

DIRTY TUESDAY - CLEARING THE MENTAL BLOCK IN THE DESIGN PROCESS

Tuuli UTRIAINEN, Antti SONNINEN and Maria KULSE
Aalto University

ABSTRACT

The purpose of this paper is to discuss how short should design cycles be. In an iterative design process, two-week cycles might be too long when a design project is in the discovery phase. In an academic context, a pedagogical intervention can open the innovation space of design teams and help the members to add new aspects to their design process. A method to lower the design teams' threshold to try out ideas and bring down the design block, Dirty Tuesday, will be introduced and evaluated in this paper.

The authors run a team-based, international product development course at their university. This Fall, a new brief prototyping cycle was introduced to help teams whose design process had come to a stand still. The exercise was called Dirty Tuesday and the five student teams of the course completed it in three hours. A tight deadline with clear outline made the teams produce quick prototypes and successfully helped to clear the mental block hindering their process. In addition to helping the teams move forward with their projects the method also engaged them to pursue a novel direction.

The scope of this paper concentrates on the first stages of a global design project. According to our knowledge and experience, extremely short iterations in the exploratory stage might help teams to attain the best results. When the design team hits a brick wall or cannot proceed with new ideas, an intervention such as the Dirty Tuesday can be a constructive solution.

Keywords: Design education, design process management, micro-cycles, Dirty Tuesday

1 CONTEXT

The authors of this paper run a design course eight months long at their university. This year there are five student teams on the course and each team consists of three to four local students who collaborate with three to five students at a global partner university. The partner universities are located in France, USA, and Japan. Each team is assigned with an open-ended design brief devised by the teaching team and a sponsor company. Each student team is given an R&D budget of 10 000 - 14 000 € and they follow the course curriculum and design deadlines. The teams have a weekly three-hour lecture as well as a weekly one-hour meeting with the teaching team consisting of five individuals – four teaching assistants and a professor. To promote peer learning the teams share a common workspace, where students have 24-hour access and a designated table space.

The course curriculum consists of user observation, need finding, benchmarking existing solutions, iteration cycles where physical prototypes are produced and tested by target users (Figure 1). The design cycles we introduce to our students last from two to three weeks focusing on different aspects of the product. This is done to encourage vast exploration of the problem space each team is working on and to have the key learning's guide the design on the final prototype.

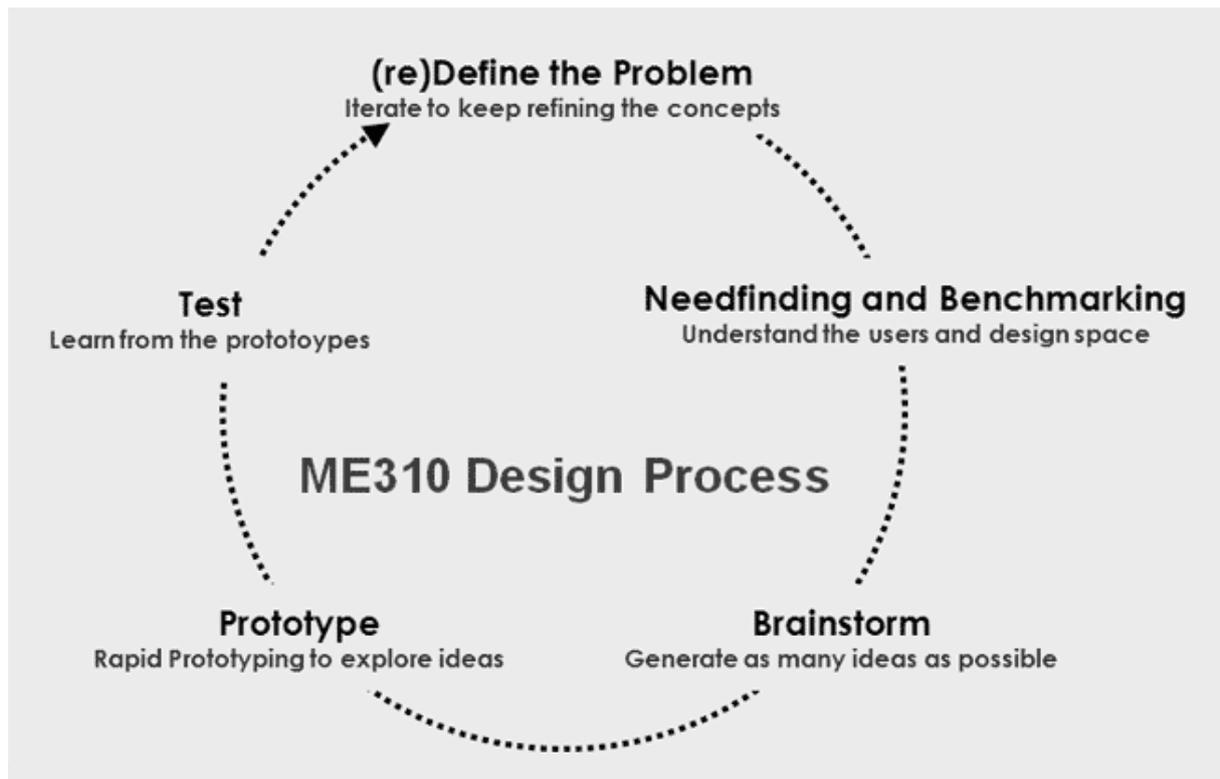


Figure 1. The Design Process of the Course

2 BACKGROUND

One of the most challenging tasks the design teams of the course have to deal with is the complexity of working with open-ended, fuzzy design briefs. By securing that the briefs are wide, it is possible to enable the students to have a real possibility for innovation and a learning process 8 months long. This also means that the problem space they face is wide and a single optimal solution is hard to find.

The more open-ended the brief the more complex the design project with more information to gather in order to create successful design. An important factor that affects product development time is project complexity along with the team's information processing capability [1]. Dealing with high level of complexity means that the students have a natural tendency to use more time per cycle. However, speed has become an essential factor of success in new product development [2]. Reducing the product development time also reduces the products time to market, which is important when operating in a dynamic business environment.

Although the course curriculum is composed of short design cycles sometimes even they seem to be too long, which means that the teams get tangled up in the ambiguity. Other product design courses have utilized quick prototyping cycles as a method to generate and evaluate ideas in a rapid way. PD6 (product development in six hours) is a short design cycle challenge between the student teams and their industry partners. In PD6 the teams are allowed to select an idea because it is 'good enough'. The focus is thus on creating solutions together as opposed to extensive information gathering. Divergence phase is thus short in this cycle and the focus lies heavily on convergence. In addition it is stated that "Prototypes work as an idea platform where one is continuing ideas further immediately and getting feedback from the ideas' functionality from both the prototype itself and team members." [3] It seems plausible, that a similar prototyping micro-cycle could be used as a tool to relieve ambiguity even in the middle of a design cycle.

3 METHODS

One of the first design tasks the students are exposed to on the course is a ten-day challenge (Figure 2), where they have to create a critical function prototype (CFP) based on an observed user need. A CFP is built to find out if a proposed solution will fill out the most essential aspect of the product – e.g. a coffee cup will have to be able to hold coffee. Need finding and early benchmarking are already

executed at an earlier stage so the teams can focus on creating a concept, implementation and testing their solution.

Three days into the challenge the ME310 teaching team had a regular feedback session with the student teams. In the meeting it became evident that four out of the five teams had difficulties to focus their project scope. This meant that the teams felt reluctant to move on from the planning and concept selection phase in the fear of choosing the wrong topic – i.e. the teams could not get past the phase “brainstorming” in Figure 1.

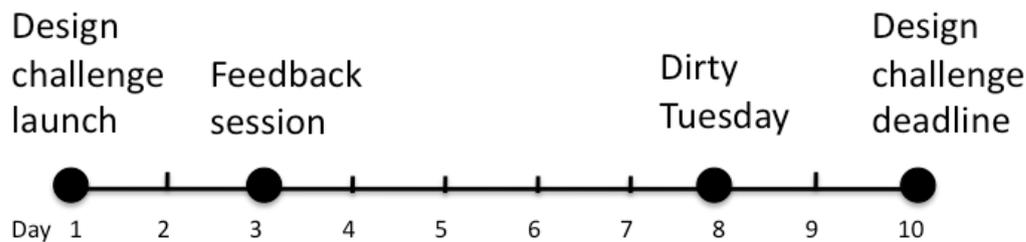


Figure 1. Timeline in the beginning course

To resolve this issue, the teaching team created a three-hour design challenge for the students. The purpose of the task was to test two hypotheses in particular:

1. Narrowing the scope down does not close off opportunities, but rather gives more ideas and guidelines for the prototype design. There is value in doing a precise test rather than trying to keep all options available.
2. The implementation phase is of great importance and offers different value than planning and thought level concept creation. According to our observations the implementation shapes the concepts and is a vast source of novel ideas on how to design parts or use the product in different ways. In addition, the creation of a working prototype is the best way to get in-depth feedback to support or contradict the design teams assumptions.

The teaching team assigned each team with a task that would help the team with the specific problem that they were facing. Each team was either provided with a specific user group or a function they would focus on. An abstraction of the prior problems and tasks assigned can be seen in (Table 1). After the assignments were presented to the teams, each team had two hours to come up with a concept for the challenge and prototype it. After the two hours had passed, all five teams assembled to share their results.

Table 1. The Problems of the Teams and the Tasks Assigned

Team	Problems prior to the exercise	Dirty Tuesday task
Team 1	Scope well defined but perhaps too conservative, mainly building on the existing industry paradigms.	Design for an extreme user who is unable to use the existing solutions.
Team 2	Scope too broad, team unable to define a specific part from the product/user experience	Design how to fulfill a specific function for a specific user type
Team 3	Many concepts and functions to select from, difficulties in choosing one.	Design a solution for a specific context that fills a specific function.
Team 4	Scope too broad, team unable to define a specific part from the product/user experience	Design a solution for a specific function.

Team 5	User group undefined, insufficient need finding and focus on the technical aspects of the project.	Design a solution for a specific user group to fulfill a specific function.
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4 RESULTS

Overall, the teams displayed a range of difficulties they were struggling with. Whereas some were The most important results of the Dirty Tuesday experiment can be summed up with the following bullet points:

- All teams came up with a relatively large amount of new design ideas.
- The teams with technology push element in their original brief were able to forget the technology they were given for a while and to focus on the needs of their users.
- All teams reported that building prototypes with a tight deadline had sped up their development process that seemed to be stuck in the ideation phase
- All teams were able to find a fresh way to look at their project and indicate the next steps to take it further

Overall, the teams had displayed a range of difficulties they were struggling with. Whereas some were trying to broaden their scope of ideas through brainstorming sessions, other teams experienced barriers in overcoming the transition from idea generation to actually implementing those into tangible design solutions. After the initial intense period of benchmarking and need finding, it was the first time for the teams to detach their thinking from their original project briefs as, according to the student group, Dirty Tuesday was experienced as “something out of our focus, something new to think about that made us totally forget about the original project brief”. Some teams had already started brainstorming ideas and felt stuck with the initial directions taken. Brainstorming on a “new subject and a specific brief” (we will call it the ‘micro-brief’) helped the students to “free their minds”, as the focus was placed upon the methodology and its basic rules (quantity over quality, no shooting down of ideas, embracing weird ideas, build and combine upon ideas, etc.), rather than the pushing for relevance or concerning a specific project output. One team described the Dirty Tuesday activity as primarily as lowering the barrier of fear, which was achieved through detached, wild ideas that needed to be prototyped, quickly.

The resolution of the prototypes varied according to the project type: The more detailed the initial project brief, the more detailed the prototype. The resolution of the prototypes was also related to the team’s previous ability to produce prototypes. Two teams (Teams 1 & 4) with the most different outcomes shall be used as examples to demonstrate the difference in effects.

4.1 Team 1

Team 1 produced a prototype that was technologically advanced and fully functional, yet rough by appearance. They had previously made a few prototypes prior to Dirty Tuesday as well. Team 1’s design brief was relatively narrow and had the user group and context of use already defined.

4.1.1 Task assigned

The team was instructed to design a video game controller for a user with no hands.

4.1.2 Prototype

A helmet-mounted air mouse with a tongue controller, built up by taking existing components of diverse controllers in order to answer the tightly set challenge.

4.1.3 Lessons learned

The team discovered that prototyping is easier than they had thought and that they can build a working prototype in half an hour. The ideas they got were not implemented later on in their project but the ideas still made them realize they need to broaden their view.

4.1.4 Effect on CFP

No effect. The team had a clear direction already before the challenge.

4.2 Team 2

Team 4, on the other hand, produced a prototype, which was on a high, conceptual level and did not go deep into technical details. Before the exercise the team felt that they were stuck and that they were working on a concept with which they “couldn’t go backwards but couldn’t go forwards either” and which was “just not working for them”.

4.2.1 Task assigned

Develop solutions for "removing the human error factor" in recycling. In practice this was explained to the student team so that users are not able to put certain kinds of waste, such as paper, glass or metal, into the wrong bins.

4.2.2 Prototype

The Black Hole, an automatic garbage sorting station: A concept level prototype. They translated the posed project-specific challenge into a prototype that was acted out and staged in front of their peers, utilizing a combination of existing components as well as props designed and assembled specifically for this exercise. Hence, Team 4 decided to act out a novel way of reducing the probability of human error in sorting various kinds of waste by developing (enacting) a system that prevents from doing so.

4.2.3 Lessons learned

The direction the team was thinking about was too narrow and did not fulfill a specific need. The value was found within the narrowed brief (detached from original project brief) that freed the student teams thinking and acting as it helped “to forward”.

4.2.4 Effect on CFP

Substantial. The team changed their concept completely based on the brainstorm and the Dirty Tuesday was described as the “turning point of the fall term”.

With respect to the problems that each team was struggling with before the Dirty Tuesday task, some student teams succeeded in stretching their thinking by challenging and ultimately changing the direction they had formerly pursued. For other student teams, the value of the micro-brief was its detached nature from the original brief which enabled a methodological practice round that took off the pressure of achieving primarily project relevant outcomes. Still, all teams reported the exercise had accelerated their learning and facilitated thinking about their projects.

5 DISCUSSION

The designed intervention of the Dirty Tuesday has successfully moved the teams to build or act out quick prototypes and to tangibly demonstrate and discuss their ideas with their peers. The specificity of the assigned tasks was meant to diversify the insights and in a guided way, by making the teams decide upon and strongly commit to one idea through a seemingly contradictory and narrowed process of the micro-cycle and the specifically assigned micro-brief. The findings of Dirty Tuesday hint that the first hypothesis presented in the methods section is plausible.

Varying lengths of iteration cycles are of great value as those require the students to break down design tasks and challenges at hand and by that making them approachable to the students. By constantly interpolating and extrapolating the problem space, stakeholders and various solution levels, the students learn to understand how to deal with thinking jams on a practical, hands-on level. The results suggest that when divergence takes control of a design team for too long, only doing something in practice helps, which is consistent with the second hypothesis of the methods section of this paper.

As the given three hours seriously limit the team’s ability to plan, the students are pushed to make quick decisions and follow a chosen approach - the micro-cycle - through and fully commit to it. It can be a practice round for methodology and tools to be used to unblock any team’s thinking by embracing ideas formerly perceived as being outside the project scope.

Further questions remain to what the introduced micro-cycles could be used for and when and how else micro-briefs can be helpful and accelerating for any team. Further research is required to determine whether micro-cycles can be useful outside the classroom and what the specific parameters for introduction should be.

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