



# Physical Rehabilitation at Home

## Use cases within the SHAPES Project



Smart and Health Ageing  
through People Engaging in  
supportive Systems



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vCare Final conference: Shaping a new approach to home-based rehabilitation

Brussels, 29th of September 2022

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 857159

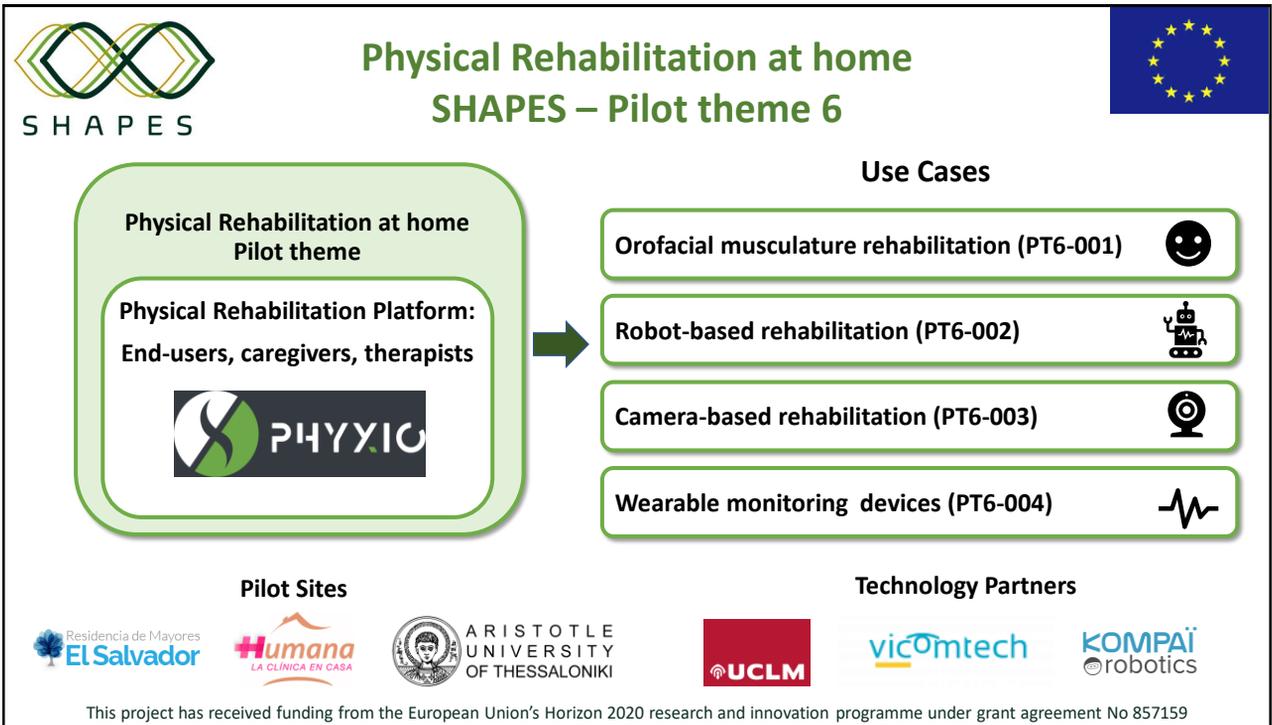
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# What are the true innovative aspects of this SHAPES Pilot?

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## Physical Rehabilitation at home Orofacial musculature rehabilitation (PT6-001)



- Face musculature conditioning and recovery from paralysis.
- List of exercises based on face gestures.
- Face gesture detection.
- Accuracy levels and progress.




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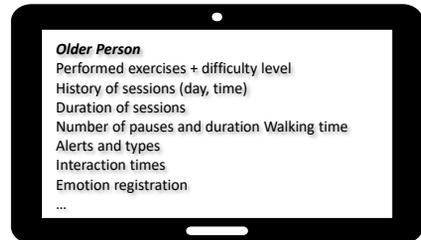
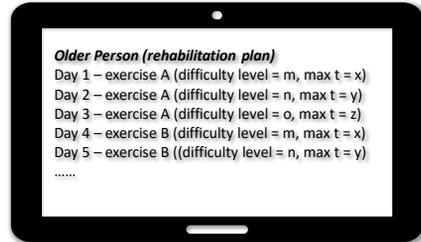
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## Physical Rehabilitation at home Robot-based Rehabilitation (PT6-002)



- Walking assistance for gait rehabilitation.
- Rehabilitation plans and performance tracking.



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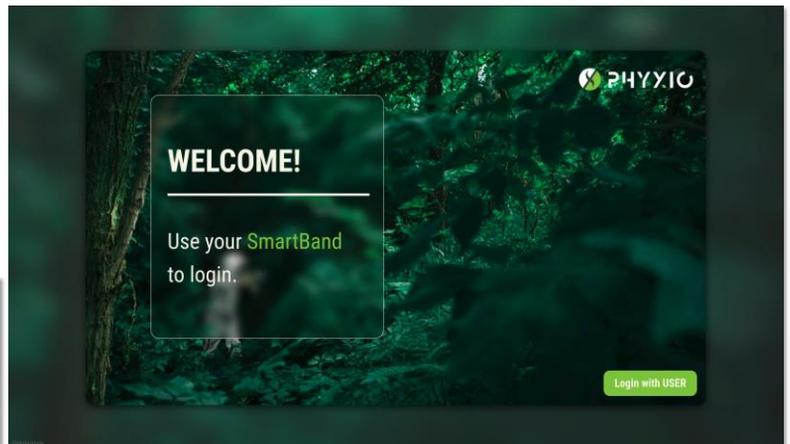
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## Physical Rehabilitation at home Camera-based rehabilitation (PT6-003)



- List of exercises available and assigned by a therapist.
- Body posture recognition.
- Number of repetitions, duration, accuracy of execution.
- Progress tracking and reporting.



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## Physical Rehabilitation at home Wearable monitoring devices (PT6-004)



- Monitoring: activity levels, steps, heart rate, sleep.
- Gait analysis.
- Fall detection.
- Progress during rehabilitation periods.



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# What are the key technological challenges faced in this pilot?

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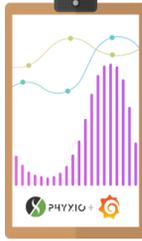
  
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**Different technologies are integrated in the pilot**

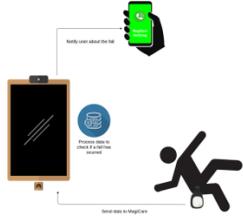














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**How have we made sure the solution was truly acceptable and usable?**

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## Physical Rehabilitation at home: Co-design methodologies



- Expert based decision making involving end-users, caregivers, therapists and digital solution developers.
- Ranking of alternatives considering:
  - Usefulness.
  - Cost of system.
  - Ease of use.
  - Ease of technical development.
  - Ease of maintenance.
  - Privacy.

Open Access Article

### Phyx.io: Expert-Based Decision Making for the Selection of At-Home Rehabilitation Solutions for Active and Healthy Aging

by Javier Dorado Chaparro <sup>1,\*</sup>, Jesús Fernández-Bermejo Ruiz <sup>1</sup>, María José Santofimia Romero <sup>1</sup>, Xavier del Toro Garcia <sup>1</sup>, Rubén Cantarero Navarro <sup>1</sup>, Cristina Bolaños Peño <sup>1</sup>, Henry Llumiguano Solano <sup>1</sup>, Félix Jesús Villanueva Molina <sup>1</sup>, Anabela Gonçalves Silva <sup>2</sup> and Juan Carlos López <sup>1</sup>

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Academic Editor: Paul B. Tchounwou

*Int. J. Environ. Res. Public Health* **2022**, *19*(9), 5490; <https://doi.org/10.3390/ijerph19095490>

Received: 6 April 2022 / Revised: 26 April 2022 / Accepted: 27 April 2022 / Published: 1 May 2022

(This article belongs to the Special Issue Supportive Systems for Active and Healthy Aging)

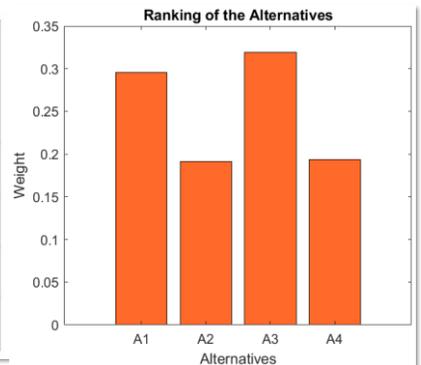
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## Physical Rehabilitation at home: Co-design methodologies



Alternatives	Phyxio Platform 	Wristband 	Webcam 	Video Conference 	Exercise Recording 	Pose Estimation 	High-precision Depth camera 
1		Optional					
2		Optional					
3		Optional			Optional		
4		Optional			Optional		



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# How can Phyx.io integrate with current practice?

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## Phyx.io dashboard and call service



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## Use of standards



- Phyx.io implements two standards for the data exchange
  - FHIR is employed for medical data
  - Symbiot is employed for other data (e.g.: monitoring of the home environment)



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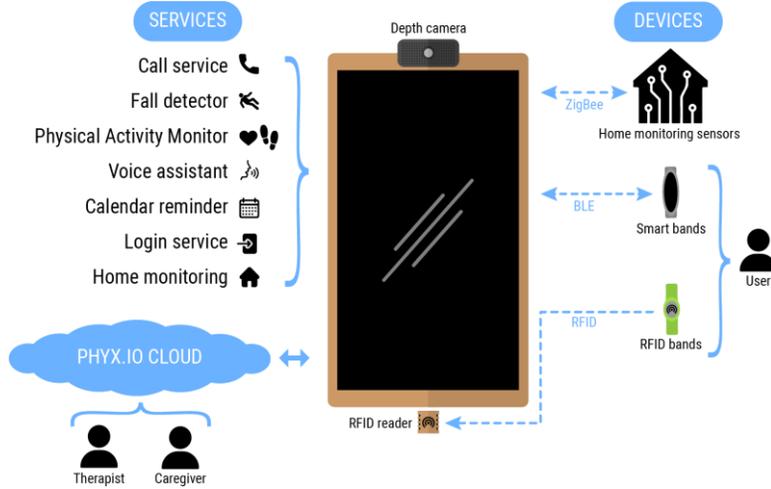
## How can Phyx.io integrate with other platforms?

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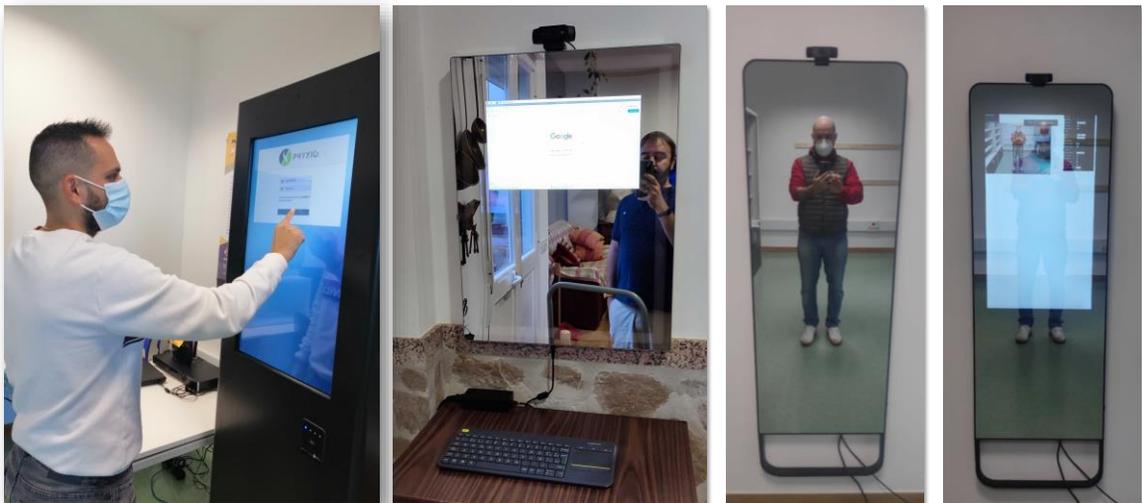
# Smart Mirror: a comprehensive solution for Ambient Assisted Living and elderly people



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# Smart Mirror: a comprehensive solution for Ambient Assisted Living and elderly people



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through People Engaging in supportive Systems



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**Thank you, merci, gracias!**

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