School of Business & Economics
Department of Information Systems

Welcome to Digital Health[1]

Summer 2022

Prof. Dr. Daniel Fürstenau, Rahel Gubser

April 27, 2022, Introduction

[1] Vorlesungsverzeichnis: Digital Health (10181611)

Agenda

- **Introduction**
- **Motivation**
- **Course Overview**

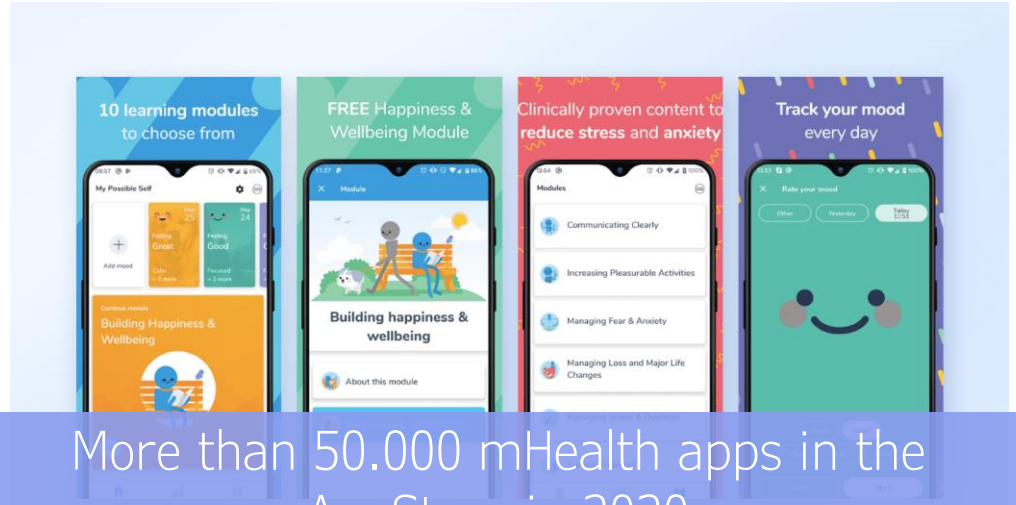
Who are we

Name:	Daniel Fürstenau
Affiliation:	Assistant Professor CBS DIGI, Charité
Background:	PhD in Information Systems, FUB
Research:	IT Management, Digital Platforms & Ecosystems in Healthcare
Topics:	Digital Health, Value-based Healthcare, Digital Health Platforms, AI4Health
Fun fact:	Donated data for a wearables study
Contact:	dfu.digi@cbs.dk

Who are we

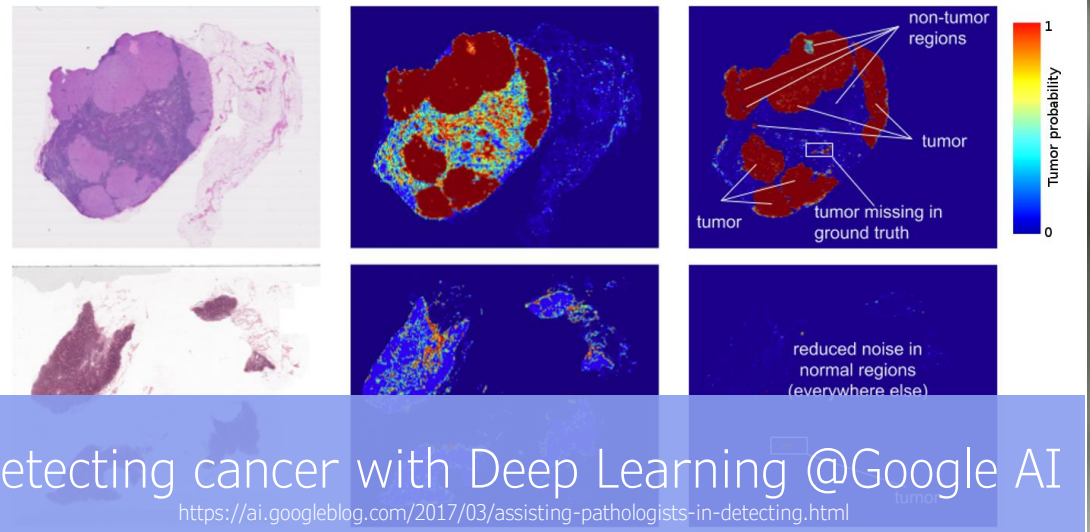
Name:	Rahel Gubser
Affiliation:	Doctorate Candidate, Charité Berlin
Background:	M.A. HSG in Business Management, St.Gallen
Research:	Customer oriented Product Management, DiGA Ecosystems, Interoperability
Topics:	Digital Health, Value-based Healthcare, SaaS Hospital Transfers, Biz Model Developement
Contact:	rahel.gubser@fu-berlin.de

Medicine`s future?



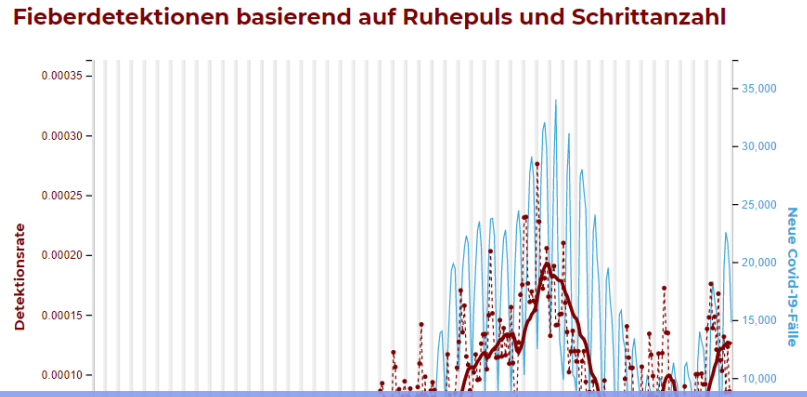
More than 50.000 mHealth apps in the AppStore in 2020

https://de.statista.com/statistik/daten/studie/1191205/umfrage/anzahl-der-bei-apple-verfuegbaren-mhealth-apps/



Detecting cancer with Deep Learning @Google AI

https://ai.googleblog.com/2017/03/assisting-pathologists-in-detecting.html



RKI predicts number of covid cases using data from 500,000 people by steps and heart rate

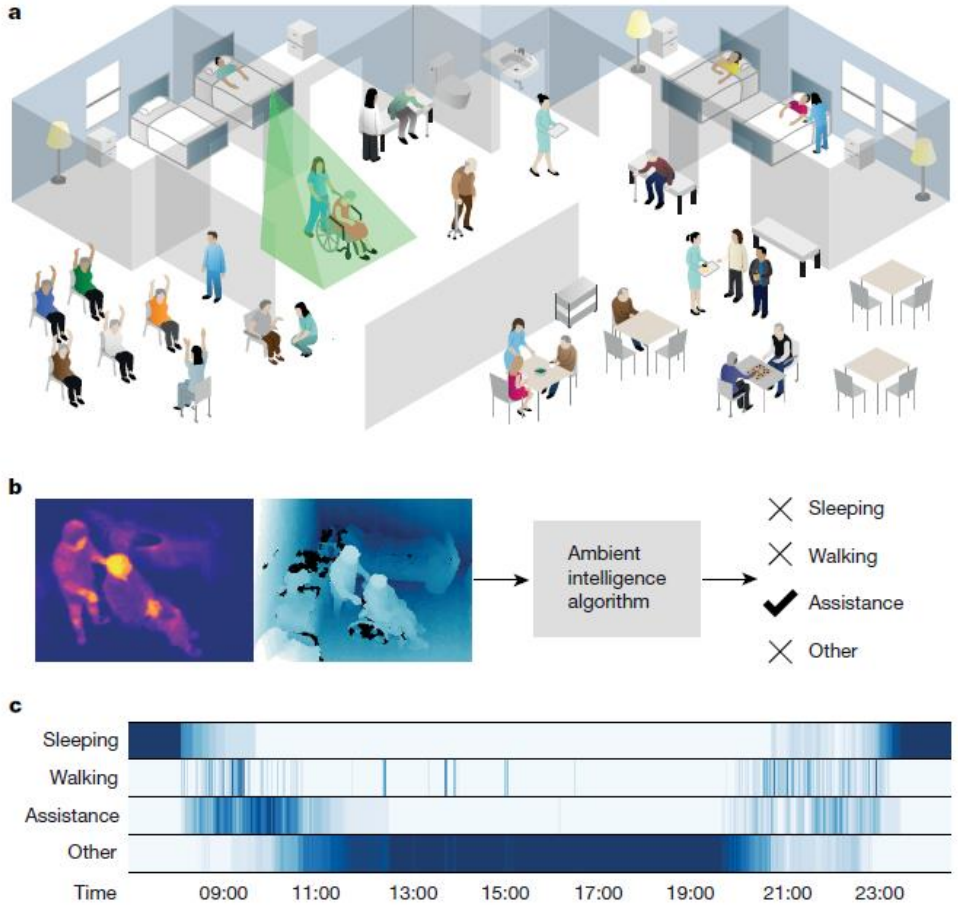
https://corona-datenspende.de/

FDA approved ECG, Apple watch detects risk of heart attack in an 80 year old woman

https://www.heise.de/mac-and-i/meldung/Apple-Watch-rettet-80-jaehrige-nach-Fallungslueck-4400182.html

Illuminating the dark spaces of healthcare

- With active and passive sensor technology long-term tracking of persons/patients becomes possible
- Shift from episodic, discontinuous care to continuous and long-term tracking
- This new data together with availability of algorithmic possibilities opens new avenues for better diagnosis and treatment → ambient intelligence
- Introduces new challenges to data privacy and anonymization («privacy preservation»)



Source: Haque, A., Milestein, A., Fei-Fei, L. (2020) Nature volume 585, pp. 193–202

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Health care and IT – our starting point

- Focus: **digital health:**

- In health care, there is **a need to share and coordinate patient information** and **a need to access medical information** regardless of location or time; technology can accommodate these needs.

- The health care sector is a **technology-intensive business environment** in which digital technology is a key source.

- With the advent of the internet, high speed computers, voice recognition, mobile technology, etc. **health care professionals today have many tools at their disposal.**

The triple aim of global healthcare goals

Higher Quality

How to measure attainment of these goals?

Lower Costs

Increased Patient Access & Involvement

8

Potential benefits of information technology

HIGHER QUALITY

Improved patient safety

Standardization and practice guidelines

Novel treatments

Foster prevention

LOWER COSTS

Improve clinical workflows

Improve physician patient communication

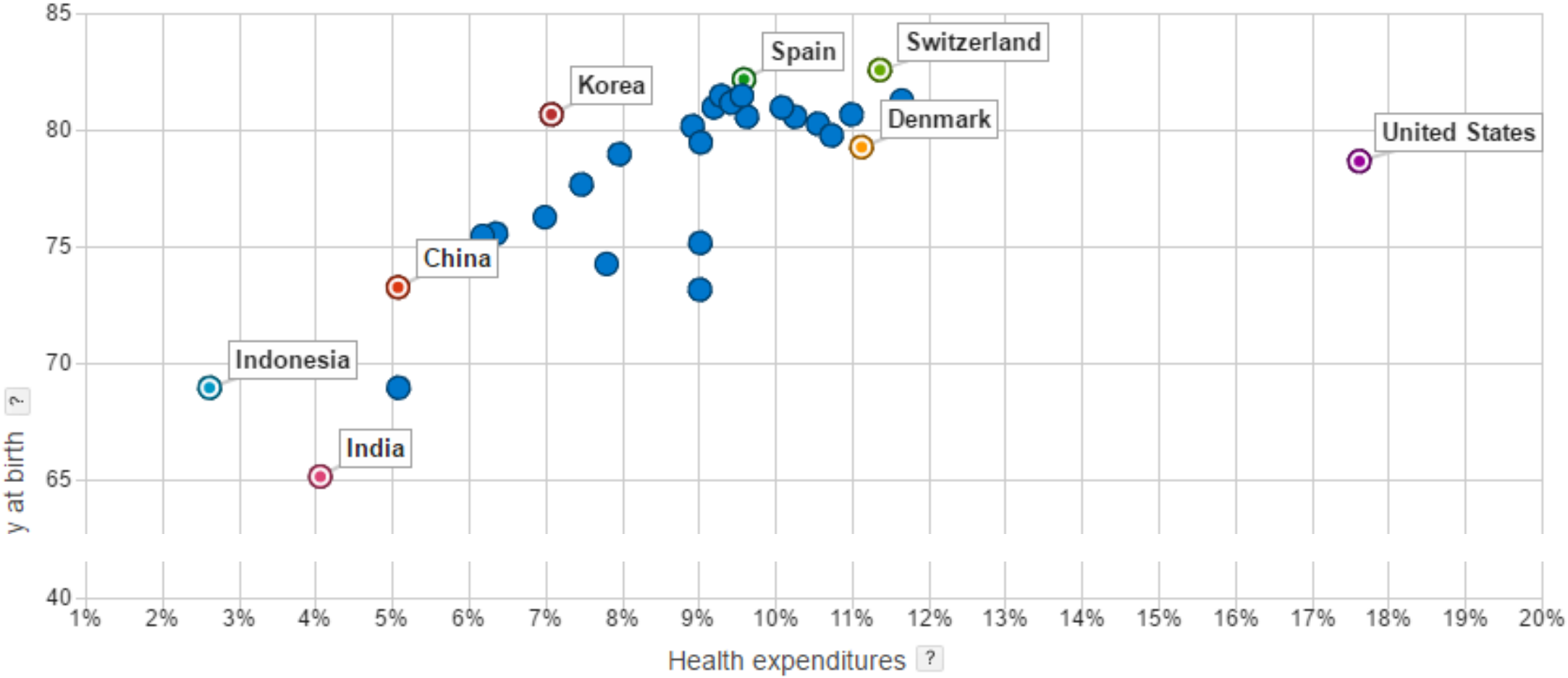
Reduce health care spending

INCREASED PATIENT ACCESS & INVOLVEMENT

Improve access to information

Enable continuity of care

Bringing cost and quality together…



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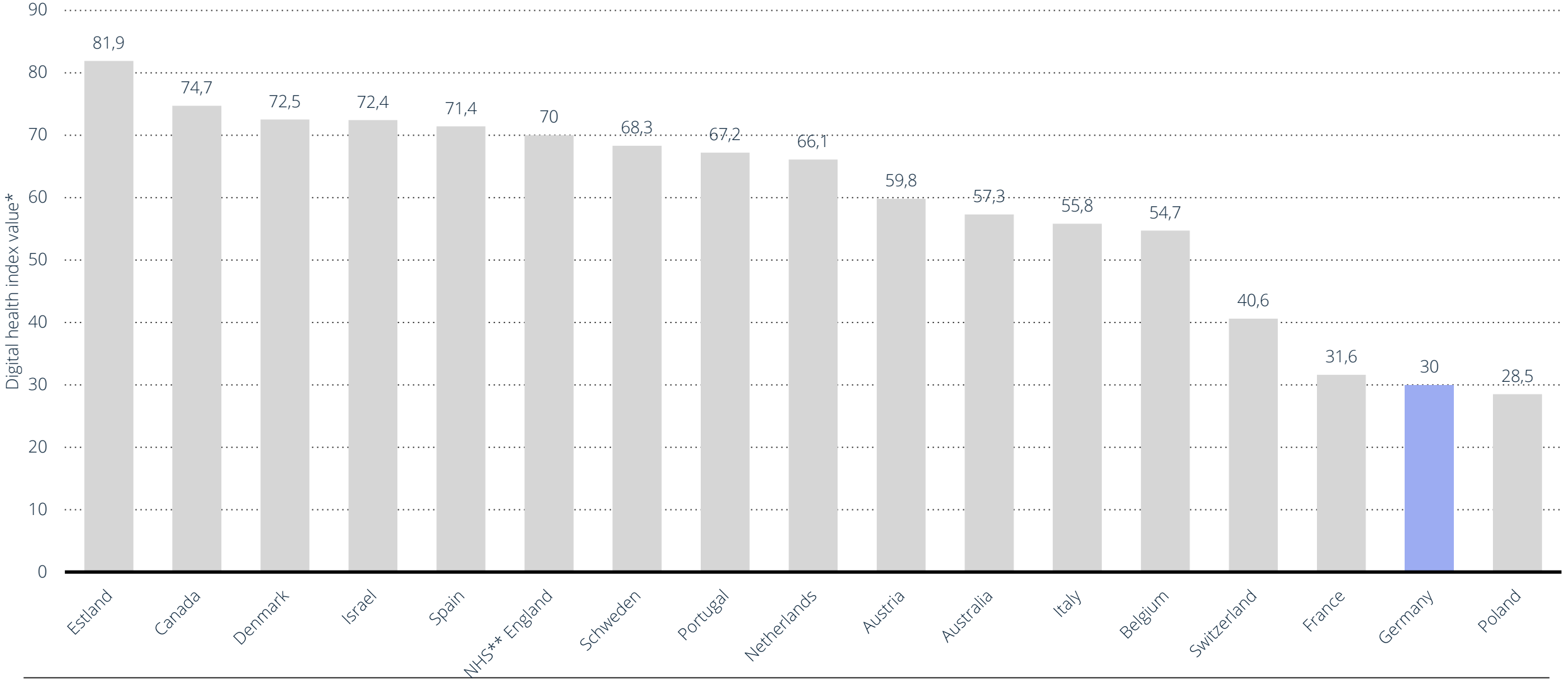
The big theme

- The **health care sector** is a domain with a relatively **low degree of digitalization**.
- This presents a **great unrealized potential to harness information technology** to help **achieving the health care delivery goals: AN OPPORTUNITY!**
- This can **lower costs, higher quality,** and **increase patient access** to health care services
- The course lays the **foundations** for discussing the **potentials** and **challenges** of **implementing information technology** in the **health care** industry

Digital Health Index: State of the Digitalization



Source: Bertelsmann Stiftung; ID 1070546

Learning objectives

- **LO 1.** Describe the function, challenges, and opportunities of using digital technologies in health care.
- **LO 2.** Identify and describe the requirements for designing, implementing, and using digital technologies in health care.
- **LO 3.** Analyze and discuss specific healthcare IT cases based on the theories presented in the course, and provide recommendation for practice.
- **LO 4.** Reflect on how the health care industry can leverage on digital technologies to address current health care objectives and requirements.

Course overview: Timeline

	Monday, 13th June					Friday, 17th June	Tuesday, 28th June	Friday, 1st of July
Meeting whole course	Kick-off & Team building	Q&A discussion	Q&A discussion + guest lecture	Q&A discussion + guest lecture	Q&A discussion + guest lecture	Q&A discussion + guest lecture		
Work on project report	**Workshops**							
Recorded Input Sessions	Input I	Input II	Input III	Input IV	Input V	Input VI		
Submission							Project Report	Oral Exam

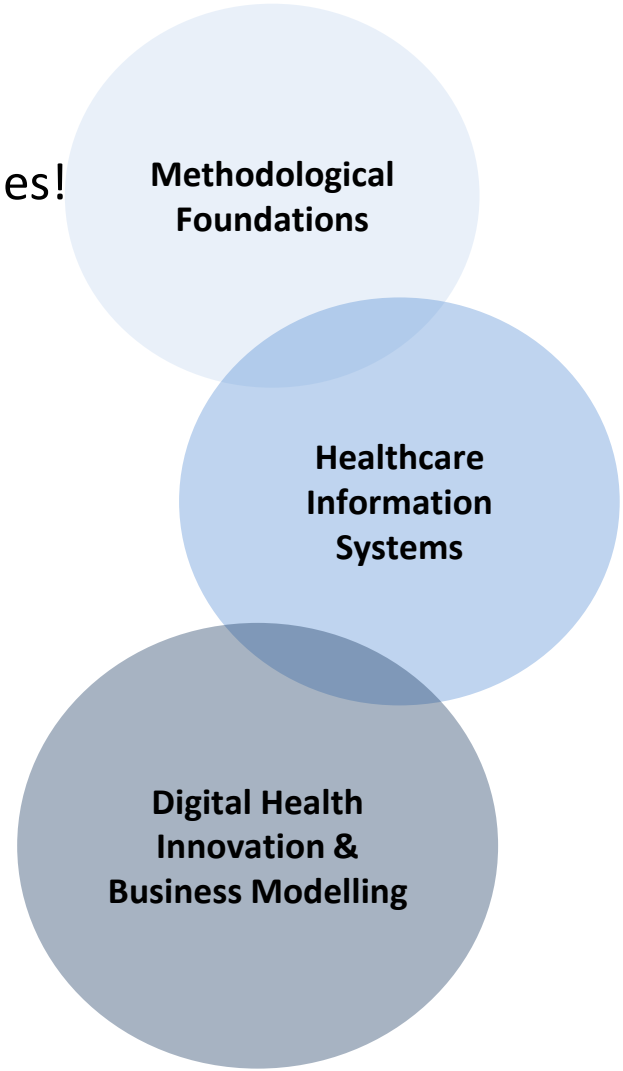
Course Overview: Input sessions

- Session 1: Introduction: Fixing healthcare with the help of digital technologies!
- Session 2: Managing Complex IT Projects in Healthcare

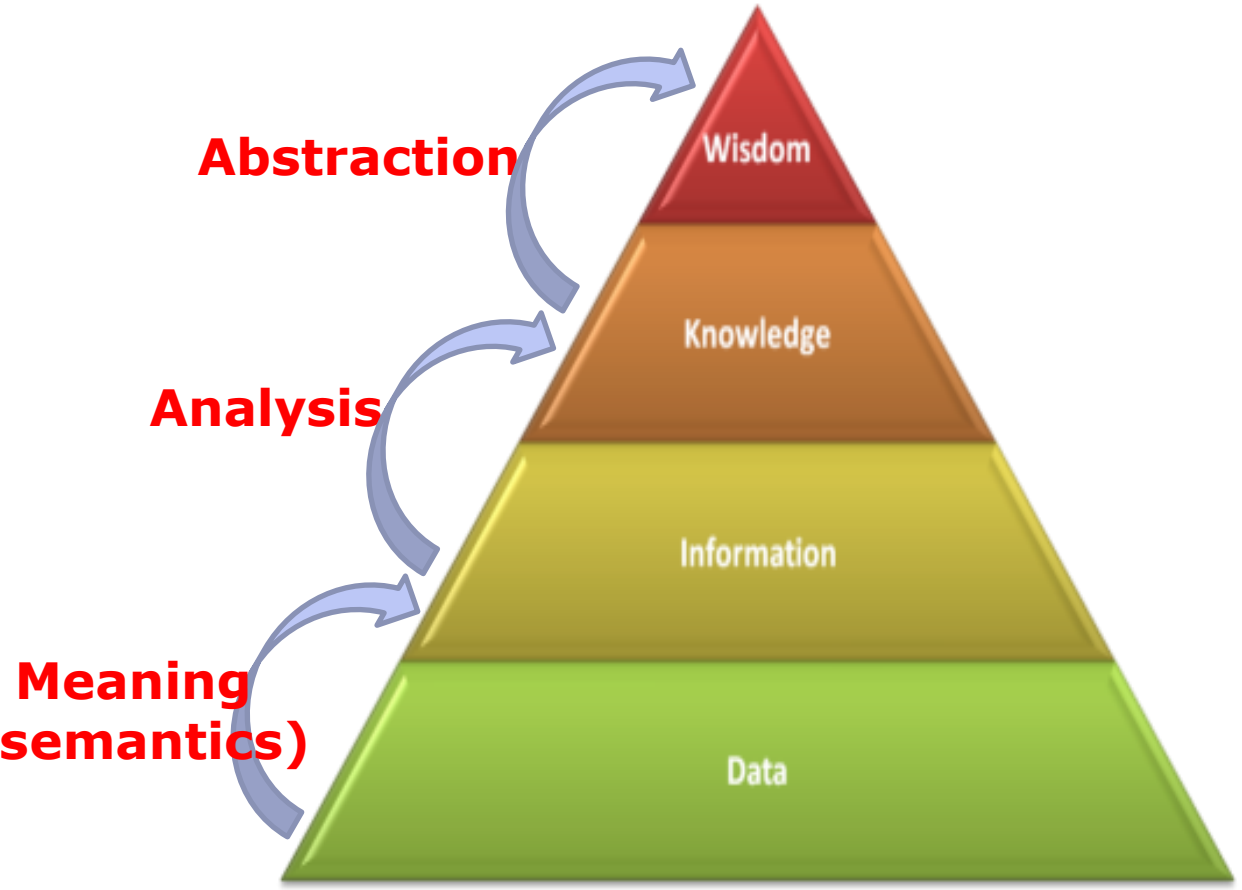
- Session 3: Electronic Health Records Implementation
- Session 4: Health information exchange, standardization & policy
- Session 5: Privacy & Security in Health IT

- Session 6: Mobile and Digital Health, Design Thinking & Agile Development
- Session 7: AI in Medicine
- Session 8: Digital Health Business Models and Marketing

- Session 9: Course Summary & Wrap Up



Health care and IT – how to make data useful



Wisdom: embodies principles, insight and moral by integrating knowledge. Answers 'why' questions.

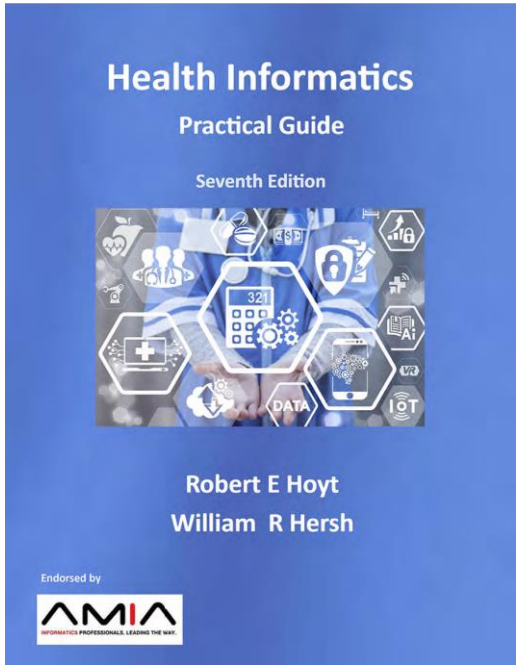
Knowledge: includes facts about real world entities and the relationship between them. It is an understanding gained through experience. Answers the 'how' question.

Information: aggregation of data that makes decision making easier. Meaning is attached and contextualized. Answers 'what', 'who', 'when', 'where' questions.

Data: unorganized and unprocessed facts; static; a set of discrete facts about events. No meaning attached to it as a result of which it may have multiple meanings.

Health information technology provides the tools to generate information from data that health care professionals can then turn into knowledge and wisdom

Readings



\+ ARTICLES &
BOOK CHAPTERS

Deliverables

- 6 ECTS

- Students apply the learned content to develop an innovative healthcare solution in a project group (group size: 2-3).
- Several rounds of feedback are provided, allowing the groups to improve their ideas.
- Students identify specific application scenario and independently obtain secondary data and use the data to assess the feasibility of the idea.
- The course concludes with a summary and wrap-up, in which students pitch the case they investigate for their synopsis paper.

- This pitch will be presented (Oral exam) and summarized within a project report (4 pages)

- Hand-in deadline: June 28, 2022
- Oral exam: July, 1st 2022

What do you need to do now?

- There are no formal prerequisites to participate. Prior knowledge of healthcare or digital technologies is helpful, but not a must.

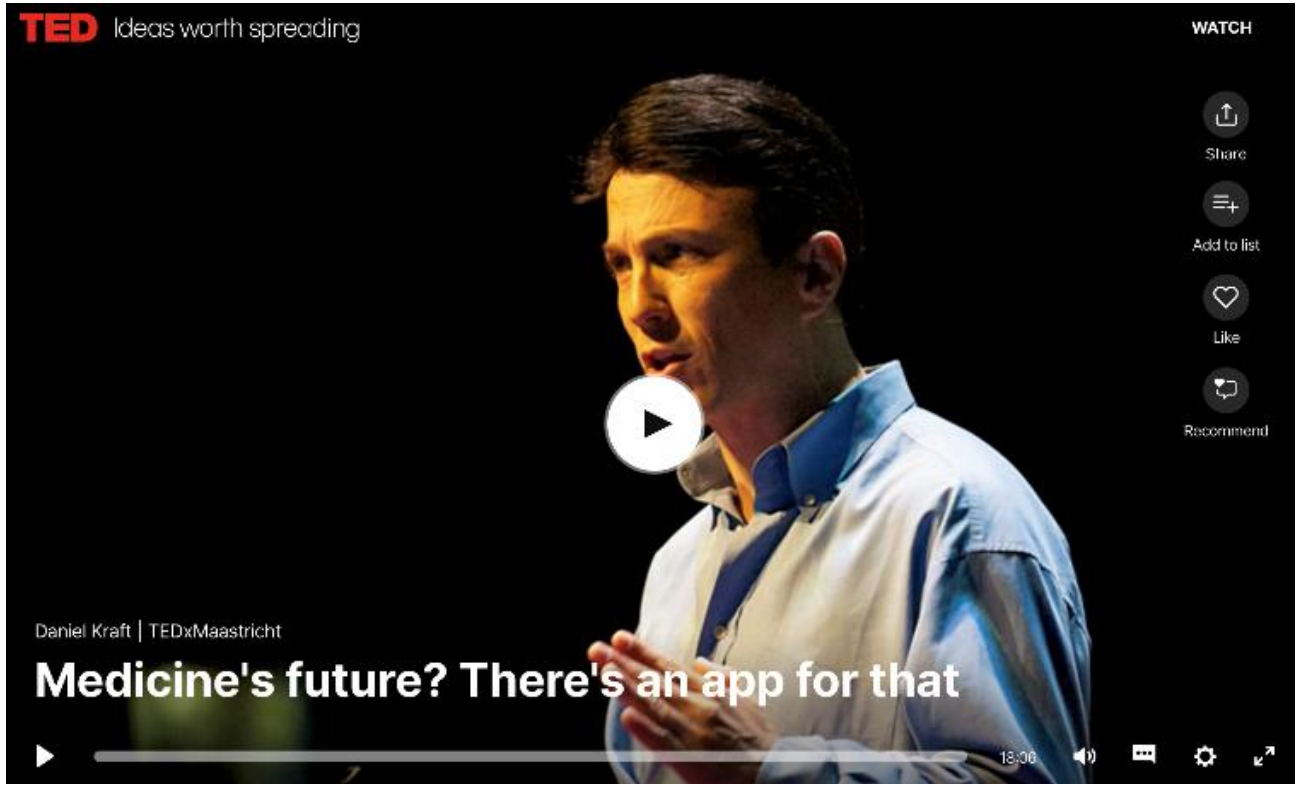
- Regular enrollment via Campus Management for FU students until May 6, 2022

  and for other students please send an email to rahel.gubser@fu-berlin.de until same date.

Find more inspiration!

https://www.ted.com/talks/daniel_kraft_medicine_s_future_there_s_an_app_for_that/up-next?language=de

TEDx Talk by Daniel Kraft



- 3D printing
- Moores law: more mobile phones
- Exponential development
- Disruptive innovation
- Medicast: Doctor comes to house
- Exponential technologies: Wearables
- Big Data
- 40.000 apps in App Store
- Genome sequencing