TÉCNICO LISBOA

DEMS

YOUR LIFE, OUR PRIORITY

1st Cycle Integrated Project in Electrical and Computer Engineering
2nd semester 2024/25: Group 12

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01. Introduction

Emergency Triage is Failing

Patients Are at Risk

"66-year-old man found dead in the emergency room of Coimbra Hospital after waiting 12 hours" (DN, 2024)

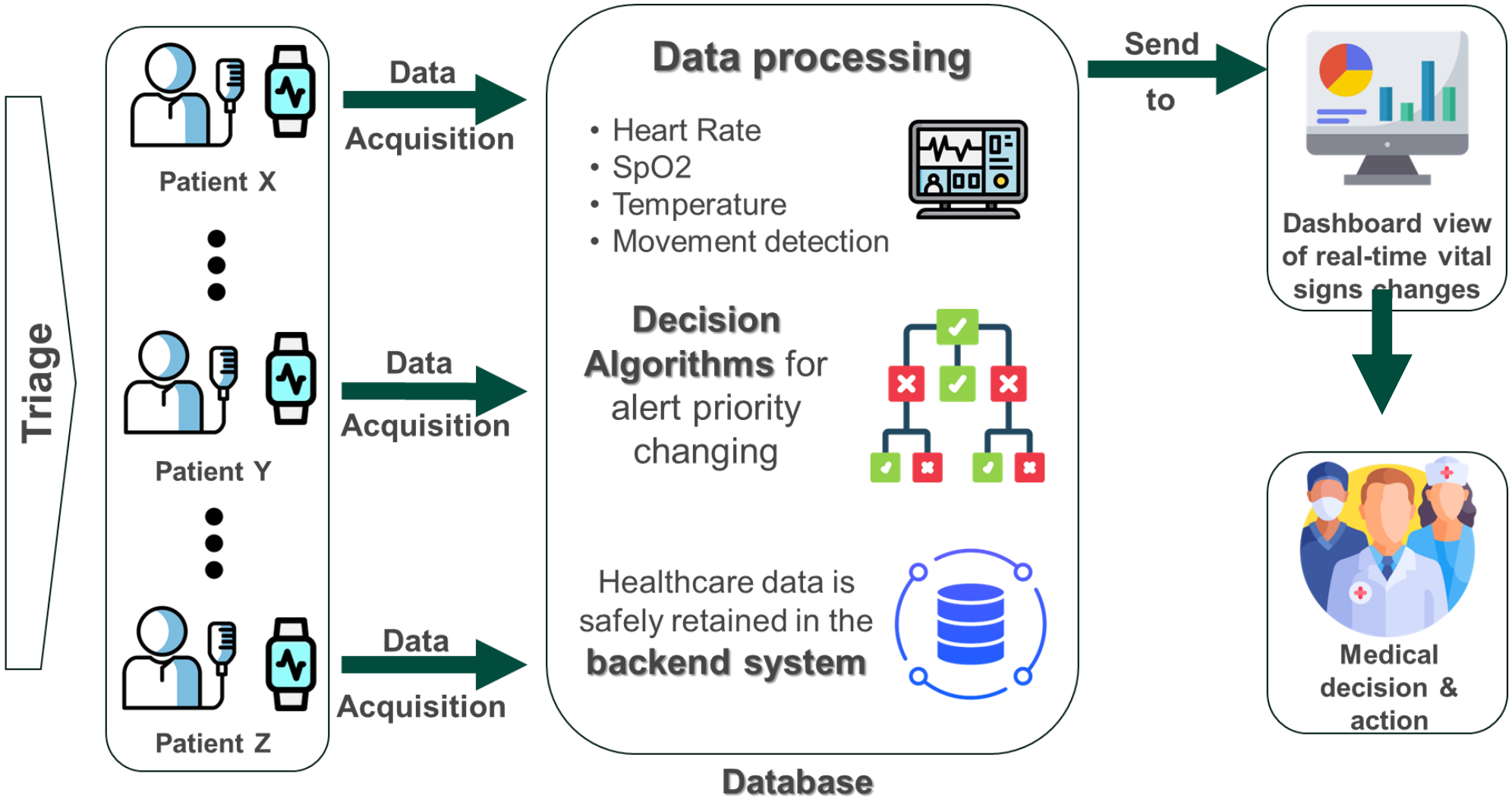
"Regulator says hospital "did not monitor" elderly woman who died in the emergency room" (Observador, 2024)

"Évora Hospital confirms death of user in the emergency service urgency" (Expresso, 2023)

02. Problem: The Challenge

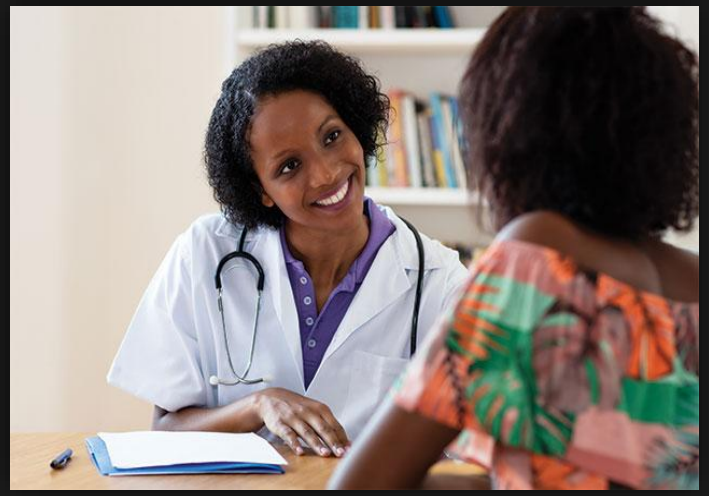
- Manual triage systems are outdated and static.
- Critical patients can deteriorate unnoticed.
- Healthcare staff are overwhelmed and resources misallocated.

03. Our Solution: System Architecture



04. Target Audience: Beneficiaries

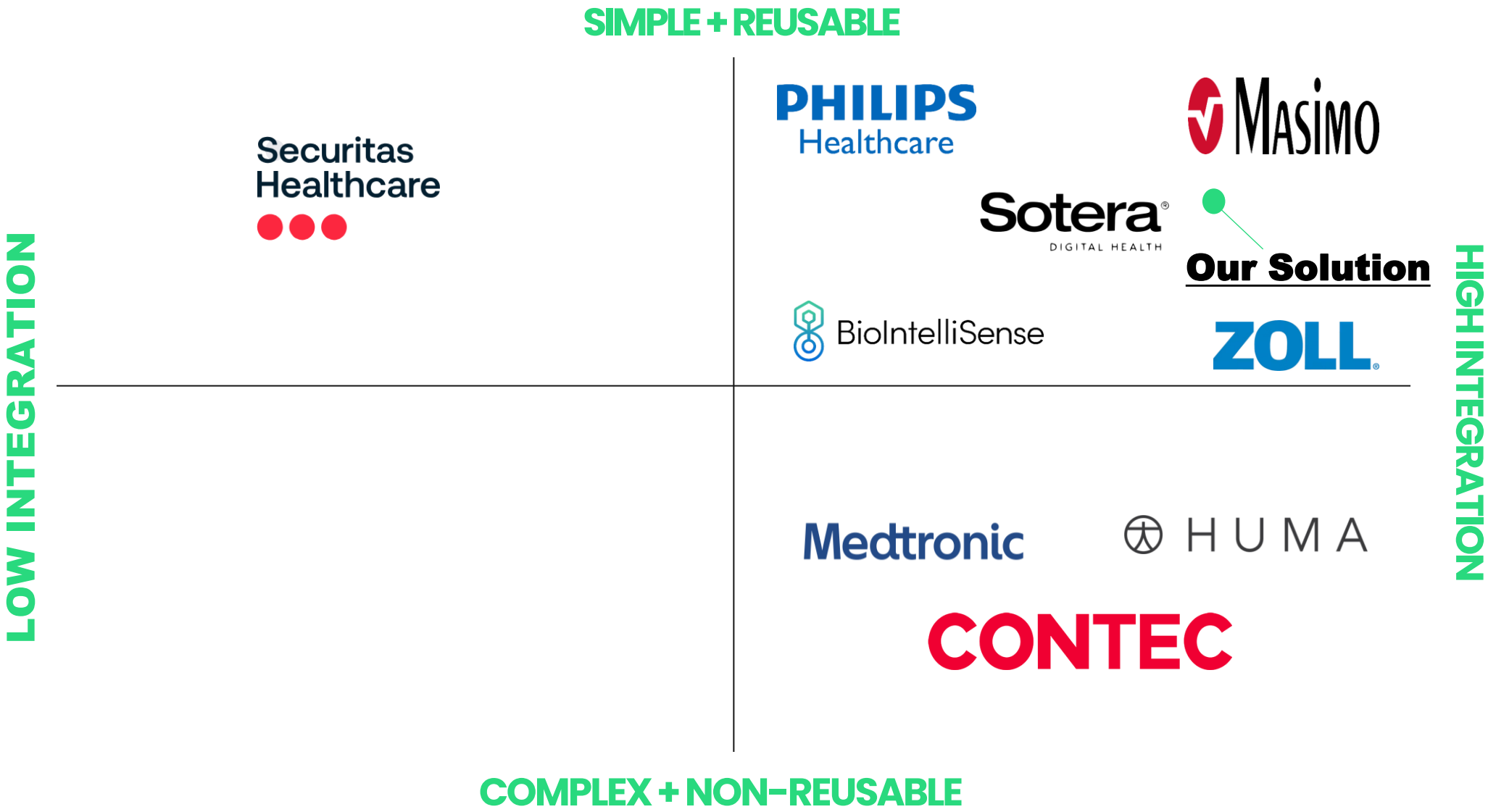
Patients in emergency room



Healthcare providers

Families and caregivers

05. Competitors



06. Our Team

Passionate about technology and impact, we're a team of students turning knowledge into real-world innovation.

João Veríssimo
Software Engineer

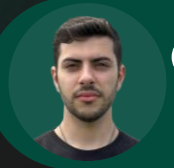
Filipe Esteves
App Developer

Marco Matos
Algorithms and Backend Engineer

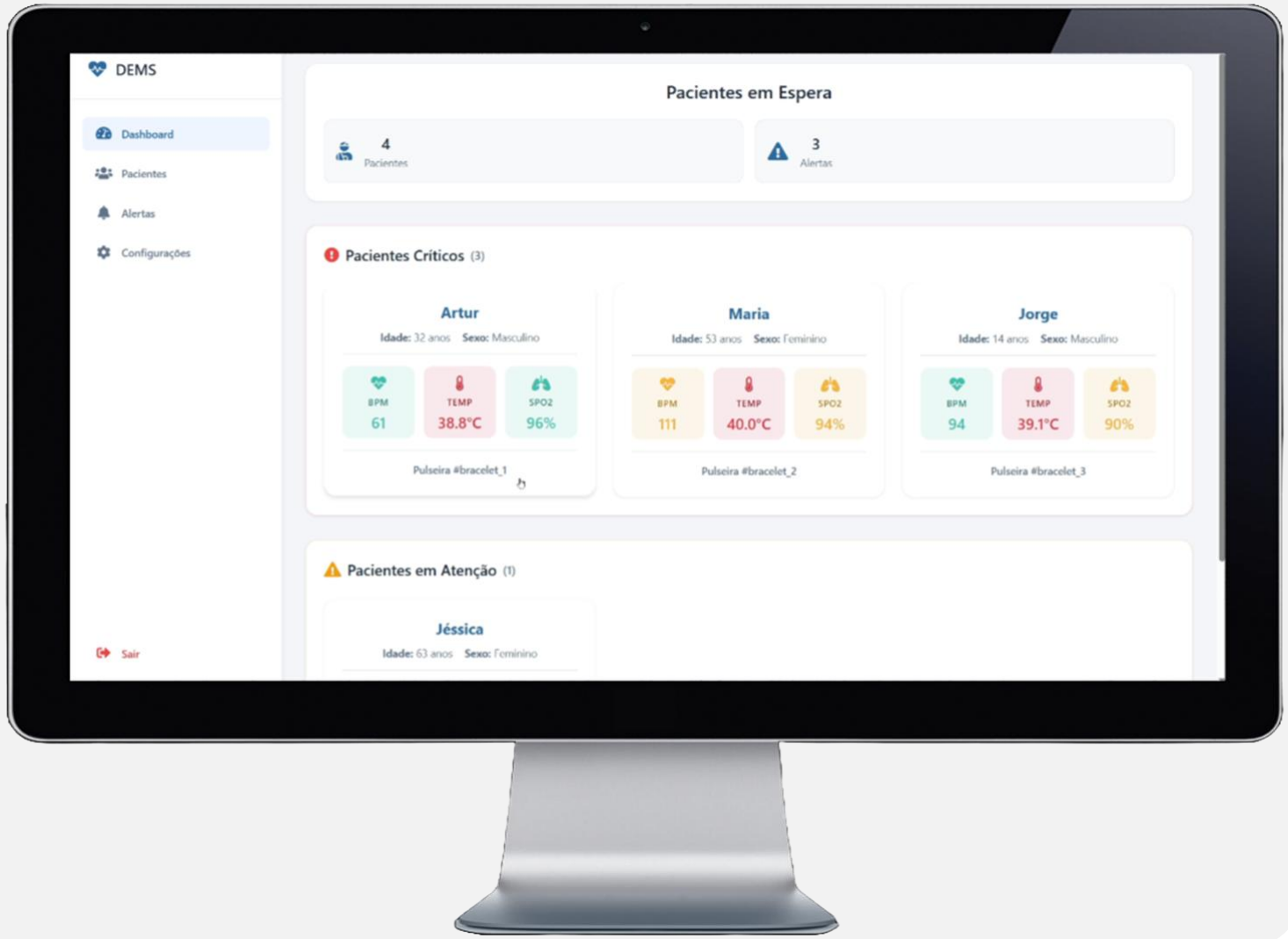
Tomás Modesto
Hardware Engineer

João Ferreira
Research Manager

Gustavo Zacarias
Web Developer



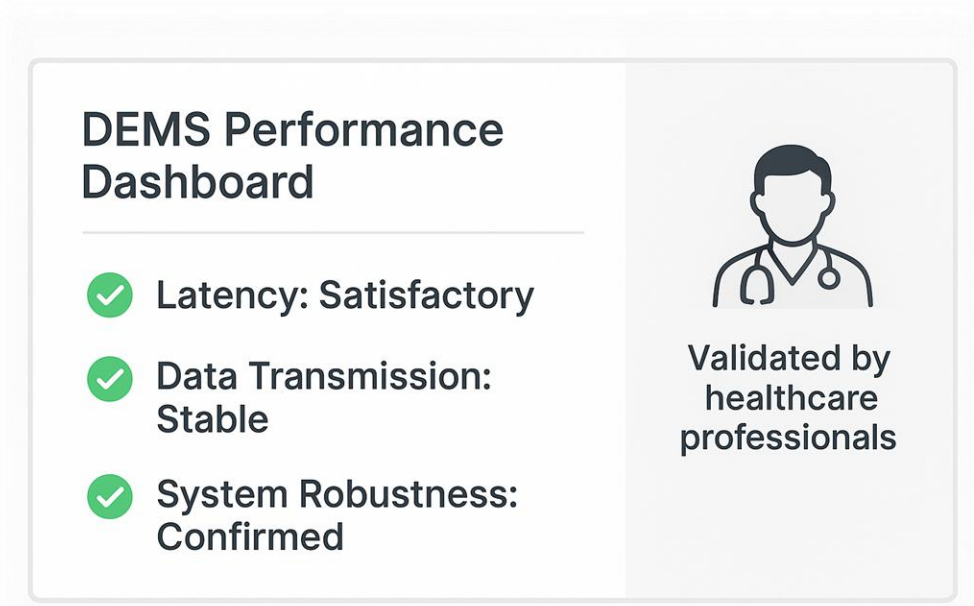
07. Results: Developed work



07. Results: Validation and Performance

The DEMS solution was validated with healthcare professionals, who provided valuable feedback on its relevance and usability in real-world scenarios.

Key metrics like latency and data transmission showed consistent, robust performance — confirming readiness for next development phases.



08. Team members' contributions (II)

João Veríssimo	Filipe Esteves	Marco Matos
Research/ Interviews	**App Development**	**Algorithms**
Algorithms	Website	**Server & Comms**
Bracelet (S)	Server & Comms	Bracelet (H)
-	Divulgation Materials	Divulgation Materials

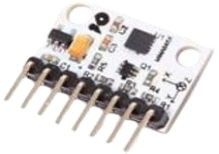
H – Hardware | S – Software | Comms – Communications

08. Team members' contributions (I)

Tomás Modesto	João Ferreira	Gustavo Zacarias
Bracelet (H)	App Development	**Website**
Bracelet (S)	-	**3D Modeling**
Divulgation Materials	-	Divulgation Materials
Research	-	App Development

H – Hardware | S – Software | Comms – Communications

09. Costs and Benefits: Technology cost

Microcontroller	**ESP32-C3**		6.90 €
Temperature Sensor	**MLX90614**		24.16 €
Oximeter	**MAX30102**		7.32 €
Accelerometer	**MMA8452Q**		8.36€
Wi-Fi	**TCP/IP**		0€*
Database Management	**Laptop/ Raspberry Pi**		39.99€

*We assume the Wi-Fi cost is already handled and not part of the current budget analysis.

Bracelet (1 unit)	46.74 €
Total	86.73 €

09. Costs and Benefits: Benefits of DEMS

	Cost-Effective	Scalable and Flexible	Improved Emergency Response	Data-Driven Insights
Cost	Less than €50 (bracelet unit)	Suitable for small and large	Faster detection of critical changes	Collects and analyzes vital information
Scalability	Affordable at scale	Deployed based on patient risk	Supports medical staff	Helps identify trends
Emergency Response	Minimal infrastructure investment	N/A	Prioritizes care	Prevents incidents
Data Analysis	N/A	N/A	N/A	Improves protocols

Information

dems.pt

https://youtu.be/5NjlfKBrWJE

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THANK YOU

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