

UNIVERSITÄTS MEDIZIN FRANKFURT
GOETHE-UNIVERSITÄT

Inside Frankfurt University Hospital: Digital Transformation Priorities and Opportunities for Norwegian Health Tech Companies

University Medicine Frankfurt

15.10.2026

Agenda

01 Introduction and short history of UMF

02 Digital UHF 1.0

03 Digital UHF 2.0

04 Specific Projects

05 Governance

06 Current challenges & political environment

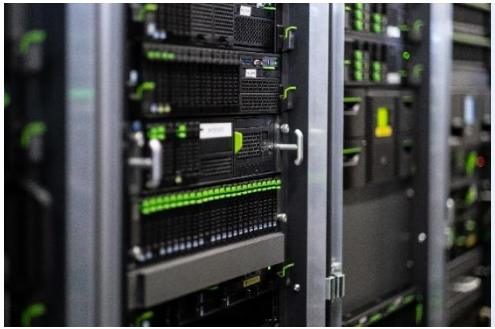


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Introduction and history

CMIO

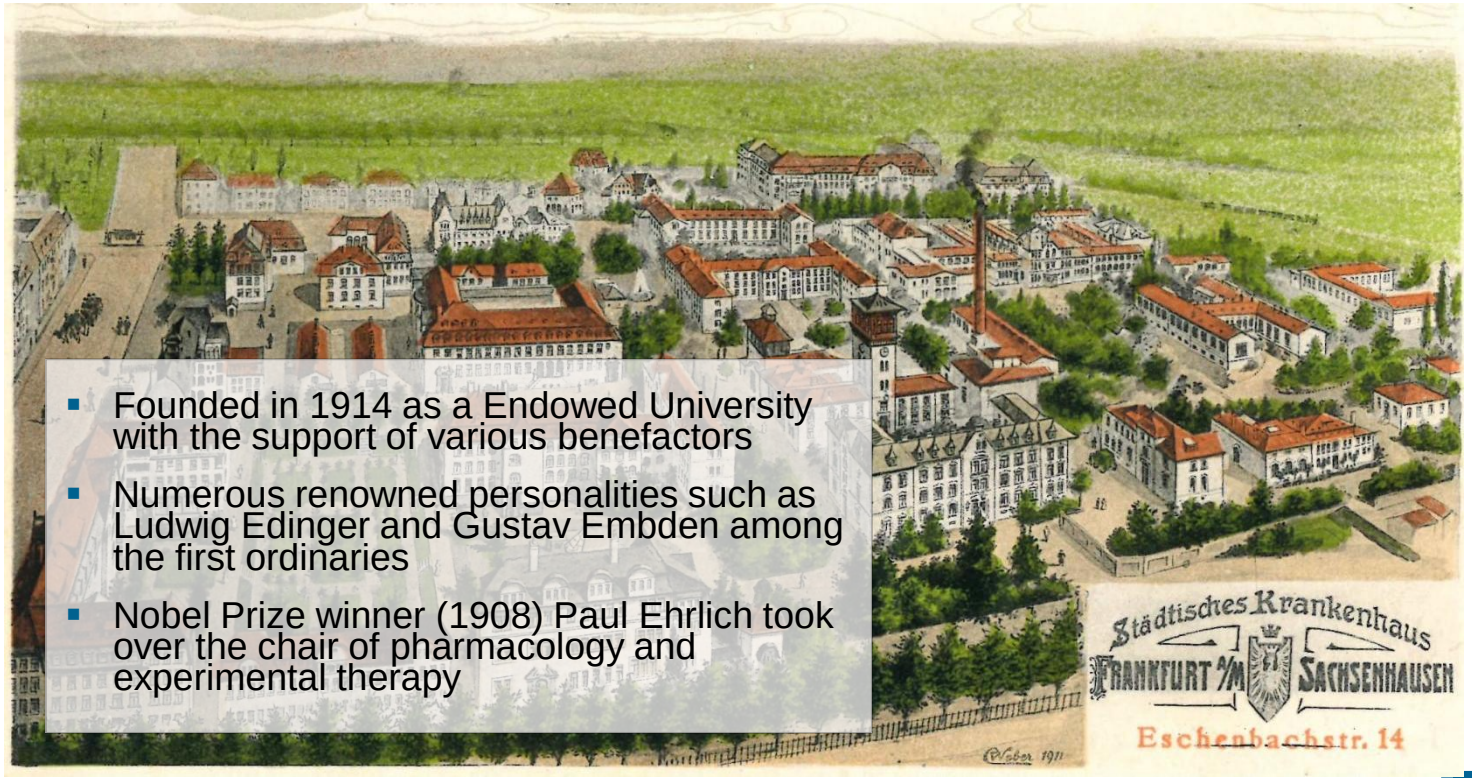
- Chief Medical Informatics Officer (CMIO), Head of Executive Department for medical IT-Systems and digtalization
- Executive Director of the University Center for Digital Healthcare (UCDHC)
- Senior Physician Gastroenterology





Place of history

University Medical Center Through the Ages



- Founded in 1914 as a Endowed University with the support of various benefactors
- Numerous renowned personalities such as Ludwig Edinger and Gustav Embden among the first ordinaries
- Nobel Prize winner (1908) Paul Ehrlich took over the chair of pharmacology and experimental therapy

Frankfurt University Medical Centre in figures

over **100** buildings
33 clinics and institutes
23 research institutes
the site stretches for
over **1.5 km**

over **490,000** outpatient treatments
over **50,000** inpatient cases
over **1,300** inpatient beds

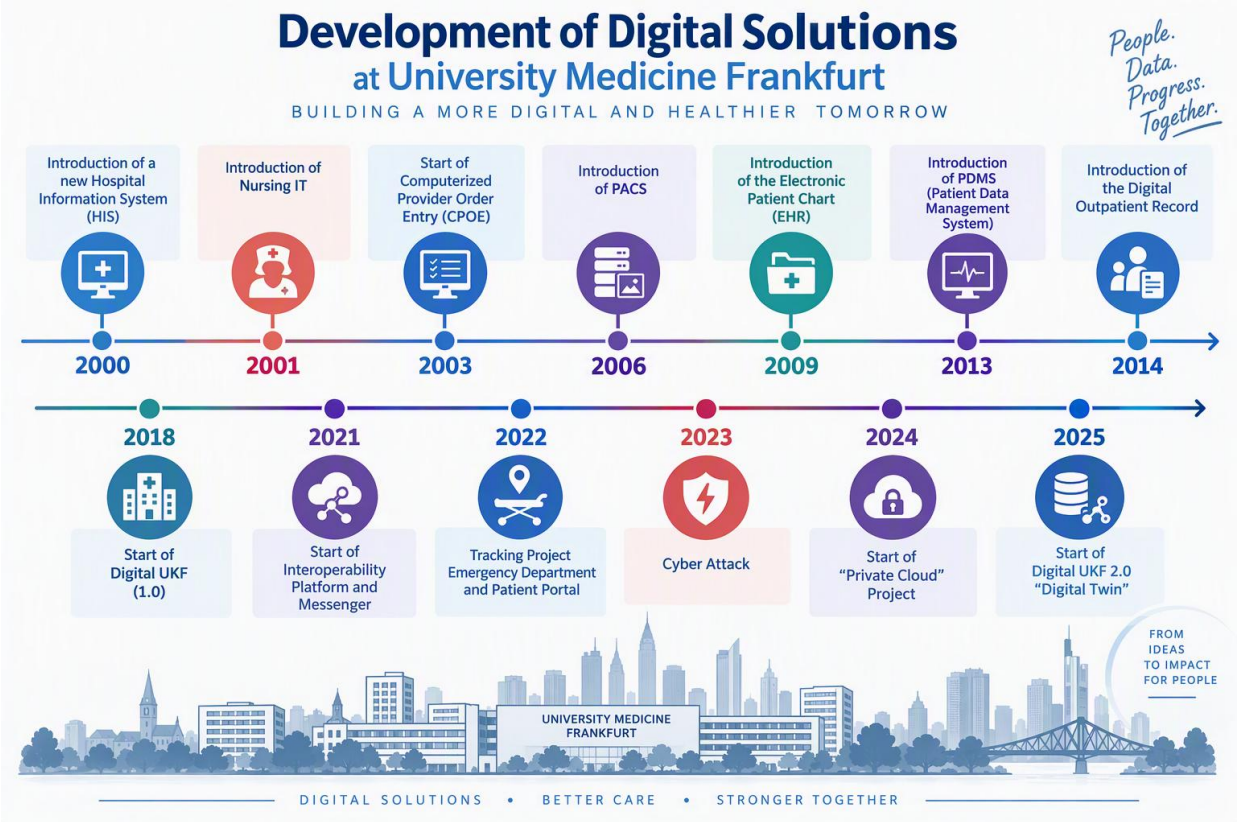
over **8,500** employees
around **4,000** students
around **600** apprenticeship places





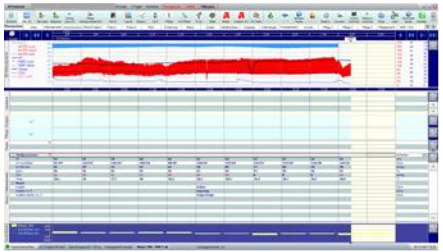


More than 25 yrs. of experience

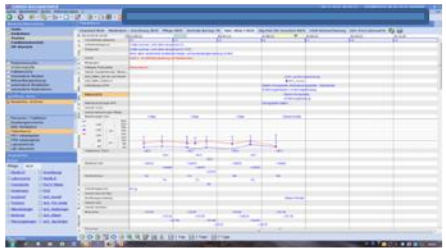


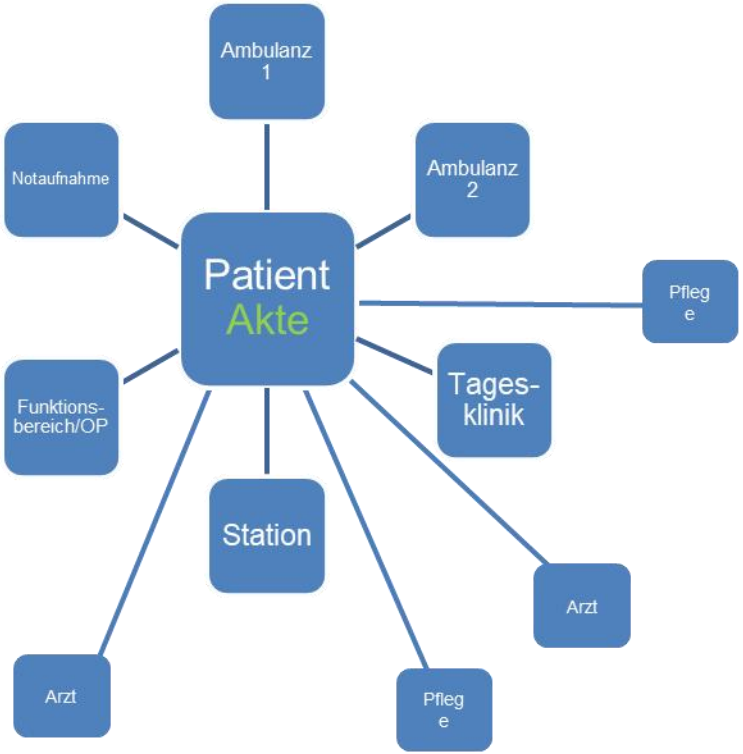
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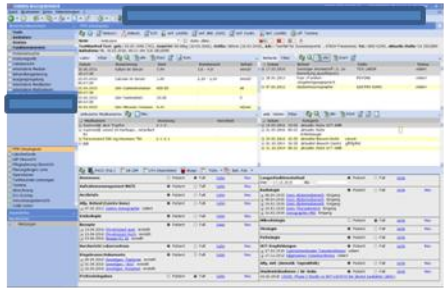
One central digital patient file

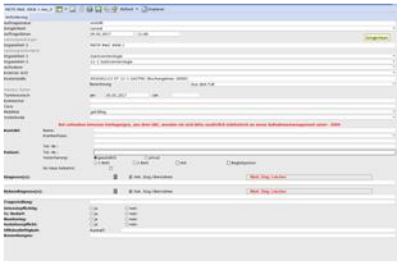








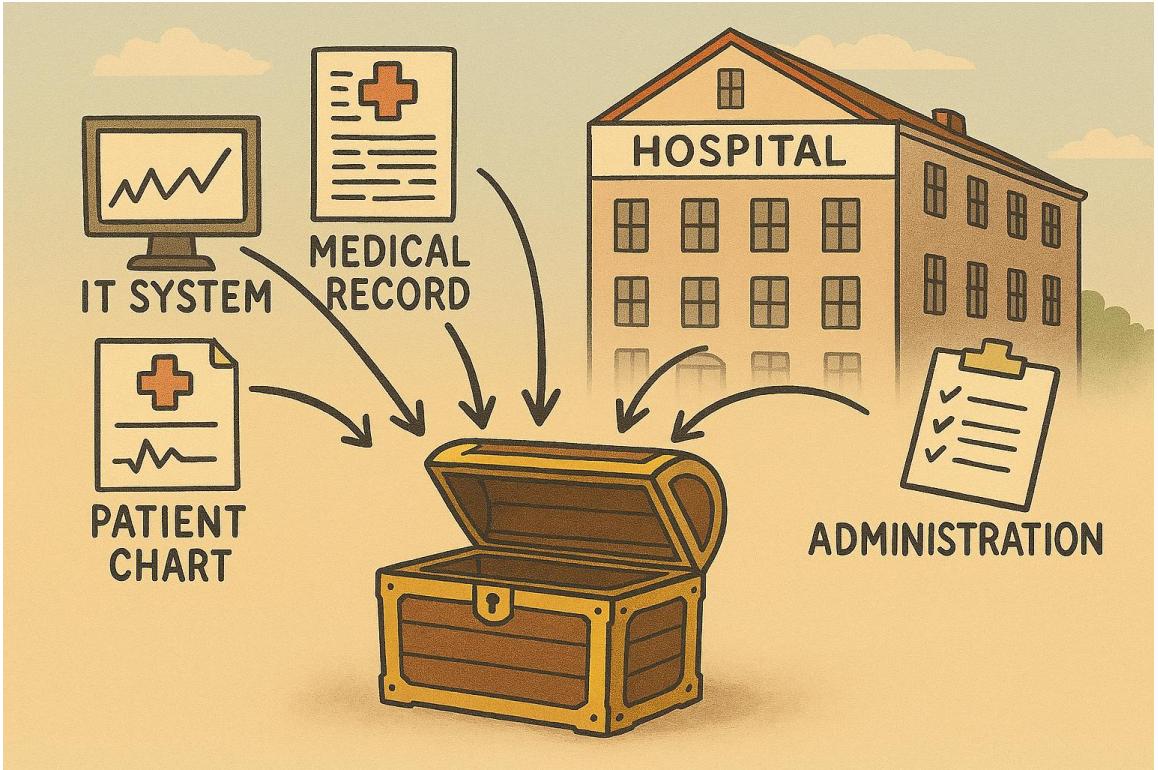




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    <last>Meier</last>
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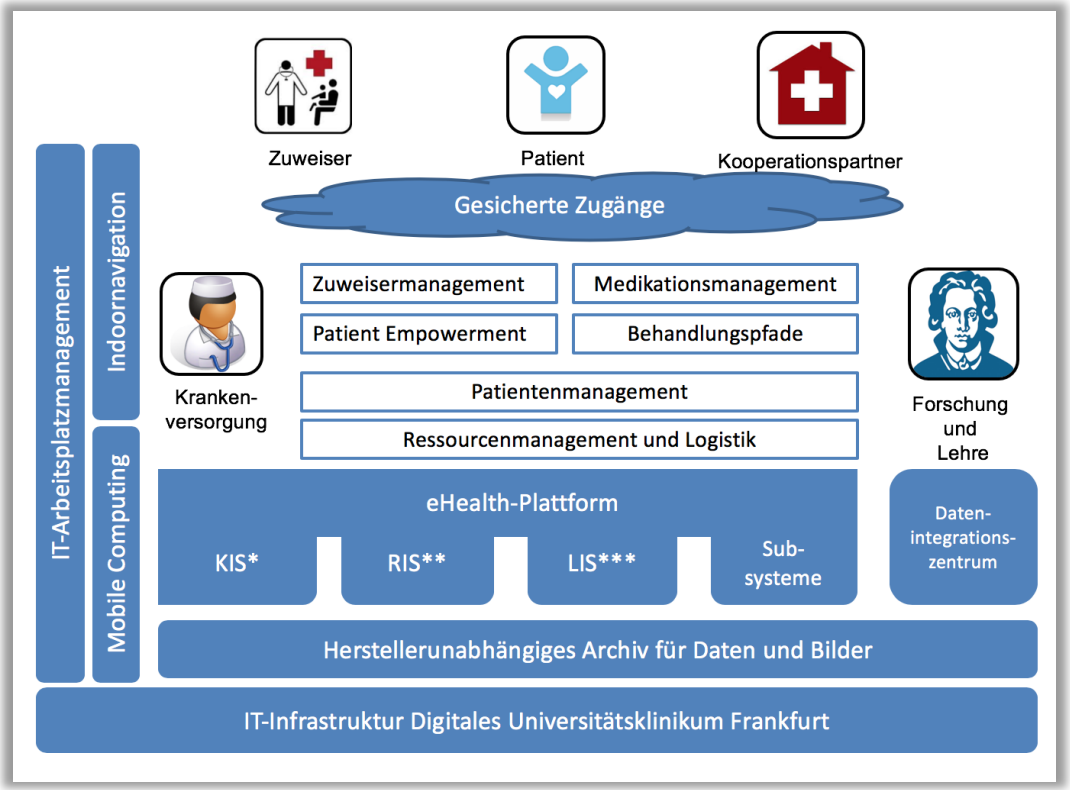
Data is the new Treasure



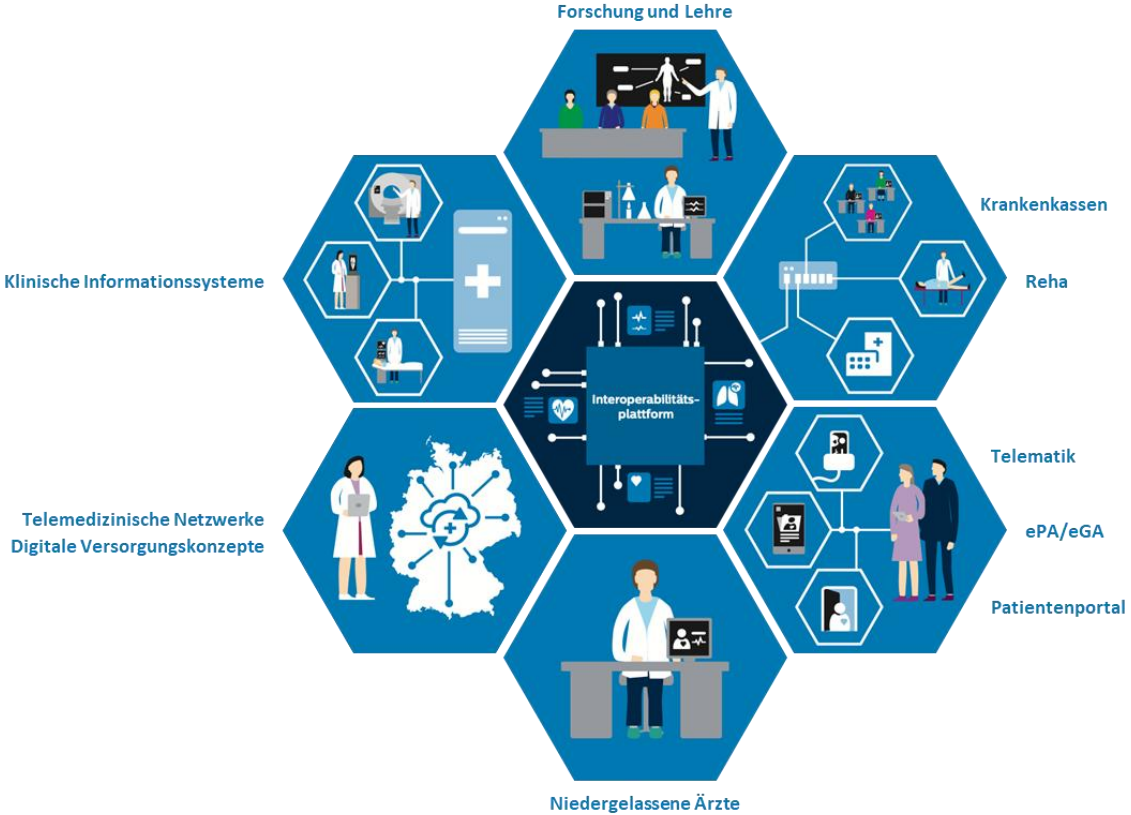
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Digital UHF (1.0) – IOP-Suite

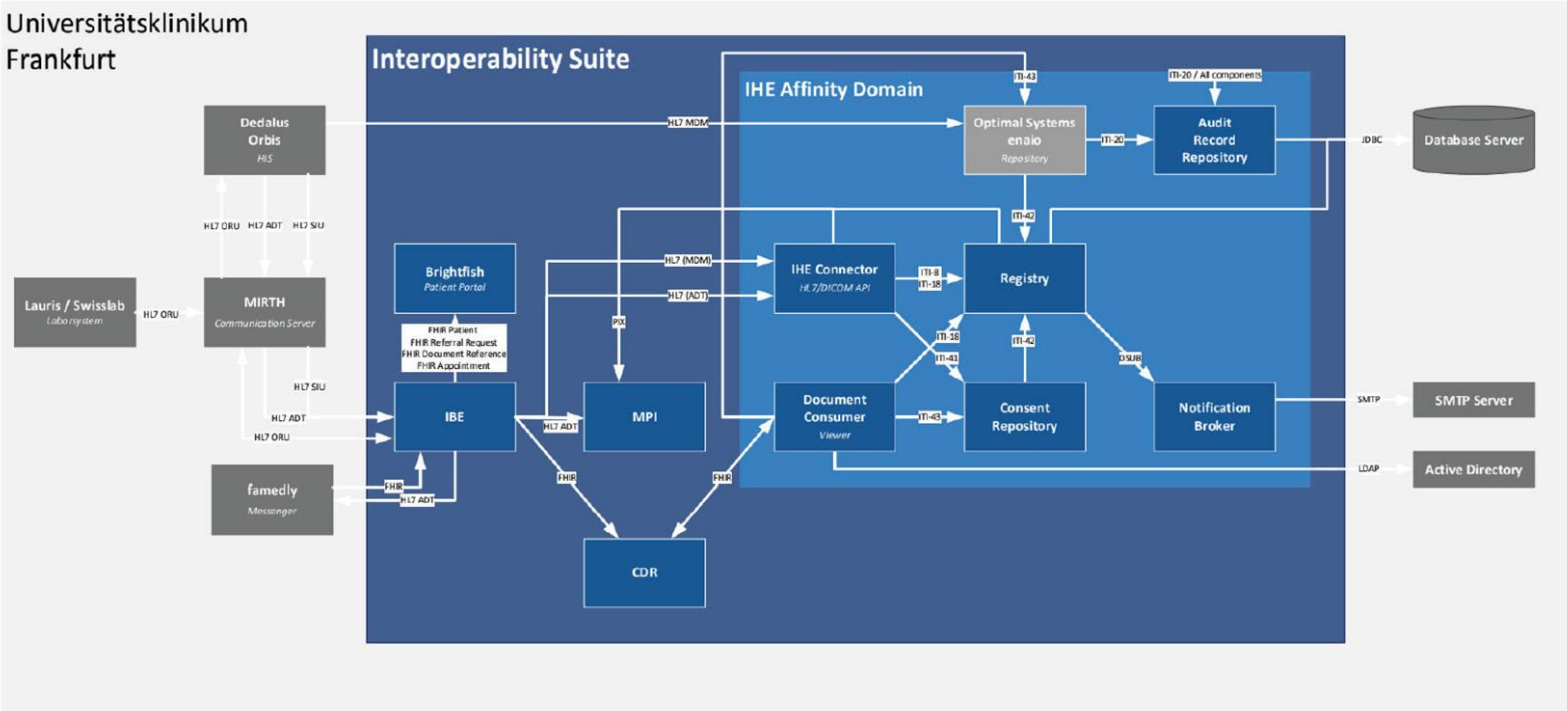
2018-2024



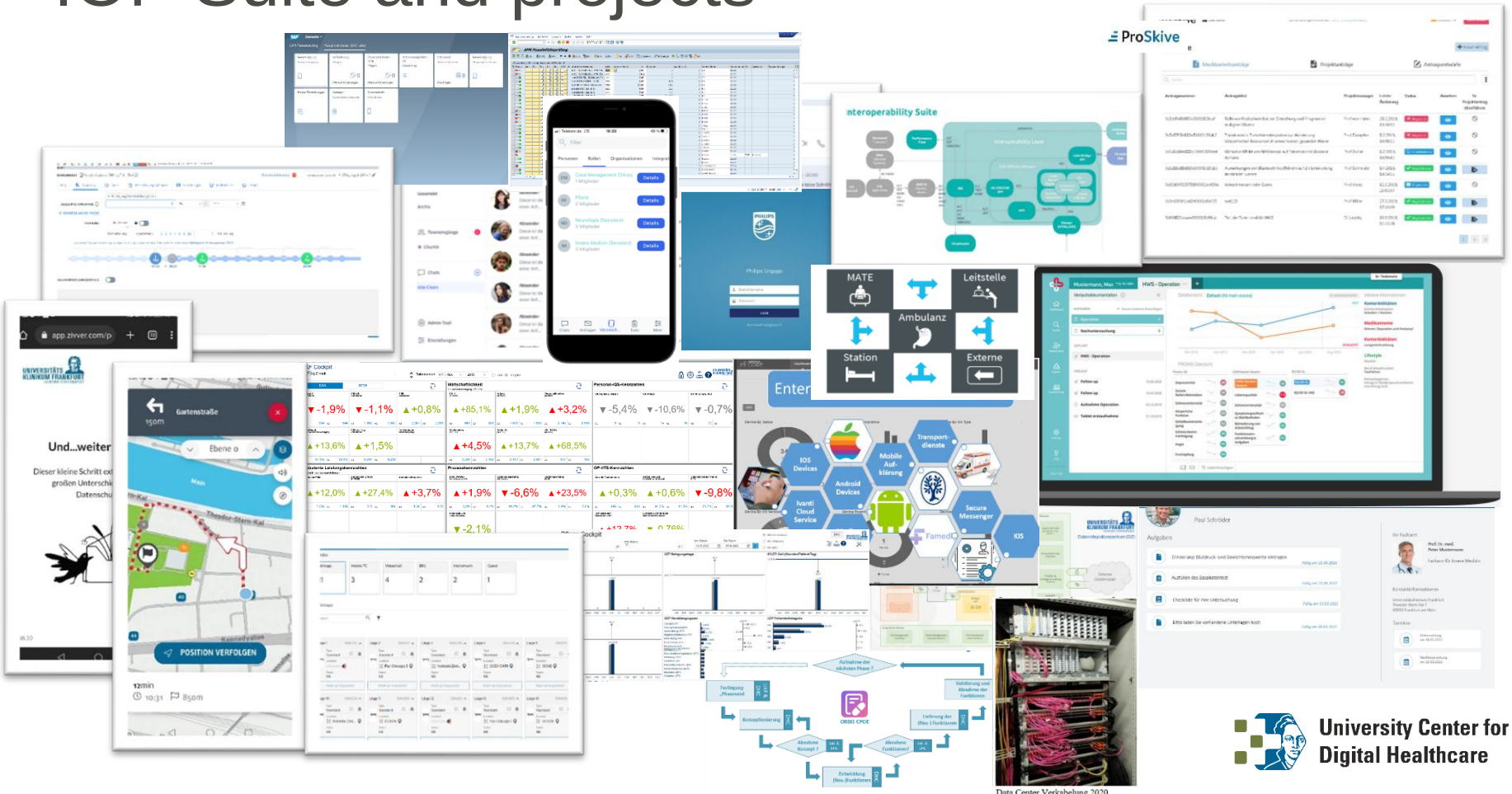
Interoperability creates networks



IOP Suite and projects



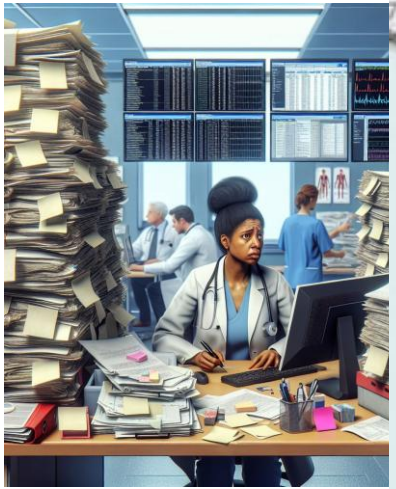
IOP Suite and projects



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CAVE: Information overload

Patient files

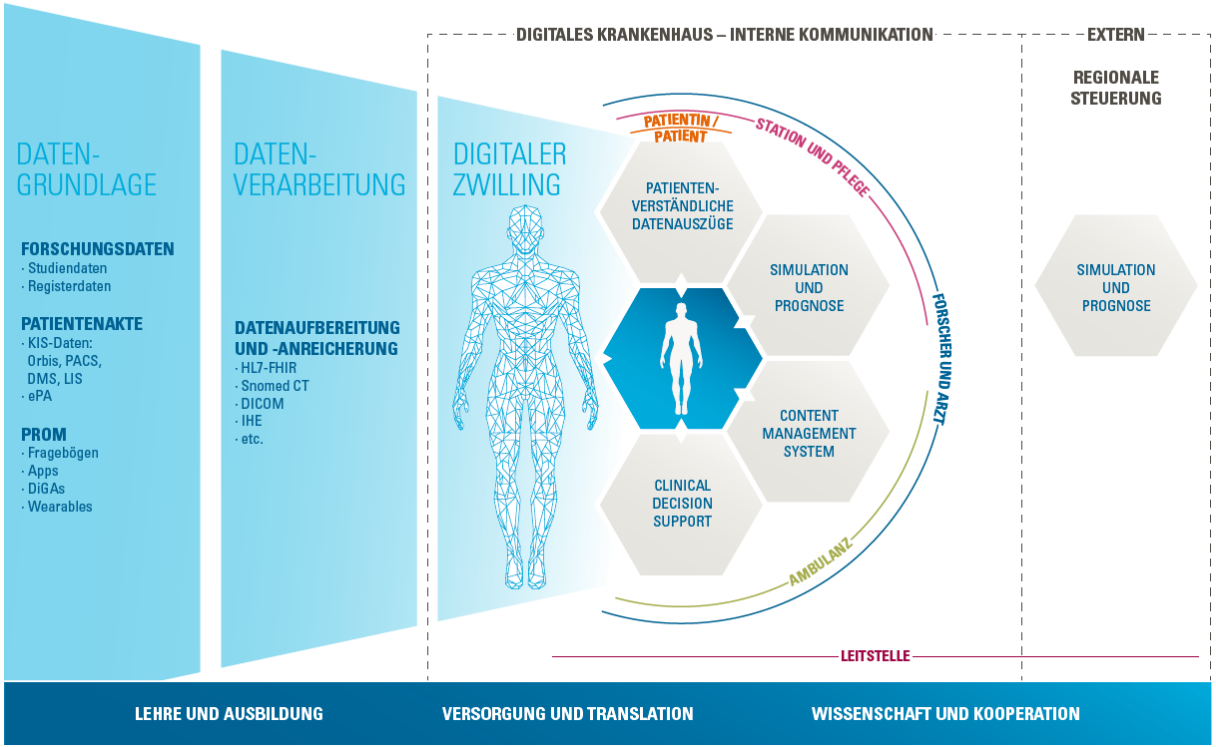




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Digital UHF 2.0

DIGITALE UNIVERSITÄTSMEDIZIN FRANKFURT



Vision: Digital Twin Patient



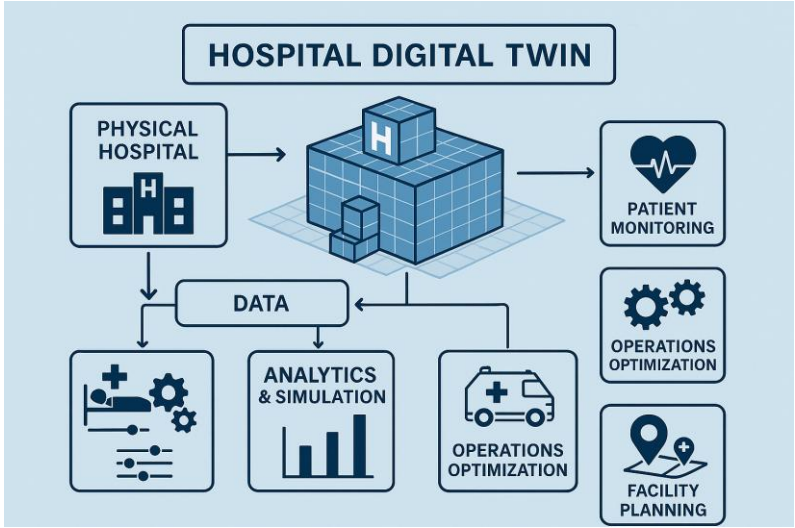




Erstellt mit Hilfe von Copilot von Microsoft

Vision: Digital Twin Hospital



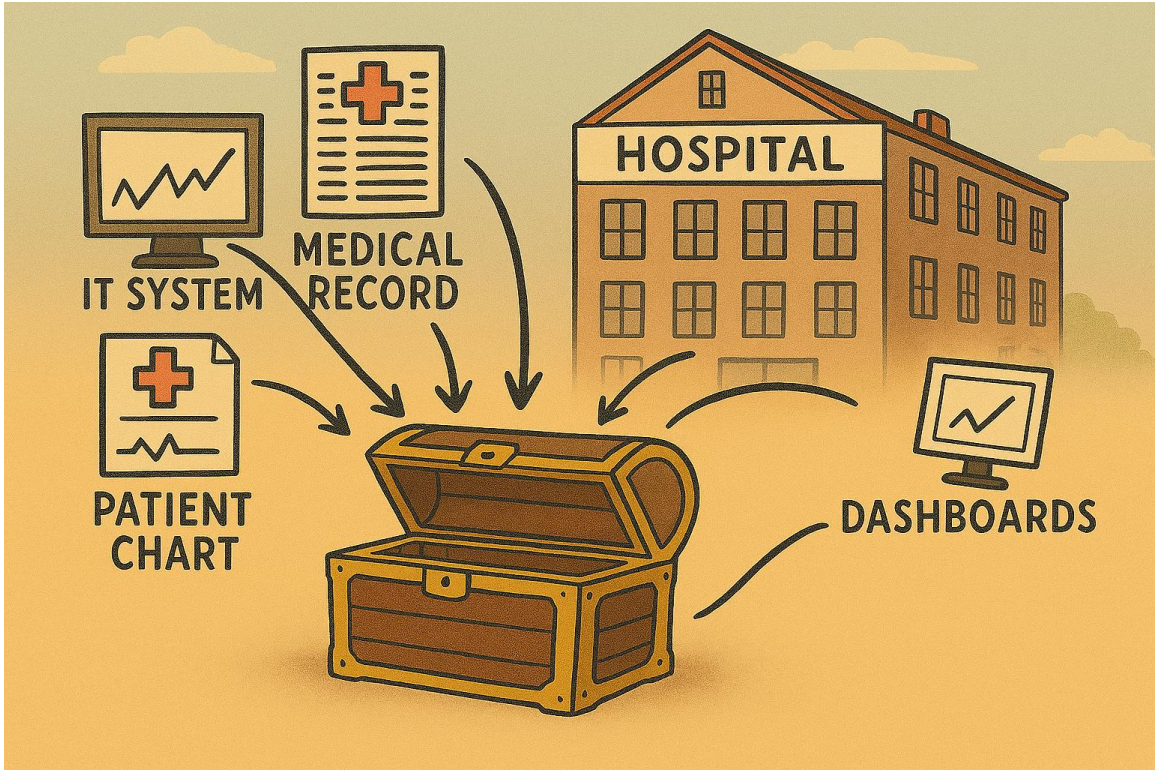




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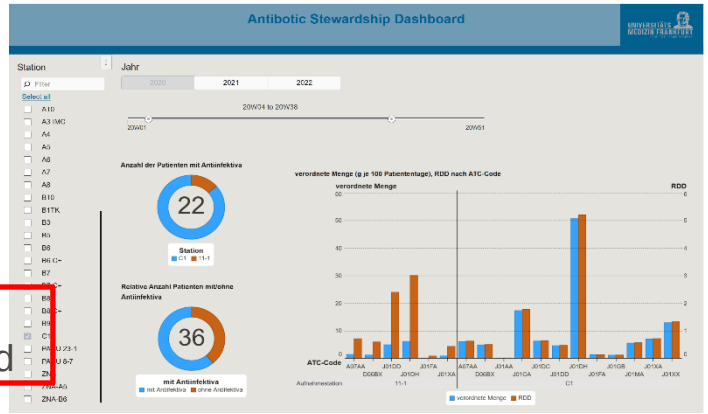

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Specific projects
on this way

1. Data Promotes Transparency

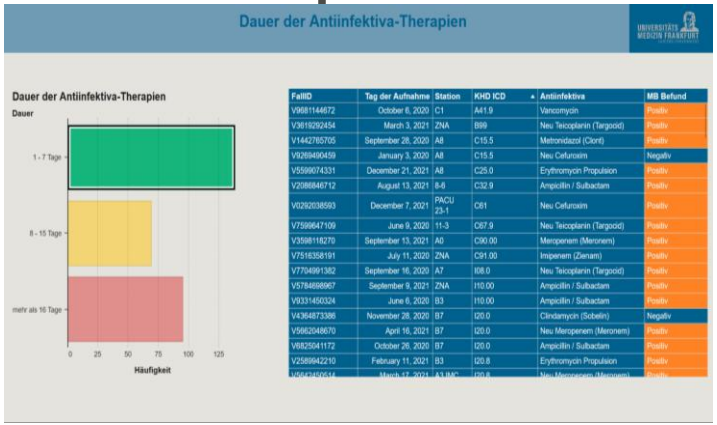


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SUSAN – Antibiotic Stewardship

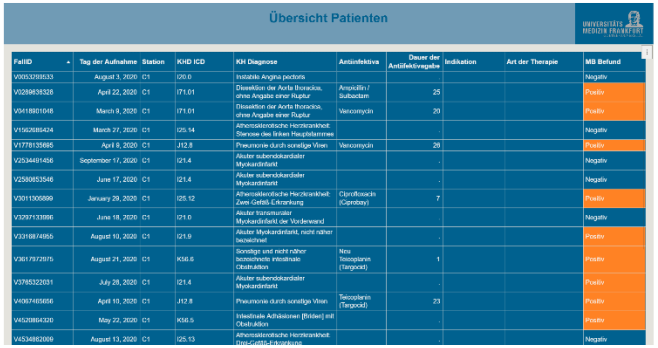


Surgical ICU-Ward



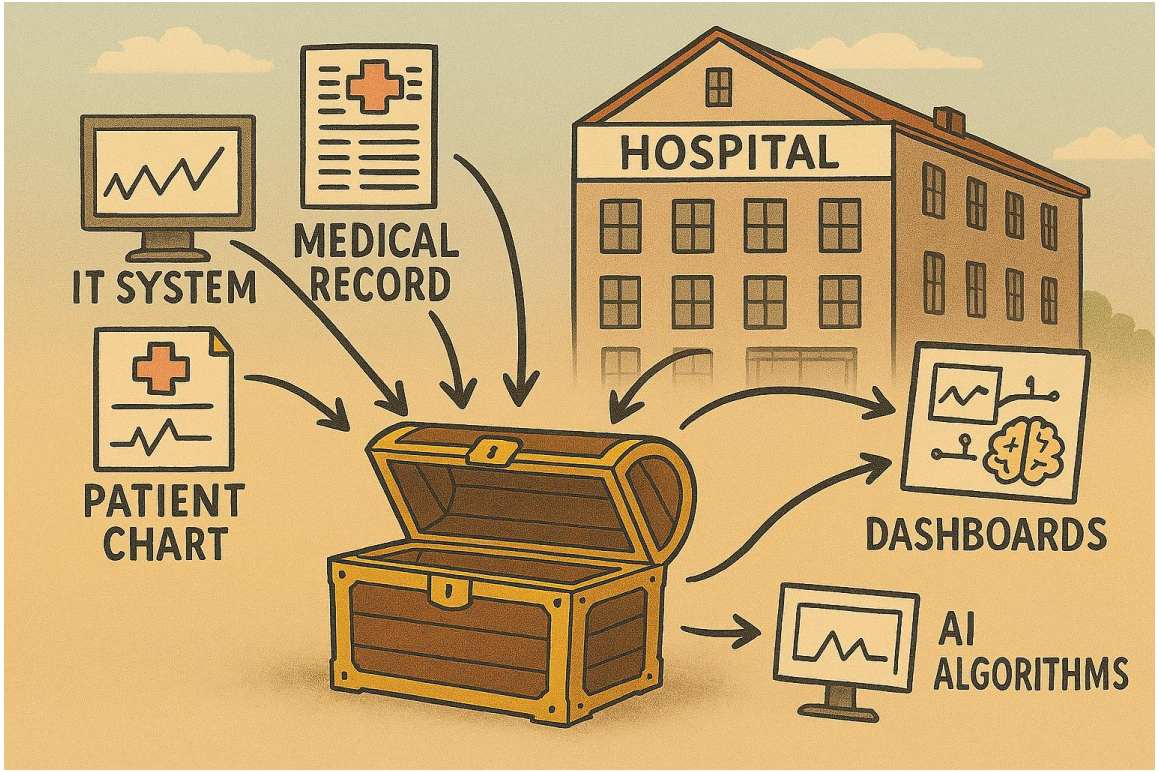
Anti-microbial Monitor

Patient Overview



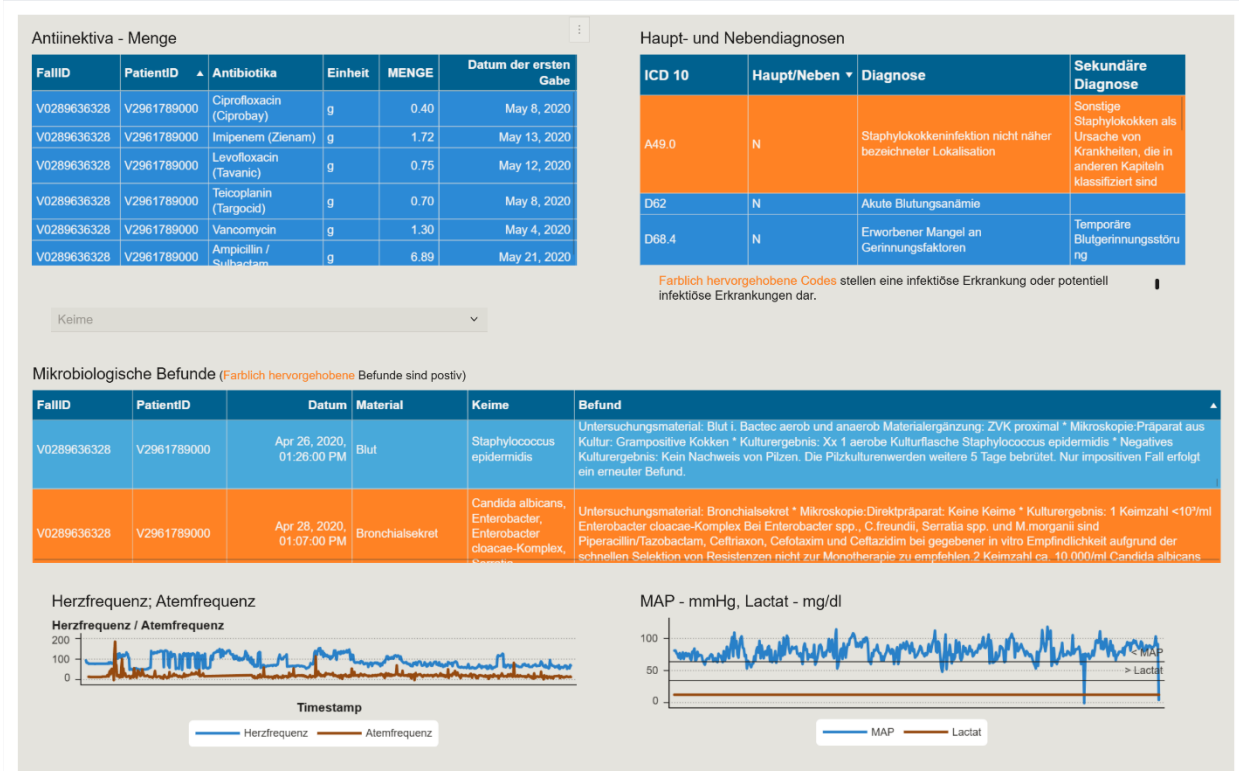
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2. Data Provides Clinical Decision Support



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SUSAN – Case based CDS



Antiinektiva - Menge

FallID	PatientID	Antibiotika	Einheit	MENGE	Datum der ersten Gabe
V0289636328	V2961789000	Ciprofloxacin (Ciprobay)	g	0.40	May 8, 2020
V0289636328	V2961789000	Imipenem (Zienam)	g	1.72	May 13, 2020
V0289636328	V2961789000	Levofloxacin (Tavanic)	g	0.75	May 12, 2020
V0289636328	V2961789000	Teicoplanin (Targocid)	g	0.70	May 8, 2020
V0289636328	V2961789000	Vancomycin	g	1.30	May 4, 2020
V0289636328	V2961789000	Ampicillin / Sulbactam	g	6.89	May 21, 2020

Haupt- und Nebendiagnosen

ICD 10	Haupt/Neben	Diagnose	Sekundäre Diagnose
A49.0	N	Staphylokokkeninfektion nicht näher bezeichneter Lokalisation	Sonstige Staphylokokken als Ursache von Krankheiten, die in anderen Kapiteln klassifiziert sind
D62	N	Akute Blutungsanämie	
D68.4	N	Erworbener Mangel an Gerinnungsfaktoren	Temporäre Blutgerinnungsstörung

Farblich hervorgehobene Codes stellen eine infektiöse Erkrankung oder potentiell infektiöse Erkrankungen dar.

Keime

Mikrobiologische Befunde (Farblich hervorgehobene Befunde sind postiv)

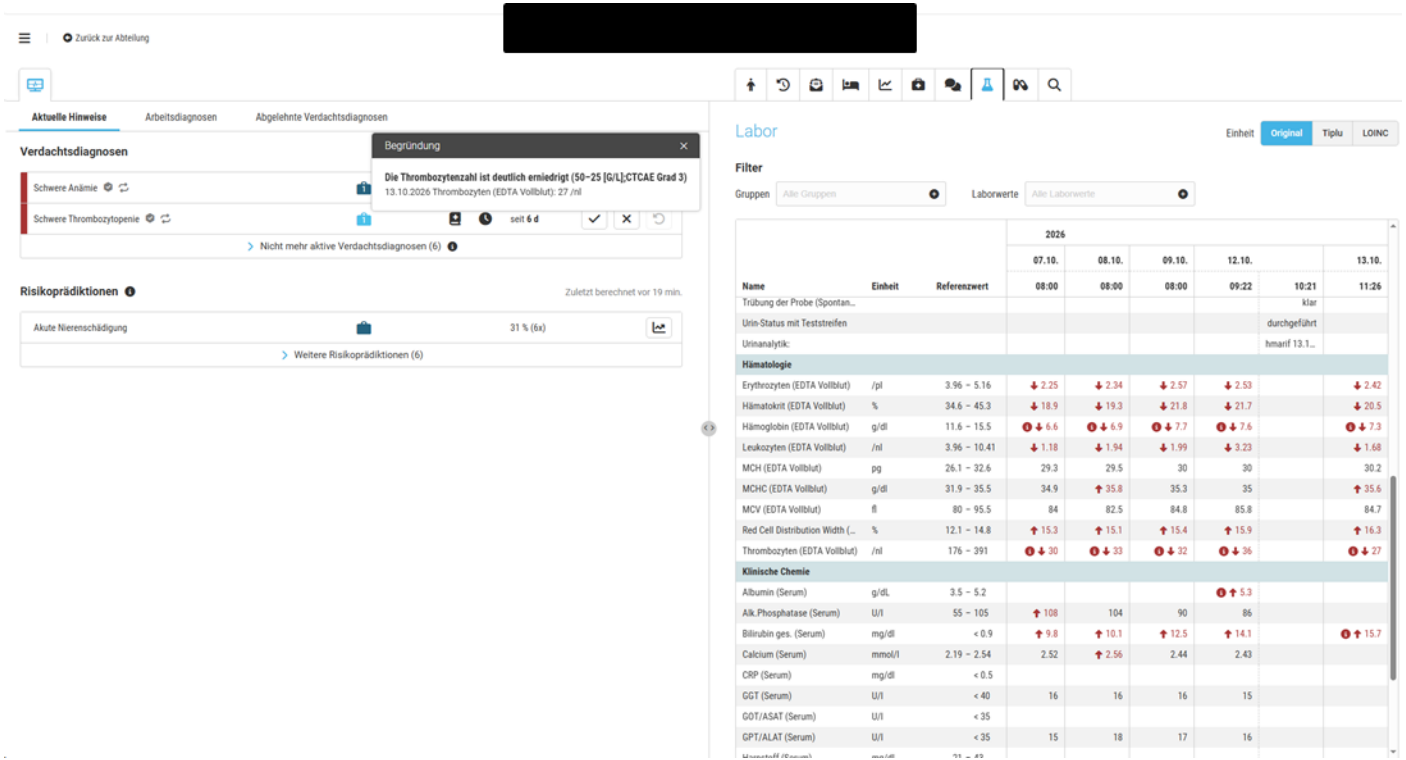
FallID	PatientID	Datum	Material	Keime	Befund
V0289636328	V2961789000	Apr 26, 2020, 01:26:00 PM	Blut	Staphylococcus epidermidis	Untersuchungsmaterial: Blut i. Bactec aerob und anaerob Materialergänzung: ZVK proximal * Mikroskopie:Präparat aus Kultur: Grampositive Kokken * Kulturergebnis: Xx 1 aerobe Kulturflasche Staphylococcus epidermidis * Negatives Kulturergebnis: Kein Nachweis von Pilzen. Die Pilzkulturenwerden weitere 5 Tage bebrütet. Nur impositiven Fall erfolgt ein erneuter Befund.
V0289636328	V2961789000	Apr 28, 2020, 01:07:00 PM	Bronchialsekret	Candida albicans, Enterobacter, Enterobacter cloacae-Komplex,	Untersuchungsmaterial: Bronchialsekret * Mikroskopie:Direktpräparat: Keine Keime * Kulturergebnis: 1 Keimzahl <10³/ml Enterobacter cloacae-Komplex Bei Enterobacter spp., C.freundii, Serratia spp. und M.morganii sind Piperacillin/Tazobactam, Ceftriaxon, Cefotaxim und Ceftazidim bei gegebener in vitro Empfindlichkeit aufgrund der schnellen Selektion von Resistenzen nicht zur Monotherapie zu empfehlen 2 Keimzahl ca. 10.000/ml Candida albicans

Herzfrequenz; Atemfrequenz

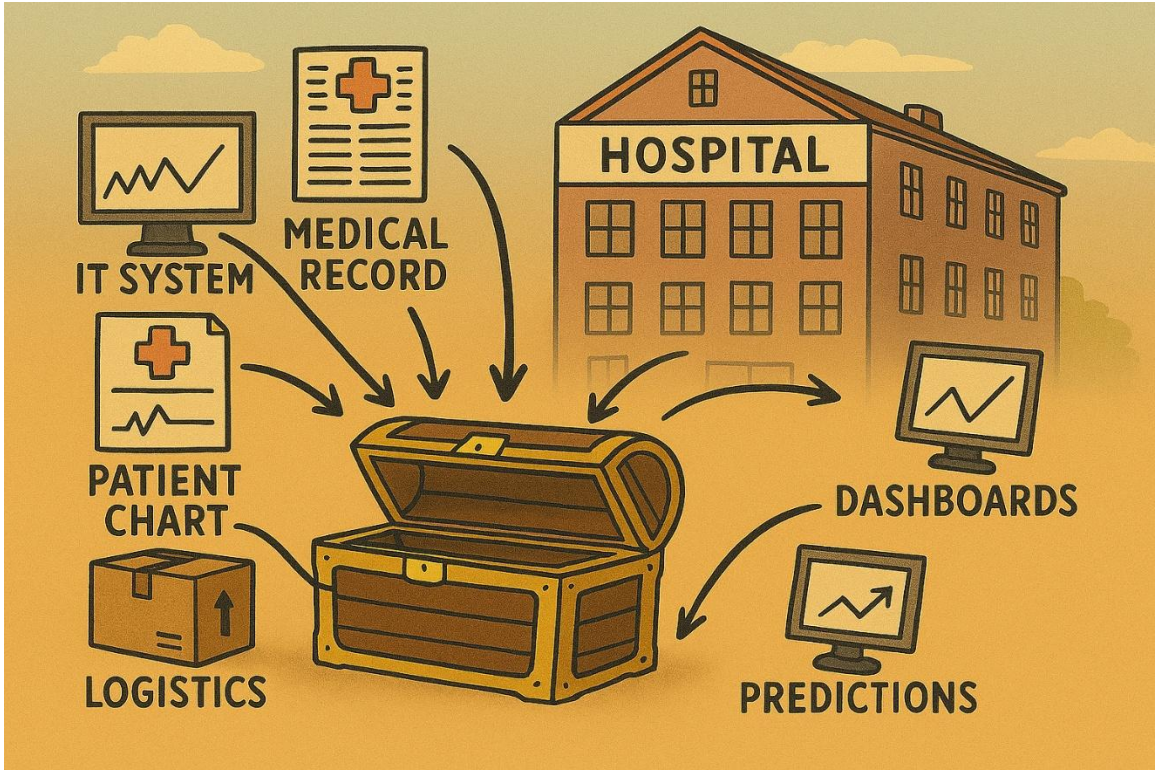
MAP - mmHg, Lactat - mg/dl

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Maya – CDSS connected to HIS



3. Data for Control and Prediction



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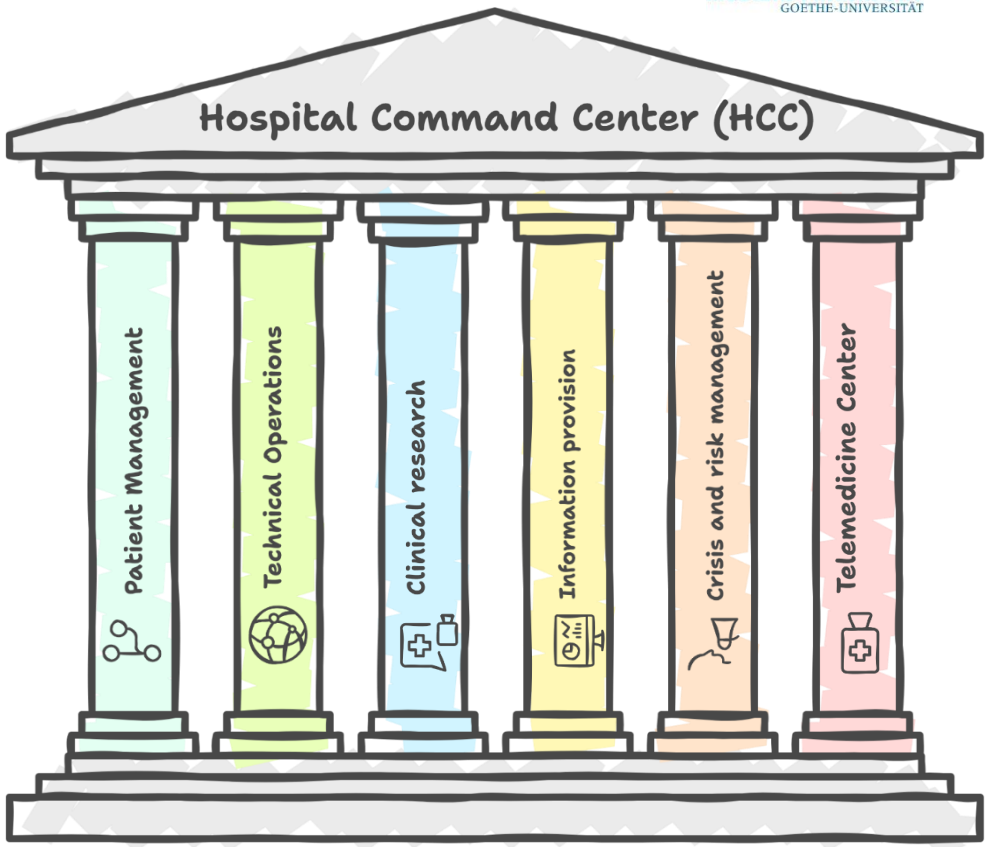
Hospital Command Center (HCC)



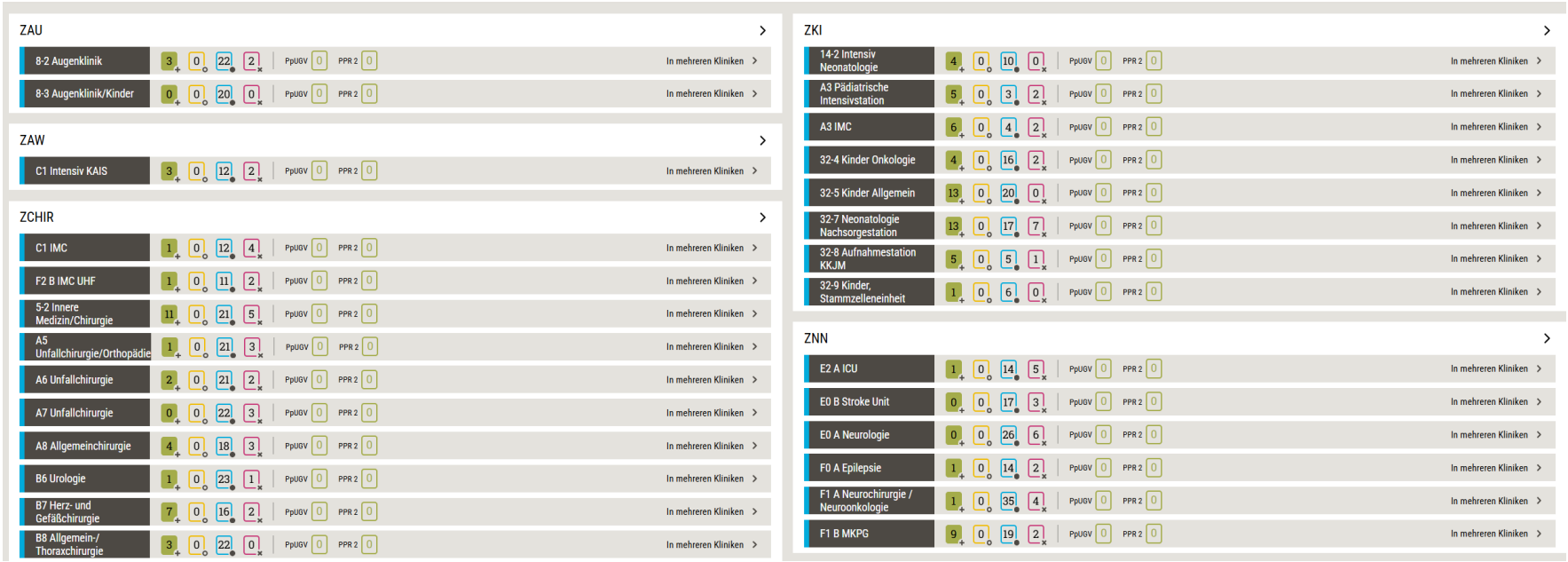
Basis of HCC

Key Facts

- central organizational structure and command and operations center for University Hospital Frankfurt and regional healthcare provision
- core function: Digital consolidation and analysis of performance data
- goal: Real-time tracking of capacities, visual representation of usage and bottlenecks
- coordination of internal resource management and collaboration with external partners (e.g., emergency services, hospitals, practices)



Dashboard of bed occupancy



- Realtime connection to HIS based on messages
- Dificulties for transfer of available bed capacity

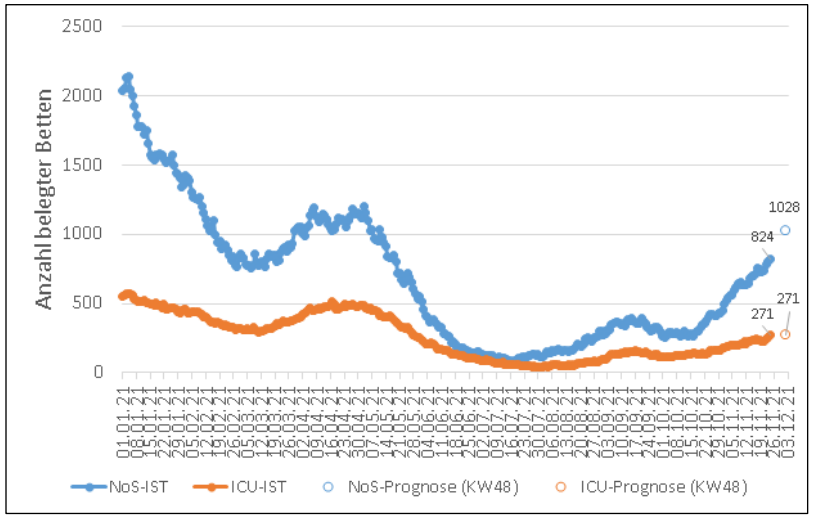
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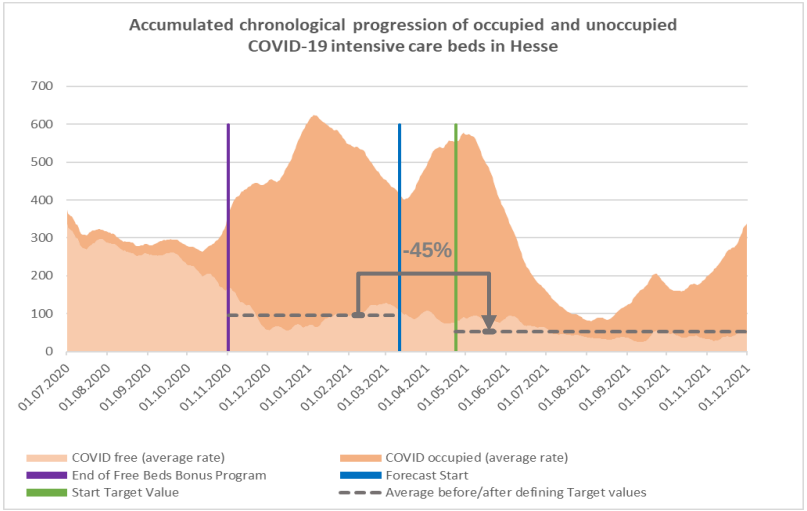
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Basis for Hospital Command Center – Evidence-Based Management During the Pandemic

GEFÖRDERT VOM
Bundesministerium für Bildung und Forschung
egePan Unimed
netzwerk universitäts medizin

Förderkennzeichen: 01KX2021





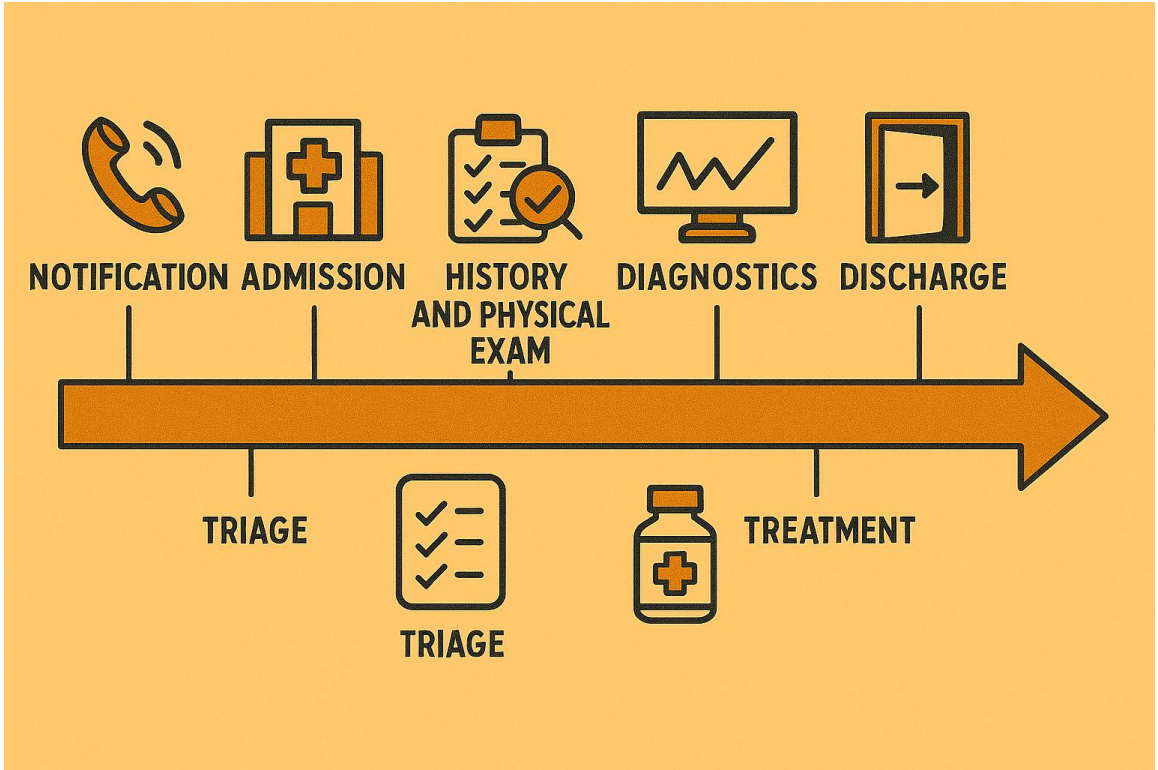
1) basierend auf IVENA-Daten
2) Worst-Case Status der ICU-Betten & ECMO Geräte (online separat per Filter abrufbar)
3) Prognose für die Belegung der Intensivstation ohne PICU und NICU, basierend auf IVENA-Daten

ProSReMod 2.0 for sustainability of forecasts



Funded by „Hessisches Ministerium für Familie, Senioren, Sport, Gesundheit und Pflege“

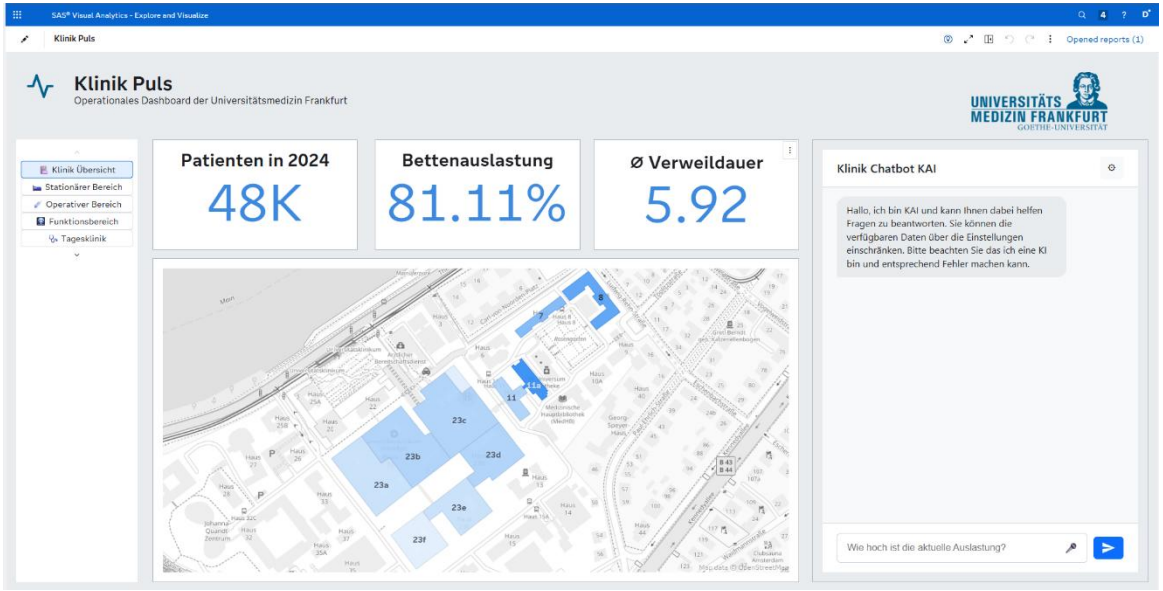
UMF forecasts on timestamps in HIS



Created with the help of Microsoft Copilot

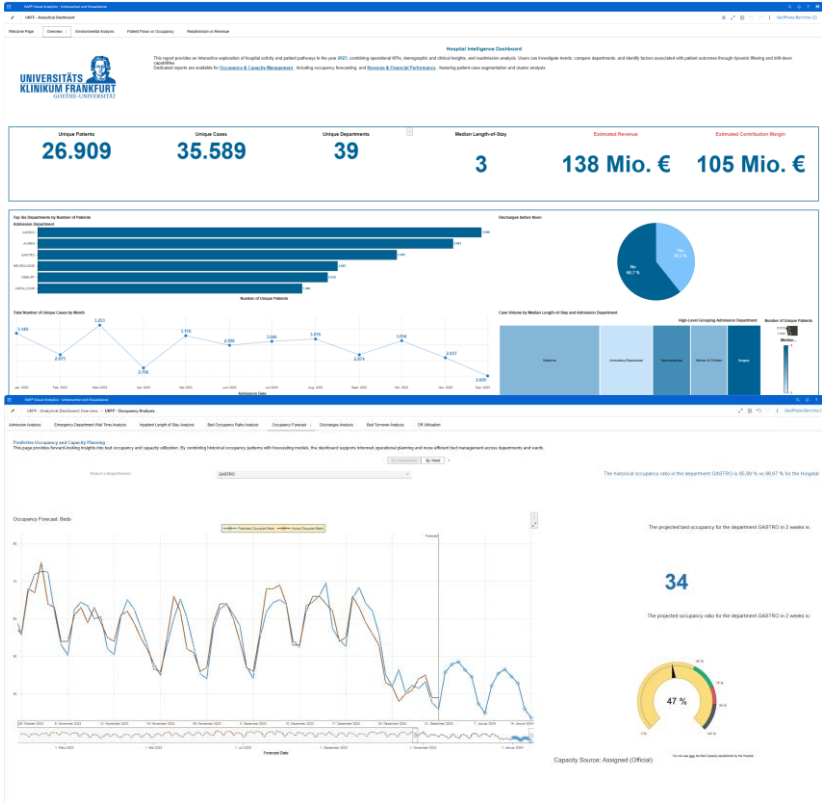
HCC: POC Big Data & LLM for Analytics

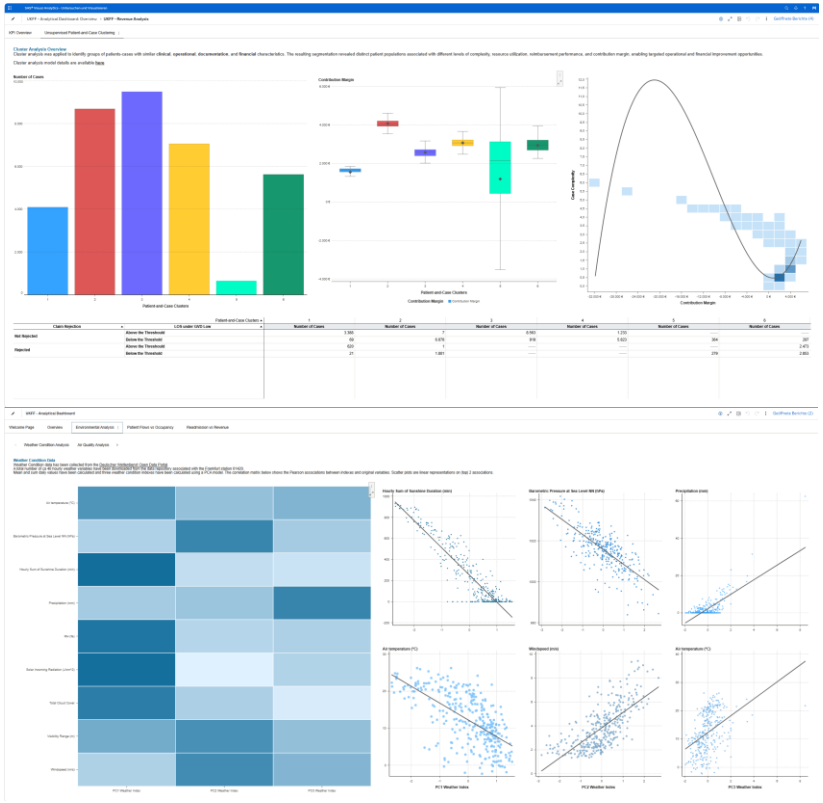
- Timestamp analysis
  - All Timestemps in HIS for the inpatient cases in 2023
- Addition of weather and event data for 2023 (e.g., black ice)
- Development of dashboard views and internal forecasts and simulations
- Big Data Analysis for Pattern Recognition
- Expansion to include LLM with the use of prompts to request analyses



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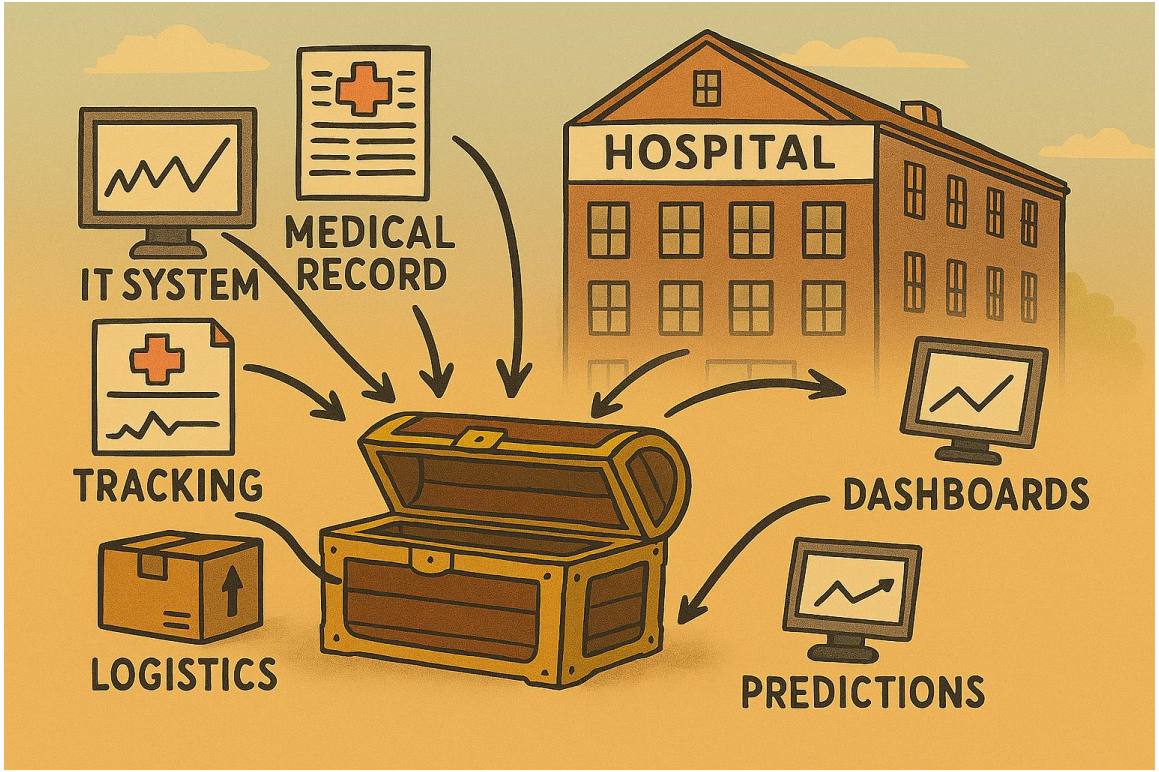
HCC: POC real-time dashboards and forecasts





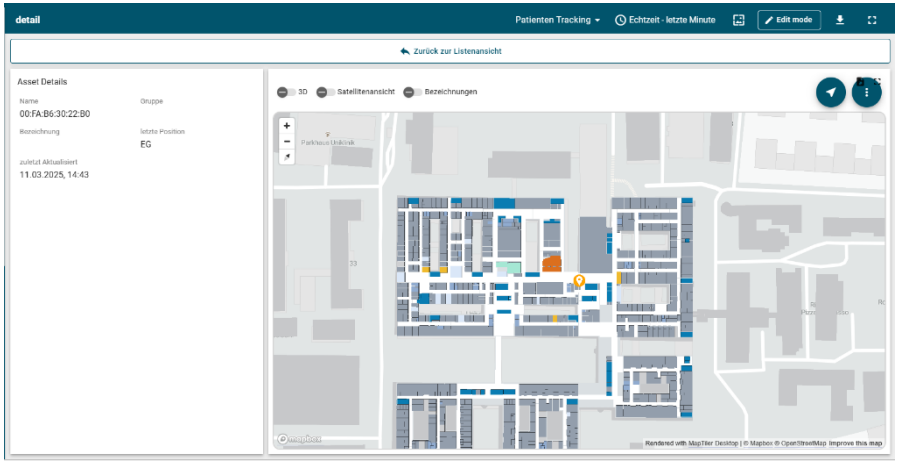
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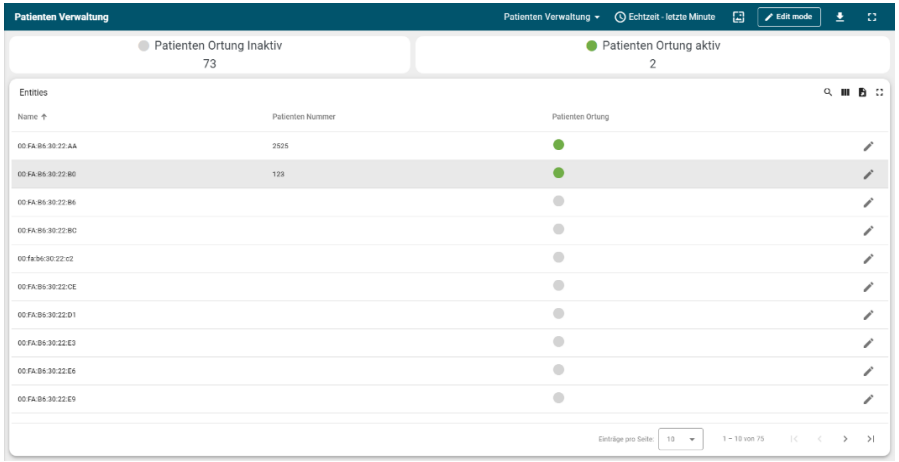
Enrichment of Data with new sources



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Real Time Localisation - RTLS





Solution

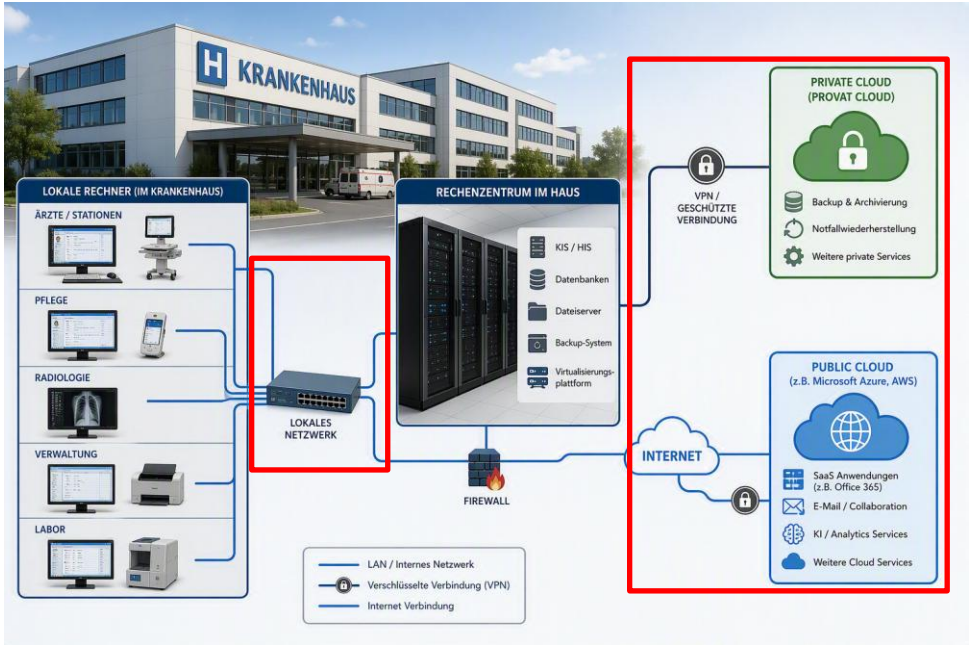
- Hypros Tracking & Tracing Lösung
- Use existing Cisco Infrastructure
  - BLE-Cisco Access Points
  - Cisco Spaces
- Selected Trackers



Use Cases (examples)

- Patient-tracking
  - Patient flow management
  - Geo-Fencing
  - …
- Device-tracking
  - Find devices nearby
  - Maintenance Management
  - …
- Process automation
  - Bed Management
  - Logistics
  - …
- Temperature Monitoring
  - Mobile refrigerated containers
  - Alerting
  - …

Two big projects in IT infrastructure



Complete migration in Privat Cloud
Access toPublic Cloud
2024-2028

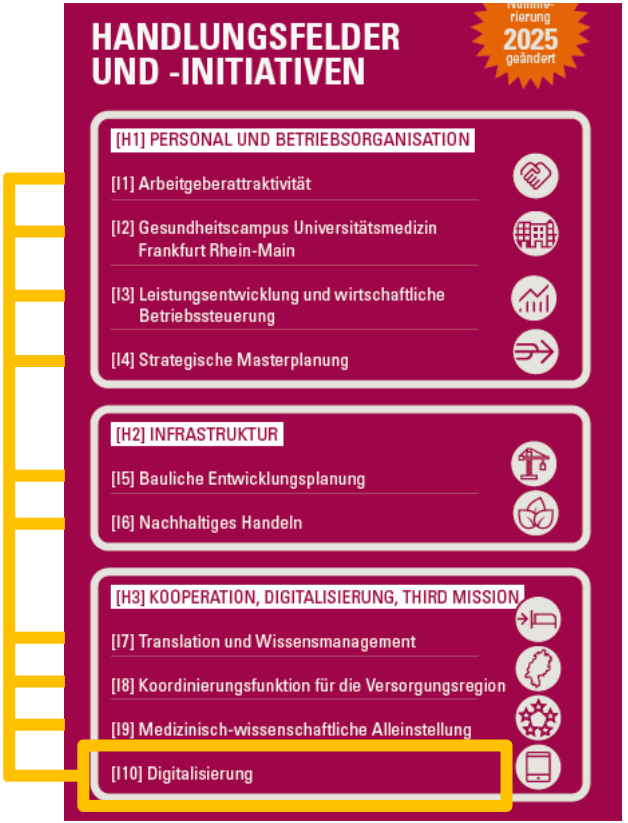
Complete redesign of LAN/Wifi
Start in 2026
Linear strategy changes in redundant network



Governance

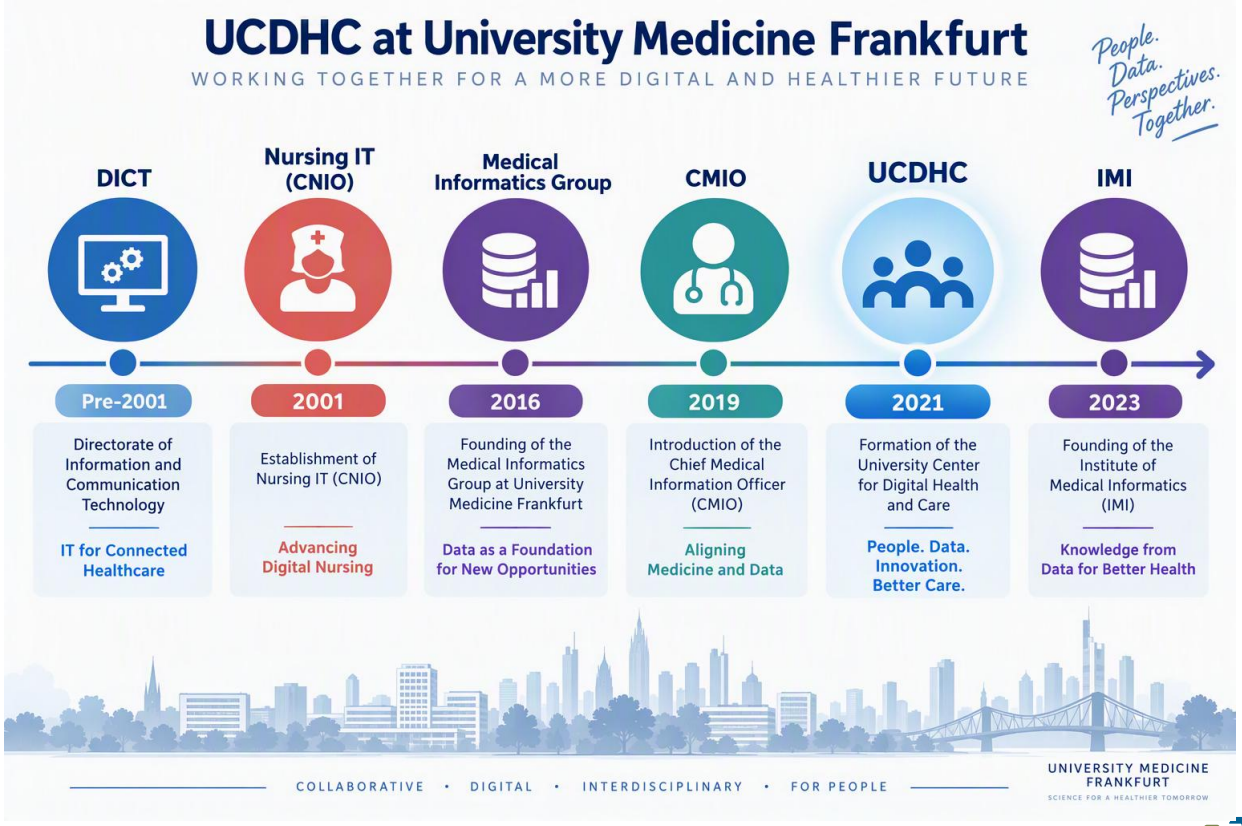
Digitization follows medical strategy



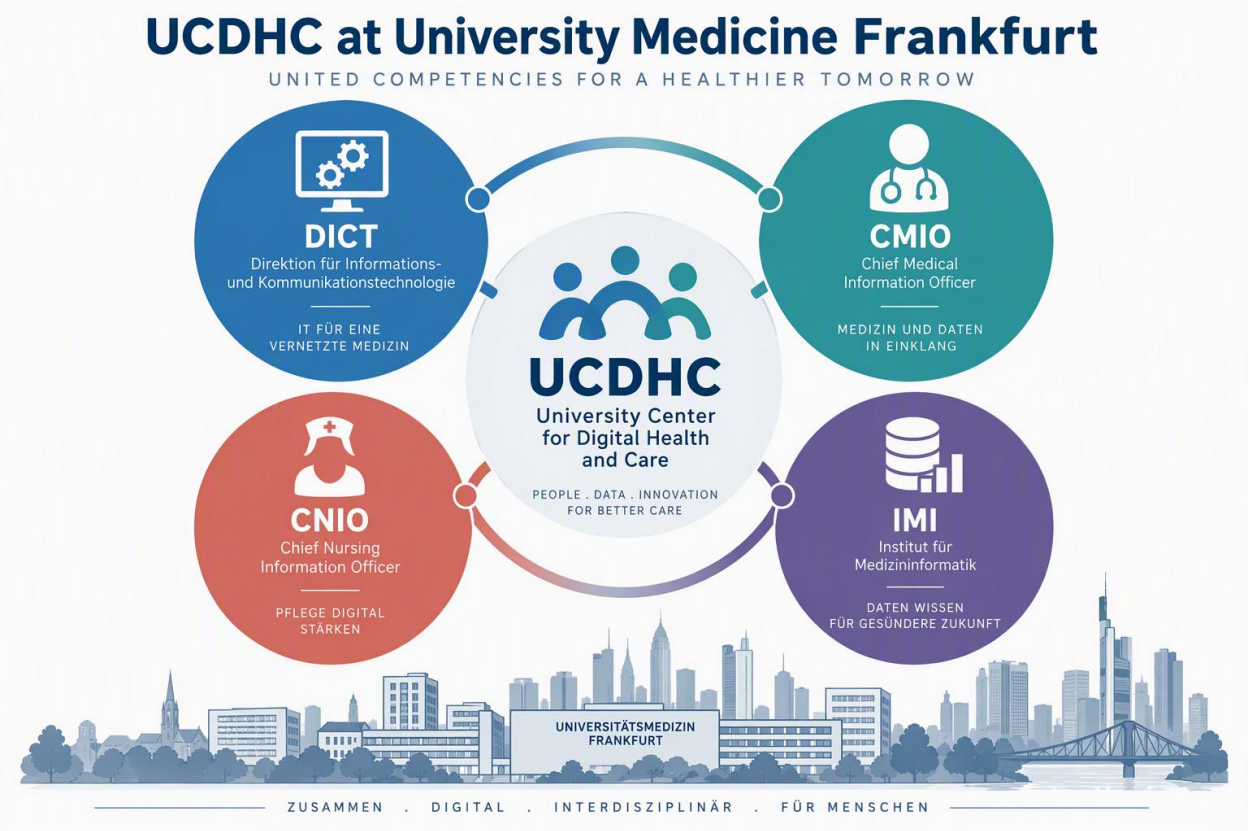


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Development of digitization governance

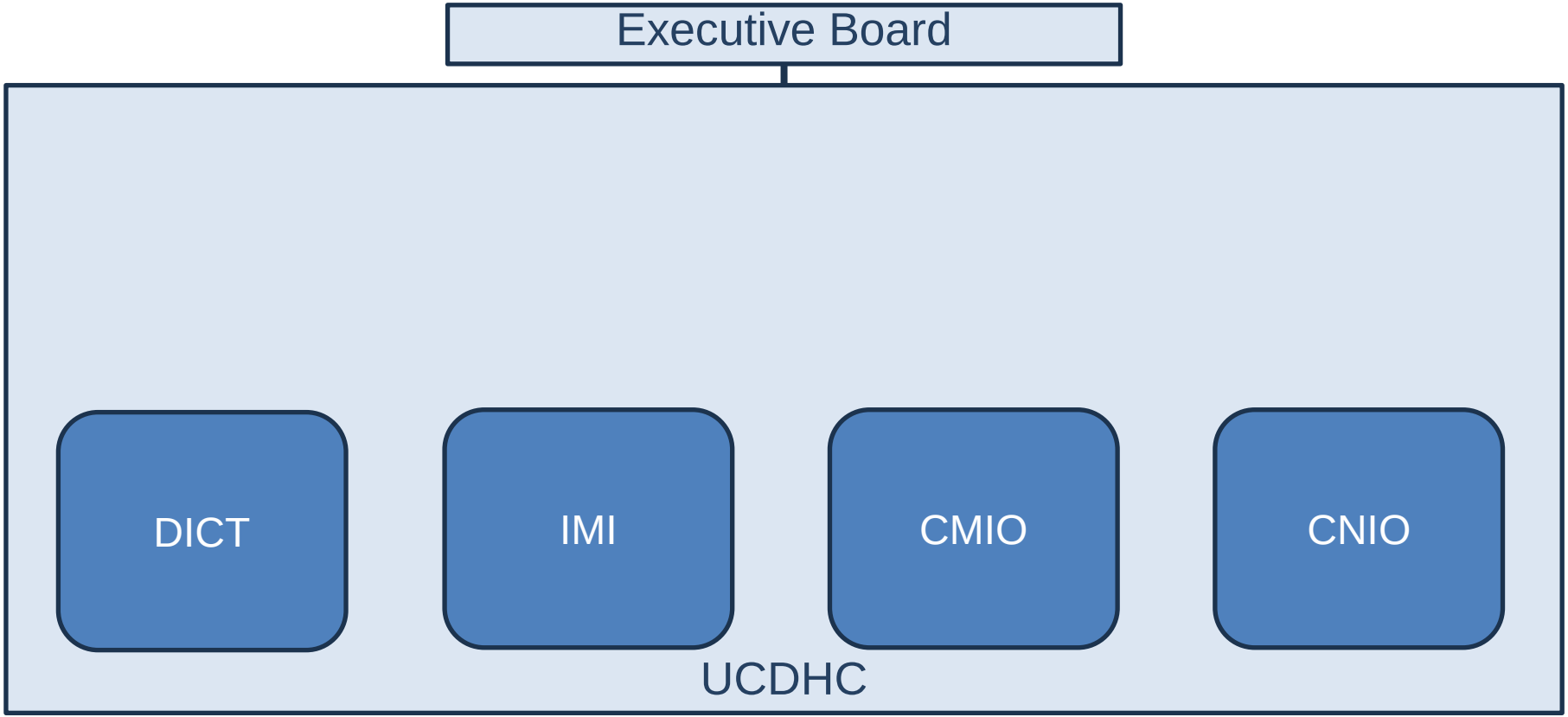


UCDHC

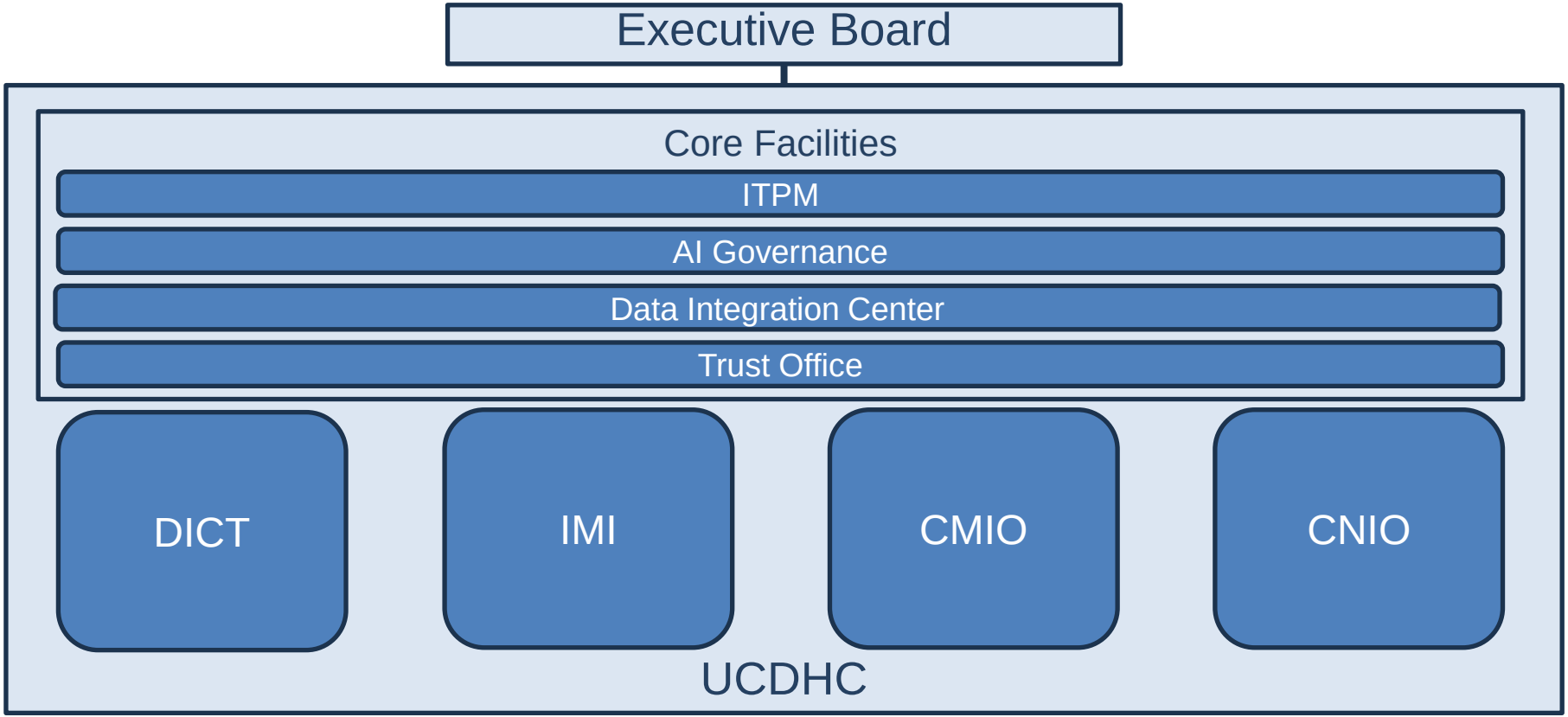


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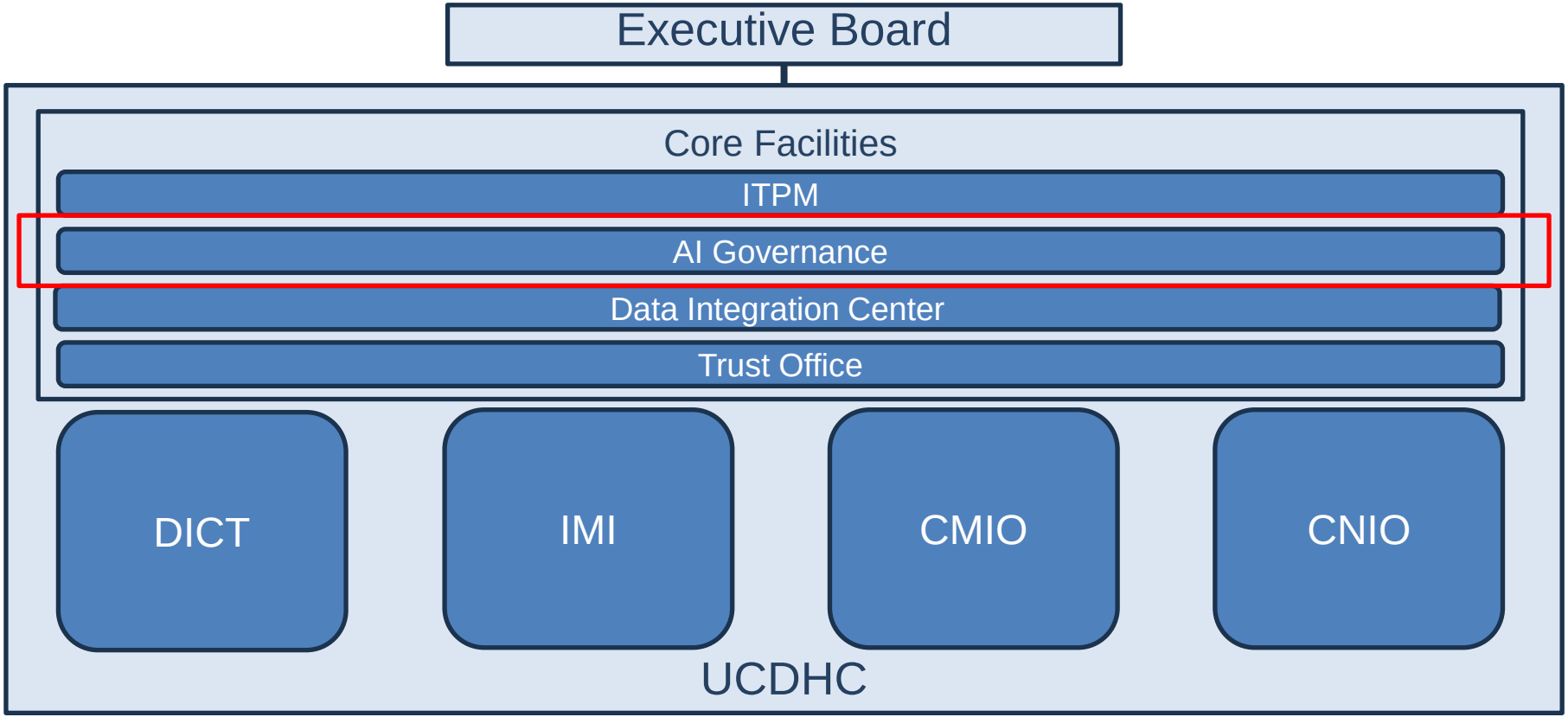
UCDHC Governance



UCDHC Governance



UCDHC Governance



AI Governance – Governess (?)



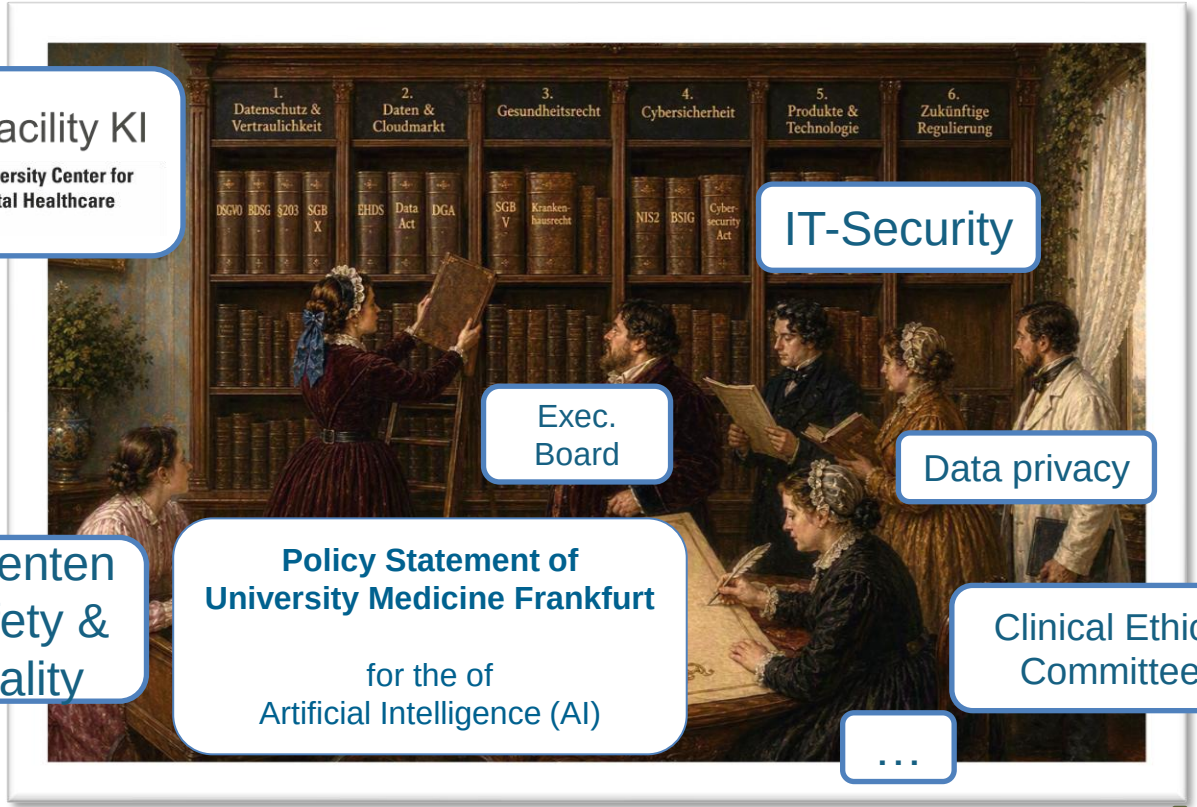
AI Governance

Regulations



AI Governance

Collaboration



Core Facility KI

University Center for Digital Healthcare

IT-Security

Exec. Board

Data privacy

Patienten -safety & quality

Policy Statement of University Medicine Frankfurt

for the of
Artificial Intelligence (AI)

Clinical Ethics Committee

…

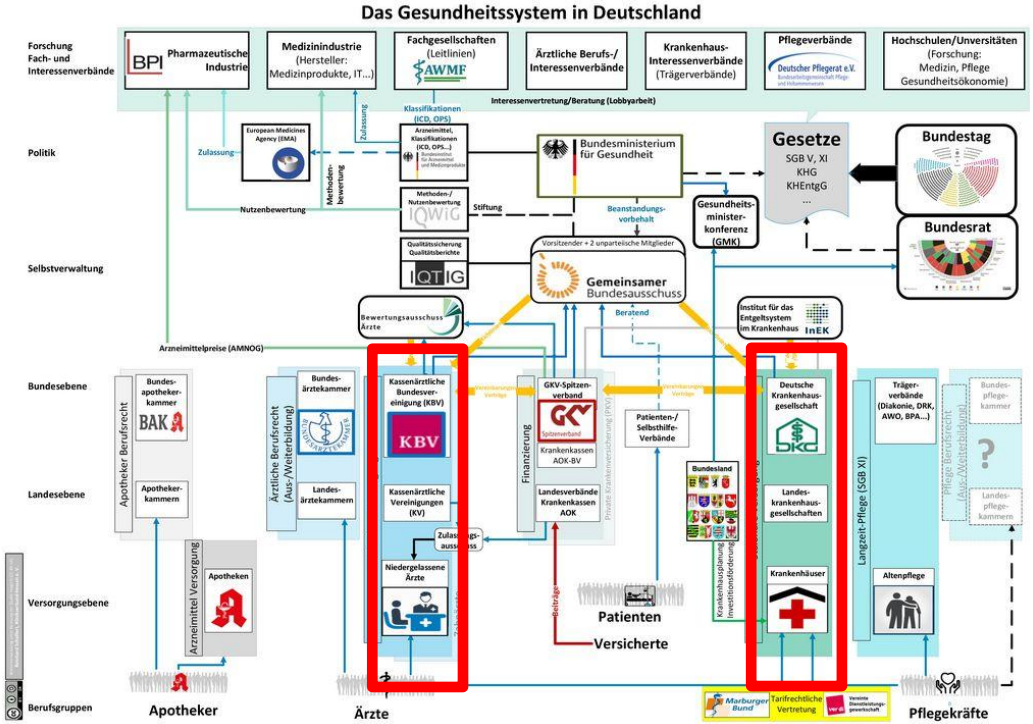
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Current challenges & political environment

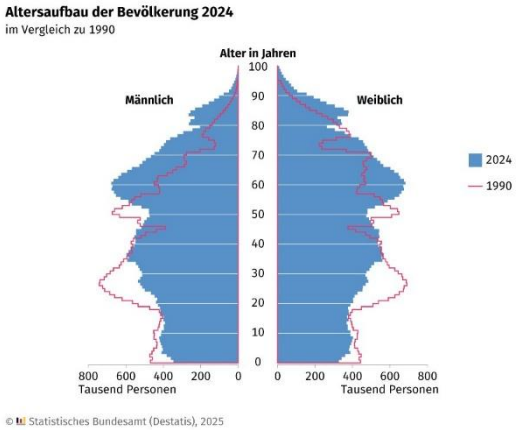
German Healthcare System (simplified)



Increasing pressure upon the healthcare system in Germany

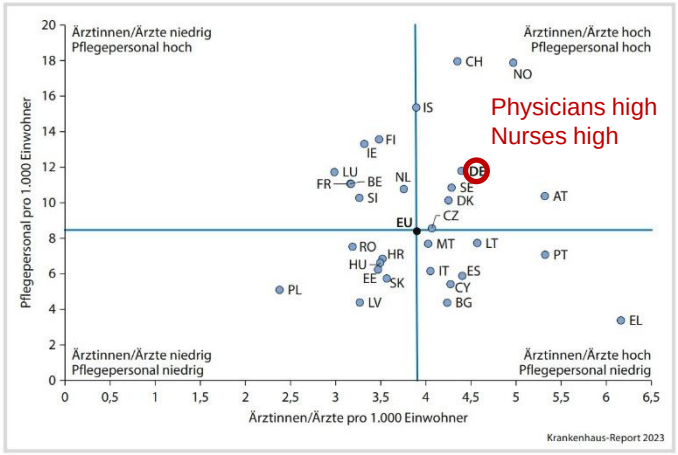
Aging society

Demographic structure of Germany´s population



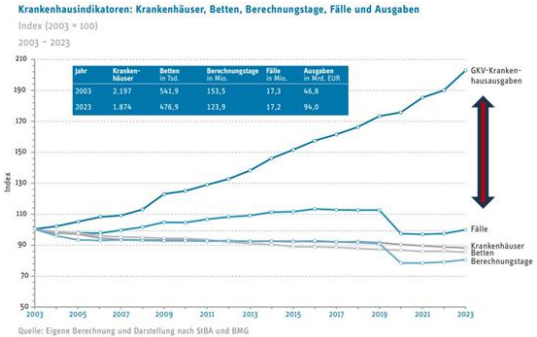
High labor costs, shortage of professionals', high workload[1]

Physicians/ costs per 1.000 inhabitants[1]



Increasing costs / decline in casenumbers[1] / insufficient federal state infrastructure financing[2]

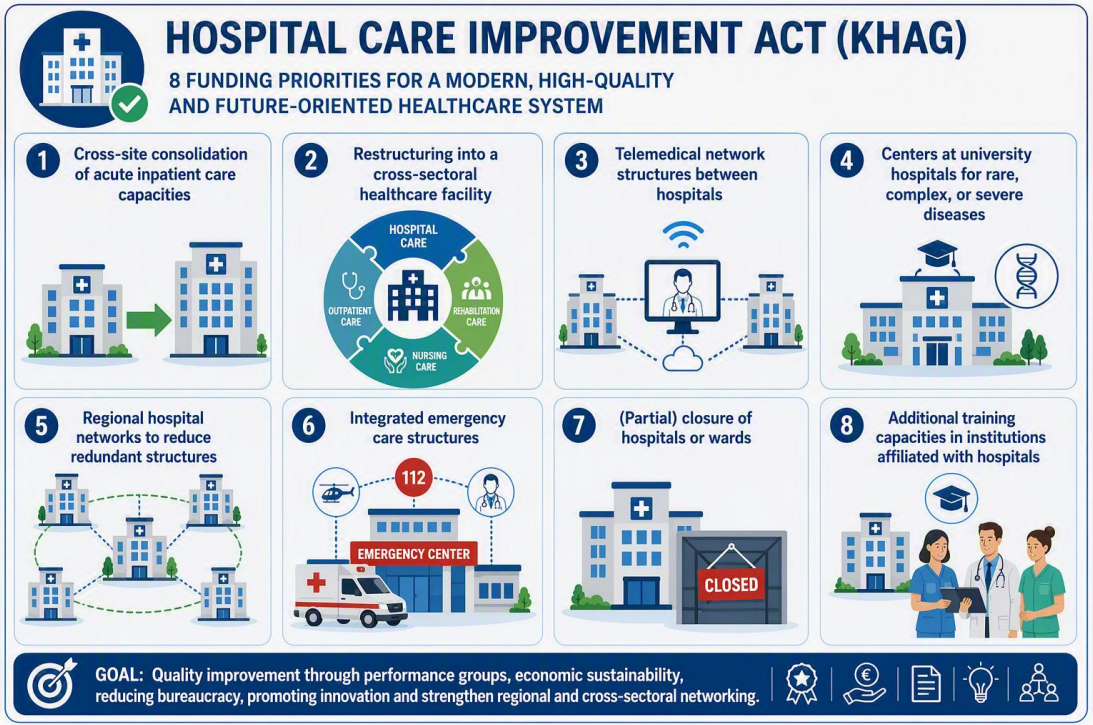
Costs vs. cases development[1]



[1] Klauber at al, Krankenhausreport 2023 – Personal
[2] Presseerklärung GKV: „GKV-Spitzenverband, PKV und DKG fordern von Ländern höhere Investitionen in Kliniken" (09.04.24)

Reshaping the hospital landscape

Hospital Care Improvement Act (KHVVG) / Hospital Transformation Fund (KHTF)



Pictures created by Copilot from Microsoft

Hospital Transformation Fund (KHTF)

- Transformation of the hospital landscape
- Focus: Consolidation and reduction of redundant structures, development of integrated cross-sector care models, expansion of telemedicine networks
- Volume : 50 billion EUR
  Period: 2026-2035

Coordination role for University Medicine

DIE DEUTSCHEN UNIVERSITÄTSKLINIKA

PRESSEMITTEILUNG

28. Juni 2023

Krankenhausreform muss Versorgung in Netzwerken fördern – Erhebung zeigt: Uniklinika stehen als Partner bereit

Bei den Bund-Länder-Gesprächen am 29. Juni müssen die zentralen Punkte der Krankenhausreform geeint werden. Denn die Zeit drängt. In einem ungesteuerten Strukturwandel könnten auch Krankenhäuser aus der Versorgung ausscheiden, die wir insbesondere für die Versorgung in ländlichen Regionen brauchen. Die drei Elemente der Krankenhausreform sind daher weiterhin wichtig und richtig: Leistungsgruppen, Vorhaltefinanzierung und Versorgungslevel.

Die Einteilung nach **Versorgungslevel**n durch den Bund bedeuten Transparenz und bieten eine Orientierung für alle Bürger:innen. Zudem zeigen sie den Krankenhäusern Entwicklungsperspektiven auf. Für die Universitätsklinika ist das Level IIIU zu etablieren und mit Aufgaben der (über-) regionalen Koordination und Steuerung von Versorgungskapazitäten sowie der Implementierung von Versorgungsnetzwerken zu verknüpfen. Schon heute sind die Universitätsklinika ein wichtiger Partner in der regionalen Versorgung. Dies zeigt eine Erhebung des Verbands der Uni-

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Nationwide standardized network: Telematik Infrastruktur



Vision: Connected Healthcare



Erstellt mit Hilfe von Copilot von Microsoft

Germany’s clinical data research infrastructure

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MII, NUM and the Data Integration Centres

MII

Medical Informatics Initiative

Established hospital DIZ and common standards for secure, interoperable data reuse.

DIZ / NUM-DIZ

Data Integration Centres

Local DIZ prepare clinical data for research. NUM-DIZ sustains and expands their services.

NUM

Network of University Medicine

Organises national research platforms and studies. NUM-DIZ is one of its data infrastructures.



MEDIZIN INFORMATIK INITIATIVE

NUM
Netzwerk Universitätsmedizin

MII built the foundation. NUM-DIZ carries it forward within NUM.

Sources: MII “About the initiative”; NUM “NUM-DIZ” and “Home” • Full links in speaker notes

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Call for participants

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RD-ATLAS

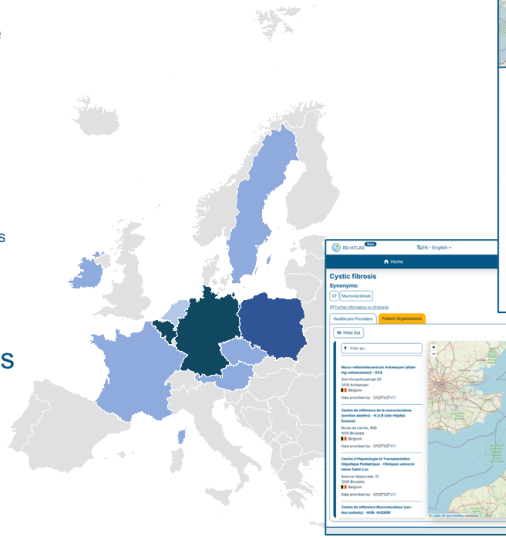
BETA VERSION
now available

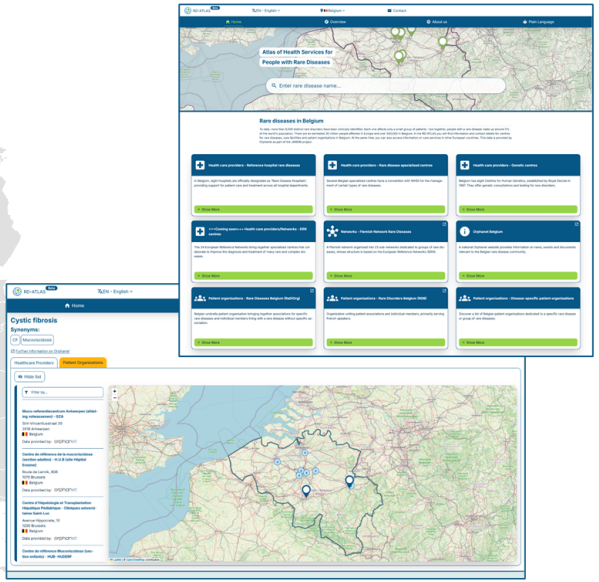
Atlas of Health Services for People with Rare Diseases

Information about Rare Diseases

Healthcare Provider

Patient Organizations





RD-ATLAS can improve Access to Care for People with Rare Diseases across Europe.

Get in touch:

Prof. Dr. Holger Storf: storf@med.uni-frankfurt.de

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Connected Healthcare[4]



The UCDHC is using Connected Healthcare[4]
to develop digital healthcare solutions that prioritise people.