

**ORCHESTRATING COLLABORATION  
IN DIGITAL ECOSYSTEMS  
AN OPEN INNOVATION APPROACH**

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April 5, 2025

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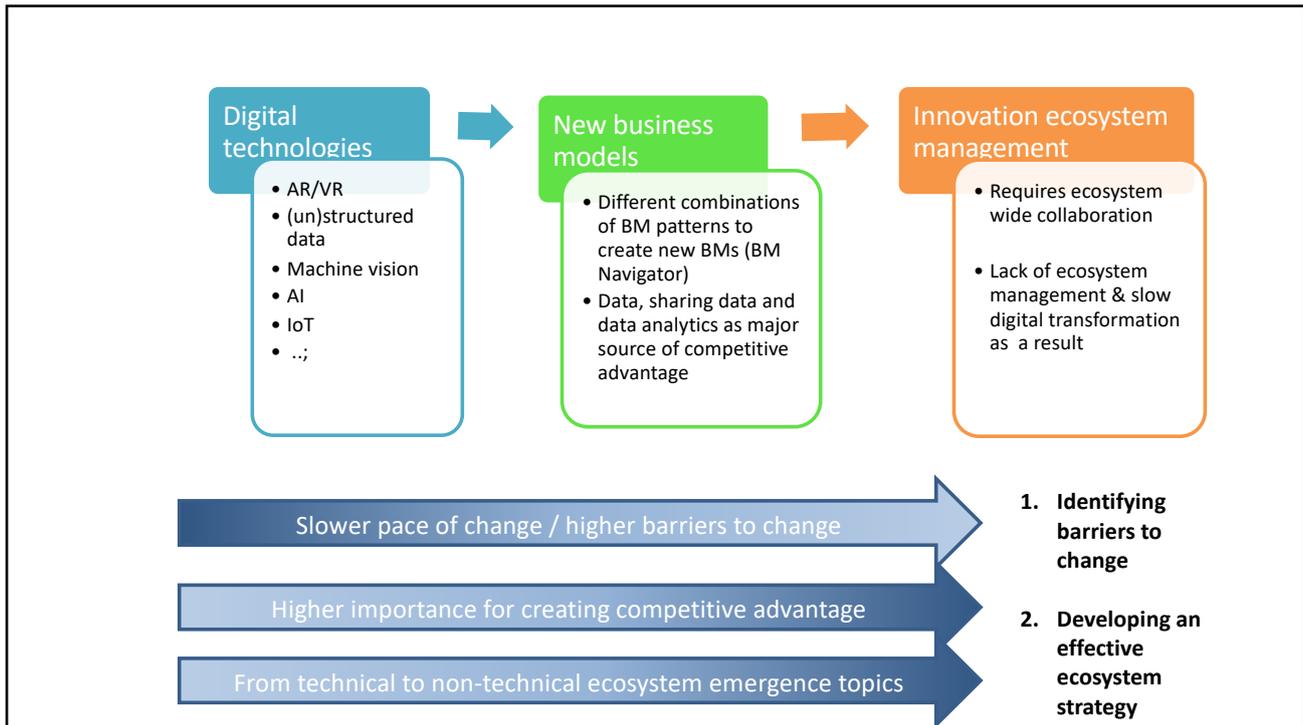
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“Some of the most important future innovations will not come from new technologies but from new forms of collaboration”

*Thomas Malone, MIT, 2015*

... and this will be even more the case for the digitalization transforming most, if not all, industries

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## What are (digital) ecosystems?

**Innovation Ecosystems** (Adner, 2017):

- An innovation ecosystem is a **collaborative structure** in which **multiple independent actors coordinate their activities to create and capture value around a shared innovation**, with success depending on the **alignment** and co-innovation of interdependent stakeholders.

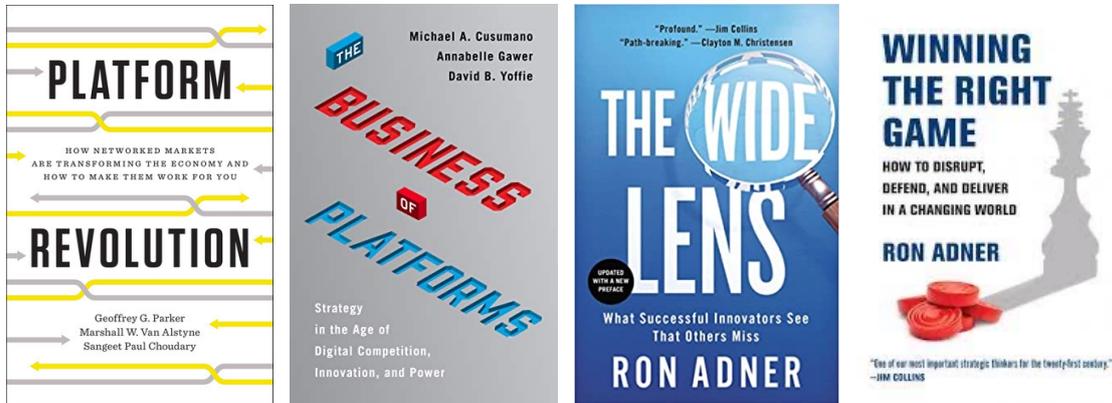
**Digital Innovation Ecosystems:**

- A digital innovation ecosystem is an **extension** of innovation ecosystems where digital technologies, platform architectures, and data flows enable coordination, value creation, and distribution among interdependent actors, fostering modularity, scalability, and multi-sided value exchanges.
- Eg. Sonaura

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### Bestsellers



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### Which industries I focus on?

- Important economic sectors
- Large value chain inefficiencies Data as a crucial driver for changes
- Traceability, sustainability, prevention, become prominent elements in value creation
- Solving global challenges: food supply, reliable and affordable healthcare, global warming
- B2B vs. B2C in literature
- Complex ecosystems with multiple partners
- Digital providers don't have the power to change the business processes
- Regulating – public authorities as partners



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## What are we talking about in practice?

- How does an ecosystem look like in practice?
- Let's explore precision agriculture - Xarvio
- Xarvio?
  - Bayer launched new Digital Farming brand xarvio™ late 2017 – Acquired by BASF in 2018
  - Brand encompasses all Bayer Digital Farming solutions
  - In 2023:
    - 100,000 farmers and consultants have registered for xarvio FIELD MANAGER (15 million hectares in 18 countries).
    - xarvio SCOUTING has already been downloaded by more than 7 million users.



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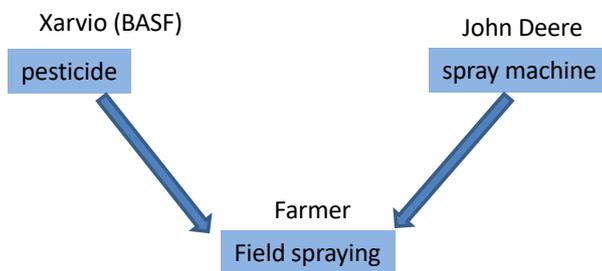
# If you were a farmer, would you purchase Xarvio?

- The video shows the benefits..
- But there are also same challenges for farmers ...
- Examples:
  - What is the value using it? Objective evidence of increased crop productivity?
  - What is the cost of using it? Too expensive?
  - Who owns the data? What is Xarvio doing with my data?
  - Lock-in: can a farmer still buy products from other vendors?
  - What is the compatibility with other data based systems?
- Other partners have similar challenges
- *Ecosystem management* is vital for the success of data driven business models
  - Who should lead the ecosystem? Xarvio? Someone else?



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## Traditional crop spraying

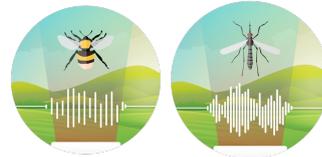


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## FaunaPhotonics

- Sensor transmits infrared, invisible light on flying insects and automatically detects the reflected light of each individual insect.
- Accurate measurement of the wing beat frequency, color and wing to body ratio of insects flying through the sensor's monitoring volume.



Wing Beat Frequency



Color

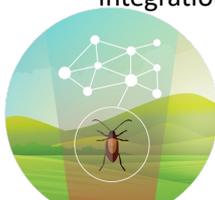


Wing to body ratio<sub>34</sub>

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## FaunaPhotonics

- Insect sensor data and automatically classifies each individual insect that is observed. The technique can scout for many insect species at once providing real-time insights into in-field insect populations and abundance.
- Species specific insect density data combined with time, geolocation and environmental data are an input to digital farming solutions. Offer data integration between in-field sensors and farming software platforms.



Automated data collection



Machine learning



Digital platform integration

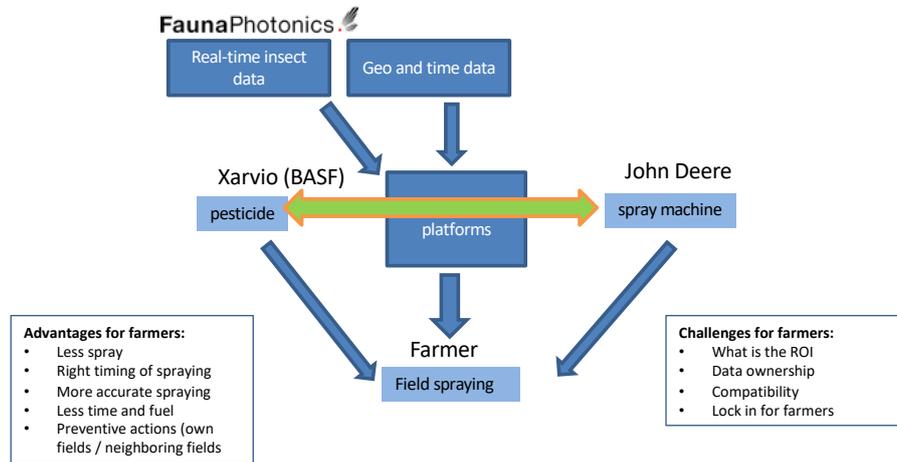


Precision spraying

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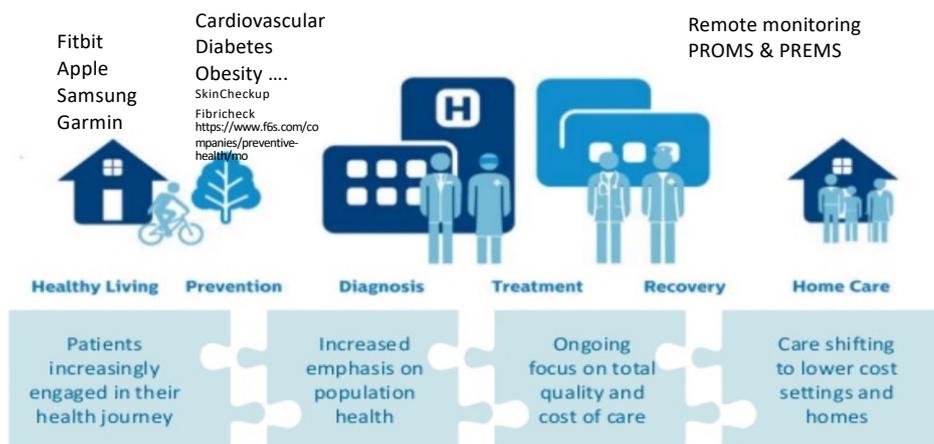
### Crop spraying in precision farming



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### Example: Healthsuite (Philips) – Health continuum



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## Data as a driver for industry change

***Digitalization = data layer as an additional source of competitive advantage***

- Agriculture
  - Data to improve soil, decrease use of pesticides, reduced irrigation waste, quality improvement
  - Traceability, improving fair trade (bext 360), agriculture
- Healthcare:
  - Keep healthcare affordable – increased efficiency – integration of data
  - Less mistakes - more accurate and earlier treatments and medication (patient history , DNA linked data)
  - AI systems for radiologists – changing skills, workflow, hospital business processes, educational programs
  - Patient centric system : data about the patient’s past and outpatient follow up
- Energy
  - Greening of energy supply – decentralized production – data analysis is crucial
  - Balancing energy grid – data analysis is crucial
  - New data-based services – data about supply, demand, prices, etc.

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## *Digital platforms play a role – but they have some specific characteristics in B2B ?*

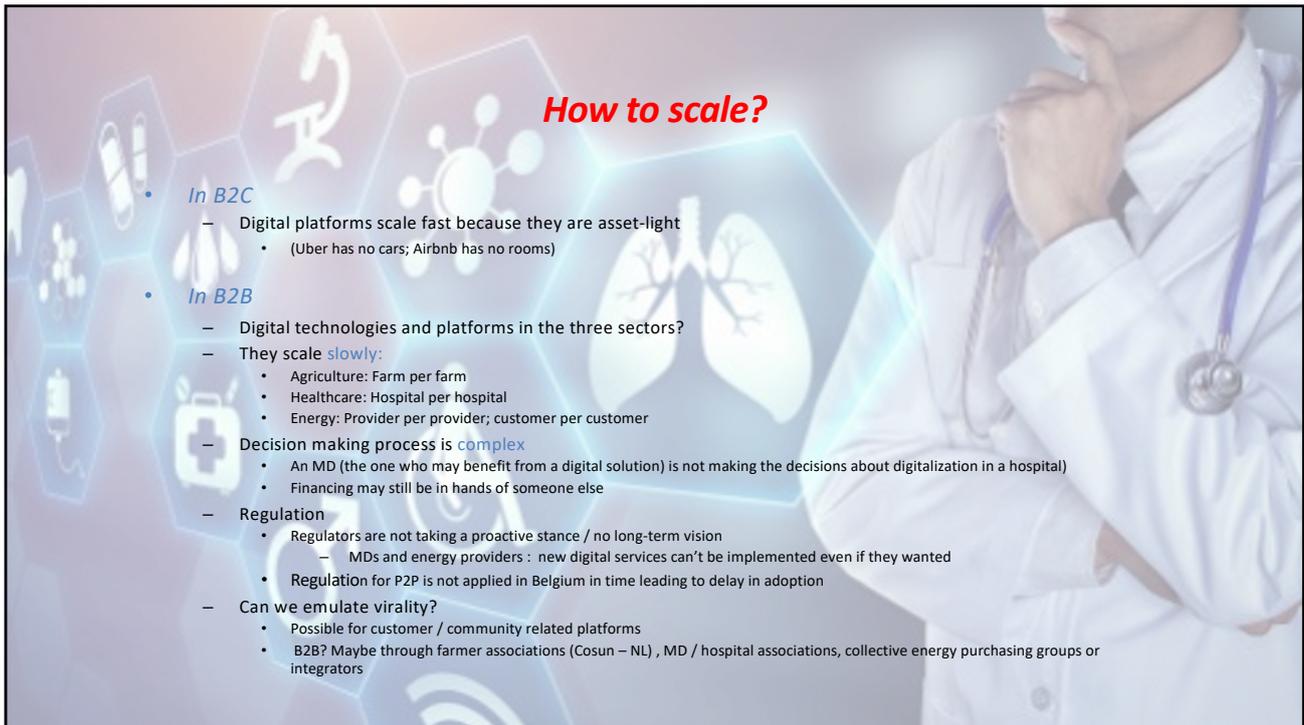
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## *Digital platforms play a role – but a different one in B2B*

- **Traditional – B2C**
  - Digital platforms connect two-sided markets (Airbnb, Uber, iOS, etc...)
  - In transactional platforms (Uber, Airbnb, Tinder) transactions are simple and standardized (a car drive; renting a room; having a date)
- **In B2B**
  - Multisided collaboration
    - Healthcare: wearables, apps, providers (different decision makers), insurers, home care, regulators, public policy makers
    - Energy: Households (prosumers), TSO, DSO, digital service companies, integrators, regulatorsetc...
    - Precision agriculture: farmers, machine manufacturers, chemical companies, digital technologies start-ups (AI, machine vision, robotics,
  - Transactions are not standardized / **personalized service** (field, patient, house)
    - Energy market : situation for each house is different (electric car, solar panels, working hours, etc)
    - Healthcare: trajectory for each patient is different (prevention, hospital visit, home care)
    - Agriculture: each field / cow requires an adapted / “personalized” approach
  - Personalized approach requires data integration and close collaboration between different players in the ecosystem

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## How to scale?

- *In B2C*
  - Digital platforms scale fast because they are asset-light
    - (Uber has no cars; Airbnb has no rooms)
- *In B2B*
  - Digital technologies and platforms in the three sectors?
  - They scale *slowly*:
    - Agriculture: Farm per farm
    - Healthcare: Hospital per hospital
    - Energy: Provider per provider; customer per customer
  - Decision making process is *complex*
    - An MD (the one who may benefit from a digital solution) is not making the decisions about digitalization in a hospital)
    - Financing may still be in hands of someone else
  - Regulation
    - Regulators are not taking a proactive stance / no long-term vision
      - MDs and energy providers : new digital services can't be implemented even if they wanted
    - Regulation for P2P is not applied in Belgium in time leading to delay in adoption
  - Can we emulate virality?
    - Possible for customer / community related platforms
    - B2B? Maybe through farmer associations (Cosun – NL) , MD / hospital associations, collective energy purchasing groups or integrators

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*Digital technologies only have a  
transformational impact if  
business processes can be  
changed*

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## Digital technologies and business process changes

Example “Hypertension monitoring for pregnant women”

- Adoption / integration risk
- Loss of income for gynecologists

**PREMOM**  
**Prenatal REMote Monitoring**  
**Of Mothers at risk**



LCRP | Limburg Clinical Research Program

JESSA ZIEKENHUIS universiteit Hasselt

universiteit Hasselt Mobile Health Unit

Prof. Dr. Wilfried Gyselaers & Mobile Health Unit UHasselt

UHASSELT



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## Premom as a project

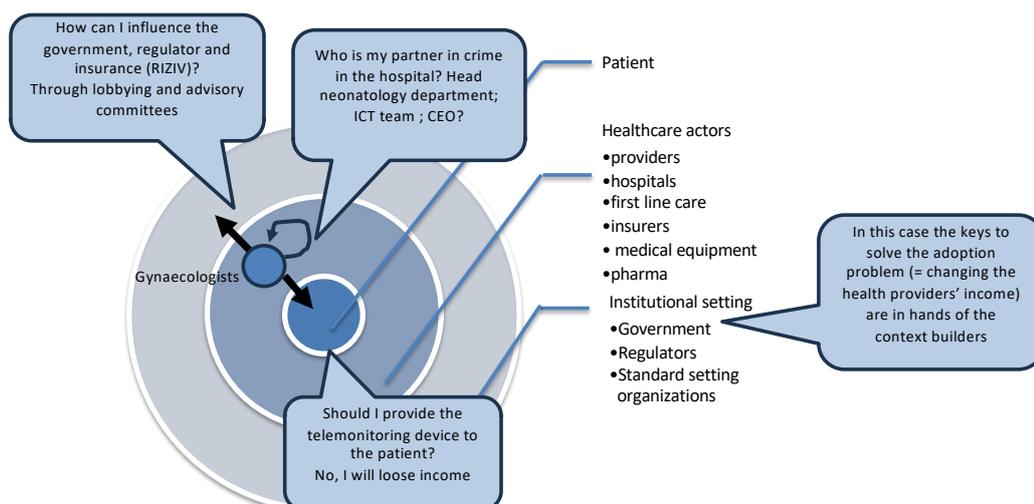
- 2014 – start of the project in 5 Flemish hospitals (70+ in Flanders) – duration 4 years.
- Objective: reducing problems with hypertension among pregnant women (starting at 11-14 weeks of pregnancy)
- What ?
  - TELEMONITORING : a pregnant woman takes a blood pressure monitor home that is linked to an app.
  - The values are checked daily by a midwife at a hospital
  - If abnormal values appear, she will contact the gynecologist. If necessary, the pregnant woman visits the hospital
  - She can always contact her gynecologist or midwife if she has questions
  - Control group – no telemonitoring
- Results:
  - Fewer prenatal admissions (till delivery) to the hospitals
  - Less cases of hypertension
  - New borns were on average 10 days older at birth
  - Fewer birth inductions
  - Major cost reductions: neonatal admissions are one of the most expensive interventions
    - In 2016: a cost reduction per pregnancy of 1950 euro
- Premom 2 : 2019-2023

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## Premom as a project – why it may end with the project?

- **Benefits for**
  - Patient:
    - less complications,
    - less risks for the mother
    - More comfort – stays at home,
    - Baby is on average born 10 days later
    - Less inductions
  - Government
    - Significant cost reductions
    - Less healthcare costs afterwards
- **What about gynecologists and hospital directors**
  - Gynecologists lose income through telemonitoring
  - Hospital directors **oppose telemonitoring** because they want a high occupancy rate of the neonatology department – lower income (wrong financing system of hospitals)

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### *Orchestrating the ecosystem?*

- Not unipolar but multipolar &
- Not only supply-side driven but also demand-side driven
  - Philips / Siemens / IBM Watson Health: Are platform providers but hit the wall in ecosystem building
  - Hospital associations / doctor associations can drive the demand side orchestration (// farmers in the Netherlands)
  - Integrators: collectivization / Platformization of customers decisions in P2P
- Stepwise
  - Starting with a MVE (minimal viable value proposition with partners that win and not upsetting partners that may lose)
  - If you can't change anything – go for a project. (internet of energy)
- Scaling
  - Define your ecosystem partners correctly (layered) + sequence their involvement

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*Including public policy makers and regulators*



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## Digital ecosystem orchestration

- Governments have been absent, ineffective or slow
- Siemens, Philips, GE and large data companies in the West got stuck in traditional business models
  - Focus on solutions for providers / hospitals
- Is China showing us the way forward?
  - Focus on critical problem in the healthcare sector (access to first tier hospitals and no trust in other hospitals)
  - Tencent / Alibaba / Ping An: build a super-platform & ecosystem including all healthcare actors.
- Companies try to monetize by *owning* data, while *sharing and combining* data leads to innovation and new services

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Ticker	0241.HK	6618.HK	1833.HK	(To be listed)
<b>Market Cap (USD)</b>	\$31B	\$47B	\$14B	\$7B (proposed)
<b>Founded</b>	2014	2018	2014	2010
<b>2020 Revenue</b>	\$2.2B (+74.0% YOY)	\$2.95B (+78.8% YOY)	\$1.05B (+35.5% YOY)	\$280MM (+262% YOY)
<b>2020 Profit Before Tax</b>	\$99MM	(\$2.6B)	(\$140MM)	(\$288MM)
<b>Users*</b>	AAU: 65MM (+35% YOY)	AAU: 89.8MM (+60% YOY)	MAU: 72.6MM (+8.5% YOY)	MPU: 25MM (N.A.)
<b>Strength</b>	E-commerce	E-commerce	Telemedicine	Telemedicine
<b>Affiliation</b>	Alibaba	JD.com	Ping An Insurance	Tencent

\* Reported based on disclosed numbers. AAU = annual active users, MAU = monthly active users, MPU = monthly paying users.  
 Note: All metrics are based on latest stock prices and 2020 annual reports (for Ali Health, the 2020 interim report as annual report is N.A yet due to difference in reporting period), available as of 28 Jun 2021.  
 Source: Health Advances analysis, company financial reports, HKEX.

HEALTH ADVANCES

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# Our Ecosystem Offers Comprehensive Services

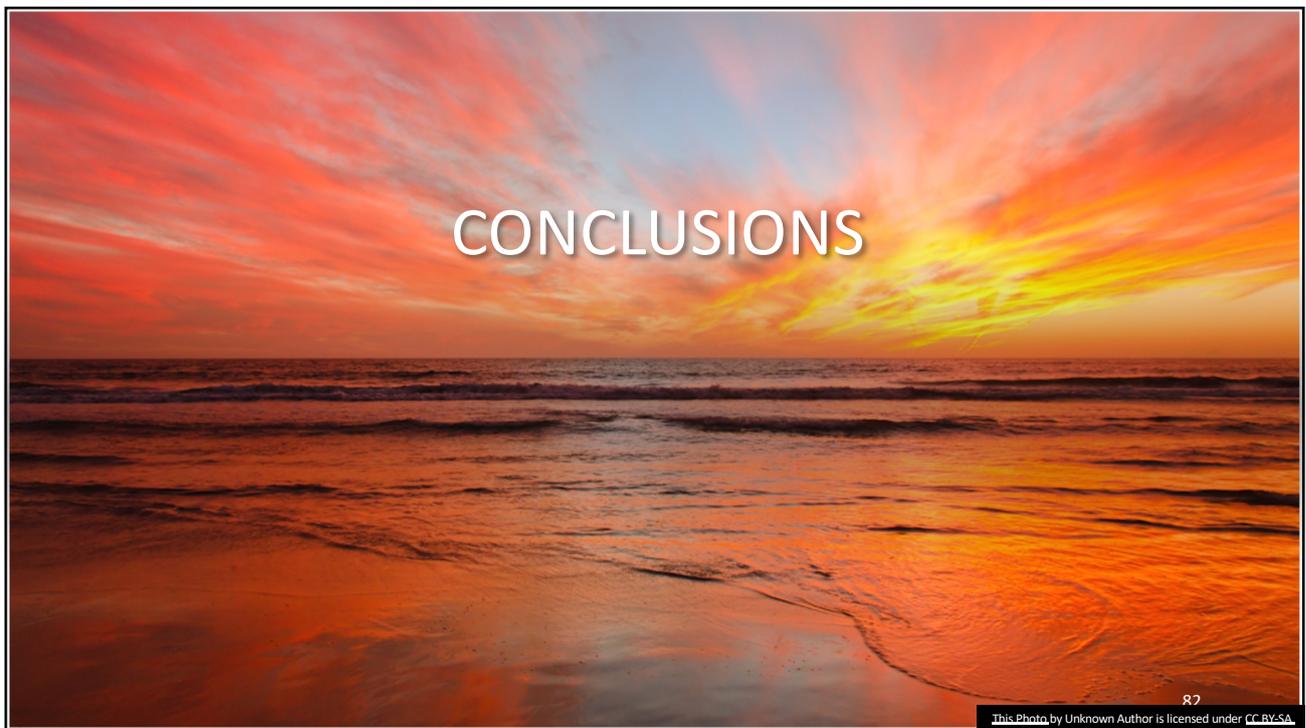
**平安好医生**

- Insurance
- E-commerce
- Doctors
- Hospitals
- Pharmacies
- Physiotherapy centers
- Health check-ups
- Fitness
- Beauty care
- AI-assisted
- Sub-healthy
- In-house medical team
- Treatment
- Internet

- 888 in-house doctors and medical assistants
- Hospital network of ~3,100 hospitals, including 1,000+ Class III Grade A hospitals
- Contracted with ~2,100 external doctors from Class III Grade A hospitals under "Renowned Doctor" program
- 7,500 pharmacy outlets
  - 国泰康健大药房
  - 健客网
- ~1,100 health check-up centers in over 300 cities
- ~500 dental clinics in about 60 cities
- ~70 aesthetic centers in about 30 cities
- Commercial insurance coverage by Ping An E Jia Bao

Note: Class III hospitals are multi-regional hospitals with large capacity that provide multiple regions with high-quality professional medical services, undertake higher education and scientific research initiatives, which are designated as Class III hospitals by the NHFPC hospital classification system. Data as of December 31, 2017

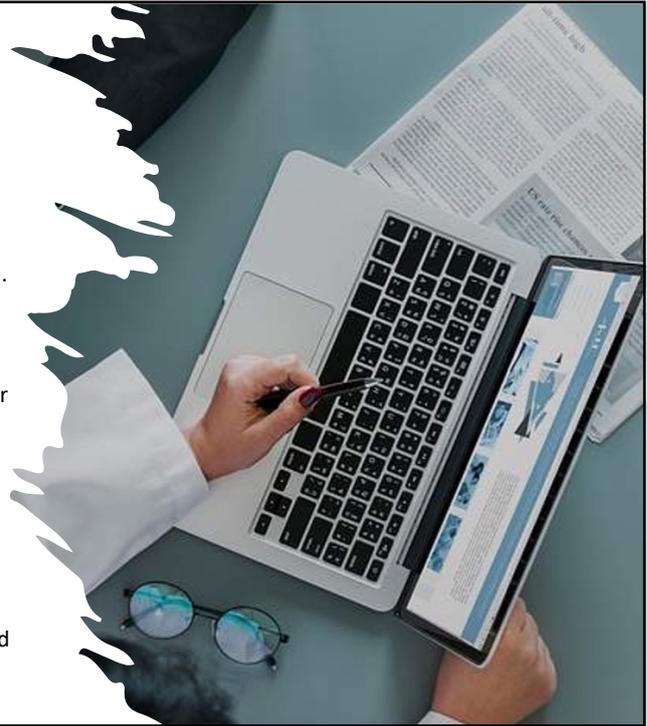
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## Conclusions

- Nowadays, **digital technologies** that have the potential to transform **ALL industries** to their core. Take a proactive stance to win!
- Data & data analytics as a new competitive force
- New and changing (digital enabled) **business models**: how do you want to create value together with partners in the ecosystem and how can everyone win being part of it?
- Digital strategy implies a shift from products & services to ecosystem solutions
- How to orchestration of an ecosystem?
  - Unipolar, producer driven orchestration doesn't work
  - Multipolar orchestration (supply and demand side driven)
  - Top-down and bottom-up



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## Conclusions

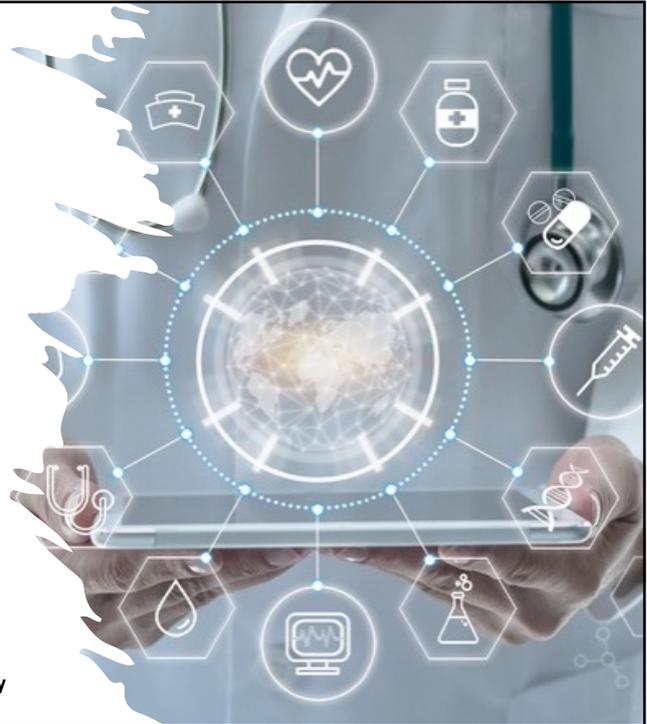
- Should western countries go for a combination of a data foundation (neutral party orchestrating the data exchange), connected platforms, and users as data owners?
  - Sharing data to construct a medical digital twin
  - In situ rights
  - What if we only want to learn from the data (AI training) ... you don't need to share the data only the data analytics.
- Is a policy measure as the EU "Payment Services Directive" (PSD2) the right direction?
  - " = financial institutions that manage payment accounts for customers have to provide third-party services access to those accounts if the account owners give their consent."



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## Conclusions

- A major role for B2B customers (hospital, agro-industry, energy players) to play in the digital transformation
  - Early adopters ... (e.g. use of AI in radiology)
  - Networks / consortia / associations of hospitals
  - Customer centric healthcare .... Connecting to primary care and patient organizations
- Public authorities / regulators / legislation:
  - ... it's not about technology, but about ecosystem emergence issues ... governments should play a proactive role
  - They can **level the playing field**:
    - They should understand ecosystem development and management
    - Be knowledgeable about digital technologies and their disruptive potential in **healthcare, mobility, energy, education**, etc.
    - **Act proactively** in shaping the **financial, regulatory and legal context** of ecosystems



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