ERASMUS+ KA2 Strategic Partnership
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HELP – Healthcare Logistics Education and Learning Pathway

OPETUSHALLITUS
UTBILDNINGSSTYRELSEN

Future outlook

Implications of digital trends in healthcare logistics

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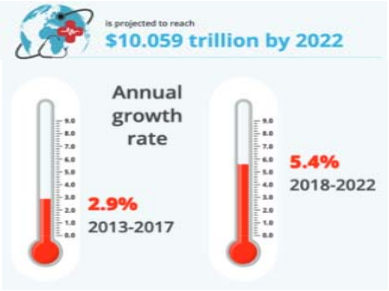
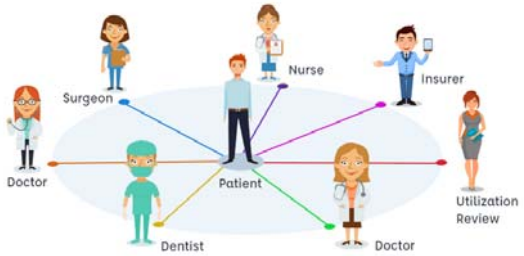
Introduction

- Pressure on financial sustainability due to
  - Higher life expectancy of population
  - Increased incidence of chronic diseases
  - Shift from single condition to co-morbidity

2018 Deloitte Global Health Care Outlook



- Central role of patients: patient empowerment to ensure efficient, effective, transparent and personalized care services
- Expansion of care continuum beyond hospital walls (i.e. outpatients) requires increased access to health data



➔ **Future initiatives respond to changes in care delivery!**

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Shift towards digitalization in healthcare

Hospitals need to align processes, technologies and people: *deliver the right product to the right patient at the right time using technological advances*

Supply Chain Management (SCM) is crucial to achieve **patient-centered, accessible, high-quality and cost-effective care** in the value-based care model

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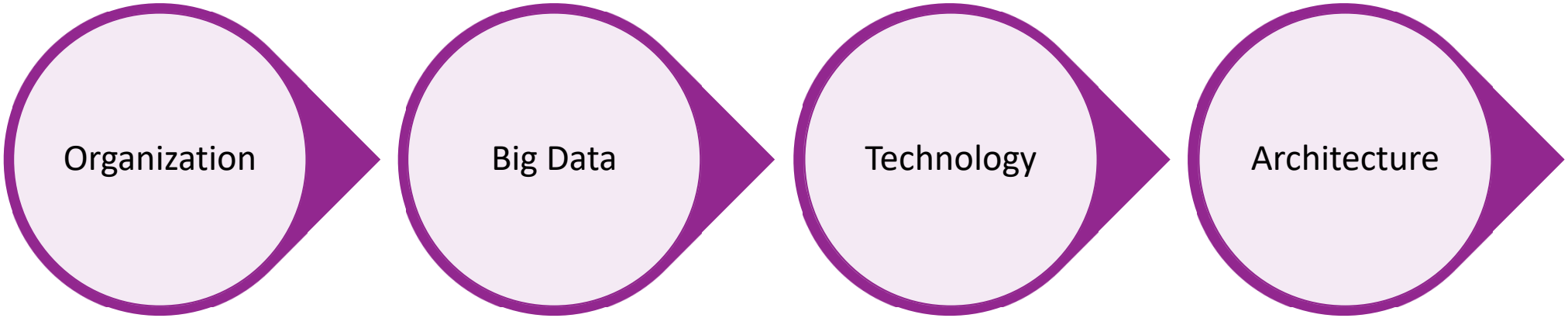
4 trends to shape the future healthcare system



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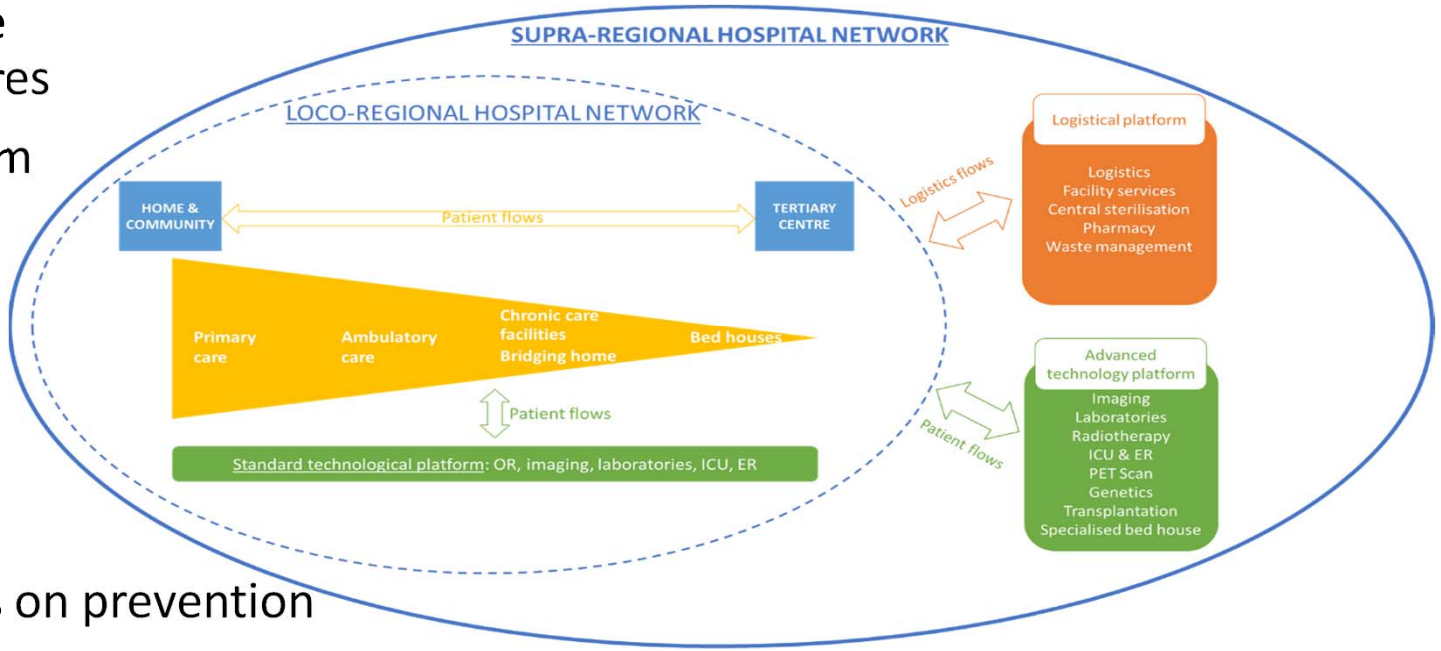
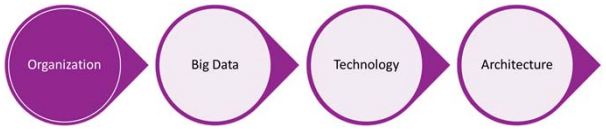
Creating hospital networks:

- Clinical services from home to specialized tertiary centres
- Logistics & facilities platform (outsourcing)

➔Information system management: **Electronic Health Record (EHR)** for information-sharing

➔Silo-based to integrated processes: focus on prevention and well-being





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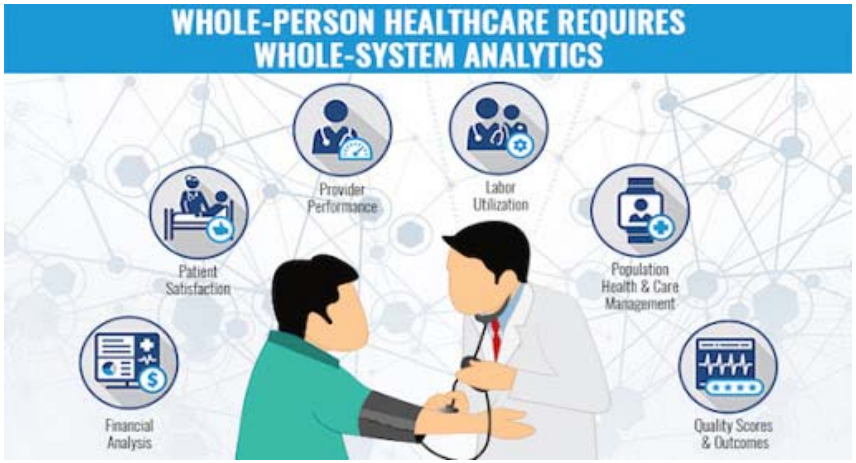
Data management in healthcare

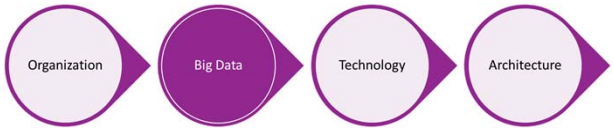
- Improve patient, material and information flow: need for **transparency**
- "**Big Data analytics**" to manage large amounts of data (patient, public health, logistics)

➔Requires appropriate technology infrastructure to move from storing data to extracting insights

➔Lessons learned from Industry 4.0 to enable **personalized healthcare, interoperability, responsivity, prevention and sustainability**



Cybersecurity → General Data Protection Regulation (GDPR) to avoid data misuse



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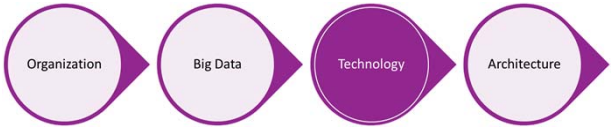
Technological enablers

- Ensure digital transformation and interoperability to improve decision making

Enabler	Application	Functionality
AI/ML	Logistics robots, Autonomous Guided Vehicles (AGVs)	Food, linen or medication distribution Patient transportation
	Chatbots	Communication with patients
	Risk prediction approaches	Risk assessment of (new) equipment and devices
	Decision support systems	Operating room programming
IoT/virtual health/ telehealth	Mobile applications (health apps), wearables Teleconference appointment	Remote monitoring of personalized healthcare Live video conferencing for virtual appointments between patient and doctor
Digital twin	Data-driven personalized medicine	Computing platform enabling mass personalization of care delivery
Block chain	EHR	Accessibility to decentral medical records
Additive manufacturing	3D/4D printing of medical devices	Highly responsive care provision close to patient bed



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From “sick” to “health” care environment

- Institution-centric → patient-centric and healing building
  - Active participation in determining care pathways: customized rooms, smart ergonomic premises, noise management, etc.
- Improve **wayfinding** systems to stimulate self-control (patient empowerment) and improve staff productivity
- Strive towards **prevention**, safety and environmental friendliness

Organization → Big Data → Technology → Architecture

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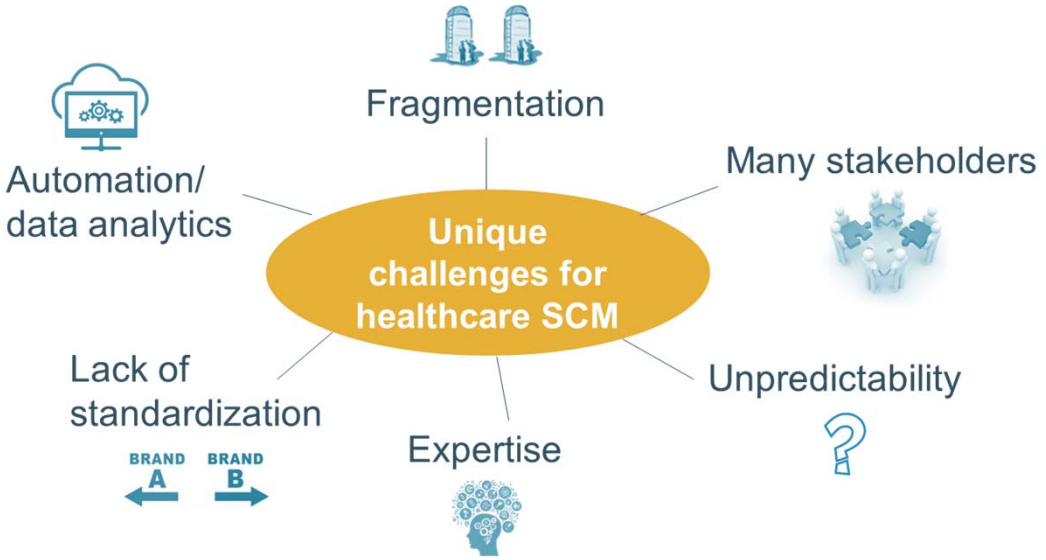
Impact of digital trends on healthcare SCM

Hospital IT systems improve the information flow, enhance connectivity and coordinate services among healthcare partners

➔**Challenges** to implement effective SCM in healthcare
➔ Align processes, technology and people



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Fragmentation

- Silo-based vs. Digital Supply Networks (DSN): performance management to control strategy and enable continuous improvement

Many stakeholders

- Common language (collaborative planning framework)
- Active participation and collaboration to obtain responsive supply chain

Unpredictability

- Data-driven inventory management: increased visiblity
- Real-time monitoring: Big Data supports decision making, streamlines processes and improves hospital performance

Expertise

- Multi-disciplinary research: knowledge transfer, best practices (Industry 4.0)
- HELP project: consolidate patient care and logistics processes

Standardization

- Product standardization (GS 1) and data standards for coordinating processes

Automation

- Technology infrastructure for analytic support: AI, ML, IoT, telehealth to improve transparency and interoperability
- RFID and barcoding: global product identifiers and automated data capture to create end-to-end supply chain

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Promising research directions

Create value through a healthcare digital transformation:

- Align IT systems, processes and people (e.g. EHR for patient data)
- Data interoperability to improve information exchange, supply chain responsivity and standardization
- Innovative technologies in AI, IoT, cloud-based computing to achieve cost-effective, accessible and personalized care

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