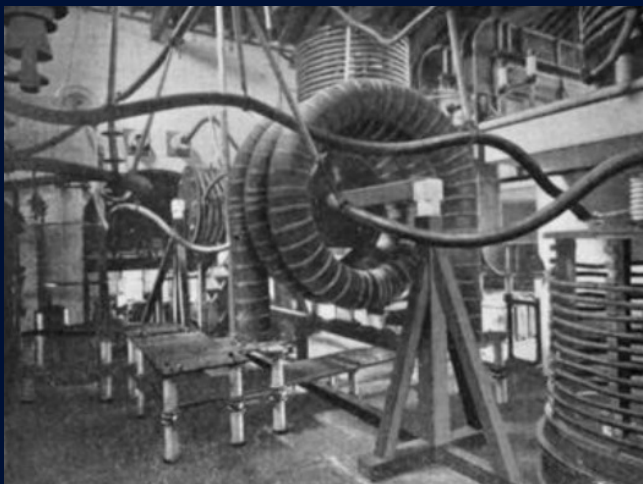# THE ROLE OF SHARING IN NOVEL PLATFORM-BASED ECOSYSTEMIC BUSINESS MODELS IN 5G EVOLUTION
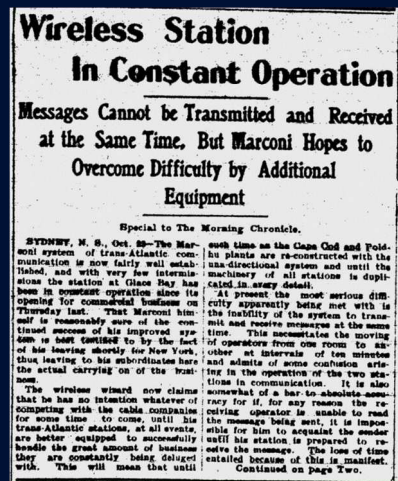
WInnComm 2019, 20 November | San Diego 2019

Dr. Seppo Yrjölä, Nokia Enterprise

100 years of interference avoidance – from one to many

Fleming's transmitter for Marconi's transatlantic transmission

The Halifax Morning Chronicle, 24 October 1907

From wood pulp mill in 1865 towards Industry 4.0

Nokia

The world's most valuable resource is no longer oil

Edwin Drake strikes oil in Pennsylvania with the first commercial well in the U.S., Aug. 27, 1859.

Research challenge

There is a strong engineering vs. economics duality in platform research.

- Engineering: components and interfaces at the core or periphery.

- Economics: to connect demand and supply in the markets.

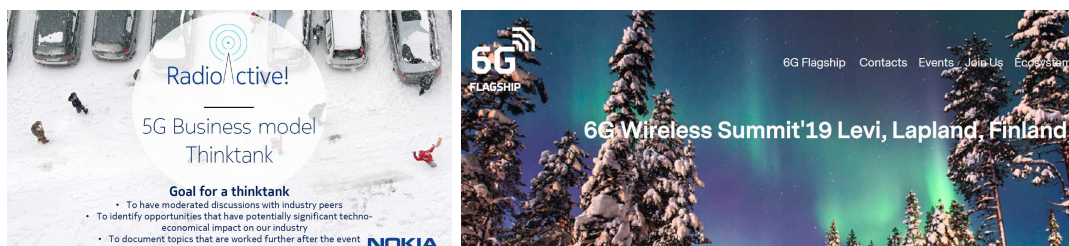- What both agree: Platforms create an ecosystem around them.

Recent discussions with a platform focus have started to pave way for understanding platform business models.

This paper aims at building a framework that could be used to examine ecosystemic digital value platform architecture emerging beyond 5G

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Method and data

- Following the cyclical process of research-oriented action research (Eden & Huxham, 2006) , the data collection consisted of two phases.

  - The results from the phase one Nokia RadioActive! user group event in Espoo in November 2017 was utilized as a foreknowledge for

  - the second phase based on data collection from the future-oriented World Cafe workshops held at and 6G Wireless Summit in Levi in March 2019.
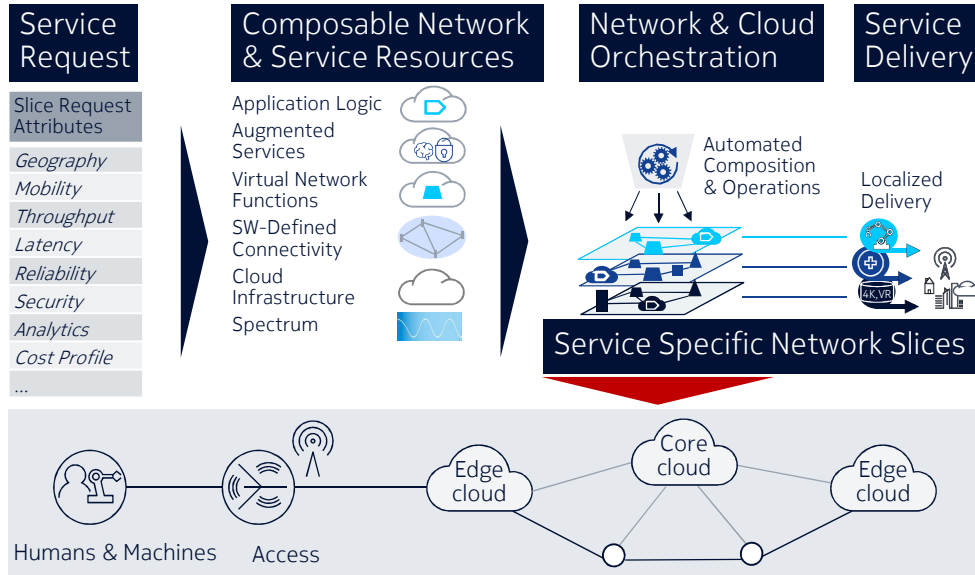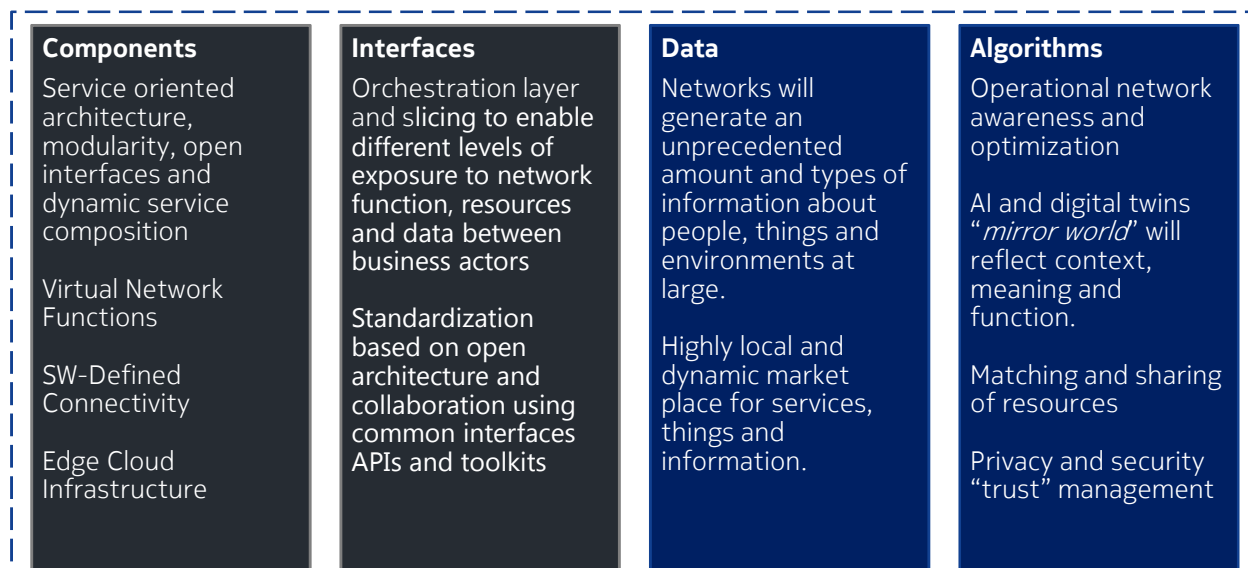

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Current network-for-connectivity business models
Builds on advanced modules and standardized interfaces

Market penetration

- 35% Customer experience[1] ↗
- 29% TCO ↘
- 10% Performance[1] ↗
- 8% Competitive positioning (fast rollout / broad coverage) ↗
- 2% 1st to market with 5G

Market/service development

- 31% New revenues: enterprise and IoT
- 20% New/enhanced revenue streams[2]
- 8% Fixed/mobile services convergence ↗

Diversification

- 33% Digital transformation[3]
- 18% New revenues new verticals
- 6% New use cases: innovation leader

Q: What are the primary objectives of your 5G strategy? [Rank the top 4]

N=50; % of Communication Service Providers (CSPs)
1: Current services | 2: Current user base | 3: Flexibility for wide variety of new revenues & and user bases

Nokia & Analysys Mason. (2019). Best practices for 5G transformation key findings from the Nokia 5G maturity index

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Wireless networks in transformation
from current network-for-connectivity model to a network-of-services model

Service-based architecture	Service modularity, open interfaces and dynamic service composition
Network slicing and edge clouds	Differentiated quality services to enterprises with edge cloud control point
Cloud Native Computing Network Function Virtualization Software Defined Networking	Flexible, scalable, dynamic and programmable virtual networks
Dynamic use of spectrum	Democratizing the tools of production through access to "free" spectrum

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The new wireless network architecture
enables agile service innovations

| Service Request | Composable Network & Service Resources | Network & Cloud Orchestration | Service Delivery |

Slice Request Attributes

Geography
Mobility
Throughput
Latency
Reliability
Security
Analytics
Cost Profile
…

Application Logic
Augmented Services
Virtual Network Functions
SW-Defined Connectivity
Cloud Infrastructure
Spectrum

Automated Composition & Operations

Localized Delivery

Service Specific Network Slices

Humans & Machines   Access   Edge cloud   Core cloud   Edge cloud

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How is this all seen in future wireless networks?
Network-of-services model builds on platform with data and algorithms

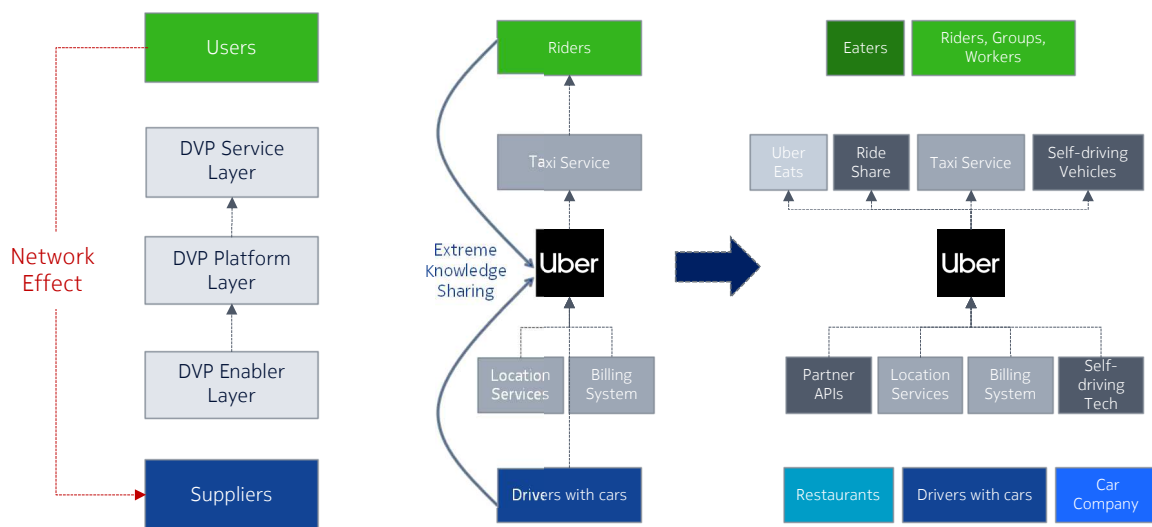| **Components**	**Interfaces**	**Data**	**Algorithms**
Service oriented architecture, modularity, open interfaces and dynamic service composition	Orchestration layer and slicing to enable different levels of exposure to network function, resources and data between business actors	Networks will generate an unprecedented amount and types of information about people, things and environments at large.	Operational network awareness and optimization
Virtual Network Functions	Standardization based on open architecture and collaboration using common interfaces APIs and toolkits	Highly local and dynamic market place for services, things and information.	AI and digital twins "*mirror world*" will reflect context, meaning and function.
SW-Defined Connectivity			Matching and sharing of resources
Edge Cloud Infrastructure			Privacy and security "trust" management

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Context - The first four digital platforms

RoW (ex. China)

Search ——→ Social
1998   2004 ←— 2009

Selling ←—— Simple
1994   2007

China

Search ——→ Social
2000   1999 ←— 2011

Selling ←—— Simple
1999   2010

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Perspective on platforms & their evolution

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Platform traits for data analytics solutions in the new world

Verticals Rule	Analytics platforms need to allow for easy specialization and onboarding of vertical-specific analysis algorithms.	Easy Specialization
New business models	Support a high rate of new service introduction, and lower the barrier to entry for new entrants.	Extreme Service Agility
Value is in the higher layers	Provide flexible analysis of real-time information streams, support a broad spectrum of analysis algorithms.	Real-time Analysis & Actuation
It's about the data	Take fine-grained data ownership and controlled sharing to the extreme.	Extreme Data Federation
Fragmented eco-system	Provide flexible architecture and integration strategies for existing blueprint solutions and OTT/IT architectures.	Heterogeneous Cloud Architectures
Greenfield is rare	Interoperate vendor components with 3rd party products and open source, including compute for core, edge & device.	Heterogeneous Connectivity

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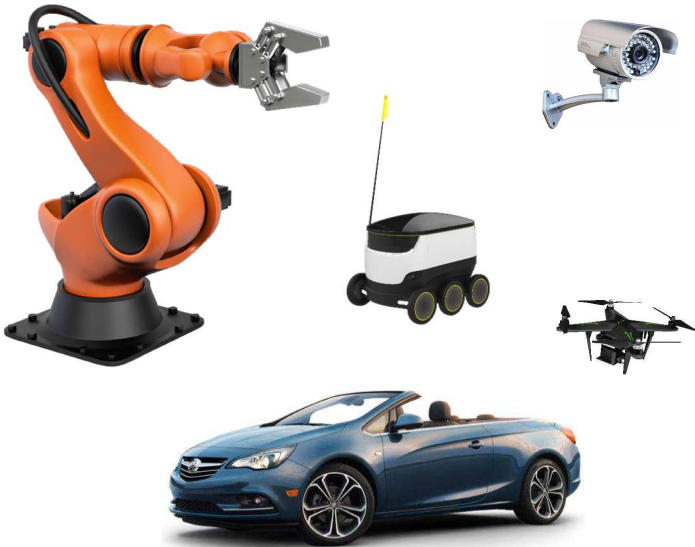NOKIA Bell Labs

Today's moments-of-truth @Webscale

Latency does not matter
Queries are rather stable
Data is homogeneous & predictable
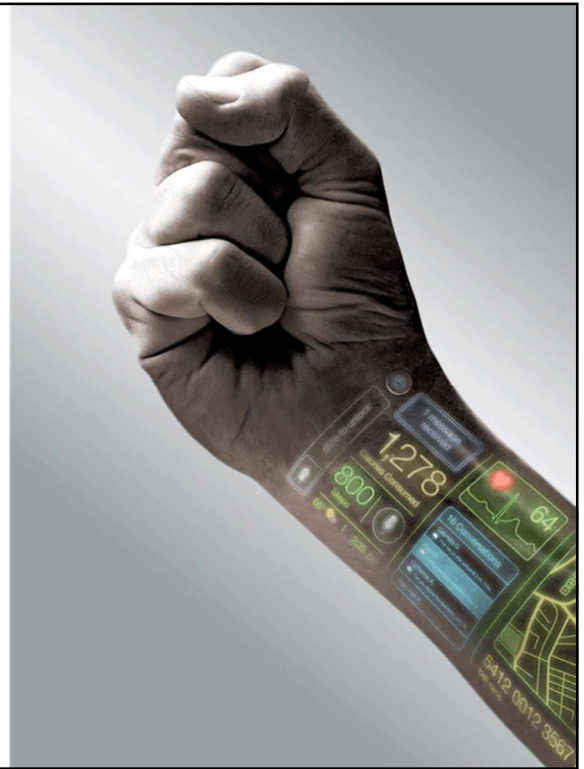Data analysis in the central cloud

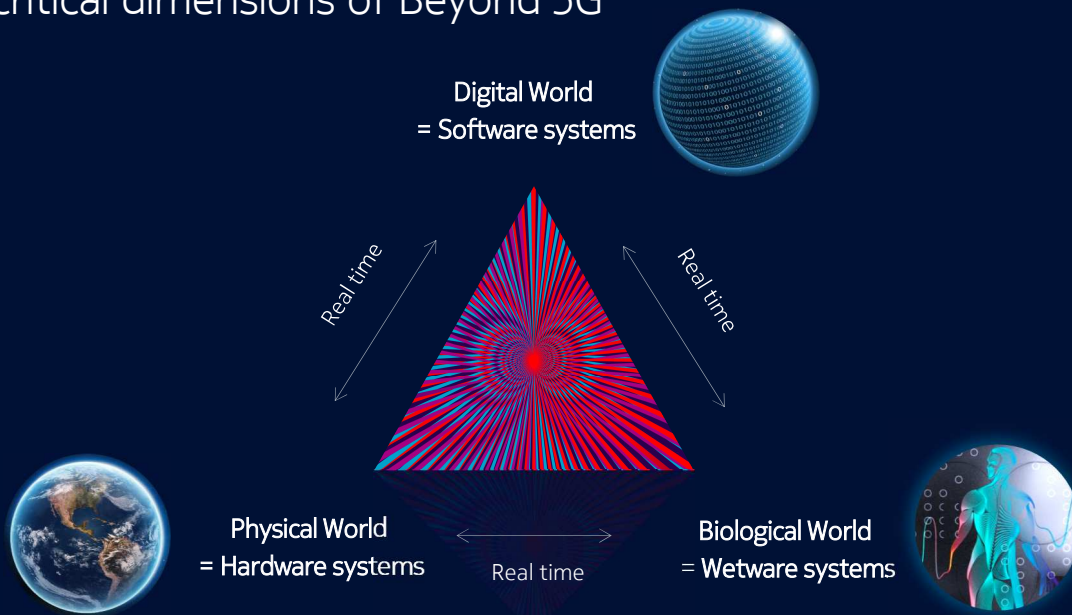14   © 2019 Nokia

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Tomorrow's moments-of-truth
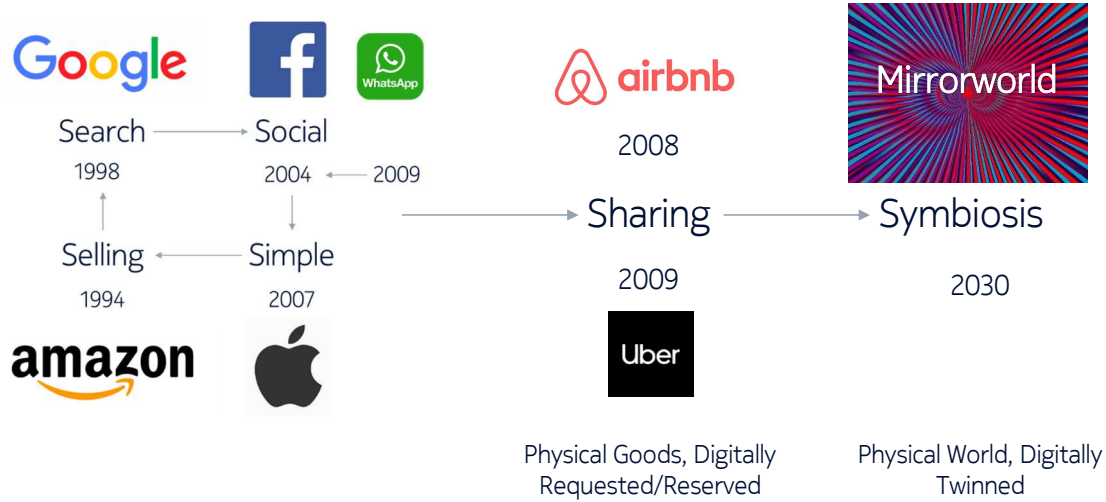New requirements from a new – industrial – reality

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3 critical dimensions of Beyond 5G

Digital World
= Software systems

Real time

Real time

Physical World
= Hardware systems

Real time

Biological World
= Wetware systems

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Summary perspective - the evolution of DVPs beyond 5G

Search → Social
1998   2004 ← 2009

Selling ← Simple
1994   2007

airbnb
2008

Mirrorworld

→ Sharing → Symbiosis
   2009   2030

Physical Goods, Digitally Requested/Reserved

Physical World, Digitally Twinned

https://www.wired.com/story/mirrorworld-ar-next-big-tech-platform/
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Thank you
Questions/discussion?

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