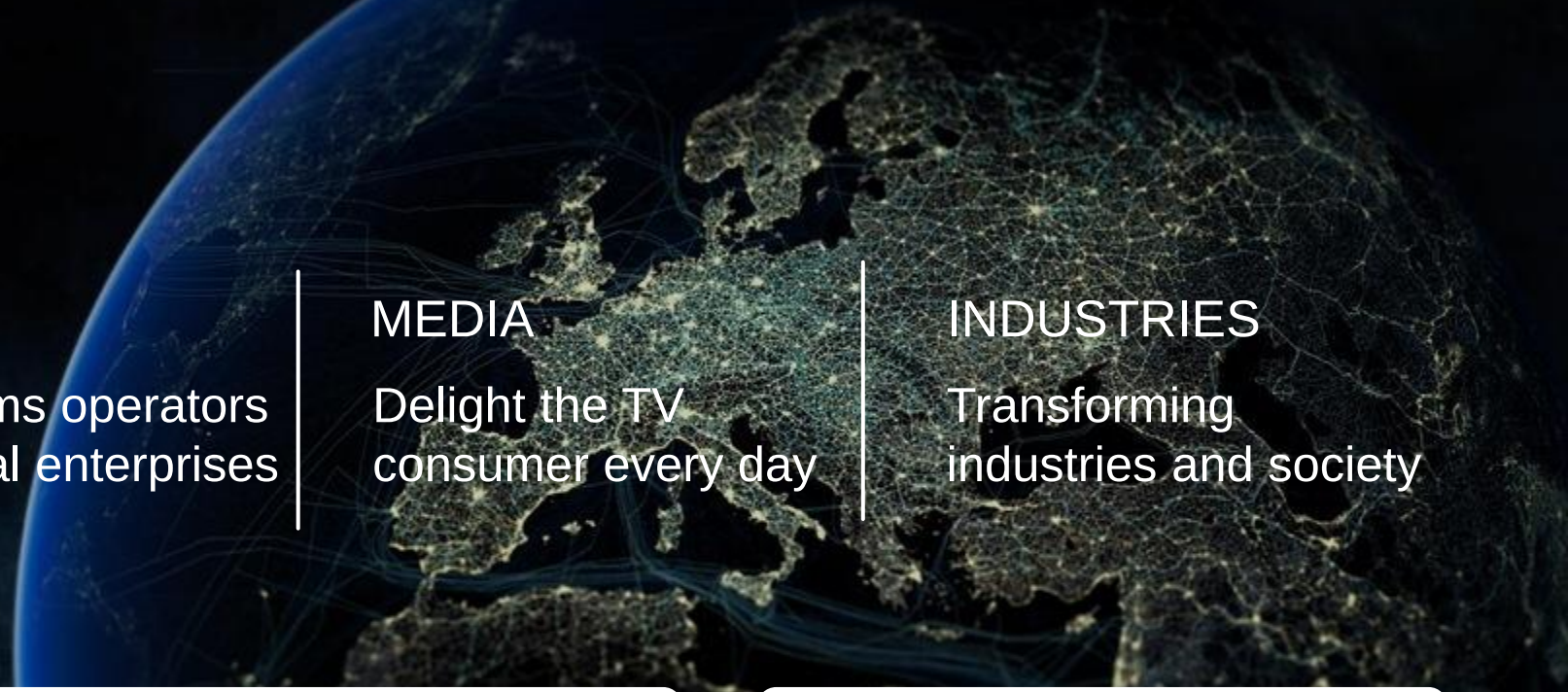
# INNOVATION @ ERICSSON

Dr Sara Mazur
Vice President and Head of Ericsson Research

# ERICSSON AT A GLANCE



## NETWORKS

One network for a million different needs

## IT

Transforms operators into digital enterprises

## MEDIA

Delight the TV consumer every day

## INDUSTRIES

Transforming industries and society

| | |
|---|---|
| 39,000 | Patents |
| 23,700 | R&D Employees |
| 35 B. SEK | Annual investment in R&D |

| | |
|---|---|
| 1 BILLION | Subscribers managed by us |
| 40% | Share of world mobile's traffic carried by Ericsson networks |
| 66,000 | Services professionals |

| | |
|---|---|
| 247 B. SEK | Net Sales |
| 180 | Countries with customers |
| 116,000 | Employees |

FY 2015 figures

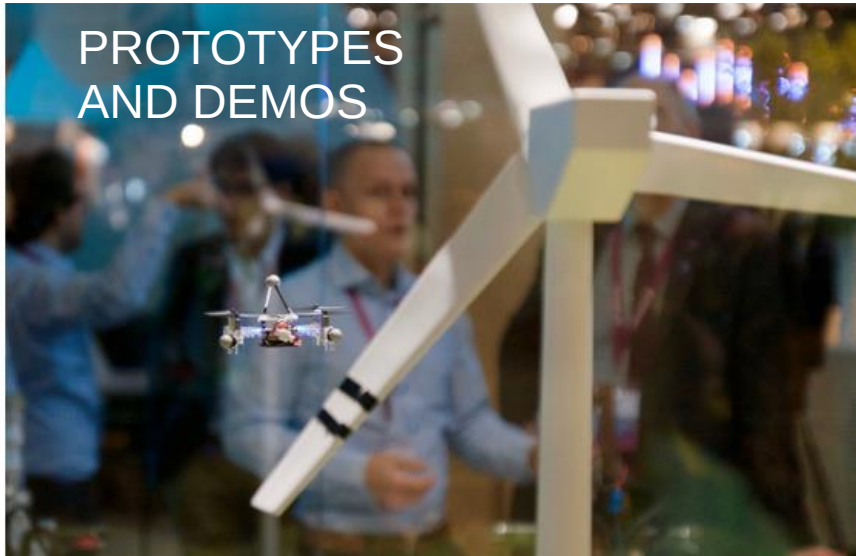
# ERICSSON RESEARCH

## RESEARCH AREAS

Radio Access
Wireless Networks
Cloud
Services, Media
Security

Networking
Management
Sustainability
Hardware
Software



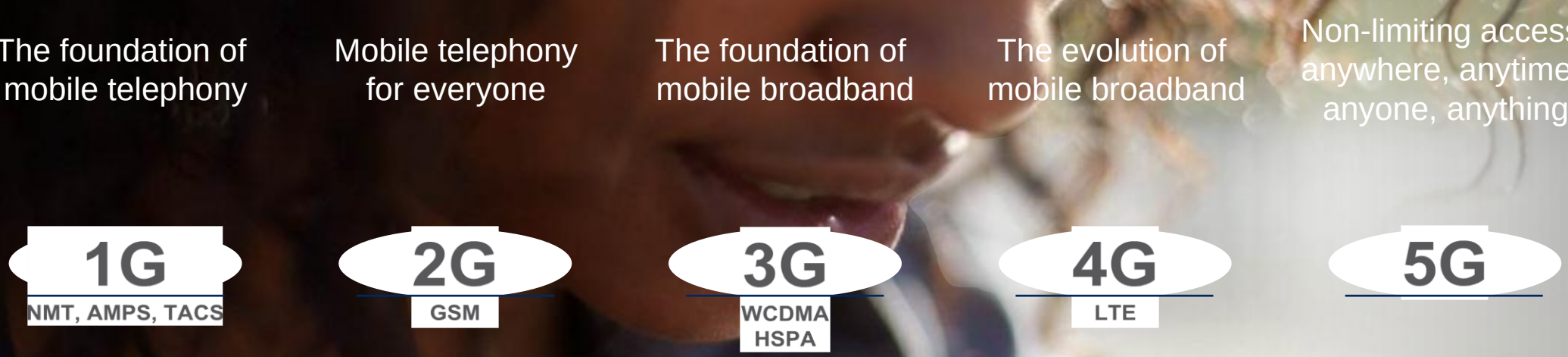


# INNOVATION IS A PART OF WHO WE ARE

# WIRELESS ACCESS GENERATIONS

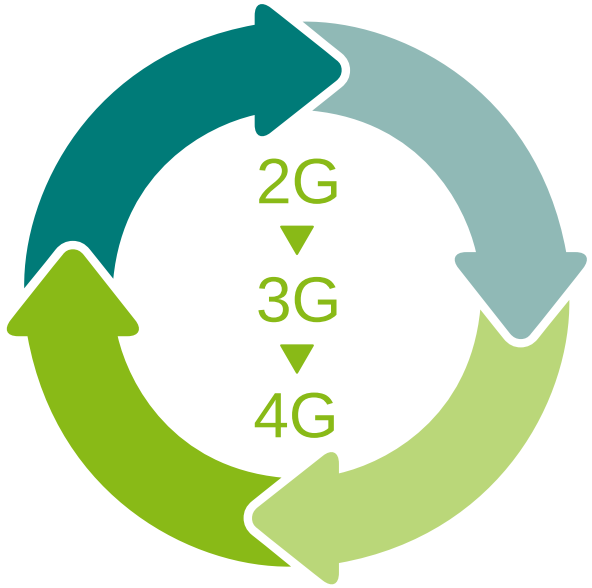
## 2G, 3G, 4G, 5G

it's invented here



# DRIVING THE WIRELESS ECOSYSTEM

**Ericsson is creating an environment in which 2G, 3G and 4G wireless technologies can thrive. We're doing this in the following ways:**



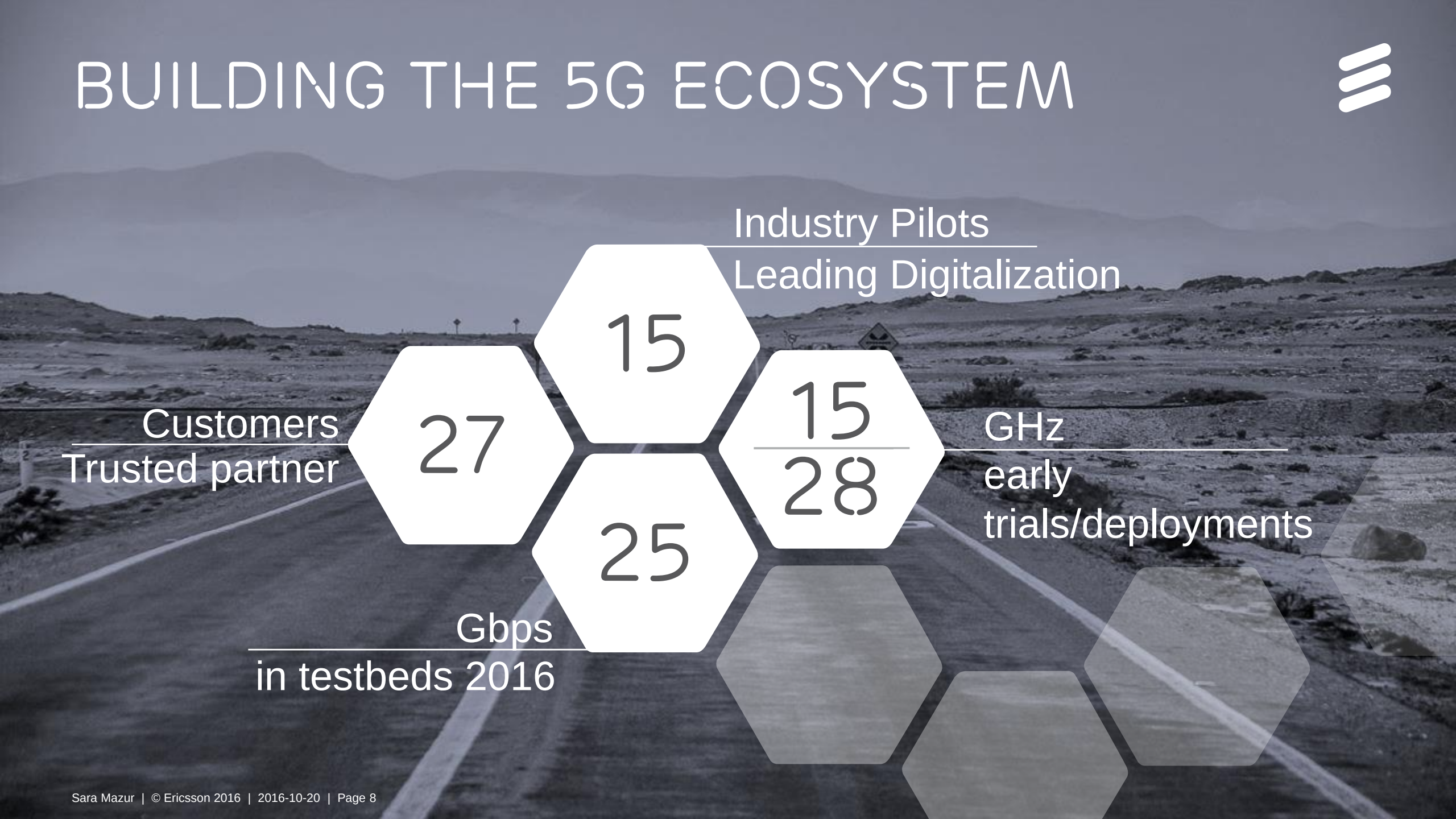

**Ericsson holds the number one patent portfolio for wireless technologies**

**We own the largest number of essential patents in wireless 2G, 3G and 4G combined**

# INNOVATION LESSONS LEARNED

Legacy innovations we now take for granted would never have happened if it wasn't for an eco-system that rewards research and investments, while at the same time enables them to be deployed globally.

# BUILDING THE 5G ECOSYSTEM



# LEADING DIGITALIZATION

5G

FOR INDUSTRIES

- AUTOMOTIVE AND TRANSPORT
- MANUFACTURING
- PROCESS INDUSTRY
- SAFETY/SECURITY
- AGRICULTURE
- ENERGY AND UTILITIES

# 5G FOR INDUSTRIES
## Some examples

### CMA
Test Site for Future Automated and Shared Mobility Systems

- Exploring the use of 5G networks for intelligent transport systems
- Investigating "as-a-service" offerings for network operators and automotive OEMs

- Reduced vehicle fleet operations cost
- Better service awareness and reduced travel time for passengers
- Usage of cellular networks in new markets

Partners: SCANIA, ERICSSON, ITRL – INTEGRATED TRANSPORT RESEARCH LAB, KTH ROYAL INSTITUTE OF TECHNOLOGY


### ABB REMOTE ROBOT OPERATION

- Evaluate mobile communication in industrial remote operation
  - Remote operations in mines – an industrial use case with strict requirements on reliability and latency.
  - Explore the use of industrial haptic communication in mobile networks

- Greatly improved health and safety
- Increased availability of personnel
- Capture key requirements for 5G

Partners: ABB, ERICSSON

### PIMM
Pilot for Industrial Mobile Communication in Mining

- Evaluate mobile communication in an industrial context
- Consider strict requirements on safety and robustness in underground mining

- Increased productivity and Improved Safety
- Industrial 5G requirements
- Understand eco system, business models, etc.

Partners: BOLIDEN, VINNOVA, VOLVO, SICS, TeliaSonera, ABB, ERICSSON, WOLFIT, PTA


### 5GEM
5G Enabled World Class Manufacturing

- Evaluate 5G technology in a manufacturing industry
- Understand ICT opportunities and solutions

Data analytics; Industrial Internet-of-Things; Factory wireless communication; Mission critical cloud

- Improved production efficiency
- Increased flexibility
- Excellent traceability
- Social and environmental sustainability

Partners: SKF, CHALMERS, ERICSSON, VINNOVA

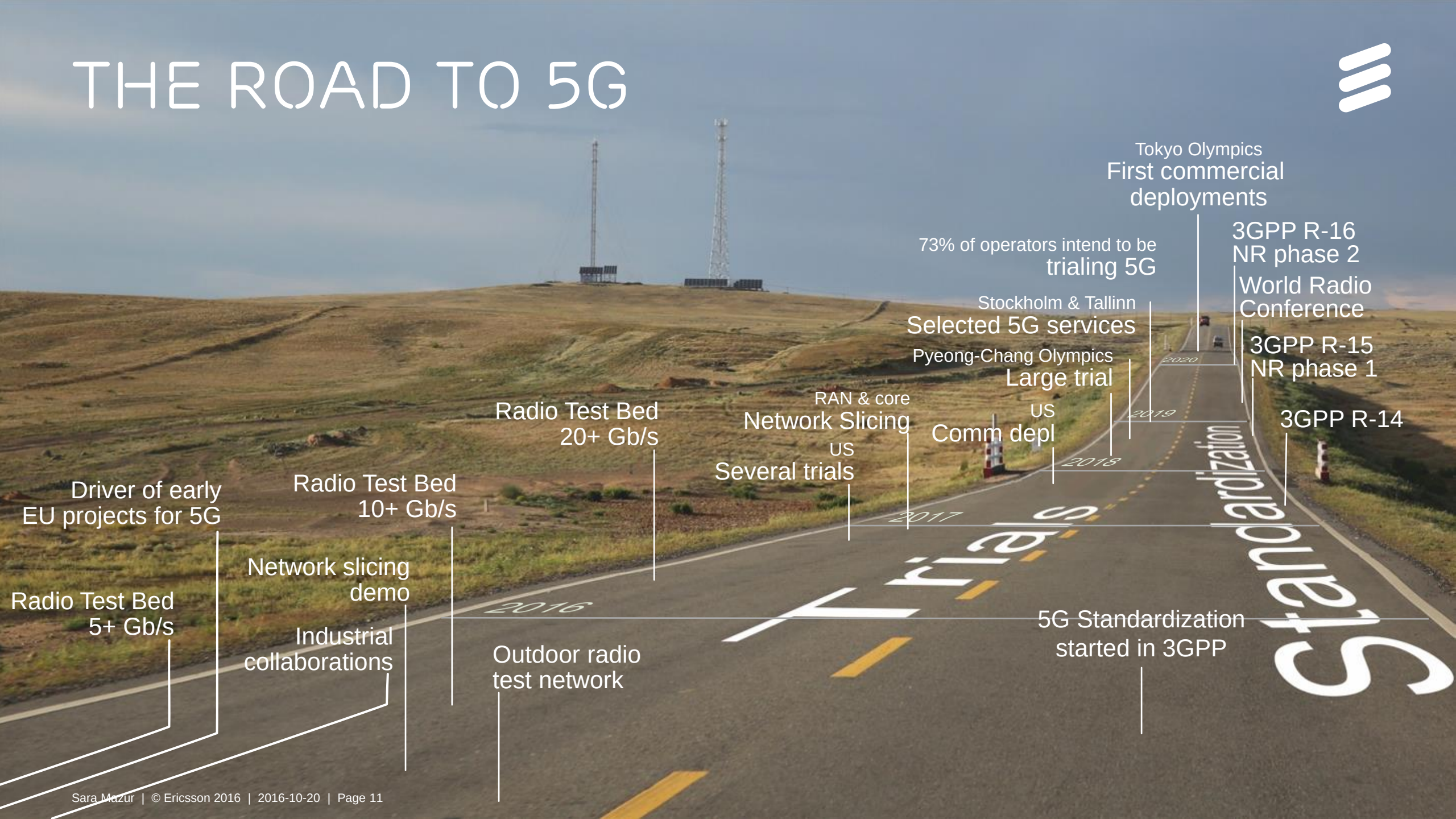

### WITOOL
Wireless Internet of Tools

- Enable IoT for construction equipment OEM (Husqvarna) and rental companies (Cramo)
- Capillary network connectivity, cloud, service enablement and machine analytics capabilities
- Demonstrated through automation of return process of machines at Cramo depot

- Efficient fleet management enabled by predictive maintenance and resource planning
- Automated processes, for example return process
- New business models
- Making use of generated data to improve products

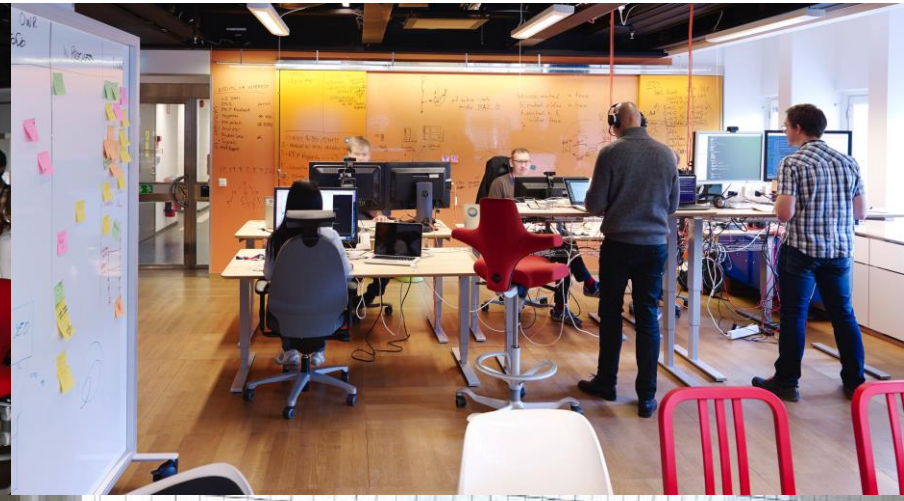
Partners: ERICSSON, CRAMO, Husqvarna

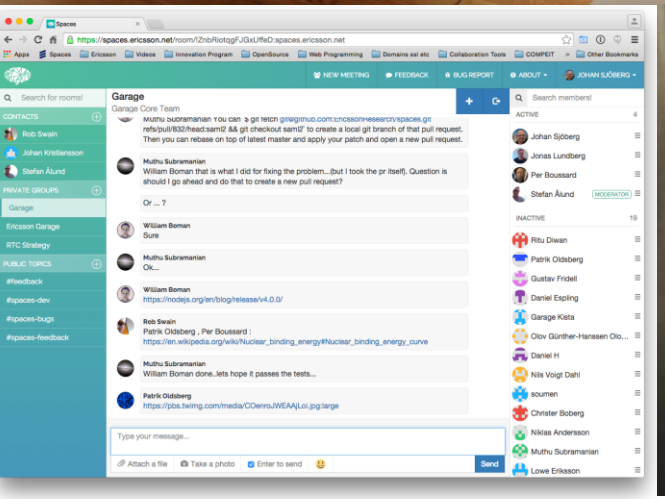
# THE ROAD TO 5G



# ERICSSON GARAGE

## A lean-startup inspired place and WoW






# CORPORATE TECHNOLOGY AND KNOWLEDGE INCUBATOR

## WAY OF WORKING
### BASED ON LEAN STARTUP

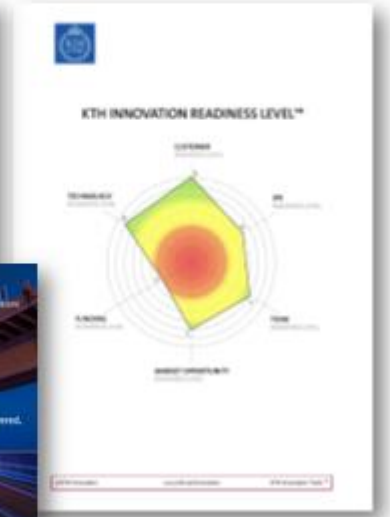
› Quick and Responsive Development
› Together with Customers



Why the Lean Start-Up Char
*by Steve Blank*, HBR 2013 M


## SUPPORT ECOSYSTEM



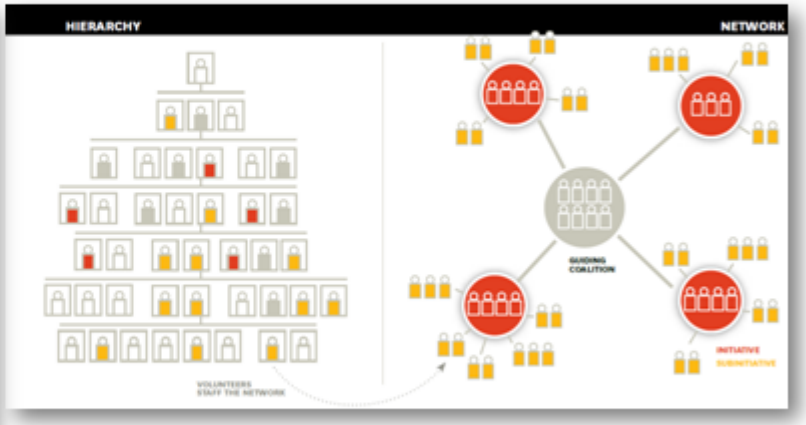




## THE SECOND OPERATING SYSTEM
### GARAGE TEAM ACROSS HIERARCHIES

**Two Structures, One Organization**

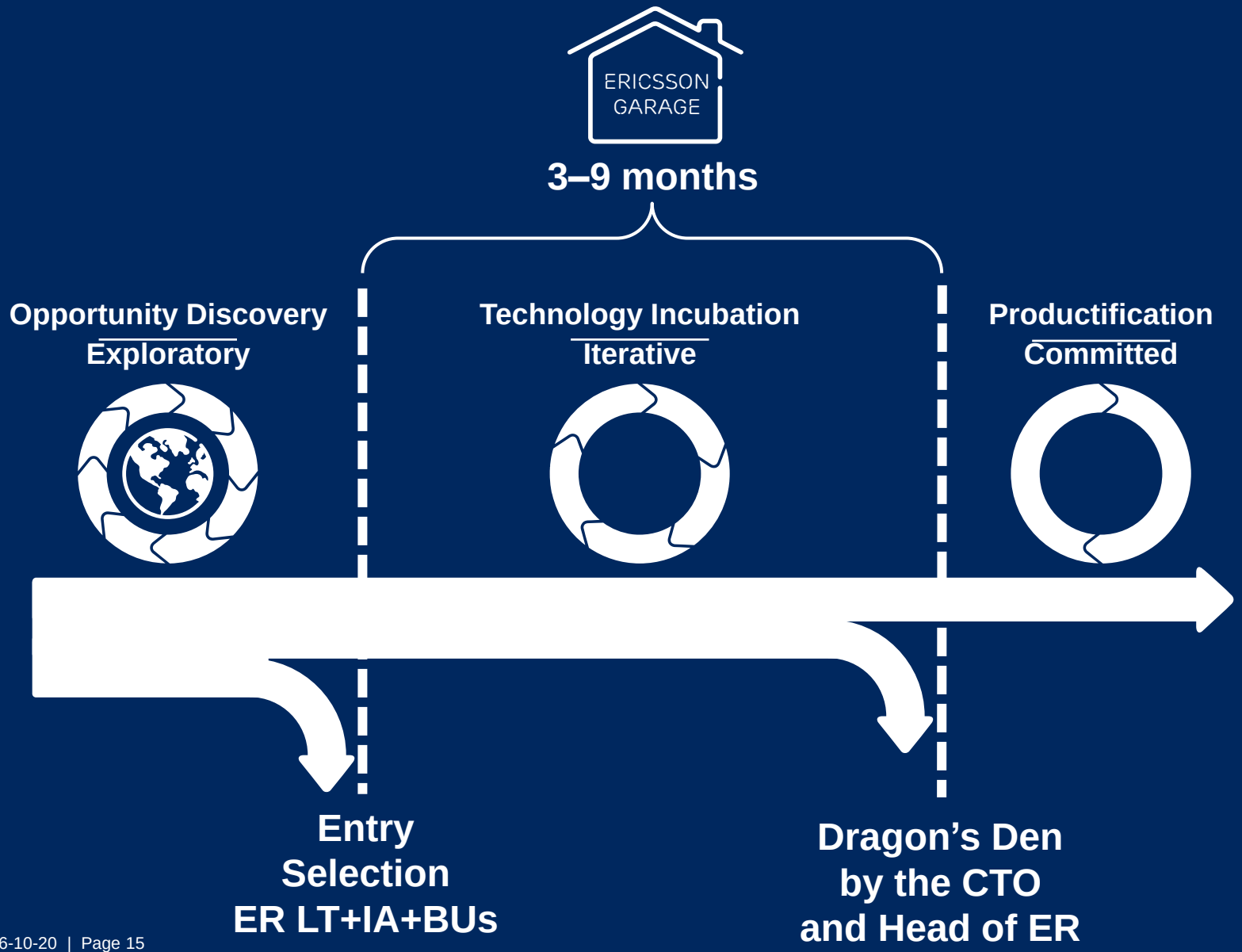
Traditional hierarchies and processes, which together form an organization's 'operating system," do a great job of handling the operational needs of most companies, but they are too rigid to adjust to the quick shifts in today's marketplace. The most agile, innovative companies add a second operating system, built on a fluid, networklike structure, to continually formulate and implement strategy. The second operating system runs on its own processes (see "The Eight Accelerators," page 52) and is staffed by volunteers from throughout the company.




*Accelerate! by John P. Kotter*
HBR, 2012 November

# PHYSICAL ERICSSON GARAGES
## AS OF 2016 JUNE

# ERICSSON RESEARCH FRAMEWORK



# SUMMARY

Ericsson Research is innovating and developing new concepts and technologies in a global organization of around 650 persons

We are building the 5G ecosystem through standardization, testbeds and early trial systems together with customers and in industry pilots.

We have started the Ericsson Garage to furhter facilitate our work on innovation together with partners and ecosystems.


THE EXCELSIOR
ERICSSON