

# VATA

**Virtual Autonomous  
Therapist Agent**



**BS**



# PROJECT

The VAPA application (renamed VATA) is the result of a European research program EUROSTARS carried out from 2016 to 2019 and co-funded by Eureka and the European Commission in the framework of the Horizon 2020 program.

bookBeo has been chosen as technical partner for its expertise in augmented reality and its development skills on connected glasses by the leader of the European project in Denmark, the company PHYSIO R&D.

Physio R&D and its team of researchers and doctors had a physiotherapy web platform (VPA - Virtual Physiotherapy Agent) giving access to physical rehabilitation exercises on PC in the form of videos and 3D animations.

They wanted to innovate to meet the demand of patients and doctors by offering them a real-time, remote and interactive service.

The addition of the term "Autonomous" to the VPA platform symbolises the first level of artificial intelligence developed collaboratively by researchers from the bookBeo team in the form of an

application interoperable with all Android devices (tablets or glasses and biometrics sensors).

4 clinical trials with 116 patients (3 finished) have already been carried out in 2 healthcare systems : Denmark and Finland (AUH & OULI) giving scientific proof that VATA is feasible to treat patients from a distance suffering from conditions such as Idiopathic pulmonary fibrosis, COPD. Results show increased exercise capacity in all of them compared to control groups.

4 others RCTs will be set up to treat with VATA platform 4 different diagnosis as severe asthma, older cancer survivors and heart failure patients with at least 60 patients in each hospital.



# SOLUTION

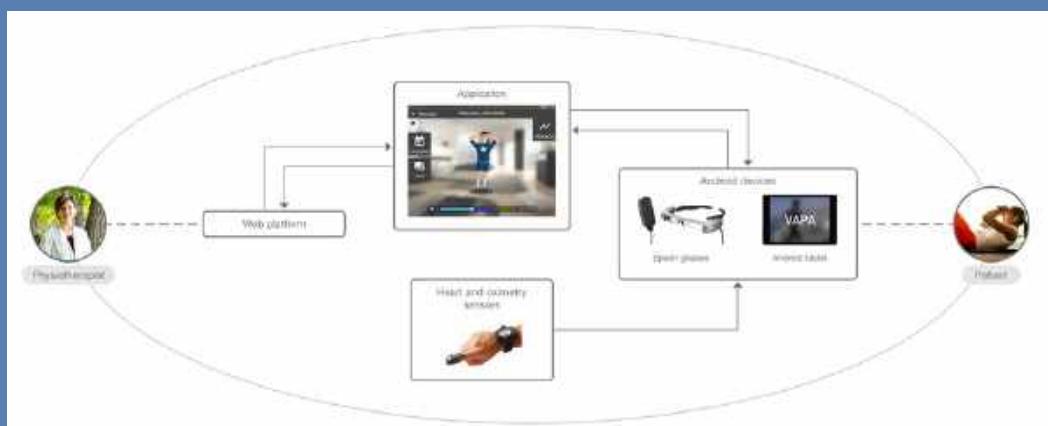
VATA is an innovative remote physiotherapy product specially designed for patients with chronic diseases by combining a revolutionary biometric sensor, that provides medical quality heart and activity data as well as cutting-edge, Augmented Reality glasses and a software with a 3D animated agent that will guide patients keeping them motivated while doing the exercises. The result is a telerehabilitation platform for those in need of cardio training and empowerment. VATA will be an effective and certified way to keep patient active.

The platform using fully integrated sensor as biometric sensor (to monitor vital functions) and augmented reality (AR) glasses to interact with the unique 3D virtual physiotherapist attached to the patient.

Alongside that, a software, give, to a physiotherapist, the opportunity to manage and guide through an interface, the patient before, during and after exercises.

Thanks to that modeling, the application can be sold or rented as Physical Rehabilitation Kits.

First kit will provide the Bio-sensor and VATA basic by using a tablet. And the second one, AR glasses and online data storage will be added to the previous one. In addition to the platform, some product can be use such as a training services to teach physiotherapists how to use the system, a one year after-sales maintenance license on biosensor and AR glasse or an additional license that unlocks additional features/customized exercise sets.



This simple schema show the different interaction between physiotherapists, tools, device and patient.

# USE CASE

## You've just had surgery after a stroke :

Depending on the cyclical state of disease, you will enter in contact with an online or real specialist who will teach how to interact with the platform and plan the first rehab program. From here all treatment will be online and be followed with recurrent video consultations. Hardware can be purchased or given by a therapist.

Whenever you wish, you get the VATA Kit, glasses and biometric sensor and start the program. A 3D avatar, charts and videos are displayed on the screen.

During the exercise, you visualize your heart rate and oxygenation level.

The Health Care Centers will meet, interview, teach the use of VATA and plan rehab for patient, after that will follow and change treatment online.



# WHY VATA ?

The increasing population of patients suffering from chronic diseases challenges the sustainability of national healthcare systems.

In the case of Chronic Obstructive Pulmonary Disease (COPD) patients, frequent exacerbations have a negative impact in the patient's quality of life. Lack of exercise contributes to exacerbations and disabilities in COPD.

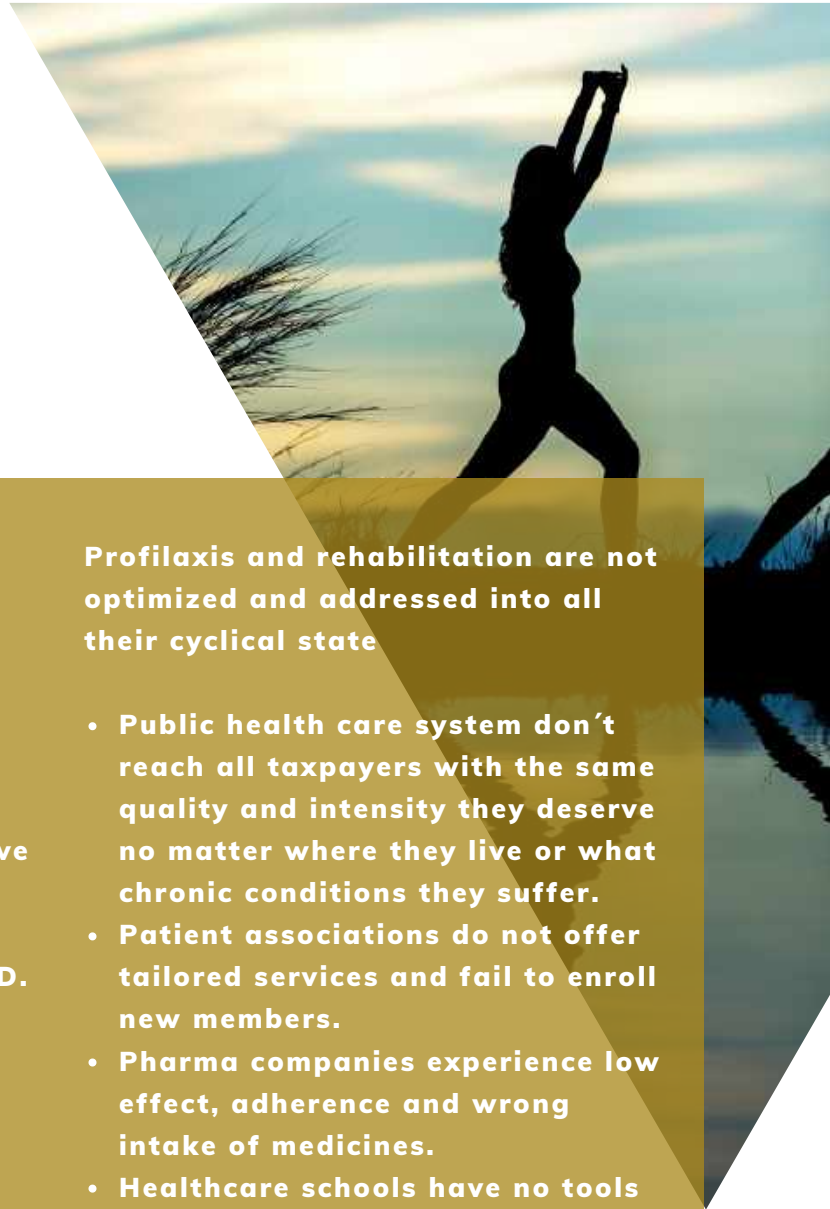
Cardiovascular diseases (CVD) are another major cause of morbidity and mortality. The value of exercise in cardiac rehabilitation is well recognized on patients that have suffered CVD events.

Frailty and long distance to the rehab locations decrease dramatically chronic cardio-pulmonary patient's participation at hospital-based rehabilitation. Training is group-customized, not addressing all patients' needs.

They are encouraged to continue training at home at the same intensity and often as possible. Demotivation and fear of high-intensity-training alone decrease adherence and effect, leading to hospitalization.

Profilaxis and rehabilitation are not optimized and addressed into all their cyclical state

- Public health care system don't reach all taxpayers with the same quality and intensity they deserve no matter where they live or what chronic conditions they suffer.
- Patient associations do not offer tailored services and fail to enroll new members.
- Pharma companies experience low effect, adherence and wrong intake of medicines.
- Healthcare schools have no tools to teach students how to reach and treat all patients.
- Insurance pays high transportation and treatment costs.



# WHY VATA ?

The value proposition of VATA is fourfold:

## **1. Improving lives**

**For the patient :**

**Due to increase number of elder and chronic patients, our goal is to keep them physically active and aware for the symptoms different diseases can affect in their daily life. The goal is to empower them to be independent coping with their diseases or prevent and slow down the impact of future worsening conditions.**

**> The patient will find comfort and freedom in his physical reeducation.**

**> The patient takes full responsibility for the follow-up of his re-education.**

**For the staff :**

**Happy health care providers are the ones that can be successful servicing their patients saving their time to the ones who really need their help. The fact that patients can experience a smooth and easy going treatment with VATA solution programmed by the therapist remotely and the therapist to be able to receive subjective and objective reports in real time to proactively and effectively prevent worsening conditions, are the success factors to satisfy the health care professional team.**



# WHY VATA ?

## 2. Lower overall costs :

**A patient costs on average between 1000 and 3000 euros per day. This generates many problems that degrade the quality of care offered to patients. Services are full. How discharge people from our care when they can't return to a similar state of health and accomodation ?**

**VATA will save a tremendous amount of time and money for patients and the healthcare system and thus improve the quality of care. The implementation of VATA solution will have an impact in the transportation, treatment, medicine intake and social services addressed the patient.**

## 3. Education :

**The platform has a module of e.-learning where it is possible to create customised e-learning packages for them to better understand their diseases and cope with symptoms but also 2 different communication channels as video consultations and chats with an specialist that can help the patient to clarify questions not addressed in the e-learning packages. The therapist will also have training workshops on the platform so that he or she is able to master the tool and therefore offer the best possible follow-up.**

# WHY VATA ?

## 4. Technological innovation :

**VATA presents both a breakthrough innovation and an incremental innovation.**

### **> Breakthroughs:**

- **VATA as a physiotherapy platform that integrates for the first time AR glasses and a biometric sensor on a fully functional system, easy to use and adapt to each patient's circumstances.**
- **VATA requires minimal equipment and does not require any special installations.**
- **VATA can give real-time feedback to patient's cardiovascular and respiratory state.**

### **> Incremental innovation:**

- **Improvement of the VATA physiotherapy platform.**
- **Development of a mobile application on Android.**



# WHY VATA ?

## Competitive advantages :

**1-direct: End users engagement. Artificial intelligence collects data from biometric sensors as pulse and oximetry to later provoke behavioural changes in the agent who guides the patient. The system ensures 90% personalized training in real time and brings the patient to train in the most efficient intensity intervals autonomously, increasing adherence with 63%.**

**2-indirect: patient has 50% more flexibility to train during the day. Training is 100% customized and monitored to their needs and two communication channels to therapist are available via chat and video conference for questions and follow ups. The treatment is customized to the patient's needs and connects to a real therapist that program the rehabilitation and follow up the patient remotely.**

**VATA's real objective is different to majority of products in the market. VATA wants to be attractive and fun, giving enough interaction and feedback so the patient enjoys the exercises' practice. This is the only way to keep patients engaged on doing physical activity. An additional difference is that VATA can be used anytime, anywhere. Other systems depend on devices that have to be installed, are not easy to transport or require human feedback that is not always available.**

# TEAM



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