FAITH project presentation

FAITH
intelligent post-cancer support

- ➢ Introduction: why the FAITH project?
- ➢ The FAITH solution ecosystem
- ➢ The FAITH project framework
- ➢ The FAITH solution features
- ➢ The FAITH project challenges, expected outcomes and implementation phases
- ➢ Observational Trials
- ➢ Study Design
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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 may affect up to 21% of cancer patients survivors*.

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

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

*Brandenbarg et al. (2019)

FAITH
intelligent post-cancer support

It is this possible feelings of anxiety and depression, post-treatment, 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**, and ultimately **inform their point of care** of these changes.

By doing this, cancer survivors who begin to experience such declines get the chance to receive as early as possible attention from their healthcare services and **intelligent post-cancer support**, and therefore, in the end, **improve their quality of life**.
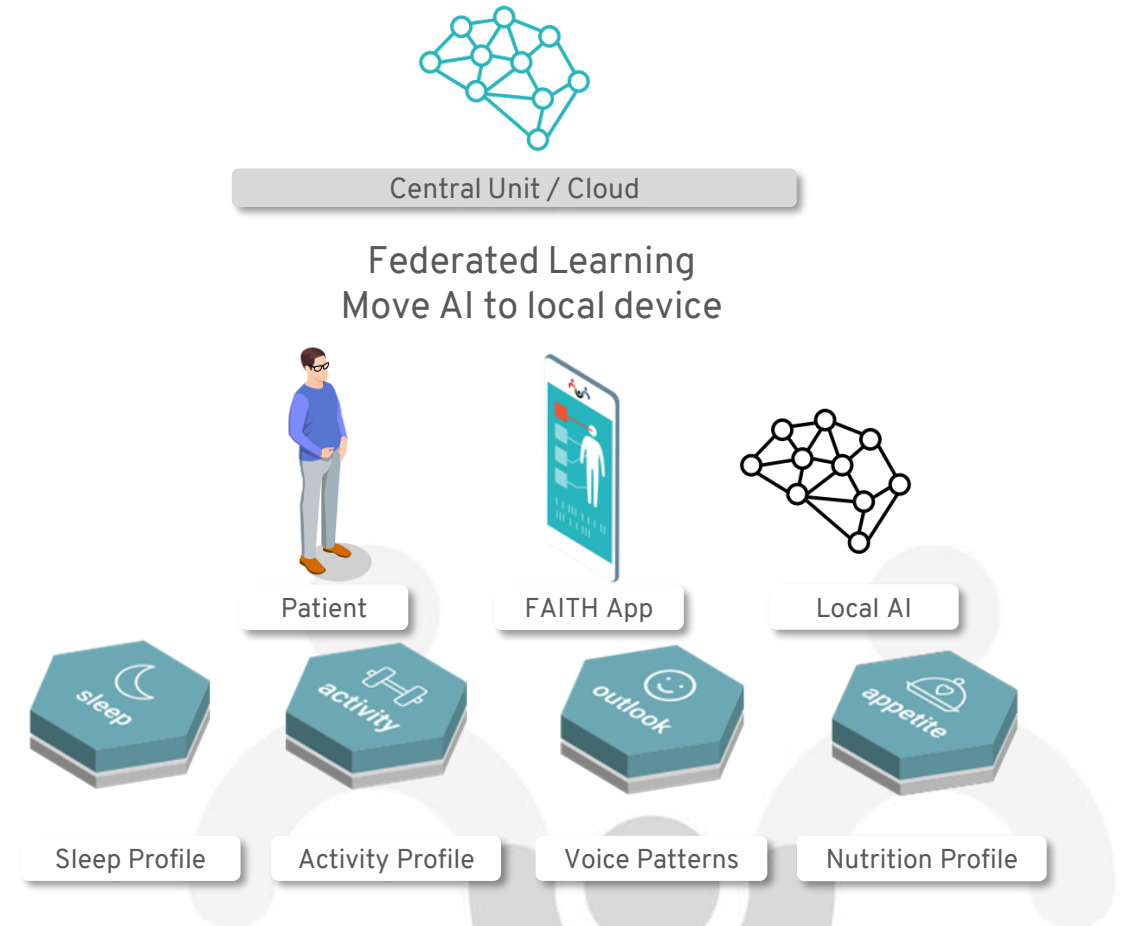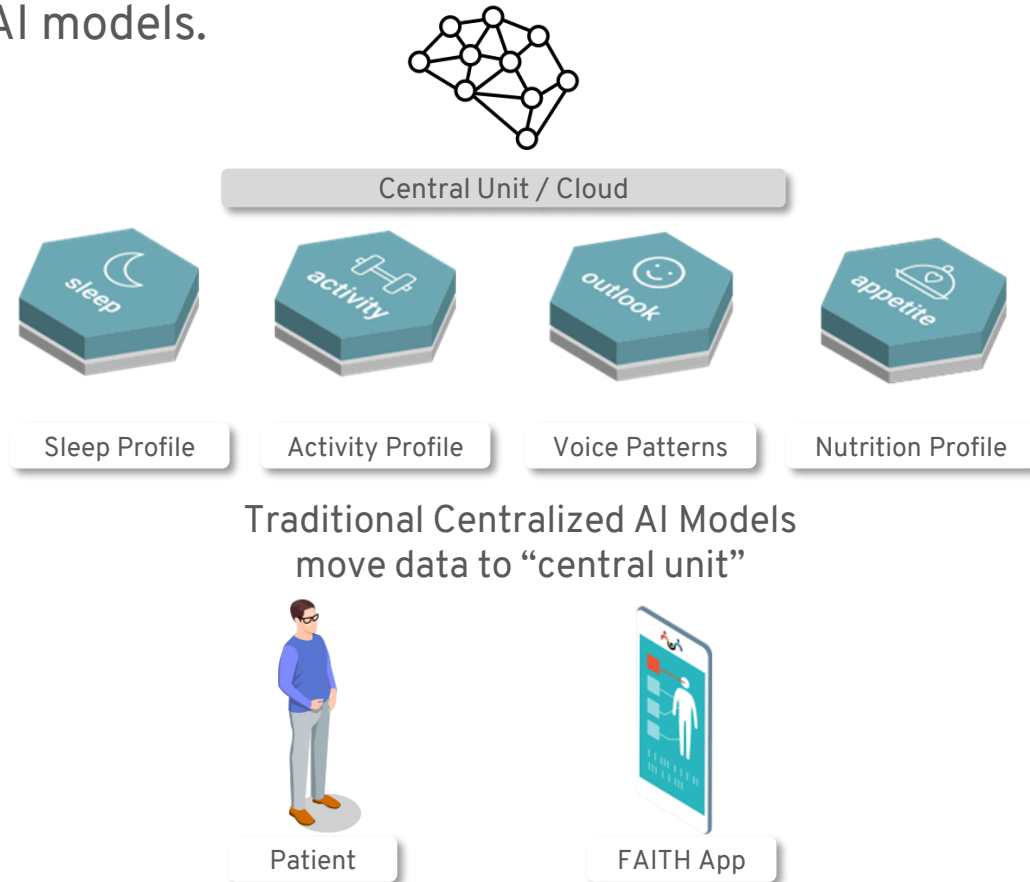
How does the FAITH project work

At the end of the project, the FAITH solution will be employed in an ecosystem which involves several actors, such as:

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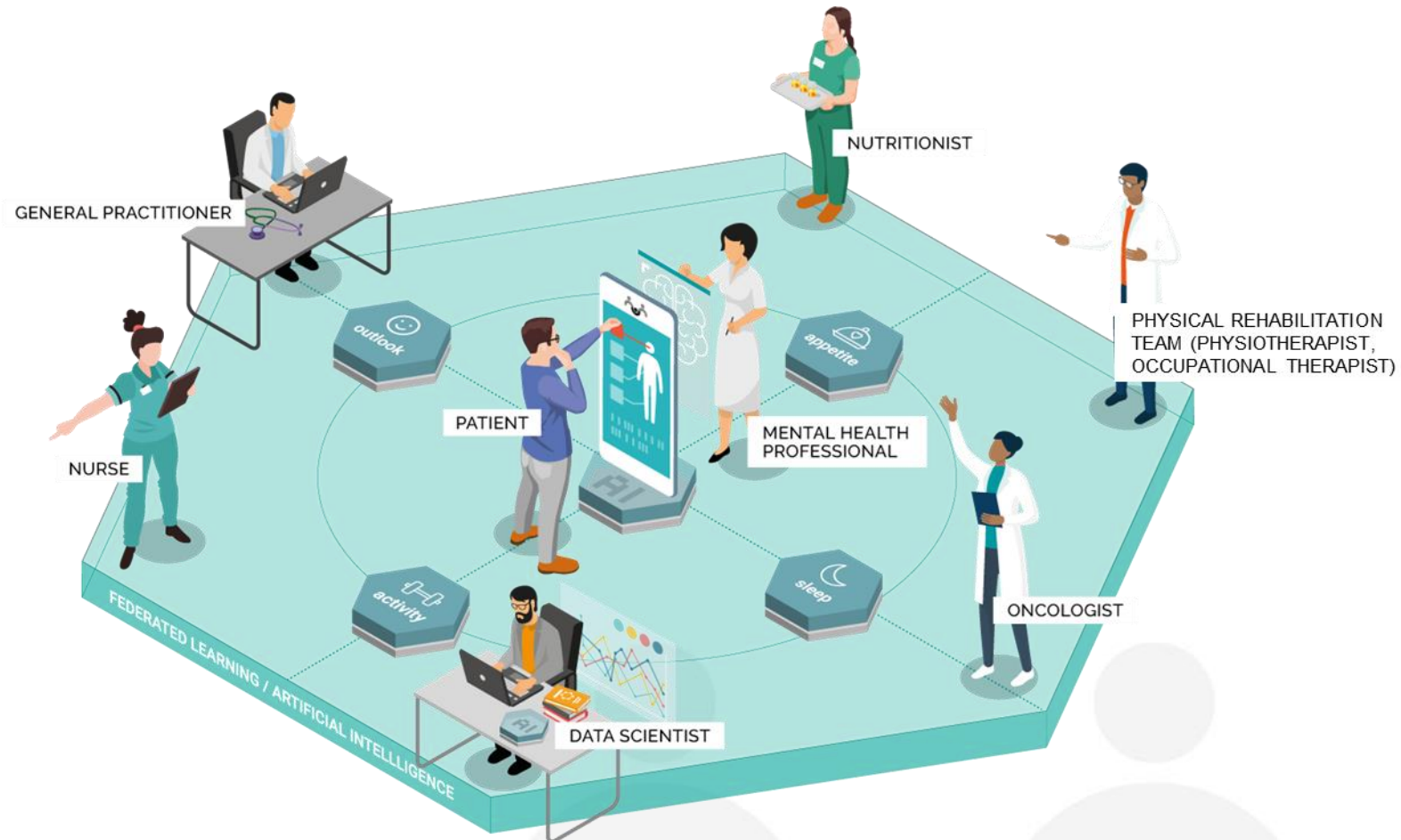
Federated Learning vs. traditional AI
FAITH relies on Federated Learning, which moves the computation to the device. By updating AI models on a user's device, the data stay local and are not sent to the Cloud. More privacy, personalised AI models.


Central Unit / Cloud

Sleep Profile   Activity Profile   Voice Patterns   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 Profile   Activity Profile   Voice Patterns   Nutrition Profile

What happens when the FAITH solution, which the project is developing, detects changes in trends of the patient's mental health?

An alert may be sent to the patient's healthcare providers. The healthcare team would then analyze the nature of the alert and offer proper support to the patient.

Patient

Medical personnel

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

Which major challenges does the FAITH project address?
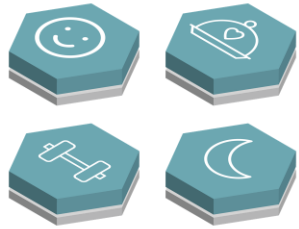
IDENTIFYING THE RIGHT INDICATORS

FAITH monitors activity, voice patterns, sleep, and nutrition as depression markers to possibly predict negative trends in patients' mental health.

TACKLING PRIVACY ISSUES

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

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 the FAITH project address?

SUPPORTING CLINICIANS

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

ENGAGING USERS

The FAITH App is designed with user experience in mind to foster proactive and regular engagement, keeping the data collection smooth and efficient at the same time.

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

AI SOLUTION

To develop an AI solution that identifies and analyses depression markers.

TESTING

To test the AI app with end users to ensure its usefulness.

INCREASED AWARENESS

Fostering awareness of cancer patients' mental health status after the end of treatments.

The FAITH project implementation phases

▶ **Requirement's gathering**: initial **assessment of needs and requirements** from hospitals and doctors. Preparation and ethical approval of of the **observational 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**.

▶ **Observational trials**: trials held **at the hospital** pilot sites where doctors and patients use the FAITH prototype; their feedback will later be evaluated to improve the **requirements gathering** and **concept refinement**.

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

Observational trials

The FAITH trial sites are **three European hospitals** that adopt the FAITH solution. 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.

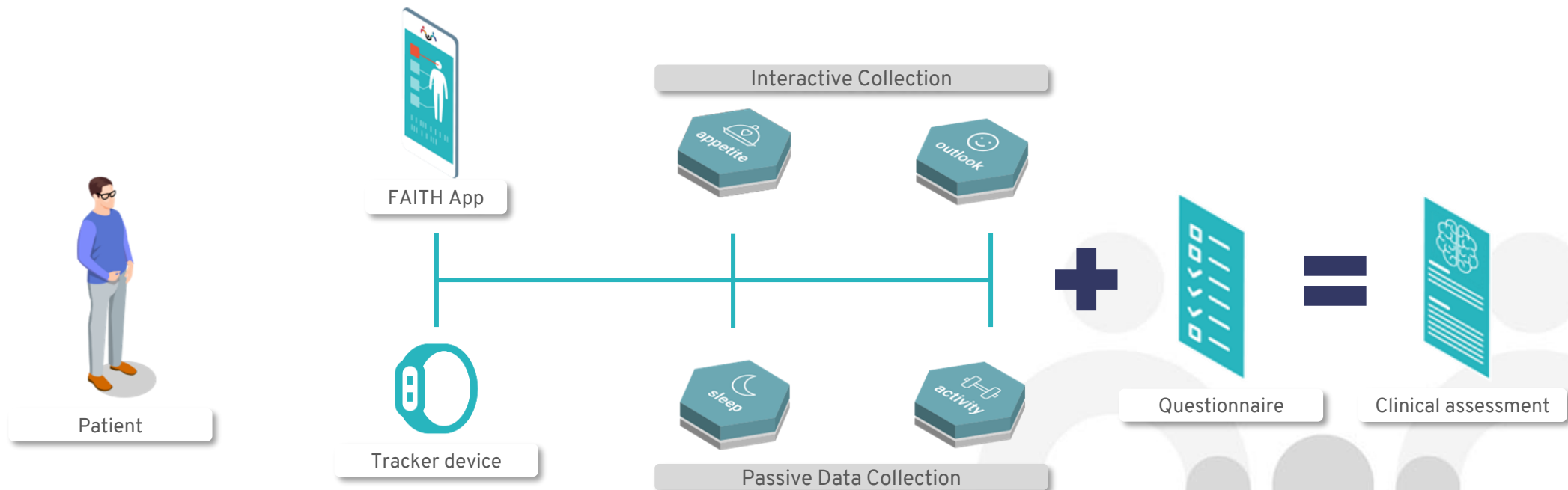| Lisbon, Portugal	Madrid, Spain	Waterford, Ireland
Champalimaud Foundation	**Hospital G.U. Gregorio Marañón**	**UPMC**
(100 Lung Cancer Patients)	(100 Breast Cancer Patients)	(100 Breast and Lung Cancer Patients)

Their feedback will guide further rounds of concept refinement of the solution.

During the trials, **the FAITH solution collects and monitors information** relating to a patient's activity, voice patterns, nutrition and sleep. The data collected will be used to train the AI algorithms that will be later incorporated in the solution.

After signing the informed consent, **the patient receives 2 things**:

Patient

FAITH App

Tracker device

Interactive Collection

appetite

outlook

sleep

activity

Passive Data Collection
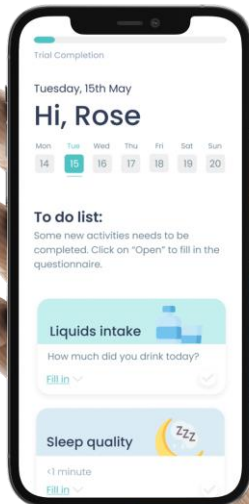
Questionnaire

Clinical assessment

The image below represents the FAITH's study design. It summarizes the timeline and scheme of the observational trials, illustrating what data FAITH collects, how, and when.
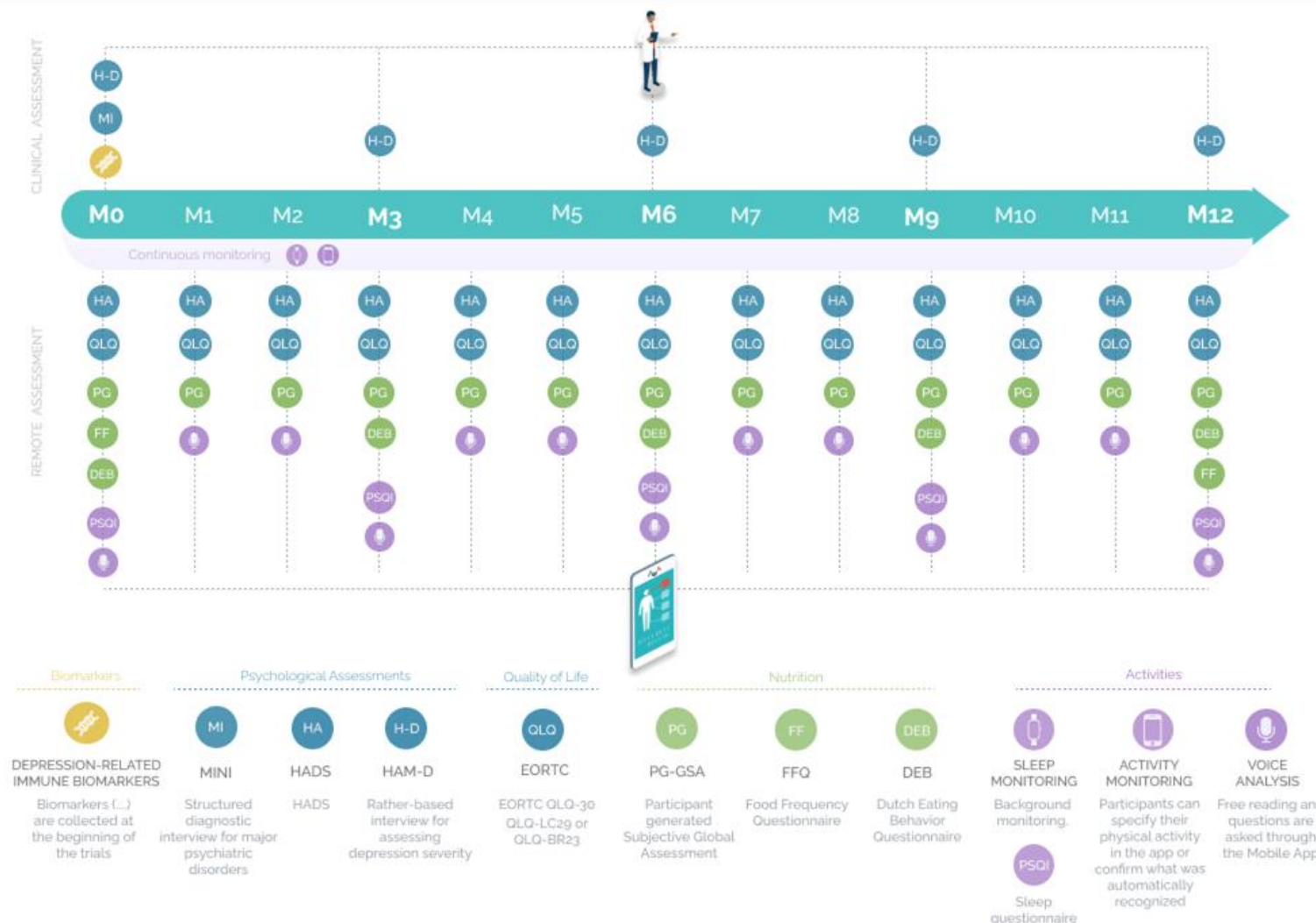
The image below represents the FAITH's study design. It summarizes the timeline and scheme of the observational trials, illustrating some of the variables that FAITH monitors, and when.
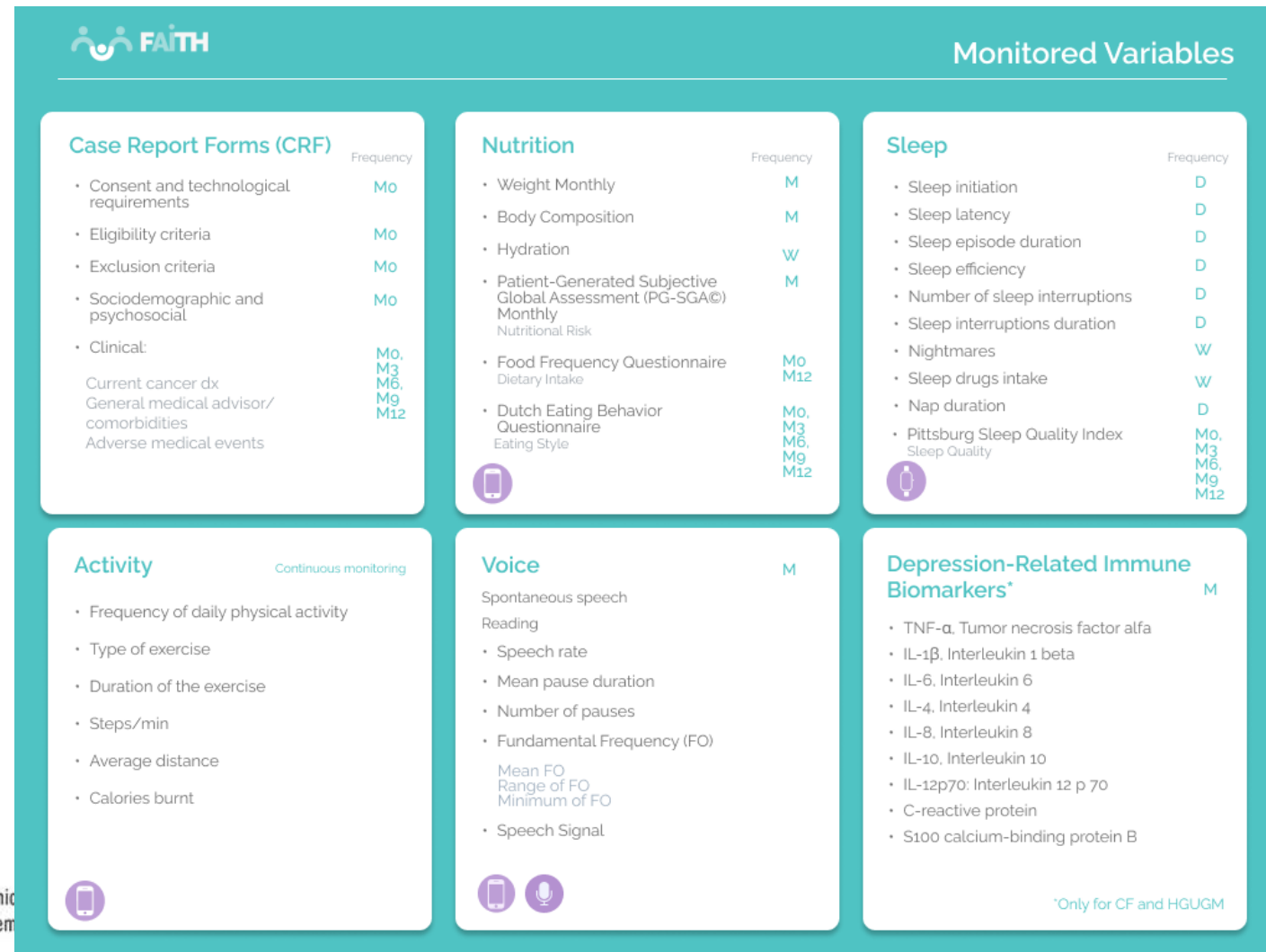
The FAITH app

Through the FAITH app, users will proactively provide information about their habits by filling in validated clinical questionnaires. These are periodically requested according to the study design.
In addition, a smartband allows the collection of sleep and activity patterns.

FAITH app
main interface

Nutrition
questionnaire

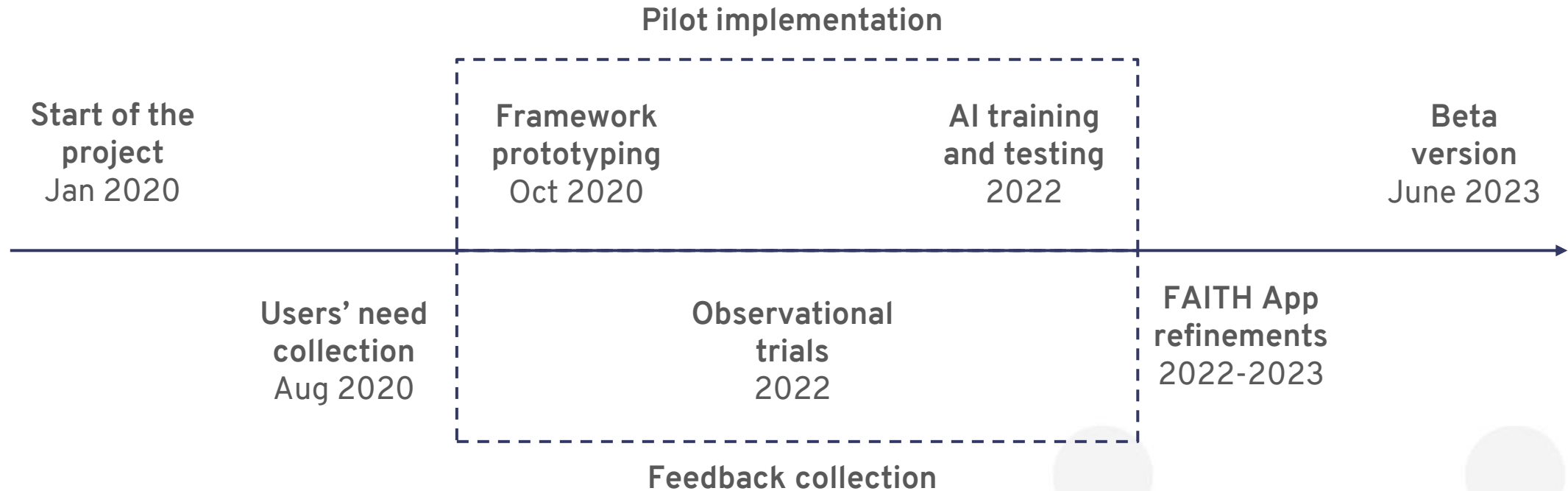Passive tracking of
activity via smartband

Conclusions

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

By using the FAITH solution, healthcare systems will access a novel and innovative method to screen depressive symptoms in oncological settings.

The FAITH project timeline

Pilot implementation

Start of the project
Jan 2020

Framework prototyping
Oct 2020

AI training and testing
2022

Beta version
June 2023

Users' need collection
Aug 2020

Observational trials
2022

FAITH App refinements
2022-2023

Feedback collection

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 Foundation is a FAITH clinical site that will **recruit participants** and **collect user 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.

UPMC

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.
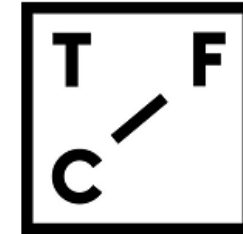
TFC

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.

External Advisory Board

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.

Jane Walsh
Expertise: Health and Wellbeing

Director of the Mobile Technology and Health (mHealth) Research Group at the NUI, Galway.

Federica Facciotti
Expertise: Immunology

A T cell immunologist and an expert in human intestinal diseases, including cancers.

Mark Sujan
Expertise: Human Factors / Ergonomics

Managing Director of Human Factors Everywhere.

In 2020, FAITH led the establishment of the **"Cancer Survivorship – AI for Well-being"** cluster, which brings together similar EU-funded projects, all addressing the issues of poor mental health, depression, and patient support. Building on this shared **common ground**, they focus on ensuring that they **adopt a user-centric approach**, collaboratively **engaging external stakeholders and end-users to collect early feedback** and validate their ongoing developments.

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

CLARIFY – Cancer Long Survivor Artificial Intelligence Follow-up

ASCAPE – Artificial Intelligence Supporting CAncer Patients Across Europe

PERSIST – Patients-centered SurvivorShIp care plan after Cancer treatments based on Big Data and Artificial Intelligence technologies

The **"Health & Care"** cluster gathers several Large-Scale Pilot projects financed by the Horizon 2020 Programme. The Cluster is framed within the OPEN DEI Innovation Action for the **digitalization of European Industry**. The cluster counts 5 working groups focused on **Dissemination, Architecture, Use Cases, KPIs** and **GDPR**. FAITH has been part of all the Working Groups since 2020.

THANK YOU!

https://h2020-faith.eu

https://dashboard.h2020-faith.eu

FAITH project

H2020_Faith

H2020.FAITH

This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement No 875358.