

Study in Patent Risk and Countermeasures Related to Open Management in Interaction Design

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Abstract

Interaction Design (IxD), which is the design process that considers how users communicate or interact with computers, has been growing in importance in recent years. Of particular note are new interface methods that go beyond the capabilities of legacy devices, such as the standard mouse and keyboard. In this study, we focus on such IxD innovations. However, it should be noted that, even though research into intellectual property (IP) management issues pertaining to IxD is important, there are currently no established precedents. Therefore, to explore the IP risks faced by IxD practitioners who engage in open management practices, we will begin by researching patent risks and the countermeasures for open management practitioners, and then explore proper countermeasures that relate specifically to IxD.

Keywords: interaction design, intellectual property, open source

1 Background and Goal

1.1 Importance of Interaction Design

Interaction Design (IxD), which is the design process that focuses on human communication and interaction with computers, (restated as communication design between humans and contents, computer systems, or other humans via computers) is gathering increased importance with advances in the development of the computing engineering field in recent years^[1]. Furthermore, the IxD field itself can be expected to gather significantly more attention with the development of digital signage and the rise of ubiquitous computing.

Of particular note is the development and practical realization of new interfaces, called Post GUI, which are different from the traditionally used mouse and keyboard interfaces. Furthermore, IxD developments are being strongly emphasized in government policies^[2]. In this study, we will focus on this kind of IxD.



Figure 1 Example of IxD
(left) Catchyoo graffiti (right) Freqtrix Drams

1.2 Problems and Goals

As mentioned above, IxD is an important field, so it is logical to assume that the management of intellectual property (IP)

rights related to that field would be of equal importance. However, when exploring such issues, a number of problems present themselves, which will be discussed below.

First, because there has been so little previous study of IP management as it directly pertains to IxD, there are currently no well-edited basic information resources, such as practical texts and/or case studies, that IxD researchers and/or production engineers (hereinafter referred to as IxD practitioners) can turn to for guidance.

Second, it is difficult for most IxD practitioners to devote sufficient resources to the aggressive pursuit of IP management strategies because, in most cases, they are researchers and sole proprietors engaged in small production operations.

Third, there is a general sense of uncertainty as to whether it would even be possible to apply previous and existing IP methods and strategies to IxD. This is because the field has its foundations in an open culture based on information sharing that has actively flourished since the beginning of the so-called informatization era.

As previously mentioned, research into the types of IP management practices that are best suited to IxD is important, so in this study we will attempt to provide well-edited basic information that is based on practical texts for use by IxD practitioners who are engaged in research or small production efforts^[3]. To accomplish this, we surveyed the composition elements of IP as they relate to IxD, and then researched the relationships between those composition elements and the current legal system. We then focused on prior and existing

exclusive IP operations (hereinafter exclusive operations), after which we conducted a case study to determine how exclusive operations are handled in the IxD field^[iv].

We determined that there are problems with exclusive operations as they are applied to patents and other IP issues. In the discussion, it indicates that open operations, management including distribution with open licenses to all interested parties (hereinafter open operations) would be more effective in the IxD field.

Next, we conducted a case study into the application of open operations as applied to IxD and looked for ways they could solve the types of problems that are often encountered when exclusive operation practices are utilized while simultaneously attempting to ascertain which open operation elements would be most useful when pursuing an IxD project^[v]. The results of this investigation showed that a study specifically targeting IxD open operation risk assessment is needed due to the serious nature of the risks involved, which can include forced termination of operations if IP right infringements are suspected.

However, there are no prior or existing studies that specifically target IxD risk management. Accordingly, in this study, we will focus specifically on risk assessments for practitioner engaged in open operation IxD research.

1.3 Process of Open Management

In this study, open operation is defined as the act of placing IP in a state that allows third parties to use it under certain conditions, and even encourages the creation of additional properties related or based on the original. It is different from exclusive operation in that operation is governed under the licence issued by the originator or owner, not by a government agency. However, the licenses used in open source software (OSS), open source hardware (OSHW), or the open content (OC) that is used in IxD are still based on copyright law, thus treating the related products as copyrighted work^[vi].

2 Research methods

2.1 Outline

In this study, we will focus specifically on risk assessments for practitioners engaged in open operation IxD research. While there have been a number of risk management studies on open source production efforts from the corporate point of view^[vii]^[viii], little prior and existing research into risk management^[ix] for open operation practitioners in general, or IxD field practitioners specifically, could be identified.

Accordingly, it is reasonable to discuss these topics using the process described below:

- a. discuss risks and countermeasures in general open operation (not only IxD open operation),
- b. discuss the requirements of the IxD countermeasures through an examination of the background of that field, and
- c. based on the resulting countermeasures defined via "a", select those best suited to IxD open operations filtering them through the requirements in the result of "b".

2.2 Risk of Open Operation

Open Operation risk assessments cover a wide range of topics including administrative strategy, so we will initially focus on risks related to IP laws (hereinafter IP risks) that might possibly result in severe sanctions such as legal injunctions and/or demands for damage compensation.

The production of IxD includes several IP elements that could be subject to a variety of IP rights^[x]. Therefore, we began our investigation by examining patent rights because the consequences of infractions in that area pose more serious risks than in others. Furthermore, because patent concerns lead straight to the core of most projects, and because other industrial property right laws, such as the Utility Model Act, the Design Act, and the Trademark Act, all refer directly to the Patent Act in many places, countermeasures to the risks related to those laws can be expected to follow Patent Law countermeasures. Therefore, in this study, we will examine the patent risk in the process described in 2.1 (a, b, and c).

Patent risks that result from infringement exist when somebody without title ownership executes patented third-party technology as a business activity (Article 68, Patent Act) or infringes by preliminary actions (Article 101, Patent Act). Publishing the technological information of a product (such as an engineering draft or source code) via a website is one of the common features in current open operation, including the IxD field. If such information includes patented third-party technology, infringement may result^[xi]. In these cases, "the title" means patent right or its license, and "as a business activity" includes offering the product free of charge. Therefore, publishing technological information about such products could result in patent right infringement.

For example, when an engineer develops an electronic device and publishes the engineering draft and software source code for operating the device, an infringement may result if the published information includes patent technology belonging to a third party^[xii].

The two primary aspects of patent risk that pertain to open operation are as follows:

- 1) those that pertain to a practitioners infringement on a third party's patent rights, and
- 2) those that pertain to a third party securing patent rights for technology produced by a practitioner who has put forth the effort resulting in the production of a new technology.

In both cases, there is a risk that a third party could execute their patent rights to restrain practitioner actions. In the next section, we will study the circumstances and countermeasures relating to both aspects of patent risk.

3 Result and Discussion

3.1 Risks and countermeasures in general open operation (not solely in IxD open operation) (process a)

3.1.1 Expected risk, circumstances, and countermeasures

Table 1 shows an overview of the circumstances and countermeasures related to the two patent risk aspects mentioned above.

Table 1 Expected risk, circumstances, and countermeasures

Expected risk	Circumstances	Countermeasures
1 Practitioner infringes on a third party's patent rights (application before being common awareness or public use)	1.1 Failure to confirm the existence of patent prior to infringement	1.1.1 Patent search >> Patent search, making patent map >> Securing an expert opinion 1.1.2 Application for patent and examination request >> Application of patent and examination request
	1.2 Patent infringement exists	1.2.1 Rights handling >> Licensing, transfer of rights 1.2.2 Request for invalidation trial >> Request for invalidation trial 1.2.3 Redesign 1.2.4 No countermeasure
2 Third party acquires patent rights for technology produced by the practitioner (after being common awareness or public use)	2.1 No patent application submission	2.1.1 Publication and proof of common awareness or public use >> Publication >> Proof of common awareness or public use 2.1.2 Application of patent >> Application of patent
	2.2 Application for patent (after being common awareness or public use of the production) was submitted but has not been issued as patent.	2.2.1 provision of information to patent office >> Provision of information to patent office >> Publication and proof of common awareness or public use)
	2.3 Application for patent (after being common awareness or public use of the production) was	2.3.1 Request for invalidation trial >> Publication and proof of common awareness or public use

Expected risk	Circumstances	Countermeasures
	submitted and has been issued as patent.	2.3.2 Right of prior use >> Publication and proof of common awareness or public use
		2.3.3 Rights handling >> Licensing, transfer of rights (>> Publication and proof of common awareness or public use)
		2.3. No countermeasure

(Table 1 notes)

<1> This means that the practitioner has infringed on the patent rights of a third party. In other words, it refers to a case where a third party has applied for a patent that covers the same technology produced by the practitioner, prior to his or her production of the technology. In such cases, if the practitioner executes the production, he or she is infringing on the third party's patent rights, and the third party can ask for an injunction and/or damage compensation.

<1.1> This means that no patent infringement by practitioner can be confirmed to exist, and that a patent infringement check is not done, so the check is needed. If infringement is found, the process moves to 1.2.
<1.1.1> Patent searches and the creation of a patent map are two methods that can be used to investigate potential infringement^[xiii].

The primary purpose of obtaining an expert opinion by a patent attorney is the prerequisite survey he or she conducts to determine the possibility of patent right acquisition, which involves a survey of related technology patents that have been previously issued. Such opinions cost a minimum of 200,000 yen, and can sometimes exceed 800,000 yen.

For infringement by a practitioner to exist, a third party needs not only to have applied for a patent, he or she must have also obtained the patent rights. However, the Japanese patent system follows the “first-to-file” principle, which means that there is a time lag between the application and acquisition of patent rights. Therefore, it is necessary to search applications that were tendered before the publication of the production (common awareness or public use) to ensure there are no overlapping applications where patent rights have not yet been awarded.

<1.1.2> Under normal circumstances, the goal of such an examination request is acquisition of patent rights. On the other hand, the acquisition of patent rights means that no third party has previously obtained the patent rights for the technology itself. Additionally it has the additional effect of preventing a third party's acquisition of those patent rights (see 2.1.2).

<1.2> This means that an infringement of a third party's patent rights, by the practitioner, exists at this time. In such cases, if the practitioner proceeds to execute production, infringement results, and the third

party can ask for an injunction and/or damage compensation. For information on the “first-to-file” system, see 1.1.1.

<1.2.1> In situations where the practitioner desires to execute production of technology that is covered by a third party’s patent rights, the practitioner needs to obtain a license or receive a legal transfer of the related patent rights. In situations where such transfers are granted, the third party patent right holder normally demands a certain amount of fee.

<1.2.2> An invalidation trial is a legal proceeding that aims at stripping the patent rights from a third party based on the claim that the patent holder does not meet the legal requirements for patent ownership. If there is sufficient evidence to invalidate a third party’s patent rights, a request for an invalidation trial can be considered a valid option.

<1.2.3> Redesigning not to infringe a third party’s patent rights, if it is possible, removes the risk^[xiv].

<1.2.4> No countermeasure is available. In a way, this choice is reasonable because the third party is not necessarily asking for an injunction and/or damage compensation, primarily because the legal expenses related to requesting an injunction and/or damage compensation are high. This is also applicable to other circumstance, such as 1.1.

<2> This means that the third party applied for the practitioner’s technology after it became common awareness and public use produced and acquired patent rights. Based on the novelty requirement, such applications should be rejected, but successful cases have been known to occur. In such situations, if the practitioner executes production, infringement results and the third party can ask for an injunction and/or damage compensation.

<2.1> This means that no third-party application for a patent that covers the practitioner’s technology exists at this time. In such circumstances, it is necessary to prevent such third parties from submitting applications to patent the technology.

<2.1.1> In situations where a third party applies for a patent covering the practitioner’s technology, if the practitioner’s achievement is well publicized and proven, the examination officer can evaluate the situation correctly and reject the application during the patent examination process. Furthermore, even if the third-party application is initially approved and patent rights are awarded (see 2.3), proof of common awareness or public use of the production can be used as evidence to support the practitioner’s claim during an invalidation trial. It is possible to substantiate that technological production exists or that it is common awareness or public use at the time, by notarization. Notarization provides clearer and stronger proof than is possible without it^[xv]. Additionally, production can be published through websites, brochures, academic publications, and similar venues.

<2.1.2> When a practitioner applies for a patent that covers a technological production and acquires the related patent rights, third parties cannot duplicate the patent acquisition. However, even if the practitioner’s application is rejected, the application could be used as evidence for rejecting the third party’s application by the “first-to-file” principle. Additionally, the document attached to the application form (description, scope of claims, drawings) could be used as evidence for rejecting separate applications when they are announced in “the laying open of a patent application” made by Japanese Patent Office. Furthermore, such announcements work as official publications in an open operation process.

<2.2> This means that a third party has applied for a patent covering the technology of a practitioner production, but has not yet acquired the patent rights. If patent rights have been acquired, the third party can ask for an injunction and/or damage compensation to restrain the practitioner’s actions concerning the product.

<2.2.1> If a practitioner provides information that confirms the existence of his or her product to the patent office, the examination officer can reject third-party applications based on such information (the adduce ratio was 72% in Dec 2011^[xvi]). This means it is highly likely that provision of such information to the patent office will result in the application’s rejection. As mentioned above (2.1.1), if the evidence has been substantiated, the proof is stronger.

<2.3> This means that a third party has applied for and acquired a patent that covers the practitioner’s technology after it became common awareness or public use of the production. If this situation is allowed to stand, the third party can ask for an injunction and/or damage compensation to prevent the practitioner from utilizing the technology.

<2.3.1> Practitioners can invalidate patent rights through invalidation trials. In such cases, proof of prior existence of the technology can provide an effective rationale for the trial examiner to reject or revoke the application. Thus, publication and proof are effective tools in this stage, just as they are in patent examinations (see 2.1.1).

<2.3.2> A practitioner can demand his/her right of prior use, which allows the practitioner to continue use of the technology. In such cases, prior publication and proof (see 2.1.1) will facilitate such arguments.

<2.3.3> To execute production of technology that is covered by the patent rights of a third party, it is normally necessary for a practitioner to obtain a license or receive a transfer of the applicable patent rights (see 1.2.1). In some cases, where the third party’s rights are valuable to the practitioner (ex. transfer of rights), it is possible that the third party will not initially agree to a license or rights transfer. During such negotiations, it can sometimes be effective to state that the practitioner has the option of requesting an invalidation trial. In such cases, publication and proof of prior usage (see 2.1.1) can also be effective.

<2.3.4> (see 1.2.4) When a practitioner has been issued a warning regarding patent right infringement by a third party, publication and proof (see 2.1.1) can provide highly effective counter evidence.

3.1.2 Discussion about each countermeasure

Application for and acquisition of patent rights is effective for both primary aspects 1) and 2), and provide very strong protection. Furthermore, acquisition does not preclude open management from the viewpoints of culture or background. In other words, it is possible to allow open production while retaining the patent rights. This choice can reduce risks significantly. However, the costs related to the acquisition and maintenance of patent rights are generally too high for IxD practitioners^[xvii].

Additionally, even if a patent acquisition attempt is unsuccessful, the application itself can increase common awareness of the technology through "the laying open of a patent application". Furthermore, in situations where a patent has been acquired, but is allowed to expire after its initial term, the lapsed patent can be used to block the acquisition of patent rights by a third party. These costs are lower than regular patent management which includes application, acquisition and maintenance. Therefore, it is clear that the patent system can be utilized as a gradual countermeasure in aspects of cost and effectiveness against patent risk in open management.

While publication and proof of common awareness or public use has a certain amount of effect in all situations described in aspect 2), notarization, the system whereby legal existence is established as a matter of official record, can be irrefutable^[xviii]. Notarization involves a "fixed date", "certification", "notarized document", and/or a "notarized document of experimental fact".

With such "fixed date", it is possible to prove the existence of the technology in question on the day a related proceeding is done. Furthermore, notarization is inexpensive (700 yen) and easy to obtain. Normally, publication can be executed through documentation or community^[xix] that announces the technology, outlines its details, and otherwise assists in the introduction.

When conducting a patent search, the provision of an expert opinion based on the investigation and analysis of a patent attorney is relatively reliable. However, it can be expensive for a practitioner. On the other hand, it is possible to conduct patent searches and create patent maps after a short period of training^[xx] as the related database can be accessed free of charge^[xxi]. This makes it relatively easy for practitioners to

conduct their own patent searches, even if such searches are not quite as reliable as a professional effort.

Furthermore, in cases where infringement is alleged, the matter is often handled based on the presumption of negligence, and the consequences of proven infringement will be calculated lower if the practitioner can prove he or she took action to avoid violations.

3.2 IxD countermeasure requirements based on an examination of the background of that field (process b)

3.2.1 Solvency

The practitioners focused on in this study are presumed to be unable to afford incurring significant IP management costs^[xxii]. Therefore, low cost countermeasures are needed.

3.2.2 Market and court cases

(Risks)

• Market

The market is small^[xxiii] and there is little competition. The background includes open culture^[xxiv].

• Court cases

Since it is very expensive to take action through the legal system, normally only major companies or "patent trolls" follow this route, and their objectives are normally limited to those with adequate capital to pay sufficient compensation.

Damage compensation amounts are normally calculated based on infringer's gain or the transfer of a certain amount of the production (Article 102, Patent Act). In a case involving open production, where the product is usually available freely via the Internet, both are normally impossible to establish as a matter of practice, and there is only one approved way for the court to calculate it (Patent Act Article 105-3)^[xxv]. Therefore, in the case of damage suits, it is often impossible for a plaintiff to confirm definite benefit. Plaintiffs must always consider the disadvantages of pursuing court cases. When a major company brings a suit against a researcher, or when the objective is an open product, this can result in damage to its own image. Thus, even if the objective is the fruit of a charitable activity, the damage can be much more significant^[xxvi].

As discussed above, patent risks do exist in IxD, but the amounts and possibilities are not excessive.

3.2.3 Required IxD countermeasure

It is needed to be low cost countermeasure and necessary and sufficient countermeasure in the case of open operation in IxD.

3.3 Best suited countermeasure to IxD open operations (process c)

Based on the countermeasures discussed in 3.1, we picked out the countermeasures best suited to IxD open operations by filtering them through the requirements in the result of 3.2.

3.3.1 Prevention countermeasure

• Patent search and patent map

Patent searching and mapping can be conducted at low cost after a short period of training because the related database can be accessed free of charge. This countermeasure is effective from aspect 1) for reducing the presumption of negligence and avoiding patent infringement.

• Notarization "Fixed date"

This countermeasure, which only costs 700 yen, can be used to prove the existence of the technology in question on the day a related proceeding is done (or when it was invented), as discussed in aspect 2).

• Utilization of patent system (application, acquisition, maintenance)

The patent system can be utilized as a gradual countermeasure in relation to the aspects of cost and effectiveness against open management patent risks. Therefore, this is an optional countermeasure. It is effective for both primary aspects 1) and 2).

3.3.2 After-the case countermeasure

• Licensing, rights transfer, request for invalidation trial

Other actions, such as licensing, rights transfer, or requests for invalidation trials, should also be taken on a case-by-case basis, after due consideration of the particular individual circumstances. Additionally, it should be noted that the use of notarization "fixed date" is effective for licensing, patent rights transfers, and invalidation trial requests, as discussed in 2).

4 Conclusion and Future subjects

This paper began with a discussion of the risks and countermeasures related to open operation as a whole (not solely to IxD open operation). We then discussed IxD-related countermeasures through an examination of that field's background. Finally, based on the countermeasures identified in the results of the first step, we selected those countermeasures best suited to IxD open operations based on the requirements contained in the results of the second step.

Future topics of study that are related to risk assessment in open management of IxD research include the following:

- 1) identification of ways to execute open operation, the effectiveness of open licensing (including patent-related article and defect liability risks, applicable (proper) licensing) and
- 2) other risks (IP risks (design rights, trademarks, copyrights, etc.), management), correspondence in cases where a market grows substantially)

Future subjects that are not related to risk assessment include the following:

- 1) conducting case studies into open management of other fields, introducing open innovation, exploring the advantages of exclusive management over open management,
- 2) building open management models in IxD and media art, and
- 3) building an IP creation cycle model that incorporates open management.

It should be noted that IP management, including open management in media art, is currently being researched and practiced in Yamaguchi Center for Arts and Media [YCAM].

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[^{xi}] Executing includes transferring by electric telecommunication lines (Article 3, Patent Act) in the case of software. Publishing through website in other case could be taken as executing as offering transfer (Article 3, Patent Act) or as indirectly infringement (Article 101, Patent Act).

[^{xii}] Copying is treated as infringement. 加藤浩一郎「ソフトウェア知的財産—法律から実務まで」, 2006 発明協会

[^{xiii}] Patent maps help users to figure out how and where various patent rights range.

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