Essay: Reflective essay on my course – project management

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This course was a really new experience for me both from learning point of view and performance wise. The practical part of the course was really helpful where ones get a chance to implement all the knowledge gain during the lectures and through self-studies. I have learnt that innovation requires collaboration, creativity, practical implementation and added value to the product. And this task becomes much easier if you have an interdisciplinary team working for a unified goal. I have truly learned a systemic approach to designing a product, that how to start from scratch and nothing to build a customer oriented or to introduce a new product into the market, how to work in teams for short span of time, how to manage and divide tasks within the group, which project management methodology to apply depending upon the nature of the project, how to filter the needs or requirements of the products, how to look for patents, benchmark for the particular project you are working on to have the basic knowledge of what already is out there available in the market. How to be creative during the synthesis of concepts for your topic or project. In my learning diaries I will be

explaining the concepts learnt during the lectures, group works, workshops and mostly through self-studies.

I learnt that most important part of the planning stage is building project team. Generally try to establish your team as soon as possible. Identifying one or two people even during the initial stages is also possible sometimes. Appointing the team early get the most out of their ownership to the project, and maximizes what they can contribute towards the product development. The first step in building an effective project team is to create a resource plan. A resource plan requires you to understand and identify the work to be done and the human skills required to complete it. An initial plan is often a high-level outline and will be refined as you break down into parts the whole of your work.

To develop an effective team, you have to start by choosing the best people for the job. This sounds obvious, but determining the best candidates isn't always straightforward. Many factors concerning potential members have to be considered, including factors such as: the skills required of them to complete project tasks, their level of influence in the organization, their access to a network of other resources, their capacity to participate effectively, their ability to work well in a team environment.

Sometimes, project managers don't have the freedom of choosing team members. Members may be assigned to the project team. If this is your situation, it is vital that you take extra care to establish a relationship with your team members before the team begins to meet as a group. Otherwise, they may not feel connected to the rest of the project team or, worse, may feel put upon and lack any commitment to the project.

Communication is an essential part of team work. Without successful communication, it is very difficult to achieve the desired result. When information is shared effectively, the workload is divided between the team members and task at hand becomes easier for all. During our project we used skype, whatsapp and Google drive for the communication purposes within our group. With so many available social apps these days in the market it's really easier for the teams to get started and have effective communication right way. It is essential that team communication occurs throughout the project in order to minimize confusion and unnecessary delays. Team members more freely share their ideas, thoughts and opinions, thus offering additional opportunities for innovation and creativity. Messages to be communicated become simplified when there is effective communication. Chances for misunderstandings are minimized, if not altogether excluded. Team attention remains on the project, completing tasks and such activities, and whatever energy is necessary in the best interest of the project.
Source: http://www.brighthubpm.com/resource-management/

Figure 1. One out of five projects is unsuccessful due to ineffective communications.
http://www.projecttimes.com/articles/effective-communication-a-challenge-to-project-managers.html
The product development process can be pictured as a funnel with a large number of new product ideas entering the concept stage, narrowing down to a fewer number in subsequent stages. Separating these each stage is a phase review where a decision is made to skip the product, enter into the next stage or redirect back to a previous stage for additional work. The purpose of the concept stage is to quickly assess a new product opportunities. This activity will be performed by a product manager with support from others in the team. The product concept proposal will typically include: description of product concept and unique/new selling proposition, Preliminary market opportunity assessment, economical overview, technical valuation, preliminary financial analysis, planned schedules, recommended core team members. The objective of the system level design is to define the product which has to be developed, and to complete the business strategy for the product. During the next stage the assumptions made during the concept stage are verified through further market research and competitive analysis. Engineering assumptions will be verified in this stage by more detailed design and feasibility tests.

Figure 2 Product development process
Source: https://sbpbusiness2000.wordpress.com/2013/01/25/new-product-development/
Lean Startup product development encourages us to first investigate if there is a need of the product in the market before we worry about the details of the new product. While old-style approaches also recommend carrying out market research and study before we engage in product planning and definition, lean

approaches increase the speed at which a startup team will operate. This allows startup teams to fail and learn faster, to adapt their product strategy and tactics rapidly, and to hopefully launch the right product with the right features in the market.

Figure 3. Lean startup product development method
Source: http://theleanstartup.com/principles

We as a group chose lean and agile method for project management. Agile Software Development methodology is for a project that needs extreme agility in requirements. Agile project management focuses on doing the process piece-by-piece, rather than in one big portion like the traditional approach. Agile methodology handles project change and complexity through communication between project team members and end users. It enables teams to appropriately respond to irregularity through short additional work sections, such as Scrum 'sprints'. These sprints aim at bringing a well-tested, functional working prototype. Planning and changes in design occur throughout the project based on lessons that are learned along the way. There's no shame in looking back to refine the outcomes or features of the product at any stage.

The work these days are more and more demanding and companies need to develop products of high quality in a short span of time. The technology is shifting rapidly and the industry is globalizing where with the help of this technology it's easier for smaller and medium size companies to reach the international market. On the other hand the bigger companies are continuously improving their processes, products and services are likely to survive in the changing market where medium sized and startup companies are booming at a very rapid speed. This is why the industry has started to hire more and more interdisciplinary teams for the product development. An interdisciplinary team consists of specialists of their own fields. A typical interdisciplinary team includes specialists of research and development, engineering, manufacturing, marketing, economics, arts, business, and design. By combining individuals' strengths in a group will add value to the product and eventually to the company. Usage of interdisciplinary teams has accelerated the product development cycle which will result fast launch of the product into the market, lowered the production costs as those teams will evaluate each and every aspect of the product before sending it to the manufacturing phase, it is usually noticed that time spend in research and development phase before sending the product to manufacturing stage will decrease the cost of the product and avoid unnecessary breaks, and even doubled the estimated sales. The value of interdisciplinary teams is that every member has their own expertise and viewpoint from their own field. The diversity of the group increases access to different types of information. A group with the members all from different backgrounds can sometimes solve the problems which will take months within a week or even the problems which feel impossible to crack. The group members also learn from each other and might get some important contacts from the other fields. The good thing is that every person know their role in the group according to their own skills set so they must contribute their maximum effort. This lets them to focus on the parts they're really good at and the other members will balance them in the areas where they don't have the core skills. This will creates a positive atmosphere and that increases productivity. A team with different expertise ensures that all the tasks of a project are completed. Even after this the interdisciplinary teams has to have the talent, knowledge, experience and technical know-how to get the job done. The team needs also a unified goal and a good leader who will lead them to the right way in the process of development. Team work is difficult, especially in a group with different skills and expertise. The group members might have opposing viewpoints which can lead to conflicts, waste of time, and it may cause damage decisions or the team's relationships. Collaboration is sometimes problematic, because every profession has its own language and it can lead to misunderstandings. Sometimes the group members use stereotypes and do not understand the value of the other ones skills and knowledge. Everyone should be valued and listened to in the team. The situation where a team member does not feel at ease and is scared to share his or her views may cut down the amount of ideas and expertise that can be crucial for the accomplishment of the project. Due to the differences in skills, interests and trainings, the team members are likely to observe the project or problem from different point of views. The group will think outside the box and that will lead to breakthrough innovations.
Source: IPD Handbook ver1.0

There is a right way and a wrong way to run a brainstorm or ideation meeting. A little preparation is required

at the initial stage of the product development. It is very important to separate the two phases. The first part is idea generation when we will use divergent method of thinking. The second part is about idea selection where will use convergent thinking.

The first step of Idea generation using divergent thinking consist of suspend judgment: No one is allowed to criticize or even discuss an idea. As ideas are expressed they are simply recorded. This can be done on post-it, computers, white boards or flip charts but no fault-finding or comments are allowed at this stage to slow down the process of idea flow. Go for quantity instead of quality at this stage: Quantity leads to quality in brainstorms so don't stop until you have a large number of ideas ' usually upto 100 or more. Go beyond reason: Wild ideas are useful because they challenge limits and inflame other fresh ideas. Ride on other people's Ideas: When one person proposes a inventive concept others should add something on with extensions, alternatives, developments and specific ways to make it occur. Associate with each other's ideas. Shift people out of routine thinking.

The second phase now is idea selection using convergent thinking method, Set criteria: Make an initial list of the ideas using some broad criteria agreed with the group. For example we want concepts that will satisfy customers, user experience, increase awareness and can be implemented in the next 2 months. Discuss the short list: When you are down to say 5 to 6 good ideas then discuss them productively. Sometimes there is a clear agreement as to which are the best. Sometimes you might want to vote to see which are the most popular. Write the list down to some really good ideas. The brainstorm is worthwhile only if it delivers actions. We should run consistent brainstorm meetings with your team. They should be exciting and motivational for people. They can deliver the concepts and innovations you need to renovate your organization.

Source: http://www.innovationmanagement.se/

How to be more creative and productive in the dreaming and scheming phase?

Be willing to explore and play. If you're trying to rush through this stage, you're going to shut down your creativity and end up thinking smaller and creating a plan to create something mediocre. Rather than trying to figure it all out on paper or in your head, get out into the real world and test out your rough ideas. In the world of design and engineering, product requirements (also called 'constraints') can often feel like restraints to our creativity and ability to design a great product or solution. We've all experienced the feeling of frustration when a constraint has kept us from implementing a good solution, sometimes literally by only tenths of a millimeter. No doubt, constraints in product design can make our lives difficult, and finding a solution that fits them all simultaneously is no easy task. However, respecting the importance that constraints play in driving a great design solution may help you look at them more as your friend rather than your enemy.

Concept selection is the process of evaluating concepts with respect to customer needs and other criteria, comparing the relative strengths and weaknesses of the concepts, and selecting one or more concepts for further investigation or development (SWOT analysis: strength, weakness, opportunities, threats). Decision techniques used for selecting concepts range from intuitive approaches to structured methods. Successful design is facilitated by structured concept selection. It is two stage process: concept screening and concept scoring. Concept screening uses a reference concept to evaluate concept variants against selection criteria. Concept scoring may use different reference points for each criterion. Concept screening uses a coarse comparison system to narrow the range of concepts under consideration. Concept scoring uses weighted selection criteria and a finer rating scale. Concept scoring may be skipped if concept screening produces a dominant concept. Both screening and scoring use a matrix as the basis of a six step process.

The six steps are:

Prepare the selection matrix

Rate the concepts

Rank the concepts

Combine and improve the concepts

Select one or more concepts

Reflect on the results and the process.

One of the reasons for us to select our project was that we wanted to design something based on emotion. Going beyond the basics functionality, consistency, and usability and we wanted to design something for humans, not for machines. We Learn how to express our brand's personality and delight our audience

through emotional design.

Figure 4. Design for Emotion

Most researchers within the field of product development agree on the importance of understanding customer needs when developing products. For example, Matzler, K. (1996) mentions: 'A high level of customer satisfaction is one of the most powerful indicators for the future of a business. Satisfied customers are loyal customers and ensure a lasting cash-flow for the business in the future.' As Ulrich, K. and Eppinger, T. (2008) puts it; 'Developing great products is hard. Few companies are highly successful more than half the time. These odds present significant challenges for a product development team'. Similarly, Lager, T. (2005) mentions that 'Nor is it enough anymore to develop a product that pleases the customer; it must also be better than competing products in the global arena.' A company's economic success depends on their ability to identify customer needs and quickly create products that meet the needs at a low cost (Ulrich, K. and Eppinger, T. 2012). In order to stay competitive on the market. Accordingly, to deliver an attractive end-product, it is important to keep customer focus in all stages of the product development process for all involved departments.

Figure 5. Customer oriented product development

During the workshops I have learnt the importance of converting your ideas into a tangible or CAD simulation prototype. In the earlier stages of product development once the team has selected the concept and wanted to pursue with their that idea, it is really important to make sketches and do some rough, quick and dirty prototyping as this will reveal number of issues related to design, feasibility and questions related to user experience. Right after the rapid prototype workshop I enrolled for a special course designed for 3D printing enthusiast. To learn how to use and print your own model with complex lattice structures. To meet the rigorous demands of product designers and development engineers, prototyping materials are the critical link to product design validation and product development process efficiency. Successful OEMs and product developers understand the value of time. Time-to-market can be dramatically reduced if prototype-to-production bridge materials mirror production material specifications. Most often it is not practical to produce hard tools to make a few parts. Hard tools are costly and time consuming. Design iterations and engineering revisions could quickly absorb budget, time and patience to complete a project.
The basic procedure for all rapid prototyping techniques can be summarized as follows:
1. A CAD model is built, then converted to STL format. The resolution can be set to minimize stair stepping.
2. The Rapid Prototype machine processes the .STL file by creating sliced layers of the model.
3. The first layer of the physical model is created. The model is then lowered by the thickness of the next layer, and the process is repeated until completion of the model.
4. The model with any unnecessary supports are removed from the final product. The surface of the model is then manually finished and cleaned.
Source: http://www.efunda.com/processes/rapid_prototyping/intro.cfm
Figure 6. 3D printing selfie: An inspiration
Writing my last lecture diary today for this course I will conclude it on summarizing the main concepts which were discussed during the interdisciplinary product development course. The interdisciplinary teams going to play an important role in future products development. Now the trend is shifting towards more and more user and costumer oriented designing. Companies and startups are more focusing on the customer demands, what they need, what problems they are facing, these been possible because of including interdisciplinary team member in decision making and product development stages. So now they can bring up the issues on to the table long before launching any product or service. Having a R&D person, marketing and manufacturing person sitting on the same table and brain storming for a unified goal or product will close the communication gap which uses to exist before when every team members used to work individually on their tasks without hearing the input from the person of different skill expertise. The design problems needed to be approach in a systemic ways, ones cannot tackle the problems or can came up with best possible solution if the project is not started in a systemic way. For designing a new product there is a

systemic approach in which you start with choosing a team, choosing a project management method, development process, knowing the main problem of your project which you have to solve, from those problems you have to extract the requirement, needs or constraints depending upon the external governing factors. Lean startup product development combine with agile has to be adopted for startup companies. Once you know the domain of your problem and constraints then you start looking for benchmark, patents so you can create the concepts and once you have selected enough concepts within your team then you need to evaluate them using the previous available information. Even for concept synthesis there is a systematic approach which led you to the best optimal solution for the later stages of prototyping. And technologies now a days such as rapid prototyping has changed the way developers work these days. It has shorten the time to launch the product to the market with low cost and high quality.

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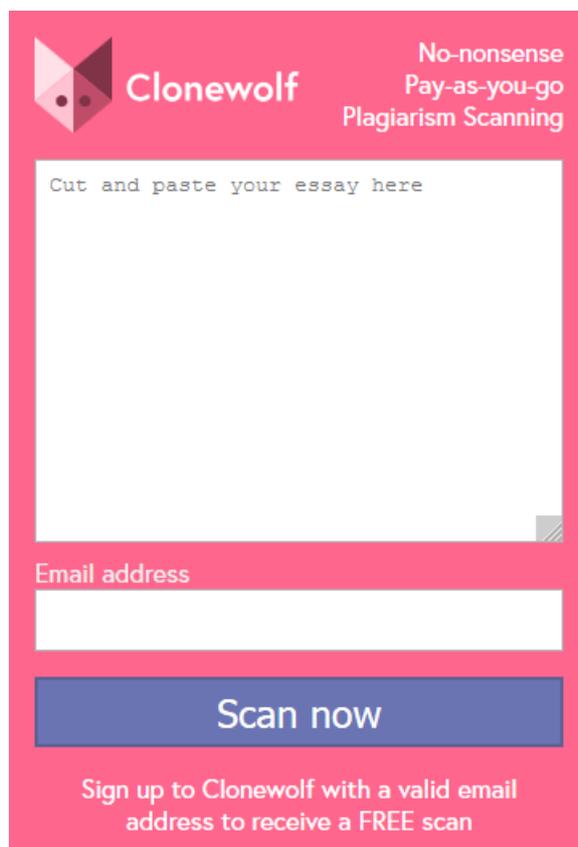|	
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