Towards A Digital Behaviour Change Intervention For People With Multiple Chronic Conditions To Enhance Self Management

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Background

- A **major criticism** of **technologies designed to support behaviour change (BC)** is that they cannot demonstrate efficacy or measurable outcomes due to a **lack of an appropriate theoretical framework** for the intervention design[1]
- **ProACT** is an EU-funded Horizon 2020 project that aims to **develop and evaluate a digital integrated care ecosystem** to support **older people with multimorbidity (PwM)**.
- The ProACT system will be designed using a **theoretically driven BC framework** to **improve adoption** and **promote positive self-management behaviours**.

ProACT Methodology

User-Centred Design

- Extensive **user requirements** study and use of **living lab** facilities to ensure **co-design** of the digital system with **key stakeholders**

Proof of Concept Trials

- **Trial sites** in **Ireland and Belgium** deploy technology to support self-management to **120 PwM's** and **support actors in their care networks** (both formal and informal) for a period of **12 months**.
- Primary trial sites will also be supported by a **transferability study in Italy** consisting of **15 PwM's and their care network**
- **Inclusion criteria** for participants with multimorbidity:
  - Over 65 years of age
  - Managing two or more conditions:
    - Diabetes
    - Chronic Obstructive Pulmonary Disorder (COPD)
    - Coronary Heart Disease (CHD) or Congestive Heart Failure (CHF)
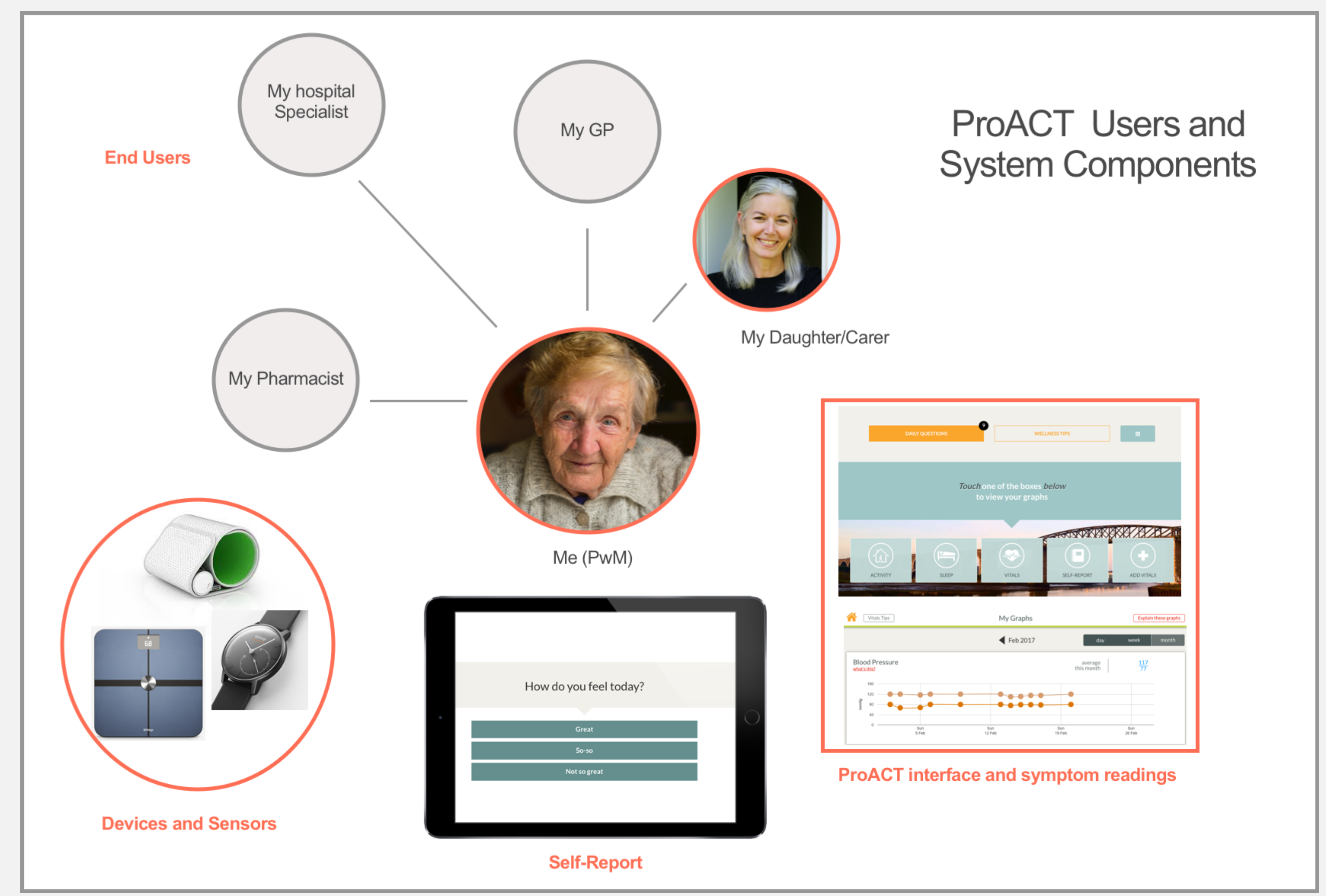   - Mild Cognitive Impairment (MCI)

BC Intervention Design

- Key contribution of our work involves the use of the **Behaviour Change Wheel (BCW)**[2] to integrate behaviour change theory with the development and design of the ProACT application.
- We are using the BCW approach to inform the design and evaluation of the proposed application but we are also using it to help translate our requirements into a meaningful digital intervention.
- Using Michie's (2014) framework[2], we have identified **three target behaviours for the main ProACT application** for PwMs and their care network. By applying this **systematic 8-stage method**, we have **designed intervention strategies** for each target behaviour.

References

1. Hekler, E., Klasnja, P., Froehlich, J., Buman, M. (2013) Mind the theoretical gap: interpreting, using, and developing behavioral theory in HCI research. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (CHI '13). ACM, New York, NY, USA, 3307-3316.

2. Michie, S., Atkins, L., West, R. (2014). The Behavioural Change Wheel: A Guide to Designing Interventions. Silverback Publishing. Great Britain. ISBN: 978-1-291-84605-8.

ProACT Target Behaviours

1. **Measure and view key symptoms on regular basis using the ProACT system (PwM)**. PwMs will be given relevant devices for measuring symptoms according to their conditions (i.e. BP cuff, digital weighing scales etc.), and a tablet with the ProACT application, which will enable them to view their symptom readings over time in an accessible format. This target is designed to encourage participants to adopt the system into their self management routine.

2. **Recognise and record changes in symptoms from baseline readings (PwM)**. Participants will be able to annotate their symptom readings to indicate whether there has been no change/small change/significant change in that symptom from their normal baseline readings. This target is designed to encourage PwMs to engage with their key symptoms over time in order to enhance self management skills for multiple conditions.

3. **Confirm viewing of key symptom readings on ProACT (Key support actors: i.e. informal carer, GP or pharmacist)**. The engagement of support actors with the ProACT system is crucial for the design of the application and intervention. This target is designed to encourage key support actors to acknowledge that they have viewed symptom readings for the person that they are caring for and to notify the PwM that they have seen their data.

ProACT Users and System Components

Conclusions

- The study will **demonstrate** how the **BCW framework** can be used to **maximise the efficacy of a digital health intervention** for older adults with multimorbidity.
- ProACT has the potential to support existing healthcare practices, and also **to improve management and integration of care for those with complex needs**, introducing new ways for key actors (e.g. informal caregivers, general practitioners, pharmacists etc.) to work together and support the PwM.
- **Self-management of multimorbidity is multi-faceted;** sustained behaviour change is most likely to occur within an ecosystem of individual, community and population-level interventions used to motivate and maintain changes.