Experiences of Learning the Methodology of Development with Design Thinking in Multinational Online Course

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Abstract — **The paper presents the experiences of the participation in an multinational online course about the Design Thinking methodology. First it gives an overview the Design Thinking methodology in teamwork, and the details and results of the development project. In the second part, we analyze the way of thinking and use of design thinking originally and by our Hungarian group.**

I. INTRODUCTION

The software development in team work can be supported with many project and team work methodology. One of them is the Design Thinking, which focuses on the start-up section of a project, the elaboration of the user needs. There are many types of Design Thinking methodology. Here we will discuss first the team work method, which we have tested in a 6 week long international pilot course of on openSAP platform for SAP open online courses. This course was available only for the invited institution, where we have performed a certain development project with a lot of other team for example from Belorussia, Germany, USA, United Kingdom, China, Nigeria, Turkey, Taiwan and from many other countries.

From week to week we passed through the phases of the methodology and presented the results for the learning community and at last we rated our results among three other groups. During these phases we have sensed, that our group is thinking a little bit on different way, so after we presented the Design Thinking methodology and the pilot project, we try to look after the reasons for this difference by analyzing the team results.

II. THE METHODOLOGY OF DESIGN THINKING IN TEAMWORK

A. Design thinking process

In the Design Thinking process there are five main steps, which starts with **Empathy** phase to gain insights on the needs of the audience of the development subject, and goes forward to the **Define** phase, where we have to use the insights of Emphasizing results to identify a problem to focus on. Next step is **Ideate** phase, where you take that problem, and solve that with many unexpected ideas with using ideation-techniques.
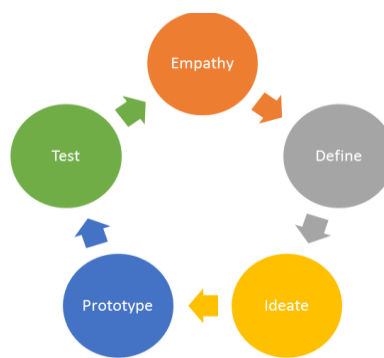

Figure 1. The Phases of development in Design Thinking Team Work Method

To generate options to solve the problem what we can come up with we create several prototypes in the **Prototyping** phase. It is important, that we should create a raw experience for us and for our "audience" to learn here, what works and what does not, and these prototypes should be tested in the last phase **Test**. We needed to learn a different way of thinking in teamwork. And it is also an important

Generally, when we start a project, all of these key values are empty, for example, we did not have a lot of empathy for people using the subject of the development, we did not really know, what the problem is, and we did not have a lot of ideas, we have not so much test result yet. The goal of design thinking is that it can give a framework to solve such hard development tasks, where the previously listed features are present, and after we work with them day by day, we got a few insights about the needs. We had some ideas and test results of some prototypes.

According to this, during the course each time we work on our project these key points become clearer and after 6 weeks, we can say that, we successfully developed a new and innovative solution for the user needs. Moreover we needed to learn how to make decisions as a team, and how to work together in virtual working space, because we could work mostly at night.

Figure 2.   Tele-Board for virtual meetings (SAP® tool)

So we learned how to use this process for our own way of action in virtual meeting place using video conference tool and a Tele-Board platform, which is a shared virtual white board.

B. Iteration process

This whole process - with the mentioned 5 steps - works, if the process is iterative. The iterative cycle helps to learn deeper insights the fastest, get more and better idea and based on that, refine the prototype. We have to try to go through the cycle as much as we can in the available time. For example, in a professional project, if we have 10 weeks, we had to try to run our cycle 10 times, but if we have only a few weeks, had to try to run our cycle also 10 times.

In iterative cycle, we have 2 moving targets: need and solution. When we come around the block and come up with the definition of the need, come up with some ideas, we test the prototypes, we had to learn if we identify a wrong need, and we need to change the result of the Define Phase.

Next, we can have the right need, but with a wrong solution, therefore we need to change the solution. This is the hardest part of the design process, but helps to identify the right need of the user and the right solution. However both of the need and the solution are moving targets, through the iterations, they come closer to each other.
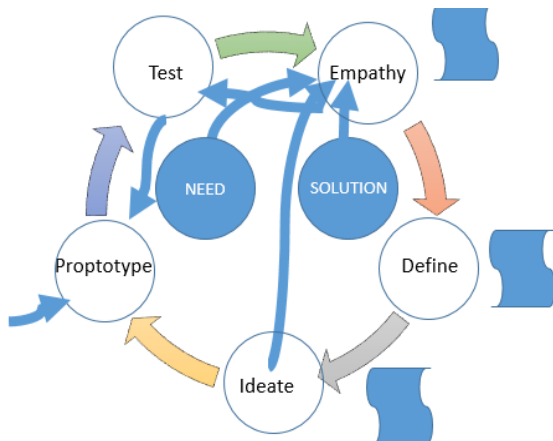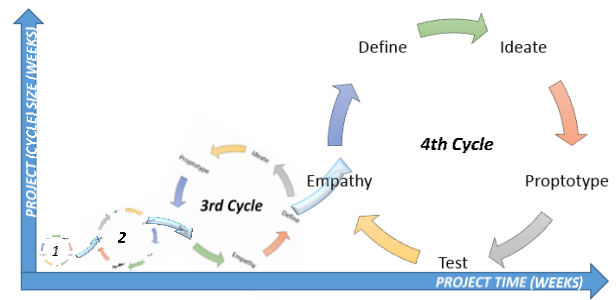

Figure 3.   Iteration ways in Design Thinking

Figure 4.   Mileage in iteration [1]

Generally, a Design Thinking process cycle is starting with Empathy Phase to come up with the user need, but we can change the steps if we have insight and idea to build a prototype and test. But we need to be careful because it has a risk to choose the wrong direction, so we have to go around the block as many times as possible to reach a refined, right user need and solution based on a deep insight. Furthermore, in the iteration process, we can use the technique of Mileage. With the iteration technique, we can learn the fastest, if we have more and more cycles. But we can start with a short cycle within the iteration process and we can give ourselves a chance to have as many projects as possible, but each after each other can be larger and larger cycles.

III.   THE PROJECT OF DEVELOPMENT OF SERVICES AND FUNCTIONALITY OF VENDING MACHINES

Our project was to redesign the working of vending machines. We had to start with the Emphasizing. As we previously mentioned, we do not need to start with the Empathy, but it is recommended to understand our end users and their needs.

A. Emphasizing

In this phase we had to gain insights on the needs of the vendor machine users. For that, all of us had to visit individually a vending machines or coffee machines or drink machines, and asked some users, who visited the machine right in that few teen minutes about four aspects of use of the machine:
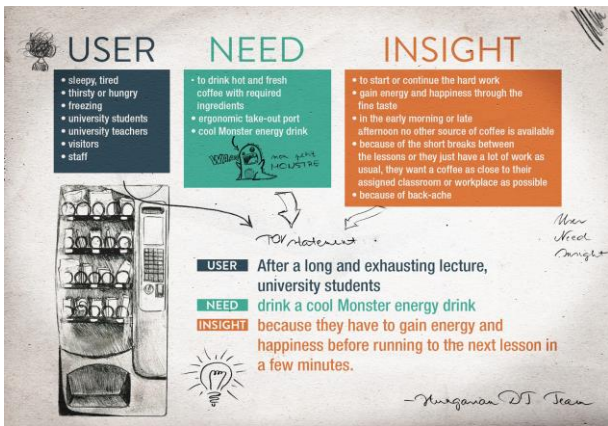

Figure 5.   The result of the Empathy phase

Figure 6.   The Point-of-View selected to provide solution for it

- What is their actual life situation?
- How and why are using this machine?
- What do they struggle with?
- What do they wish from the machine?

After the survey, we had to summarize the group findings. The merged result is shown on Figure 5.

B.   Define the Point of View to serve with solutions

In the second phase we had to define only one chosen Point of View (PoV in short) of the vending machines users based on the key insight about them. It is important that the PoV has to be specific not general. First we analyzed the collected data of insight, and a created individual User+Need+Insight statement.

Then we tried to merge and combined the individual statements by looking after similarities and differences and correctness, as it is presented in Figure 6.

C.   Ideation

The third phase of design thinking is the Ideation phase. In this phase we had to generate a lot ideas and concepts individually for our vending machine development through Brainstorming technique. During the idea collection, we had to focus on the PoV. In the second step, together as a group, we had to sort the ideas into most radical, the safest and most delightful idea groups.

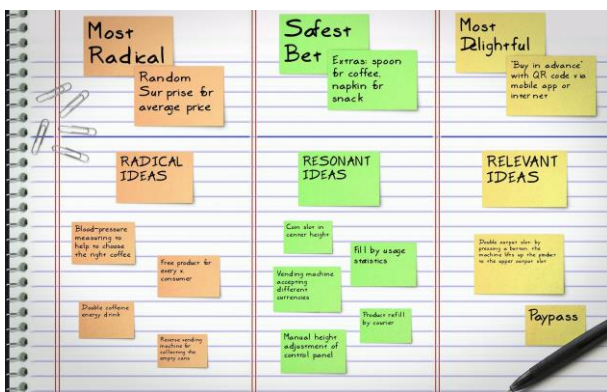For this task we applied the Tele-Board, which result is presented in Figure 7 of.

Figure 7.   Results of Ideation Phase in three categories

Figure 8.   The rough and the refined prototype

D.   Prototyping

Next week we reached the fourth phase and we had to make some prototypes for our selected ideas. We had to make "ten-minute prototypes" to test with our end users. They could give us a relevant and honest opinion of it and even if they not satisfied with our prototype we just can throw it away and search after other prototype or idea.

E.   Testing

The last phase of our progress was the Testing, which was really delightful. We could see how people react to our work and for our new ideas.

Figure 9.   The testing phase with real users

IV.   DESIGN THINKING IN INDIVIDUAL WORK

In comparison with the Design Thinking in team work, we can use the Design Thinking the individual development projects, such as designing user centric components of software system, like user interfaces. During the development, the keys are very similar, but the Empathy and Define phases has got its own iteration cycle. (Figure 10)
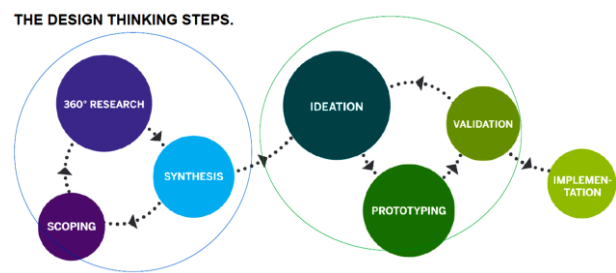

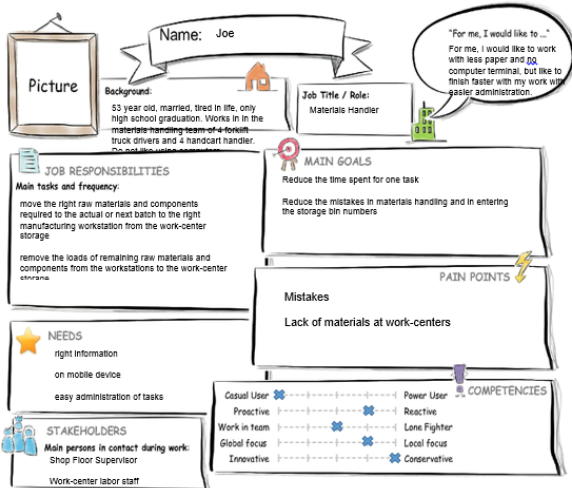Figure 10. The Design Thinking steps with double iteration cycles (SAP® tool)

Figure 11. Persona (SAP® tool)

To solve the task of 360 degree research first, we have to create the story of the user to get insight to the user's life, work, role and skills. Second step is to create the persona of the user based on the collected information to see his/her goals, skills, mistake opportunities, needs, responsibilities and life situation. (Figure 11)

Third step is to create the user experience journey to collect the user actions (steps) and his/her mindset, touchpoints and pain points during the actions (Figure 12.), which can help the scoping phase. If the result of Scoping right, we can proceed to the next process cycle.

V. DIFFERENCES IN THINGING IN DESIGN PROCESS

The significant feature of Design Thinking – focus on the real customer needs and deep insights and recheck it again and again – is a different way of product development. Normally, we start with the analysis of the problem or the needs, but the way of design thinking emphasizing suggest going to the field of use of the project subject by the users. This can help in any phase to counterbalance our instinct to jump right to a solution.

During the phases from week to week, our team had tried to follow the instructors' recommendation, but we could sense that in every phase there was the effect of the anticipation or intuition from our mind: what will be the result, the solution and how can it be connected to the results of the present phase. Sometimes we forgot not to think forward as in a chess game, and this could break the focus on the actual task. For this opportunity, our course mentors were helped the work of the teams, and they had recommended to rethink some points of our results, especially the Point-of- View and the Ideation map.

After the course closing we discussed in the team, that we just envisioned our ideas during the Empathy phase, although these idea were not so clear than after the Ideate phase. Therefore our focus on the Point-of-View was not so strong and we lost it a little bit during the Define and Ideate phase. But our mentors helped to refine it, so some iteration steps were included into the design process.

In the Prototype phase this focus was regained, and our prototype was rated almost to 100%, which shows, that our thinking was/is very solution-oriented, and therefore this methodology can really help not only to develop a good product, but answer the right need f the user with the right solution.

VI. SUMMARY

In this paper, we presented briefly the methodology of Design Thinking in team work learned and practiced in a pilot course of openSAP platform and discussed the steps of the performed development project. We analyzed the experiences during this development project and discussed the benefits and strong points of the methodology. And for an outlook we compared the Design Thinking in team work and in individual work.

ACKNOWLEDGMENT

REFERENCES

[1] openSAP Design Thinking Pilot Course, URL: https://open.sap.com/courses/dt1-pilot2, 2015

[2] openSAP Build Your Own SAP Fiori App in the Cloud, URL: https://open.sap.com/courses/fiux1, 2015
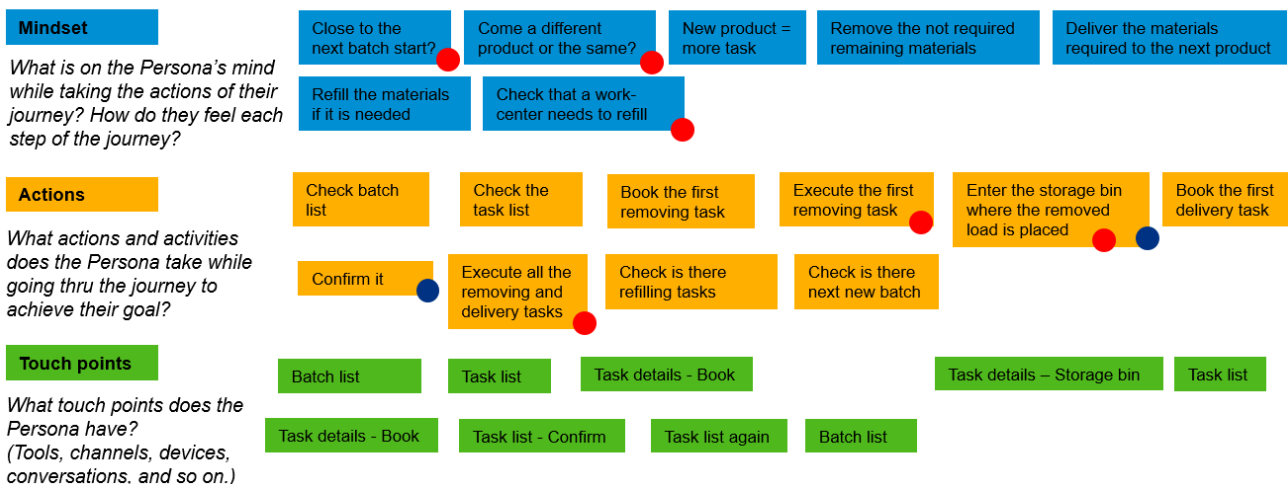

Figure 12. User Experience Journey of a plant material handling scenario (created by SAP® tool)