Liberty-enhancing businesses

Making money through the freedom of others

Licensing agreements are of vital importance in the new digital economy. Successful licensing strategies limit the way others can consume a creative work, placing the producer of the work in a position to maximise the profit they accrue from their efforts. The aim of my thesis will be to measure the impact of different licensing strategies on the success of startups releasing new physical product designs. Quantitative evidence will be gathered from controlled experiments to show if and when liberal licensing is better, in which circumstances and why.

The idea that all available intellectual property rights must be enforced to maximise profit has been challenged across a number of licensing industries. Where the recording and software industry has led, more will follow as the impact of the "digital revolution" cascades through their sectors (Gershenfeld 2007). The commoditisation of digital hardware and software, and the democratisation of product design through digital fabrication techniques, has led to the emergence of challenging alternative business models. Open Source, Creative Commons and similarly liberal licenses underpin a growing collection of products and services without the encumbrances and transaction friction of rights-controlled resources.

Establishing the right licensing and access strategy for any product is enormously difficult. Established business models for content producers tend to choose restrictive policies and paid licenses while a counterculture of hackers and makers prefer sharing their material in the public domain, or using licenses which leave many freedoms open for others.

Liberal licensing can help creatives to promote themselves, stimulate adoption of their designs, foster collaborations and encourage others to share valuable insights. A shift of emphasis from products to services can also undermine traditional assumptions; actively facilitating the adoption of your designs by others can create a rich market for consultancy and support which the original creator is uniquely able to anticipate and serve.

In spite of the huge range of alternative business models available, the question often remains whether simply imposing license revenues on those who use a design is the most profitable approach.

My PhD will investigate this question by designing tools to assess the market's response to a range of licensing strategies. These tools will be proven by market-testing a suite of products which already exist in prototype form. The launch vehicles for these products will be carefully crafted, drawing on my commercial experience as a implementor and strategist and combining perspectives from management science to choose an appropriate experimental protocol for this artificial intervention in the real-world digital economy.

Experiments will compare liberal licensing agreements with those which impose a narrow enforcement of intellectual property rights. The influence of licensing on stakeholder behaviour will be modelled and monitored, and hypotheses put forward regarding the impact of those behaviours on long term value flow and profitability.

This work is a natural extension to less rigorous experimentation into public domain invention already undertaken during a commercial sabbatical from BT's Research and Development labs. From February to April 2010 the Enigmaker project microblogged the prototyping of six new inventions, released into the public domain as part of a crowd-sourced invention guessing-game. One of these, a Creative-Commons-licensed design branded the Tacticalendar, has since been released as a consumer product.

Experimental results will be made available to start-up companies navigating the same challenging terrain, and should help them decide when to allow others the freedom to exploit their output, and when they should register and impose intellectual property rights to limit that freedom, in order to achieve the greatest commercial gain.

Rationale and Objectives

Society profits hugely from the exchange of insight and information. Its beneficiaries build upon shared work to achieve goals which are otherwise out of their reach. However, business strategies reliant on intellectual property rights concern themselves with prevention. Through measures such as patents and copyright, creators are invited to create legal obstacles for others to benefit from their work. Many feel that they must enforce these rights to defend their professional role and earning power.

Intellectual property legislators believe that the limits on imitation and innovation imposed by licensing laws are critical to defend revenue streams which support new creative output. However where the decision to enforce rights disadvantages paying customers, this can choke the intended commercial dividend. Naive licensing can not only restrict liberties, but actually threaten or limit a product's success, leaving no winners at all.

Business losses from eager license enforcement can take place directly through loss of market share or reduced revenue owing to the restricted freedoms of the complexity of license management around a company's product. There may also be an opportunity cost from missing out on a potential strategic position, design improvement, customer relationship or other profit-generating mechanism. The potential to engage customers in design improvements, or to establish alternative revenue streams lubricated by openness and sharing, are easily overlooked until a competitor demonstrates their value.

In common with many industry commentators (Hacker 2000, Doctorow 2011), I believe that the limitations on consumer freedoms imposed by legitimate, copy-controlled digital distribution represented a huge disadvantage against the more accessible and flexible, unlicensed, alternative of ripping content from CDs and DVDs. As consumer choices have played out, the emergence of liberal digital distribution and consumption mechanisms such as iTunes and the iPod has undermined the 'A&R' advantages which record labels once had as gatekeepers to the consumer marketplace. Mainstream sales volumes for the copyright industry are in freefall and disintermediation now threatens their existence.

Similarly, licenses which channel the contributions of many interested parties into an asset available to all are at the core of Firefox, Google Chrome, Linux, Android, Apple's Mac OS X and iOS. Against the odds, "thriving communities...who write ...code, then give it away" (Moody 2001) have eroded the market share of proprietary and closed source alternatives, including those as well-resourced and dominant as Microsoft Windows and Internet Explorer, by exploiting the organising power of "technologies of cooperation" (Rheingold 2003).

It is too soon to tell if liberal license approaches will be ‘game changers’ in every industry. So far, the commercial mainstream of inventors, engineers and product designers have not adopted them as widely as the software community. However, even if we expect their impact to be more limited in this field, there is value in understanding the boundaries of the business terrain in which they can contribute to commercial success.

Despite the scarcity of actionable insight, established design companies should not rest on their laurels and continue with traditional models. Contributors across all industries need an informed standpoint concerning the flow of value in radically liberalised economies which goes beyond mere licensing revenue. An analytically sound picture of the way intangibles can flow through businesses, lubricating relationships and facilitating the unlocking of new value is needed. Strategists need to weigh up which IP rights they should waive, what the form of the expected payback should be, and how they should orient their business in order to best harvest the dividend, for example facilitating "grassroots" engagement with their offering through "virtual communities" and other communications tools (Rheingold 2000).

As other disruptive innovations have proven, by the time new competitors have emerged and proven the case for liberal licensing it may already be too late to defend existing markets against those playing the game-changing wildcard.

The studies I propose are inevitably narrow in scope, but should offer hard data for decision-makers, supported by an analytical framework. The thesis should help them articulate a successful licensing strategy for product designs in spite of, or indeed because of, the availability of digital fabrication tools. In particular the evidence gathered should prevent businesses from adopting self-defeating licensing approaches where liberal alternatives are more profitable than intellectual property enforcement.

Method

Initially, work will focus on identifying and analysing how the licensing choices for a product design are coupled to market propagation factors. These factors in turn determine the scale of a product's penetration and success. They are likely to include...

- the friction and cost of negotiating a license as a threshold to testing or adoption
- the influence on decision makers of a license's guarantees regarding future freedom of use or modification
- the propensity to share promotional information about a freely-licensed product versus a commercially-licensed one
- the likelihood of feedback concerning quality or potential design improvements when the design asset is shared with the community
- the creators of complementary products seeking compatibility with products which are freely licensed in preference to those with limitations

The form of analysis for this first phase of study is closely linked to strategy choice in game theory, (Von Neumann and Morgenstern 1944) and could be led by in-silico experiments using agent-based-modelling techniques (Kreps 1990, Axelrod 1997). The results of such experiments should not only be interesting in their own right, but also help articulate the aspects of behaviour of the target audience through simplified toy worlds, which real-world experiments can directly measure in later studies.

The modelling phase should give rise to hypotheses concerning the initial conditions and parameters under which competing licensing strategies succeed or fail. Specific questions can then be posed as part of live market experiments. Working closely with the management school an experimental protocol will be defined for launching one or more businesses or brands, instrumented to probe the response of the market to different license offerings.

A large collection of prototype designs has already been prepared whose 'staged' product launch can act as a credible backbone for these experiments. One candidate is a working prototype of an Alti-Vario flight instrument intended for the hobby gliding market. Another working prototype, developed in collaboration with a ten year old entrepreneur from Wrexham as part of CBBC's My Genius Idea programme, augments the traditional keyboard with MIDI-driven LEDs which can interactively teach melodies to piano students.

In an example experiment, assuming the simplest possible protocol, these products could be simultaneously promoted on one hand as an open design - inviting imitation and variation, and on the other as a closed offering - a static product with a patented design. Comparisons can then be made between the success of the different 'faces' in attracting attention, sales, or eliciting other important behaviours from the target audience.

Contrast with related work

This work is deliberately complementary to existing work in "open innovation" (Chesborough 2003) and "user innovation" (von Hippel 2005).

Henry Chesborough (2003) emphasises the disclosure of the intellectual property assets held by a company as a means of forming alliances and collaborations to maximise exploitation of a portfolio, but his manifesto depends heavily upon the model of license revenues as a profit mechanism, in stark contrast to the opportunities arising from liberal licensing.

Eric von Hippel (1988, 2005) emphasises the value of lead users' contributions to the definition and solution of commercially valuable design problems, but he does not establish particular strategies by which the licensing of the organisation's own intellectual property can be used as a means of gathering and channeling user innovation to maximise profit.

The focus on the licensing of product designs contrasts strongly with existing work concerning the economic motivations of developers and the optimum licensing of software (Lerner and Tirole 2002,Colazon and Fang 2009). As von Hippel's evidence base demonstrates, product design is an

accessible discipline without the same asymmetries between a developer and a user population.

The licensing of inventions and product designs is a distinctly different domain, a rich seam for new enquiry which can deliver timely data to support decision makers at the cutting edge of the digital economy.

Key Questions

Creating a defensible protocol for a controlled experiment within the real digital economy is not trivial. I anticipate that experimental design will consume a great deal of the time, effort and collaborative work within the PhD.

Simplistic approaches will fail to achieve a statistically significant data set to reduce the influence of sheer randomness on the results. On the other hand large numbers of trials targeting the same audience of decision makers could easily threaten the independence of those trials. Evidence concerning the behaviour of agents in the market for a given product is also likely to be impacted by self-selection bias, distorting the results compared to the population as a whole.

To mitigate some of these effects, the scale of trials can be varied. At one extreme, the impact of individual concepts on a web visitor's immediate behaviour can be tested by presenting different messages and images within a single page-impression. At the other extreme, two entirely separate campaigns and brand presences could be presented to the marketplace, each sporting a different licensing model, (but backed by the same actual product), and the aggregate effect of the campaigns as a whole can be measured.

These issues and more will need to be addressed to create a defensible data set which is of value to commercial decision makers.

Relevance to Highwire

Highwire's post-disciplinary approach, with a focus on the intersection between the digital, design thinking and business organisation, offers a perfect environment for this study to develop and be challenged by informed and interested colleagues.

I have an established body of work and a history of engagement in open source, rapid prototyping, design and business strategy, but I am passionate about the opportunity to collaborate with others who arrive at the same problems but with a different momentum. I trust the skills I've developed as an entrepreneur, prototypist and facilitator during my industrial and voluntary work will can be an asset to others' projects too.

As a visiting scientist for BT at MIT Media Lab I learned to respect the insights that emerge from diversity combined with the faith that the deepest problems will succumb to analysis if they are simply approached from the right angle. The students and staff I have met at Highwire combine hacker culture with academic rigour in a similarly powerful way.

Having recently relocated to Lancaster, I'm exploring a number of opportunities to work with Highwire at the time of writing, and although I very much hope my PhD application is successful, I am committed to establishing a productive relationship with the LICA and Info21 communities as a springboard for future commercial projects and experiments.

Profile

I am a contributor and user of open source and public domain design projects, with ten years of industry experience as a commercial inventor, platform architect and product designer. I was originally recruited into industrial research through my academic work in agent-based modelling and artificial evolutionary systems at the University of Sussex.

My experience in industry and the maker community spans the whole spectrum of perspectives on licensing. At one extreme, my work at BT Labs has led to a number of granted patents and the prototyping and deployment of a great deal of trade secret and privately licensed technologies. At the other extreme, I

am an author and maintainer of software, workshop facilitator and hacker for open source projects built on Arduino and Processing, creator of the Enigmaker public domain invention project, and the Tacticalendar - a Creative Commons BY-NC-SA-licensed design for a laser-cut consumer product.

As a lead contributor and instigator of emerging technology projects, my role blends naturally into that of the technology strategist, marketeer and entrepreneur, attempting to drive cashflow through the technologies I create. This last perspective is definitive in the scoping of the proposed project. Decisions around the liberal sharing of IPR lack the hard numerical certainties of the profit and loss accounting for conventional markets, and no established heuristics seem to exist which can help structure the decision to proceed on a given licensing strategy.

With your help, this is a gap I hope to close.

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