Requirement Analysis and Problem Finding Using Design Thinking Concepts in Students' Information System Projects

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***Abstract*— Developing an information system from scratch involves finding the true problem of users and doing proper analysis of their requirements. However, it is very common for users not receiving an information system or management system that fully solves all their problems. We believe the requirement analysis stage is crucial and traditional system development lifecycles are not involving the users enough throughout the lifecycle, hence causing a subpar outcome especially in student's final year project. In this paper, we present a way to do requirement analysis and problem finding by using design thinking concepts and apply it to students' first phase of final year project. Two case studies of current students are presented in this paper and their deliverables of strategies used respective stages are shown. According to these students, by applying design thinking in their requirement analysis stage and involving their users in the loop, they have a better understanding on the foundation of their users' problems and can come up with a proper proposed solution.**

Keywords*— *design thinking, requirement analysis, problem finding, final year project

I. Introduction

This Design thinking concepts are not being taught formally [5][8] in university's curriculum, but it is one of the most in-demand skills [5] in the industry. In order to equip information technology graduates with this skill, we have students to learn and study design thinking before the start of their final year project and asked them to apply in their project methodology.

Developing an information system which is fit for use and following users' requirements is complex. There is a possibility that a user could not articulate their problem to a group of system analysts and developers, hence some miscommunications cause different solutions to be created. In the end, users go back to their old ways of doing their daily task because it feels more familiar to do so, rather than use an implemented solution. It is important for someone collecting these requirements to find the root of user's problems by asking the right questions, brainstorming with users, and always keeping them in the loop. Design thinking process scaffolds these activities, and in this paper, we present how we adapted the design thinking methodology in students' first phase of final year projects. Students were asked to approach two real world users who needs an information system to be developed to solve their current problems. The first phase of these two-part final year project includes collecting requirements, defining the problem statements and objectives, analyzing the information collected and proposing a solution to respective target users. We will present how we apply design thinking in finding users' problem and doing the requirement analysis in students' projects. We will also describe the design thinking stages and show some samples from student's work from the respective stages.

II. Applying Design Thinking for Collecting Requirements

First, Two case studies of current students undertaking their first phase of final year project are presented. They were asked to use design thinking as their project methodology, as opposed to the traditional methods, which are a very linear way to develop an information system.

The students were asked to take the IBM's Enterprise Design Thinking course [1] and to obtain at least the Practitioner's badge. The current curriculum plan does not include a specific design thinking methodology, so they must learn on their own pace. Once they have obtained the Practitioner badge, they started creating the plan on how to gather requirements using what they have learned from the online course and discussed together during biweekly supervisory meetings.

Design thinking skills are learnable, with proper support from supervisors or lecturers, while giving constructive feedback [7]. Both students are doing a project on developing an information system, one is a customized e-commerce system, and another is a management system. They used interviews to collect information, but the difference with interview methods

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