

# Designing meaningful interaction with mental workload data

## 1 Project background

### A transfer in measuring Mental Workload

Create an environment and job content that aligns with the capabilities and state of the workers

Place people in the most suitable position by assessing their cognitive load

**Mental workload (MWL)** is defined as the perceived relationship between an individual's total mental processing capability and the amount required by the task at hand (Bagheri et al., 2020). As individuals navigate through various tasks and responsibilities, their cognitive state plays a pivotal role in determining performance, well-being, and overall productivity.

In the past, measurements of MWL were primarily used to reduce errors in high-risk tasks, typically conducted through traditional questionnaires in controlled experimental environments. However, with advancements in technology, Neurotechnology, involving the application of principles from neuroscience to develop tools, devices, and techniques for understanding and interacting with the brain and nervous system, enabling us to understand our MWL status anytime and anywhere.

## 2 Research questions & Methodology

### Research Goal

The main goal of this study is to bridge the gap between traditional methods of measuring mental workload and the utilization of wearable neurotechnology for measuring mental workload.

### Research Question

- RQ1.**  
What do people understand Mental Workload in terms of this terms and the outcome of this technology?
- RQ2.**  
How to motivate people to self-track their Mental workload through this technology?
- RQ3.**  
What are the user needs when self-tracking Mental workload?

The first research question involves how do people understand the concept of MWL. As a novel technology and new concept of measuring cognitive data, there are some potential sub-questions worth exploring:

- Will user correctly perceive the meaning of tracking Mental Workload?
- What is the understanding of Mental Workload from users' perspective?

Literature Review

Interviews

Survey

The second research question refers to how to motivate and attract users formulate a self-tracking behavior? To make people actively track their cognitive data, some potential questions needed clarify:

- If the design of current neurotechnology enough to encourage people keep self-tracking their cognitive data?
- If not, how to stimulate a self-tracking motivation on cognitive data?

Interview

User test

Shift: Technology Support

Self-tracking scenario

Neurotechnology

Theory of MWL

User understanding

User Needs

Device users

Optimisation for user needs

The third research question discussed the design to stick users on this technology after starting using this technology. To achieve it, the design is supposed to correspond with user need and expectations. As a result, several user research becomes crucial as:

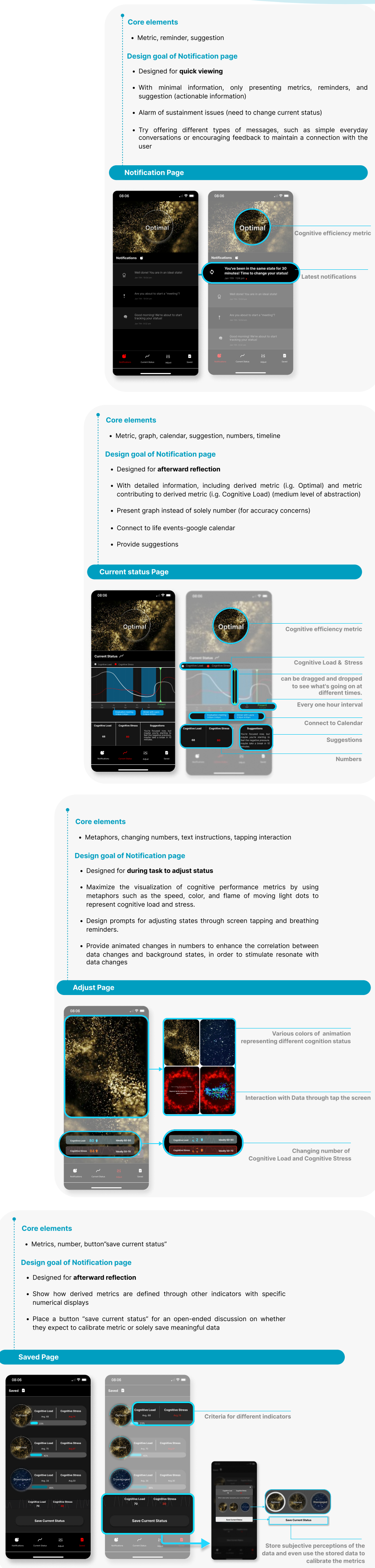
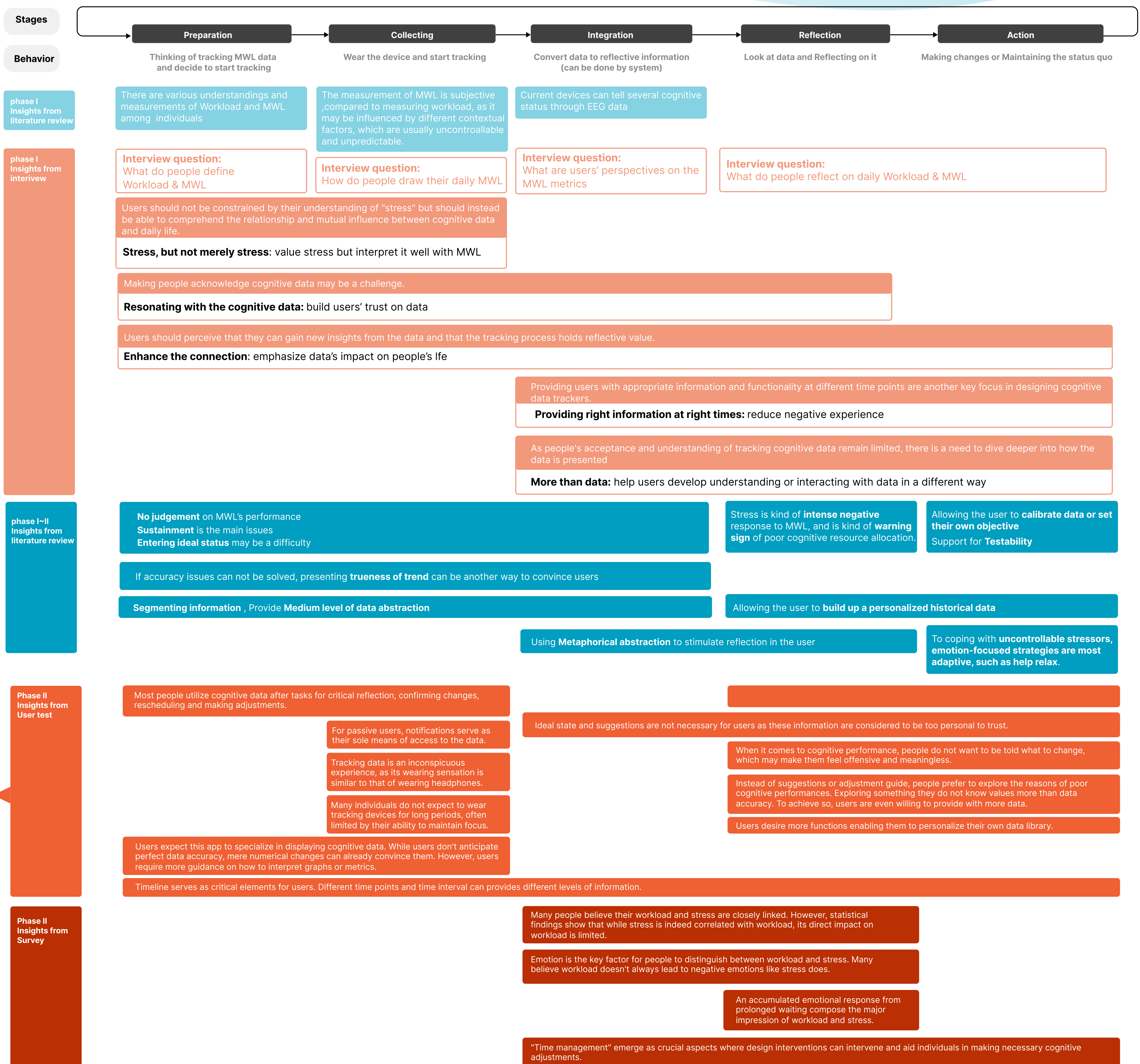
- If the contents and functions in current technology align with user need?
- What are the expectations on this technology from users' perspective?

User test

Interview

## 3 Main Takeaways

Utilizing Li et al. (2010)'s five-stage personal informatic self-tracking model helps explore user behavior and needs from different stages and identify areas where need further user research.



Yu-wei Chen  
Designing meaningful interaction with mental workload data  
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Design for interaction

**Committee**  
Dr. Christina Schneegass  
Dr. Tilman Dingler

