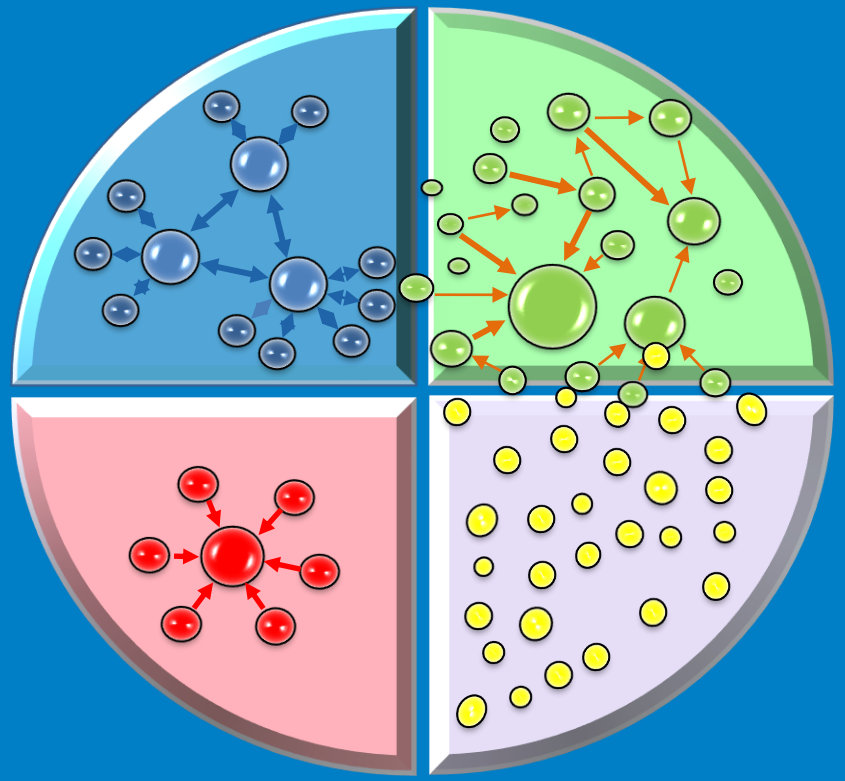
Data economy, Platforms and Sector specific solutions

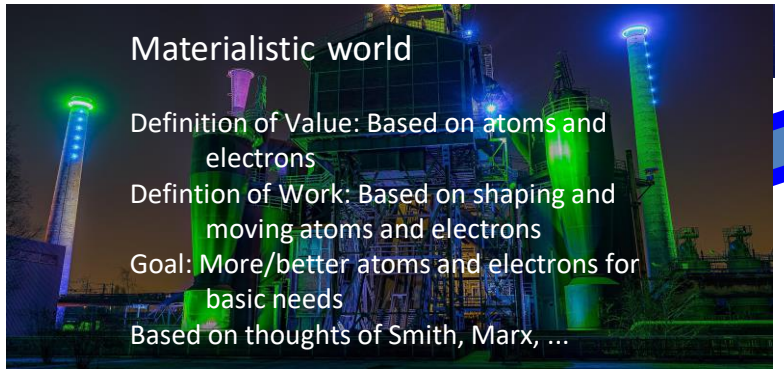


Timo Ali-Vehmas
Executive in Residence
Aalto Univertisity
February 15, 2023

Disclaimer

The opinions expressed herein are my own personal opinions and do not represent my employer's views in any way. Nothing shared in this presentation should be considered official statement or sanctioned by any organization I am affiliated with.

Data economy will drive all sectors of society



Bits connect atoms and electrons, Who defines the rules?

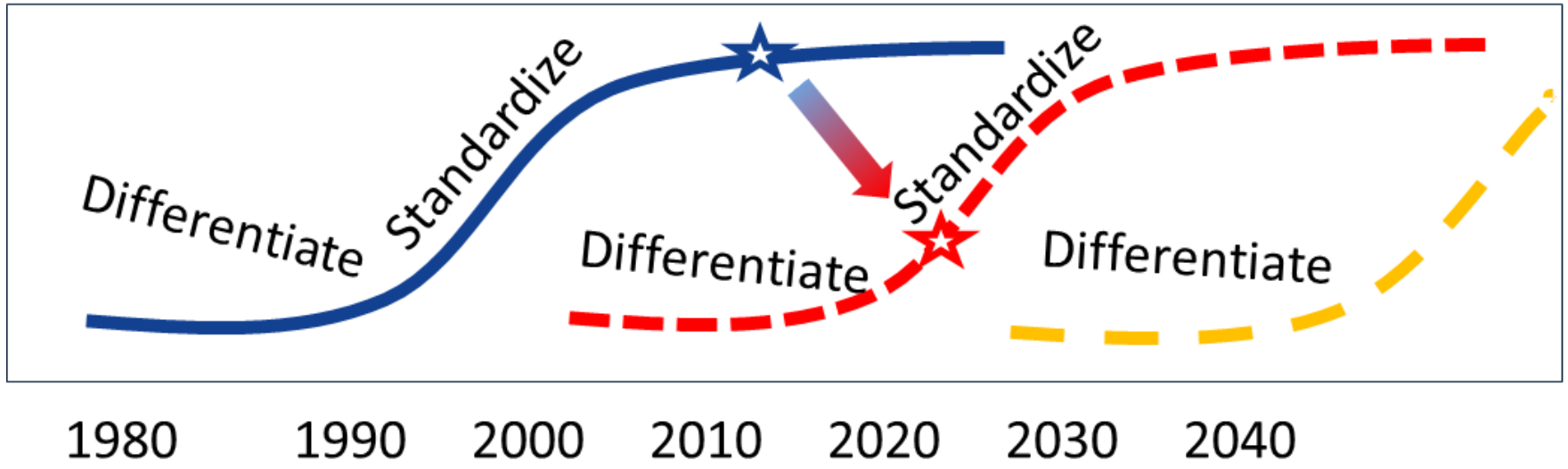
Case Finland

- No Growth (due to e.g. Nokia crash)
- No structural renewals (due to e.g. lack of political leadership and technical competences)
- Massive challenges due to lack of high quality work force (due to e.g. low fertility and low immigration)

- High interest in Green and Digital (due to e.g. EU priorities)
- Overdeveloped obedience (e.g. how to implement GDPR)
- Reasonable knowledge base in digital technologies.
- Low understanding on the ecosystems, platforms and disruptions
- Multiple small steps taken to the right direction. Big picture missing.

- Political pressure (due to e.g. election and public awareness)
  - Renewal of traffic taxation model and traffic congestion charge.
  - Challenges to implement the health care and social care renewal
  - …

From Communication to Information driven business and beyond

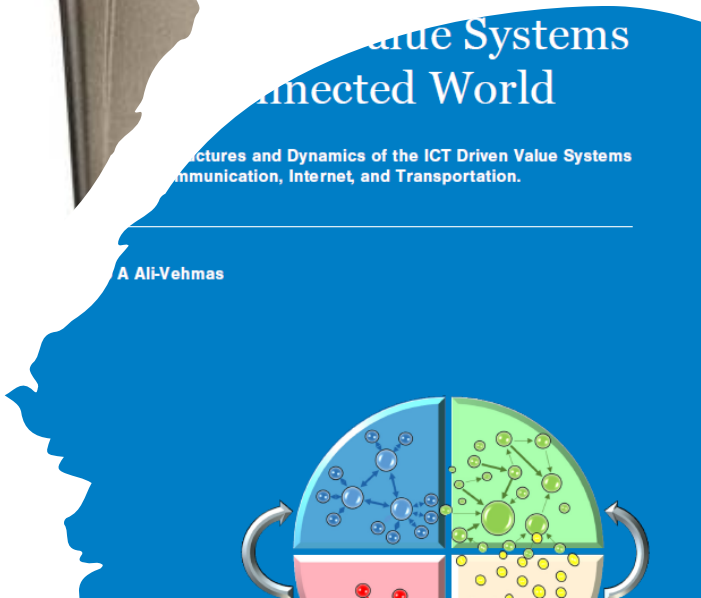


Leading Innovation and Compatibility by Standardization

Competition…. and Collaboration driving innovation differently

- In different sectors of society
- In different business dynamics
- In different technologies

Many lessons are learned in the ICT driven industries, Are they portable to other sectors of life ?

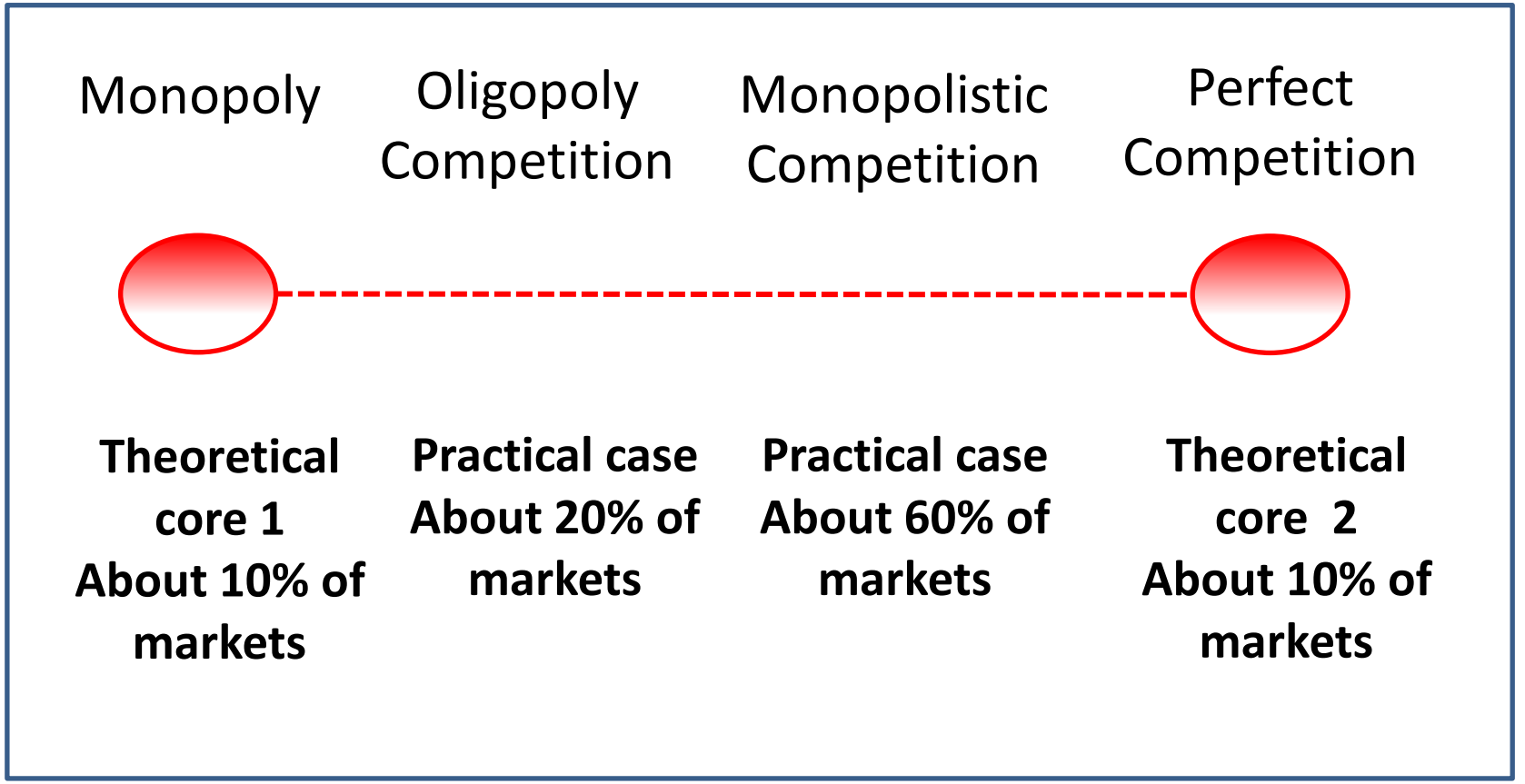


PART I: Four Scenarios:

of Competition, Collaboration and System Dynamics

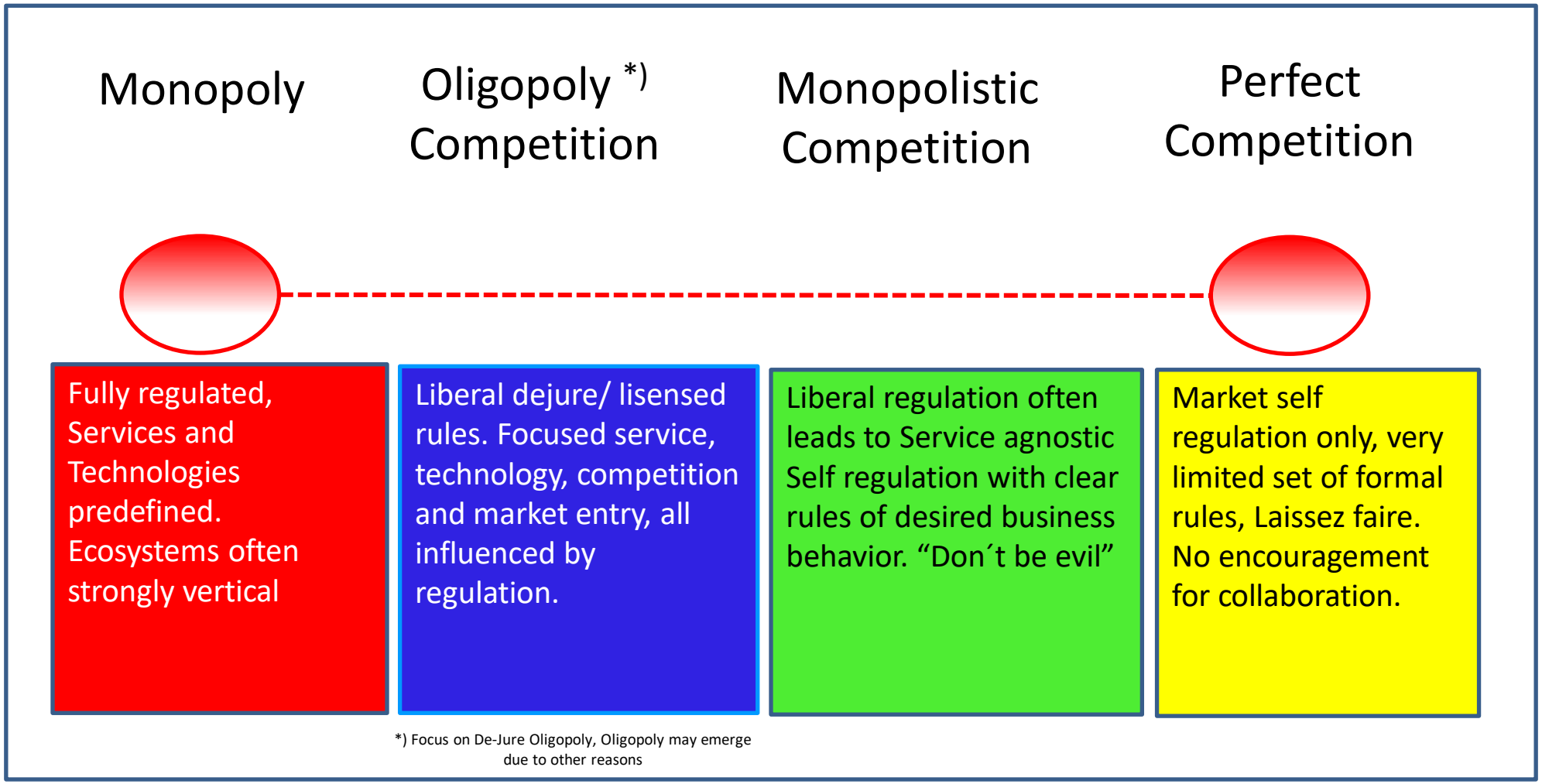
Let´s talk about Competition

Four types of Competition



We must talk about Regulation

Four styles of Regulation set the playing field for Competition and also for collaboration



System models are not static. State transitions between the models is a major force in value creating disruptions

Let´s talk about Collaboration

Four types of Competition yields multiple different forms of Collaboration

=> Triple Helix

Etzkowitz and Leydendorf 1995

Public-Private
Partnership =>

=> Quad Helix

Arnkil et al 2010

Government rules,
sometimes necessary
De Jure Monopoly

Liberalized but licensed
Maximize the value creation
Using limited resources
De Jure Oligopoly

Unlicensed i.e. license exempted
Aim high, be good, not evil

De Facto Monopolistic competition

Start-up Entrepreneur and
other independent actors
Laissez-fairse
De Facto Perfect Competition

PP-P => PPPP-P (YYYY-Y)

Quad Helix includes all 4 types of actor groups
Yielding 4+6 different styles of collaboration

Timo Ali-Vehmas

Exhibit 1: Four simplified trust models

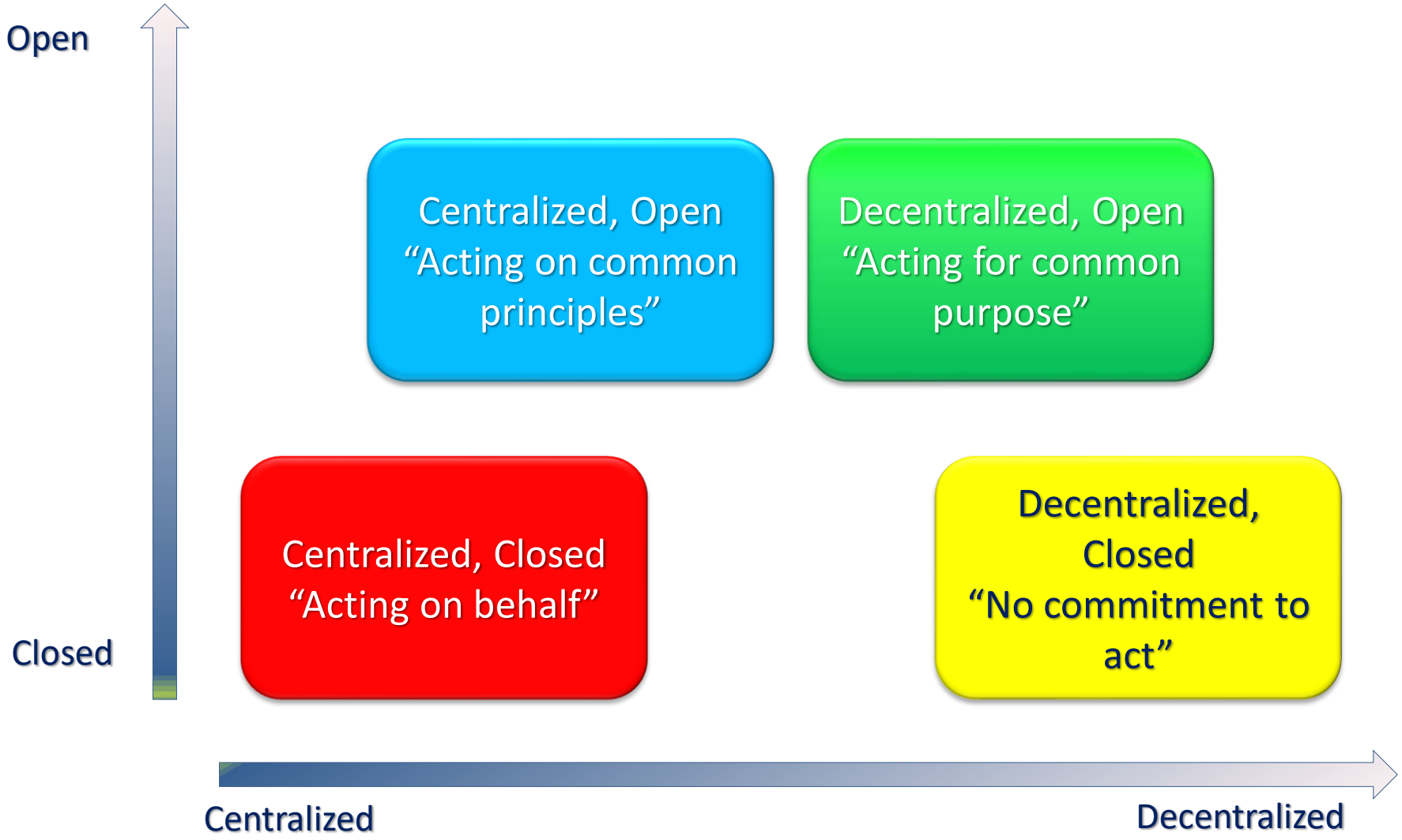
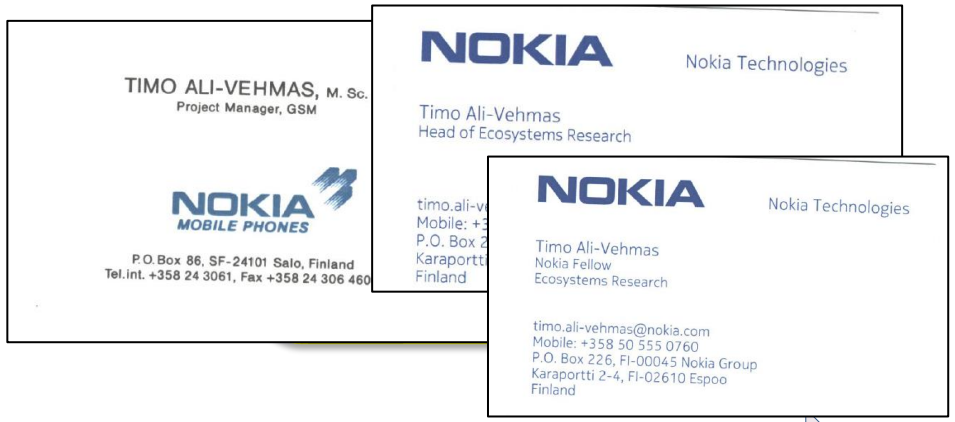


Exhibit 1: Four simplified trust models

Open

Closed

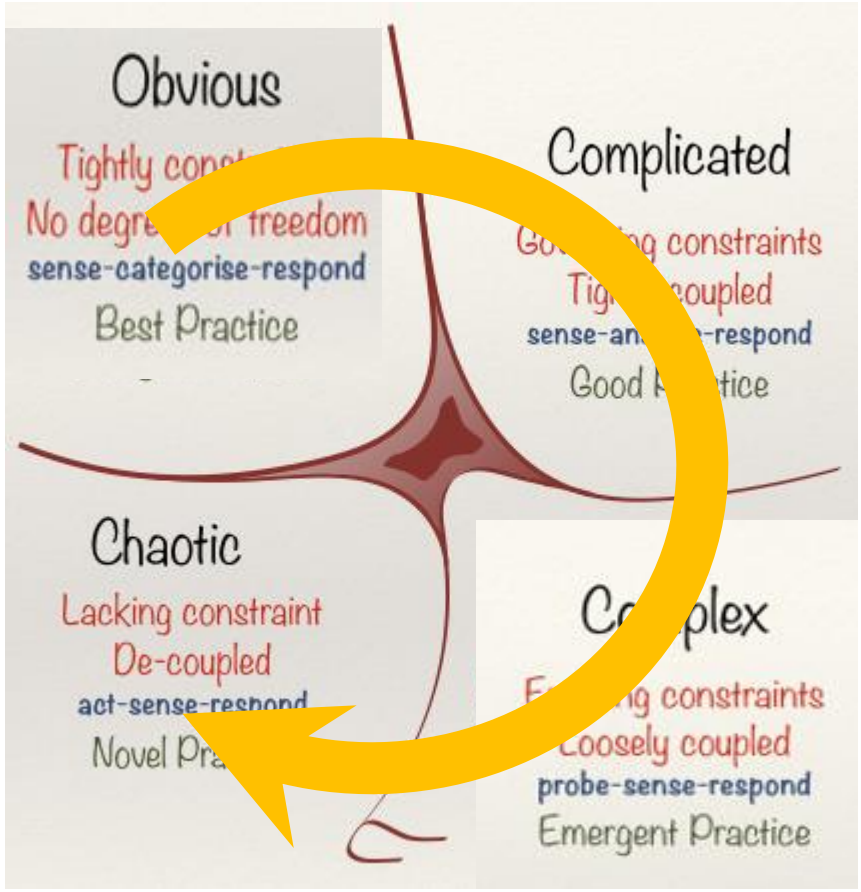


Centralized

Decentralized

Exhibit 2: Complexity in Knowledge management

Four ways to manage knowledge



Cynefin framework

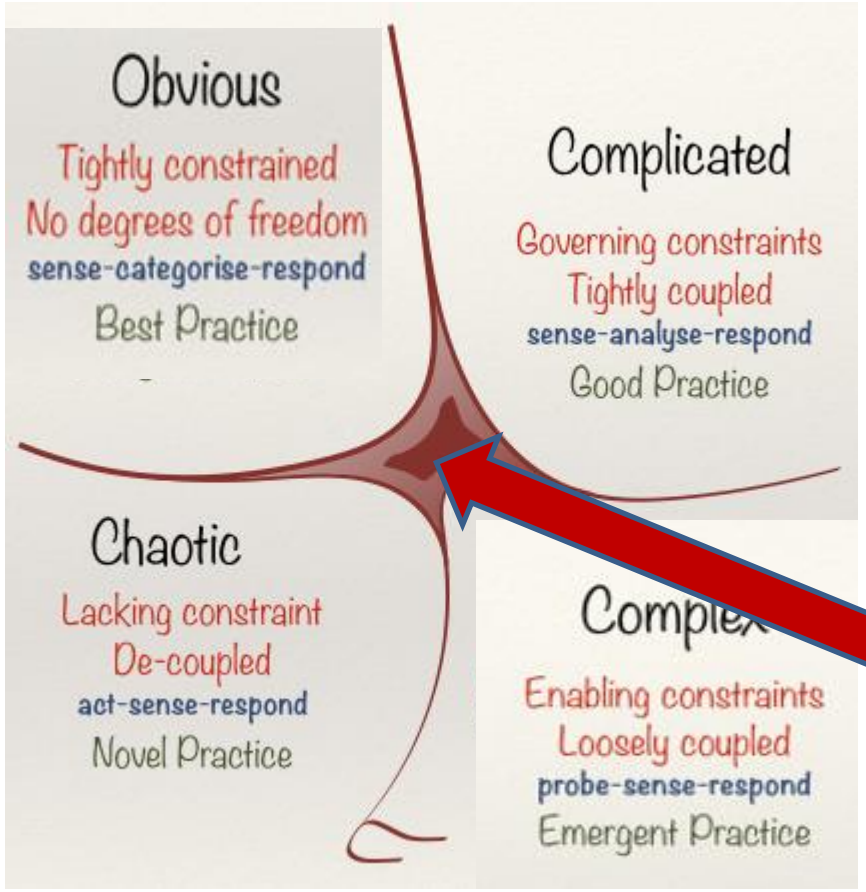
The **Cynefin framework** is a conceptual framework used to aid decision-making. Created in 1999 by Dave Snowden when he worked for IBM Global Services, it has been described as a "sense-making device".

Cynefin offers five decision-making contexts or "domains"—*obvious* (known until 2014 as *simple)*, *complicated*, *complex*, *chaotic*, and *disorder*

— that help managers to identify how they perceive situations and make sense of their own and other people's behaviour. The framework draws on research into systems theory, complexity theory, network theory and learning theories.

Exhibit 2: Complexity in Knowledge management

Four ways to manage knowledge



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Beware of Hybris of Hybrids State of Disoreder

Exhibit 3: Standardization

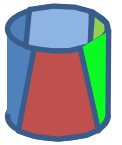
Four types of Competition and Collaboration when Leading the Industry in the world of Standards and Standardization

FOUR TYPES OF COMPATIBILITY PURSUIT	Mandated/ Non-Collaborative	Openly Collaborative
Driven by a public actor (Government)	1: Mandated de jure standard	2: Licensed de jure standard
Driven by a private actor (Companies)	4: Proprietary dominant design	3: Voluntary de facto standard

In Reality, Borderlines are blurred

Ali-Vehmas, Rissanen, Heikkilä 2020

More Sample behaviors of Systems models



Competition Model	Compatibility Pursuit	Regulatory approach	Innovation creation and diffusion	Value Creation/ Capture	Trust	System models Examples	Std Metaphors
Perfect Competition	None or Random	Market regulation, limited set of rules, Laissez faire	No Focus, Who ever may do what ever.	Random. Strong IPR but no licensing or full secrecy.	No Trust	**Random Bazaar:** SPAM, SPIT Fastmobile etc.	**Public Beach** **(Random Standardization)**
Voluntary Collaboration Economy, DeFacto Monopolistic Competition	Application and Social Compatibility	Self regulation of applications. Service agnostic regulation of the network	Value: End-Users' surplus Indirect reciprocity Super-distribution	Value created by new applications Value captured by Emerging paradigms. Rules defined internally.	By Peer Group (Mutual trust)	**Power Law bees:** WWW, OSS (Linux, Apache..) Wikipedia IETF	**River** **(Self-Standardization)**
Dejure Oligopoly	Inter-network, Inter-System compatibility	Liberal Telecom regulation. Limited service regulation, Limited technology and spectrum regulation	Value: Network effect, Produces' Profit Direct Commercial Inter-working	Value amplified by network effect. Value captured by commercial actors. Essential Interface openness	By Trading (Commercial agreements Court of law)	**Business as usual:** GSM , CAMEL, IN, 3GPP, OMA	**Channel** **(Commitee Standardization)** **Pump Station**
De jure Monopoly	Intra-system compatibility	Internally fully regulated, Services and Technologies predefined. Also corporate internal systems, "regulated" by the corporate IT.	Value: Producers' Costs Management driven Cost and Performance	Low new value creation. Value capture controlled by regulator. No IPR licensing	By Authority	**Proprietary:** RIM etc. **Public Services:** National PSTN, ITU, National TV Broadcasting	**Fountain** **Jacuzzi** **(Autohority driven Standardization)**

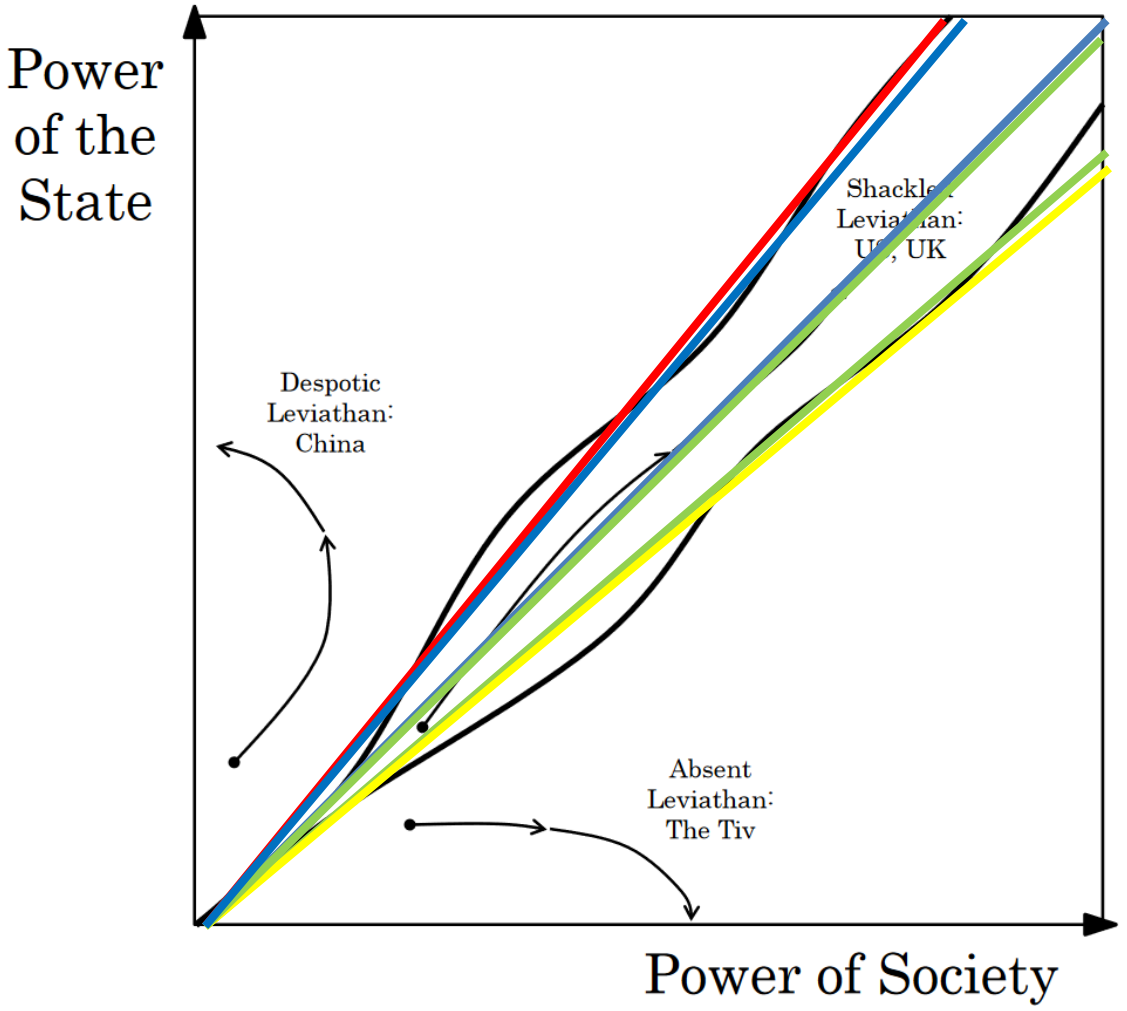
After thought…

Daron Acemoglu: Narrow Corridor

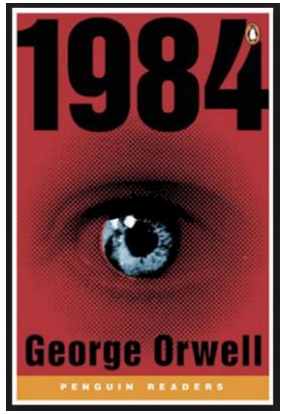
- A description how the optimum systemic balance is between monopoly and perfect competition.

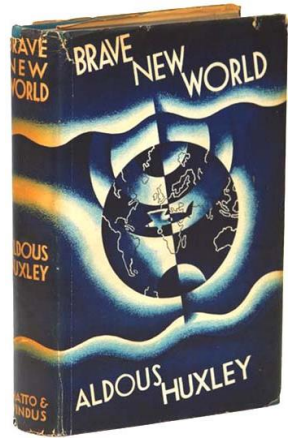
This research

- …shows more details, i.e. two parallel lanes of traffic in the narrow corridor
- ..and the deep factors separating all these from each other.



Between Charybdis and Scylla





Timo Harakka: ”Kasarmi, Kasino vai Kansankoti”

PART II: Productivity Paradox ?

Three Simultaneous Drivers unleash the Value Creating Disruption

1. ICT Technologies
2. Data and Identity
3. Platform Ecosystems

Let´s Look at some history

Technology (Piston engine)




Operative Mode (Assembly line)



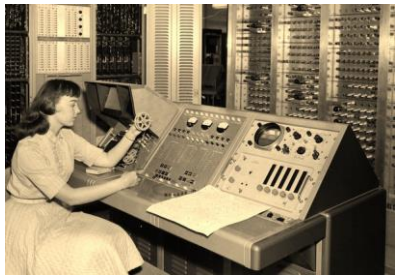

Enabling raw material and Process (Oil & refinery



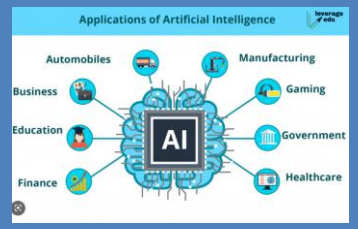


Copy Best Operative practices

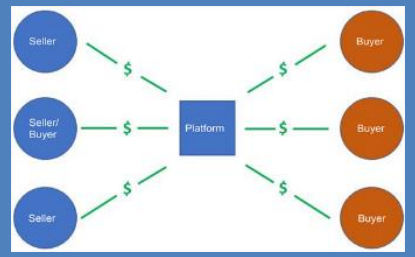
What can we learn ?



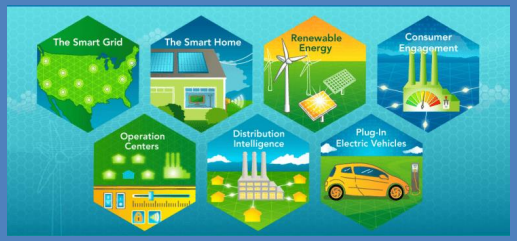
Technology (AI&SW)



Operative Mode (Multisided Platform)



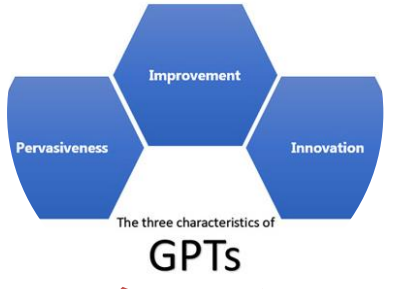
Enabling raw material and Process (Data& IoT)



Copy Best Operative practices

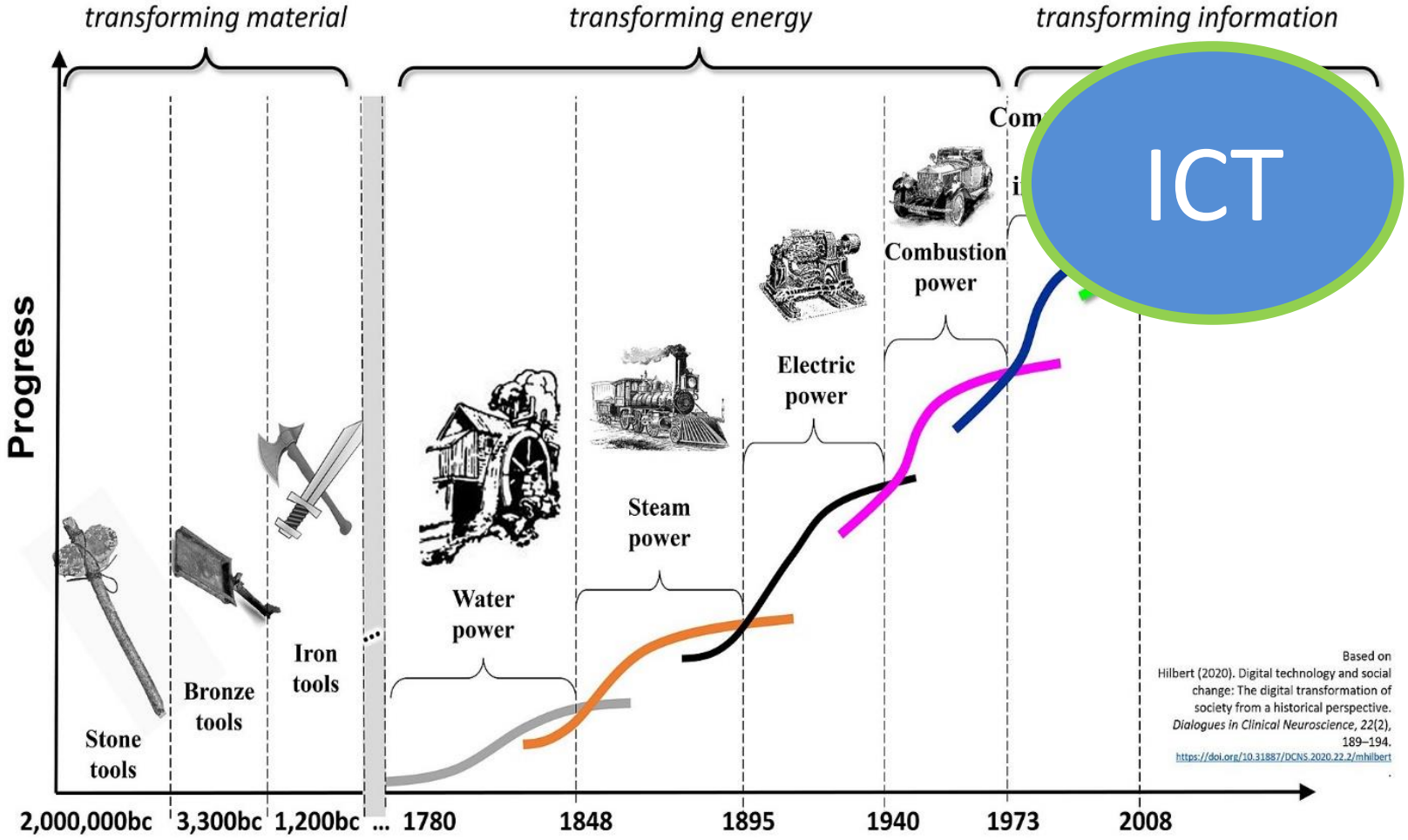
1

Need to look at General Purpose Technologies



K- waves of GPTs

= Focus areas of Standardization



”Unlimited” Capabilities of NEW IT Technologies

Evolutional Exponential Explosion in signal processing

From Adaptive Equalizator to Deep Learning machines

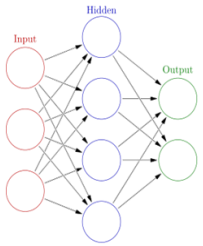
10 Important Machine Learning Algorithms

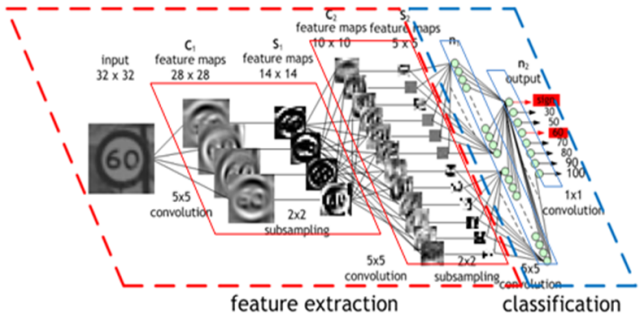
https://www.youtube.com/watch?v=KNMy7NCQDgk

- Supervised learning

Moore´s Law =
Performance is doubled every 18 months

  - Clustering algorithms
  - Principal Component analysis, Eigenvalues and Eigenvectors
  - Singular Value Decomposition, PCA in multiple layers
  - Independent Component analysis, Prior knowledge of system
- Deep learning, as a special case
  - Feedforward and Recurrent networks
  - **Convolutional network**



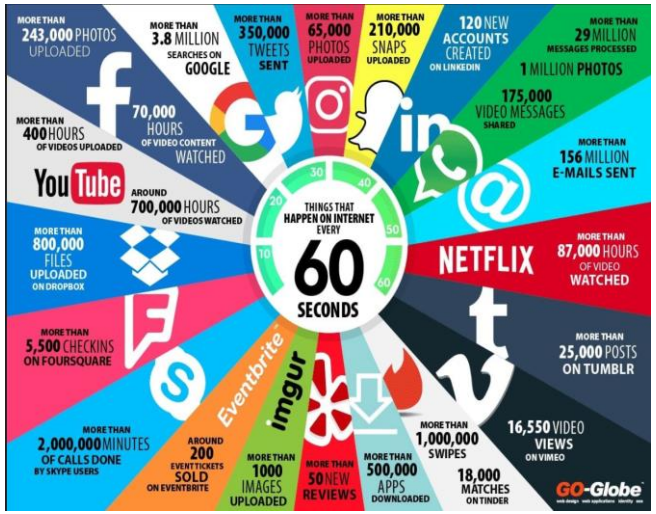


An owl looking professor talking about competition, collaboration and ecosystems to a large audience of smart people in a nice lecture hall

DALL-E 2022
Openai.com

1 5G Technology is neutral – 5G Ecosystems are not

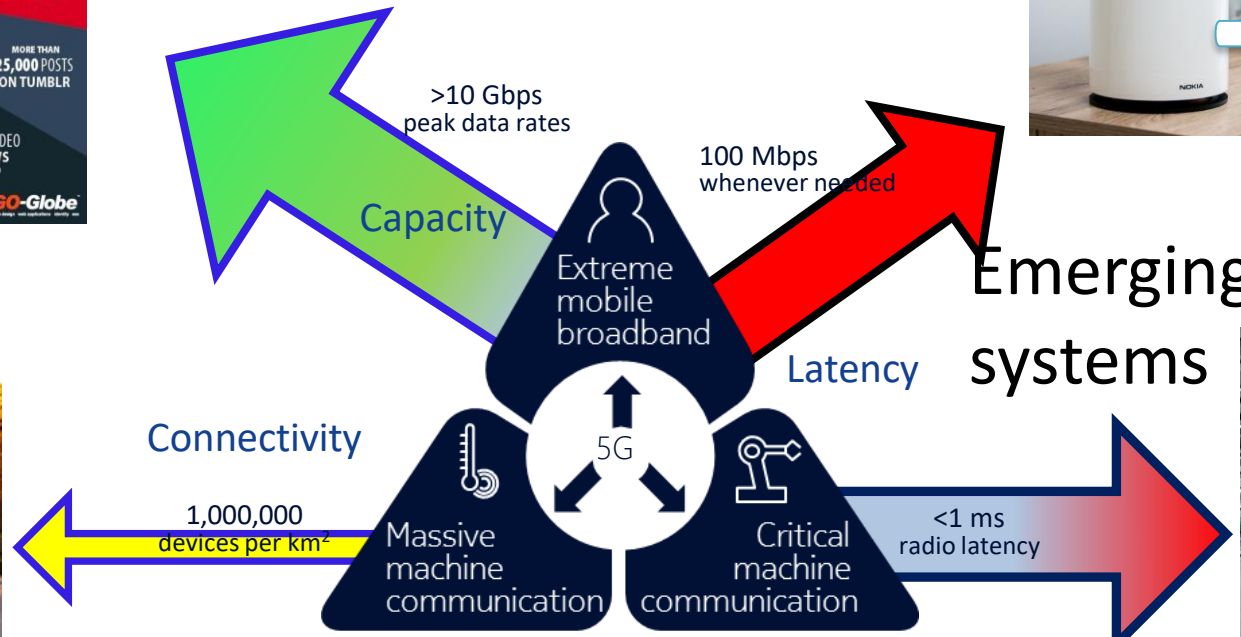
4G evolution



Fixed wireless

Narrow band IoT

Emerging Vertical Business systems



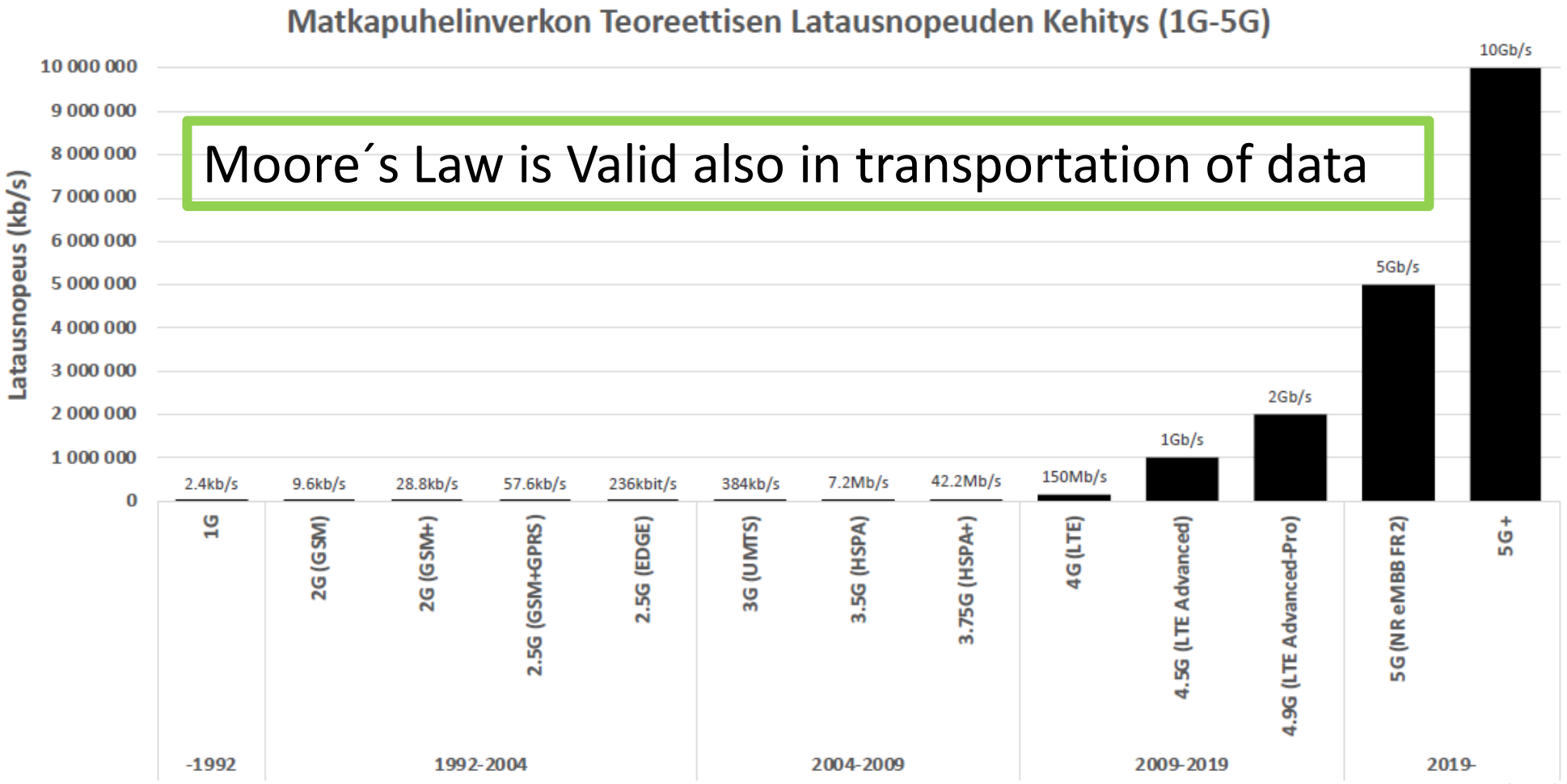
5G serves all use cases

⇔

Major Ecosystem Innovations become possible

1 5G Technology is neutral – 5G Ecosystems are not 4G evolution

Nar



Ali-Vehmas, T., Heikkilä, J., & Rissanen, J. (2020).

ess

Major Ecosystem Innovations become possible

2

Personal Data (Data and Identity)

The New Scarce Resource! + New Technologies => New bubble ?

State of the art:
Catch if you Catch can

State of the art: Spectrum Auctions

State of the art: GDPR & PDS2 + DMA, DA,..

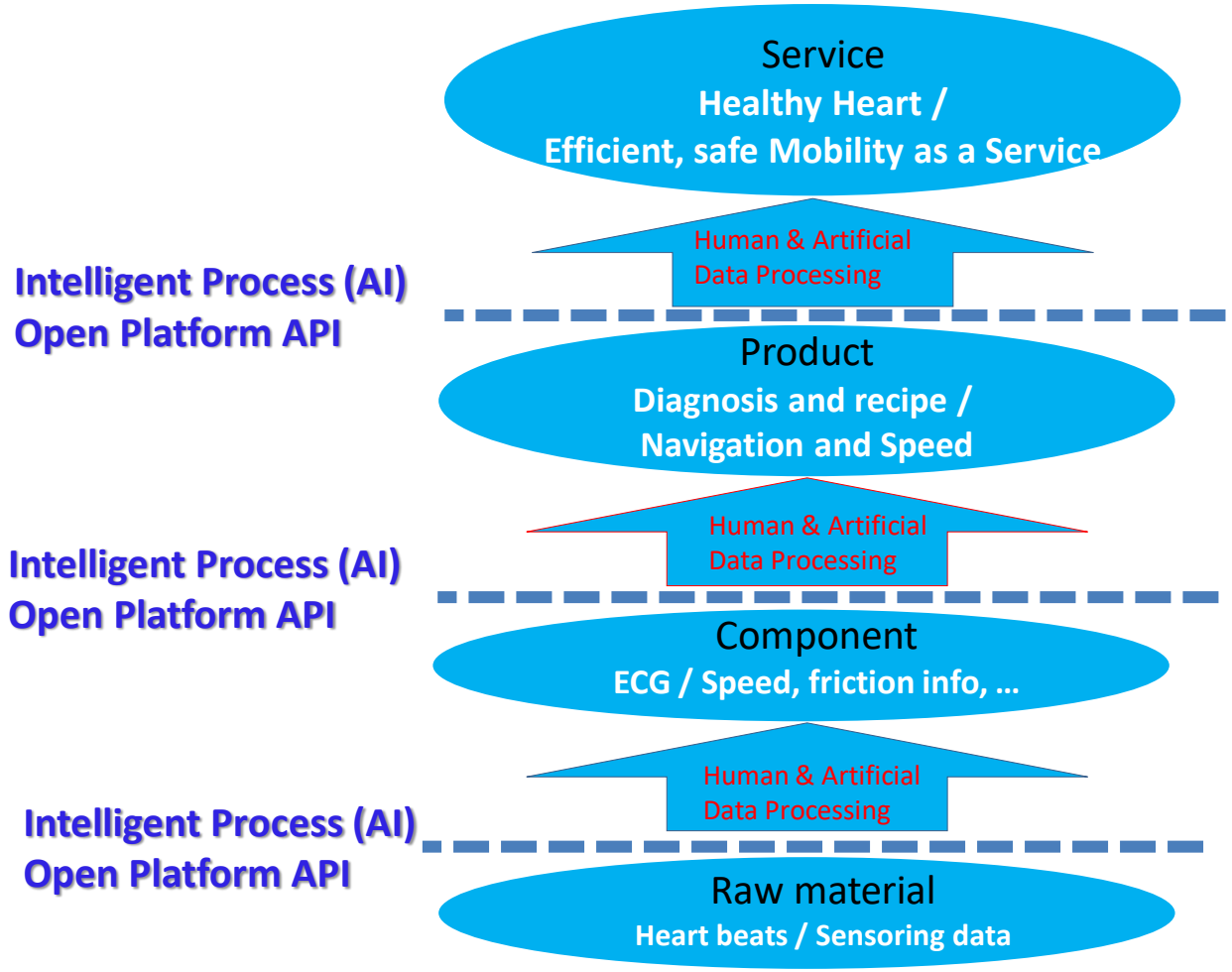
Data is scarce because of

- Data cathering is still expensive
- Data cleaning is expensive
- Data annotation is very expensive
- Access to data is limited by the rules and regulations

Case Finland: Overdeveloped attitute to data privacy, Solution can be found by organizing the controllers, not by controlling the data

2 Digital Opportunity – Stairway to Wisdom

Data and Processing are dualistic, How about ownership ?



Service: Wisdom

Resource/Product: Knowledge

Resource/Product: Information/ Indication

Resource: Raw Data

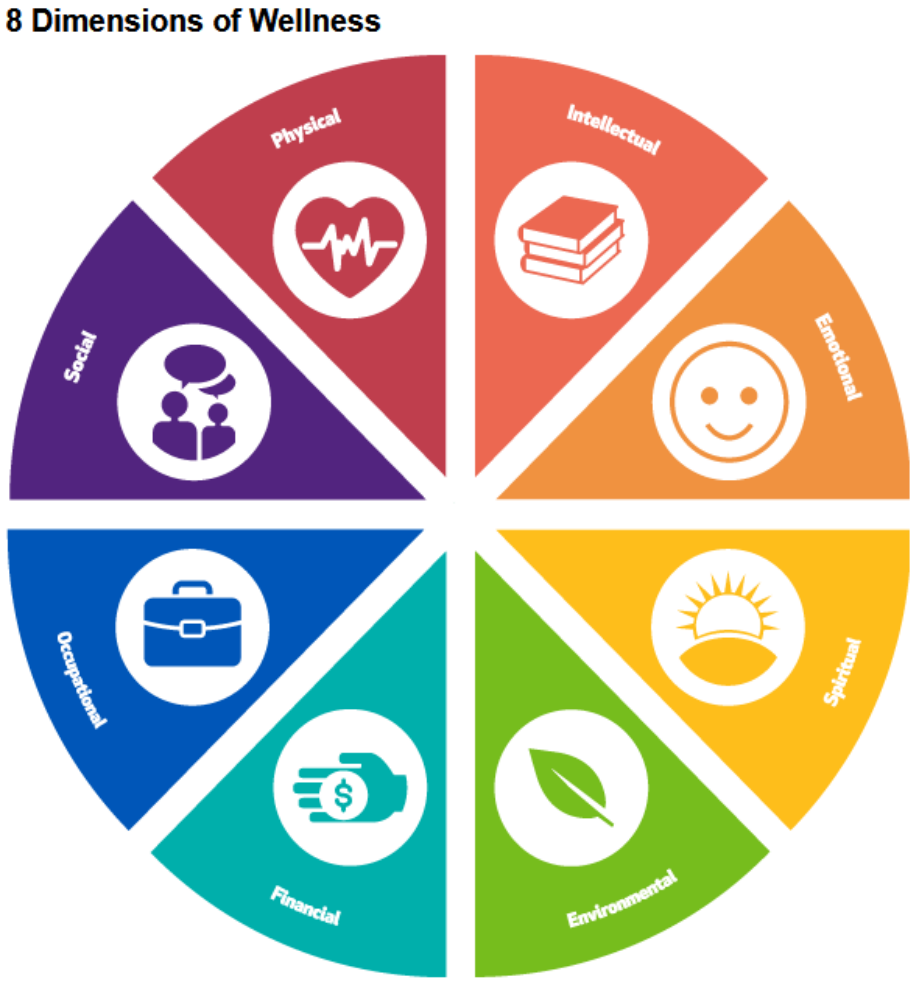
Four layers of Bargaining between data controller and data processor

2

Let´s focus on Well-being

8 Dimensions of Well-being !

- ✓ Wealth (Financial and Material)
- ✓ Health (Physical and Mental)
- ✓ Education (Intellectual)
- ✓ Work (Occupational, Personal life)
- ✓ Friends (Social life)
- ✓ Political voice (Spiritual)
- ✓ Environment (Sustainability)
- ✓ Security (Emotioal)



Joseph Stiglitz, Amartya Sen, Jean-Paul Fitoussi, 2009
https://ec.europa.eu/eurostat/documents/8131721/8131772/Stiglitz-Sen-Fitoussi-Commission-report.pdf

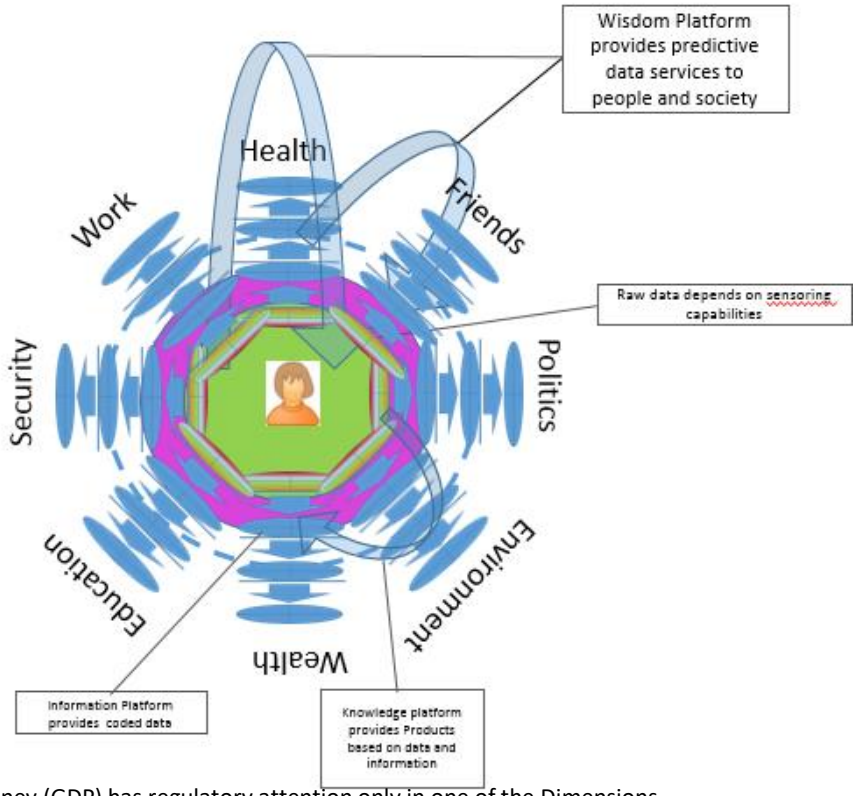
2 Data is often organized according to well-being

Value: Linear Value in Time variant Variance (cumulative when data is collected over time)

- Exponential Value due to multiple covariances
- Exponential Value also through personal networking
- Transformational value of Programmability of the society

⇒ Value is not in the bits but in the correlations!
⇒ Value is in the time variations
⇒ Access to Value = Access to correlations and time series
⇒ Access to Data = Asset + Liability (=Ownership?)

Data is important in all **8 Dimensions of Well-being** =>
Cross sectoral value creation is critical
Data is important on and between all **4 layers** of Data, Information, Knowledge and Wisdom
Each sector includes the **4 business dynamics**!
=> 8x4x4=128 problems to solve!

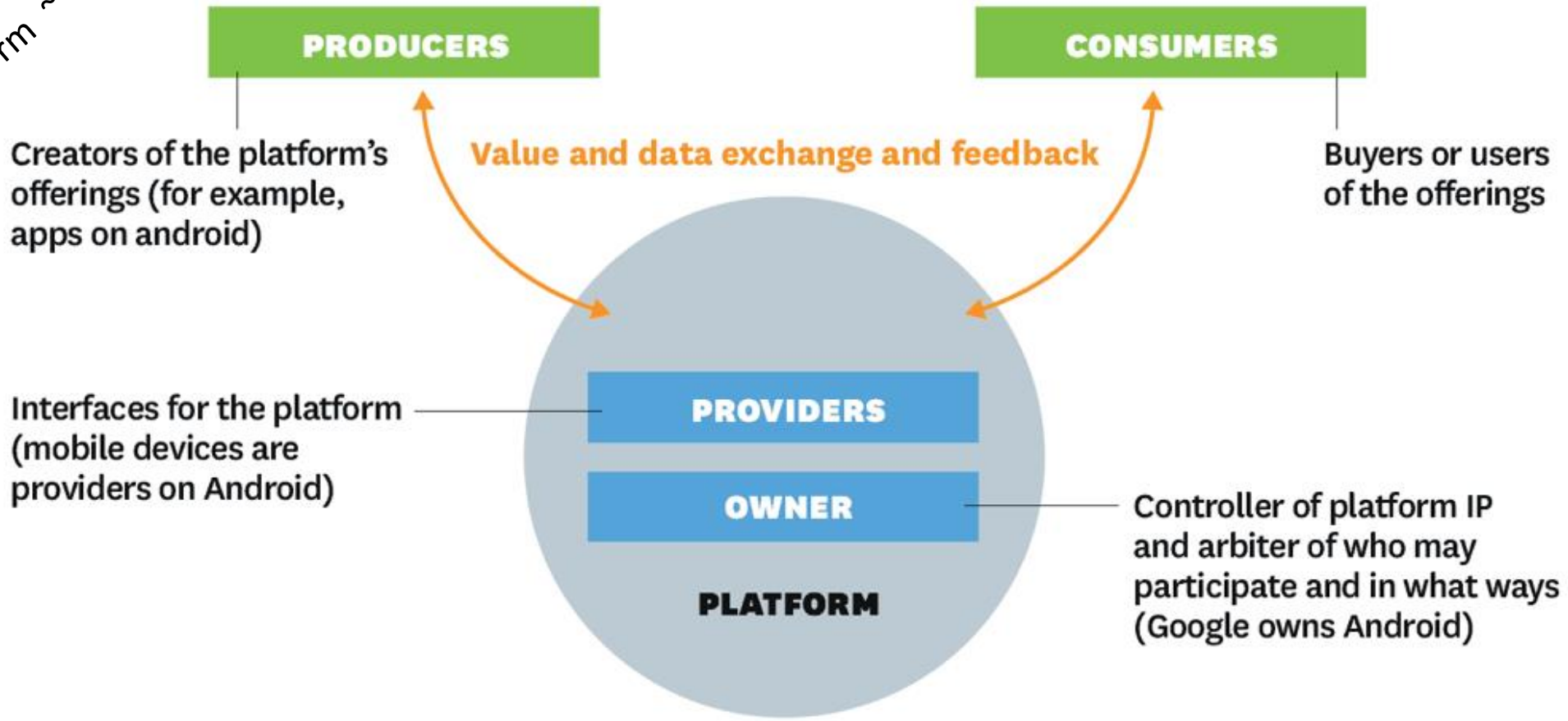


Note: Money (GDP) has regulatory attention only in one of the Dimensions

3

Platforms win always in Data Economy

Double sided platform ~ G3.0



SOURCE MARSHALL W. VAN ALSTYNE, GEOFFREY G. PARKER, AND SANGEET PAUL CHOUDARY
FROM "PIPELINES, PLATFORMS, AND THE NEW RULES OF STRATEGY," APRIL 2016

Platform may be operated, and Services may be provided by
Public, Private, People (and Personal) actors

3

Four generations of platforms

for ever stronger network effects

Generation 1: In House Technology Platform (dominant until mid 1990's)

- Developed to enable re-use of common parts of the design
- One directional: Platform owner provides the platform as "common good"
- Examples: DCT - Nokia Mobile Phone's internal product platform, Open public data (Kansalaisen Karttapaikka)

Generation 2: Internal platform converted for external use (dominant until 2005)

- Developed by "platform leader" for competing product companies (Katz, Shapiro, Cusumano, Gawer...)
- Two directional: Platform owner develops the platform in co-operation with platform users on commercial basis
- Required business model change, platform leader to divest all competing product offerings
- Examples: Cellular chip sets, Windows SW, WinTel dual platform

Generation 3: Two (multi) sided platform (dominant today)

- Developed specifically to connect two independent sides of the business through fully controlled information platform (Tirole, Parker, van Alstyne, ... also Zysman, ...)
- Platform leader combines the network effects of demand and supply side to archive exponential power gain
- New roles for developers and end users, Subsidized services
- Example: Search – Platform – Advertiser

Generation 4: Multiple Multi-sided markets on one platform (emerging)

- Developed to connect multiple independent sectors of business into one platform
- Combining multiple two and multi-sided platform businesses ion one data based platform (....)
- Examples: Alphabet, Amazon platforms including services for most of the sectors of society
- Challenging the structures and services of national states

Generation 5: What next ?

- Converging of clusters through edge computing
- Diluting Open standard interfaces by open source software (Androindization G2)

3 Network effects of Platform Business

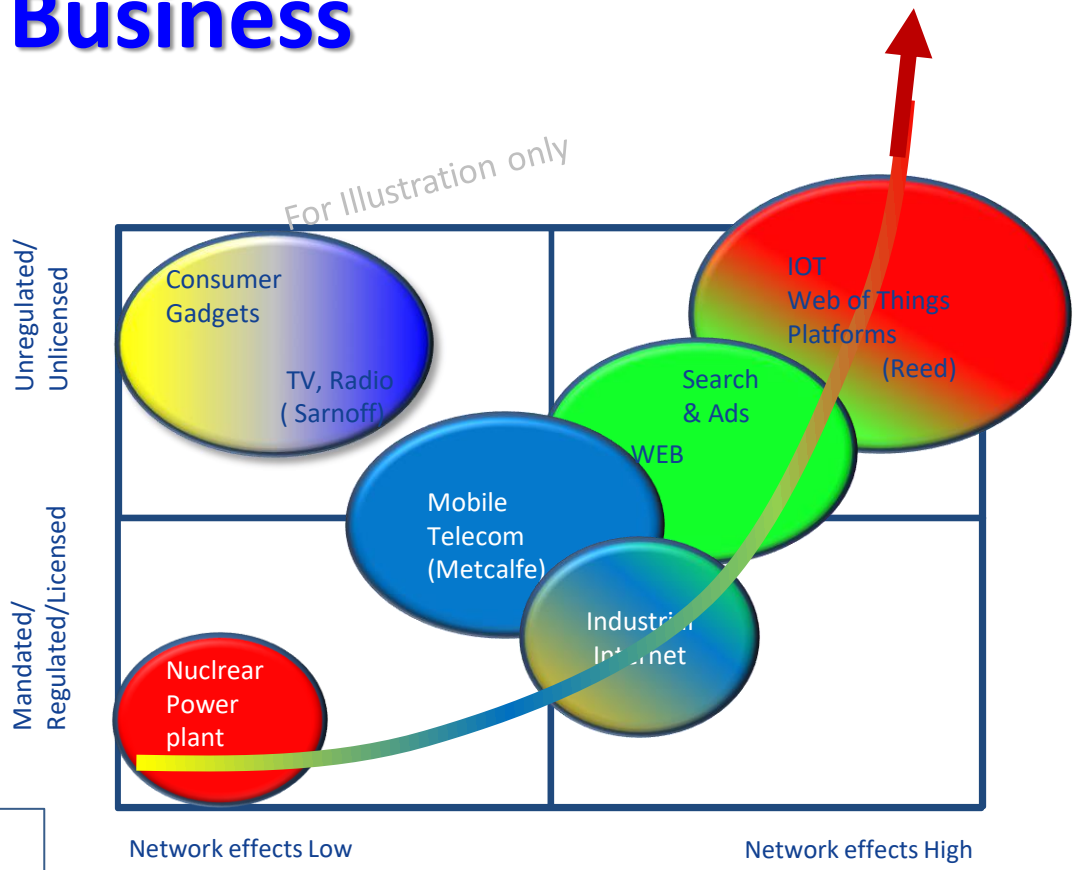
Network effects depend on

- Internal factors: Collaborative actions of the stakeholders, network structures, internal open API's, and characteristics (information, throughput and delay) of resulting feedback loops
- External factors: Available resources, technologies and regulations

Network effects influence the dynamics of competition and value creation

Bundling over clusters can maximize the Network effects!

Sarnoff:	Value ~N
Metcalfe:	Value ~ N^2
Reed:	Value ~2^N



Expected Network effects drive Platform leaders and their game plan:

Deeper pockets enable higher stakes, to gain the Winning position at any costs. And then Winner takes all.

Data Economy - a New Formula

1. (min) Data Economy costs and performance optimized: Moore's law

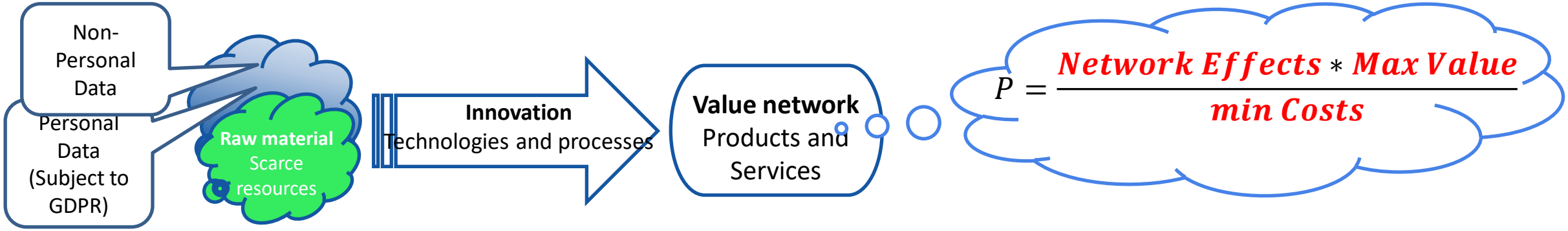
- Cost of Storing, Transporting, and Processing of Digital information approaches zero
- Global benefits of economy of scale
- Processing is not only a cost but processing based on AI creates additional new value as the machines learn by doing

2. (MAX) Performance surplus breaks traditional limitations: Porter et al. … Perfect Differentiation becomes the norm:

- Fully personalized services maximize the revenues
- No need to standardize for variatety reduction
- Possibility to Price discrimination

3. (Multiply) New value creation through network effects: Laws of Sarnoff, Metcalfe ja Reed Multisided platform theories of Tirole, van Astyne et al.

- Consumer based network effects (downstream)
- Supplier, developers' network effects (upstream)
- Bundling of network effects between the traditional industry sectors (Multiple Multi-sided networks)



PART III: EcoSystem Design!

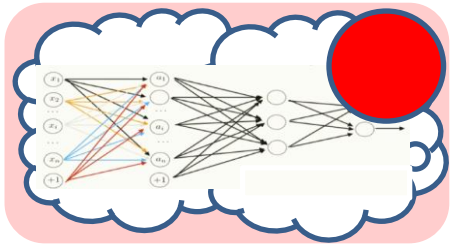
1. System architecture (Ecosystem)
2. Levers and controls (Ecosystem dynamics)
3. Choose the Ccosystem wisely (One of the scenarios)

No more fuzz on Data neither on Technologies

Let´s focus on the ICT System Architecture

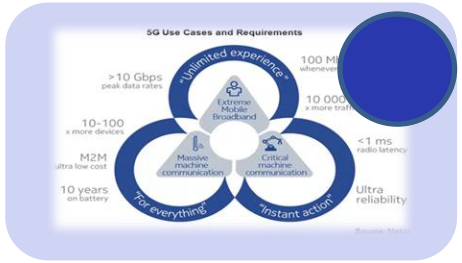
Three Regulated Interfaces => Four Clusters

Content ~
Cloud ~ AI
Big data



Open Internet
Net Neutrality

Network ~ 4G, 5G
Mobile network,
Internet



Industry

Open Air Interface
Device Neutrality,
Roaming

User Interface ~
Mobile Device,
AR/VR,
Local Connectivity

Open Device
e.g. User ID/Security/Data
(+Lock/Unlock etc).

Things ~ Sensors
and Actuators,
End Users' DATA

Consumer

Regulation based interfaces disconnect the systemic dependences between the clusters and limit the network effects that the multi-cluster actor can gain

M Fransman 2010

Let´s re-focus to ICT System Architecture

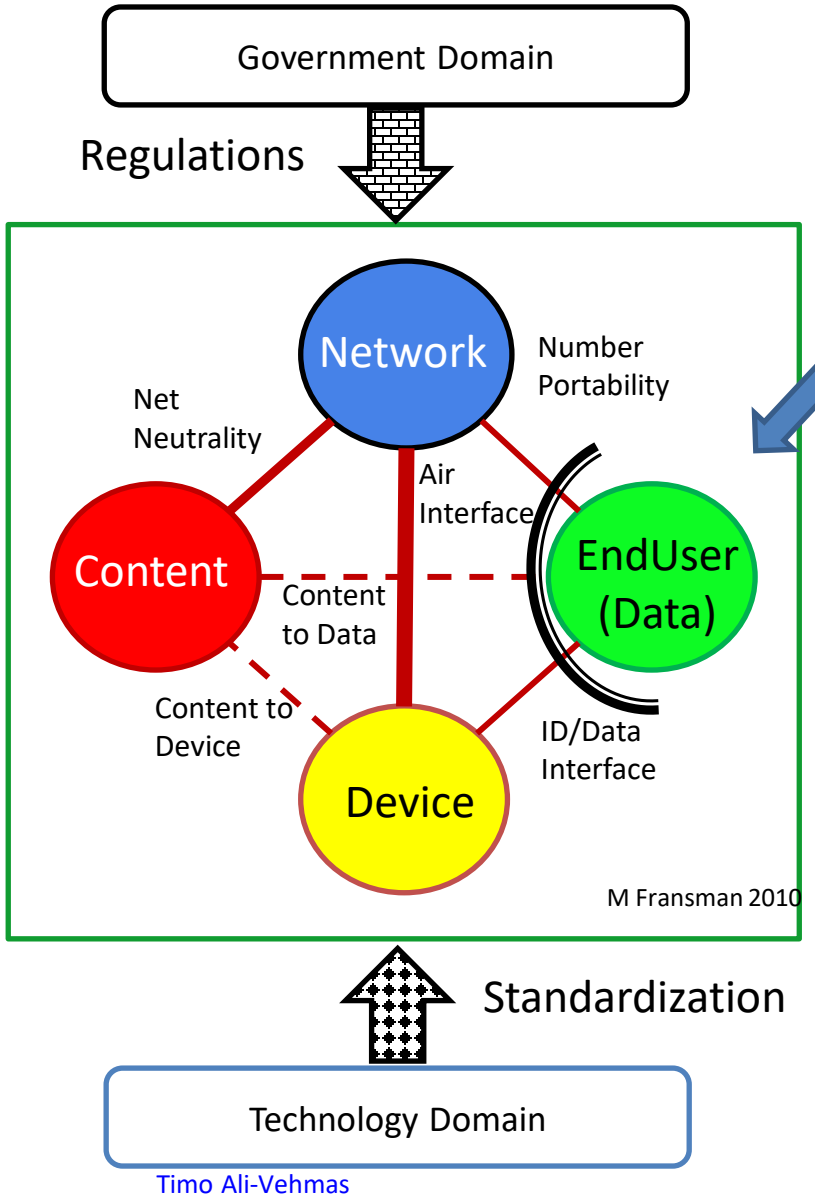
Four Clusters =>

Six Essential Interfaces

that drive the dynamics of the ecosystem

Each Interface to be defined to drive one of the 4 scenarios of competition:

1. Government monopoly
2. Government enabled open standards
3. Privately driven open standards
4. Private dominant design



Timo Ali-Vehmas

Critical Question:

How to protect the Consumer/Citizen in this game ?

How to equalize the asymmetry in knowledge?

4 clusters for Functional Standardization

6 embryonic interfaces for Interoperability Standardization

4x6x4=96 Dynamics considerations to seek alignment within an Ecosystem

Thinking about Levers and Controls….

Critical to Cloud/Service providers (most likely candidates to gain Winner take all position)

- Levelling the playing field for new entrants (Web3.0?)
- Sustainable regulative constraints for data access and ecosystem scaling

Critical for Network operators

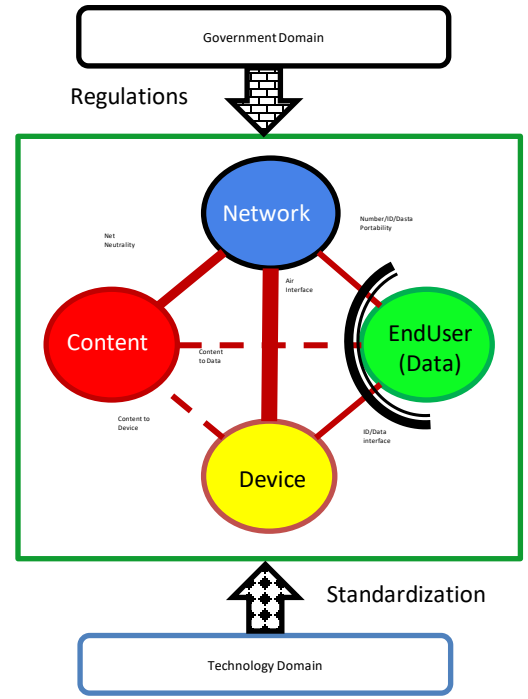
- Clarified Net neutrality to enable new technologies while maintaining desired business models. How to manage the new opportunities ?
- Evolution of Open air interface, 5G and 6G
- Levelling competition with Cloud actors

Critical for Device companies

- Data portability between the clouds a.k.a data platforms
- Application portability between clouds a.k.a between application stores
- Levelling competition with Cloud actors and Network operators

Critical for Consumers/Citizens

- Data portability between the networks, between clouds and between device verticals
- "PSD2" for all interfaces => DA, DMA, DSA,..
- "Identity" extended to all devices = Digital Wallet (eIDAS..)
- **Balancing the vast asymmetry in capabilities and knowledge with all other actors**
  Citizen => New Role of emerging data operators (myData) GDPR



⇒ Critical to any ICT driven business: All interfaces require aligned sets of regulations and standards

⇒ Critical to all: Sustainability (many aspects), (cyber)security, Predictability

We need to make a conscious choice in Controlling the ecosystems

To choose your desired business dynamics => Recognize the Factors to control power of Innovations

Pick up your favorite dynamics, one of the four options =>

Choose your options accordingly for each of the factors, in a dynamic fashion, noting the phase and maturity of the business.

1. Access to raw material to drive the selected scenario, consider for instance:

- Openness of Access to Data
- Data from all sectors of well-being
- Data as an asset and liability
- Quality and Uncertainties of Data

2. Competition in Innovation Ecosystems to drive the selected scenario, consider for instance:

- Openness of Innovation and Interfaces
- Competition and Power of Platforms (Network effects)
- Ecosystem Sustainability, Network externalities

3. Interoperability of Interfaces and data to drive the selected scenario, consider for instance:

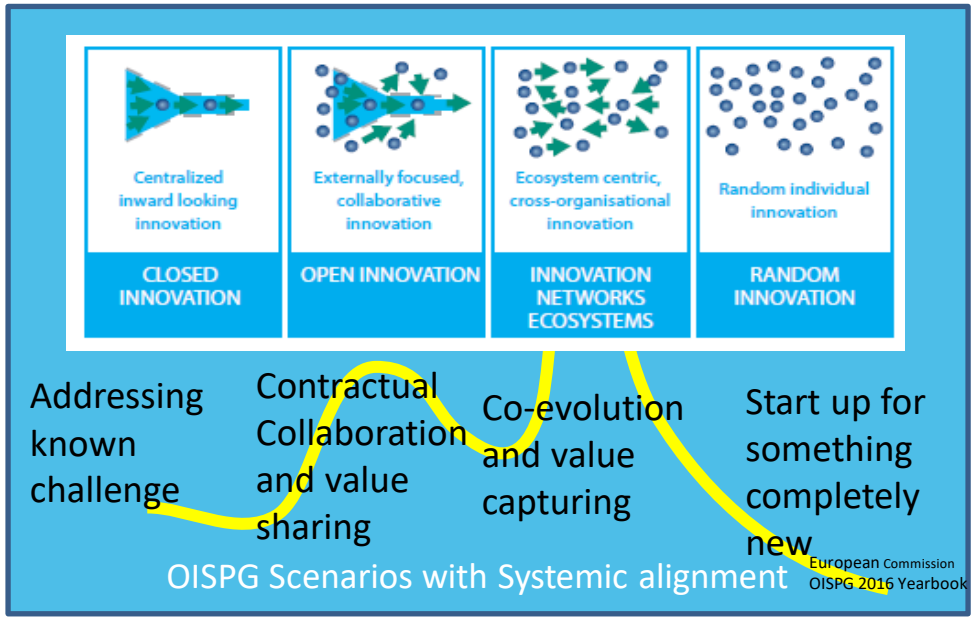
- Openness and Interoperability of all and any Data (DIKW) over all embryonic Interfaces
- Geographical and political limits of markets

4. Consumer's Choice to drive the selected scenario, consider for instance:

- Mobility and portability of Consumer (End User) with his Data and Data Flows
- Fair value sharing

2. Semi-Centralized /Semi-open

3. Semi-Decentralized /Open



1. Centralized /Closed

4. Decentralized /Closed

Technologies are Neutral, Ecosystems are not=>
Regulations should be technology neutral, not taxonomy based

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- Openness of Access to Data
- Data from all sectors Contributing
- Data as an asset and liability
- Quality and Uncertainties of Data

Liberte

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- Competition and Power of Platforms (Network effects)
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Egalite

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Fraternite

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Consumer´s Choice

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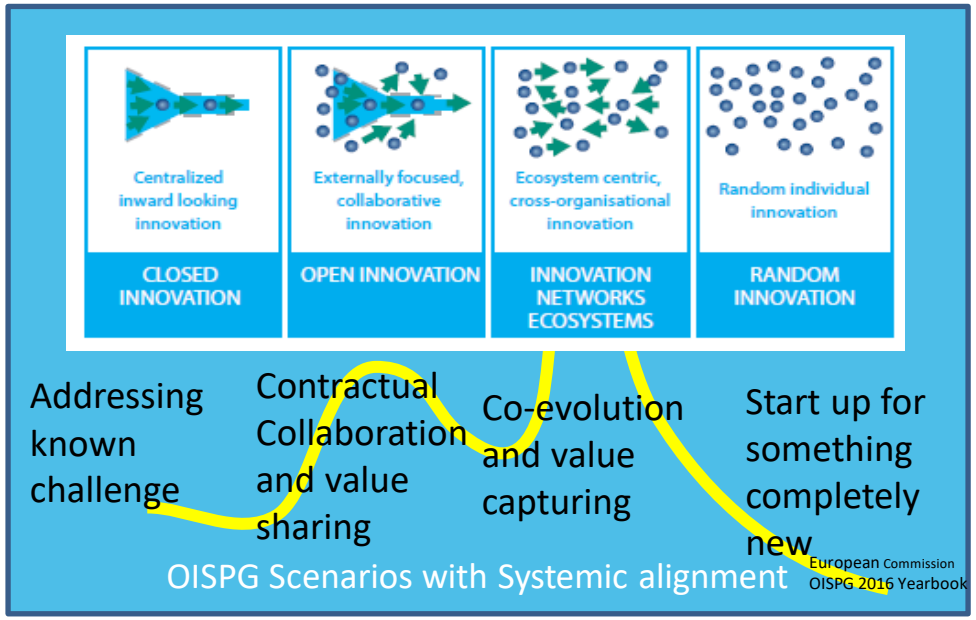

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Regulations should be technology neutral, not taxonomy based

Case Traffic: Licensed Multisided Platform For Traffic and MaaS ?!

Licensed traffic providers (Public and private ownership)

Neutral Controlling Authorities: **Quis custodiet ipsos custodes?**

Legal Intercept

Service data and charging

Customer/Citizen and his car and gadgets

Licensed Traffic Operator´multisided platforms = “Wisdom”

Minimum data

Fees, compensations Taxes

Anonymous data

Road, Street and Parking space owners
Government tax authorities

Service and technology developers and providers

Secondary use of Data (DIKW)

Car Company data bases

Esimerkkinä Digitalisaation Mahdollisuuksista Liikenteessä

Autoliikenteen uudistuminen: Iloinen asia

Tähän asti tapahtunutta:

- Ensimmäinen ohjelmallinen autoluokka: Alennettua nopeutta kulkeva auto.
  - HW pohjaisesta segmentoinnista SW pohjaiseen digitaaliseen differentiaatioon
- Autotyypille “lisensioitu” tiekapasiteetti: Länsiväylän vähäpäästäkaistat.
  - Hämärät rajat aiheuttavat kuitenkin ongelmia
- Autojen pysäköinti ja lataus palveluntarjoajan avulla.
  - Esim. Fortum optimoi latausajan, Parkman kerää parkkimaksut

Työn alla:

- Kuljettajan ei tarvitse olla sisällä autossa. Ensi askeleita ulkoiselle älylle.
  - Laitteiden etähallinta (sisätilan lämmitin ja lukot, valot ja äänitorvi)
- Rikesakoista rikemaksuihin: Kielloista sallivuuteen ?
  - Kohtuullinen nopeus ei ole isompi rikos kuin kohtuuton hitaus
- Nopeusrajoitusten kehittyminen: Peräkärryjen ja moottoriteiden uudet nopeudet
  - HW koodattua kiinteää segmentointia

Autojen tekniikka kehittyy (hitaasti ?)

- Liikennetilanne ja Liikennemerkit näkyvät mittaristossa reaaliaikaisesti.
  - Downloading Augmented Reality Widgets
- Autot osaavat ajaa itsekseen sallittua nopeutta muun liikenteen mukana.
  - Adaptive system functions, Paras tekoälysovellus tähän asti
- Myös muita personointia lisääviä applikaatioita, kuten pysäköinnin avustin, pysäköinn maksut, palvelu ja media applikaatioita jne.
  - Käyttöliittymien ja digitaalisen suorituskyvyn heikkoudet ovat merkittävä este

Provokatiivinen Esimerkki Digitalisaation mahdollisuuksista: Mitä voisin tehdä itse ennen itseajavia autoja ?

Seuraavat luonnolliset askeleet regulaatiossa:

- **Ohjelmoitavat nopeusluokat kaikkiin segmentteihin**
  - ja lopulta täydellinen dynaaminen differentiaatio sallitaan.
- **Ohjelmoitavat autokohtaiset ennakoivat liikennemerkit ja liikennevalot**
  - Mahdollistavat suuren määrän lisää liikenteen tuottavuutta ja turvallisuutta parantavia dynaamisia toiminteita
  - Jotka ovat merkittävästi edullisempia kuin fyysinen tie-infraa. Esimerkki: auton pääsy sivutieltä päätielle (Liikenteen ruuhkautumisen esto käytössä mm. USA:ssa)
- **Yksi kuljettaja voi ajaa montaa autoa**
  - ja lopulta autot voivat liikkua etäkuljettajan toimesta jo ennen kuin ne osaavat tehdä kaiken itse. Syntyy tarve autonajo-operaattoreille, joka voi olla disruptio mahdollisuus esim. Autokouluille, Parkkipaikkoja hallinnoiville yrityksille jne. Myös rattijuopumus jää historiaan.
- **Rikemaksuista tiemaksuihin**
  - jotka määräytyvät tien kulutuksen mukaan. Energian kulutus pitää hallita erikseen.
- **Liikenteen valvonta automatisoituu ja säätelee itse itsensä**
  - ja lopulta valvonta sopimusten pitävyydestä siirtyy liikenne-operaattoreille (kuten vakuutustoiminnassa ja teletoiminnassa jo nyt on tilanne). Viranomaiset valvovat että järjestelmä toimii ja vain oikeuden päätöksillä puuttuvat yksittäistapauksiin.
- **Tarvitaan myös uusia liiketoimintamalleja: Autoliikenteen lisensioidut operaattorit**
  - Joiden mandaattina tarjota liikennekapasiteettia mahdollisimman edullisesti mutta kestävällä tavalla
  - Vain puhtaan Itse-organisoitumisen varassa systeemin kaupallinen dynamiikka ei toimi riittävän hyvin kansalaisten näkökulmasta

Ja Niin Edelleen - Mitähän meistä itse kukin toivoisi tapahtuvan ?

Tekniikka ei ole este – ei edes hidaste

Autojen tekniikka kehittyy ja auttaa kuljettajaa tekemään ihmeitä !

- **Kaikki liikenteeseen liittyvä tieto saatavilla reaaliaikaisesti kaikissa autoissa.**
  - Vanhoissa autoissa lisälaitteen avulla (White box!.... Voi olla ihan tavallinen moderni puhelin).
- **Jokainen auto, kuljettaja, tieosuus, liikennetilanne, säätilanne on oma ”luokkansa”**
  - lopulta täydellinen optimointi matkakokemus mahdollisuuksien ja maksuhalukkuuden mukaan. Suuri matkanopeus ei ole sinällään oleellista vaan matkan sujuvuus ja turvallisuus.
- **Auton hallinta etänä toimii riittävän täydellisesti ja nopeasti.**
  - Hajautettu automaatio (tekoäly) täydennettynä ihmisen tekemillä toimenpiteillä tarvittaessa
- **Autoihin voidaan ostaa ja ladata tilanteen mukaan kaikki ne sovellukset, mitä asiakas, auton omistaja, kuljettaja, matkustaja tai muu toimija haluaa ja on niistä valmis maksamaan.**
- **Autosta tulee liikkumisen palveluiden ja sovellusten käyttölaite.**
  - **Moottorin ja alustan ominaisuudet ohjelmoitaviksi**
  - **Liikennelogiikan ominaisuudet ja liikennetilanne dynaamisesti hyötykäyttöön.**
  - **Kuljettajan personointi, palveluiden siirtyminen autosta autoon.**
  - **… ja monta muuta**
- **Autot toimivat kuten kännykät, ml. Liikennepalveluiden roaming.**
  - **Kansalliset Liikenne-operaattorit kilpailevat mandaattinsa puitteista**
  - **Myös itse-organisoituvien toimintamallien rooli tärkeää. Liikennepalveluita voidaan tarjota kavereille. Myös esim. kaupungit voivat tarjota palveluita paikallisesti jne.**

Eri toimijoiden Roolit = Valta ja vastuusuhteen pitää olla joka tilanteessa ja kaiken aikaa hyvin selkeitä

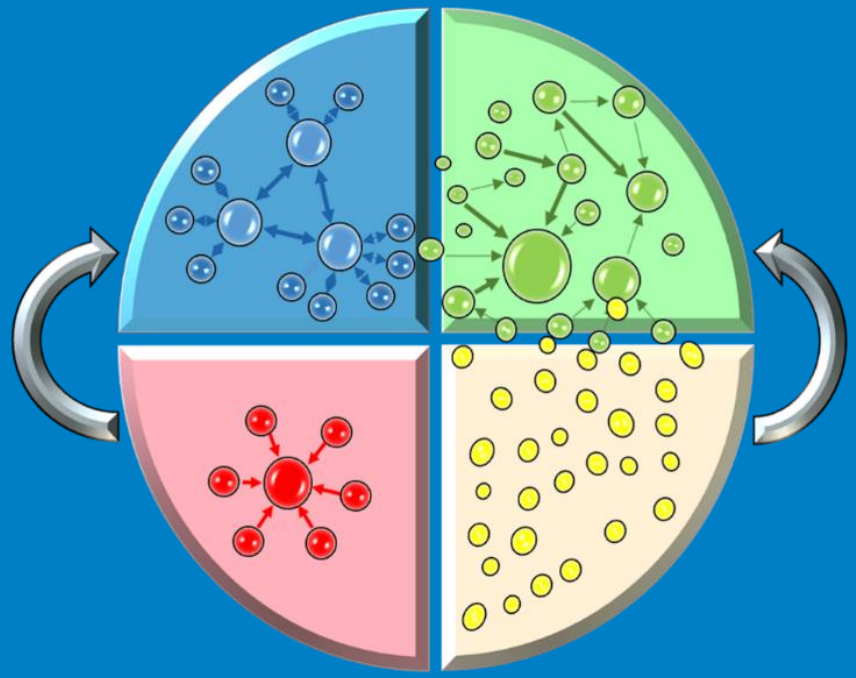
Ja lopulta autot ajavat itsenäisesti.

Mutta jo sitä ennen on lähes loputtomasti mahdollisuuksia innovointiin, autojen liiketoiminnan arvo siirtyy energia-intensiivisyydestä tietopohjaiseksi ja kuluttajien palvelutaso, maksuhalukkuus ja asiakastyytyväisyys (myös kansalaistyytyväisyys) kasvavat merkittävästi.

Managing ICT ecosystems is like gardening: Harmony and interoperability enable sustainable use of resources, enable competition and let all the flowers to blossom – In the proper ways, time and place.

”These are my principles and if you do not like them, I have other principles.” (Groucho Marx)

Thank you, How can I help ?



Timo Ali-Vehmas, D. Sc. (Tech)

November 2022

Example: Licensed Multisided Platform For Health and Well-Being ?!

Service providers (Public actors)

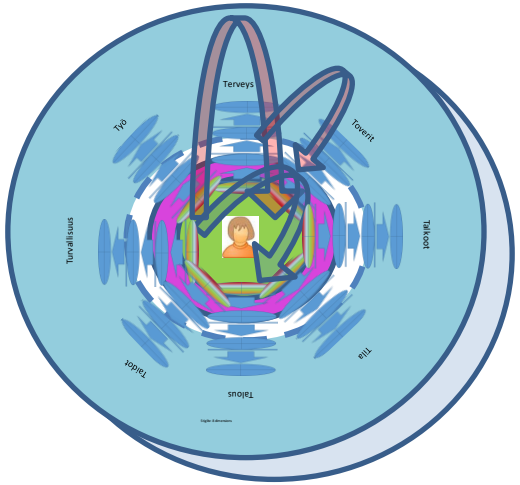
Service providers (Private actors)

Service Providers (Third sector)

Secondary use of Data (DIKW)

Neutral Controlling Authorities

WB platforms on every WB geography (SOTE alue) <=> "Wisdom Management"



Lisensed Data operators acting on behalf of people

Customer/ Citizen and his data

Service and technology developers and providers