Ericsson 5G

"Society 5.0"
5G technology and the challenges to get there

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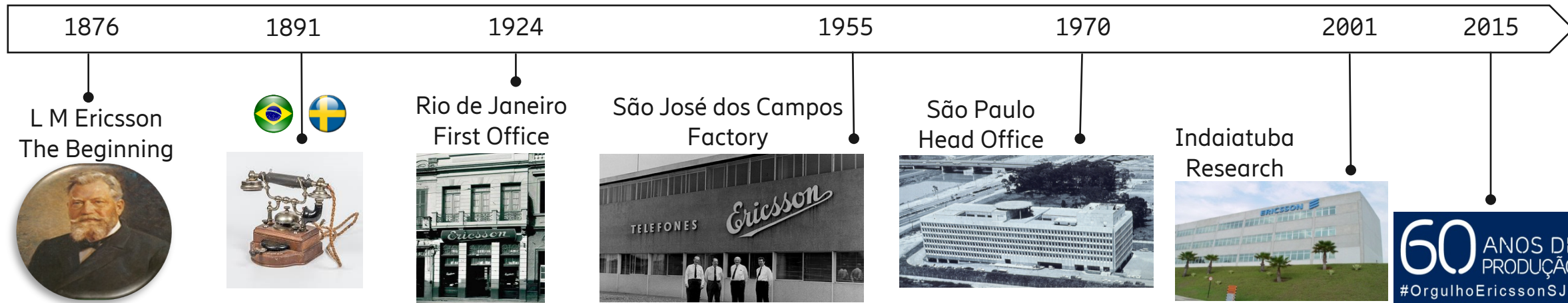
Ericsson

Ericsson is one of the leading providers of Information and Communication Technology (ICT) to service providers. We enable the full value of connectivity by creating game-changing technology and services that are easy to use, adopt, and scale, making our customers successful in a fully connected world.

Image: Ericsson headquarters, Kista, Sweden

By the numbers:
— 180+ countries
— 23.3 b. BRL in sales
— 94.756 employees (3.000 Brazil)
— 49.000 patents

Q2 2019 figures

1876	1891	1924	1955	1970	2001	2015
L M Ericsson The Beginning		Rio de Janeiro First Office	São José dos Campos Factory	São Paulo Head Office	Indaiatuba Research	60 ANOS DE PRODUÇÃO #OrgulhoEricssonSJC

5G
What is it?

5G
USE CASES

▶ BROADBAND AND MEDIA
EVERYWHERE

SMART VEHICLES,
TRANSPORT

CRITICAL SERVICES AND
INFRASTRUCTURE CONTROL

CRITICAL CONTROL
OF REMOTE DEVICES

HUMAN MACHINE
INTERACTION

SENSOR NETWORKS

USE CASE 1
BROADBAND AND MEDIA
EVERYWHERE

USE CASE 1

BROADBAND AND MEDIA EVERYWHERE

Opportunity areas
- Mobile Broadband evolution
- On-demand anything
- Events platform
- Live TV at scale

Benefits
- **Maximizes customer experience** in both indoor & outdoor environments
- Enables industry **transformation**
- Meets **consumer demands** for TV on their terms

5G technology brings
› Mobile broadband in crowded areas
› Media consumption on consumers' terms
› TV for in-home screens and mobile devices
› Evolved Mobile Enterprise collaboration services

Target Users
› Mobile operators
› Pay TV Operators
› Broadcasters
› Over The Top providers

USE CASE 2
SMART VEHICLES AND TRANSPORT

USE CASE 2

SMART VEHICLES AND TRANSPORT

Opportunity areas

- Autonomous vehicles
- Connected bus-stops
- Connected trucks
- Connected cars

5G technology brings

- › Sustainability
- › Safety
- › Fleet monitoring
- › Navigation & augmented reality
- › Eco-system scale and diversity

Benefits

Intelligent transport systems and **massive machine type communication**

New services and business models can be supported with **sensors** embedded in **roads**, **railways** and **airfields** to communicate to each other and/or with **smart vehicles**

Target Users

- › Automotive
- › Security & insurance
- › Transport & infrastructure companies
- › Administration/governments

USE CASE 3

CRITICAL SERVICES AND INFRASTRUCTURE CONTROL

USE CASE 3

CRITICAL SERVICES AND INFRASTRUCTURE CONTROL

Opportunity areas
- Public Safety
- Mission critical utilities – Energy active grid
- Mission critical utilities – Water active grid

Benefits
- Manage **massive number of connections**
- Energy and water utilities connecting to **millions of networked devices,** enabling **real-time intelligent** and **autonomous** decisions

5G technology brings
- › Security
- › Enable real-time, intelligent and autonomous decisions
- › Robust coverage
- › Reliability
- › Sustainability

Target Users
- › Police and security services
- › Health care
- › Agriculture
- › Energy utilities
- › Water utilities

USE CASE 4

CRITICAL CONTROL
OF REMOTE DEVICES

USE CASE 4

CRITICAL CONTROL OF REMOTE DEVICES

Opportunity areas

- Remote control of heavy machinery
- Real-time process control
- Factory automation
- Remote surgery

5G technology brings

› Unique performance and latency characteristics required for these critical tasks

› Mobility

› Security

Benefits

- Controlling heavy machinery remotely to lower risks in hazardous environments
- Increase efficiency and reduce costs. Replace communication bus with wireless links

Target Users

› Manufacturing

› Oil plant

› Mines

› Healthcare

USE CASE 5

HUMAN MACHINE INTERACTION

USE CASE 5

HUMAN MACHINE INTERACTION

Opportunity areas
- Immersive augmented reality
- Immersive gaming
- Surveillance
- Tactile internet
- Smart biker-helmets
- Child monitoring
- Smart houses
- Smart shipping/post

5G technology brings
- › Reliable & Precise
- › Non Intrusiveness
- › Privacy
- › Real-time
- › Sustainability

Benefits

Tactile internet and smart interaction between **humans and machines**

New business opportunities based on **context awareness** as the main difference from M2M

Target Users
- › Health care – remote check up
- › Universities & researchers
- › Municipalities
- › Fitness

USE CASE 6

SENSOR NETWORKS

USE CASE 6

SENSOR NETWORKS

Opportunity areas

- Agriculture & Environment
- Smart buildings & Cities
- Consumers & Utilities

5G technology brings

› Efficiency - smart grid, asset tracking

› Eco-system scalability

› Security

› Business Intelligence

› Sustainability

Benefits

Maximizes productivity in both indoor & outdoor environments

Expand business opportunities and business models through monitoring, tracking and automation capabilities in large scale

Target Users

› Municipalities

› Farm

› Agriculture

› Water and electricity distributors

5G
Today & Tomorrow

First with commercial 5G live networks in 4 continents

18 Live networks

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24 Announced 5G contracts

T-Mobile — Live
Sprint — Live
Verizon — Live
AT&T — Live
Vodafone Ireland — Live
Vodafone UK — Live
Vodafone Germany — Live
DiGi Romania — Live
Swisscom — Live
TIM Italy — Live
Vodafone Spain — Live
Batelco — Live
Ooredoo — Live
STC — Live
Etisalat — Live
SK Telecom — Live
KT — Live
Telstra — Live

*As of August 2019

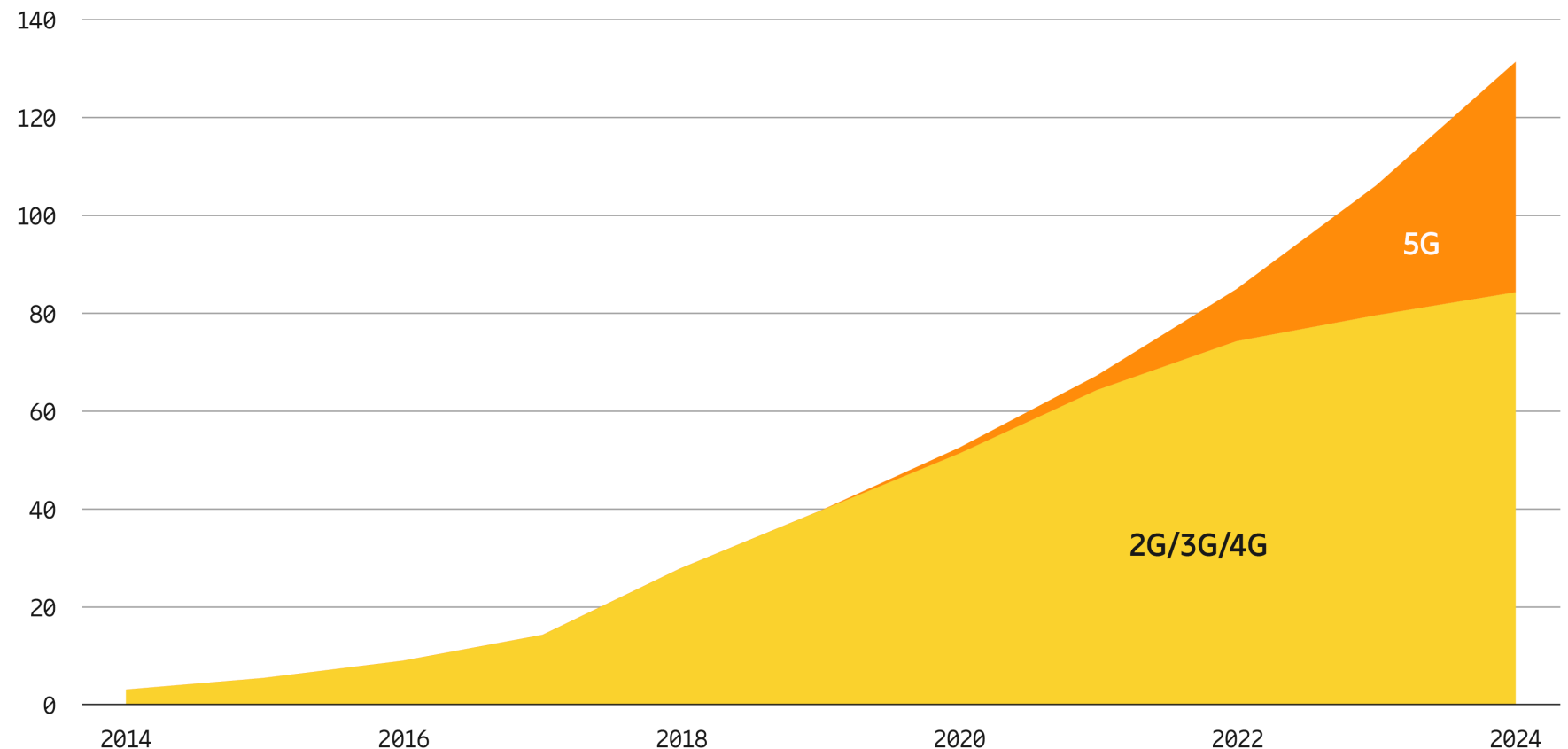# 5G networks forecast to carry 35 percent of mobile data traffic globally in 2024

Smartphones continue to generate most of the mobile data traffic – close to 90 percent today and projected to reach 95 percent at the end of 2024

131EB
Total traffic predicted to reach 131 Exabytes per month in 2024

Global mobile data traffic (EB per month)

5G

2G/3G/4G

140
120
100
80
60
40
20
0

2014 2016 2018 2020 2022 2024

5G
Challenges

Challenges

Governmental (Brazil)

Anatel Spectrum Auction 2,3Ghz, 3,5GHz

- *When: Q1 2020 ?*
- *License Price: ?*
- *Money for investment: ?*

"The Antenna Law"

- *Municipal (5570) 2 Months to 2 Years to install antennas*
- *5G will have 10x more antennas than 4G*

ANATEL
Agência Nacional de Telecomunicações

MAPA DOS MUNICÍPIOS BRASILEIROS

Challenges

Operators (Brazil)

Network

- *Prepare & Plan for Coverage*
- *Prepare & Plan for Capacity*
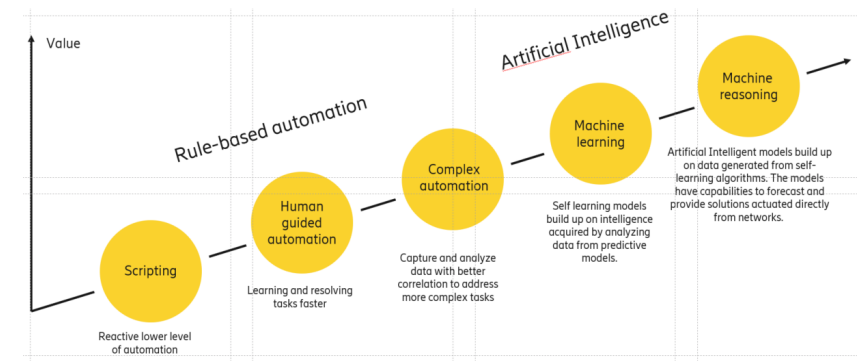- *Network Performance - Latency*

Learn New Technologies

- *5G*
- *Artificial Intelligence*
- *Cloud Systems*
- *Machine Learning*

Network Operation

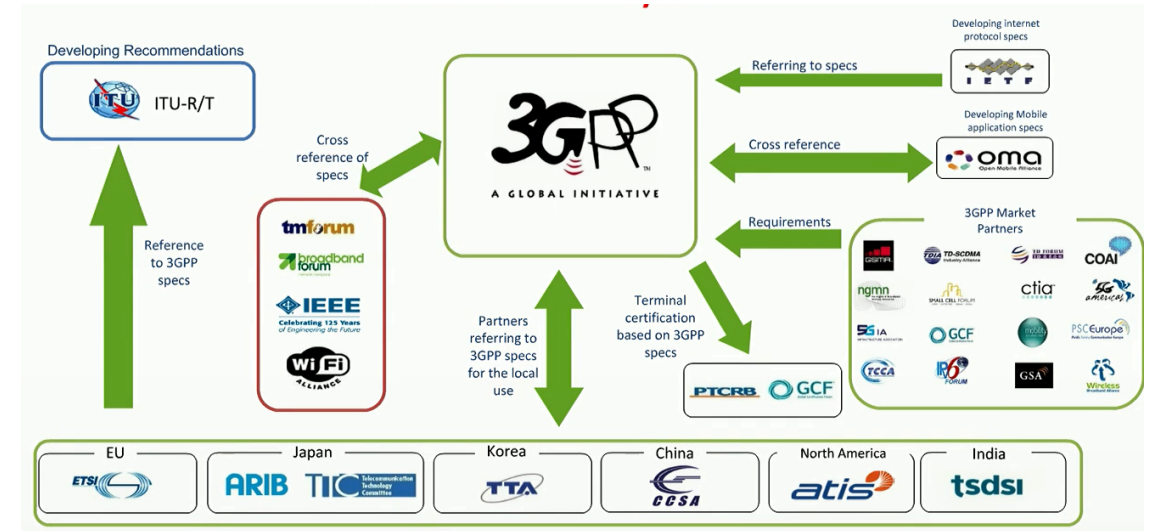- *Rule-Based -> Artificial Intelligence*

Challenges

Technology

Standardization and regulation

- *Standards developing organizations*
- *Industry forums*
- *Regulatory bodies and administrations*

The perfect Technology Storm for Society 5.0

- *5G (Speed +Low Latency)*
- *Artificial Intelligence and Automation*
- *Cloud Systems*
- *Device revolution for Augmented /Virtual Reality*
- *Quantum computing / computers*
- *Network function virtualization*
- *Vertical Industries going Wireless*

To know more about our 5G visit
http://www.ericsson.com/spotlight/5G

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