

# THE FUTURE OF DESIGN THINKING FOR MANAGEMENT EDUCATION. PROJECT-BASED AND GAME-ORIENTED METHODS ARE CRITICAL INGREDIENTS OF SUCCESS

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## ABSTRACT

*In this research, the authors will share the experience of bringing Design thinking methodology to Management Education. This paper explores the current developments in the field of Design Thinking, provides a foundation for the Future Design thinking approach. Finally, we will review a successful case study on how universities plan to implement Design thinking strategies to support project-based education of graduate students, will provide the analysis of Academia - Industry-sponsored Design thinking projects.*

## INTRODUCTION

Design thinking methodology is a useful tool for addressing "wicked problems" that do not have simple, clear answers (Cross, 2011; Brown, 2009; Martin, 2009; Leifer, 2016). Although the design-thinking approach is not a new concept and has been around for almost 50 years (Leifer et al., 2005), it has recently gained great popularity as companies have realized its value.

In brief, Design Thinking is an approach that aims at creating innovative ideas that solve customer-defined problems and therefore considers the customer's needs and expectations throughout the whole product development cycle. Namely, Design Thinking represents means of investigation that heavily relies on understanding how the result of design exercise will be used. While traditional development approaches follow a procedural method of different sequential phases, Design Thinking allows to move between the different steps and as a result, enables to deliver human-centered solutions for a given problem in a structured form, thereby following six iterative stages: (1) get an understanding of the problem; (2) observe users' behavior; (3) interpret the empirical observations; (4) generate ideas to solve the issue taking into consideration the actual user behavior; (5) built a prototype; and (6) test the prototype (Brown and Barry, 2009; Taratukhin, Baryshnikova, 2016). Among the design-oriented companies, many, such as Apple, SAP, IBM, INTUIT, and others, belong to the field of information technology. IBM is also a practitioner of design- thinking and business process modeling.

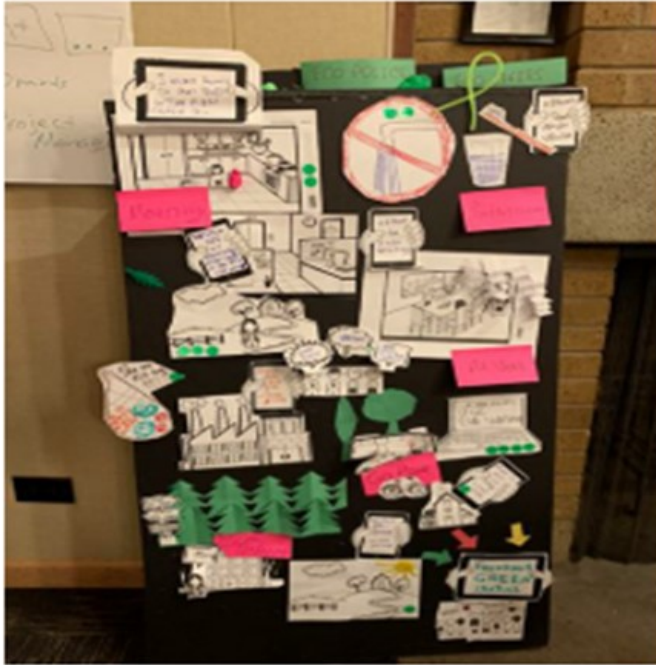
## THE FUTURE OF DESIGN THINKING

The key philosophy of Future Design thinking is to extend the human-centered focus of Design Thinking to include tools that enable deep insight into where companies and organizations have come from, that they might act and innovate to be ready for uncertain futures. Traditional Design Thinking is well conceived as human-centered, as a way of delivering deep insight into people's needs and wants, reconciling these with business feasibility and technological viability, to deliver successful innovation. The Future Design Thinking augments and expands the scope of Design Thinking with a broader perspective on the human and cultural components to innovation, creativity, and strategic decision making with tools to implement this more comprehensive perspective.

At the methodology level, the Future Design thinking is further development of Design thinking (aka Stanford Design Method), based on significant new understanding of Ideation and Prototyping stages, novel approach of use storyboards (for example

SAP Scenes) and finally Gamification approach as a possible way to improve learning motivation and engagement specifically for millennials and post-millennials students.

## EXHIBIT 1 Use of SAP Scenes.



During Design thinking stages, is it very efficient to use of IDEO methods cards (IDEO), NOVA tool (NOVA), Tangible Business Processes Modelling tool (TBPM) (Edelman, 2009), and other approaches to support Design thinking approach.

SAP Scenes (SAP AppHaus) (below) is another excellent example of free of charge available tool and a method developed by SAP AppHaus Heidelberg to create storyboards about products and services. The **Scenes Basic Set** includes generic illustrations that can be adapted to a wide variety of use-cases but has a limited industrial specific. It is why SAP AppHaus decided to create **Scenes add-ons** - a set with additional illustrations focusing on a particular topic or industry. We want to stress that the storyboard method is a compelling approach for understanding the problem, to move to the Ideation stage of Design Thinking, and to create and analyses different scenarios. Such an approach is also much applicable for management education projects will allow to share student's ideas with industry sponsors. The authors implemented SAP Scenes as part of the EMBA teaching process as well to train Masters in Business Informatics in one or two days of teaching modules. Scenes include a set of pre-defined illustrations that can be physically or digitally combined in stages to create a visual story and presented below.

Harmonization of current game-oriented software-based approaches for better understanding of business processes (Rutherford, 2019)) and physical card/storyboards such as SAP Scenes method can be a very effective way of bringing management education in Innovations to the new level. For instance, we use a hybrid approach specifically for MBA students, they are very much capable of dealing with mobile apps as part of day to day business, and physical cards are a great tool to create a tangible experience. In fact, tangible experience is an essential ingredient for successful Design thinking management education.

Further, the ideas selected during Design thinking process are embodied in prototypes. Prototyping is an iterative process. In the course of it, one can generate new ideas, improve old ones, get a clearer vision of the problem and solution. A prototype can be everything that can interact with: physical prototypes, including previously mentioned storyboards/games/sets; software prototypes; sketches on paper; role scenarios, etc. Specifically, to management students, it is essential to show the critical difference between Marketing studies methods (customer-oriented elements) and Design thinking as (human-centered and prototype oriented), to stress the importance of prototyping stage for not only for physical product but also for service design (Stickdorn, 2010).

Prototyping tools examples are presented as follows:.

## EXHIBIT 2

Design thinking prototyping tools and use of IDEO cards and Design thinking games.



Even though this paper will pay specific attention to Ideation (storyboards implementation) and Prototyping stages of Design thinking, the overall the Future Design thinking process is also required a better understanding of how people and new technologies will change the way people and computers will interact, to structure the successful Design thinking project.

It is also essential to pay specific attention to the way how to structure project teams, how to use team members with managerial, engineering, liberal arts backgrounds as one team. It is exceptionally very important to create a strong empathy across team members. Empathy - the ability to look at the world through the eyes of other people, to understand their needs, desires, and the tasks they face. In other words, Empathy is the necessity to understand, so to speak, the vocabulary of people, because in this way the respect is shown to them-it shows that they are expressed in one language (Taratukhin V, Pulyavina. N., 2018). That is why it is

also essential to have an interdisciplinary team of students with diverse education and culture backgrounds.

The next part will stress the importance of Project-based approach to education, using the current Stanford ME310 Project as an example.

### **PROJECT-BASED APPROACH. STANFORD ME310 COURSE**

Stanford ME310 course is a great example when two teams: US University - Stanford and International University (or Universities) will need to work together and to deliver the results for Industry partners. For today, Universities from USA, Germany, Switzerland, France, Austria, Japan, China, Latin America are part of the ME310 community. It is a unique opportunity to work on real challenges from Industry.

Stanford ME310 project has length nine months, graduate-level only (Engineering, Management and IT, Master level students), and provided significant intercultural experience for participants.

As the results, project-based learning is an integral part of the whole studying process as while correctly working at the project, and the students gain skills in solving the critical practical tasks, get the knowledge and skills, which can be used in further educational and professional activity. In our case, we will review the current Project Stanford ME 3103 project, sponsored by the consortium of Austrian companies and SAP SE. Seven students (MBA program, Engineering, Business Informatics backgrounds) from Stanford University, Vienna University of Technology, and University of Muenster are engaged in the research on the future of workspace. One solution students plan to explore first is the use of a virtual reality environment for a better understanding of a user creates and specifies the space, furniture, and services desired. The overall product vision is a platform that can easily match people's "dream" environment with existing offerings. In fact, platform user can find out things that were not previously planned in this process as well. Space, appliance and service providers then learn with the user what the user wants and provide AI-powered tools to help the user with the build. After the virtual environment is created, a database for existing environments will be searched and a few closest matches will be provided for the user to choose from.

Project is possible next steps include getting data for existing spaces and services from industry partners, prototyping VR devices for usability, and doing more integration testing. As a result, the aim is to build a platform for next-generation residential/office developers and service providers to engage potential users quickly, and for customers to have a perfect journey creating and accessing the dream environment.

### **EXHIBIT 3**

**Virtual reality (VR) platform test prior provided to Stanford ME310 Future of Workplace Project participants.**



While the project is still in progress with the final results that will be presented in June 2020, it is already clear that the Design Thinking approach used in this project showed it is clear viability and effectiveness for multidisciplinary team. More details will be reviewed and provided after the project's finalization.

### **CONCLUSION AND FUTURE WORK**

The authors shared the experience of bringing Design thinking methodology to Management Education. We analyzed the current developments in the field of Design Thinking, defined a foundation for the Future Design thinking.

Also, paper elaborates on project-oriented education, which, being embedded into university programs, enable senior engineering and management students to develop design, project, and entrepreneurial skills while working on real-life innovation challenges formulated by an industry partner. The paper concludes with further research directions specifically to the use of VR hardware as part of project-based design education and shared initial research results.

We believe more attention required to understand the fundamental issues behind team culture, communication, and stress, language issues. Some initial research presented in (Anikushina, V., Taratukhin, V., Stutterheim, Christiane von (2018)), and we plan to extend such research further.

## REFERENCES

- Anikushina, V., Taratukhin, V., Stutterheim, Christiane von (2018). Natural Language Oral Communication in Humans Under Stress. Linguistic Cognitive Coping Strategies for Enrichment of Artificial Intelligence, *Procedia Computer Science*, Volume 123, Pages 24-28
- Brown, T., and Barry K. (2009). *Change by Design: How Design Thinking Transforms Organizations* – Harper Publisher. – 272 p.
- Cross, N. (2011). *Design Thinking: Understanding How Designers Think and Work*. Oxford UK and New York: Berg.
- Edelman, J., Grosskopf A. (2011). [and others] Tangible Business Process Modeling: A New Approach / *Stanford University, International conference on engineering design*, 2009 – 10p.
- IDEO Methods Cards. Retrieved from <https://www.ideo.com/post/method-cards>
- IBM. Enterprise Design Thinking courses and certifications. Retrieved from <https://www.ibm.com/design/thinking/>
- Leifer, L. et al. (2005). Engineering design thinking, teaching, and learning. *Journal of Engineering Education*, 94 (1), 103-120.
- Leifer, L et al. (2016): Design Thinking: A New Foundational Science for Engineering. In *International Journal of Engineering Education*. 32 (3): 1540-1556
- NOVA-Tools and methods for norm-creative innovation. Retrieved from <https://www.vinnova.se/en/publikationer/nova---tools-and-methods-for-norm-creative-innovation/>
- Roger M. (2009). The Design of Business: Why Design Thinking is the Next Competitive Advantage. *Harvard Business Review*, 132-147.
- Rutherford, T. (2019). *ERPsim SAP Labs & Textbook: ERP for Competitive Advantage & Using ERPsim to Simulate the ECC to S/4 HANA Migration*, ISBN-13: 978-1074624552
- SAP Design Services (2019). Retrieved from <https://experience.sap.com/designservices/>
- SAP AppHaus (2019). Retrieved from <https://experience.sap.com/designservices/apphaus/scenes>
- Stickdorn M. (2010). *This is Service Design Thinking: Basics, Tools, Cases*. BIS Publishers.
- Taratukhin V, Baryshinkova A., Kupriyanov Y., Becker J. (2016). Digital business framework: Shaping engineering education for next-gen in the era of digital economy, *The American Society for Engineering Education Annual Conference & Exposition Proceedings*. ASEE
- Taratukhin V, Kupriyanov Y., Anikushina V., Welch C. (2018). Leveraging the Tech-savvy Next-generation Talents and Hackathon Techniques to Accelerate Digital Enterprise Journey and Space-related Endeavors, in: *The American Society for Engineering Education Annual Conference & Exposition Proceedings*. ASEE.
- Taratukhin V, Pulyavina. N. (2018). The future of project-based learning for engineering and management students: Towards an advanced design thinking approach, in *The American Society for Engineering Education Annual Conference & Exposition Proceedings*. ASEE, 2018