FAITH project presentation

FAITH

intelligent post-cancer support

Table of Contents

- ✓ Introduction
- ✓ Why FAITH?
- ✓ FAITH Ecosystem
- ✓ FAITH Features
- ✓ Challenges
- ✓ Expected Outcomes
- ✓ Implementation Phases
- ✓ Methodological Trials
- ✓ Conclusion
- ✓ Timeline
- ✓ Consortium & EAB & Networking

a Federated Artificial Intelligence solution for moniToring mental Health status after cancer treatment

FAITH is an EU-funded research project aiming to provide an **Artificial Intelligence based solution** that remotely identifies **depression markers** in people that have undergone **cancer treatment.**

Cancer patients face several challenges, which may affect their **mental health** and potentially lead to anxiety, depression, and therefore worsen their quality of life.

Cancer has an incidence of 18 million new cases per year.

Depression affects approximately 15% to 25% of cancer patients.

As the world population increases in age, we are faced with **a rising occurrence of cancer**.

In parallel, advances in medical science ensure ever more people survive cancer, and some of them can **feel that their self perceived quality of life could be affected**, experiencing feelings of anxiety and depression after treatment has completed.

It is this post-treatment consequence of anxiety and depression that FAITH is addressing.

FAITH is creating an innovative solution that uses **Artificial Intelligence based technologies** to track targeted depression markers in cancer survivors to be able to **monitor downward trajectories** in these markers, and ultimately **inform their point of care** of these declines.

By doing this, cancer survivors who begin to experience such declines get the chance to be more aware of their mental health situation, receive as early as possible **intelligent post-cancer support**, and therefore, in the end, **improve their quality of life**.
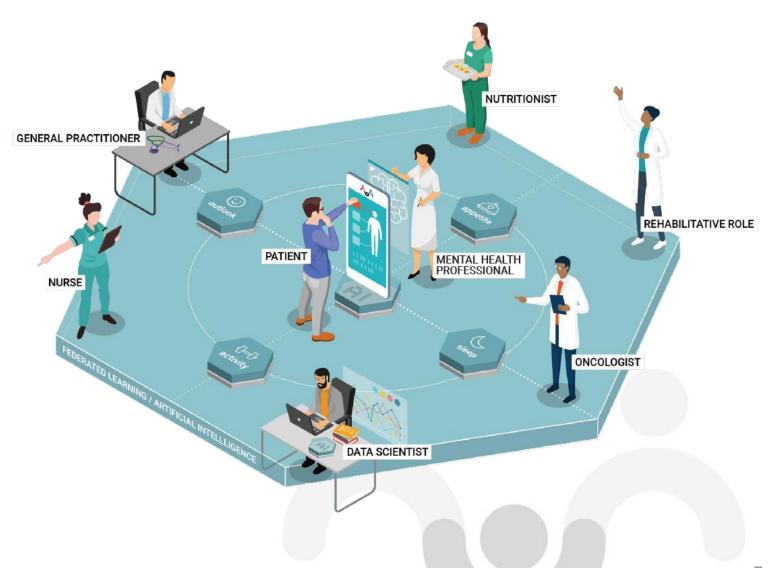
How FAITH works

The FAITH solution ecosystem involves a number of actors:

o The **patient,** who provides input to the FAITH app.
o A team of **healthcare professionals** revolving around the patient.
o **Data scientists**.
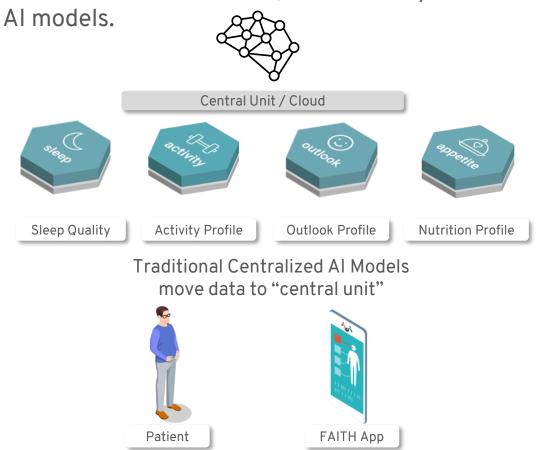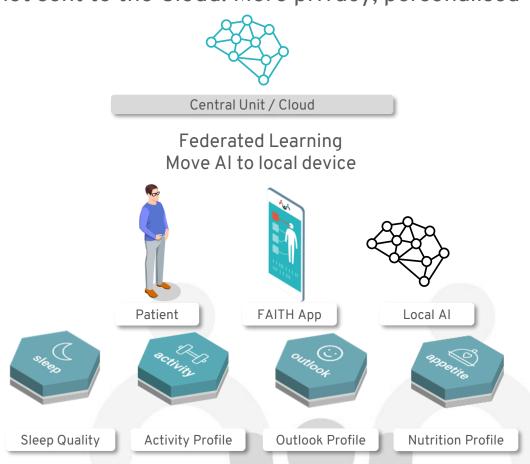o The **Federated Learning Artificial Intelligence** for data gathering and monitoring.

7

Federated Learning vs. traditional AI

FAITH relies on Federated Learning, which moves the computation to the device. By updating AI models on a user's device, the data stay local and are not sent to the Cloud. More privacy, personalised AI models.

Central Unit / Cloud

Sleep Quality | Activity Profile | Outlook Profile | Nutrition Profile

Traditional Centralized AI Models move data to "central unit"

Patient | FAITH App

Central Unit / Cloud

Federated Learning
Move AI to local device

Patient | FAITH App | Local AI

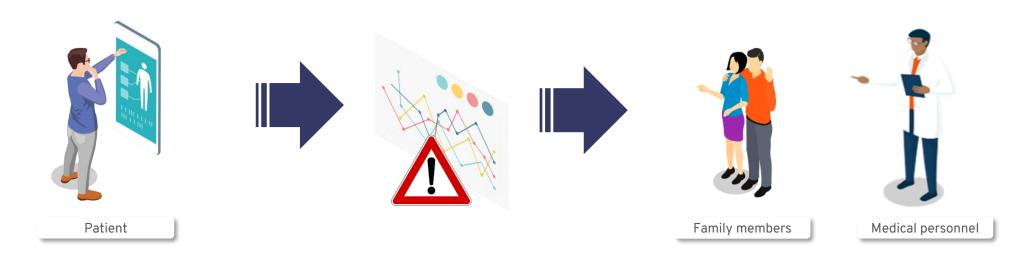Sleep Quality | Activity Profile | Outlook Profile | Nutrition Profile

What happens when a negative forecast on the patient's mental health is detected?
An alert may be sent to the patient's healthcare providers or other caregivers. The healthcare team would then analyze the nature of the alert and offer proper support to the patient.

Patient

Family members

Medical personnel

This is a possibility, but FAITH is studying the best course of action to undertake. The definition of this aspect will be one of the results of the project.

Which major challenges does FAITH address?

IDENTIFYING THE RIGHT INDICATORS

FAITH monitors activity, outlook, sleep, and nutrition as early depression markers to predict negative trends in patients' mental health, which could affect patients' quality of life.

TACKLING PRIVACY ISSUES

To safeguard user's privacy, FAITH records and processes data on the user's mobile phone only, and nowhere else.

AI TRUST

Explainable AI provides the healthcare team with a reason for its output, allowing results' interpretation and informed clinical decisions.

Which major challenges does FAITH address?

SUPPORTING CLINICIANS

FAITH does not make automatic diagnoses of depression.
By monitoring patients' mental health, FAITH works to support clinicians, rather than to replace them.

ENGAGING USERS

The FAITH App will formulate specific questions to engage the user as naturally as possible, using a voice interface.

The goal of FAITH is to develop a **better model for mental health monitoring** of cancer patients, to improve their quality of life. To reach this overall goal, the project will pursue three **smaller objectives:**

AI SOLUTION

Developing an AI solution that identifies and analyses depression markers.

VALIDATION

Validating the AI solution with end users to ensure its usefulness.

INCREASED AWARENESS

Fostering awareness of their mental health status in cancer patients and their doctors.

Validation trials

Requirement's gathering: initial **assessment of needs and requirements** from end users (hospitals, doctors, and patients). Preparation and approval of the **clinical trial protocol**.

Prototyping: drafting the architecture specifications, data reference models, and use case scenarios. Building the platform and feeding data to the framework. Developing user acceptance criteria and users' feedback questionnaires. Developing validation criteria from the doctors' perspective. The concept is **prototyped for a real-life situation trial**.

Trials: iterative **trials at the hospital pilot sites**. Doctors and patients validate FAITH. Then, feedback from these trials it is evaluated in further rounds to improve the **requirements gathering** and **concept refinement**.

Delivery: final testing and validation to assess the healthcare, societal and business impact of the deployed FAITH solution. **Exploration of market deployment activities**.

FAITH has real end-users participating in trial sites in **three European hospitals**. Both clinicians and patients will **adopt the FAITH solution for one year** to assess its usability, as well as to support the development of the AI algorithms.

Lisbon, Portugal

Champalimaud Centre for the Unknown

(100 Lung Cancer Patients)

Madrid, Spain

Hospital G.U. Gregorio Marañón

(100 Breast Cancer Patients)

Waterford, Ireland

UPMC

(100 Breast Cancer Patients)
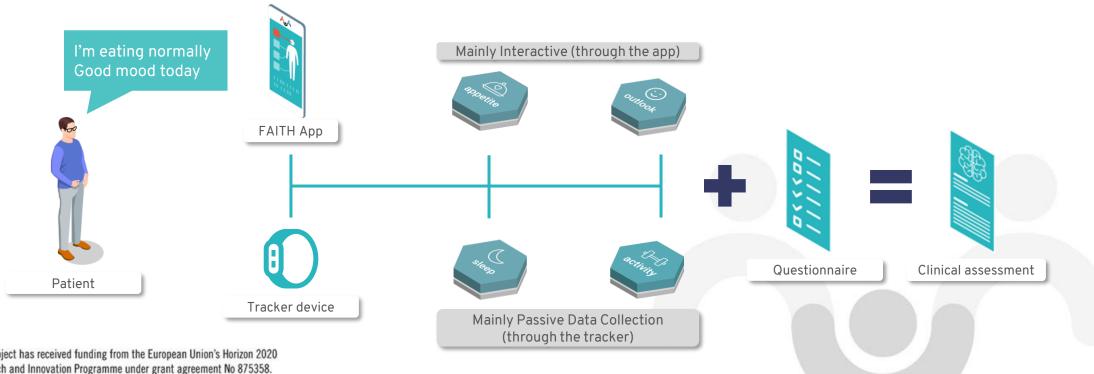
Once the FAITH concept is prototyped, **iterative, real-life situation trials** will occur in the three hospitals. Their feedback will guide further rounds of concept refinement of the solution.

During the trials, **the FAITH solution,** supported by AI-based solutions, **collects and monitors data** relating to a patient's activity, outlook, nutrition and sleep.

After treatments, when leaving the hospital, **the patient receives 2 things:**
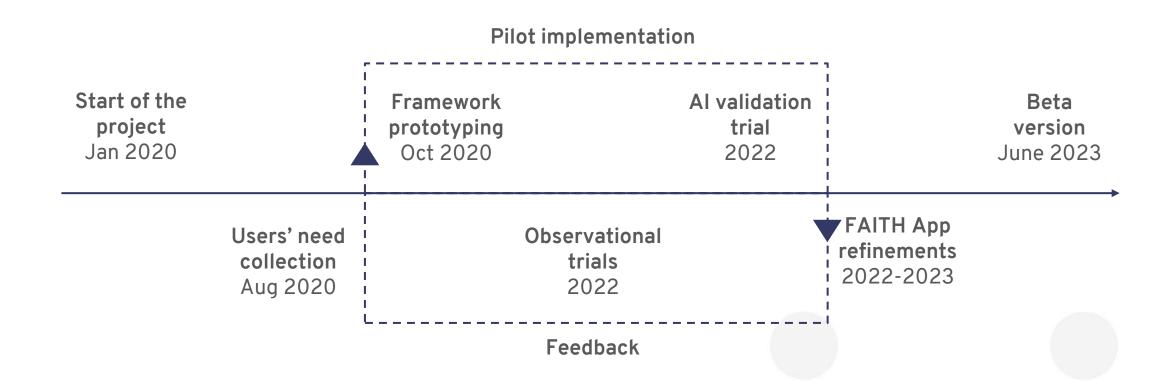

I'm eating normally
Good mood today

Patient

FAITH App

Tracker device

Mainly Interactive (through the app)

appetite

outlook

sleep

activity

Mainly Passive Data Collection
(through the tracker)

Questionnaire

Clinical assessment

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By using the FAITH solution, **cancer survivors** will be brought to the attention of their healthcare services once their depression markers start to show signs of downward trajectories. This means they can be offered **intelligent post-cancer support** as early as possible, helping to **identify trends which could affect their quality of life**.

Pilot implementation

Start of the project
Jan 2020

Framework prototyping
Oct 2020

AI validation trial
2022

Beta version
June 2023

Users' need collection
Aug 2020

Observational trials
2022

FAITH App refinements
2022-2023

Feedback

Who we are

Consortium Partners

FAITH brings together a strong **multi-disciplinary team** with partners from five European countries (Ireland, Portugal, Spain, Italy and Cyprus).
Our consortium comprises **technology and data experts**, **Cancer Hospitals**, and **SMEs**.

WATERFORD INSTITUTE OF TECHNOLOGY

One of the largest Institutes of Technology's in Ireland.
WIT is the **project coordinator**. It leads all management and technical oversight of the project's delivery.

UPM – LIFESTECH

The largest technological university in Spain. UPM oversees the design and implementation of the **system architecture** and lead the **pilot trials activities**.

UNINOVA INSTITUTE

A research institute working closely to industry to ensure proper **technology transfer to business**. It is responsible for integrating the hospital data and ensuring data interoperability and privacy.

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CHAMPALIMAUD FOUNDATION

The Champalimaud Clinical Centre is involved in the **validation trials** of FAITH, including the **collection of users' needs**.

HOSPITAL G.U. GREGORIO MARAÑÓN

A public referral national center for high-tech care in Spain.

Its Medical Oncology Service **supports the requirements gathering** and provides insights for functional and technical requirements.

UPCM

A private hospital committed to providing high quality, patient-centred care.

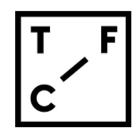UPMC participates in the initial **requirements gathering** and in the later **trials phase**.

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DEEP BLUE

A Research & Consultancy SME, specialized in Human Factors and user-centered design, validation and dissemination. It contributes to the collection of **requirements and users' needs** and **leads the dissemination of the project.**

SUITE5

Suite5 provides research-inspired innovation for its clients.
It supports the research and development of the FAITH concept and investigates the best **exploitation paths** to ensure it reaches the market.

TFC

An SME company with decades of experience in standardization, dissemination and go-to-market strategies.
It leads the **standardization and quality management**, supporting communication and exploitation.

FAITH is supported by an **External Advisory Board** (EAB) to help with the project direction.
The EAB acts as an independent body that helps with innovation, technological and market acceptance.

FAITH is organizing **recurrent "Meetings of Minds"** with similar EU-funded projects, all addressing the issues of poor mental health, depression, and patient support. Building on this shared **common ground**, the engaging projects are focusing on ensuring that they **adopt a user-centric approach**. To this end, the Meetings of Minds **engage external stakeholders and end-users to collect early feedback** and validate the ongoing developments of the projects.

Furthermore, the cluster will also explore **possibilities for industrial uptake** of the projects' outcomes.

FAITH – a Federated Artificial Intelligence solution for moniToring mental Health status after cancer treatment

Menhir – Mental health monitoring through interactive conversations

Oncorelief – A digital guardian angel enhancing cancer patient's wellbeing and health status improvement following treatment

LifeChamps – A Collective Intelligence Platform to Support Cancer Champions

QUALITOP – Monitoring multidimensional aspects of QUAlity of Life after cancer ImmunoTherapy - an Open smart digital Platform for personalized prevention and patient management

THANK YOU!

https://h2020-faith.eu

https://dashboard.h2020-faith.eu

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in **FAITH project**

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