

INTELLECTUAL PROPERTY ISSUES AS CONSTRAINTS ON DESIGN THINKING PROJECTS IN UNIVERSITY SETTINGS

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ABSTRACT

The importance of innovation in today's economy can be seen in both organizational efforts to develop new-to-the-world products and methods, and in the efforts of education systems throughout the world to teach students how to innovate. Incorporating design thinking into the curriculum provides students with experience of the innovation process. Students involved with such design thinking projects, however, may encounter intellectual property issues, which can constrain their efforts. This paper describes several key issues that have been seen in design thinking projects in university settings, and provides guidance in dealing with intellectual property in the projects.

Key words: Design Thinking, Innovation, Project-based Learning, Intellectual Property

INTRODUCTION

The increasing importance of innovation in developing and sustaining competitive advantage has led many businesses to seek new methods of creating value. This has been accompanied by the enhanced role of designers in many firms, which has evolved from the tactical, downstream provision of aesthetic product add-ons, to a broader role of creating new ideas to meet customers' needs and desires (Brown, 2008). "Design thinking" refers to the tools, methods and principles that designers have acquired to support the process of innovation. Design thinking has been applied to such diverse fields as architecture, engineering, health care, and biotechnology (Brown 2008; Friedman, 2011; Li, 2002).

Design thinking involves gathering insights, often through observations of what people actually do and how they are feeling. Design thinking is a creative and iterative process that incorporates visualization, idea development, the creation and prototyping of models, and gathering feedback (Razzouk, & Shute, 2012; MacGregor, 2010; Liedtka & Ogilvie, 2011). While this process is often used in the development and refinement of products, it can also be applied to transforming services, processes, and strategy (Brown, 2008).

Incorporating design thinking in the university curriculum can provide students with a framework for managing innovation and the practical experience of doing so (Beckman & Barry, 2007; Dym, Agogina, Eris, Frey, & Leifer, 2005). One benefit of the use of design thinking teams in university settings is that students have opportunities to actually create innovative products and services. Depending on the student project, this value creation may arise from work with existing business organizations, or it may take place independently of such firms. The development of potentially valuable new products and services, however, gives rise to concerns about intellectual property. Intellectual property (IP) concerns can generate constraints on the creation of value in design thinking teams, and on the level of collaboration among team members. Organizations' desires to protect trade secrets and commercialize patents may constrain who is involved in innovation projects, the incentives for sharing information and fixation or preconceived ideas regarding areas in which their IP can be applied.

This paper describes several key issues that we have encountered over many years of facilitating design thinking projects in university settings. Though the focus of this work is on teams in universities, we suggest that the key issues discussed also are relevant in a variety of

organizational settings. Guidance is provided regarding issues that constrain the operations of organizations and teams that arise when using IP in design thinking projects.

INTELLECTUAL PROPERTY: PATENTS AND TRADE SECRETS

Recognition of the importance of innovation can be seen not only in efforts to develop new-to-the-world products and methods, but to protect those innovations from simply being copied by potential competitors. Intellectual property (IP) measures, such as patents, trade secrets and copyrights are used to serve this end. Innovators may file for a patent, which grants exclusive rights to the inventor for a specific period of time. The patent, once granted by a government's patent office, provides the right to exclude others from making or selling the patented invention in that country, generally for at least 20 years (Elias, 1999; Harris, 2002; Cardwell & Ghazalian, 2012). Currently, all countries grant patents based on who is the first to file a patent application for the innovation (Roberts, 2013).

While the innovation is being developed and up to the time the patent application is published by the patent office, inventors may treat their idea as a trade secret. Unlike a patent, the life span of a trade secret is determined only by the ability of the firm to keep it a secret and the ability of the information itself to continue to provide competitive advantage. Limitations of patent protection, including the cost and length of time of the patent application process, have even led some firms to forgo patent protection for certain types of information in favor of keeping their innovation as a trade secret. The formula for Coca-Cola, and Kentucky Fried Chicken's "secret recipe" are examples of trade secrets that have been maintained for a long period of time. To effectively manage trade secrets one must develop a clear understanding of what information needs to be protected, take proactive steps to prevent unauthorized disclosure, and ensure that these steps are actually being followed. To protect trade secrets, firms establish barriers to disclosure, limiting access to confidential information and developing contractual barriers such as nondisclosure (or confidentiality) and noncompetition agreements (Elias, 1999; Bixby & Baughn, 2010).

IP AND CONSTRAINTS

Treatment of an innovation as intellectual property is intended to constrain others from simply making use the innovator's ideas, and to help ensure that the efforts devoted to the creation of new sources of value are rewarded. While IP serves as a reward for innovation, IP issues are also one of many types of constraints that designers face in their work.

CONSTRAINTS IN DESIGN

Constraints can have both positive and negative effects on the solution to a design problem. Constraints may help to ensure that the required results are delivered. When designing a building, there are client constraints that are not absolute such as where to place furniture. Regulatory constraints, on the other hand, are controlled and cannot be changed, such as a sprinkler system for fire safety. Constraints may encompass the technical performance of the total design, such as durability to resist weather, or may include rules about proportion, form, color or texture (Lawson, 2006). They may also relate to the goal of having a proprietary, unique selling feature to the product (Cross, 2011). Constraints can also be assessed in terms of the desired relationship as being either internal or external. When designing a house, all elements of the object being designed are internal such as having the kitchen and family room connected, while external constraints would be the distance from the street the building needs to be placed. The balance between internal and external constraints may not always be equal. The importance for design problem solving is to interact and negotiate a solution with the different functions and types of constraints (Lawson, 2006).

IP CONSTRAINTS IN STUDENT DESIGN THINKING PROJECTS

WHO OWNS THE IDEA?

Those involved in a design thinking project often have a potential ownership interest in the innovations and outcomes of the project. For example, our design thinking projects usually involve four types of participants: the students in the class or on the team, the local business partner the team is working with on the project, the course instructor, and the university. While each participant type has unique legal interests in the project, each may not be aware of the other parties' interests.

Students may naively assume that whatever ideas they come up with on the project "belong" to them. That may or may not be correct depending on the university's policies. Most often in US universities, if the student comes up with a new idea, invention, innovation or business concept during their enrollment as a student in a university, the student has a legal right to ownership of the idea. This ownership claim may be complicated if there are several students working together on a project. Do the students own the innovation jointly, in common, or in equal or unequal shares? What happens if one of the students on the project dies? Does their interest transfer to the other partners or to their heirs? In most cases without an explicit agreement, each student would share equally in the ownership rights of the innovation.

An easy way to specify each student's interest is for the team to establish a Limited Liability Corporation (LLC) that identifies the ownership rights of each team member. An LLC is simple, low cost legal entity that usually can be established by the students without an attorney using state provided forms. However, if the student receives compensation for their participation in the course, for example as a graduate assistant receiving a stipend or tuition waiver or as a paid intern, the student's status may be considered that of an employee and they will not have ownership rights to the innovation unless otherwise stated. Another complicating aspect could involve the use of university facilities or equipment beyond what is "normal and usual." A student's "extraordinary" use of university facilities or resources may reduce their ownership and provide the university with a basis for making a claim to some or all of the resulting IP.

Likewise, faculty instructors are generally considered employees of the university and as such have no claims on the project-related IP. As an employee, any interest resulting from their participation would accrue to the university, their employer. In situations of innovations made by the faculty member on their own in the normal discharge of their employment duties, the university may have a policy that allows some sharing of the IP, either through ownership, licensing or royalties. For the most part, university IP ownership rights on innovation would accrue through the student teams' extraordinary use of facilities or resources, faculty employee involvement, student compensation or other policies in place.

The ownership interests of the business participating in the project will depend on what agreements, if any, the company has made prior to the start of the project, and whether and to what extent the company provided IP or guidance to the project as an initial idea or technology to work on in the project. A company may or may not understand its legal rights regarding ownership in these situations. The first time a company participates in a design thinking project, they may not understand, exercise or protect their ownership rights. However, if the project yields valuable results, they will quickly realize that it is better to state up front, at the beginning of the project, what each party's rights are in the project.

A complicating factor in the situation is whether each party knows in advance what their role and rights are within the scope of the project. For example, the university has most likely acted to protect their rights and responsibilities by establishing policies and procedures relating to project derived IP. In that sense, they have protected their interests. But what about the other parties to the project? Each party has their own obligation to know their rights and responsibilities and act accordingly. If a party does not know their rights, the other parties usually have no obligation to alert them to their rights or to act in the other party's best interest. So, there may be a situation where the university understands the project IP issues, but the students and the company partner may not. The students and the company may not become aware until the project is underway or ending. This can result in disappointment, mistrust and legal actions. While the university may not be under an obligation, moral or otherwise, to alert the project partners to the IP ownership issues at the beginning of the project, it may be in their best interest to do so, especially if they hope to have subsequent projects with the company or maintain good relations with their students. Avoiding the issue may be legally correct, but it may adversely affect the potential for future collaborations on innovation projects.

ESTABLISHING LEGAL GUIDANCE

Each university will have or should have a set of policies concerning the creation, ownership and use of intellectual property on campus. These policies will establish the parameters or constraints of how ideas, inventions and innovations can be used in student projects. Faculty should talk with their university Technology Transfer Office or their university general counsel *before* introducing any design thinking projects into classes. The professor or instructor at the university is an employee of the university and will be held accountable for following the applicable university policies and rules whether aware of them or not.

Among the policies and forms the university technology transfer office or general counsel may provide include invention disclosure, patent application, assignment of rights, licensing and royalty agreements, and non-disclosure agreements. Each of these addresses a specific aspect of the IP creation and management process. How much experience a university has will likely shape their level of sophistication in managing the aspects. If the university's experience is lacking, they may be learning as they go, resulting in unintended mistakes and errors. If however, the university has an established history of IP management or has used another university as a model for its processes, the policies, procedures and forms may be well-constructed and efficient. As legal documents, they will be binding on all involved in the process.

A common legal document used in the management of design thinking projects is a non-disclosure agreement (NDA). The NDA is an agreement between the signed parties that they will not share information about the project with people outside the agreement, in most cases that would be outside their team or outside the class. The purpose of the NDA is to protect the parties to the NDA from loss of proprietary information about the project. An intended benefit of the NDA is that it allows the parties to the agreement to speak freely and share ideas and improvements with having to be concerned about the loss of such communications.

However, we have noticed that in working with potential project funding groups, such as venture capitalists (VC) and angel investors (angels), that they are very reluctant to, if not adamant about not, signing NDAs. For example, in speaking with our student teams on project presentations, a local active angel investor refused outright to sign an NDA, much to the dismay of the students, saying that he was interested in making money on their startup efforts, not in stealing their idea in order to start the venture himself. Active angels and VCs encounter numerous ideas and business plans on a daily basis. Agreeing to sign an NDA is seen as hindering their mode of operation. Also, angels are not only interested in making money on deals but are genuinely interested in mentoring startups and participating in the development of the team and business concept (Payne, 2010). But getting students to understand and accept that angels and VCs will not sign NDAs is difficult at first. We have found that it is the novice entrepreneurs and team members that are most reluctant to accept this condition of investor involvement.

MANAGING INFORMATION FLOW BETWEEN ORGANIZATIONS AND STUDENT TEAMS

Whether the inventor/researcher is part of the university or part of the company participating in the project, how much and when information is shared can affect the use of the information. We have noticed a difference in the amount of information provided about the IP (invention/innovation/patent) depending on whether the source of the IP information is with the company or the university. For example, inventors/researchers in the private sector may be reluctant to fully disclose or share any progress or new insights with the student team beyond what is contained in the patent. That is, while they may have made significant gains in further developing the technology in question, they may hold back on sharing the "latest discoveries" with the students. In contrast, we have noticed the faculty inventors/researchers are more prone to disclose their latest discoveries with students and other researchers, even though the new insights may not be legally protected by a patent or formal invention disclosure. Moreover, many faculty, driven by the pressures of publication, tenure and grant requirements, become more focused on finding the next discovery than on fully exploiting the inventions and innovations already made. For example, a faculty member may be so focused on publishing for tenure and meeting grant requirements that he submits papers for presentation and publication for follow-on inventions

before filing the paperwork necessary to disclose the invention to the university or to file for patent protection.

Company Non-disclosures Constraining Student Contribution

Many of our students work in highly competitive business environments and find themselves reluctant to share information with the other students because of constraints placed on them by their employment contracts. Upon their employment with these companies they are compelled to sign nondisclosure contracts. Since they come from a professional background and work with knowledge from these businesses that is confidential, they are unable (prohibited by contract) to share some ideas or processes that could benefit their project at the university in the MBA program. If they share too much information from their businesses, in class to the other students, they could find themselves in very difficult legal position or out of a job and liable for financial damages.

MANAGING INFORMATION FLOW AMONG TEAM MEMBERS

One of the most recent dilemmas we have faced is the sharing of ideas amongst the students. There has been a hesitancy to share ideas with one another as there is a fear that one student may use another student's idea as their own outside of the university setting. This concern has hampered in-class sharing of ideas amongst team members. Because of these feelings, we now have our students sign a non-disclosure agreement which includes their group and all students in the class and their comments made in the class. The NDA was prepared for the class by the university general counsel in conjunction with the technology transfer office. This approach is similar to that used by other universities and has been successful so far.

This sensitivity of not wanting to share ideas with classmates may possibly be exacerbated by the controversy over who really came up with the idea for Facebook. A week after Mark Zuckerberg launched his Facebook site in 2004, he was accused by three Harvard classmates (Divya Narendra, Tyler Winklevoss and Cameron Winklevoss) of having stolen the idea from them. The allegation turned into a lawsuit, as the competing company founded by the classmates sued Zuckerberg and Facebook for theft and fraud. The subsequent success of Facebook, the popularity of the movie about its startup, and the ownership controversy which the movie included, have served to make students more aware of the risk of sharing ideas without adequate legal protection (Carlson, 2010).

INVENTORS' COGNITIVE CONSTRAINTS

In order to understand the intellectual property or technology being applied in the project, the students have a very steep learning curve. First, while faculty inventors may have spent years or decades working on a particular innovation, the students must become subject matter experts in only several weeks. In order to do so, student team members, and often the faculty course instructor, rely on the inventor/researcher to explain the innovation or invention, its content, nuances, purpose and possible uses and applications. Therefore, the students' understanding of the intellectual property and the potential range of discoveries or applications by the team may be inadvertently distorted by the inventor/ researcher's explanation of the IP. Second, the inventor/researcher may have preconceived and entrenched notions for the use of their innovation. This is in conflict with the design thinking process, where one starts with a beginner's mindset and explores all possibilities for the use of the intellectual property (innovation/invention/patent). Inflexibility is a roadblock for the iterative process of diverging and converging of the many research techniques used in the design thinking discovery process. The remedy for these situations is dependent on the team's ability to take full ownership of understanding the IP beyond what they were told by the inventor/researcher. Also, the team must take special efforts to look beyond the applications provided by the inventor/researcher. It is only through an open-minded approach to the discovery process that the team can fully realize the benefits of the design thinking methodology.

CONCLUSION

Using intellectual property in design thinking projects presents constraints on the process, which can affect the success or outcome of the project. While we have outlined several issues in which the use of intellectual property can constrain its use in projects, there are ways to minimize any negative effects.

Our view is that being proactive in the management of IP issues is the best way to address it, especially if the projects involve students and company participants. Bringing company partners into projects is a cultivation process. We hope that our time spent getting to know the partners, getting them to know our programs and our students is an investment in building a relationship. Likewise, our students may be students now but soon will be graduates, alumni and potential project partners as part of the business community. As such, being proactive to create a relationship climate that is positive, transparent and trustworthy goes a long way in taking the project from a "one-off" situation to a long-term recurring partnership between all participants.

If we are working to build a solid trusting relationship with our participant partners, looking out to pre-empt any problems supports this effort. Being proactive in discussing potential problem issues and constraints up front, at the beginning of the project, puts everyone on equal footing and can be instrumental to building a strong recurring partnership.

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