

Pitching Session

Call 7 – Topic 2: User-centric technologies and optimised hospital workflows for a sustainable healthcare workforce

Number	First Name	Last Name	Job position	Organization	Title of the presentation
1	Robert	HOFSINK	PPP Manager	Philips	SHERPA - Smart Human centered Effortless support for Professional clinical Applications
2	Claudia	IGNEY	Innovation Manager	Siemens Healthineers	Revolutionize hospital workflows and fight mental stress in the healthcare environment
3	Andreas	CHIOCCHETTI	Professor	Goethe University Frankfurt am Main	Manage Mental Health in Chronic Diseases
4	Hasan	GÜNER	R&D Leader	ERTUNÇ ÖZCAN CO.	NICU SmartFlow - Digitalize Neonatal Care Through Smart Technologies For Improved Quality And Efficiency
5	Erik	KOOMEN	Anesthesiologist Pediatric Intensivist	University Medical Center Utrecht	ASSISTANT - Adaptive and Sustainable Digital Workflows for Healthcare Provider Empowerment
6	Yoram	LEV YEHUDI	Director	Orientos UAB	CAPABLE – Cancer Patients Better Life Experience
7	Esmeralda	MEGALLY	CEO & Co-Founder	Xsensio	Streamlining workflows with personalized health monitoring
8	Scott	RUSSELL	Founder, CEO	INNATIFY	AI innovation to reduce nursing shortage impacts
9	Maria	ZISIOPOULOU	Health Care Operations Manager	University Hospital Frankfurt, Germany	Data-driven Scorecard-based clinical management System (DASCO)
10	Theresa	AHRENS	Department Head	Fraunhofer IESE	“Fraunhofer Partnership” for Digital Health Solutions
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IHI Call Days | Call 7

Topic 2: User-centric technologies and optimised hospital workflows for a sustainable healthcare workforce

SHERPA

Smart Human centered Effortless support for Professional clinical Applications

Contact person name: Robert Hofsink

Organisation: Philips

E-mail: robert.hofsink@philips.com

Link to:

- Marketplace opportunity
- Participant profile

*Sherpas are some of the **most well-trained and experienced** climbers in the Himalayas. Their **wisdom, strength and sharp instincts**—in despite of their small figure—often leads outsiders to believe they have a '**sixth sense**' or 'magical powers' in these isolated places. For this reason, companies wouldn't think of going on an expedition or trekking tour without their **guidance and assistance**. (<http://www.argophilia.com/news/sherpas/216459/>)*

Challenges

- Estimated global shortage of 15 million healthcare professionals by 2030 (source: WHO)
- The number of medical images for radiology in the past 20 years has increased with 792% while the number of radiologists working with this data has increased with only 62% (source: Deloitte, Socio-economic impact of AI on healthcare)
- Many clinical AI tools are emerging, but are rarely adopted in the clinical practice:
 - Lack of evidence on the added value
 - Poor fit in the workflow or suboptimal training



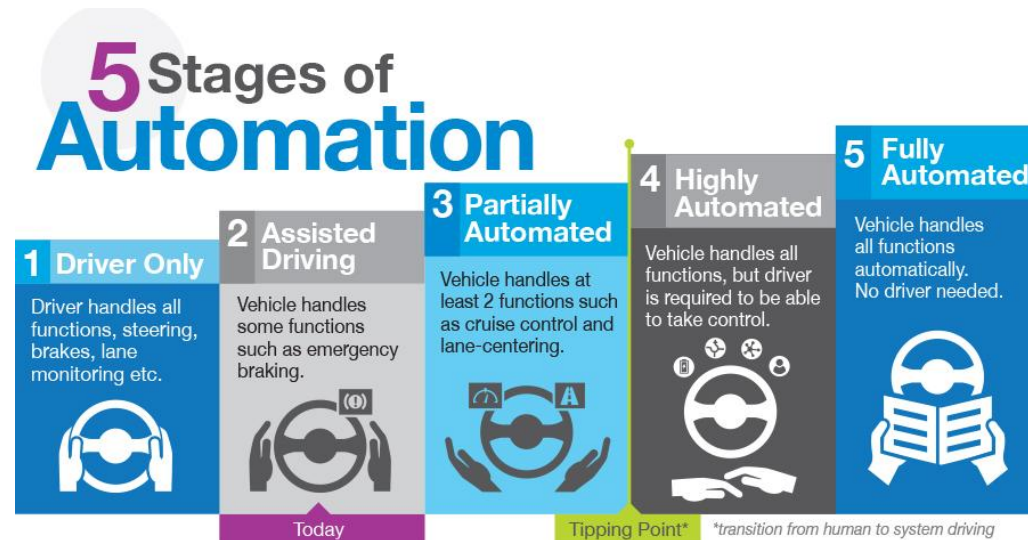
*“Staff shortages in healthcare are only increasing the workload among radiologists, cardiologists, nurses, and other healthcare providers. Costs are rising, people are getting older, and more chronic care is needed,” said Bert van Meurs, director of image-guided procedures and precision diagnostics at Philips, during a meeting at its headquarters in Amsterdam last Friday. **“Human-centered innovation is a force that can be deployed to relieve the burden of care. Technology must become subservient in this.”***

<https://innovationorigins.com/en/with-human-centered-innovation-and-ai-philips-aims-to-unburden-healthcare/>

Objectives

- Increase procedure intelligence in clinical workflows
- Increase the level of assistance and automation in complex or tedious manual tasks
- Human-centered AI: not driven by what is technically feasible, but by what is humanly desirable

Automotive domain analogy



Main activities and impact

- Development of data/imaging/AI-based building blocks for the assistance/automation of manual tasks during diagnosis, planning and treatment in clinical workflows, e.g. automate image acquisition settings, image assessment, device selection
- Demonstration and validation in clinical application (neurovascular interventions), including scalability towards other clinical applications
- Impact assessment of new clinical tools and workflows

Expertise and resources

- Core consortium established (Philips, partners in The Netherlands, France, Germany etc.)
- Interested to connect with:
 - Pharma partners interested in evaluating feasibility of image-guided drug delivery
 - Medtech partners (interventional devices)
 - Patient organizations
 - HTA

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Intelligent automation solutions for healthcare

Revolutionize hospital workflows and fight mental stress in the healthcare environment

Dr. Claudia Igney

Siemens Healthineers AG

claudia.igney@siemens-healthineers.com

Topic number 2: “User-centric technologies and optimised hospital workflows for a sustainable healthcare workforce “

Intelligent automation solutions for healthcare

Challenges and objectives

- Clinical staff subjected to high stress and mental pressure / little to no focus on patient centric tasks
- We address the staff shortage by robotics assistants and increase the patient touchpoints of healthcare providers
- Optimized and faster workflows free up capacities to manage more patients and improve the patient journey

Scope of the project

- Establish an open platform and common interfaces for automation features from various vendors
- Develop and validate a concept and a prototype for robotized workflow automation solutions in a relevant clinical environment
- Adjust medical and pharmaceutical consumables to maximize automation potential
- Demonstrate clinical value and benefits of automated workflows for patients and healthcare providers based on robot friendly healthcare settings



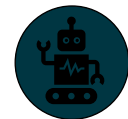
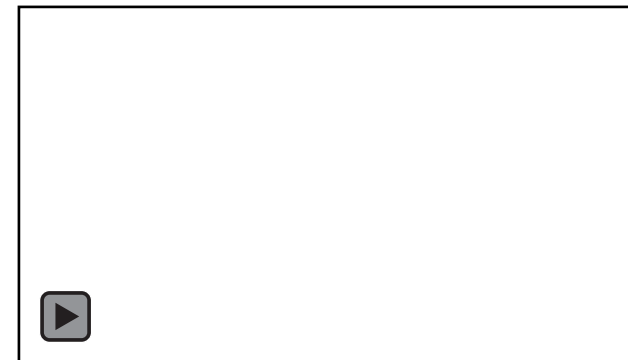
Intelligent automation solutions for healthcare

Project deliverables

- **Innovative automation solutions** that
 - **anticipate workflows** in healthcare facilities like operating room, radiology department, intensive care units
 - actively **support medical staff** in their daily work with patients to **reduce their burdens and mental stress**
- **Showcase rooms** for an innovative hospital of the future with infrastructure and **equipment adapted to robotics interactions** to optimize the clinical workflow
- **Proof** that intelligent automation solutions, e.g. **robotics assistances**, are the key to a **sustainable healthcare workforce**

Impact of the project

- **We pave the way for innovative automation** in healthcare by showing the **potential of robots** as a **new workforce**
- **We provide new standards** for robotic related automation including **interfaces** and **future healthcare facilities**



Intelligent automation solutions for healthcare

Expected duration / budget (optional)

- Duration: 36-60 months

Partners (optional)

- Academic / clinical partner research institute, e.g. hospital with OR and stationary access
- Industrial partner providing robotics arms, grippers or computer vision features etc.
- Partner in pharma / medical consumables to evaluate and develop interfaces and suitable materials for robotics interaction
- Consulting partner for hospital infrastructure

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- User-centric technologies and optimised hospital workflows for a sustainable healthcare workforce

Manage Mental Health in Chronic Diseases

Contact person name: Andreas Chiocchetti

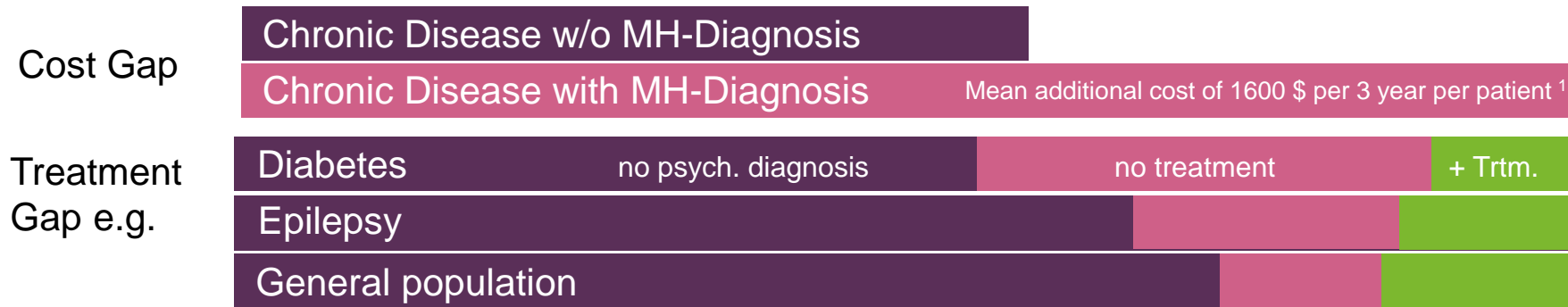
Organisation: Goethe University, Frankfurt

E-mail: andreas.chiocchetti@med.uni-frankfurt.de

Link to:

- <https://ihi-call-days.ihi.b2match.io/participations/206970/opportunities>
- <https://ihi-call-days.ihi.b2match.io/participations/206970>

Challenges and objectives



- Increased patient and workforce burden due to co-occurring mental health challenges
- MH-Problems are multi-directional:
Consequence of diagnosis, Treatment side-effect, Co-occurring condition, Genetic correlations
- Standardized guidelines for prevention, screening and monitoring are available but increase current workload; only partially implemented (e.g. EPI-MH guidelines in less than 30% of NIH hospital)
- MH-Problems worsen treatment adherence, increase demand for health care workforce
- Technology assisted decision support and monitoring not available in routine settings

Reduce healthcare professional workload for diagnostics, planning, and complex interventions of mental health comorbidities in chronic disorders providing standardized digital solutions, training as well as biomarker-based prediction and monitoring.

Main activities



- **Assess and monitor NEEDS:**
 - stakeholder engagement framework
 - embedded and empirical ethics
- **Develop, implement and evaluate digital TOOLS**
 - mental health radar: ePROM based digital support tool
 - screening, monitoring and decision support
 - medical professional and patient centred dashboards
- **Develop and implement MODELS**
 - biomarker (genetics, imaging) and patient (HL7 etc.) based
 - predict drug (adverse side) effects,
 - identify individuals at risk
- **TRAIN and empower stakeholders**
 - professional and patient specific knowledge and care networks
- **FAIR data resource**
 - continuous model improvements
 - Data access for reasearch and development

Expertise and resources offered

- Clinical Expertise Neurology
- Clinical Expertise Psychiatry
- Clinical Data-Science, Bioinformatics, Machine Learning
- Pre-Clinical Research
- Patients' Representatives (currently Epilepsy)
- ePROM and ECRF development
- Software Development, Data Management (HL7, FHIR, OHDSI)
- Social Sciences Legal Economics Ethics
- Impact-oriented project management / CDE
- 27 people (90% Academia), 8 countries (seven within the EU)
- 4 coordinated EU grants, involved in 15 EU-grants



Expertise requested

- Research Institutes:
 - Non-neurological chronic diseases
 - Machine learning and ML-OPS
- SME
 - Interface development and deployment
 - Medical App/Software development and regulations thereof
- Large companies with focus on
 - Health ICT, Biomarker development (imaging, genetics)
 - Health ICT software solutions
 - Prevention strategies
 - Biopharmaceutical industries w/ expertise in precision medicine modelling



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Topic-2: User-centric technologies and optimised hospital workflows for a sustainable healthcare workforce

NICU SmartFlow

Digitalize Neonatal Care Through
Smart Technologies For Improved
Quality And Efficiency

Contact Person Name : Dr. Hasan GÜNER

Organisation : Ertunç Özcan Co.
E-mail : hasan.guner@ertuncozcan.com
Link to : www.ertuncozcan.com
[Marketplace opportunity](#)
[Participant profile](#)

CHALLENGES AND OBJECTIVES

Neonatal Mortality^①

17.4

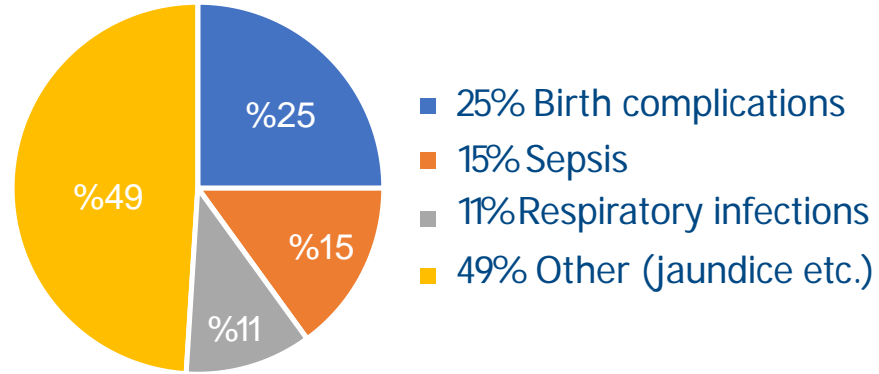
per 1000 newborns

The Sustainable Development Goals^①

<12

per 1000 newborns by 2030

Neonatal Morbidity^②



The number of patients per nurse should be between^③

1.5-3

① "Levels & Trends in Child Mortality", UNICEF, 2021.

② "Global Health Estimates", WHO, 2022.

③ "Standards for Nurse Staffing in Critical Care", BACCN, 2009.

CHALLENGES AND OBJECTIVES

Call Items

Care Accessibility
Ease of Integration
Process Optimization
User-Centricity
Innovative Workflows
Improved Quality
Operational Efficiency

Technological Solutions

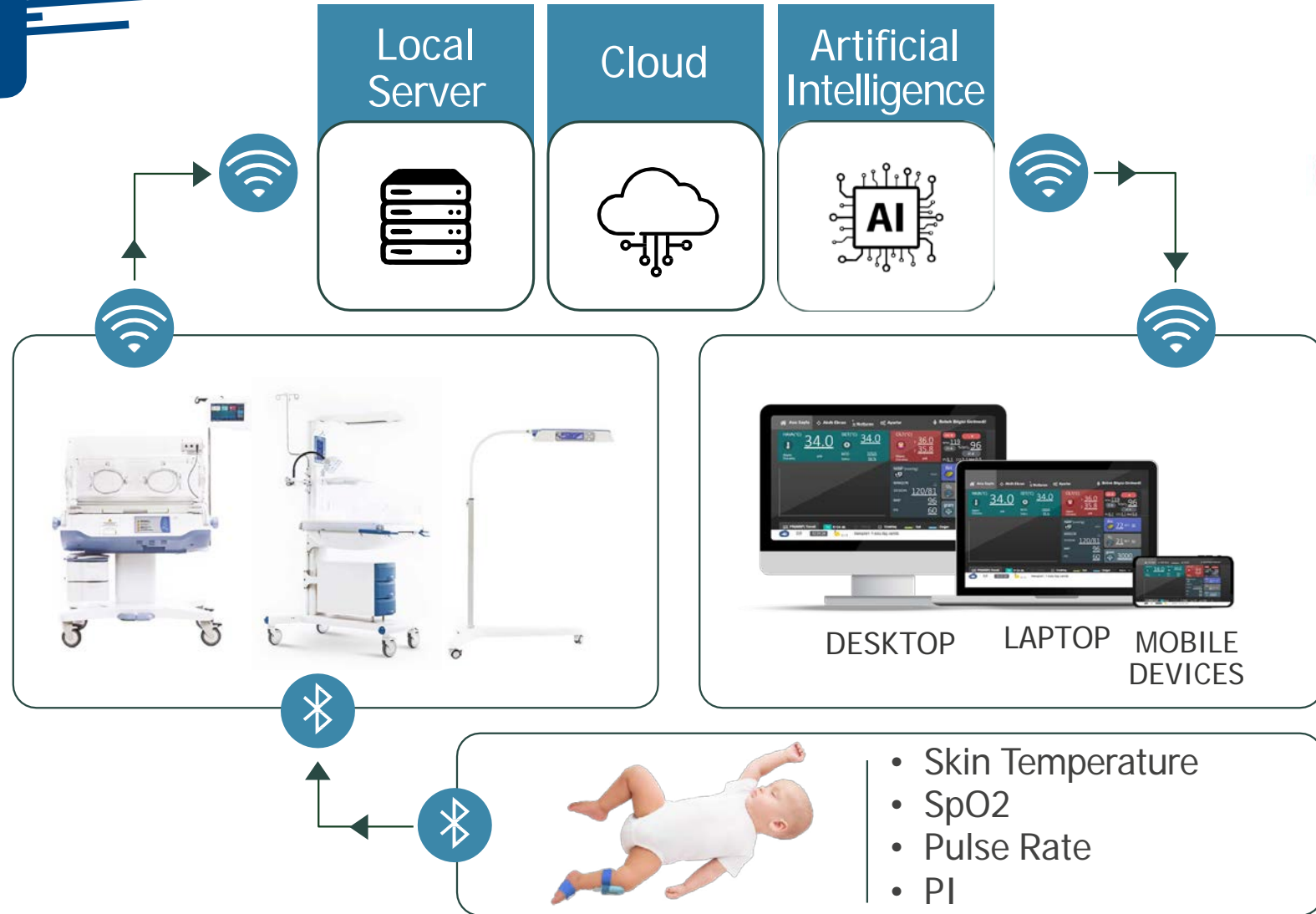
Remote Monitoring
Wearable Health Sensors
HL7 Integration
Mobile Health Apps
AI-assisted Decision Support
Cybersecurity



MAIN ACTIVITIES

Objectives

- Unified Data Management
- Real-time Continuous Monitoring
- Wearable Sensor Integration
- Decision Support Tools
- Secure & Mobile Accessibility
- Task Management Efficiency



ERTUNÇ ÖZCAN

NICU SmartFlow Modules



Wearable Health Sensors



Wearable Phototherapy ^①



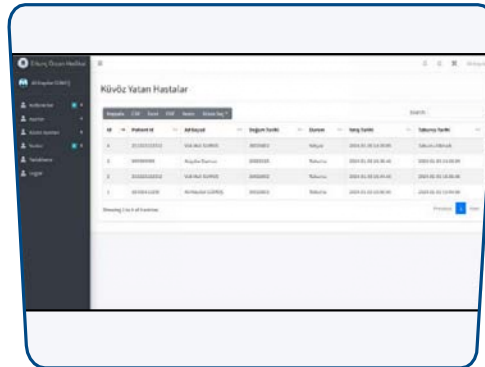
PoC Bilirubinmeter



Mobile Health Apps



Remote Health Monitoring



HL7 Integration



Artificial Intelligence

EXPERTISE AND RESOURCES OFFERED

55+ years of experience

1st rank in Turkey NICU market

15.000+ more product at NICU

35+ export to Country



NICU Incubator



Open Bed w/ Radiant Heater



Led Phototherapy Unit

Our Team of PhD & MSc Degree Holders



Hasan Güner, PhD
Electrical & Electronics Engineer



Sinem Ulutürk Cinbiş, PhD
Sociologist



Sultan Esin Ercan, PhD
Specialist Nurse



Özge Aktuna Kabakçı, MSc
Biotechnology Specialist



Tuğçe Şimşek, MSc
Biomedical Engineer



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Kübra Özdemir
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Melike Serra Şahin
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Hatice Özcan Şerbetci
Medical Engineering



Tolga Balıkçıoğlu
Electrical & Electronics



Serkan Çelik
Mechanical



Adnan Savaş
Mechanical



Yağmur Aslan
Biomedical



Ebrar Kızılgedik
Biomedical



Utku Durusu
Biomedical



Fevziye Ceyda Dirlik
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Royal College of Art
Smart Textiles



Dr. Aykut EKEN
TOBB ETU
Biomedical Engineering

International & Local Partners



EXPERTISE REQUESTED

- Wearable health sensors
- Mobile & web application development
- Hospital information systems
- Workflow & process optimization
- Artificial intelligence & big data



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ASSISTANT - A d a p t i v e a n d S u s t a i n a b l e D i g i t a l W o r k f l o w s f o r H e a l t h c a r e P r o v i d e r E m p w e r e m p t e m e n t *

Contact person name: Erik Koomen & Joppe Nijman

Organisation: University Medical Center Utrecht

E-mail: info@assistant.contact

Link to:

- [Marketplace opportunity](#)
- Participant profile: [Erik Koomen](#) & [Joppe Nijman](#)

* Working title

ASSISTANT

Challenges and objectives

Challenges:

- Overburdened healthcare workforce (staff shortages, administrative burden, data and alarm overload)
- Inefficient workflows and resource allocation
- Complex and time-consuming device management

Objectives:

- To develop a user-centric, safe and adaptive digital healthcare framework
- To promote human-computer/device interaction by optimizing user-interface experience (UIX)
- Implement remote monitoring, remote control and (AI-driven) nudging systems for healthcare providers

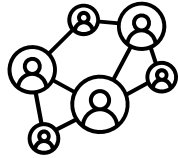
Expected Impact:

- Increased job satisfaction and reduction in healthcare provider burnout
- Optimized healthcare provider efficiency
- Improved patient outcomes, safety and satisfaction

Potential Results:

- Improved healthcare provider engagement and retention
- Adoption of nudging decision support systems for optimal task prioritization
- Decision support tools tailored to provider workflows

Main activities

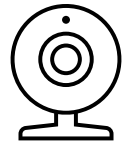


Digital healthcare framework

Implement inter-device communication and interoperability (SDC), foster data-availability

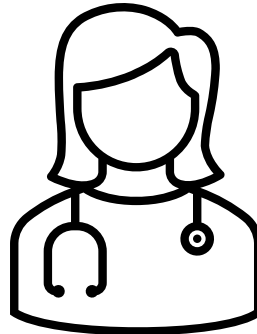
Training, Implementation, and Feedback

Provide comprehensive training on utilizing the tools and clinical workflows
Collect feedback to iterate on the design



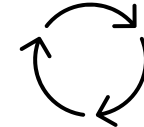
Remote control & monitoring

Enabling remote control of devices, such as medication pumps (SDC).
Facilitating seamless availability of remote monitoring data in healthcare framework



Adaptive clinical support systems

Make modular, user-centric and time-saving clinical solutions, e.g. medication prescription software bidirectionally communicating with pumps

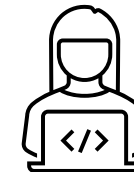


AI nudging systems

Build algorithms for task prioritization and alert healthcare providers (nudging).
Continuous improvement of AI algorithms and system usability

Human-computer interaction

Development and implementation of an easy-access user-friendly interface & experience (UI-UX)



Expertise and resources offered

- The UMC Utrecht (large Dutch academic hospital, >1000 beds, >12.000 employees) team focused their IT, implementation research and new construction projects towards functional support of the care and cure. A strong multidisciplinary approach guarantees patients benefit from the latest available expertise and innovative technological solutions.
- The UMC Utrecht team is partner in the European IHI call 3 “Smart and Silent ICU” project.
- Already interested partners for this consortium:
 - UMC Utrecht (consortium lead, academic hospital) [NL]
 - Ascom (large company, IKAA) - *mobile workflow healthcare solutions provider [I]*
 - B Braun (large company, IKAA) - *medical technology company [DE]*
 - Draeger (large company, IKAA) - *medical and safety technology company [DE]*
 - Systematic (large company, IKAA) - *software and systems provider [DK]*
 - Checkpoint Cardio (SME) - *telemedicine and remote monitoring solutions provider [BG]*
 - Neolook Solutions BV (SME) - *video augmented healthcare service provider [NL]*
 - Princess Maxima Center of Pediatric Oncology (hospital) - [NL]

Expertise requested

- Hospitals willing to investigate, improve and implement new clinical work processes with IT/technical support
- Academics and research institutes interested in development, research, and implementation of human-computer interaction and (AI-based) clinical decision support systems (CDSS)
- IT partners (SME, large companies) companies who can support workflows (clinical (EMR), logistics, planning) and/or develop CDSS and UI/UIX
- Medical device companies (SME, large companies) producing devices with standardized inter-device communication (such as SDC/ SDPi) and are looking for integrated care solutions in intra- and extramural care.

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IHI Call 7 Topic 2

User-centric technologies and optimized hospital workflows for a sustainable healthcare workforce

Yoram Lev Yehudi
info@capable-project.eu

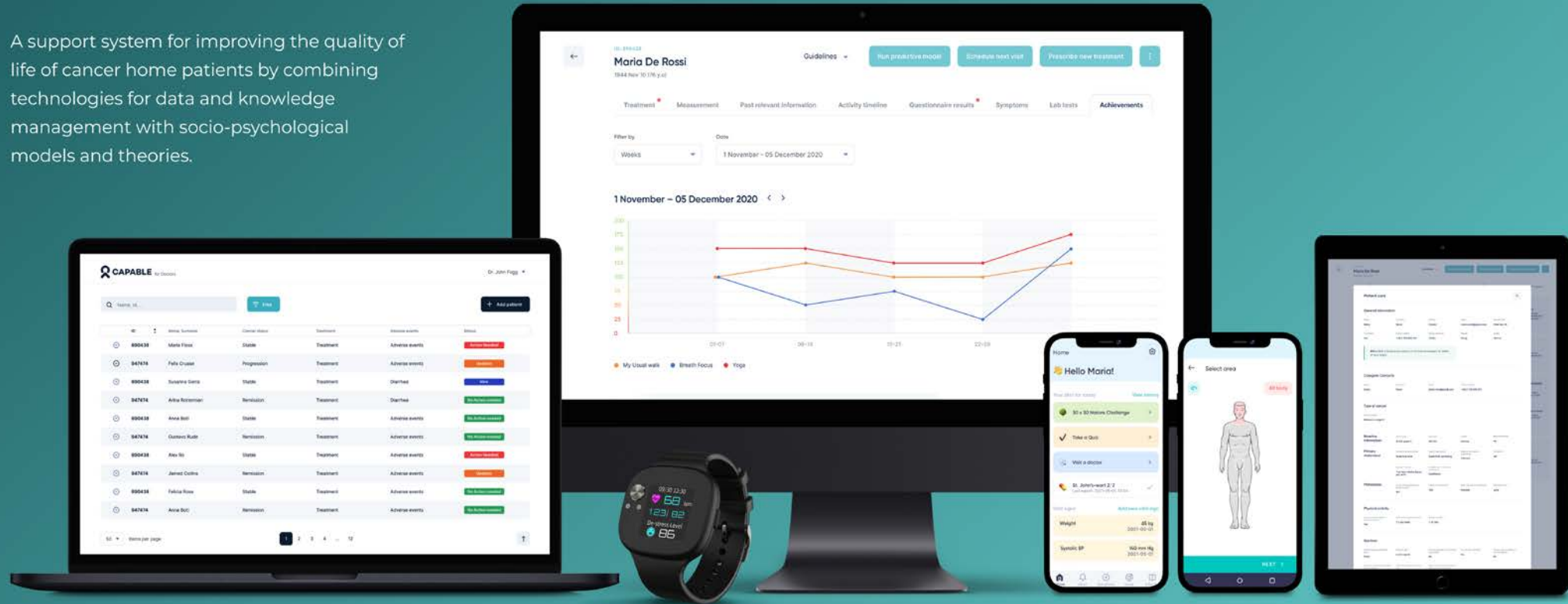


This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 875052

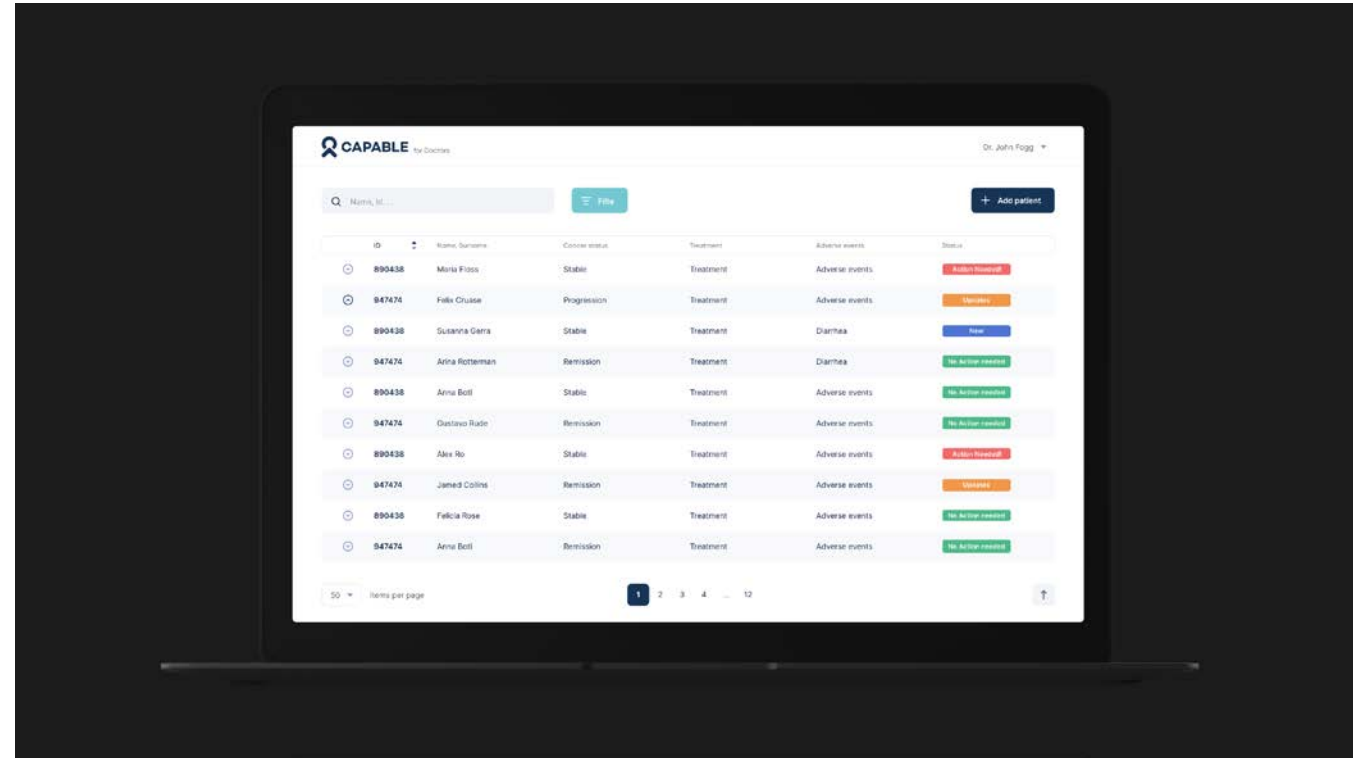
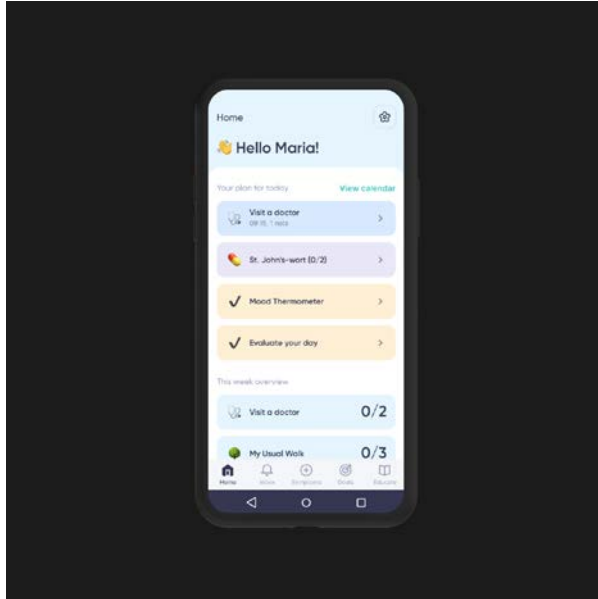
What is CAPABLE?



A support system for improving the quality of life of cancer home patients by combining technologies for data and knowledge management with socio-psychological models and theories.



What is CAPABLE?



EU funded project 875052, Started Jan 2020, ending Jan 2024; TRL 6 (working prototype, piloted at 3 EU hospitals (IT, NL))

Preliminary Feedback

Patients and caregivers love it!

Developed in collaboration with both sides

Evidence-based feedback expected later this year



We tick all the boxes

→ Expected outcomes



- **Healthcare professionals** - Assistive technologies and improved hospital workflows, resulting in optimised procedures or new capacities; improving workload and job satisfaction.



- **Patients** - An improved care journey experience and enhanced healthcare services.



- **European healthcare systems** - Increased functionality or new and better capacities.



- **Healthcare providers** - Improved cost-effectiveness and efficiency of care delivery, and a better experience of both hospital staff and patients.

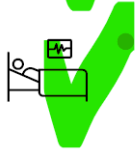
* Actions under this topic must contribute to at least three of the following outcomes

We tick all the boxes

→ Expected impacts



Innovative technology contributing to halting the current efflux of medical professionals, fostering **sustainable careers in healthcare**;



Improved patient care through advanced diagnostic and treatment technologies, more efficient clinical workflows, privacy and security of patient data;



Companies develop technological solutions to **support healthcare professionals**; considering workflow integration and reflect end-user needs;



Healthcare systems improve their capacity and resilience because of more efficient and sustainable solutions.



Contribute to the '**Comprehensive Approach to Mental Health**' and '**a Europe fit for the digital age**' strategies of the European Commission.

What do we need?

We want to fund a market take-up and wider impact:

- Regulatory (started)
- Connection with hospitals
- Large scale pilots
- Expansion to other cancer types (currently mainly renal and melanoma)
- Potential new use case: early detection and management of drug side effects (of interest to pharmaceuticals)
- Scale up (infrastructure)

What we are looking for:

An industry partner who can help with
these activities
and
fund ~50% of the project

Contact

Thank you for your attention!

For more information see
<https://www.capable-project.eu>
info@capable-project.eu

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IHI Call Days | Call 7

● **Topic 2:** User-centric technologies and optimised hospital workflows for a sustainable healthcare workforce

Streamlining workflows with personalized health monitoring



- Contact person name: **Esmeralda Megally**
- Organisation: **Xsensio**
- E-mail: esmeralda.megally@xsensio.com
- Link to: [Link to Xsensio Marketplace opportunity](#)



[Link to Xsensio profile](#)

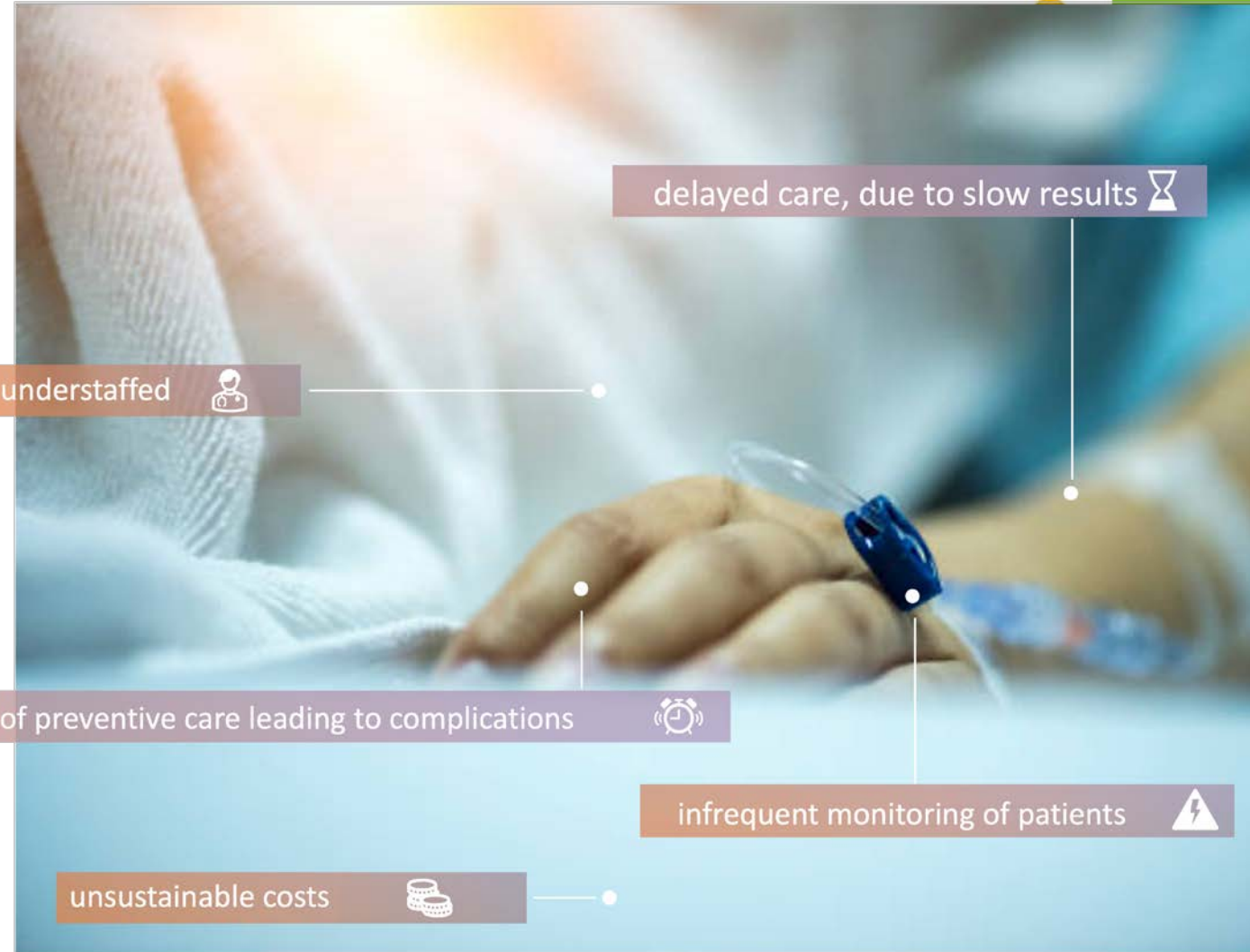


Challenges

Overburdened healthcare system:

- Understaffed, leading to limited patient monitoring
- Reactive, with unstable patients detected too late.
- Expensive, with avoidable complications

Leads to ...

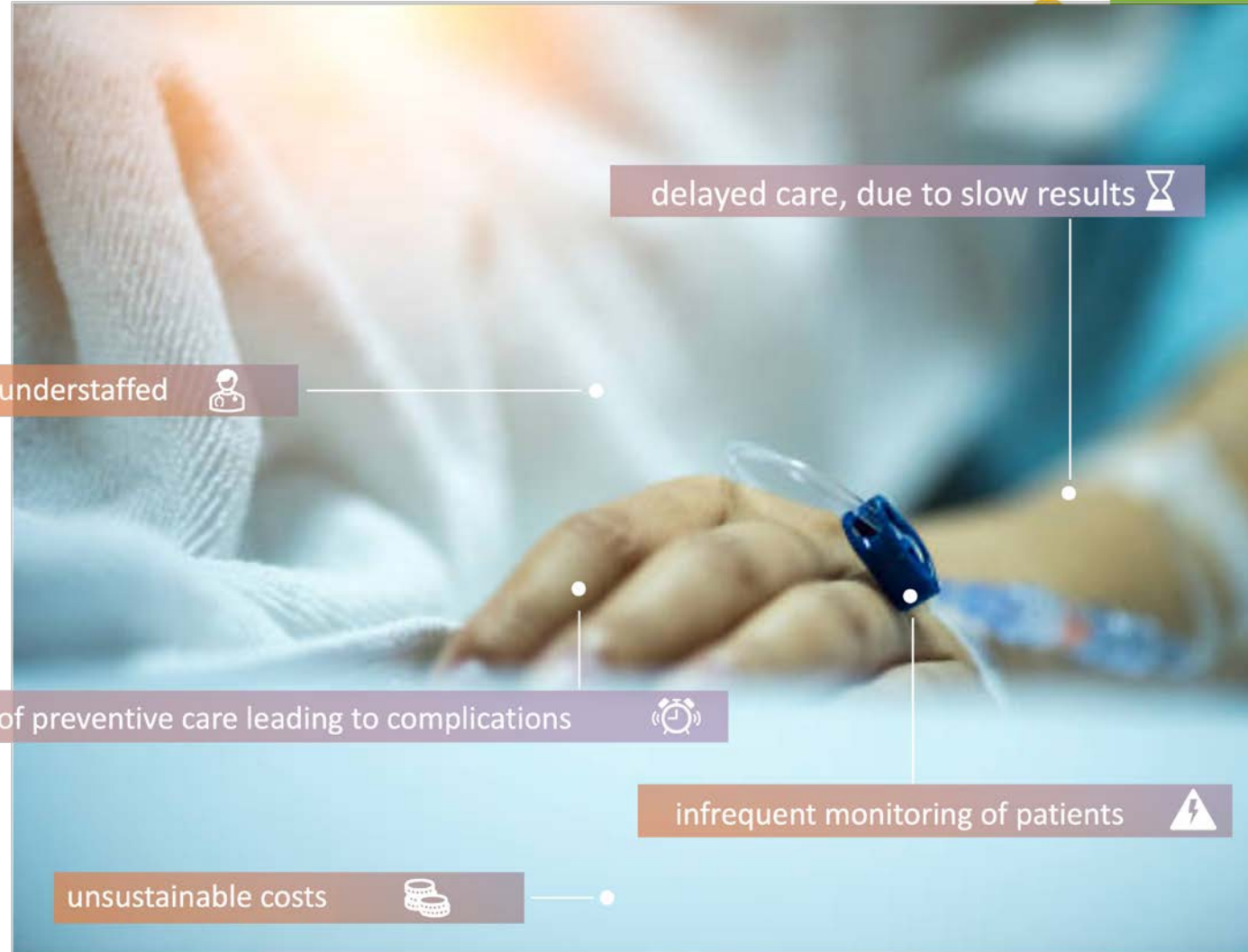


Challenges

Overburdened healthcare system:

- Understaffed, leading to limited patient monitoring
- Reactive, with unstable patients detected too late.
- Expensive, with avoidable complications

Leads to inefficient workflows!



quickly triage stable vs unstable patients



THE LAB-ON-SKIN™ SOLUTION



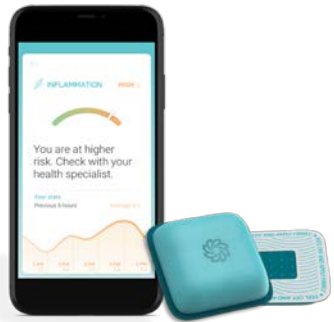
fluid

Focus for IHI Topic 2:

Realtime monitoring of critical care biomarkers to detect shock dynamics and organ dysfunction in at-risk patients in ER, operating room and ICU.



Public-private partnership to develop + clinically validate + integrate user-centric solutions along critical care in ER, hospital, operating room, ICU to identify unstable patients faster, and offer personalized care.



SM
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IHI Call Days | Call 7 | Topic 2

- User-centric technologies and optimised hospital workflows for a sustainable healthcare workforce

AI innovation to reduce nursing shortage impacts

Contact person name:

Scott Russell

Organisation:

INNATIFY

E-mail:

Scott.Russell@innatify.com

Link to:

- Marketplace:

ihi-call-days.ihi.b2match.io/participations/325651/opportunities

- Participant profile:

www.linkedin.com/in/scott-russell-healthtech/



Solution is grounded in research and industry validated; mitigating risks to guide long-term hospital value



CHALLENGES

- ✗ 1 million shortfall of health workers across Europe
- ✗ Nursing job strain at 61%, twice the EU average
- ✗ Sick leave levels consistently above 8%-12%
- ✗ 19%-45% EU nurses considering changing profession
- ✗ Hospital budgets increasingly under pressure



SUCCESS MEASURES

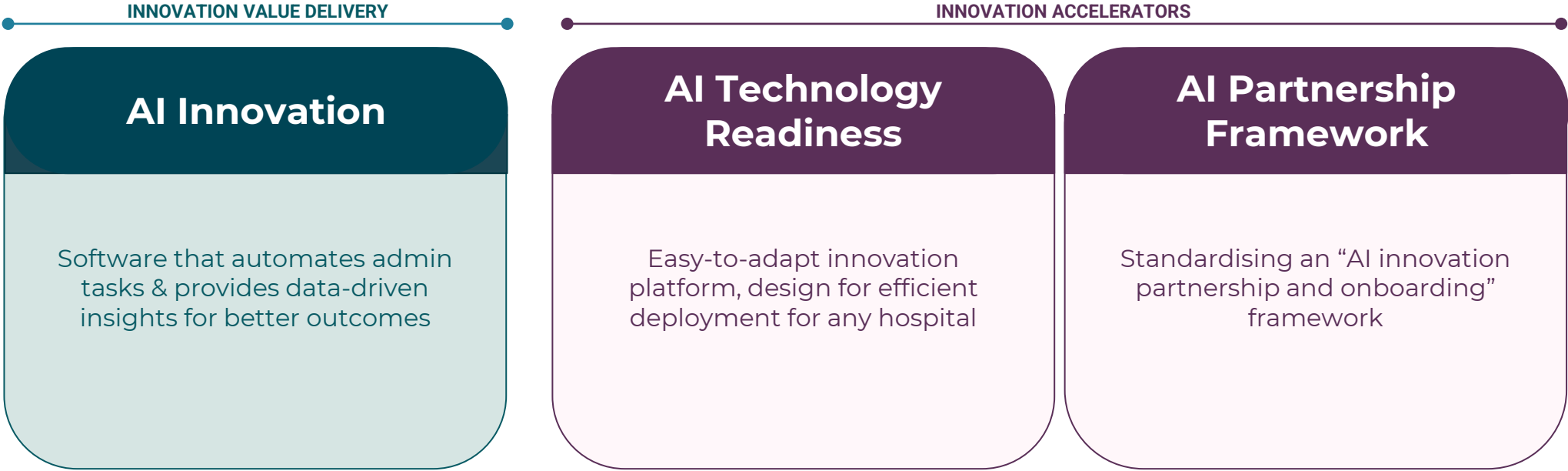
- ✓ Unlock 2,000+ hours of Nurse Management time, per hospital
- ✓ Save each hospital €1M p.a., linked to skills shortage
- ✓ Support improvements in nurse satisfaction & reduce turnover
- ✓ Innovation can be indirectly linked to increased patient care
- ✓ Easy-to-adapt innovation, that scales across EU hospitals



IHI ALIGNMENT

- ✓ Innovative tech & solution
- ✓ Boost capacity & resilience
- ✓ Support Mental Health
- ✓ Improved patient care
- ✓ Public-private partnership
- ✓ Build on EU knowledge

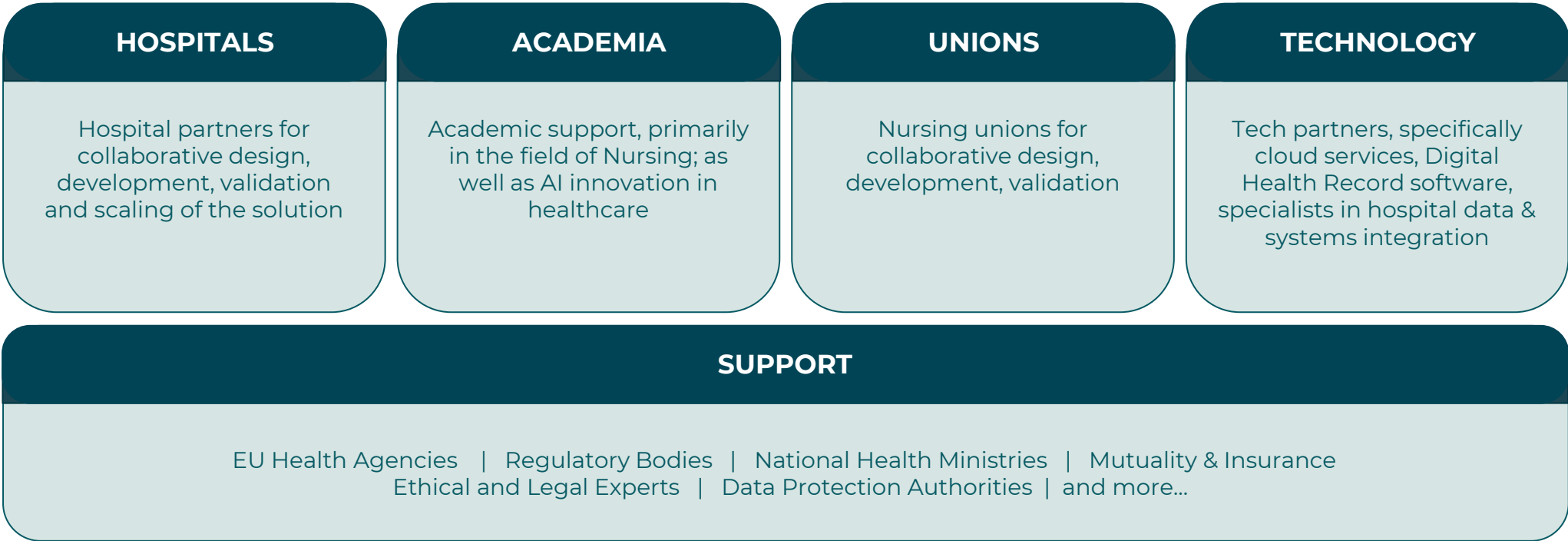
AI innovation enhancing nurse satisfaction plus associated benefits; also strategically setting EU foundations for AI innovation in hospitals



Initial collaboration conversions with established R&D partners, with everyone aligned on the primary problem to be solved



Seeking collaborative partners to scale the solution, emphasising a cross-disciplinary team for lasting success beyond project completion



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IHI Call Days | Call 7

- Topic 2:
- User-centric technologies and optimised hospital workflows for a sustainable healthcare workforce

Data-driven Scorecard-based clinical management System (DASCO)

Contact person name: Dr. Maria Zisiopoulou

Organisation: University Hospital Frankfurt, Germany

E-mail: Maria.Zisiopoulou@herz-frankfurt.de

Link to:

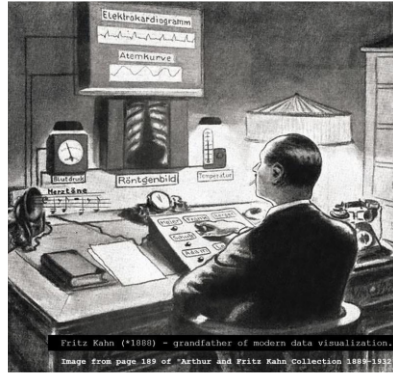
- Marketplace opportunity: <https://ihi-call-days.ihi.b2match.io/participations/324992/opportunities>
- Participant profile: <https://ihi-call-days.ihi.b2match.io/my>

Challenges and objectives

“In healthcare environment, it’s not only about how much data , information, and technology you have at your fingertips ...



... it’s what you do with it...”



Starting point – need for action

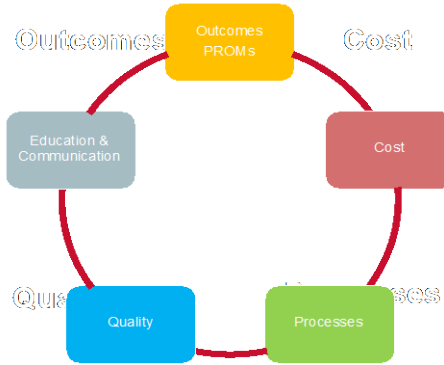
- Patient data are collected continuously in a hospital: data on medical history, laboratory tests, diagnosis, treatments and costs
- The **multimodal use** of these **data** can help to **improve results, processes, efficiency and quality**.

	Beteiligung der Akteure					Beteiligung der Akteure			
Ergebnisse	xxx		xx		Ergebnisse	xxx	xx	xx	xx
Prozesse	xxx			x	Prozesse	xxx	xx	xx	xx
Wirtschaftlichkeit	xx		x	xxx	Wirtschaftlichkeit	xx	x	x	xxx
messbare Qualität	?	?	?	?	messbare Qualität	xx	xx	xx	xx

Main activities

Standardised Data Collection

The scorecard measures the **KPIs in 5 areas**

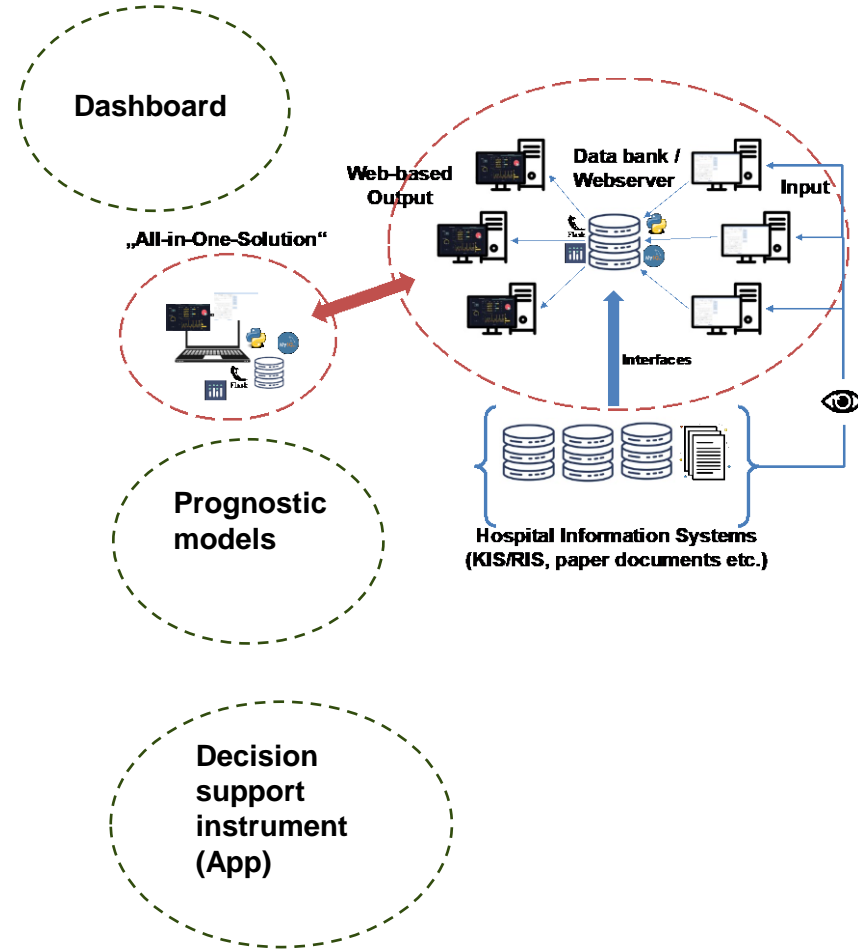
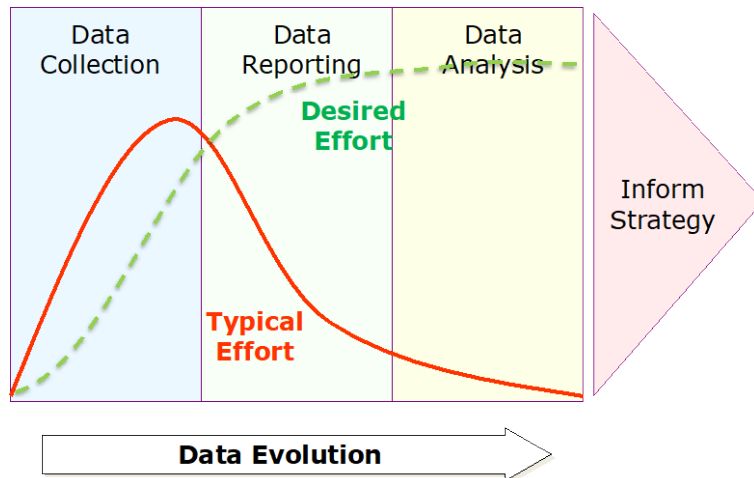


and from **4 perspectives**:



... which are quite individual and follow quite different aims.

The right use of these data can help to **improve results, processes, efficiency and quality.**



Expertise and resources offered

- We are bringing expertise in outcomes research, existing large database of clinical and real world data, opportunities for gathering prospective high quality health data.

Expertise requested

- We are looking for private companies (start-ups and / or small, medium or large established companies).
- We are looking for the following expertise: Data analytics, app-development

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Topic 2

“Fraunhofer Partnership” for Digital Health Solutions

Contact person name: Theresa Ahrens, PhD

Organisation: Fraunhofer IESE

E-mail: theresa.ahrens@iese.fraunhofer.de

Link to:

- <https://ihi-call-days.ihi.b2match.io/marketplace/opportunities/UGFydGljaXBhdGlvbk9wcG9ydHVuaXR5Ojg4NjA4>

- <https://ihi-call-days.ihi.b2match.io/participations/207544>

Challenges and objectives

- Holistic User-Oriented Hospital IT System Modernization
- potential results and expected impact:
 - Data-driven optimization of procedures to benefit health professionals
 - Automatization solutions by foundation models/AI
 - Reduction of inefficiencies for scheduling and administrative tasks

Fraunhofer expertise and resources offered

#WeKnowHow

The Fraunhofer-Gesellschaft is the world's leading applied research organization with 76 research institutes, specialized on product transfer to market with public-private partnerships.

„Fraunhofer Partnership“					
IAIS	ISST	IESE	IPA	IZI	ZDD®
AI, Foundational Models, Large Language Models, Data Science, AI Hospital Qualifications, Visual Analytics, Clinical data analytics	Data spaces and Data ecosystems, Interoperability and Connectivity, intelligence from data in healthcare systems	Digital Twins, Virtualization, Health 4.0, Pharma 4.0, DependableAI	AI, workflow and process optimization, automation and data management in clinical processes	Clinical Science, Project management, Interoperability in medical care, Analysis & evaluation of medical parameters for AI, Diagnostic, Immuno-oncology, Infection pathology	decentralized bio-analytics and diagnostics with services along the complete value chain, teaching and qualification programs
IAIS website	ISST website	IESE website	IPA website	IZI website	ZDD website
Dario Antweiler	Anja Burmann	Theresa Ahrens	Malte Volkwein	Andreas Oberbach	Ullrich Stein
dario.antweiler@iais.fraunhofer.de	anja.burmann@isst.fraunhofer.de	theresa.ahrens@iese.fraunhofer.de	malte.volkwein@ipa.fraunhofer.de	andreas.oberbach@izi.fraunhofer.de	ullrich.stein@izi-bb.fraunhofer.de

Main activities

„Fraunhofer Partnership“			
Foundational Models for Hospitals	Digital Twins for Medical Device and Hospital Virtualization & AI-based Process Optimization	Interoperability in clinical processes	Educational Program
IAIS	ISST & IESE	IPA & IZI	ZDD®
Use Case: Trustworthy & Multimodal Clinical Large Language Models	Use Case: Operation Room, Emergency Department	Anticipation of future patient paths and usage of resources based on clinical data and retrospective patient paths	Train-the-trainer Concept development and realization of specific education programs

Expertise requested

- Consortium leadership
- Domain experts for Hospital Software
& Digital Twin co-creation
- Mainly looking for:
 - **SME and large enterprises with * IKOP and ** IKAA**
 - University Medical Centers

Pitching Session

Today 24 January 2024, 14:30 – 16:00 Brussels time

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3	Andreas	CHIOCCHETTI	Professor	Goethe University Frankfurt am Main	Manage Mental Health in Chronic Diseases
4	Hasan	GÜNER	R&D Leader	ERTUNÇ ÖZCAN CO.	NICU SmartFlow - Digitalize Neonatal Care Through Smart Technologies For Improved Quality And Efficiency
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IHI Call Days | Call 7

Topic 2: User-centric technologies and optimised hospital workflows for a sustainable healthcare workforce



David Belo

[david.belo@safe-ai-4u.eu]



SAFE AI [4U]

Profile: <https://ihi-call-days.ihi.b2match.io/participations/322106>

Marketplace: <https://ihi-call-days.ihi.b2match.io/marketplace/opportunities/UGFydGljaXBhdGlvbk9wcG9ydHVuaXR50jg4NzI5>



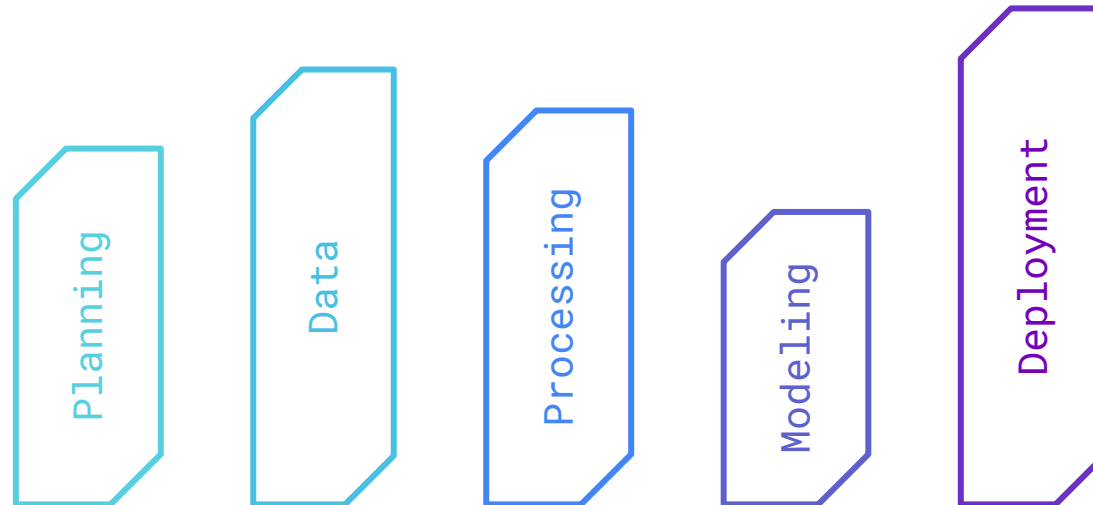
Challenges

HOSPITALS FACE THE SAME ISSUES THEY HAD 10 YEARS AGO

- **Workflow is not optimized** - a lot of bureaucracy
 - **Patients waiting in the Urgency Wards**
 - **Critical patients** not having proper **treatment in time**
 - Medical staff more overburdened - more fatigated
 - All these have been aggravated after COVID pandemic (no recovery time)
-
- AI is being employed to high-end decisions, but there is a lot of health facilities that **DO NOT HAVE PROPER DATABASES**

Solution

- TARGET THE WORKFLOW CYCLE IN EACH STEP



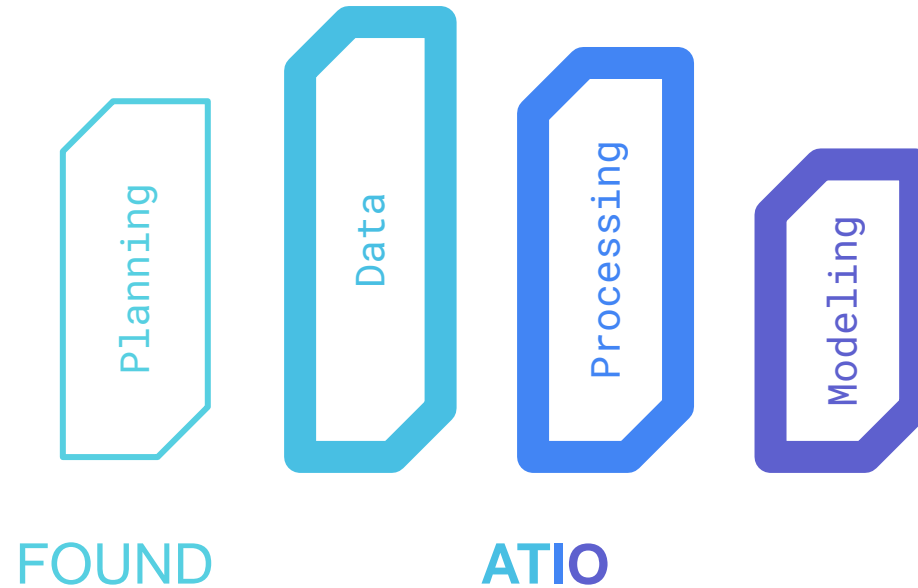
Objectives



FOUND

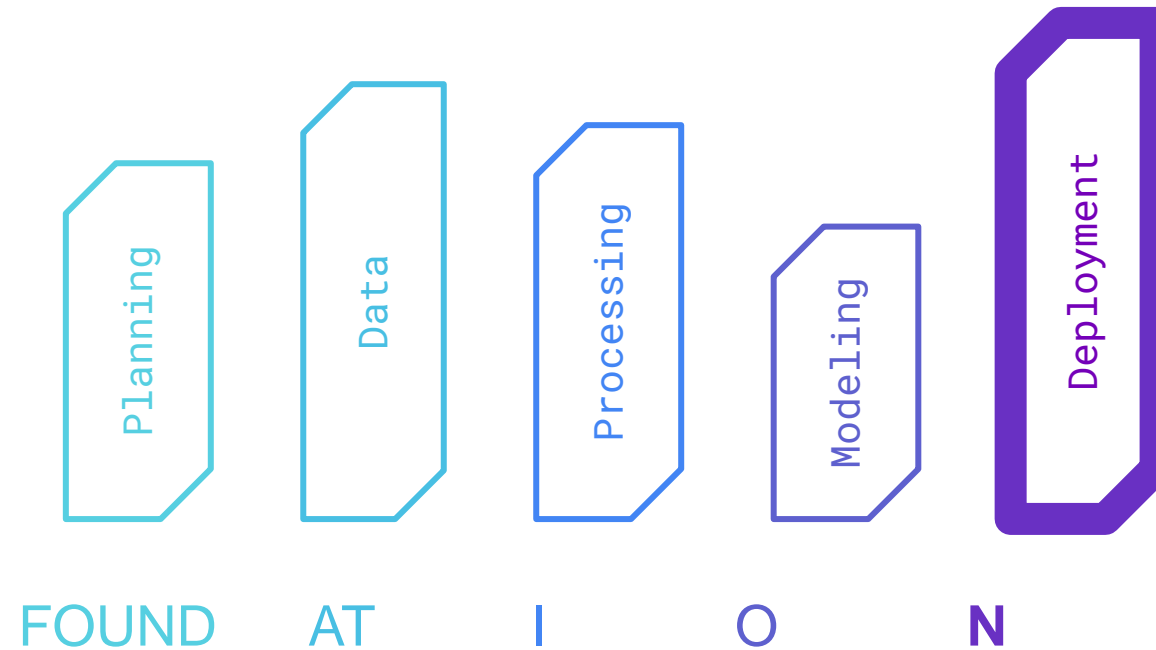
- **F**ostering **O**ptimization, **U**nderstanding, and **iN**formed **D**ecisions
 - In-field research with teams of medical staff and user-centered design teams

Objectives



- Analysis of **T**asks' efficiency
 - Analysis of bottlenecks within the service and act upon it
- Intelligent **O**ptimization
 - **Use AI to smooth existing procedures**
 - **Optimize repetitive procedures**
 - Make healthcare digitization easier

Objectives



- **N**ational Healthcare System
 - We aim to impact the healthcare system by providing the long-awaited solution

Potential and impact

- **Reduce significant administrative costs**
- **Reduce morbidity and mortality of patients**
- **Decrease the time needed for monitoring patients in clinical trials**
- **Increase the flow of patients** (many leave due to the waiting) ensure that proper medical care is delivered - **increasing medicine sales**
- **Restructure of the public and private healthcare data systems**

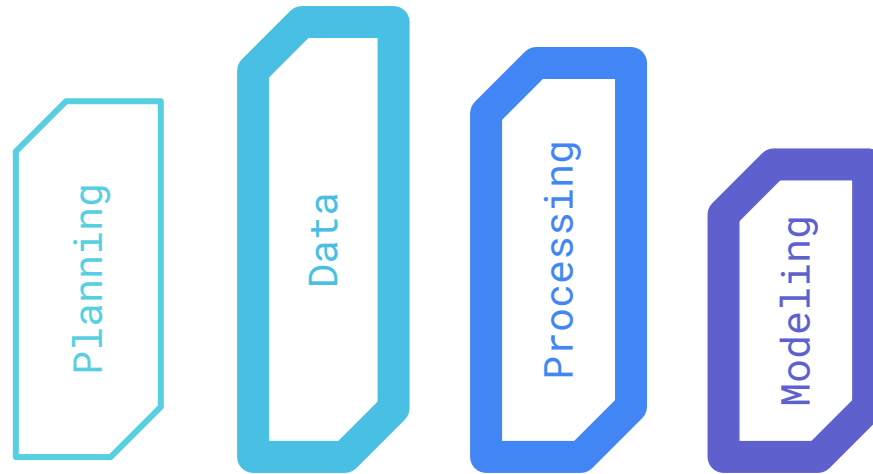
SAVE LIVES

Main activities



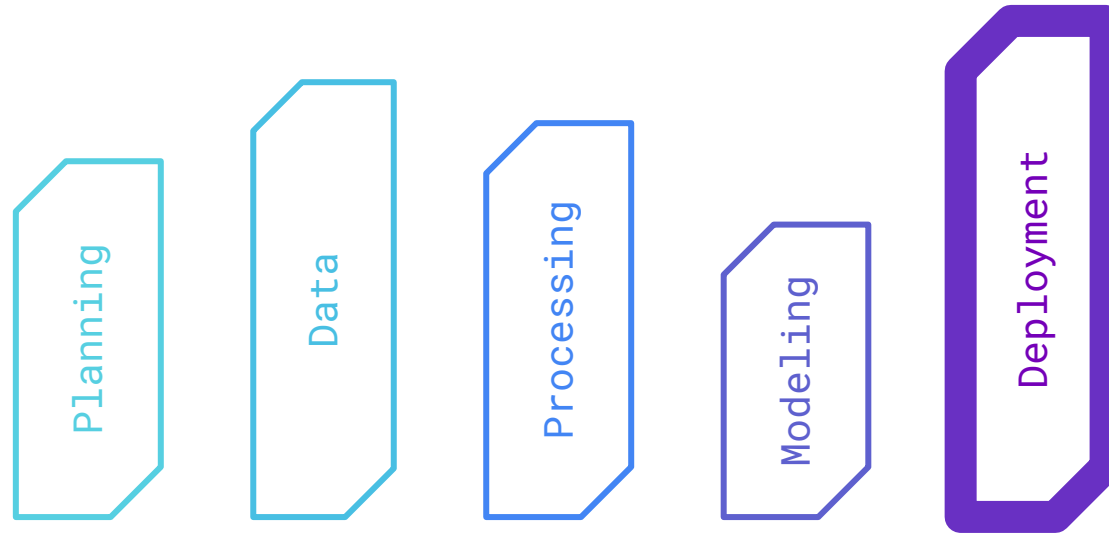
- **User-centered design approaches to understand each health center and pharma industry** - we have defined 3 use-cases at the time-being with different layers of expertise

Main activities



- Use A.I. to **ease the life of healthcare professionals and pharma industry:**
 - e.g. reduce bureaucracy tasks, provide speech-to-text approaches, etc.
 - Use A.I. to help the healthcare digitization process
 - Use A.I. to help monitoring patients with anomaly detection algorithms - namely for **heart conditions**

Main activities



- **Secure Cloud database for interoperable operations,** such as access EHR in different healthcare centers

Expertise and resources offered

Currently, we have 4 confirmed partners:

- **ciTechcare**
 - Experience in the implementation of User-centric approaches in Hospital de Leiria
- **Hospital de Setúbal:**
 - One of the use-case owners with particular interest in cardiology
- **TIGA** - SME for the National Turkey Healthcare System
 - Experience in the structure of the healthcare data of Turkey
- **Safe AI [4U]**
 - Expertise in Responsible A.I. Solutions in Healthcare

- **We do not have in-kind contributions:**
 - **But looking for partners - talk to us :)**

Expertise requested

- SMEs or large companies with expertise in healthcare software development
- Research institutes with experience in User-centric methods
- IHI partners that could offer in-kind contributions

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IHI Call days | Call 7 | Pitching sessions

Call 7, topic 2: User-centric technologies and optimised hospital workflows for a sustainable healthcare workforce.

Prof. Dr. Jens O. Brunner
(DTU/Region Zealand)

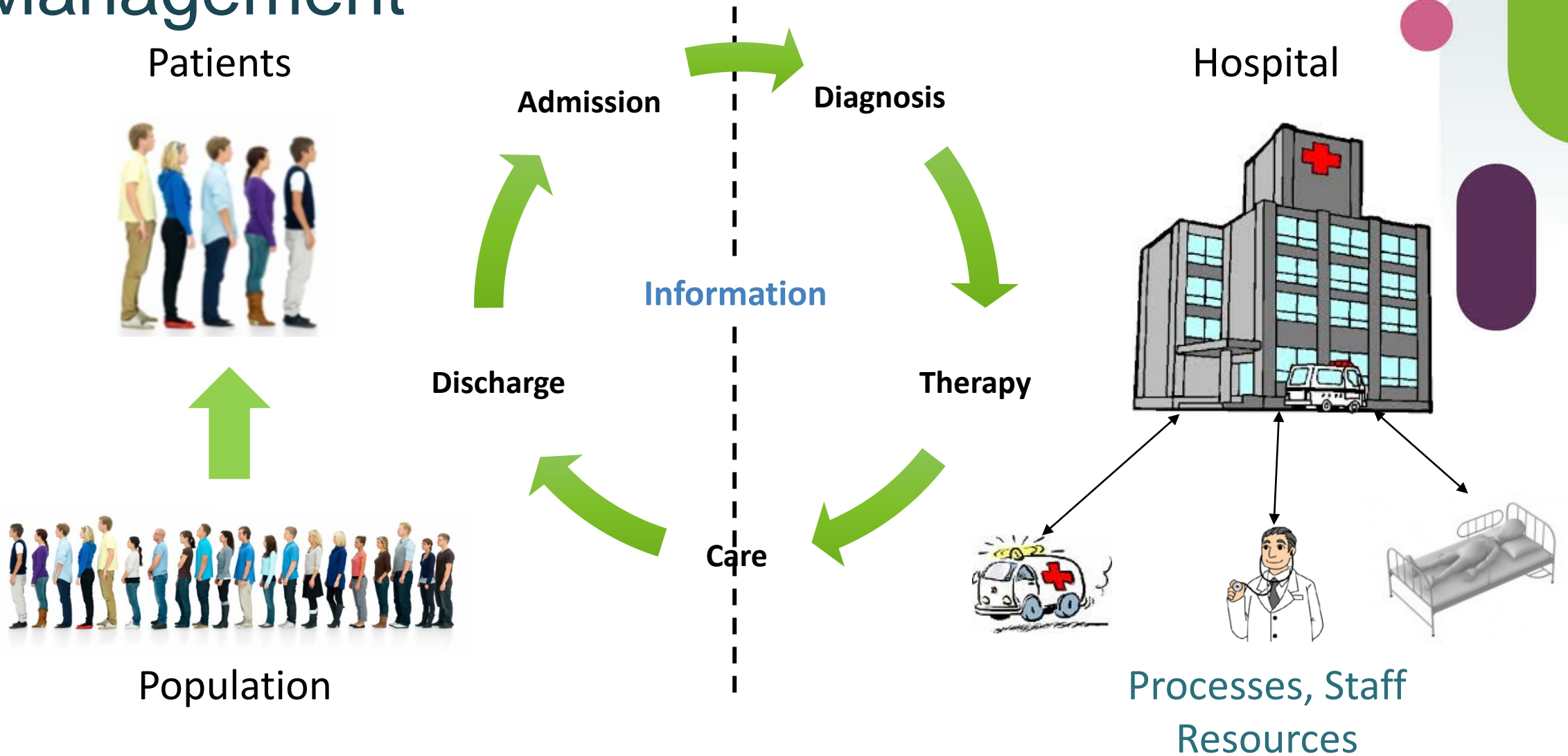
January 24, 2024

Academic curriculum Vitae

- 2023 Full Professor for Decision Science in Health Care, Department of Technology, Management, and Economics, Division of Management Science, **Technical University of Denmark** (DTU/Region Zealand)
- 2013 Full Professor for Health Care Operations/ Health Information Management Faculty of Business and Economics, **University of Augsburg**
- 2012 Interim Professor for Service Operations Business Faculty, **University of Mannheim**
- 2009 Doctorate (Dr. rer. pol.) TUM School of Management, **Technical University of Munich**
- 2006 Business Studies (Dipl.-Kfm.) Business Faculty, **University of Mannheim**



Research focus: Health Care Operations Management



Data-driven decision making Healthcare

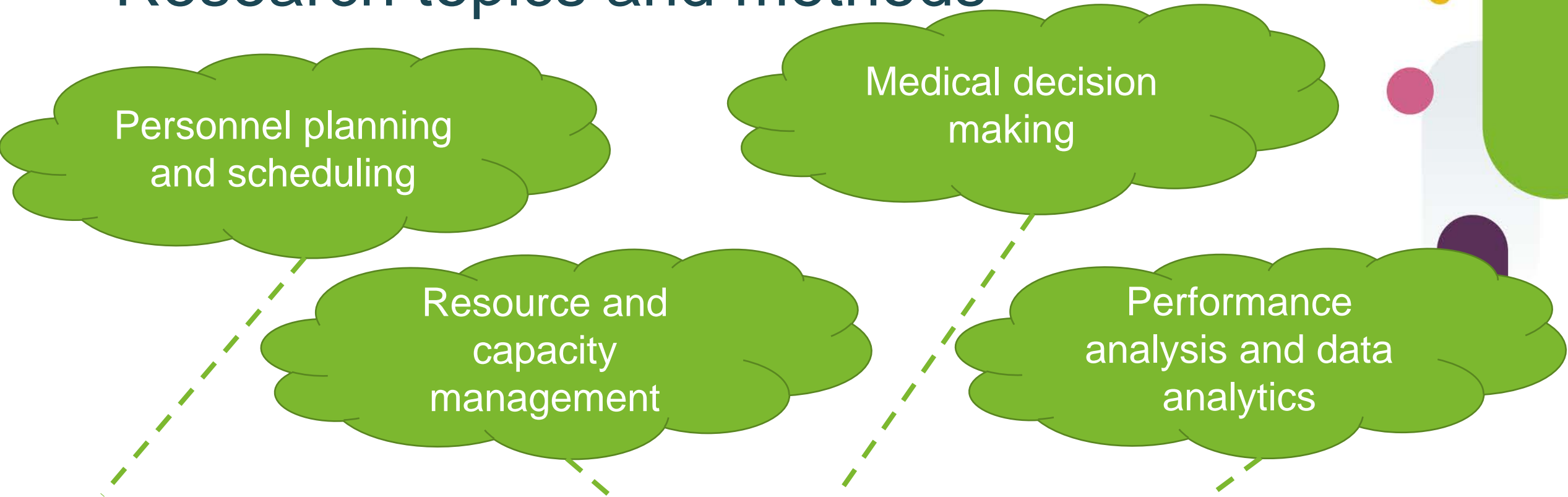
Data Science (Analytics)

Operations Management (Research)



Definition of requirements for information systems

Research topics and methods



Mathematical programming	Artificial intelligence	Optimization algorithms	Data science	Simulation	Statistical analysis
	Visualization		Heuristics	Decision analysis	

Thank you for your attention!



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IHI Call Days | Call 7

● **User-centric technologies and optimised hospital workflows for a sustainable healthcare workforce.**

Optimization of space/workforce and better patient care in optometric/ophthalmology departments

Contact person name: Jacques Charlier

Organisation: Metrovision, French SME

E-mail: o.amoyal@argentumconsultants.eu

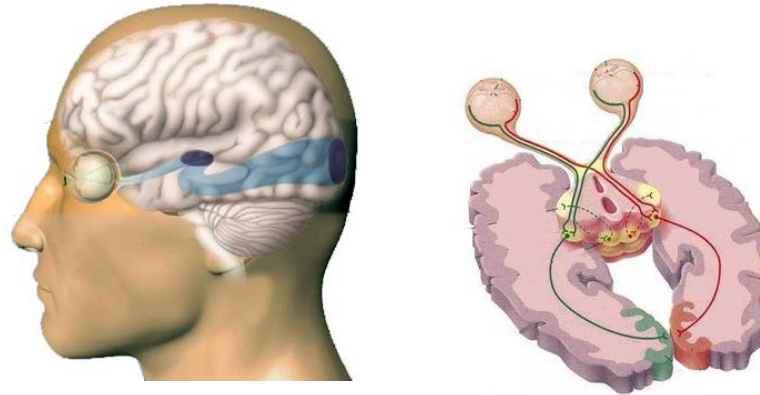
Link to:

- [Marketplace opportunity](#)
- [Participant profile](#)

Challenges and objectives

TESTS OF VISUAL FUNCTIONS

- Diagnosis
- Follow-up of treatment
- Evaluation of visual aptitudes
- Evaluation of new treatments



MANY DIFFERENT TESTS with different equipments,
different suppliers, ...

❖ Vision psychophysics

- Standard automated visual field
- Manual "Goldmann" perimetry
- Dark adapted chromatic perimetry
- Dark adaptometry
- Full field stimulus threshold (FST)
- Photo aversion (PAT)
- Contrast sensitivity
- Glare
- Metamorphopsia
- Attention visual field

- Attraction perimetry
- Preferential looking

❖ Vision electrophysiology

- Electro retinography (ERG)
Flash, Pattern, Multifocal
- Visual evoked potentials (VEP)
Flash, Pattern
- Electro oculography (EOG)

❖ Video oculography

- Pupillometry
- Control of fixation
- Saccades, pursuits, OKN
- Scan path analysis
- Reading test

Challenges and objectives

A SINGLE MULTIMODAL PLATFORM

- Simplify the patient's journey
- Reduce costs (regulatory, space, ..)
- Single interface (training of technicians, ..)
- Modular and expandable



❖ Vision psychophysics

- Standard automated visual field
- Manual "Goldmann" perimetry
- Dark adapted chromatic perimetry
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Main activities

- Treatments of the future

To develop innovative techniques for testing the efficacy of new treatments being developed in clinical trials (including gene therapy research)

- Technologies of the future

To develop and validate new innovative techniques of visual function tests based on multimodality, advanced eye tracking technology, ...

- Meet challenges such as testing at young ages.

Expertise requested

- We would like to be a partner for this call and not a coordinator
- We would be happy to collaborate with Hospitals, Clinics, Research Institutes, CROs

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IHI Call Days | Call 7, topic 2

- User-centric technologies and optimized hospital workflows for a sustainable healthcare workforce

Validated and proven healthcare as a part of eHealth

Contact person name: Kristleifur Kristjansson MD

Organisation: Skraeda

E-mail: kris@sjukraskra.is

Links to:

- [Marketplace opportunity](#)
- [Participant profile](#)

Challenges and objectives

- Standardized Psychometric Tests – Pillars of Psychology.
 - Used for everyday diagnosis and progress and efficacy assessment
 - Digitalization of healthcare
 - EMRS blamed for health care worker burnouts
 - Mental health apps in the thousands – the App craze!
 - Psychometric testing with professionals at the copy machine and filing cabinets!
 - Majority of psychometric tests are worldwide still done on paper – manual errors
- What about digitalising the proven clinical methodologies!?

Dr. George Gellert, Medical Advisor,
Impact/Value Demonstration

 **Infermedica**
Artificial Intelligence in Medicine

Only when scientific research on health IT impact and value demonstration is regarded as being as important to healthcare delivery as clinical trials, will spending on health IT become rational and systematic”

 innovative
health
initiative

Main activities and outcomes

- Implementation of our Quera™ solution for digitalized and integrated psychometric testing in collaborative clinical institutions
- Efficiency study of pre and post implementation for
 - Work hours saved
 - Visits saved, travelling miles saved
 - Throughput of patients
 - User satisfaction: clinicians/institutional employees and patients
- Collaborative development of easy-to-use interface for the digitalization of institutional/standardized treatment and follow-up protocols with remote digital therapy, monitoring and interventions
- Validation studies for efficacy and efficiency



Expertise and resources offered

- Quera™ is has already been used in Iceland for psychometric testing of thousands of patients – even across borders: Spain – Iceland.
- Being implemented at the Mental Health Care Center for Primary Care in the Capital Region
- Interests expressed at the University of Iceland and the Psychiatric Department at the University Hospital
- Skreda has 15 years of eHealth development and service provision
- **Skraeda would be bringing in-kind contributions (IKOP* and/or IKAA** as a Private member**

* IKOP - in-kind contributions to operational activities

** IKAA - in-kind contribution to additional activities

Expertise requested

- Clinical institutions that are interested in improving their workflow efficiency and workforce satisfaction by digitalization of proven diagnostic and therapeutic modalities.
- Clinical research institutions capable and qualifying for validation research of the above and of digital therapeutics



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Cell and gene therapy workflow optimization

Single fully automated, functionally closed
gene delivery platform in a compact
bedside device

Dr. Sonja Steppan

Fresenius SE & Co. KGaA

Sonja.Steppan@fresenius.com

Topic number 2

Cell and gene therapy workflow optimization

The problem

Growing patient population



~ **2 million** new cancer cases/year¹



One in six cancer related deaths²



Over 5000 monogenetic diseases³

Challenges in cell & gene therapy delivery



Complex manufacturing and supply chain



Time consuming process – **4 weeks**⁴



Extensive treatment costs **\$373k**⁵ – **\$3.8M**⁶ leading to reimbursement issues⁷

More efficient strategies are urgently needed to deliver gene therapy and make curative treatments accessible to all⁸

¹ Cancer key facts | WHO

² Cancer statistics 2023 | PubMed

³ Rodwell S 2014 Eucerd Joint Action Key Developments in the Field of Rare Diseases in Europe in 2013 pp.1–90

⁴ Caruso HG 2019 Shortened ex vivo manufacturing time | Journal of Neuro-Oncology

⁵ Gilead's Kite bags second CAR-T okay with Tecartus nod in mantle cell lymphoma | Fierce

⁶ Pflanz 2019 5 most expensive FDA-approved gene therapies | lifesciencesintelligence.com

⁷ Gene therapies should be for all

⁸ Point of care manufacturing is slowly becoming a reality | pharmaalmanac.com

Cell and gene therapy workflow optimization

Closed System

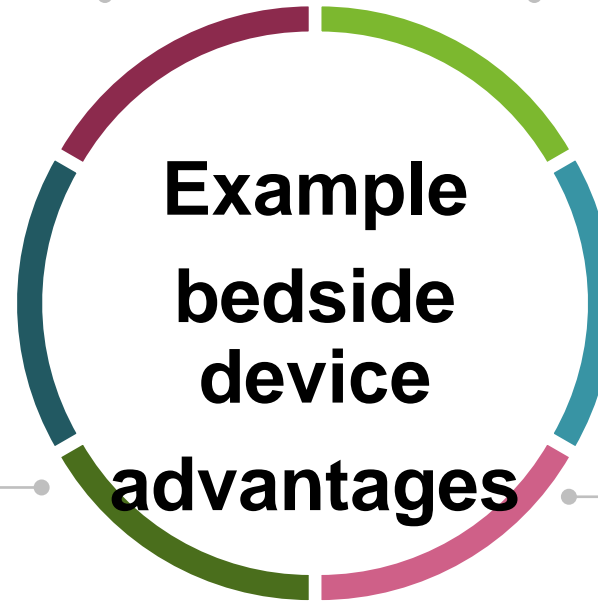
Prevents exposure to external environment, replaces clean room requirements, enables point-of-care manufacturing

Integrated process

Gene and cell therapy manufacturing in one device, supporting viral & non-viral transduction

Automation

Reduces need for highly-trained personnel, accelerates manufacturing process, reduces risk of human error



Flexibility

Democratizes access to CGT and same day treatment without need for highly specialized facilities

Point of care

Cost-effective bedside manufacturing of CGT solves logistic and infrastructure problems and reduces time to manufacture significantly

New technologies

Integrates cutting-edge technologies like microfluidic cell separation and enables non-viral gene delivery

Impact of the project



Patient centered treatment model, providing **global access** to CGT for more patients



Cost-effective manufacturing of CGT in hospitals, solving reimbursement issues



Easy workflow, **streamlining CGT administration** in clinical settings in one day



innovative health initiative

Cell and gene therapy workflow optimization

Partners



Pharma companies
for therapeutic target development



Academic institutions
with expertise in gene therapy research



Healthcare facilities
for clinical trials and expertise in cancer therapy



Patient organizations
to ensure that patients have access to new treatment modalities



Biotechnology companies
specializing in precision medicine technologies



Regulatory affairs experts experienced in navigating regulatory requirements

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● User-centric technologies and optimised hospital workflows for a sustainable healthcare workforce

Solutions for home-based treatments of chronic diseases – improved patient outcomes and healthcare workflow support

Contact person name: Anne Panhelainen, PhD

Organisation: Sooma Medical

E-mail: anne@soomamedical.com

Link to:

- Marketplace opportunity:

<https://ihi-call-days.ihi.b2match.io/marketplace/opportunities/UGFydGljaXBhdGlvbk9wcG9ydHVuaXR5Oig4OTc0>

- Participant profile:

<https://ihi-call-days.ihi.b2match.io/participations/323959>

Challenges and objectives

- Sooma aims to provide accessible improved treatment to depression and chronic pain
- Challenges that we aim to solve
 - 5 - 7% of people is estimated to suffer from depression and its total cost only in EU rises over 100 billion euros annually
 - Chronic Pain prevalence in EU is even higher causing similar costs
 - **Current treatments are unsatisfactory for depression and chronic pain**
 - **Burden to health care is overwhelming**
- Our objectives
 - Improve the efficacy, safety and accessibility of the treatment of depression and chronic pain: individualized brain stimulation treatment designed for at-home treatment with patient-centric approach
 - Facilitate the exhausted clinical workflow: automatization of the management of difficult chronic and relapsing diseases and more cost-efficient treatment solutions
 - Our objectives answer the IHI Call perfectly

Main activities

- Possible project activities with Sooma's contribution
 - Designing online environments (portals, mobile applications etc.) for the management of depression, chronic pain and other chronic disorders
 - diagnosis, individualized treatment approach, automated remote support and monitoring of compliance and effects, detection of relapse
 - Designing medical devices to meet the needs
 - Improved treatment efficacy
 - Easy to self-administer by the patient at home
 - Cost-efficient and accessible
 - Compliant with regulatory requirements

Partner seeking consortium



Expertise and resources offered

Partner seeking consortium

- MDR certified (Class IIa) noninvasive brain stimulation (tDCS) treatments with proven results
 - treatment system: medical device - treatment management platform - patient application
 - patient guidance and remote monitoring (treatment compliance, technical quality, treatment outcomes with standardized clinical assessments)
- Sooma tDCS treatment has been in clinical use for several years (over 20 000 patients treated)
 - Deep insight in
 - Designing, manufacturing and bringing to market novel at-home treatment systems
 - Healthcare needs in managing chronic disorders that lack satisfactory treatments
 - Automatization and streamlining of the treatment management
 - Treatment individualization

Expertise requested

Partner seeking consortium

Solutions for home-based treatments of chronic diseases – improved patient outcomes and healthcare workflow support

- Sooma is seeking a consortium with fitting project
- Consortium could consist of for example, but not limited
 - technology and science institutions with deep understanding on monitoring biomarkers (such as activity, movement, sleep, vital signs, facial expressions, vocal and visual biomarkers)
 - companies specializing in digital treatment solutions
 - clinical research partners for clinical insight and clinical validation



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UX Monitoring for Workflow Optimisation

Contact person name: Janne Pitkänen

Organisation: Adusso Ltd.

E-mail: janne.pitkanen@adusso.com

Link to:

- Marketplace opportunity: [UX Monitoring for Workflow Optimisation](#)
- Participant profile: <https://ihi-call-days.ihi.b2match.io/participations/322964>

Challenges and objectives

- Often the challenges with new technologies and clinical procedures are related to **user adoption, ease of use, information processing burden, and patient safety**. However, at the same time, these are the biggest opportunities for success when addressed properly.
- Our project fits reasonably well into IHI objectives as we aim to **develop more advanced workflow analytics** that contribute to the call topic directly. In addition, it creates opportunities to collaborate with partnering organisations to **bring our expertise and capabilities available for collecting evidence on the applicability and impact of new solutions**.
- For example, we have analysed how remote appointments affected the workday structure of nurses and the satisfaction of the patients.

Main activities

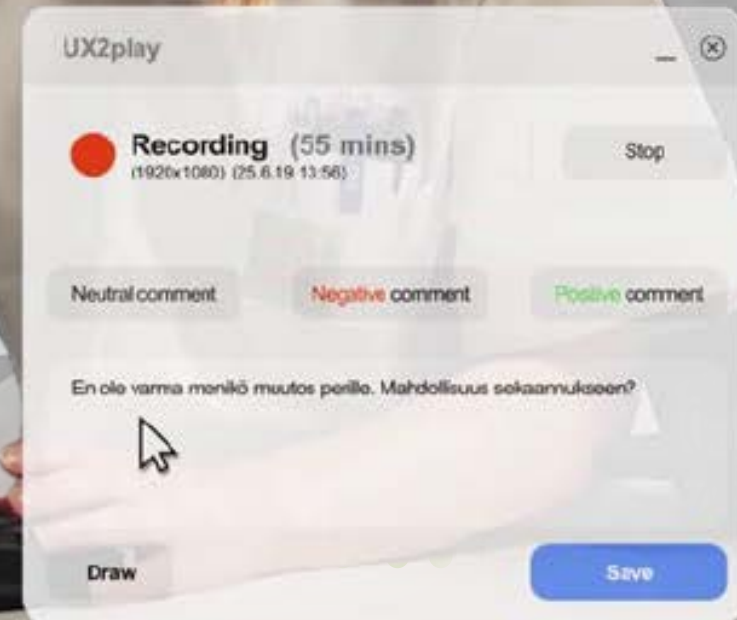
1. **Identifying** target solutions for evidence gathering
2. **Planning** the fieldwork and refining the objectives
3. **Conducting** the observations and data collection and developing the workflow analysis capability based on real examples
4. **Analysing** the results for assessing the impact
5. **Disseminating** the outcomes and considerations for further adoption of the developed solutions and capabilities

Expertise and resources offered

- We have expertise in conducting work studies in hospital settings to understand **how new technologies and procedures affect clinicians' workflows**
- Our work is usually done in **collaboration with healthcare institutions** such as university hospitals to
 - **observe existing practices** and practical considerations in daily work
 - **evaluate the impact of new technologies** on clinical practices and job satisfaction of healthcare professionals

Expertise requested

- **MedTech companies** that are seeking to collect evidence about the actual impact of their new solutions on workflows
- **Research institutions/hospitals** that are representing the real-world environment to utilize the solutions
- **Expert organisations** such as SMEs that have complementary capabilities to be worked with in similar settings



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● User-centric technologies and optimised hospital workflows for a sustainable healthcare workforce

New tools for measuring user experience

Contact person name: Andrew Spink

Organisation: Noldus Information Technology

E-mail: Andrew.Spink@noldus.com

- [Marketplace opportunity](#)
- [Andrew Spink's profile](#)

Challenges and objectives

- How do you know if a solution is 'user centric'?
- Just asking users has drawbacks:
 - Socially desired answers
 - Interrupt and disturbs process
- Objective measurements give additional data
 - Sensors indicate stress, emotions, etc
 - Multimodal data integration with AI-based analysis
- Medical devices require high usability
 - Used in stressful situations, extra frustration not wanted
 - Users might not be good with technology
 - High impact: Tools and methods can be used in all R&D, not just medical

Main activities

- Develop software platform for UX* testing of medical devices
- Support partners UX testing medical devices

*User experience



Expertise and resources offered

- No partners/project yet
- Expertise and resources:
 - Professional software development
 - Dozens of EU (Horizon/IHI) projects, >100 projects
 - Synchronization, Sensor fusion, AI, analysis, visualization, etc
 - 30+ years, 120 000+ customers, 100 countries

Expertise requested

- Potential end users of our tools:
 - Developers of medical devices
 - UX researchers
- Rest of a consortium needed for the Call



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- Topic 2: User-centric technologies and optimised hospital workflows for a sustainable healthcare workforce

Post-acute rehabilitation: a challenging hospital setting

Contact person name: Federica Vannetti

Organisation: Fondazione Don Carlo Gnocchi ONLUS

E-mail: fvannetti@dongnocchi.it; grantoffice@dongnocchi.it

Link to:

- [Marketplace opportunity](#)
- [Participant profile](#)

Challenges and objectives



- Describe the main objectives of your proposed project / proposal and how they address the outcomes and impacts of the topic.
 - What problem are you trying to solve?
 - **Post-acute Rehabilitation settings are very challenging** because the patients during their stay in hospital have to improve their motor and cognitive abilities, find new strategies to reach daily living independence as much as possible despite their incurred disabilities. **The work of physiotherapists**, but also of **nurses** and **care assistants**, is **very demanding** in terms of **biomechanical effort**, and the incidence of musculoskeletal disorders in these categories is very high. On the other hand, to realize possible achievable recovery is an essential expectation from patients and their families to **physicians**, who consequently often experience **high levels of mental stress**. Innovative technologies could reduce these criticisms, e.g.:
 - by using **wearable sensors to monitor and assess stress level** in workforce or to alert clinicians when too intense physical effort is achieved. This approach may help also the hospital manager to **prevent** and to **increase safety** of their employers during work by means of AI.
 - by using robotics (**robo-companion**) to assist or to rehabilitate patients (**exoskeleton**),
 - by using **AI to optimize rehabilitation treatments and pathways**, also predicting recovery trend or as **decision support tool** to help clinicians in complex situations.
 - Is your project suitable for IHI?
 - The described problems **fit very well with the main outcomes of the call** (see call text) and the wide aim of IHI initiative that is **to translate health research and innovation into tangible benefits** for patients and society and ensure that Europe remains at the cutting edge of **interdisciplinary, sustainable**, patient-centric health research.
 - Give concrete example of potential results and expected impact
 - Introducing wearable sensors to detect in real-time work conditions at high-risk (mental and physical stress) could **prevent the occurrence of musculoskeletal pathologies or burn-out**, bringing a vantage both to the worker and to the employer **reducing sick leaves**
 - The **robo-companion** that moves along a ward interacting with patients could help to **stimulate patients** that suffer of cognitive impairment improving their recovery or to help nurse to **detect patients' needs** an **increase care quality**
 - **Improve capacity and resilience** because of more efficient and sustainable solutions, that **improve work conditions** of healthcare workforce.





Main activities

- To analyze the post-acute rehabilitation hospitals environment focusing on physical and mental stress of workers and hospital workflows, defining three situations that are more critical
- Integrate different technological solution in the three selected cases setting up three scenarios
- Develop demo of tech solutions, by using a co-designed approach between tech partner, rehabilitation hospital staff, patients, caregivers
- Experiment and test that solutions in different settings (on the basis of different rehabilitation pathways), in different hospitals
- Analyze cost-efficacy and measure impact of the proposed solutions



Expertise and resources offered

- Describe the partners and expertise you already have
 - We have a list of potential partners (we have not yet confirmations), but also, we are looking for partners (see next slide)
 - **Our expertise** is related to
 - Post-acute **Rehabilitation settings** and healthcare workflows **management**
 - **Medical device validation** (in particular, robots and exos)
 - Prototypes **testing and experimentation** in significant clinical rehabilitation settings
 - Participation to **EU project**
 - Defining and conducting **clinical trials** taking into account also all **regulatory aspects**
 - Bioengineering (from **AI** to **biomechanical** assessment)
- We are a **not-for-profit organization**, so we don't put in-kind contributions



Expertise requested

- To implement the described project, its needed:
 - Companies developing (SME/large):
 - social robots
 - body-area sensors network
 - workflow management software
 - Research organization developing:
 - AI algorithms to extract risk profile based on sensors network data to be implemented in the workflow management sw
 - Protocols of interaction between patients and robo-companion
 - SW for cognitive stimuli to put on board on robo-companion
 - Rehabilitation hospitals developing:
 - Set-up of experimental scenario of technological solutions adopted
 - Newly care pathways that include proposed solutions (in particular, those involve patients directly, e.g. robo-companion)
 - Policy maker developing:
 - Analysis of impact related to introduction of tech and digital solutions in rehabilitation hospitals in terms workers safety and prevention
 - Implementation of risk minimisation measures following regulatory decisions
 - Data security
 - Experts on social science developing
 - Analysis on acceptance both for workers and patients/caregivers



Thank you for your attention

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