Mood Detection and Prediction Among Young Adults in the UK: A Feasibility Study Using Ecological Momentary Assessment

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Background

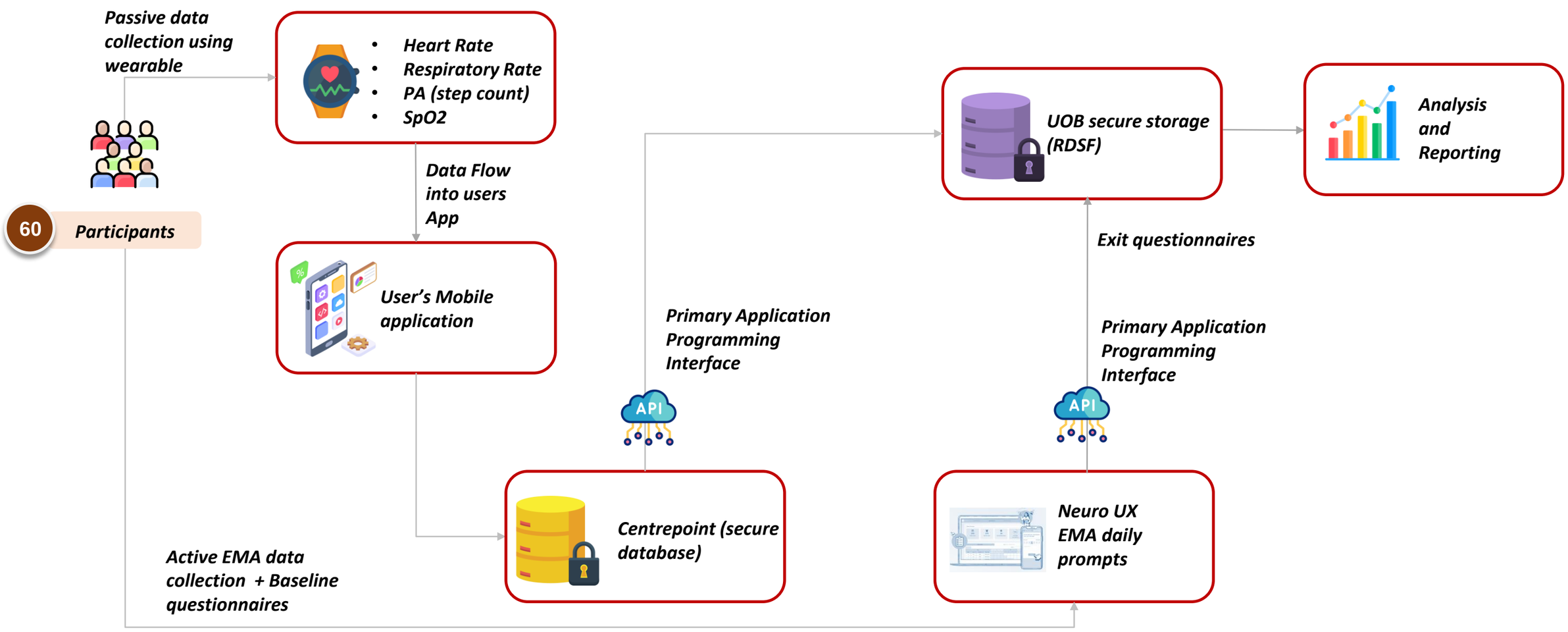
- Mental health disorders are disproportionately higher in young adults[1] and are major contributors to student dropout in the UK, especially in South West England[2]
- Monitoring of known mental health biomarkers, such as sleep and physical activity, through wearable technology can enable appropriate supports and interventions, positively contributing to long-term outcomes[3]
- Ecological Momentary Assessment(EMA) can capture mental health data closer to real-time than traditional reflective mental health assessments.
- By processing interrelated, multi-modal data within machine learning pipelines, we may be able to build predictive models, unlocking the capacity for novel means of interventions and personalized support.

We aim to establish if passive monitoring of wearable-derived sleep and physical activity data can be used to predict changes in momentary and longer-term mood states

Our work So Far

- Developed a feasibility study protocol in line with NICE guidelines and applied for Ethical Approval.
- Selected appropriate Ecological Momentary Assessment (EMA) questionnaires and digital dissemination tools through an internal pilot study.
- Generated a theoretically grounded combination of questionnaires which will allow us to position our findings within traditional, and more novel, measurements of mental health.

Process Flow



Next Steps

- Aim to recruit ~60 participants, aged 18 to 29 years
- Establish a data management plan for the transfer, harmonization, cleaning, and preprocessing of data.
- Develop a machine learning model used to predict mood, comparing the accuracy and explainability of each.

References

1. World Health Organization. (2014). *Mental health atlas 2014*. World Health Organization. https://apps.who.int/iris/handle/10665/178879

2. Health Innovation South West. (2023). *Regional programme — children and young people's mental health programme review*

3.Harvey, A. G., Murray, G., Chandler, R. A., & Soehner, A. (2011). Sleep disturbance as transdiagnostic: Consideration of neurobiological mechanisms. *Clinical Psychology Review, 31*(2), 225–235.