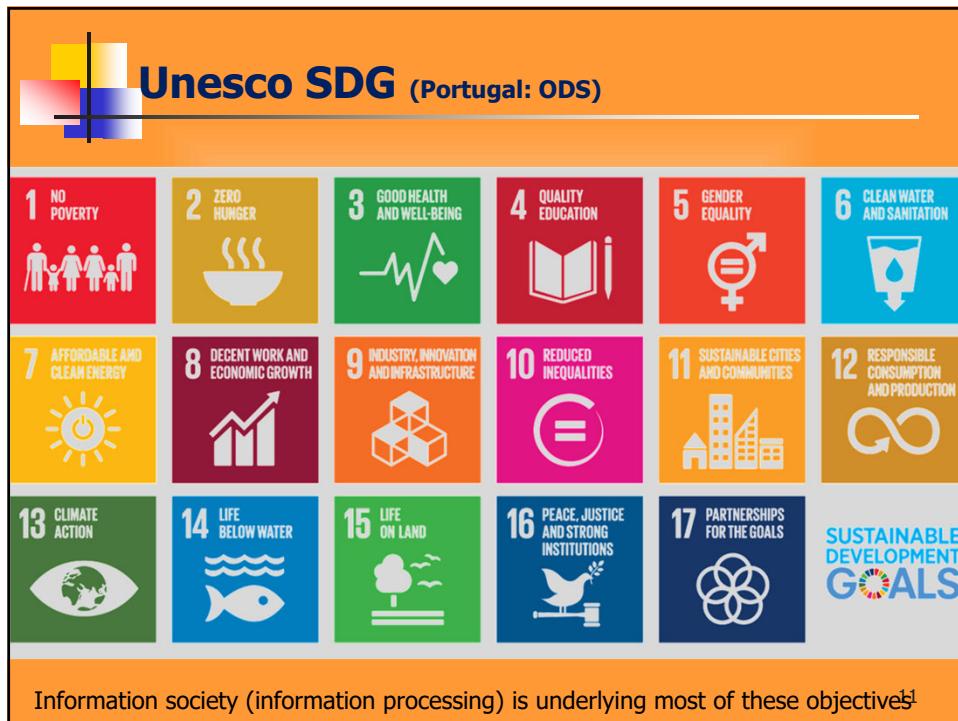


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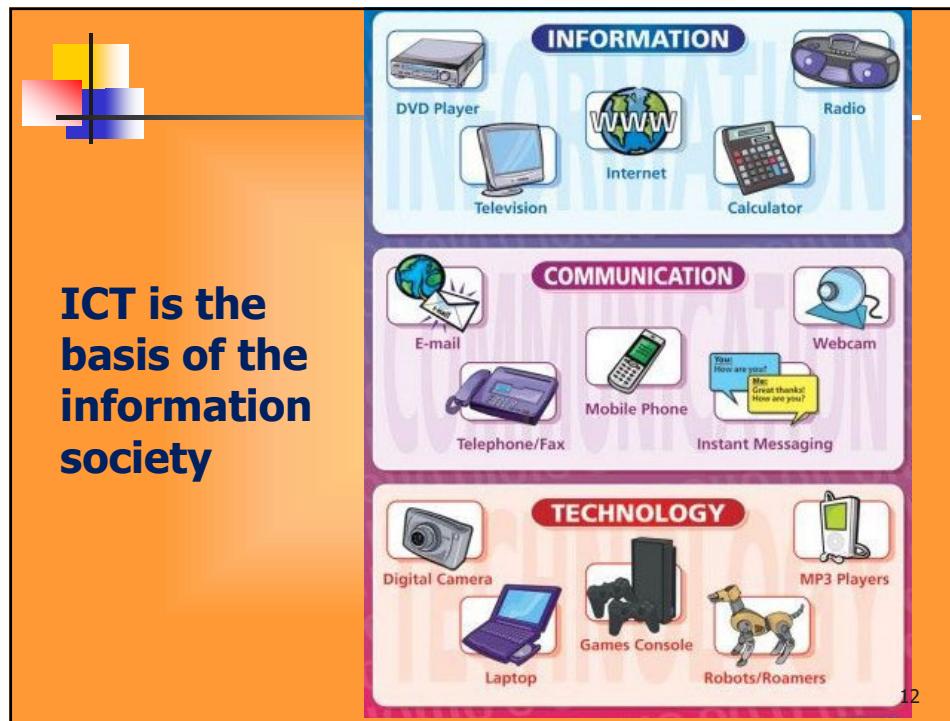
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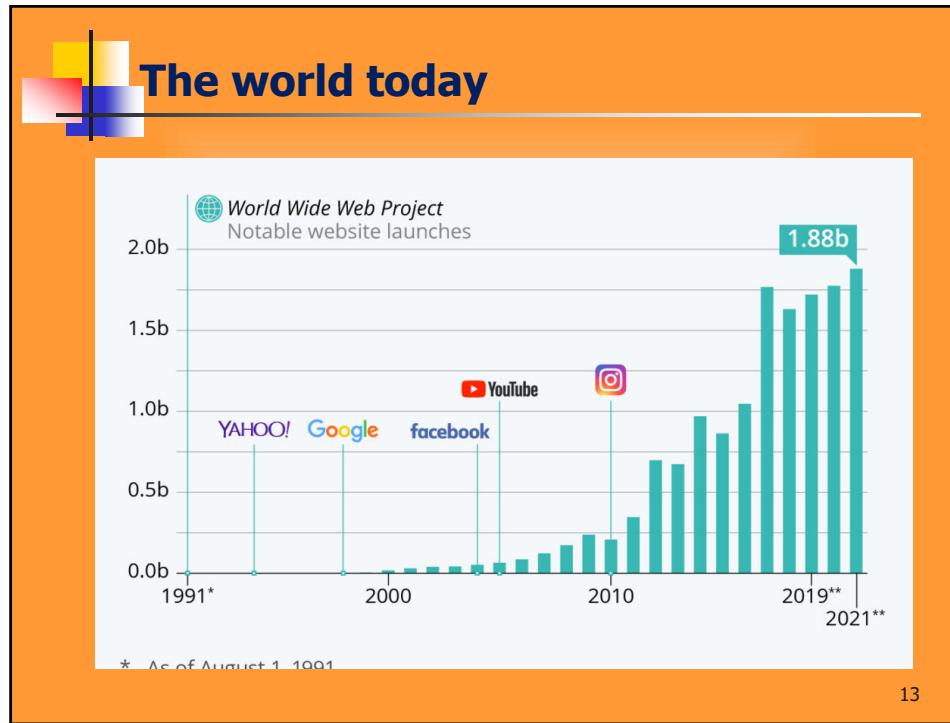
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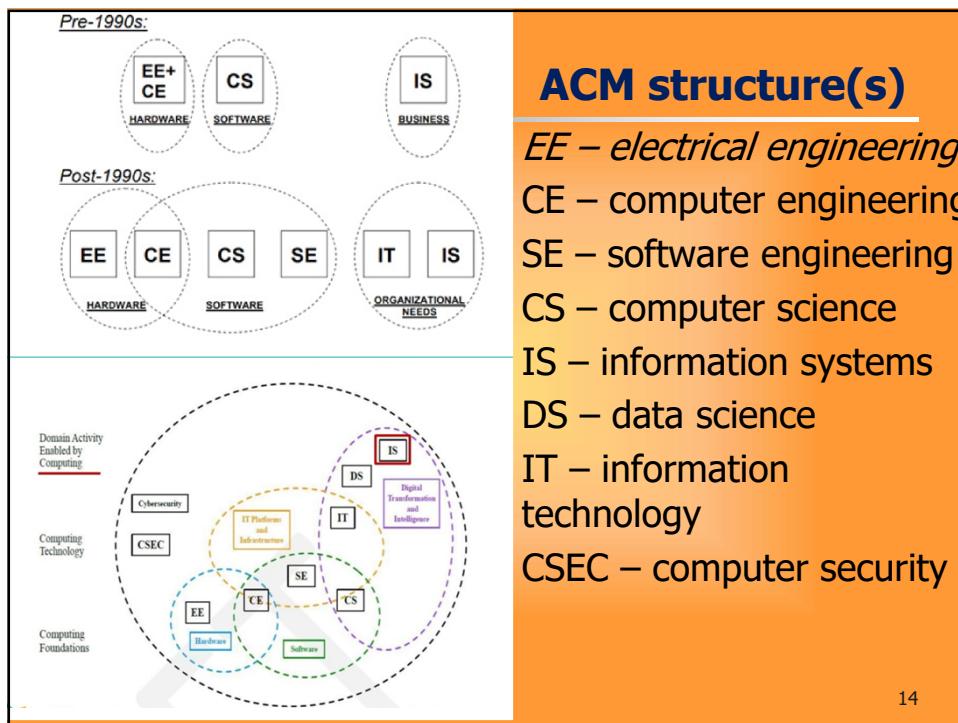
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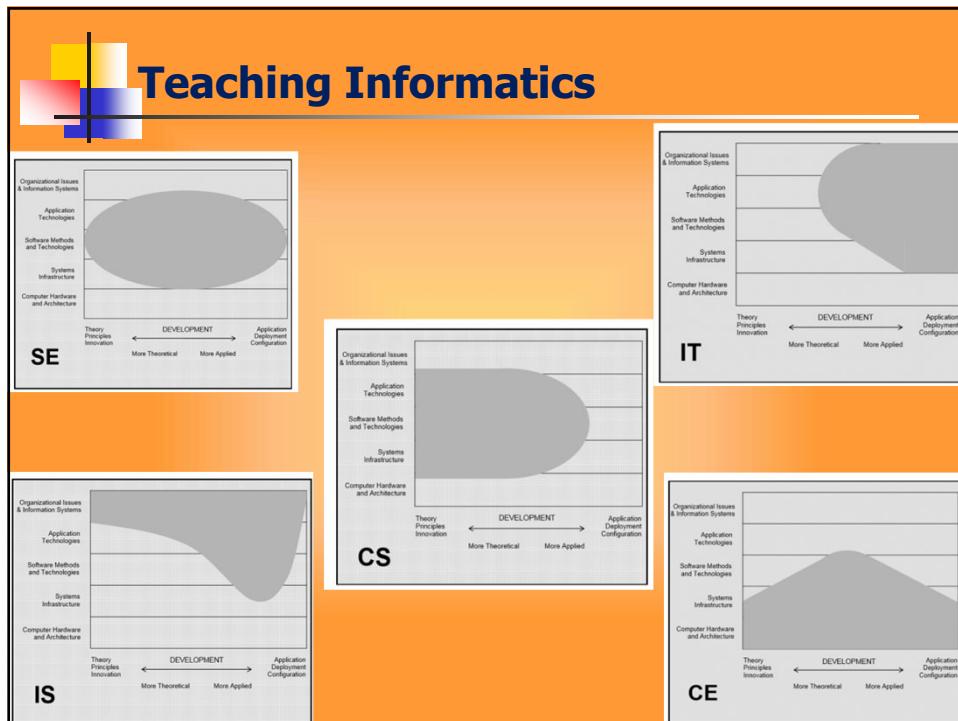
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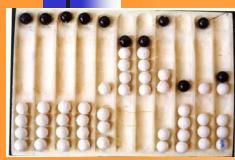
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## Brief historical perspective of ICT

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## Computer evolution

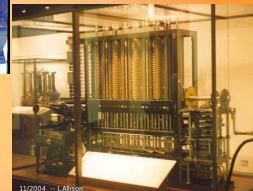
Abacus (? BC)



Pascal, 1642,  
Calculating Machine (adder)



Babbage, 1822  
Difference Engine



Hollerith, 1890  
Tabulating Machine



IBM, 1944  
Mark 1

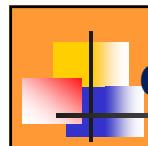


ENIAC, 1946



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## CS milestones

- Turing, 1930, Universal Machine
- Von Neumann, 1945, computer architecture (data+program)
- John Bardeen, Walter Brattain and William Shockley, 1947, Transistor
- Huff, 1970, microprocessor
- IBM PC, 1981, DOS
- Apple, 1984, Macintosh
- Berners-Lee, 1989, WWW
- Apple, 2007, iPhone

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## IBM Supercomputing timeline

Year	Event	Image
1954	NORC	
1961	IBM 7030	
1966	IBM 360	
1997	Deep Blue wins its match with chess grandmaster Garry Kasparov.	
2004	Blue Gene ushers in a new era of high-performance computing as it helps biologists explore gene development.	
2008	Roadrunner is the first supercomputer in the world to reach petaflop speed.	
2011	Watson beats human competitors on Jeopardy!, earning a million-dollar jackpot for charity.	
2012	Sequoia, the third-generation Blue Gene system, reaches speeds of 16.32 petaflops.	
2018	Summit begins work at Oak Ridge National Laboratory; a sister machine, Sierra, launches at Lawrence Livermore National Laboratory.	
2019	Pangea III, the world's most powerful commercial super-computer, for Total to accurately locate new energy resources.	
2020	IBM helps launch the COVID-19 High Performance Computing Consortium to research the COVID-19 virus and its potential cures.	

GFLOPS

CPU Speed

1985

1997

2004

2011

2012

2018

2019

2020

1954

1961

1966

1997

2004

2011

2012

2018

2019

2020

1950

1960

1970

1980

1990

2000

2010

2020

1954 NORC

1961 IBM 7030

1966 IBM 360

1997 Deep Blue

2004 Blue Gene

2011 Watson

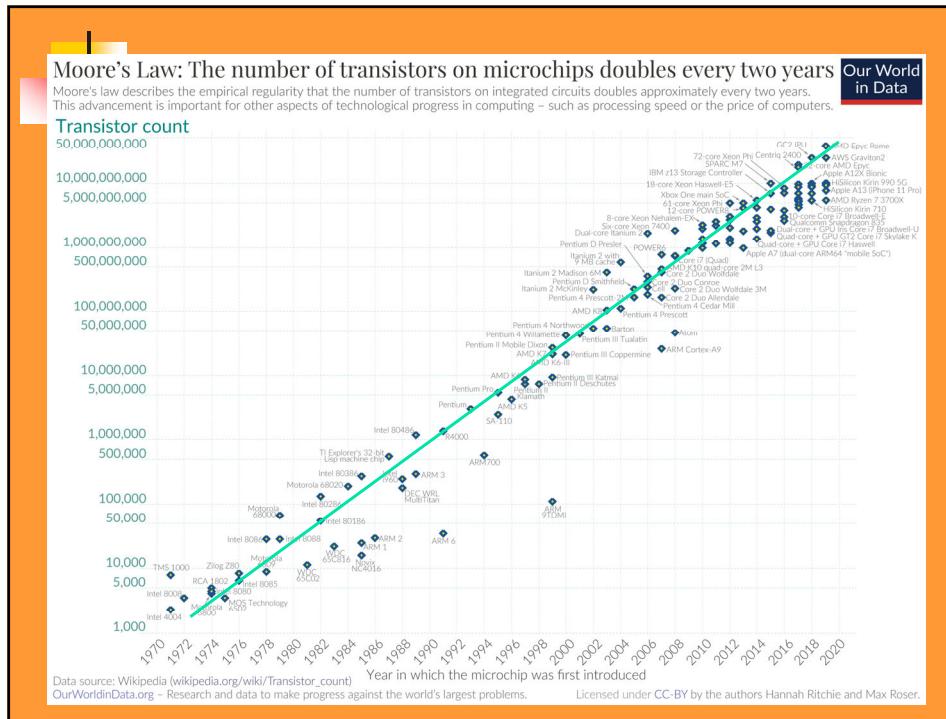
2012 Sequoia

2018 Summit and Sierra

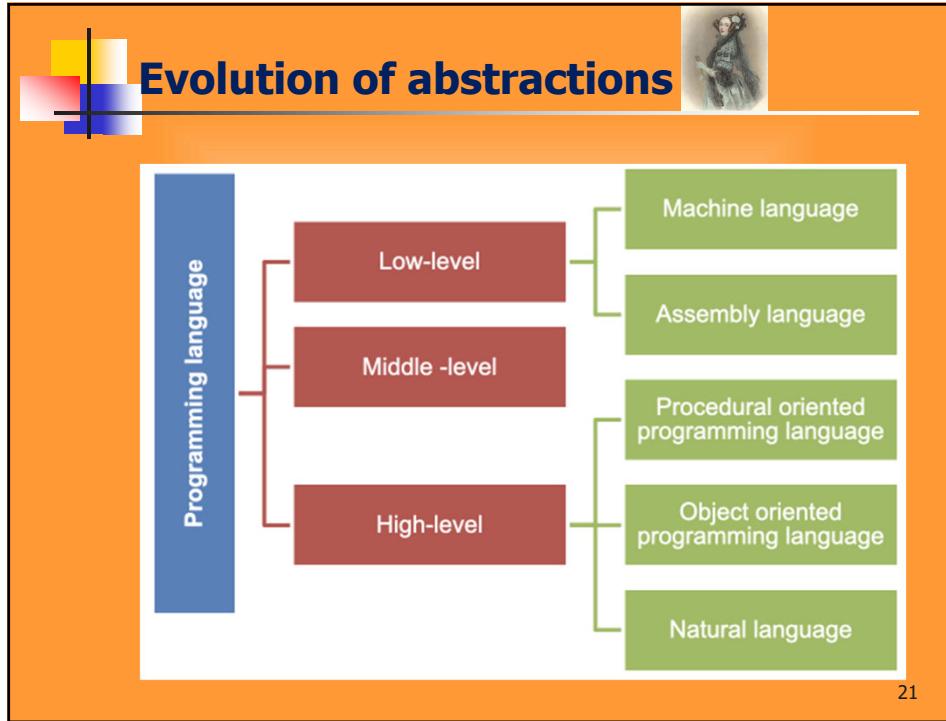
2019 Pangea III

2020 High Performance Computing Consortium

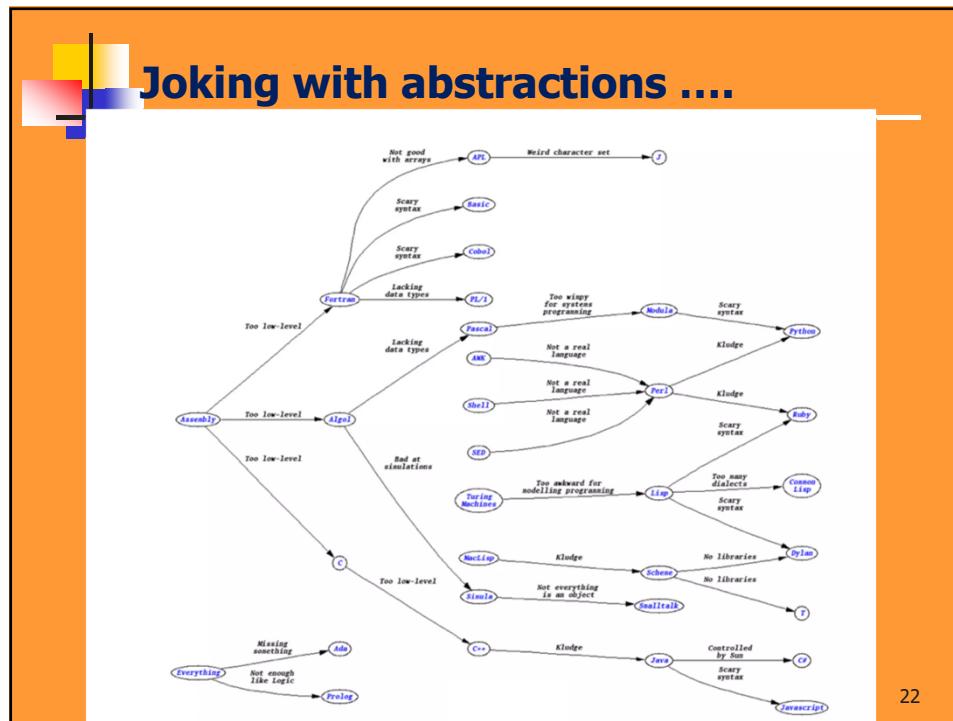
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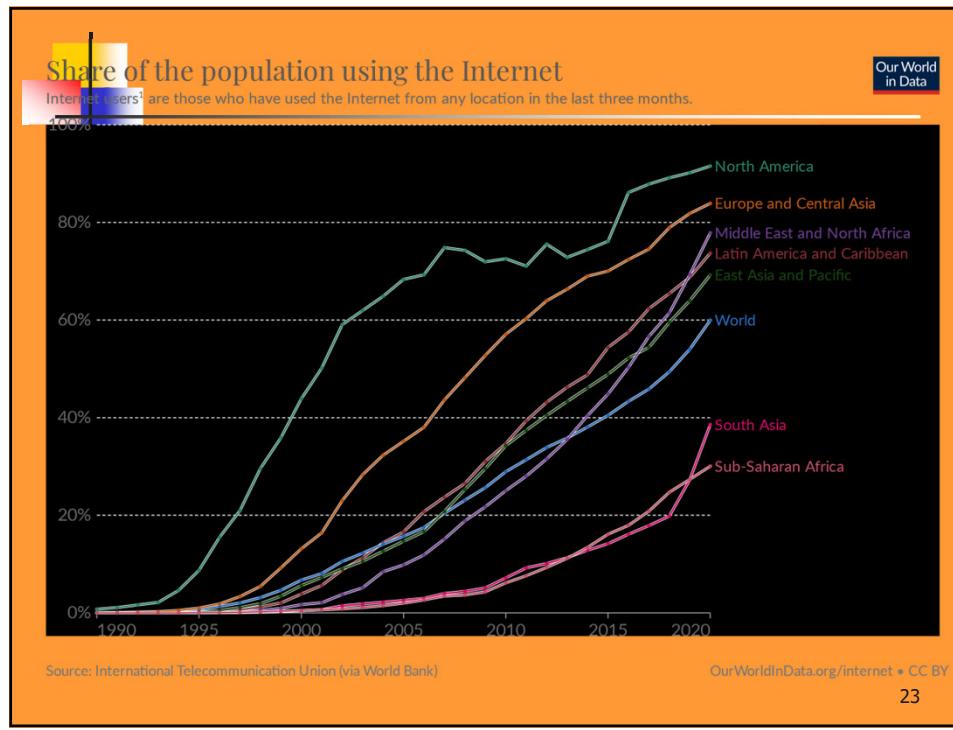


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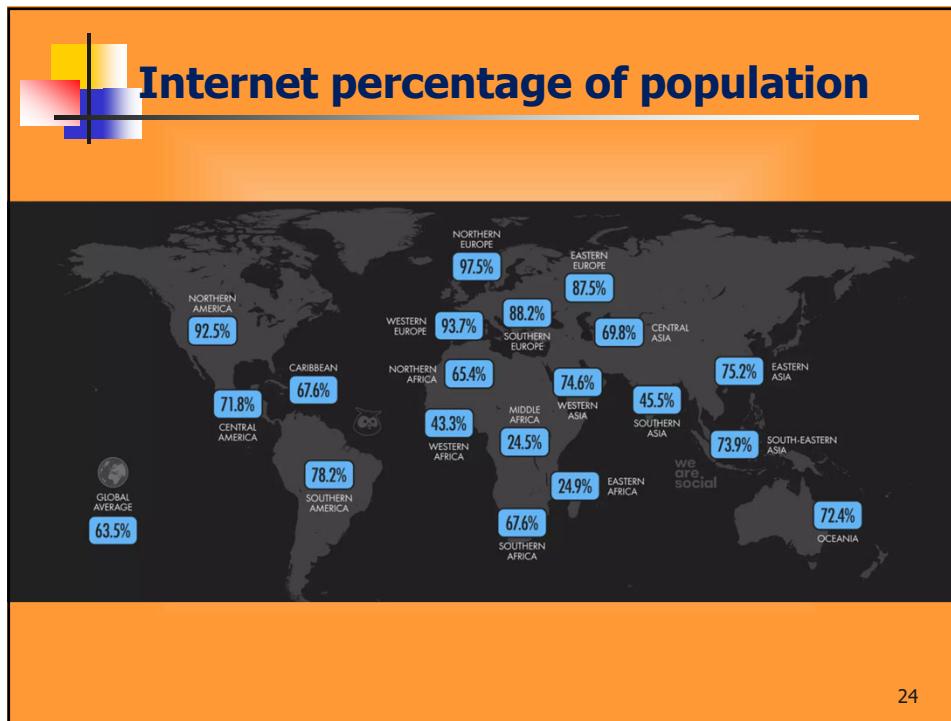
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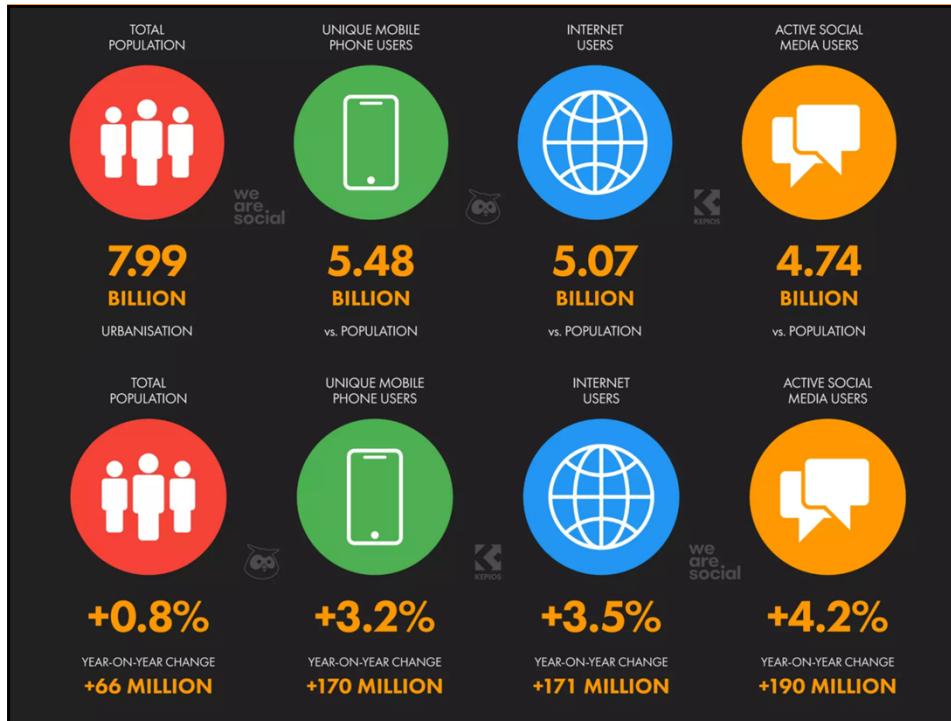
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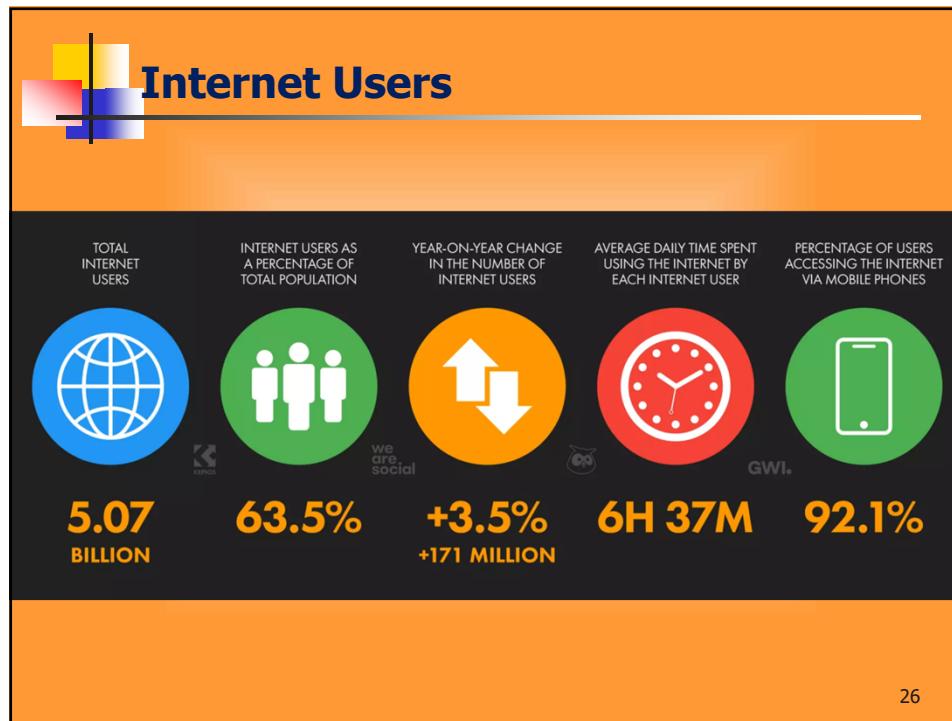


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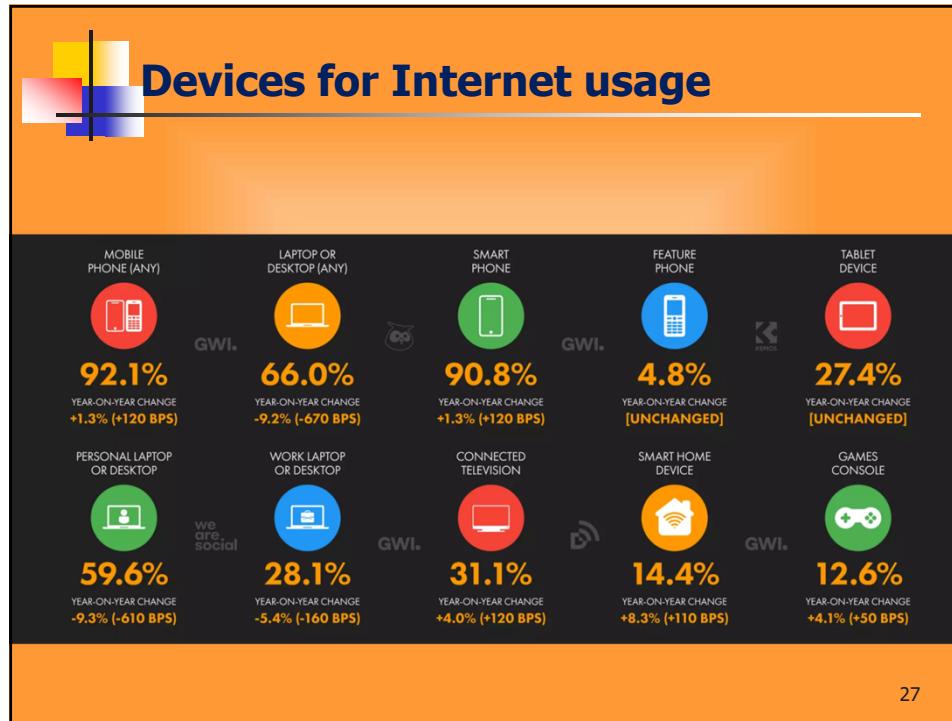
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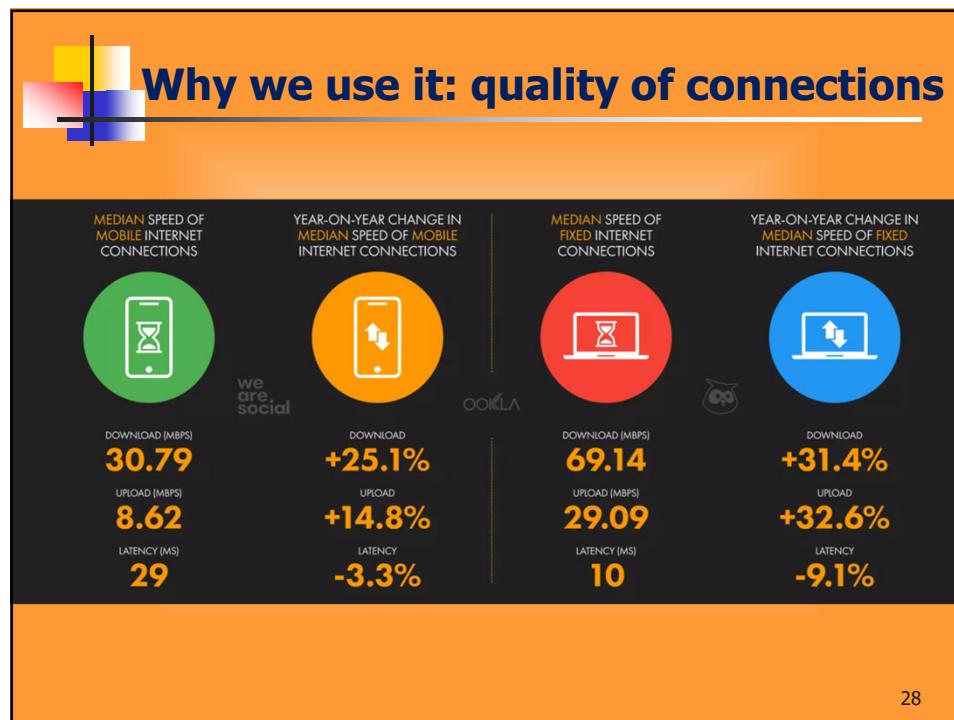
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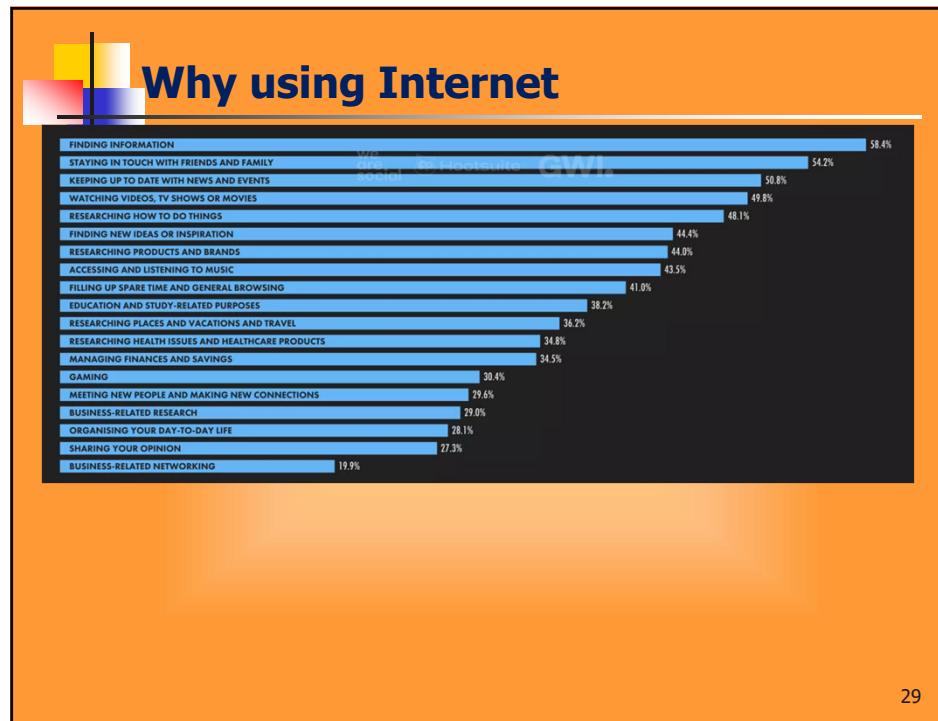
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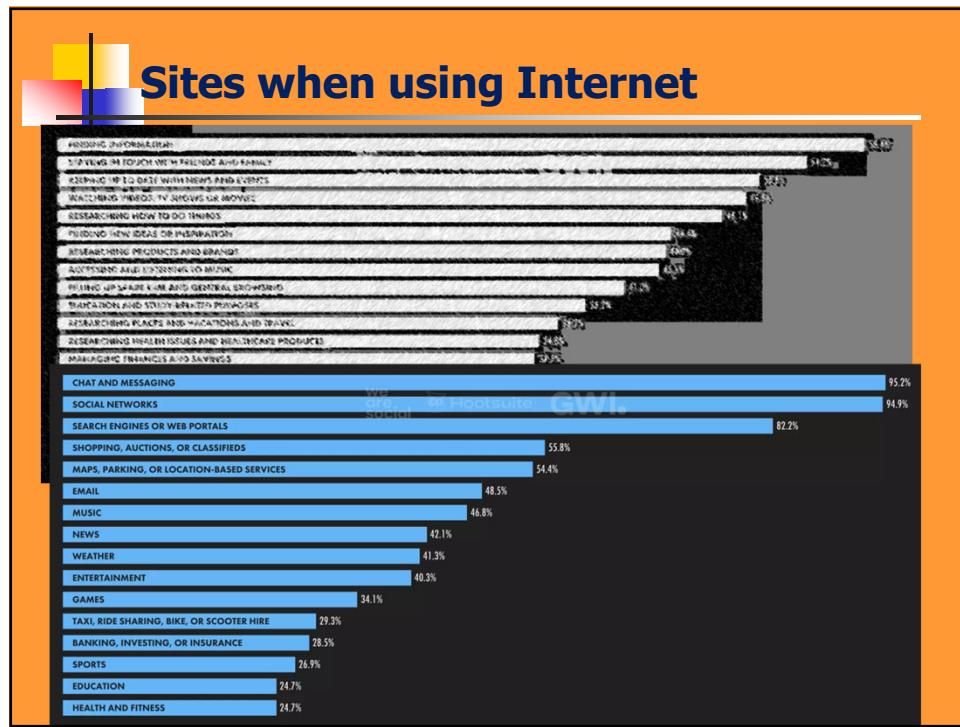
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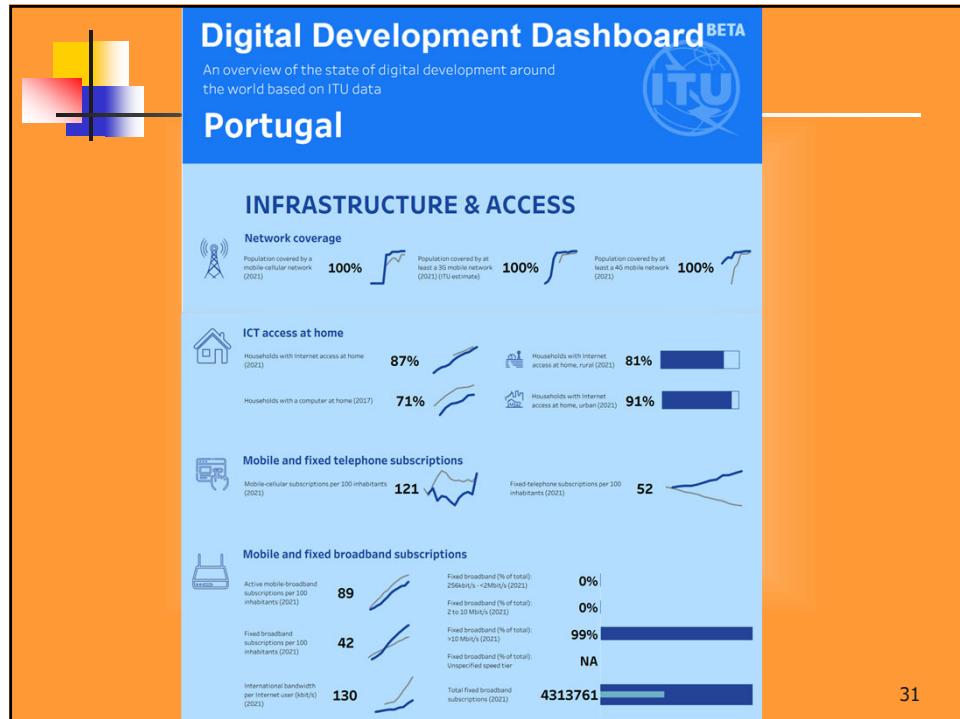
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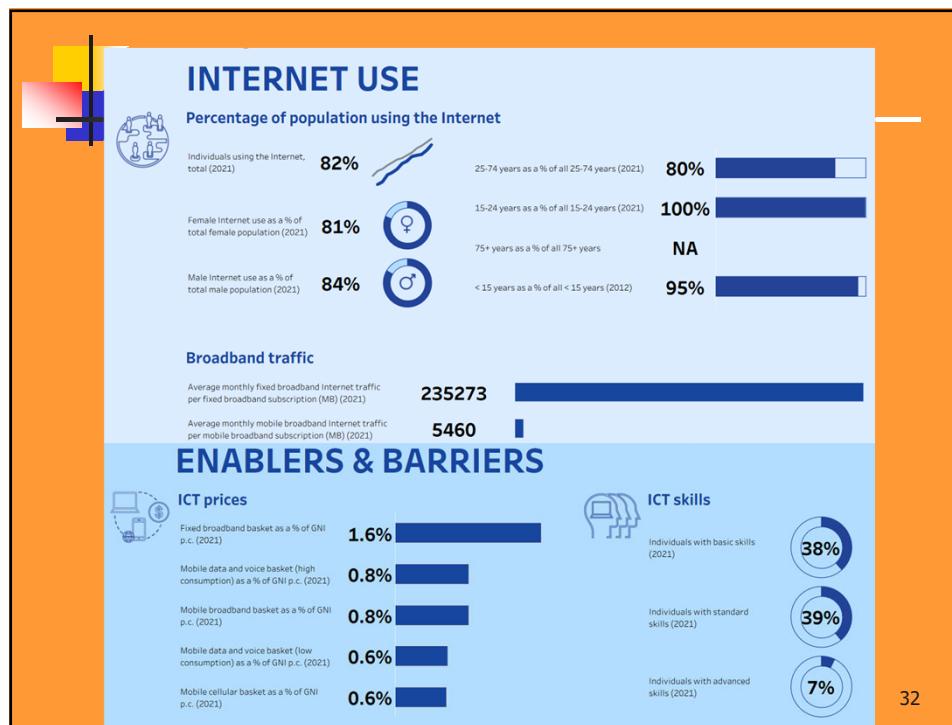
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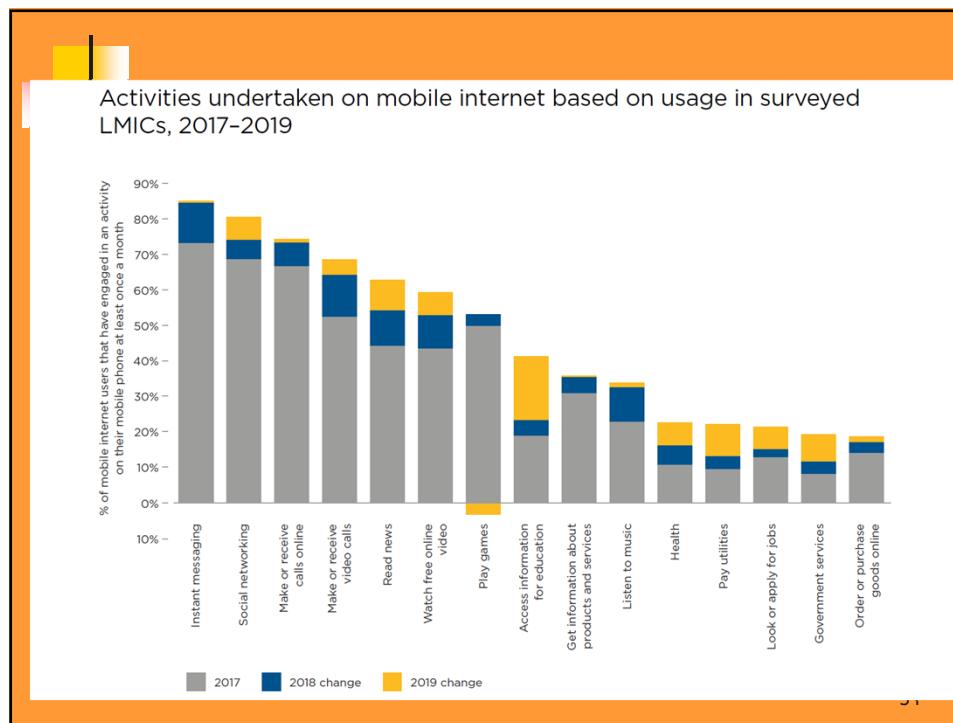
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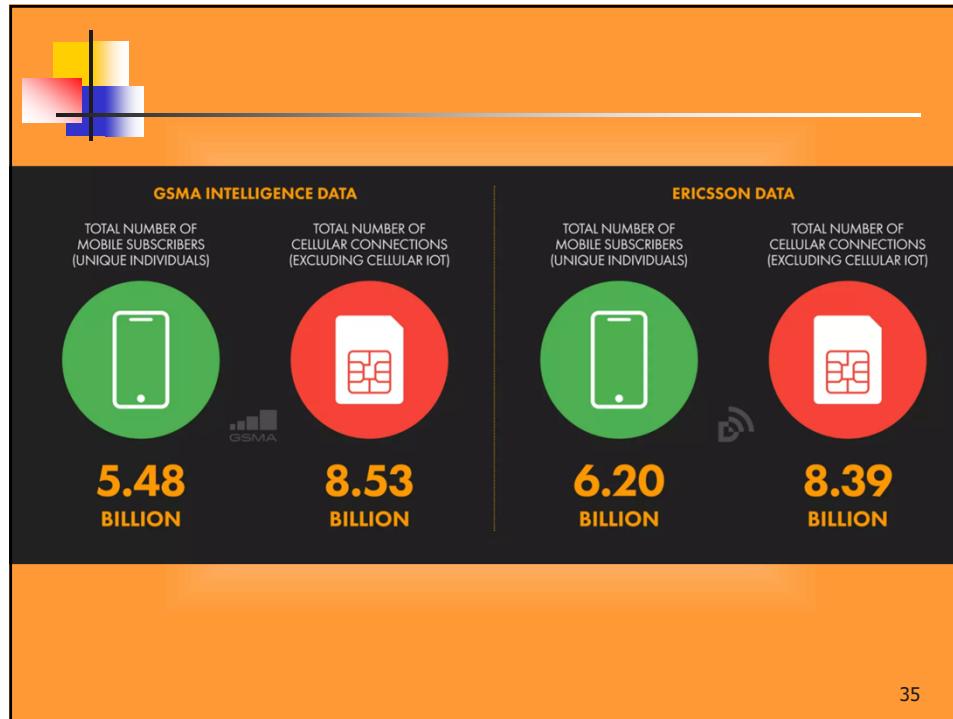
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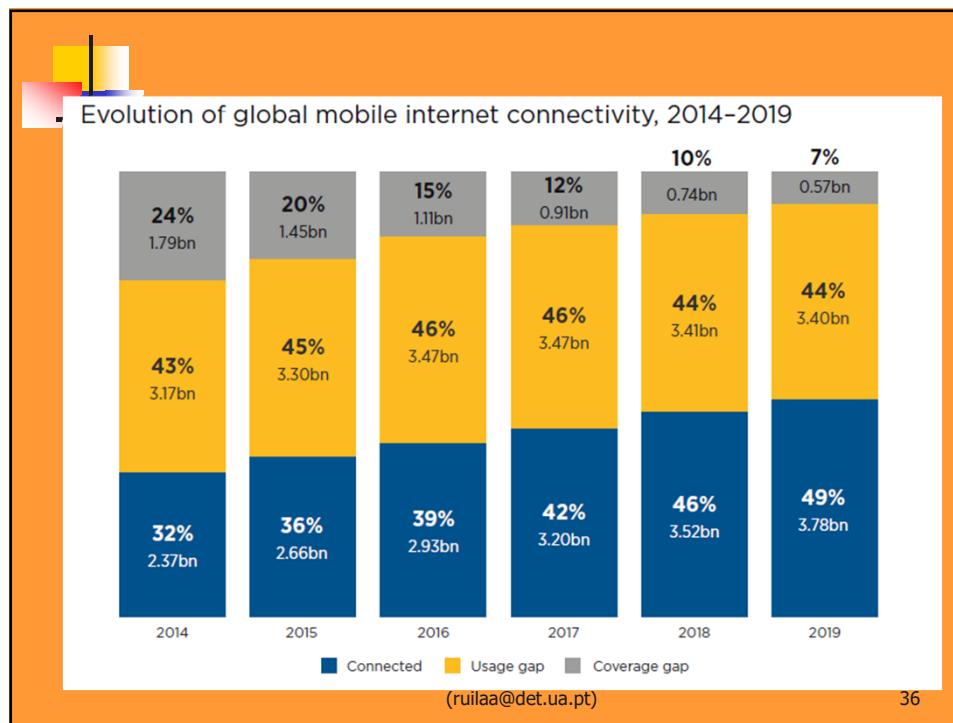
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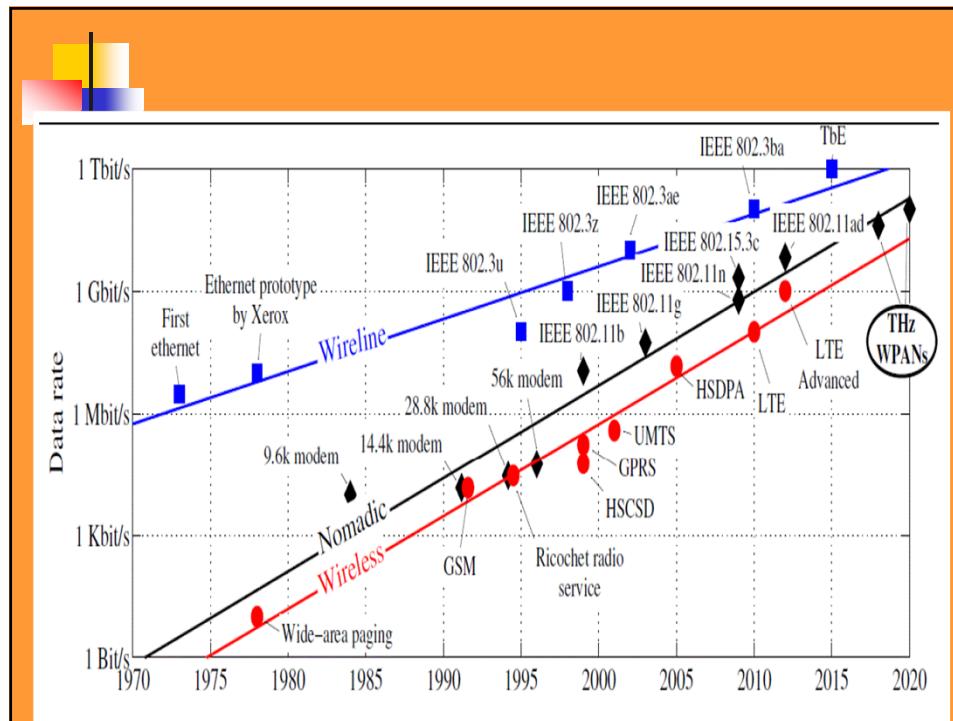
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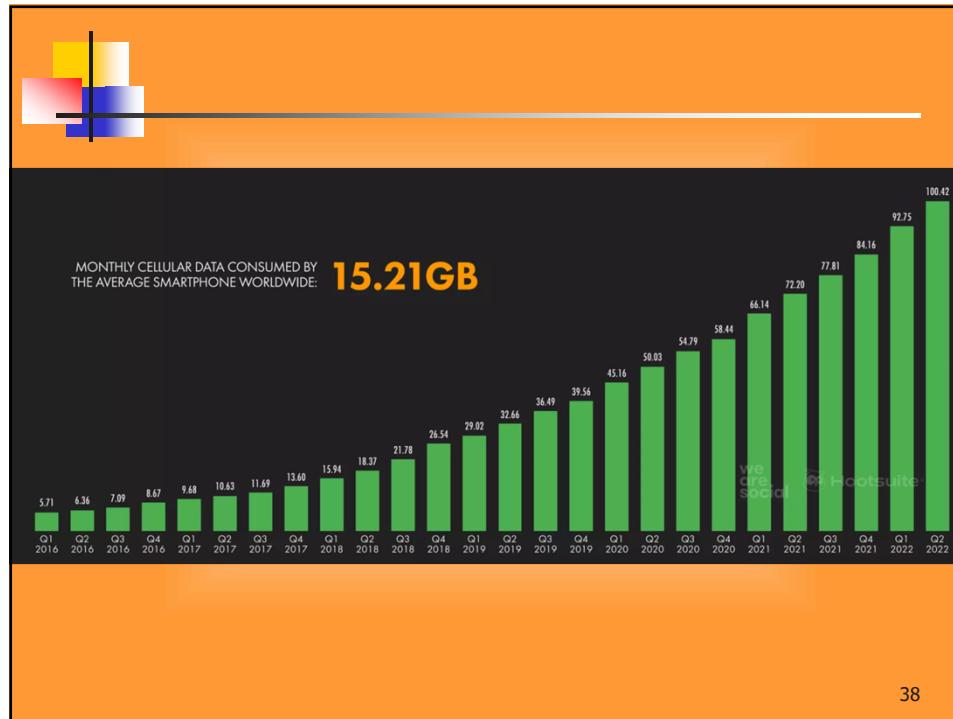
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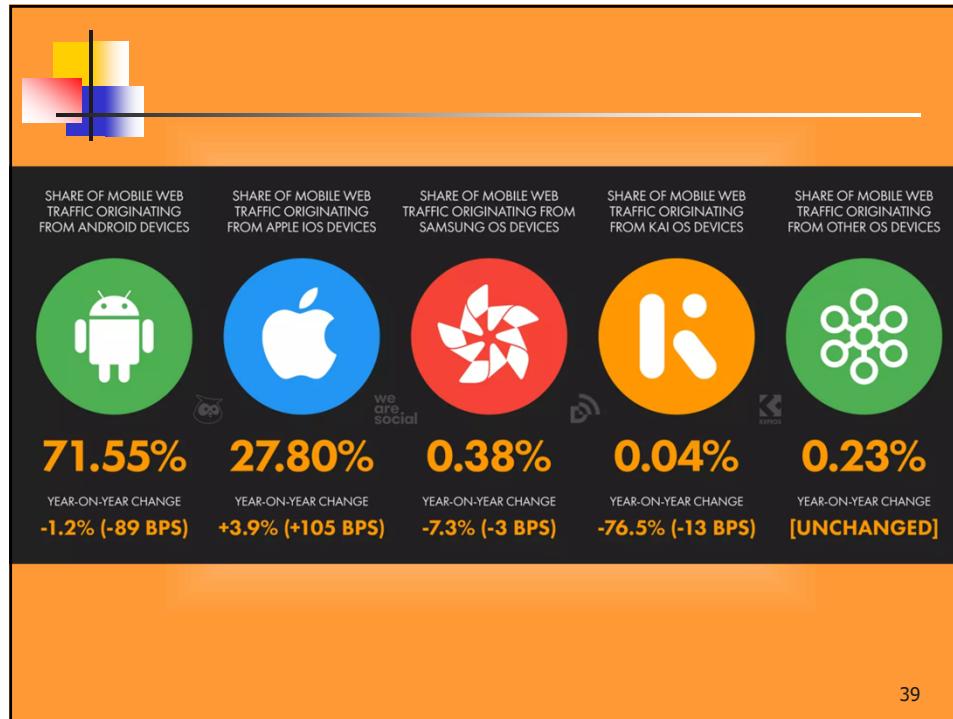


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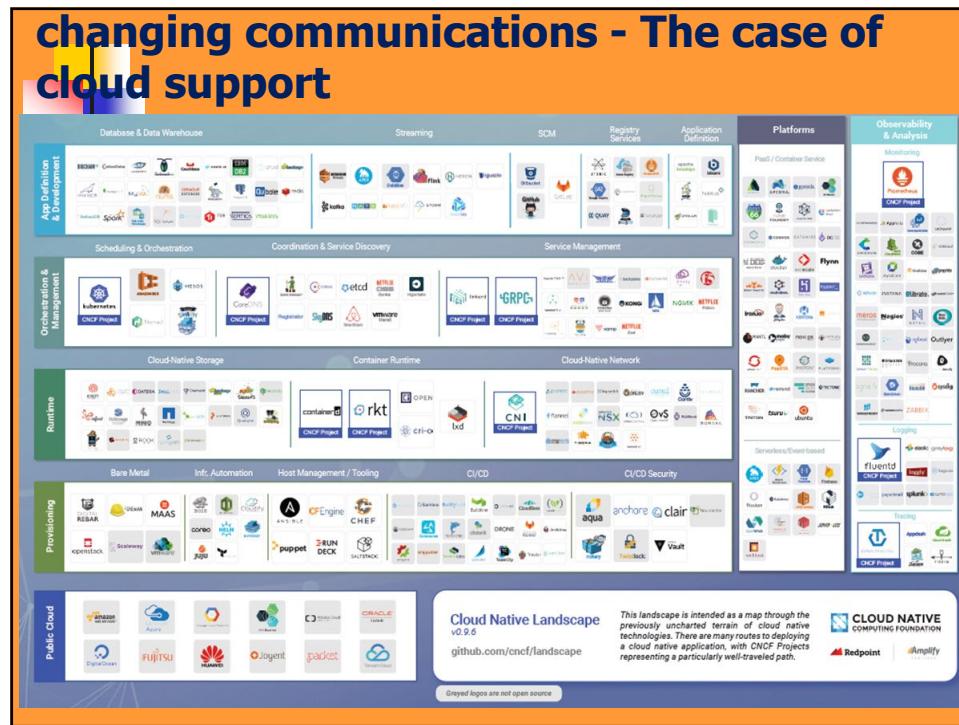
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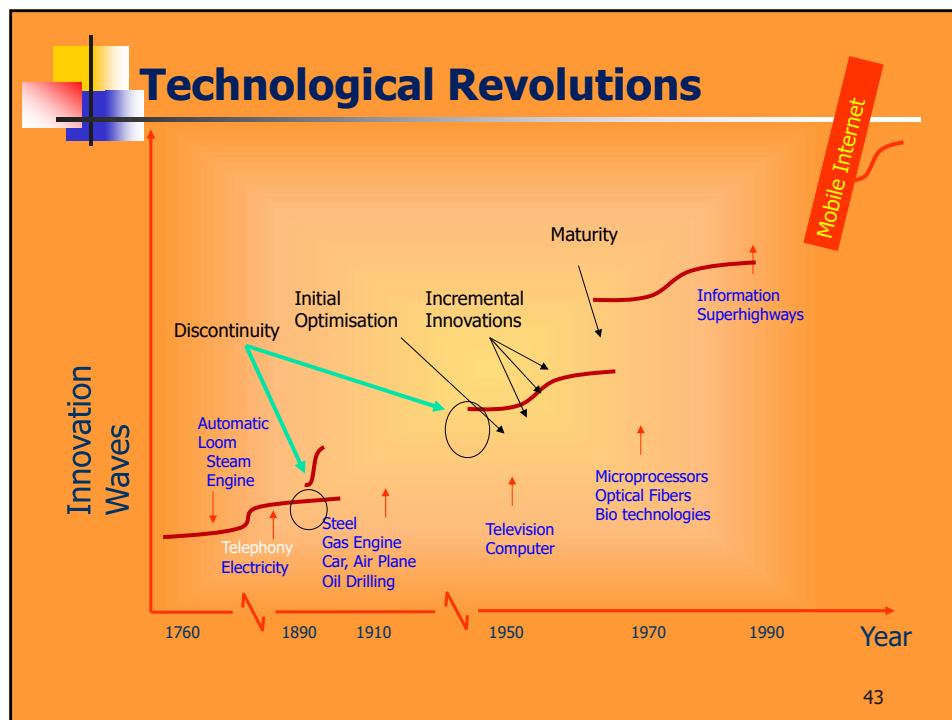
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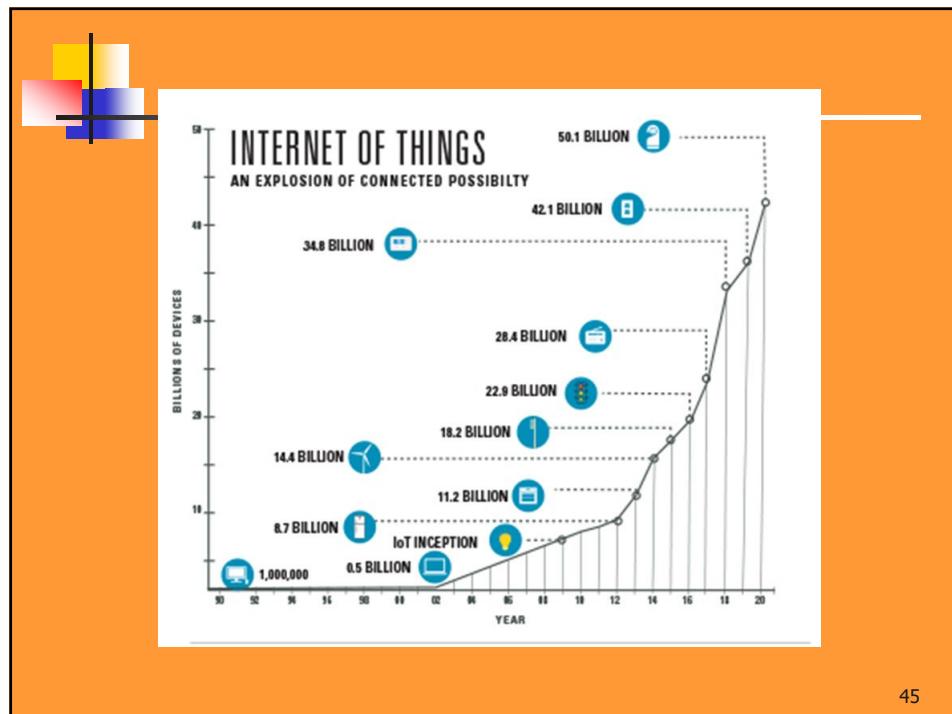
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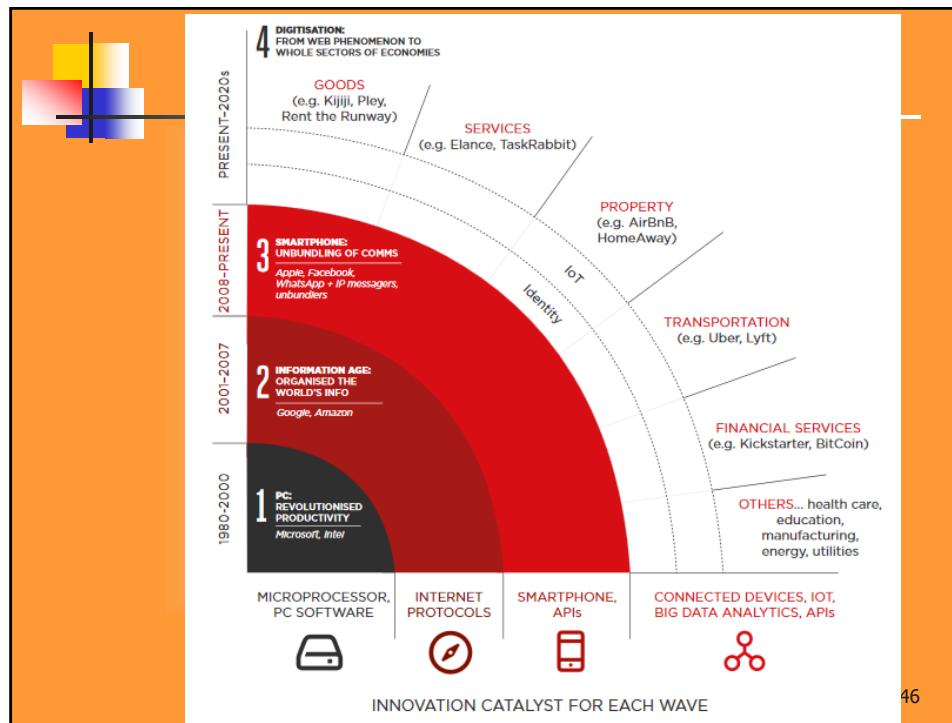


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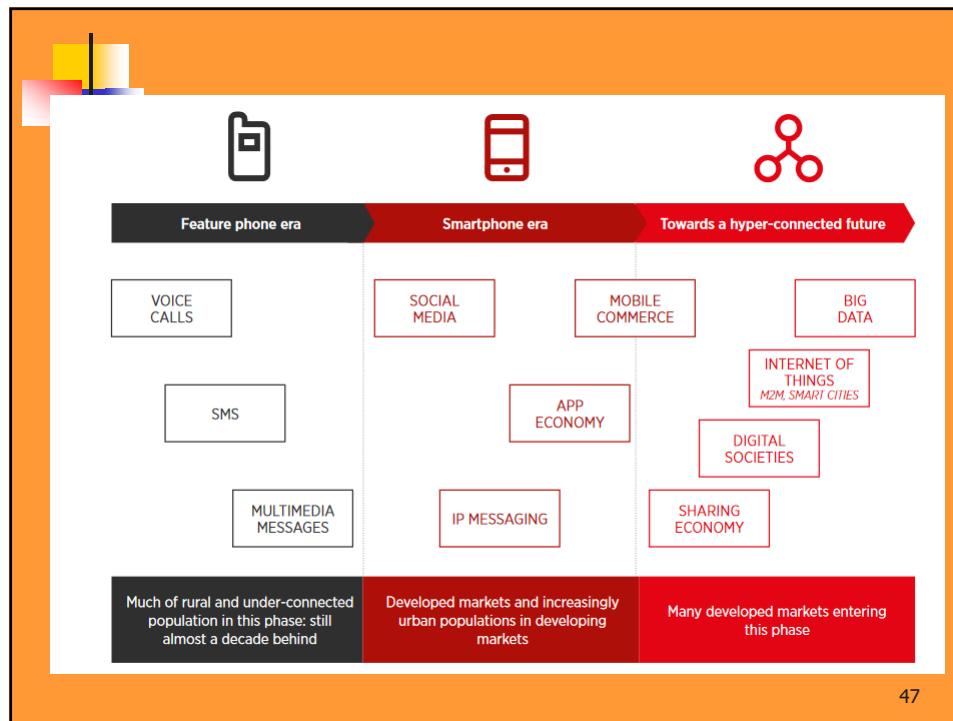
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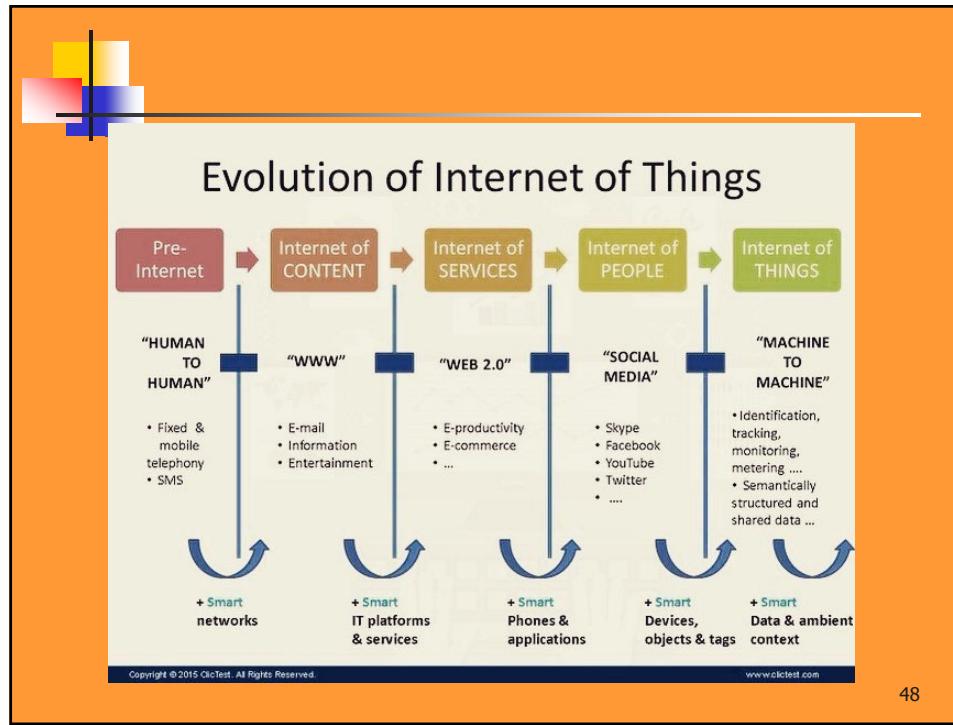


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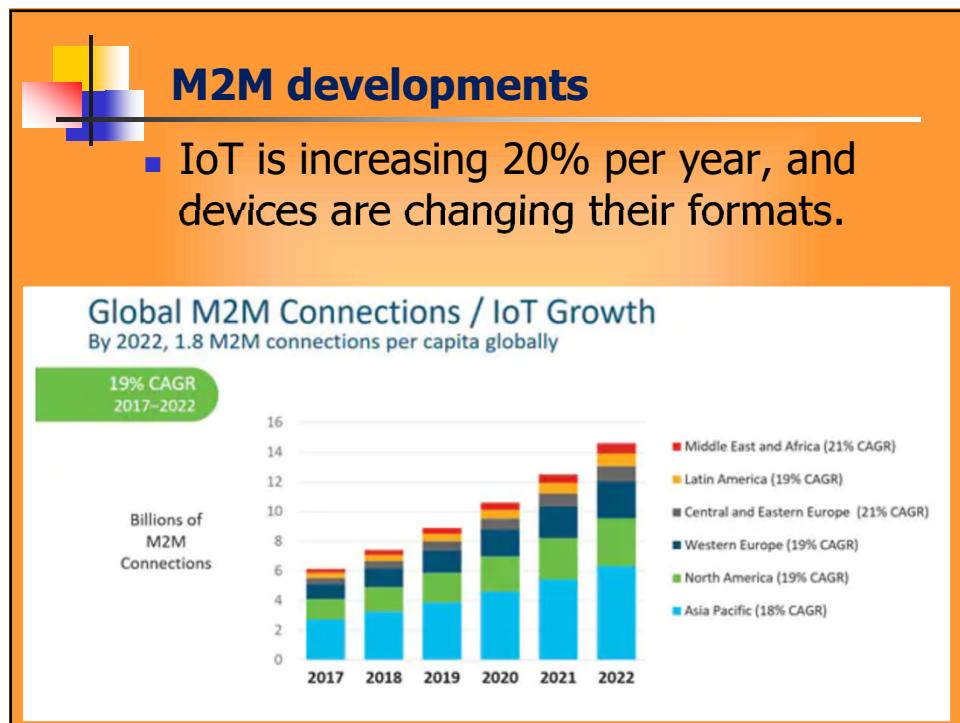
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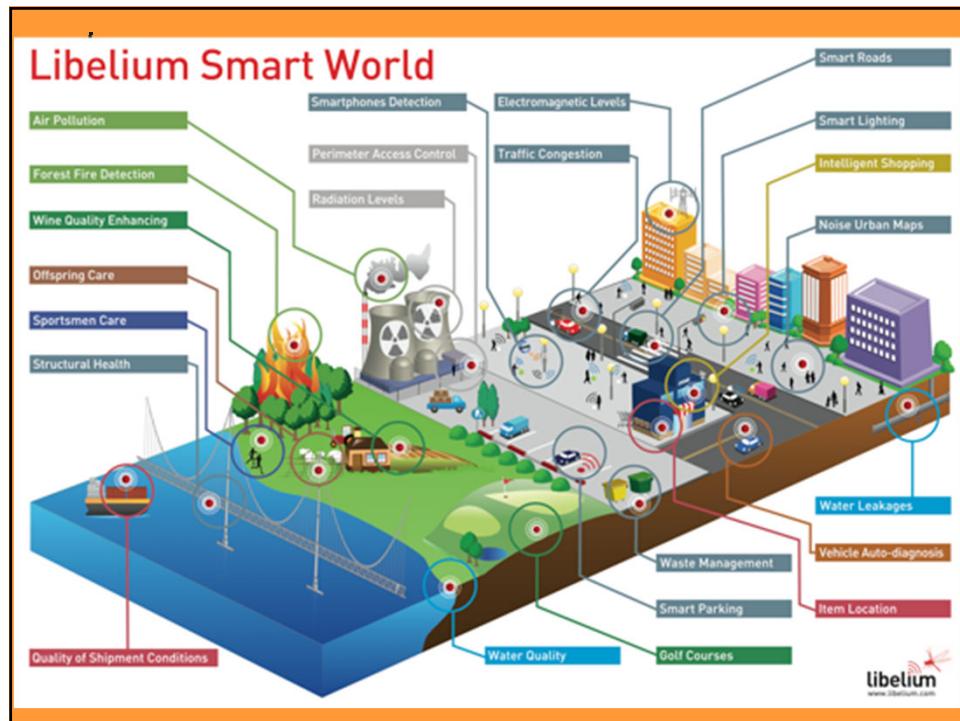
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## Consumer IoT

- Focused on consumer needs
  - Automation, Notifications
- Integration with products
  - Increase value for existing products
  - Expandable products (pay as you go/want)
  - New use cases and products
- Behavior tracking/learning
  - Prediction, image recognition

Source: Rouge Group

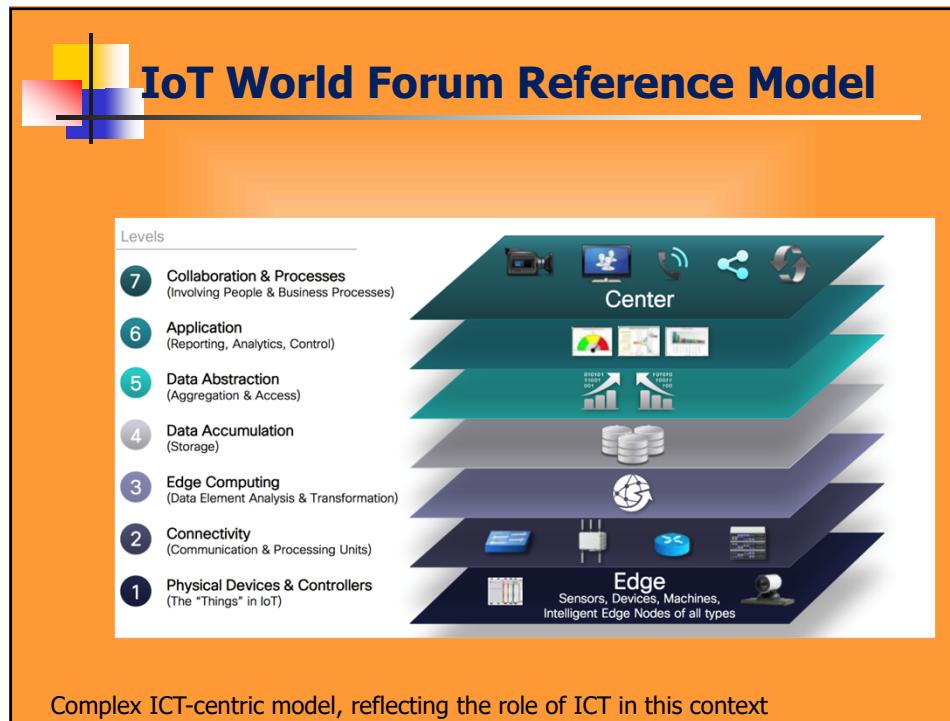
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## Enterprise IoT

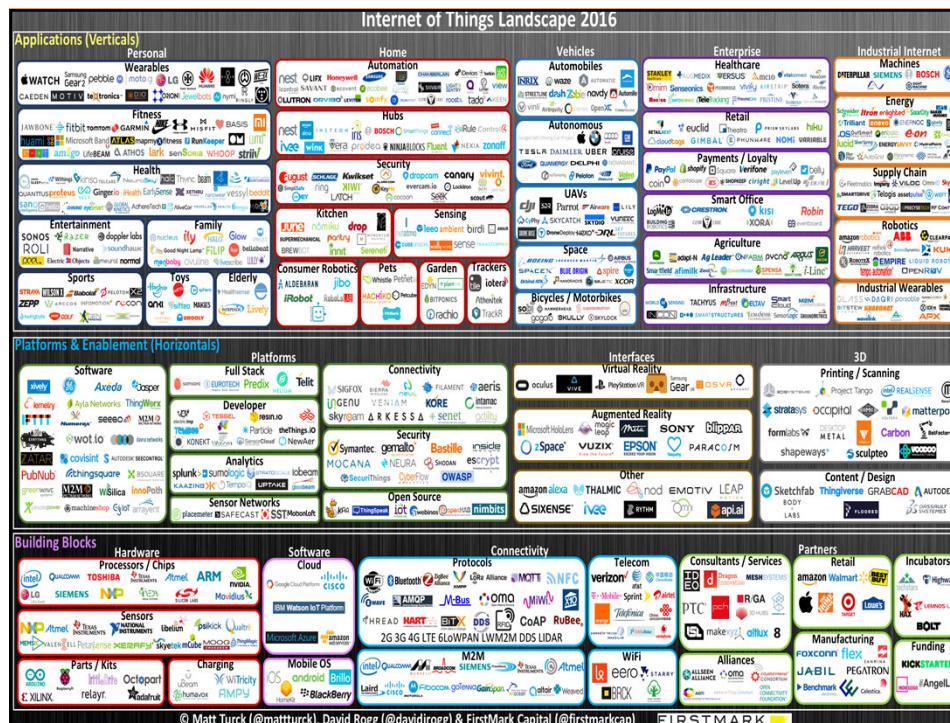
- Focused on enterprise needs
  - Fleet management
  - Process Optimization
  - Integration
- Must offer measurable impact
  - % reduction in cost, delay, etc..
  - % increase satisfaction
  - % reduce in RMA
- Sensor driven approaches
  - Using deep analysis
  - Prediction capabilities
    - with longer time frames

Source: Rouge Group

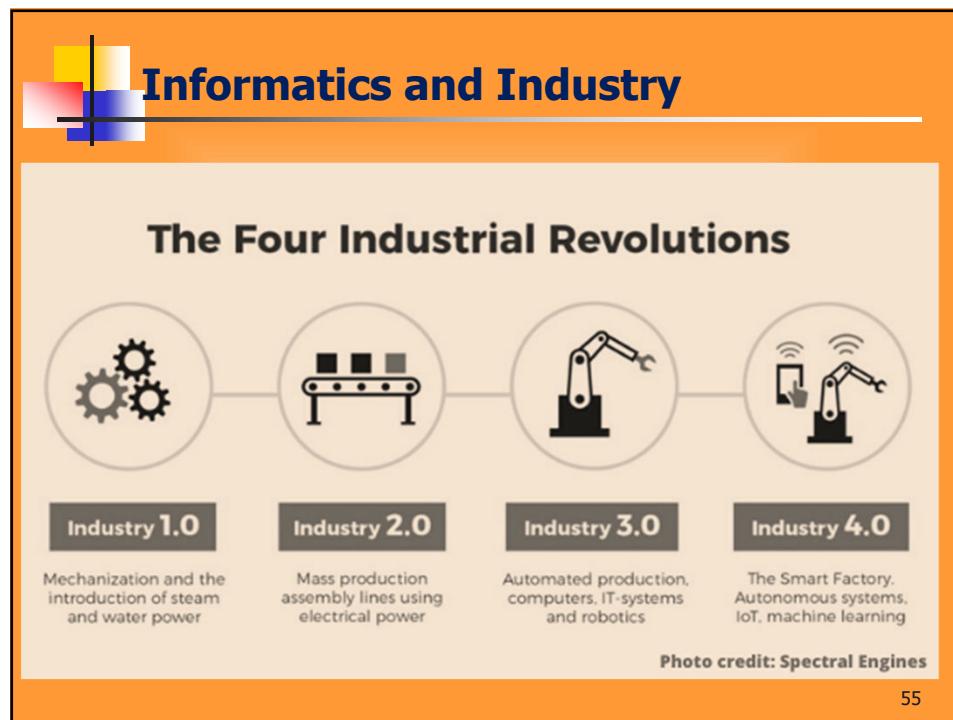
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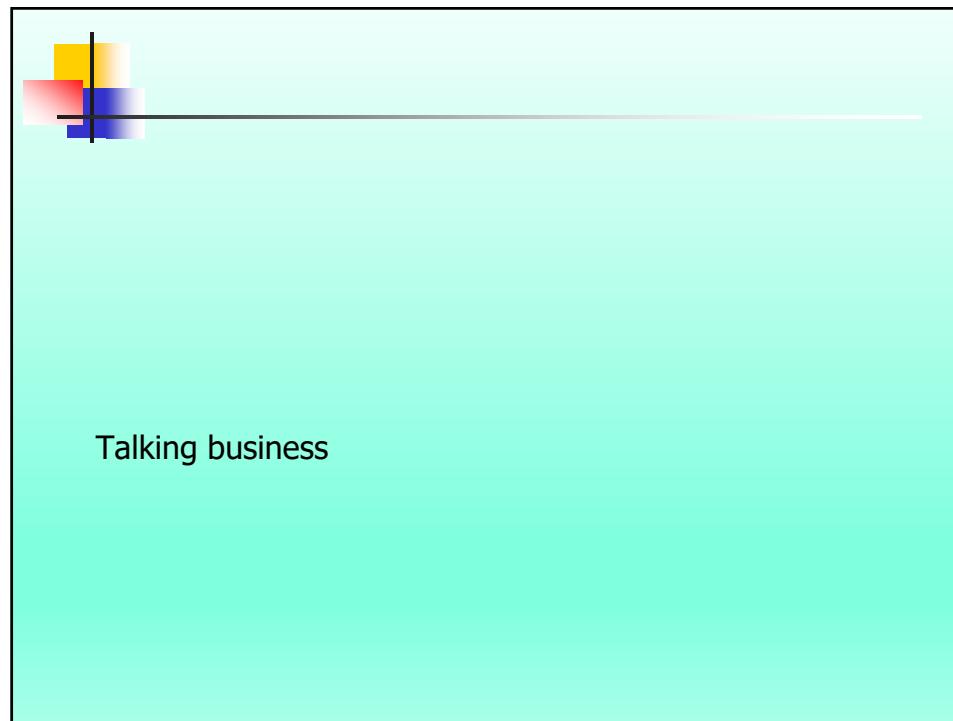
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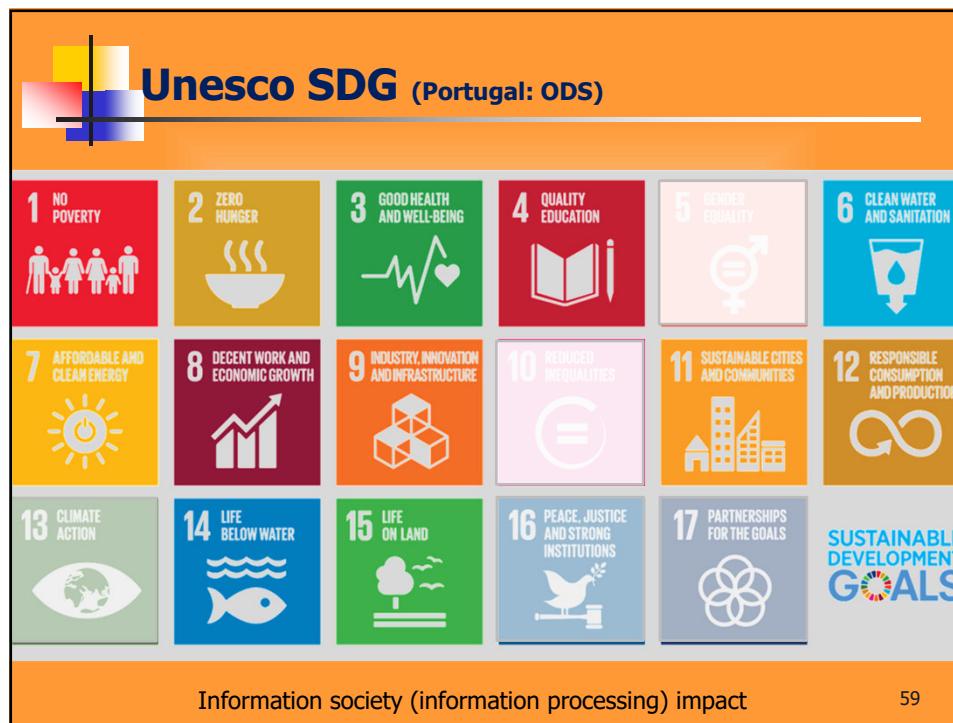
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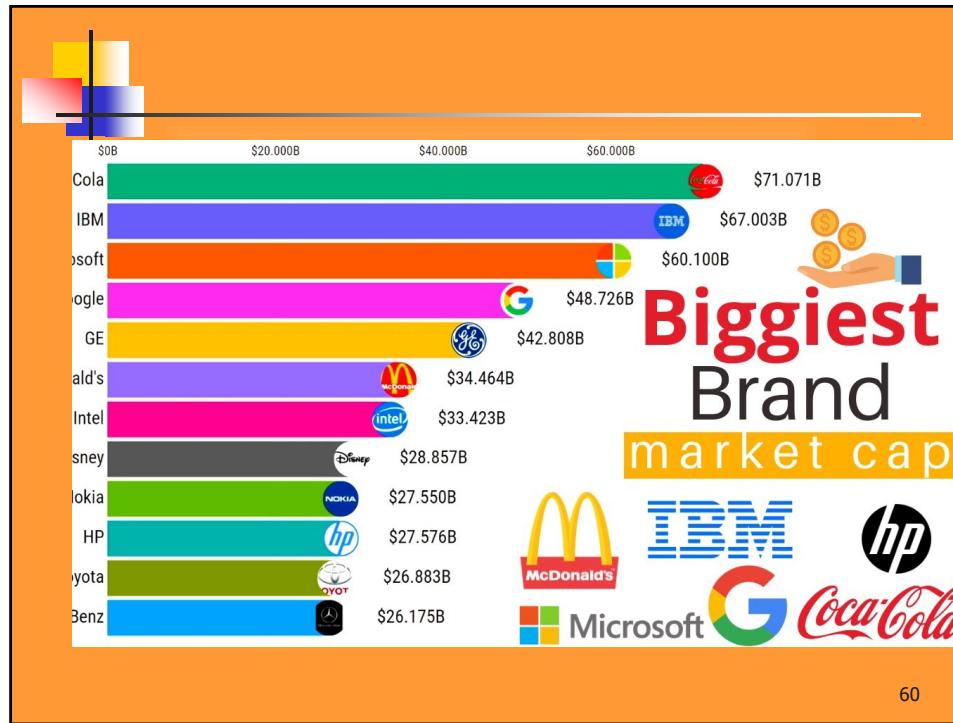
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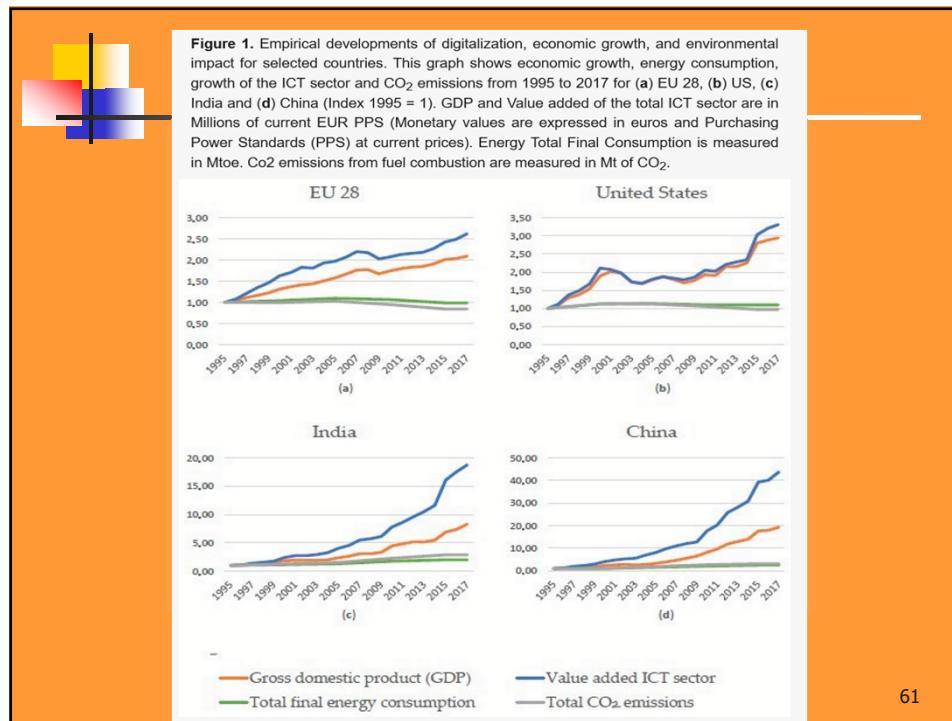
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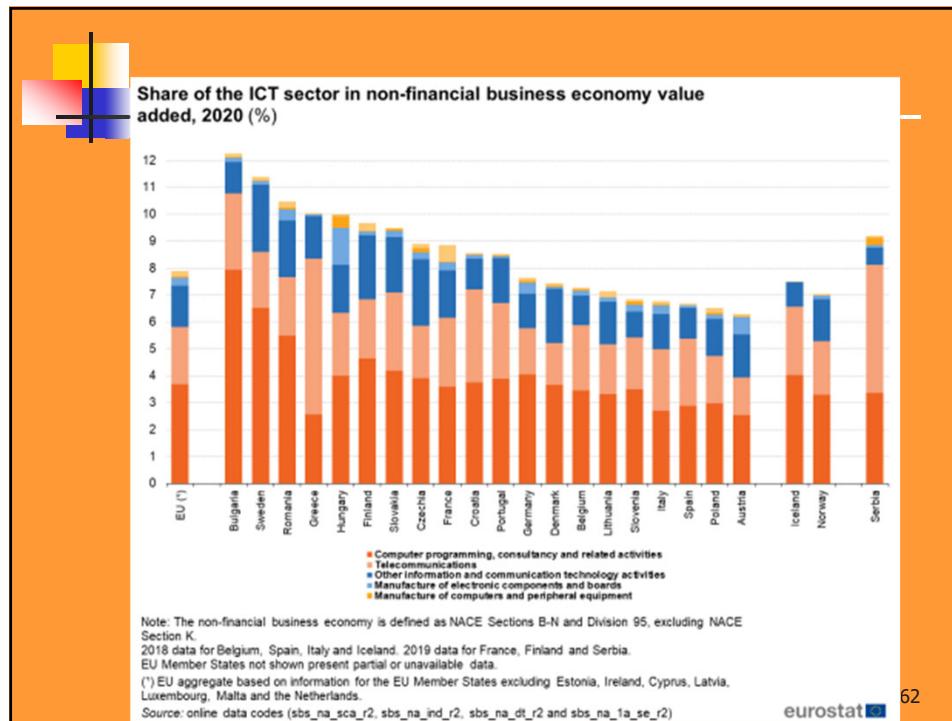


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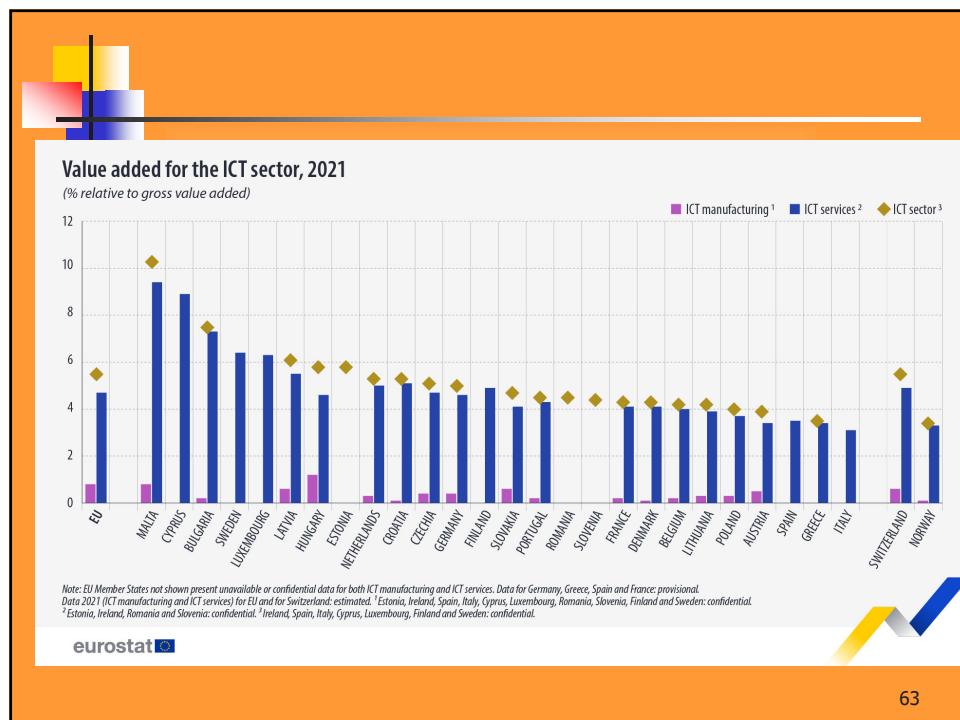


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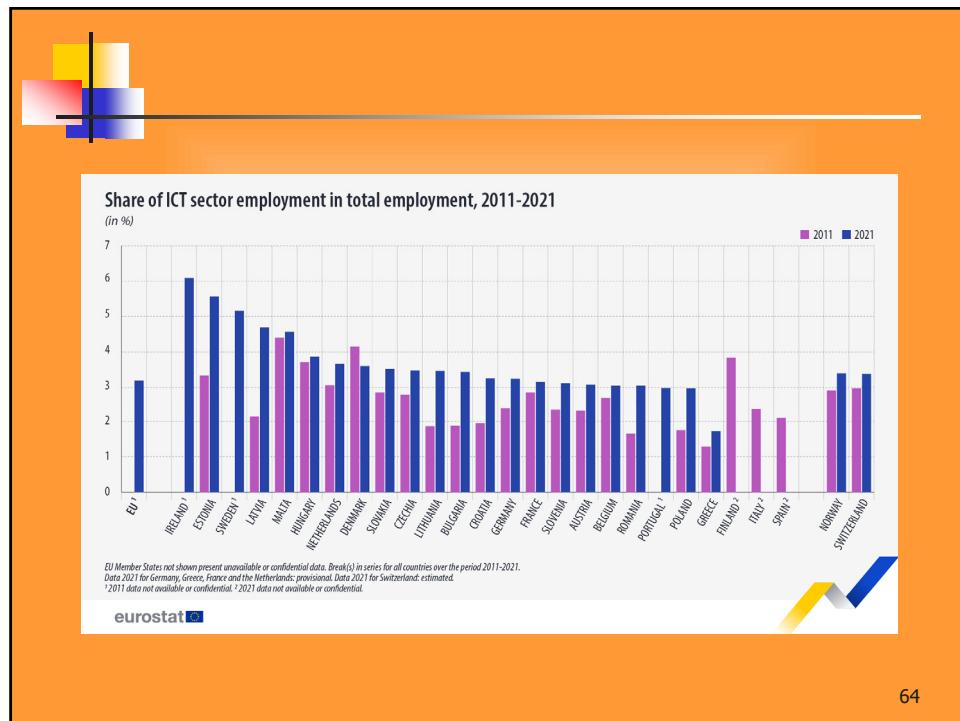
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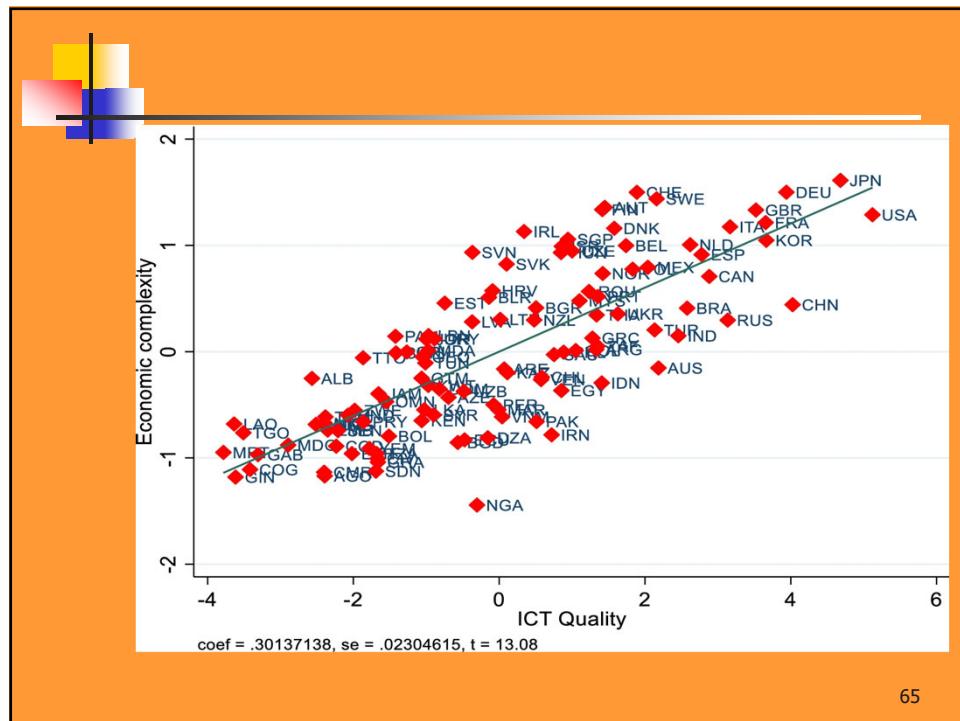
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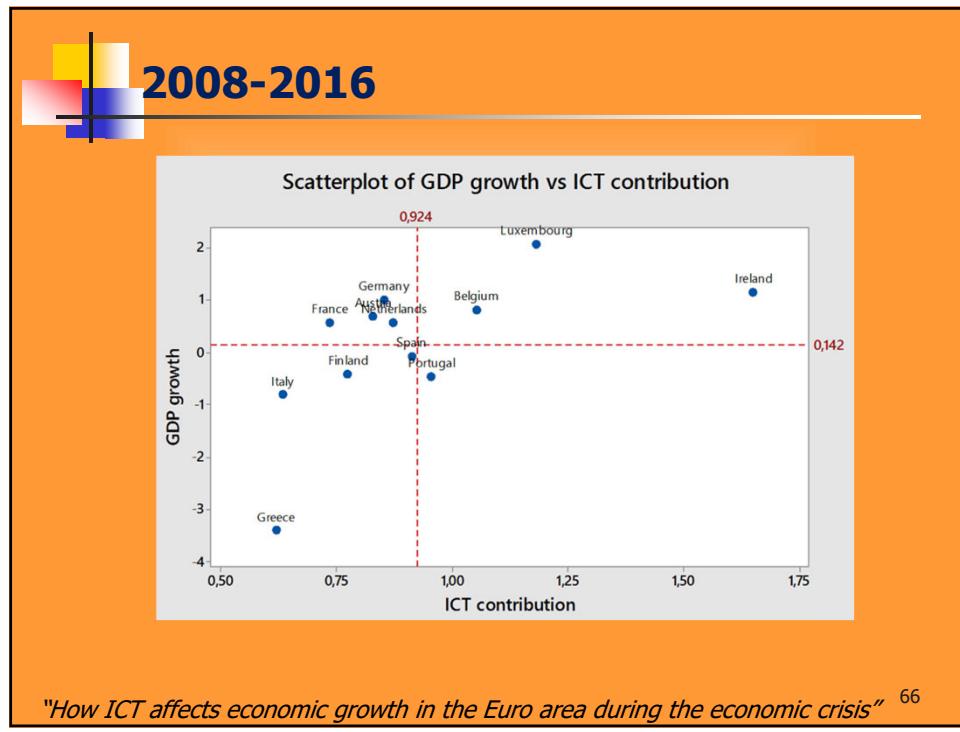
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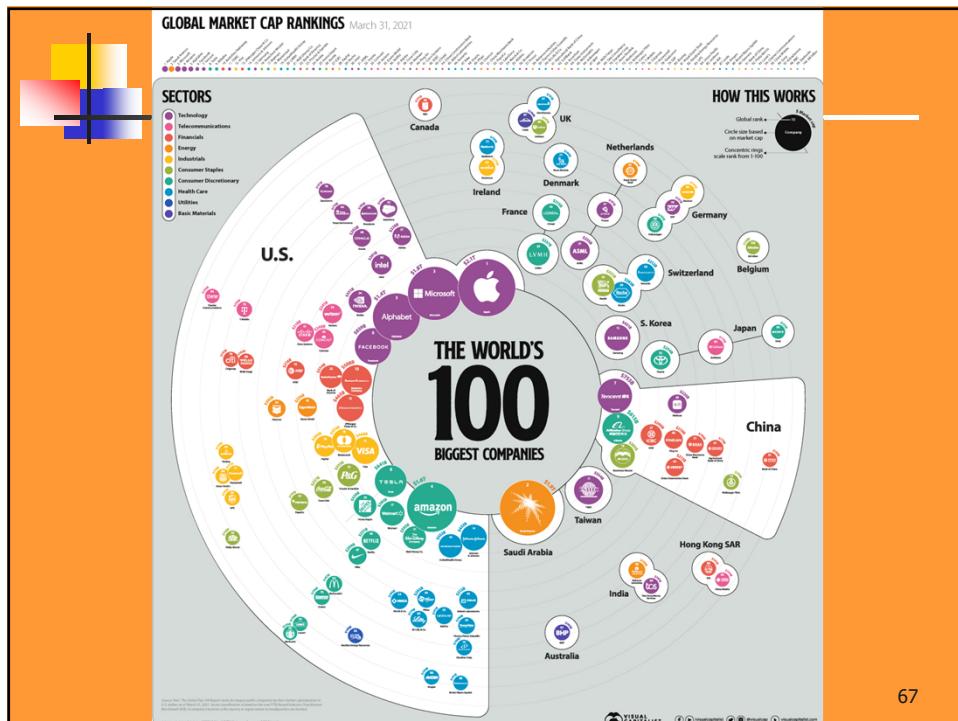
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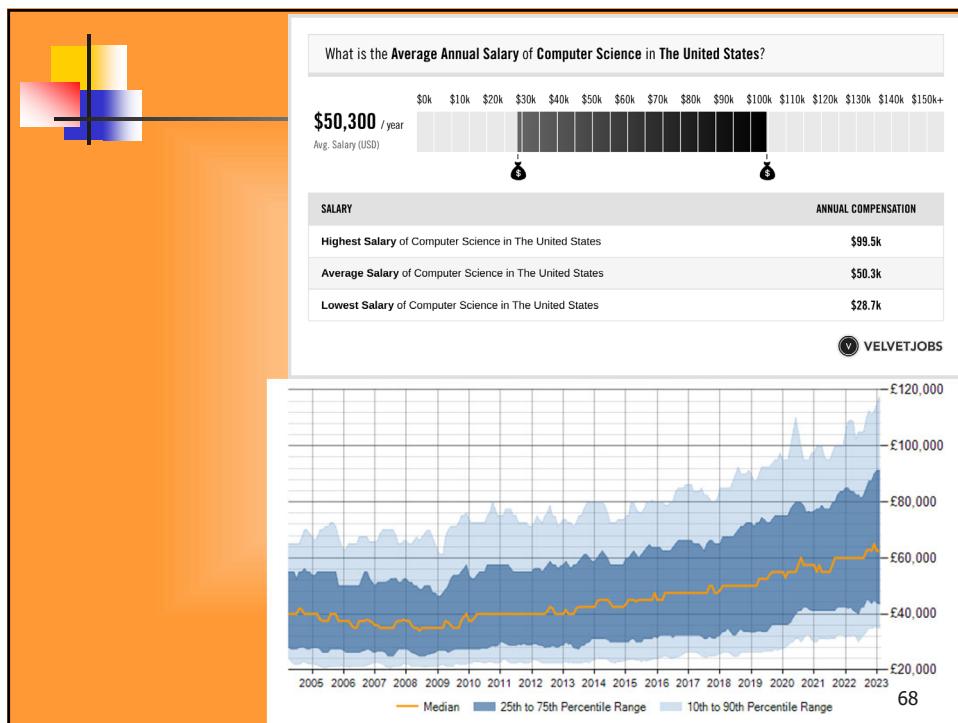


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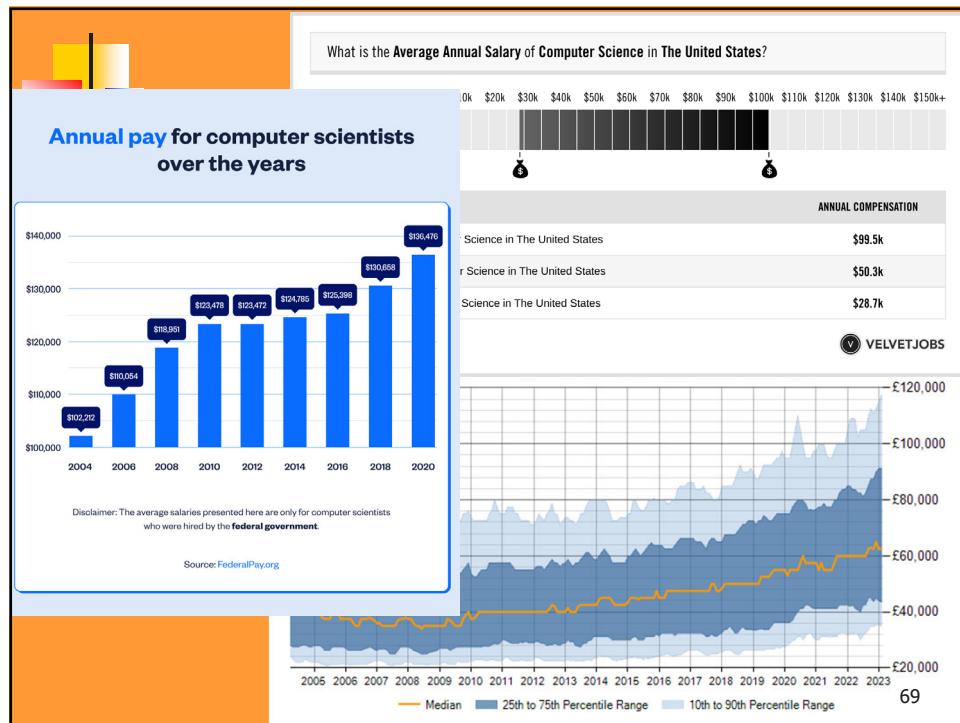


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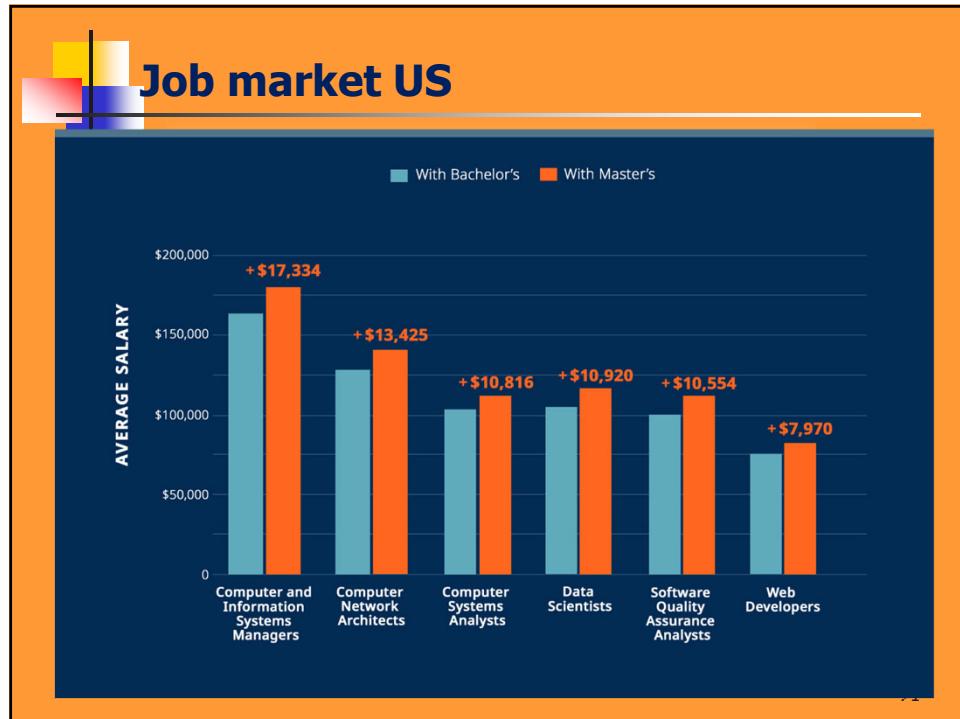
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## The details of the salaries

- You are not a hacker
  - But a professional CS/CE/IT
- Doing genius-level code
  - Is only done once
  - Reproducibility, legibility, reliability is much better in the long run
- You think you are a computer genius
  - But most of your life, you will be a factory (*of code*) worker (in case of doubt: *operário fabril*).
  - For every "core programmer", there is 4-5 elements for essential jobs: user requirements, design, localization, testing, validation, documentation, customer support, deployment, etc...

Why?

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## I am going into a start-up!

- None of the different functions before disappears
  - Now you will be doing all of them across a small team
  - And you will be doing as well the non-technical aspects of the business: selling, funding, management, marketing, acquisition, human resources....

This means?

**The business is NOT CODING.**  
**The business is providing competitive solutions using ICT.**

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