

Digital Business Framework: Shaping Engineering Education for Next-Gen in the Era of Digital Economy

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Abstract

12 MSc and 6 PhD engineering students from six different universities were engaged in design thinking session and were offered to tackle a challenge of creating a communication channel effectively bridging international IT company, its industry partners and customers, and academia in the new paradigm of Digital Business Framework.

Key ideas generated by the participants of the Jam referred to creating a web-portal and mobile app that will support social-media type of communication between Industry and Academia. Suggested platform will allow businesses to deploy information about ongoing research projects, calls for participation for academia and in its turn could identify opportunities to join industry projects, position its areas of expertise and get better involved in understanding trends for educating future of workforce.

The framework describes herebelow the main steps towards stable, successful, long-term academia-industry cooperation. The framework is industry-oriented, meaning that the process is initiated by the enterprise partner.

Introduction

Today the interaction process between business and academia is far from perfect while joint projects can bring a lot of benefits for both sides, especially, in IT industry. It is associated with a notable amount of obstacles when searching for partners and setting collaboration process. At the same time rapid digitalization of economy implies higher requirements to the effectiveness of communication between different bodies involved into driving innovation, competitiveness and growth. So it is necessary to develop Digital Business Framework which supports creating an effective communication channel bridging together companies and academia.

12 MSc and 6 PhD engineering students from 6 different universities were engaged in research of this problem and analysis of potential solutions for the international IT Company during a Design Thinking Jam. A Design Thinking Jam is a workshop where participants

collaborate and co-innovate with domain experts, generate creative ideas and develop concepts and prototypes of solutions in order to respond to real-world, user-centered design problem [3]. Such a non-trivial approach to problem-solving process enables to get not only an effective result but also to obtain a lot of advantages for both business and academia. For instance, companies have an opportunity to apply new prototyping technologies, leverage student talent for recruiting needs and develop company's HR-brand. As for universities, there is a chance for scholars to develop design and communication and project-management skills, get exposure of real-world design problems and showcase competencies to potential employers.



Fig. 1 Design Thinking Jam

Methodology

During a Design Thinking Jam participants apply a respective problem-solving methodology called Design Thinking. Design Thinking is a methodology that aims at creating innovative ideas that solves customer- defined problems, and therefore takes into account the customer's needs and expectations throughout the whole product development cycle [6]. 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 such as the Waterfall Model follow a procedural approach of different sequential phases, Design Thinking allows jumping between the different phases and thus enables to deliver creative and user-centered solutions for a given problem in a structured fashion, thereby following six iterative stages (compare Fig. 2): (1) get an understanding of the problem; (2) observe users' behavior; (3) interpret the empirical observations; (4) generate ideas to solve the problem taking into consideration the actual user behavior; (5) built a prototype; and (6) test the prototype [2].

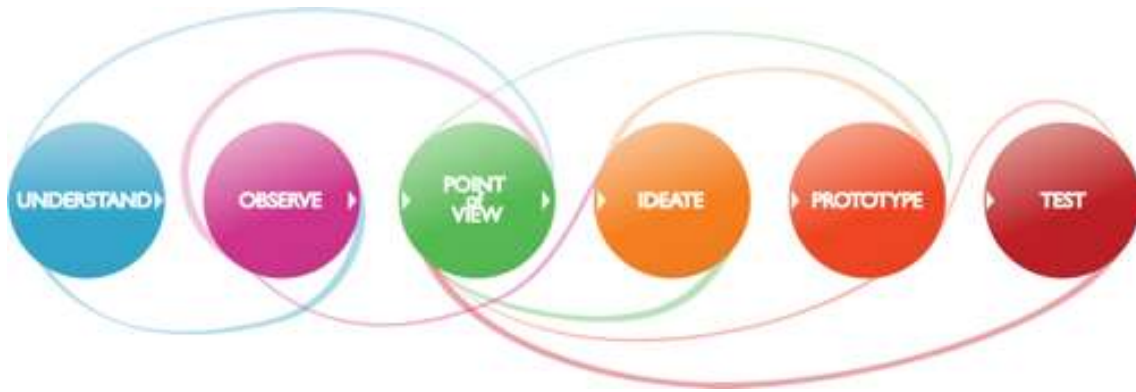


Fig. 2 The Six Design Thinking Phases

Research stages

The first step of this approach is to get an initial understanding of the problem. During this stage students have analyzed current problems of the collaboration of business and academia. It has been identified that the basic challenge is an absence of open communication channels bridging together international IT company and academia that can be effective in conditions of the Era of Digital Economy.

Observation is the foundation of a human-centered design process. It involves viewing users and their behavior in the context of their lives and interviewing users in order to identify the right users to design and uncover needs that people have [9]. The fact is that interaction with people directly reveals a tremendous amount of ideas they have, about the way they think and the values they hold [5]. As a result of this stage basic needs of the main stakeholders, such as companies and universities (students, professors and administration) have been determined. From the effective collaboration with academia business expects the attraction of intellectual resources in the form of innovative ideas, finding valuable labor resources among talented students, opportunity to carry out various researches and others. For universities successful cooperation with business will enable them to get an experience of developing projects into real business cases, maintain the reputation of the university through partnerships with well-known companies and draw attention of potential employers.

The main goals of the next stage are to develop a deep users' understanding and the design space and to come up with an actionable problem statement - point of view – that is, to interpret the empirical findings [10]. In order to interpret the results of many interviews with the company's representatives and professors students built a composite character profile for enterprise and universities that have helped to structure information.



Fig. 3 Design Thinking Jam

Ideation is a step which focuses on the idea of generation in terms of concepts and outcomes [11]. The aim of ideation is to explore a wide solution space – both a large quantity of ideas and diversity among those ideas [7]. Moreover, it is important to follow the brainstorming rules [1]:

- One conversation at a time;
- Go for quantity;
- Use headlines;
- Encourage wild ideas;
- Be visual;
- Stay on topic;
- No criticizing.

As a result of ideation the solution concept was developed. The final solution was to create a web-portal and mobile application which will provide a social-media type of communication between Industry and Academia. This platform will allow businesses to deploy information about ongoing research projects, call for participation for academia and in its turn can identify opportunities to join industrial projects, position its areas of expertise and get better involvement into trends' understanding for educating future workforce.

Next step - prototyping is getting ideas and explorations out of head and into the physical world. A prototype can be anything that takes a physical form – be it a wall of post - it notes, a role -playing activity, a space, an object, an interface, a storyboard and others [12]. For prototyping of the social-media platform for academia and business an interface of main screens and use-case diagrams that illustrate basic functions of the solution have been used.

Testing is the opportunity to refine solutions and learn more about users [4]. However, it is worth noticing that testing is an iterative process that initiates creating the next version of the prototype. The prototype of the business-academia platform concept has been showed and discussed with the stakeholders. The team of students has the positive feedback from them. So such type of the platform has the prospective for development and further implementation.

Conclusion

Design and prototyping an effective communication channel enabling effective academia-business communication will allow shaping engineering education for next-gen thanks to huge opportunities for open experience and knowledge exchange with IT industry. Businesses in its turn will gain a more direct access to the academia research results thus shorting its innovation cycles. So this communication platform may become a core for Digital Business Framework fostering the innovation development of both business and academia.

The Design Thinking approach used in this research exercise showed its viability in boosting business-academia communications. Workshops of that type help to identify real problems and come up with feasible, creative and non-standard solutions thereof. Furthermore obtained within workshop skills ;of the essential business problems for companies, to obtain valuable experience of creative problem-solving process and opportunity to learn and apply new business technologies for students and to develop Digital Business Framework for both sides by innovative ideas, products and services.

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