cess. While creating the model, I drew inspiration from *dynamic research sketching* – a tool developed by Markussen et al. (2012) that builds on the framework of Brandt & Binder (2007).

The latter attempts to define design research that is driven by designerly experiments through three elements: *research question*, *program*, and *experiment* (Brandt & Binder, 2007) *(Figure 3-3)*. In this context, the research question sets the overall scope of the research project, guiding the inquiry. The program acts as an intermediary between research question and empirical exploration. Although always provisional, it contextualizes and frames the designerly experiments "by proposing the possible" (p. 5). As such, the program defines the area of exploration: it sets the goals for what is to be achieved by the design solution, while at the same time leaving it open to how this is accomplished. Experiments, on the other hand, challenge the program. As a vehicle for knowledge production, they "deliberately [seek] to establish the strength and scope of the program in relation to an overarching knowledge interest" (p. 4). Relating their framework to design research at large, the authors regard the purpose of design research to show the strength of the suggested program beyond the individual experiment. Rather, the program must be substantiated through a series of experiments and interventions which may take many forms such as co-design design processes, prototyping, and so on.

Dynamic research sketching builds on the above-described framework by adopting its three constituents (*research question*, *program*, and *experiment*) to define an experimental design research project (Markussen et al., 2012). However, it differs from Brandt & Binder's (2007) concept in three ways: First, dynamic research question includes theory construction as an integral part of the research process in the way that it uses explanatory sketching (Markussen et al., 2012). Second, it takes a more detailed look on the role of the experiments and interventions conducted. This leads to an understanding of the constructive role of experiments: research sketching reveals not only what experimentation does to the theory that is fed into the research project, but also how each

experiment influences the knowledge flow of the research project as a whole. Unraveling these interrelationships is – third – what makes research sketching inherently dynamic. Unlike Brandt & Binder's static diagram of an experimental research process *(Figure 3-3)*, dynamic research sketching shows how research question, program, and experiments mutually influence each other for each individual research project. Thereby, it uncovers the dialectic process of experimental design research where the outcome of experiments influences the program and research question. For ex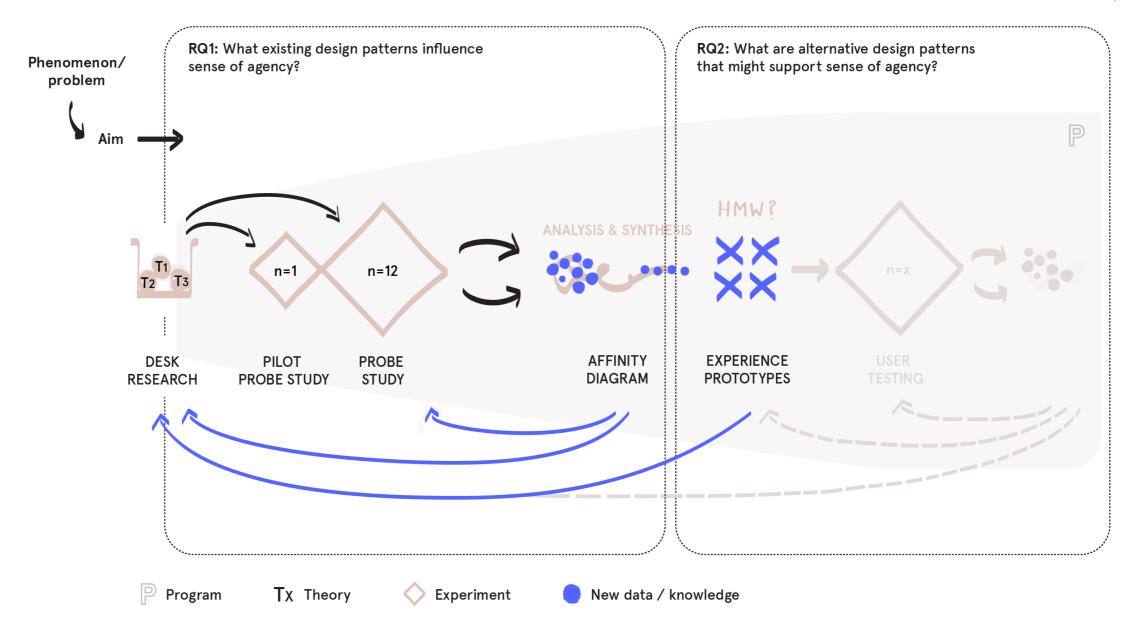ample, experiments may lead to a reformulation of the research question, or to a broadening or narrowing of the program.

The following figure shows the research study design of this paper in the form of a dynamic research sketch, as developed by Markussen et al. (2012) *(Figure 3-4)*.

Starting from the top-left corner of the figure, I preluded the research in this paper with the following problem statement: *how can we design interfaces that give back control toward the people who interact with these interfaces?* (see chapter 1.2).

The research aim was to redesign design mechanisms for a greater sense of user agency. Based on my problem statement and research aim, I first conducted desk research to thoroughly explore the topic. I tapped into the following three research areas: dark patterns of interaction design *(T1, ⇒ chapter 2.1)*, philosophy of technology *(T2, ⇒ chapter 2.2)*, and previous work on sense of agency for digital well-being *(T3, ⇒ chapter 2.3)*. The knowledge output from these three research areas led me to formulate my first research question (RQ1): *What existing design mechanisms influence sense of agency?* Within the scope of this

Figure 3-4: Research study design of this paper, inspired by Brandt&Binder (2007) and Markussen et al. (2012).