Intellectual Property Challenges in HCI and Software Organizations

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CHI'13, April 27 – May 2, 2013, Paris, France.
ACM 978-1-XXXX-XXXX-X/XX/XX.

Abstract
User experience designers and software developers often design and develop creative and innovative solutions when building software products. Naturally, companies want to leverage these creative works and recover their investment by filing for the intellectual property (IP) rights. Obtaining IP rights enable software companies to, among other things: trade license usage with other companies, control the use of their technology and inventions, and gain competitive advantage in the marketplace. However, claiming rights to IP can also constrain a designer and developers' creativity and product innovation as companies seek to minimize IP-related risks. This position paper will consider how organizational learning can help companies better incorporate the input of designers and developers when setting their IP public policy agenda.

Author Keywords
HCI; Intellectual Property (IP) Law and Policy; Organizational Learning

ACM Classification Keywords
H.5.0 [Information interfaces and presentation (e.g., HCI)]: General; K.4.1 [Computers and Society]: Public Policy Issues---Intellectual property rights

Type	Overview
Patent (strongest)	Provides rights for up to 20 years for utility, design, and plant patents (e.g., swipe to unlock phone).
Copyright	Protects works of authorship and works of art, which have been tangible express, for the life of the author plus 50 years (e.g., lines of code).
Trademark	Protects words, names, symbols, sounds, or colors that distinguish goods and services forever as long as they are being used in business (e.g., icons). No constitutional basis.
Trade Secret (weakest)	Information companies keep secret to give themselves an advantage over their competitors (e.g., UX design process). Protected by contract law.

Table 1. Types of IP Protection

General Terms

Legal Aspects, Management, Human Factors

Introduction

Intellectual property (IP) laws and policies help ensure that entities—individuals and organizations—have the ability to own the rights to their creative work and encourage innovation. Ownership of IP rights, generally, enables owners to use the IP as if it were any other good a person might buy, sell, or trade. However, like with many other private goods, when one person owns the IP rights, they are often no longer freely available to others (i.e., the good is excludable). This effect of IP rights has implications for how software company HCI practitioners (viz., user experience designers and software developers) perform their job. For example, company IP policies may direct HCI practitioners to avoid looking at anything that may subject them to IP-related risks (e.g., litigation). The challenge with such direction is that it is difficult to prove that designers and developers were not influenced by a competitor's product given that software is ubiquitous but intangible. As a result, designers and developers become overly cautious about what they incorporate into a product and have to consult various governance entities (e.g., corporate lawyers, etc.), thus limiting their comfort with using their creative ideas [6].

This position paper seeks to promote discussion about how software companies can better enable their HCI practitioners to be creative toward fostering innovation, while remaining aligned with public IP laws and policies in an effort to minimize IP-related risks. Toward accomplishing this dual objective, an organizational learning framework is used to facilitate discussion around existing approaches to how software organizations learn about IP challenges experienced by designers and developers. The contributions to HCI through participation of this workshop are: 1) an increased awareness of how designers and developers are affected by public IP laws, 2) how their input is currently incorporated in IP public policies, 3) and the identification of best practices for getting the input of designers and developers into IP public policies.

Intellectual Property Laws and Policies

Intellectual property enables the government to assign a value to creative intellectual output and facilitate the protection of that valuable resource from unauthorized use. The US Patent and Trademark Office (U.S. PTO)—the principal government agency responsible for I—defines intellectual property as "Creations of the mind – creative works or ideas embodied in a form that can be shared or can enable others to recreate, emulate, or manufacture them" [7]. There are four primary ways to protect IP (Table 1): patents, copyright, trademark, and trade secrets [1]. Four federal laws provide the framework for protecting IP: Article I, Section 8, Clause 8 of the U.S. Constitution; 17 USC §102; 35 USC § 101; and 15 USC § 1051.

Although IP laws existed, software was denied acknowledgement as IP until the 80's, in large part because software was understood as mathematical algorithms (which were not seen as novel); and because it is abstract (which was contrary to patent requirements). It was not until a 1981 U.S. Supreme Court case—*Diamond* v. *Diehr*—that software was recognized as patentable by the courts and, thereafter, the U.S. PTO [5].

Key Federal IP Laws

US Const. art. I, § 8, cl. 8: enables Congress "To promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries."

17 USC §102: "Copyright protection subsists, …, in original works of authorship fixed in any tangible medium of expression, …, from which they can be perceived, reproduced, or otherwise communicated…"

35 USC § 101: "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title."

35 USC § 101: "The owner of a trademark used in commerce may request registration of its trademark …"

IP Challenges in Software

UX design and software development entail a mix of science (i.e., developing and contributing to theories that provide an understanding of software systems and users), engineering (i.e., the building of quality software products), and art (i.e., the application of creativity that makes a product unique). The last, and most relevant to this work, is the art of UX design and software development. As designers and developers gain their understanding from scientific study and build software through engineering practices, they apply their creative energy to make a software product unique [2]. It was the art and creative energy that contributed to the success of top software products like the iPhone, Facebook, and Google.

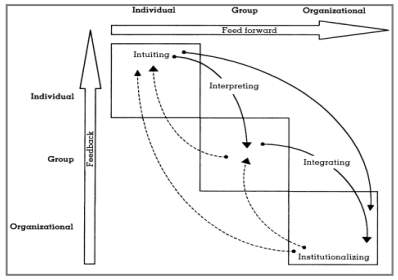
The challenge, however, is that two people can have similar ideas without knowing about each other's creative work. Two designers/developers that work for different software companies could create similar designs if they have similar academic and cultural backgrounds, philosophies about design, and worldviews. Creating similar designs could also result from the design leveraging a common way of thinking or doing something. One example is evident between the iPhone and Android devices [4]. Both the iPhone and Android phones allow the user to unlock their phones by horizontally swiping their finger across the bottom of the screen. Apple filed a patent for this swiping interaction that could result in a legal battle if another manufacturer (e.g., Google, Samsung, or HTC) comes close in their design for unlocking a screen.

Given the level of risk at the operational level, it is key for organizations to ensure that HCI practitioners and the organization are learning ways to best manage IP concerns from each other. Merely pushing policies onto HCI practitioners does not help solve the problems HCI practitioners may experience. The organization must also be willing to refine their IP policies and public agenda in light of the challenges experienced by their HCI practitioners. Organizational learning can help facilitate this need.

Organizational Learning

Crossan et. al. posit an organizational learning framework that represents the feed-forward and feedback learning flows across the individual, group, and the organizational levels (as shown in Fig. 1). Learning occurs across the three levels through four social and psychological processes known as 4I: intuiting, interpreting, integrating, and institutionalizing [3]. In essence, intuiting occurs at the individual level, interpreting occurs at the boundary of the individual and group levels, integrating occurs at the boundary of the group and organizational levels, and institutionalizing occurs at the organizational level. Feed-forward learning flow is when learning moves from the individual to the organizational level; feedback learning is when learning moves from the organizational level to the individual level.

One possible scenario in the context of this paper and this framework could be that designers and developers are the individuals that work in teams (i.e., the group level) within the organization. Each designer or developer's intuition about IP challenges develops from their daily experience with innovating while protecting the company from the risk of IP infringement. Designers and developers interpret their challenges and begin to share them within their team, with other developers and designers, and with their managers.



Organizational Learning Framework [2]

The teams begin to develop a shared understanding of how IP challenges influence their roles and adjust their dynamics as part of integration. Finally, institutionalization occurs when the corporate IP policies and the organizational IP public policy agenda include perspectives from designer and developer's experiences.

Conclusion

This paper sought to consider how user experience designers and software developers can affect, and are affected by, challenges stemming from IP laws and policies.

Software organizations can learn ways to better intuit, interpret, integrate, and institutionalize best practices for dealing with challenges faced by UX designers and software developers by applying an organizational learning framework.

Further research on how IP laws and public policies affect HCI professionals is needed toward improving the environment in which HCI professionals work. Research is also needed on how to better incorporate the perspectives of HCI professionals in public policymaking and the impact of doing so.

Bibliographical Notes

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Acknowledgements

Thanks goes to the National Science Foundation (NSF) grant IIS-0851774 for their support of this work through the REU Site program at Virginia Tech.

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