PUBLIC INNOVATION

INTELLECTUAL PROPERTY IN A DIGITAL AGE

WILLIAM DAVIES AND KAY WITHERS

ippr

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Foreword

It is over a decade since the progressive left first embarked on developing its policy programme for the digital age. In that time, a number of once geeky concepts have entered mainstream policy debates. The knowledge economy, digital inclusion and e-democracy were niche ideas when they first emerged from networks of academics, technologists and think tanks, but have since become important parts of this Government's vision. It takes confidence on the part of policymakers to harness the benefits of fast-changing technology for the public good, and, for the most part, I believe we have done well.

While intellectual property (IP) rights have long been recognised as a decisive factor in helping Britain exploit the benefits of the digital age, identifying the appropriate policy framework in this area has been far more difficult. The topic has led to explosive and less than constructive debate, in which one side has demanded ever-stronger IP protections, while the other has called for widespread freedoms to share information with impunity. The Government's position, that radical change one way or the other is unnecessary, has held firm, but we must continue to explore what more could be done to help businesses, educators and consumers exploit the economic and cultural benefits of networked technologies such as the internet.

The report is also welcome because this is a debate that needs to be relevant and accessible to the public at large. As a parent, I have seen my own sons' sedentary leisure activities go from watching two TV channels, to watching several, to playing computer games, to surfing the net, to generating their own material on websites such as 'YouTube' in just a few years. By the time they are adults, they need to be in a society in which ordinary citizens understand and accept the core principles of IP.

Against this backdrop, this report makes a progressive and evidence-based contribution. New Labour won the 2005 election with a Manifesto pledge to modernise copyright, and the Treasury later launched its Gowers Review of Intellectual Property. The value of the ippr's intervention lies in the overarching analytical framework that it has produced, through which intellectual property rights can be better understood, and defended or criticised where appropriate. The report also offers a comprehensive collection and assessment of evidence in this area, which should make it an important source for those seeking independent expertise on the topic.

The authors' most important message is that government should foster a climate in which innovation is something all are capable of, and all are rewarded and recognised for. IP is central to this, wherever it adds to the

UK's capacity to innovate. By the nature of this issue, the recommendations given here will not please all parties, but, in common with ippr's work as a whole, whether or not the reader concurs with the conclusions of this research, this report contains a wealth of useful evidence and rigorous policy analysis.

Matthew Taylor
Chief Adviser on Strategy, Prime Minister's Office

Executive summary

Intellectual property rights (IPRs) have always spawned controversy for economic, moral and cultural reasons. Economists recognise that many private businesses and individuals require a degree of legal protection for their innovations, or else will lack the incentive to produce them, but fear that protections can also hamper competition and create monopoly. Consumers, educational institutions and archivists argue that IPRs risk impeding their legitimate rights to enjoy and share cultural artefacts, and some complain that the public sphere is becoming impoverished by the legal and technical regulation of information in the interests of business. However, the UK's role in the world economy as a producer of intangible goods may mean that there is little choice but to pursue such a model.

Digital technology is fuelling such arguments. The emergence of the internet means that valuable information and content can swiftly be shared with a vast audience of users. To tackle this, Digital Rights Management (DRM) is used by companies to micro-regulate how information and content can be used, and has received blanket legislative protection in most developed countries. The once symbiotic relationship between IPRs and public domain has become increasingly oppositional as a result of these technological changes.

This report presents an overview of the arguments and evidence that underpin IPRs, and the development of IPR policy in the UK and internationally. In doing so, it defines the terms used, explores the separate concepts of public domain and the public sphere, and shows how digitisation is transforming some of these categories. The report argues that government must seek ways of developing an IPR regime that balances all the various competing interests. A voice must be given to producers, but it equally should be given to other groups that feel the impact of the ways in which information is regulated.

There are four dimensions of the public sphere outlined in this report that correspond to four priorities that a public-interest IP regime must seek to balance: the economic incentive to innovate; the economic value of public domain; the civic value of access and inclusion; and preservation and heritage. However, there is undeniably a potential tension between public domain and the economic incentive of IPRs. Throughout this report, it is argued that the 'best' model of IPRs is not based on economics alone, nor can it be identified using a simple model of evidence-based policy. There are moral, cultural, political and economic complexities, as we demonstrate through the case studies presented in chapter three.

The lack of a consolidated attempt in policy circles to give value to openness, while simultaneously promoting the strength of IP protection, has increased this tension. There are often vagaries and conflicts in the current regime that mean there are conflicting interpretations of IP. Fair dealing in copyright is unclear, for example, and often left open to interpretation by rights-holders and users alike. Attempts by private firms to define fair dealing has increased risks that certain actions that have previously been thought of by citizens as 'fair' are now restricted. In particular, there are demonstrable problems with contracts and licences and, in enforcing these, DRM tools. This report argues that this has serious implications for society in general, but in particular, negatively impacts people with accessibility issues, academic researchers, archivists, and consumers where problems arise with interoperability and access.

When the economic, the political, the cultural and the moral are closely connected in a policy problem, policy frameworks need to be built to recognise this. An inter-disciplinary analysis along with a hybrid notion of what government's goal should be is therefore essential. Economic analysis alone is not enough: indeed, where purely economic analyses are attempted, their conclusions have tended to radically diverge. Instead, a more suitable approach assesses rival IP systems as integrated models of information policy. Each model offers a different way of balancing competing priorities, and each has its own over-arching consistency.

Our conclusions and recommendations set out what we believe to be the most progressive model of information policy, which recognises the interests of the public first and foremost, and identifies what role IPRs play in achieving that. This need not involve weakening existing rights, but means resisting calls to strengthen them and investing more actively in public domain information and content.

The report's key recommendations include:

- Developing a model of IP policy that places knowledge as a public resource first and private asset second and promotes recognition of the overall coherence of this model. We argue that this should not be perceived as 'anti-business'; instead it will deliver both cultural and economic benefits and will underline the economic importance of IP protection as benefiting the rights holder in order to ultimately benefit the public.
- Creating as strong a political voice for public domain as currently exists for other interests. This is not to diminish the claims of these other interests, but to ensure the full picture – in both the short and long term – is taken into account to enable effective policy development. We assert that high quality public domain is both a cultural and an economic good and that the Government should make steps to develop and

defend it, through initiating the establishment of a UK Centre for Public Domain.

- Providing better legal protection to ensure that consumers, librarians, archivists and commercial researchers can pursue non-commercial objectives without fear of recrimination.
- Assisting small and medium-sized enterprises (SMEs) and individual creators to better utilise the IP system, by creating cheaper routes to enforcing IP rights and reforming the process of registering patents on a European level.
- Renewing the Patent Office with a wider mission that encompasses the public interest and takes a lead in promoting and undertaking research to assess the effectiveness of public policy in this area.

Introduction

> Intellectual property rights may encourage inventiveness but not connectivity. Europe needs both. (Barry 2000: 111)

The UK's creative and productive future depends on its ability to cope with a paradox. As our industrial base shifts further away from the manufacturing of goods, so the economic significance of intangible assets – ideas, culture, and artistic and scientific innovations – grows. It is this familiar tale of the knowledge economy that hides the contradiction: knowledge now has to perform two often mutually incompatible functions at once.

On the one hand, wealth and jobs depend on our ability to commercialise innovation, which, in turn, requires legal and technological mechanisms capable of protecting it from being immediately copied by competitors. Intellectual property rights (IPRs) are the foremost such mechanism, but, increasingly, it is the set of technologies collectively known as digital rights management (DRM) that restrict the sharing of commercially valuable assets. Advocates of IPRs argue that, unless knowledge can be kept scarce in the first place, there can be no knowledge-based economy at all.

On the other hand, our economic prosperity, not to mention our cultural vitality, depends on the survival of an entirely opposite role for knowledge in society. It is through the sharing of information that we are able to develop our intellectual and creative talents, discover new artists, create new businesses, forge alliances between academic and commercial institutions, and learn from one another. Technology has been supportive of this in recent years, with the internet offering unprecedented opportunities to share ideas and content, across any distance and at zero marginal cost, as well as to innovate in the form of new businesses. Human capital and social capital are assets that must be nurtured collectively and publicly, for our long-term wellbeing.

Knowledge must, therefore, perform the roles of both commodity and social glue, both private property and public domain. This problem is not unique to public policy; businesses also face the dilemma of how much service they should offer a customer for free as a way of cementing the relationship, and how much should be charged for as a revenue stream. The question of when to sell and when to share cuts to the heart of the knowledge economy, with different answers leading to different economic and cultural models. For example, *The Guardian* shares all its online news content freely, including access to archives. *The Financial Times*, on the other hand, offers limited free access, then numerous subscription packages pro-

viding personalised services to enhance usability. In any case, IPRs sit at the very centre of the dilemma.

The nature of the debate

The advantage of adopting a 'balanced' and 'evidence-led' approach is now recognised across the majority of public policy fields. But there are few areas of policy where it is more yearned for than that of IPRs. Lawyers, politicians, consumer advocates, businesses, inventors and artists are all happily united in their professed desire to move beyond ideology, hyperbole and empty rhetoric on the topic of IPRs, and yet a fear persists that policy is being carved out in an illegitimate or biased fashion. It is important at the outset to get an idea of why this might be, and, hence, what sort of debate we are involved in.

The first thing to bear in mind is that the way we create and uphold IPRs influences an unusually large and disparate number of social activities, both nationally and internationally. What we are talking about here are the legal rights to use, privatise and sell information, raising not only policy questions about the most effective ways of managing such rights, but also major political questions about how we want to regulate information in the digital age.

To take a film as a simple example, an IP regime must accommodate the desires of its financers to recoup their upfront investment, the rights of the director to be recognised as such, the rights of consumers to get value for money and watch the film at the time and place that suits them, the interests of the public in having sophisticated (and perhaps home-grown) cinema available to them, the interests of future generations in being able to view the film as a piece of heritage, the interests of other film-makers looking for inspiration or pieces of footage, the need for film schools to be able to use the film as an educational material, and so on.

The balanced and evidence-led approach that we are all seeking would require that this complex roll-call of stakeholder interests be synthesised into a straightforward evaluation of which outcome is *best*. But when a policy intrudes into economics, culture, education, industrial development and beyond, it is not clear that there can ever be a universally agreed best course of action. It is hard to apply the utilitarian notion that the 'ends justifies the means' when there is so little shared idea of what the ends are. But neither can we duck the question of which outcomes IPRs can be reasonably designed to achieve.

The second source of unease in this debate is perhaps even more problematic. This lies in the fact that many of the factors that have to be weighed up when taking decisions about IPRs are not necessarily presentable in terms of empirical evidence anyway. There are two reasons for this.

Firstly, many of the benefits of a healthy IP regime are intangible, relating to cultural vibrancy, happiness, democracy or the more diffuse factors in the knowledge economy. For instance, we can have a good idea of which scientists made a certain medical breakthrough, and a good idea of who was paying their salary at the time, but it is far harder to pinpoint who exactly invested in those scientists' education, or inspired them to conduct and publish research in the first place. An IPR regime that imperilled this *culture* of innovation in favour of short-term economic gains would be self-destructive.

Evidence is equally of little use when we come up against the more political dimension of IPRs. There are various circumstances in which we might choose to take up a position on IP that has little to do with its outcomes, and much to do with our values. For instance, plagiarism is a breach of the moral rights of a creator or author to be recognised for their work, quite aside from its economic consequences. Equally, there are certain types of information, such as government publications or classic literature, that we choose to make freely available to everyone through libraries or the internet, as a civic right. Once again, there is little point in searching for evidence of why this is a good idea, one must simply commit to it.

The final reason why the balanced and evidence-led approach on IPRs has failed to materialise is that this is such a deeply technical area. For a long while, the legal mechanisms that made up the IPR regime were deemed to be a specialist issue that required little input or oversight from politicians and citizens. In the UK, the Patent Office is a quasi-autonomous body, which aims to ensure that the system is running smoothly, and advises ministers if there is ever a need for change. Meanwhile, the World Intellectual Property Organization (WIPO), the World Trade Organization (WTO), and the European Commission (EC) shape a good deal of IP law internationally. Achieving uniformity, especially with the US, is deemed to be one of the administrative goals of a domestic IP regime such as ours.

But, over the last decade, IPRs have risen to become a mainstream political concern, for various reasons. The growth of the internet saw a dramatic increase in piracy, as file-sharing software enabled consumers to download music for free, generating fierce debate about the values of the networked age. Furthermore, where music was being correctly paid for, consumers wondered why DRM often prevented them from sharing the songs with their friends, or playing them on certain devices.

Meanwhile, with a growing number of Western jobs dependent on the production of intangible products and services, policymakers have had to consider the extent to which IPRs are helping or hindering markets for intellectual goods. The most important issues, however, often remain buried in legal and technological jargon, which few politicians and citizens successfully penetrate. The interest in ensuring a fair IPR regime has grown;

the confidence in the system for delivering that fairness has, if anything, declined, as excessive lobbying and technicalities obscure the real choices at stake.

Balancing competing priorities

None of these dilemmas is about to disappear, and any legitimate intervention in this debate must, therefore, acknowledge them. There are a number of ways that this report seeks to avoid the pitfalls of this debate.

Firstly, we have adopted an interdisciplinary approach, which presents different types of evidence side by side; some economic, some cultural, some sociological, and so on. In particular, the report focuses on four domains, illustrated in Table 1. There are the interests of existing rights-holders and creators in being appropriately rewarded for their innovative activities. This is a very diverse group, which spans global publishers on the one hand and self-employed inventors or artists on the other, but it is important that we get some grasp of how much of the UK economy depends on the exploitation of IPRs. Then there is a separate economic question about public goods, and the long-term public interest in ensuring that incumbent businesses do not receive excessive protection from government, which might hamper market competition, new enterprises and consumer benefits.

Alongside these economic questions, there is an important civic agenda, namely to ensure that the benefits of ubiquitous information and communication technology (ICT) are exploited for educational and democratic purposes. The pursuit of 'digital inclusion' is incompatible with an economic regime that erects barriers to information wherever it is profitable to do so. And finally, there is the supreme long-term importance of preserving cultural and intellectual artefacts for future generations, and of sharing those of previous ones. Traditional models of IPRs have in-built ways of ensuring that any information is *eventually* released into the public domain, but the question is, how successfully does our current regime support the activities of those who are working for the greater good of historical progress?

Table 1: priorities to be balanced by an IPR system

	Economic benefits of IP	Economic benefits of public domain	Civic benefits of inclusive networks	Cultural benefits of heritage
Benefit sought	Incentive to innovate or create	Higher market competitiveness and trust	Education and democratic participation	Progress from generation to generation
Example	Financial reward to novelist	Pooling of ideas to create new business	Access to free learning materials online	Museum producing collection of old works

It is not inevitable that these interests are in conflict with each other, but nor is it unlikely. One of the purposes of this report is to define the possible trade-offs in empirical terms, but it is also our goal to define and defend a balance that is in the public interest. This requires an understanding of *who* the public is, and *what* its interest consists of. This is partly a question of scale.

As far as the World Wide Web is concerned, the public is a global one, which has no government acting to defend its interests, even if there are international bodies with responsibility for IPRs. There are ways of regulating information that serve the public interest in a global sense, but not in a national sense, and vice versa. For instance, developing economies, whose industries are less dependent on IPRs, clearly have more to gain from global information sharing than developed economies such as the UK's. Equally, a lot of BBC content is being made available online to the UK public but not the global public, on the basis that it has been funded by the national licence fee.

This report is focused on a UK context, and makes recommendations within the limits this implies, but it is conscious of broader global or humanitarian notions of the public interest, and these are drawn out where appropriate.

At a national level, it is clearly in the public interest that jobs are created in the economy, but it is a fantasy to assume that governments play no role in determining what *kinds* of jobs in what *kinds* of industries. Economic and business policies do not sit in a vacuum, but must be constantly answerable for the sorts of economic 'externalities' that they are producing. Although governments no longer talk about 'industrial policy', and bristle at accusations of 'protectionism', there are areas, such as the creative economy, where support (and sometimes subsidy) is offered to industry on the basis that it delivers benefits over and above those which appear in annual reports. Equally, there may well be types of industry that are economically vibrant but bring negative externalities, and are, therefore, strategically neglected.

Where a government sits on a topic such as IPRs will depend not only on what sort of industrial base it is and is not currently defending, but also on what forms of capitalism it is and is not seeking to nurture in the future.

Finally, in answer to the excessively technocratic nature of this field, the report is intended partially as a handbook for those wanting to understand and participate in this debate. In particular, guidance is given on where different powers lie, how much room for manoeuvre the UK has, what the law actually says, and what we know about its impact in the UK, or, in cases where UK evidence is lacking, overseas. The sense that democratic dialogue is failing on this topic is a serious one, and some of the remedies sought in this report are therefore to do with process. For, while policymakers need well-grounded advice on which is the best course of action, it is also impor-

tant that the channels for IP policy are appropriately reformed, so that future changes in the law do not suffer from the democratic deficit that they suffer presently.

Outline of the report

Chapter One gives an overview of the arguments that underpin IPRs, and the development of IPR policy in the UK and internationally. It also defines the terms used, explores the separate concepts of public domain and the public sphere, and discusses how digitisation is transforming some of these categories. The chapter is intended as an introduction to those less well acquainted with this debate, rather than those with existing expertise.

Chapter Two collects together the evidence that is available on how IPR affects the UK economy and society. This is done by using the four themes outlined above, namely, the economic benefits of IPRs, the economic benefits of the public domain, how IPRs affect digital inclusion and how IPRs affect those engaged in heritage activities. The caveat stressed earlier – that an evidence-led approach will not resolve all of our dilemmas and political differences on this topic – should be carried in mind, but a clear and credible collection of evidence is the best starting point for argument.

Chapter Three contains our four case studies, based upon an integrated approach to the economic, social and cultural role played by IPRs. These case studies are the Ordnance Survey, a trading fund that currently operates on an independent commercial basis, retaining IPRs over its mapping data; The Road to Guantanamo, a UK-made film that was released under a range of different and innovative distribution channels, with different implications for the business model underpinning it; Plastic Logic, a small to medium rnterprise (SME) that has developed a new plastic chip as an alternative to silicon chips, in collaboration with Cambridge University; and the British Library Sound Archive, currently being compiled. In each instance, our goal is to dig down inside the organisation and the economic model, to look at how public and private interests are interwoven, and to ask where IPR is and is not performing well for both.

Chapter Four contains our conclusions and recommendations. These are based upon the ippr's progressive values, and a desire to develop an economic model that is suited to the current direction of UK industry, but sustainable for the long term. While trade-offs have to be made in certain instances, and no policy programme can please all parties, a holistic approach ought to ensure that the interests of business and those of the public are aligned in the longer term.

1. Background: why do we have intellectual property?

Debate surrounding the politics of IPRs has been nothing if not lively. At its fiercest, differing viewpoints have tended to polarise completely, preventing reasonable discussion and eradicating the possibility of a democratically moderated compromise. Certainly in the US context, the proponents of stronger IPRs, such as the large content industries, and the proponents of weaker IPRs, such as the open source movement, have often been, to borrow a phrase from the philosopher of science Thomas Kuhn, 'describing different worlds'. Conflict has hinged on some surprisingly basic questions, such as: what, actually, is an intellectual property right?; from where does such a right derive?; and how does it actually function? Public ignorance has been exploited by both sides in order to warp popular understanding, and load the relevant vocabulary in politically expedient ways.

This is most manifest when it comes to the term 'intellectual property' itself, which remains contentious. The reason for this is that IP is not technically property at all, but a *limited-term monopoly right* to the piece of information concerned.

Copyright and patents exist so as to ensure that an innovator, creator or publisher is granted a certain length of time between releasing their work to the public, and the public having full licence to use it themselves. The duration of this period of grace (known colloquially as 'term') varies considerably, and remains the most controversial issue in this debate. Yet only a fundamentalist believer in IPRs would suggest that term limits be removed altogether, a move that would make IPRs equivalent to physical property rights. One should, therefore, note at the outset that the reality of IPRs is never as protective as either their strongest advocates or their fiercest critics make out: copyright and patents are policy mechanisms that regulate the sharing of information, and by no means simply techniques for preventing it.

We have chosen to use the term 'intellectual property' in this report simply because it is now common currency, and offers a good means of capturing some core trade-offs that governments need to make in their approach to information in a digital age. We are well aware of the shortcomings of the term, and intend to use this chapter to clarify the background and key distinctions that need to be understood before an enlightened discussion of IPRs can proceed.

This chapter begins by examining the four dominant arguments for the existence of IPRs – the 'Lockean', the 'utilitarian', the 'economic' and the 'French/moral' arguments – and how these might be brought to bear on contemporary concerns. We then review the history of IPRs, the different func-

tions of copyright and patents, and the internationalisation of IP law as enforced by the World Intellectual Property Organization (WIPO) and other agencies. The chapter then turns to the question and definition of public domain and the role of IP in the 'public sphere' more broadly. Finally, we explore why digital technology has placed strains upon these systems and arguments, and attempt to characterise the disputes that have arisen.

Philosophical roots of intellectual property rights

Given that IPRs are not rooted in conventional property rights, the question of why they exist at all will always remain a live one. There will always be a sceptical faction that denies that knowledge should ever be controlled for commercial gain, but this perspective tends to overlook the diversity and philosophical richness of the justifications for IPRs, which contain economic, moral, cultural and political dimensions. It is worth examining the four most credible and pervasive justifications that have pertained over the history of this debate.

The Lockean approach

Published in 1689, John Locke's *Second Treatise of Government* outlined a theory that provided justification for private property rights. Although modelled on the ownership of land, Locke's ideas have heavily influenced discussions about IPRs for several centuries. Attempting to explain how a person may legitimately acquire property rights over resources that were previously unowned or held in common, Locke outlines what is known as his 'labour desert theory'. This theory is based on the premise that, for each person, "the Labour of his Body, and the work of his hands, we may say, are properly his" (Locke 1694). Thus, when an individual labours on an object, he mixes 'his' labour with the object and, through adding the value of his endeavour, can legitimately come to own this object. This is subject to Locke's proviso that there is enough left over for others.

In the context of IP, mixing one's labour – one's creative or inventive effort – with resources held in common justifies a degree of ownership of the end creative product. This approach alerts us to the time and effort that artists, inventors and publishers put into the works they produce, and has occasionally been used in the past to make a case for perpetual ownership of one's intellectual endeavours. However, letters from John Locke written before the birth of copyright show he actually favoured a limited monopoly, for a period of time, based on the life of the author (Rose 2003). The argument also does little to clarify how to balance the just rewards of a creator or inventor against those of their employer or publisher. If, for instance, a cartoonist were producing work for Disney, would Locke's argument imply that they should hold the rights to parts of the end product?

The utilitarian approach

In contrast to the Lockean justification, utilitarian defences of IPRs have been concerned less with how goods are produced, and more with their consequences. The basic idea of utilitarianism is that the morally correct action in any given situation is that which brings about the best possible outcome for society, considered in terms of total sum happiness or benefit.

IPRs can be seen as utilitarian where they provide the conditions to promote the best outcome for all. Without private property rights, resources can eventually become subject to what has been famously described as the 'tragedy of the commons' (Hardin 1968). A piece of common land left open and available to all might fail to be managed properly, because each individual would use the land as much as possible in order to secure the greatest amount of private reward. Eventually, the land would be overused and worthless for the purpose of growing crops or grazing animals, and all users would suffer. Private property rights potentially achieve a more efficient management of a resource, which is in the interests of all. Through private ownership, everyone can benefit.

An analogy between land and the 'intellectual commons' has been drawn many times. One could argue that, without the potential for private 'ownership' over intellectual goods, they would become neglected in the same way that land would be. Although some people clearly receive greater benefit from IPRs than others, the utilitarian argument would be that the *net* benefit of restricting use of creative works and inventions is greater than allowing unrestricted use. On the other hand, the analogy to land has been criticised for attempting to parallel a finite resource (land) with an infinite one (knowledge/ideas). Against this, Edmund Kitch, who provided the prospect theory of patents[1], claimed the analogy was a good one, since what mattered was the ability to put knowledge and ideas to good use, and this resource remains finite (Kitch 1977).

Both of the above justifications influence the way we think about IPRs today. The language of the Lockean approach finds many parallels with today's concept of IPRs, where there is repeated talk of reward and desert for creative endeavour. Even those who disapprove of rampant economic inequality in society may recognise that a widely-acclaimed author such as Zadie Smith *deserves* to benefit from the work and talent that have gone into her or his books. The utilitarian approach is evident in discussions of providing balance between incentive to innovate and providing free access to information. It is also echoed quite clearly in the US constitution, which gives the US Congress the power "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" (Article 1, Section 8, Clause 8).

The economist's approach

The most significant type of utilitarian justification for IPRs is that given by economists, on which a tremendous amount hangs for the construction of IP policy today. IPRs are monopoly rights, and economists tend to dislike monopolies on principle. How, then, do they sanction these particular forms of rights? How the argument works is set out below.

Markets for intellectual or information goods cannot work in the same way as markets for tangible goods, such as wool, oil or other physical products. This is because of the peculiar economic quality of knowledge. Firstly, it is 'non-rival', meaning that its use by one person does not affect use by another, and stocks cannot be depleted by overuse. For instance, the fact that an additional 100 children are taught about dinosaurs in class does not in any way affect the knowledge that millions of others already have about dinosaurs. The 'asset' has been enjoyed by more people, without removing it from anyone else. This is not to say that a *book* about dinosaurs can be freely reprinted without affecting anyone (clearly the book's author and publisher will feel affected), but that *in principle* there is no limit to how many people can enjoy knowledge as an abstract entity.

Secondly, knowledge is 'non-excludable', meaning that it is difficult to exclude unauthorised users from accessing knowledge. Obviously there are specific techniques to prevent private information from becoming public, but, once a piece of information has become public, it is then very difficult to regulate who can and cannot know about it. A suitable analogy would be a public park. While a public park is not 'non-rival' (because too many users would destroy its value), it shares this 'non-excludable' nature because it does not distinguish between authorised and unauthorised users.

A combination of these two traits means that knowledge is technically classed by economists as a public good. Its non-rival and non-excludable nature means that, in the absence of any legal or technological intervention, it has an innately public quality, which makes it very difficult to conceive of a market for it. Why, for instance, would I ever pay someone for air when it is easily available to me and there is more than enough to go round?

The problem is that new informational and cultural goods do not occur naturally, and may require a considerable amount of money and effort to be produced and distributed. But, unless a producer can have a good chance of recouping some revenue for this time and investment, they may not bother to produce the goods at all. There is an incentive problem that could result in underproduction of desirable informational goods, which harms both producers and consumers.

To get round this problem, governments have provided for state-granted, time-limited monopolies for information goods in the form of IPRs. These help make goods private that would otherwise be public. They

erect artificial barriers to use, and introduce scarcity into the goods supply. Without IPRs, innovators and creators would be unlikely to recover the investment in the R&D that went into producing the good in the first place. While monopolies are traditionally anathema to many economists and governments alike, the interruption to the competitive market is deemed necessary to provide sufficient incentive for creators and innovators to continue adding to society's stock of cultural works and scientific knowledge. So, for economists, IPRs represent a crucial bridge between the intellectual and the economic spheres of society.

The continental approach and the concept of moral rights

The UK's copyright system developed around the business interests of publishers, enabling them to recoup the upfront investment that printing necessitated. But the development of copyright in France developed to uphold the rights of the author, and relied heavily on a philosophy of moral rights.

This emerged following the French revolution, in response to a prevalent public mood that ideas and information should be free for all to use. However, writing on behalf of the Paris Publishers' Guild, Diderot asked "what form of wealth could belong to a man, if not a work of the mind… If not his own thoughts ... the most precious part of himself, that will never perish, that will immortalise him?" (quoted in Hesse 1991). This plea outlined the case for perpetual property rights from which emerged legal recognition of the rights of authors in the late 19th century. It is for these historical reasons that French copyright treats a protected work as an extension of the personality of the author, and differentiates between economic and moral rights (Fisher 2001).

Moral rights, therefore, refer to the right of a creator to be recognised for their work and to object to any derogatory treatment of the work that is prejudicial to their reputation or honour. In the UK, moral rights are granted to authors of literary, dramatic, musical and artistic works, and to film directors. In the UK, it is possible to waive these rights, whereas in France, for example, it is not.

Legal development of intellectual property rights

Our present IPR system is the product of several hundred years of economic disputes, ad hoc political decisions and technological developments. While we may complain that IP policy lacks an overarching rationale, it probably never had one, with accidents and short-term decisions shaping a system whose legacy survives today. While it may be intellectually enthralling to consider how one might construct an IP regime from scratch, this does not reflect the nature of the contemporary policy challenge, which is heavily

'path-dependent'. An awareness of the accidents and legal steps that led us here is, therefore, indispensable.

The birth of copyright

Copyright is the exclusive right to print, publish or sell copies of a work. As such, its significance and efficacy are heavily conditioned by the copying technologies available. The growth in the number and efficiency of such technologies places strains upon the norms and business models that underpin publishing, and it is the function of copyright to relieve some of these tensions to some extent. In the digital age, where copying of documents, images and music is a basic trait of many ubiquitous consumer products and activities, the responsibilities placed upon the copyright system become far heavier. At its inception, copyright had far narrower functions in society.

Copyright was introduced into UK law under the Statute of Anne of 1710, which provided protection for literary works for the term of 21 years. This came into being nearly three centuries after the invention of the printing press and followed various attempts to exert state control by distributing licences to print solely to members of the printers' guild (the Stationer's Company), and only for books agreeable to the crown. Nearly 300 years later, copyright remains the most important function for protecting the UK's creative industries, and covers the majority of creative works, including literary creations, computer programs, sound recordings, films and original artistic works. Copyright does not protect ideas, but the *expression of these ideas*. Unlike patent protection, copyright does not require registration; it is immediate upon committing the creative expression to some form, be it film, novel or music.

The Statute of Anne introduced the concept of a limited monopoly for creative works and this remains the basis of copyright law today. Copyright for literary, dramatic, musical or artistic works lasts for life plus 70 years, while copyright in sound recordings lasts for 50 years. Minimum terms for copyright protection are set out in international treaties, but individual countries do have the option of lengthening copyright protection beyond these periods: in 1993, the EU Directive on harmonising the term of copyright protection introduced a single duration for copyright monopolies across the EU of life plus 70 years. This represented an extension on the previous UK term of life plus 50 years.

First steps in patent law

It is a key feature of capitalism that advances in production techniques are liable to be copied by a firm's close competitors, meaning that the comparative advantages offered by innovation can swiftly vanish. While this process of knowledge spillovers is responsible for the energy and 'creative

destruction' of capitalism, there is also a risk that it can act as a disincentive to invest in expensive innovation.

Patents are an attempt to deal with precisely this problem. They allow key innovations to be publicly registered with the government, barring competitors from using them for a fixed period of time. They allow the innovative firm to recoup its costs, while ensuring that the breakthrough does not remain altogether secret. The UK has the longest continuous patent tradition in the world, and, over nearly 600 years, the concept of a limited monopoly has remained in patent law, and the term has not extended beyond 20 years.

Unlike copyright, which is granted automatically, patents have to be applied for. The UK Patent Office received 28,223 applications for patents in 2004, from innovators across the world (Patent Office 2005). In order to receive a patent grant, an invention must satisfy a number of conditions. In the first place, it must be new. An invention cannot be patented if its method has already been disclosed, either by another patent application, word of mouth, demonstration, advertisement or journal article, even if the inventor has developed their innovation independent of this information. Secondly, the invention must involve an inventive step, that is, it must be non-obvious, given the stock of relevant technical knowledge available at the time of filing. Finally, the invention must be capable of some industrial application.

Not all inventions are patentable. Exclusions include discoveries; scientific theories or mathematical methods; aesthetic creations (which would ordinarily be covered by copyright); schemes or methods for performing mental acts, playing games or doing business; and the presentation of information and computer games.

For an application to be granted, the inventor must provide to the Patent Office a full description of the invention, which, upon grant, is published by the Patent Office and contributes to a comprehensive source of technical information. Patents last up to 20 years but must be renewed every year starting from the fourth anniversary of the patent filing date. Fees increase every year: from £50 for the fifth year to £400 for the twentieth. In order to gain international protection, a patent owner must register their patent in the different territories they wish to gain protection, and most seek to register valuable patents at the three major patent offices: the Japanese Patent Office, the US Patent Office and the European Patent Office.

It is worth pointing out that an invention does not have to be physically produced in order to be patentable. In fact, many patents are licensed and brought to market by organisations and companies other than the patent owner. Here, the emphasis is on knowledge transfer through patents, and gaining financial return from licensing rather than sale of a patented product. There have been concerns that companies have used this technique to

register patents in an attempt either to prevent other innovators from developing new products, or to demand excessive licensing fees. Such practice is commonly called 'patent trolling' and can increase both the inefficiency and cost of the patent regime, although it is recognised as less of an issue within the UK than the US.

Internationalisation

As international trade grew, it became clear that IPRs were never going to function effectively without a degree of international harmonisation. Where a given country does not respect the IPRs granted in another, it offers an easy and obvious opportunity for would-be pirates to circumvent IP legislation. It was for this reason that the 1883 Paris Convention set out international regulations relating to 'industrial property' (patents and trademarks), while the Berne Convention of 1886 provided international regulations relating to copyrighted works. These later merged to form the United International Bureau for the Protection of Intellectual Property.

Since the Paris and Berne Conventions, there have been three important developments in the creation of transnational IP standards, which heavily shape the UK's present situation. There is limited scope for policy manoeuvre, and this is set out in Box 1.1.

Firstly, there was the creation of the World Intellectual Property Organization (WIPO) in 1967, later to become an agency of the United Nations. WIPO's key mission was to promote the importance of IPRs in developing nations, rather than to promote harmonisation between developed nations. But, because developing nations were typically net *importers* of IP goods, they did not necessarily see signing up to all WIPO treaties as in their national interest. WIPO had little clout to enforce IP rules internationally, at a time when there was both growing concern about piracy, and growing commercial importance of IP to a number of industry sectors in the developed world.

The inadequacy of WIPO as a tool for enforcement led to the second major development: the Trade Related Aspects of Intellectual Property (TRIPS) agreement. In many ways, TRIPs represents the most important piece of IP legislation to emerge in the last century, and, perhaps, since the introduction of the Statute of Anne itself.

Moving from the complex and toothless set of treaties overseen by WIPO to a global settlement on the provision and protection of IPRs, TRIPs represented a significant shift towards thinking of knowledge as conventional property, and as a financial asset. It sets out minimum standards for the protection of patents and copyright, in the first place requiring that the substantive obligations of the Berne and Paris Conventions be complied with, and also provides guidelines to government for effective enforcement. Perhaps most importantly, it ties IPRs to other trade negotiations, and sets

into IPRs the principles that are also central to the World Trade Organization (WTO): that of national treatment, most-favoured nation treatment and reciprocity. These provisions aim to outlaw the favouritism of home inventors, thereby ensuring free trade in IP.

The third significant development consisted of two WIPO treaties in the late 1990s, later to be enacted in the US and European Union via the Digital Millennium Copyright Act (DMCA) and the European Union Copyright Directive (EUCD) in 2002. The purpose of these treaties was to build on the Berne Convention, and to update copyright standards at a time when growing digitisation of content was making copyright enforcement harder.

Of key importance was the drive to "create new norms to respond to the problems raised by digital technology, and particularly the internet" (WIPO 2004: 270), which became known as the 'digital agenda'. This digital agenda covered a number of issues including rights applicable to the storage of works in digital systems, the limitations on and exceptions to copyright in a digital environment, and technological measures of protection and rights management information. It was the passage of the latter into US and EU law that has proved most controversial.

The DMCA and EUCD prohibit the manufacture, sale, distribution and use of technological tools that can circumvent DRM protection measures. This was, in part, an attempt of governments to avoid a potential 'arms race' with those involved in developing DRM technologies locked in a never-ending battle against many others seeking to develop circumvention technologies.

Instead of regulating against specific acts, this legislation chose to regulate technology itself. This indicates both the extent to which governments and rights-holders perceive non-commercial copying as a threat to copyright industries and the vulnerability of DRM technologies, which are normally very easy to break, given the right tools. It is also a result of the difficulty industry and government face in regulating individual users, as the illegal use of file-sharing software reveals. Through prohibiting the development, ownership, sale or transfer of circumvention tools, the average user is unlikely to come in to contact with such technologies in the first place.

Between them, TRIPs, the WIPO treaties, and the Berne and Paris Conventions are intended to provide a multilateral framework for the protection of IP worldwide. Most members of the WTO are also signatories of Berne and the WIPO treaties, and TRIPs itself requires members to comply with the major provisions of the Berne Convention. WIPO and the WTO also developed an agreement to provide a "mutually supportive relationship" and to establish "appropriate arrangements for cooperation between them" (WIPO 1995).

Box 1.1 How much room for policy manoeuvre does the UK have?

The complex legislative patchwork produced by a combination of TRIPS, WIPO Treaties and European law means that policymakers do not have a very wide range of options when it comes to altering some of the most important pieces of IP law in the short term. In the longer term, they can hope to influence the policy discussions and debates that take place within Treaty-forming bodies, such as WIPO and the WTO, and at European Union level where the Patent Office commonly represents UK policy. This is a lengthy process. However, the following areas can be identified as potential levers for change at a domestic level:

Patent breadth, not depth

Patent length is dictated by TRIPs and must be at least 20 years. However, governments have significantly more leeway in deciding patent breadth.

Patent breadth determines the scope of the patent award, limiting or extending the technological coverage of the grant and defining where subsequent inventions will be infringing or non-infringing advances on existing inventions. In short, patent breadth reflects the extent to which innovations are protected from competition.

Allowing greater breadth of protection can greatly enhance the strength of a patent monopoly. It can extend the "effective" life of a patent, that is the point at which the patent either expires or is displaced by a non-infringing innovation, either by encompassing all previous technological improvements providing "lagging patent breadth", or by encompassing new and improved products that utilise its patented technology, providing "leading patent breadth". Leading patent breadth is most likely to extend effective patent life, and "without it the rate of innovation may be seriously suboptimal" (O'Donoghue *et al* 1998: 4).

Countries are also able to control the administrative practices of their patent offices to ensure the system works efficiently. Most recently, concerns have been raised in the US regarding the workload and expectations of patent examiners at the US Patent Office. One solution that has been offered, and is currently being piloted in the US, is providing a system of 'peer review' for applications, enabling access to a wider group of experts and, hopefully, in the process, improving the quality of patents granted.

Copyright balance

For copyright, minimum terms are stipulated by international agreements. The UK is a signatory to all major copyright treaties, and, as such, can only provide protection at the level of, or beyond, minimum term in order to receive

reciprocal protection for its creative works overseas. Attempts to strengthen the regime by extending term continue in the name of harmonisation above and beyond international treaties. For example, the current discussion as to whether to extend protection for sound recordings is in part motivated by the fact that the US currently offers longer protection, and many in the music industry feel that the UK should seek to match this level. However, the UK Government is free to resist such calls, as they do not stem from requirements in international law.

Beyond length of term, the UK Government has scope in a number of areas to determine the balance between rights-holders and users. Rather than looking at rights of copyright holders, they can consider the rights afforded to users of content, in other words the fair dealing provisions. The majority of recent campaigns on copyright reforms have, therefore, focused on such areas, as well as issues surrounding the protection of DRM technologies (the anti-circumvention provisions).

The UK's copyright legislation is, in part, determined by relevant EU Directives. There is, of course, opportunity to revisit such Directives, and the EU Copyright Directive is up for review at the end of 2007, three years after its adoption. The EU Copyright Directive provided some scope for Member States to interpret and implement the provisions in different ways. Thus, while it sought to harmonise copyright legislation across the EU, some differences continue to exist from country to country.

Digital rights management

The emergence of DRM over the past 20 years, together with the recent laws that criminalise circumvention of it, heralds a new phase in the evolution of IPRs (see box 1.2). Rather than rights being granted by law and enforced by governments, copying protection technologies enable individual companies to decide upon the consumer freedoms and the public access that their product will allow. Those who use and defend DRM explain that it safeguards the commercial viability of creative industries and software production, for example by providing secure markets for IP producers to distribute their goods.

Critics argue that it signifies a 'Wild West' approach to property rights, in which rights are granted to anyone who has the capability to claim and defend them. For instance, there have been cases of companies using DRM to protect content that they do not hold copyright to, and yet the DCMA and EUCD make it illegal to break such protections, regardless. Together with growing use of tailored licensing arrangements, DRM means that the politics of IPRs are less and less about what lies on the statute book, and more about fragmented practices via which information is privatised and controlled.

There have been claims that both the DMCA and the EUCD go further than required by the WIPO Copyright Treaty. The latter aims only to defend DRM that is itself protecting copyrighted works, not to defend DRM *per se*. However, the EUCD leaves some room for manoeuvre for individual member countries. It states that Member States shall "take appropriate measures to ensure that rights-holders make available to the beneficiary of an exception or limitation [to copyright] the means of benefiting from that exception or limitation" (Article 6 (4) EUCD), thus obtusely addressing the problem of copyright exceptions, or fair dealing, that can be hindered by DRM.

Countries have chosen to interpret and implement these provisions in different ways. Germany's legislation covers only *technological protection measures* (TPM), meaning DRM that covers copyrighted works. In Denmark, the wording suggests that only DRM aimed at preventing copying, rather than access to the work, will be covered. For example, the Danish Ministry of Culture has previously asserted that DVD region encoding *can* be broken legally by the consumer, where this is to facilitate their own access, rather than for purposes of piracy. The UK, by contrast, has chosen to protect any technology, device or component which is designed, in the normal course of its operation, to protect a copyright work (The Copyright and Related Rights Regulations 2003). Thus, it would seem, situations outside the scope of acts covered by copyright are not included.

As far as exceptions to copyright are concerned, UK law states that citizens can complain to the Secretary of State where they feel their fair dealing rights have been limited by DRM. However, this does not apply to works "made available to the public on agreed contractual terms in such a way that members of the public may access them from a place and time individually chosen by them" (The Copyright and Related Rights Regulations 2003, Article 296 Section 9). This provision would not, therefore, apply to accessing on-demand works for example through Apple's iTunes Music Store, or other contract-based services. Denmark has a copyright licence tribunal that can instruct rights-holders to make works available to an individual or a group. Rights-holders have four weeks to comply, after which the user may legally circumvent the DRM.

Public domain and the public sphere

Throughout the preceding sections of this chapter, we have witnessed how IPRs seek an appropriate balance between the private interests of creators and publishers, and the public interest, however understood. Yet it is important to recognise that there is not necessarily a zero-sum game between the two: it is not the case that stronger rights automatically mean fewer benefits to the public, nor that pursuing greater benefit to the public will inevitably undermine the interests of rights-holders. There are two reasons for this.

Box 1.2 What is DRM?

DRM technologies consist of two main elements: the identification of IP, and the enforcement of usage restrictions.

DRM can identify, describe and set rules using technological means. For example, DVDs and CDs can be *watermarked*. Watermarks are incorporated into the fabric of the content, and this mark follows the content when it is copied, no matter how the copying occurred. Watermarks can be used to guarantee the integrity and authenticity of digital content, and ensure that bootleg copies are unusable. A copied DVD can be recognised as illegal when the watermark does not match the number pressed onto the plastic of a DVD disk.

Encryption can be used to scramble content in order to make it unusable for unauthorised users unless they are in possession of the relevant 'key': the code that can cipher the encrypted message.

DRM techniques are not new. The Serial Copy Management System was developed in the 1980s for use on CDs. It used copy control marks, which enabled digital copies to be made from the 'master' copy but not from subsequent copies. Region encoding, the system that prevents DVDs from being viewed in a region other than that in which they were released, has also existed for many years.

Firstly, those individuals and organisations that produce and profit from IP have, at some stage, benefited from various public goods, such as an education system, libraries or just a generally dynamic culture. A society that invests in these public goods is likely to produce more high-quality IP at some point down the line than one that neglects them. This is not to say that these public goods cannot themselves be partly covered by IPRs. Libraries and schools provide copyrighted as well as uncopyrighted works, just as new bands may be inspired and influenced by a CD that they have paid for.

What is most important in all of this is that public goods remain publicly accessible to a reasonable extent so that this sort of inspiration can continue to happen, and not necessarily that they be made entirely free of IP protection. If IPRs create an incentive to produce better artistic and scientific work, then it can just as easily be in the long-term public interest to strengthen rights as to weaken them.

Secondly, there are plenty of ways in which cultural and informational goods can be provided for free, without this undermining the interests of rights-holders. Museums, libraries and archives can, for the most part, easily co-exist with commercial publishers, although the digital age is making

this relationship more unwieldy. There are circumstances in which zero-sum games *do* arise, such as when the BBC considers making a service available for free that another organisation operator has been making available only commercially. But the civic goals of inclusion, education and cultural vibrancy can very often be pursued through institutions and policies that pose little threat to IPRs, and do not imperil business models.

Underpinning this analysis is an important distinction between two separate uses of the word 'public'. On the one hand, there is what we refer to as 'the public sphere', the national and international space of free, unregulated discussion that was initially made possible by the rise of newspapers and pamphlets in the 18th century. This may just as easily consist of protected works, such as new novels, as of unprotected works, such as classic texts. On the other hand, there is what is known as 'public domain', which refers to information and content that, for one reason or another, is ineligible for IP protection and should, therefore, be readily accessible in a public sense. This distinction is critical, and needs to be explored in detail.

Public domain

Public domain is often likened to a 'common', in an intellectual rather than a physical sense. Put simply, public domain is information that is not covered by IPRs or held in secret, but it is not itself a recognised legal category in its own right. As a specific type of publicly available information, it refers to a finite subset of the public sphere more broadly. For instance, if you are watching SKY News, the information being broadcast is quite evidently being made 'public', but the content remains covered by copyright, and is, therefore, not in 'public domain', which also explains why it is not made freely available over the internet. But a work of ancient philosophy is in both public domain *and* the public sphere, because it is publicly available and not covered by copyright.

Public domain can, therefore, be divided into two major categories:

- Information that is not subject to IP protection because either protection has expired (for example, a Shakespeare play), or because the information in question is not eligible for protection (for example, a mathematical formula).
- Information that could be protected but which has been designated as freely available (for example, government-funded research, such as the development of the World Wide Web by Tim Berners Lee at CERN).

Thus, ideas or facts, which cannot be protected by copyright, would fall under the first category, as would an invention subject to a patent awarded over 20 years ago, or creative works for which copyright protection has expired. The second category includes much of the work undertaken by universities and some government agencies.

Public domain is often posited as the direct opposite to information covered by IPRs; the open common to IP's enclosed land. However, this is misleading. After all, it is mainly because IPRs have a limited lifespan that public domain achieves its definition. Prior to the introduction of IPRs, it was not the case that everything was unowned, or that everything existed in common. Until the introduction of the Statute of Anne, for example, printing and publishing were controlled by the Crown through the Stationer's Company. Literary works were not published freely, but were subject to a perpetual monopoly held by the printer. The hope must be that a strong IPR system and a vibrant public domain feed into each other in a virtuous circle, with future rights-holders feeding off public domain, and protected works falling back into it after an appropriate period of time.

The public sphere

The public sphere is one of the most important legacies of the European Enlightenment of the 18th century. The concept encapsulates various activities, including the free circulation of ideas, the critical use of political judgment and comment, art criticism and satire, and open dialogue in pursuit of progress. Technologically speaking, it is newspapers, pamphlets, broadcast technologies and the internet that make the public sphere possible, although we should not underestimate how useful these same technologies can be in the hands of those seeking to suppress public debate. Face-to-face environments, such as coffee shops, may also have played an important part in the formation of the public sphere, but there is no doubting that the ability offered by the printing press to conduct discussions over distance was a critical enabler of this phenomenon.

The public sphere has both moral and legal underpinnings. The most important moral norm of the public sphere is that of inclusiveness or accessibility to all. As the most famous theorist of the public sphere, Jurgen Habermas, puts it very simply, "We call events and occasions 'public' when they are open to all, in contrast to closed or exclusive affairs" (Habermas 1961: 81).

The notion of 'social inclusion', or, in the context of the internet, 'digital inclusion', carries something of this essential public spirit within it. Indeed, some might argue that digital inclusion issues are not so much about access to hardware anymore, but rather about access to content or digital places through which people can take part in debate and informed discussion.

A second moral injunction is that arguments and works should be assessed on their own merits, and not on the status of the author. The publishing industry, together with prize-giving agencies and critics, carries responsibility for upholding this norm, through seeking out and celebrating new talent, and aiming to ensure that low quality work remains either unpublished or properly criticised.

The legal foundations of the public sphere are no less important. Insofar as copyright makes the modern publishing industry possible, it is a key factor in the modern public sphere. Whereas, previously, the state had fiercely regulated literary content that was intended for the public at large, the expiration of the Licensing Act in 1694 and the subsequent introduction of copyright meant more publications, as well as dissenting opinion, were able to enter a sphere of open discussion. Works were now distributed as commodities, subject to a new regime of property rights defined by the courts, rather than as objects of magnificence issued by Royal Decree.

The public sphere is further supported by IPRs as they apply certain conditions or obligations in return for protection. These ensure that the public in general can benefit from the creativity or innovation the IPR covers. Restricted uses provided under 'fair dealing' provisions and patent disclosures, for example, enable academics to copy small selections of works to illustrate their arguments by quotation, and would-be innovators are able to search patent databases to access a valuable record of technological advance. The defence of the right to comment, parody and criticise works further enhances the democratic potential of publications and the potential value to be experienced by individuals.

One question that 21st-century policymakers need to address when considering these issues is how important public domain is in buttressing the public sphere. As we have stressed, the fact that a book or song is under copyright may not prevent it playing an important role in the public sphere, so long as the publishing industry is in good health, retail outlets and libraries are well distributed and consumers are not priced out of the market. But there is undoubtedly something *particularly public* about public domain, just as Trafalgar Square has a *more public* quality about it than a National Trust Home.

Traditionally this was not an especially contentious issue, given that public domain content still had to be reproduced for the public, at not much more cost than protected content. A book that is in public domain, such as Austen's *Pride and Prejudice*, would have been only marginally cheaper than one that is not, such as one of JK Rowling's *Harry Potter* series, because a great deal of the cost would lie in production and distribution. But, with the emergence of widespread digital technology and the internet, the vast public potential of public domain becomes apparent. It is to this that we now turn.

Digitising the public sphere

The growth of the internet was seen as the beginning of a new era for the public sphere. As formal, mass media had become increasingly owned and controlled by corporations, the internet provided the potential for a renewed and revitalised sphere of communication. It offers opportunities

of equal access to all, removing publishing bottlenecks existing in the offline world and allowing anyone with access to the relevant technology the chance to publish thoughts, comments, news and information, first in text form, then increasingly in multimedia formats, such as audio and video. Two new publishing models have already emerged as a result.

Firstly, there are projects and licences that actively aim to support the sharing of information in the digital age. One of the foremost of these, Creative Commons, is a body that produces a range of licences that creators can apply to their work prior to publication, which allow them to take advantage of the internet's potential to distribute content quickly and easily. These range from the most restrictive (content can be shared, but not altered or commercialised) to the most open (content can be used for any purpose). Projects such as these need not be hostile to existing copyright law, especially since they are entirely compatible with it. But they are born out of a sense that the full public potential of the internet will not be exploited unless active steps are taken to define and protect public domain.

We raised the question, above, of how important public domain is to the public sphere: does unprotected material necessarily benefit the public more than protected material? In the digital age, there is a strong argument that it does, due to the internet's network structure and interactive nature. From some perspectives, the internet requires a new model of IP, one that offers permission to share and adapt content by default. Technology that lends itself to highly efficient knowledge sharing and collaboration requires legal sanction, which is what Creative Commons and similar projects aim to provide. Proponents of such measures would argue that the public interest in public domain is now far higher, given the opportunities to share and adapt that have only recently emerged.

Secondly, digital technology is altering the business model of commercial publishers, to enhance the profitability of 'the long tail'. Technology journalist Chris Anderson has developed this idea over a series of articles, a weblog and a book, to investigate how the vast growth in consumer choice afforded by the internet will affect retail and consumption patterns (Anderson 2006). What has emerged from his analysis is that the majority of online shopping transactions involve the purchase of niche goods that are not available on the high street. So, for instance, Amazon.com makes 57 per cent of its revenue from selling the books that cannot be bought in book shops.

If retail (including merchandise produced by the creative industries) used to revolve around selling *a lot of a few things*, it will increasingly revolve around selling *a few of lots of things*. The 'long tail' refers to this large number of small audiences, who collectively make up a sizeable segment of total market demand. Anderson argues that there is, potentially, as much or more revenue to be made from serving this market as in the traditional

'blockbuster' model (ibid).

Where digitisation introduces problems for our understanding of the public sphere, and specifically the role of IPRs in it, is in the ambiguous *temporal* identities of digital content. As argued in a previous ippr paper, commercial and non-commercial areas of information distribution tend to be distinguished from each other in terms of their time horizons (Davies 2005).

Civic or democratic dialogue occurs as a constant, short-term exchange of ideas, through the internet, in public spaces and political forums. A broadcast, on the other hand, would traditionally be understood as something that happened once or twice over a limited period of time. By contrast, the information that IPRs aim to protect is packaged into 'chunks' to be used, sold and consumed over a long period of time, potentially years. But, for those working in heritage organisations, such as libraries, the important time horizon is not just measured in years, but centuries. These different genres of public communication, and different time horizons, are laid out in Table 1.1.

Table 1.1: Different dimensions of the public sphere

	Deliberation	Service	Content	Heritage
Temporality of communication	Synchronous; active	Synchronous; passive	Asynchronous; temporal	Asynchronous; timeless
Examples	Socialising, debating	Performance, education	Academic paper, sound recording	'Great art', scientific breakthrough
Goal for policy	Greater access and inclusion	Investing in public domain	Creating incentives to innovate	Supporting preservation and conservation

What the table indicates is that the legitimate role for IP is to protect content sufficiently that it can be commercialised over the medium term, but not to protect it so much that it can't be enjoyed by the public in the short term, or preserved for future generations in the long term. The policy challenge is to enable these different spheres to co-exist happily, and prevent them from undermining one another. For instance, one would hope that libraries and publishers could respect the norms of copyrighted *content* and national *heritage* at the same time; or, to use another example, that those providing radio services could live side by side with those selling sound recordings.

In an analogue world, these different dimensions were kept physically separate. But digitisation reduces communication and information to a single format, and blurs the distinctions between separate domains, creating ambiguity. When, for instance, is a piece of multimedia content being provided as a 'service', with revenue returning to a broadcaster, and when

should it be understood as a piece of 'content', with all revenue returning to its producer? It is exactly this sort of fundamental question that Ofcom's 2006 Television Production Sector Review (Ofcom 2006) had to address, with the legitimate length of rights windows for broadcasters being hotly disputed.

Arguments between publishers and archivists demonstrate something similar. Publishers fear that digital archivists are creating non-commercial access points to copyrighted material that could replace their own commercial channels. In an analogue world, this fear of substitutability would not exist: the fact that a book or CD was available in a library would not be deemed to undermine its success in a shop.

As Table 1.1 outlines, this complexity creates diverse goals for policymakers, which too often tend to get treated as discrete areas of policy. IPRs become seen as an issue that only affects producers and innovators, without sufficient regard for their impact on other aspects of the public interest. As John Vickers, then Chairman of the Office of Fair Trading (OFT), commented, "central to the political economy of pro-competitive reform is the fact that the potential losers – protected incumbents (especially the less efficient) – tend to have a much louder voice than the far larger number of gainers – new entrants and above all the general public as consumers" (quoted in Vickers 2003).

The argument in this report is that government must seek ways of developing an IPR regime that balances all the various competing interests. Voice must, of course, be given to producers, but it must equally be given to those other groups who are affected by the way in which information is regulated. The four dimensions of the public sphere, outlined in Table 1.1, correspond to the four priorities that a public-interest IP regime must seek to balance: the incentive to innovate, the economic value of public domain, access and inclusion, and heritage. In the following chapter we explore each of these issues in detail, to assess how IPRs affect them individually.

2. Evidence: the consequences of intellectual property in the UK

The conflicts that occur around IPRs rest on disputes over the proper role of knowledge and culture in our society. In our analysis, there are four such roles that an IPR regime needs to factor in, which are sometimes exclusive to one another, but otherwise compatible, and even mutually reinforcing. These are: to provide for economic incentives to innovate; to uphold economic benefits of public domain; to safeguard civic inclusion; and to enable preservation of heritage. Those who depend on, or deal with, our copyright and patent systems on a day-to-day basis will very often be most concerned with one of these roles in particular, though not necessarily to the exclusion of the other three. Commentators and critics are often more dogmatic, however.

So, for instance, a software company that is dependent on IPRs to recoup its initial investment in its product will, understandably, seek to ensure that its rights are upheld as strongly as possible, thereby ensuring that future investments can be made in a confident fashion (see Phelps 2005). Equally, the 'creative industries' include a variety of companies producing intangible assets, such as film, computer games and designs, and often depending on IPRs to ensure that these are not shared excessively or reproduced elsewhere. Elsewhere in the knowledge economy, patents are an important mechanism for ensuring that science and innovation returns revenue to those who paid for it in the first place. As we discussed in the previous chapter, most economists accept that markets for intangible goods will not function unless government provides an element of protection for the producer.

Set against this economic benefit of protection is the economic benefit of information sharing and public domain. This is far harder to quantify because it affects the economy at large – and not just the national economy – but it should not be too hard to understand. Where firms feel that their position in a marketplace is assured, their incentive to innovate can fall, while the prices they charge can rise. Only the presence of competitors, and especially the threat of newcomers, can prevent this from happening and ensure that the public interest is upheld.

Freely circulating information ensures that no market advantage can be exploited for too long, and that competitors can swiftly benefit from imitating market leaders, although there is clearly an important question as to *how much* imitation is legitimate. It also enables reputation and 'network effects' to develop, which engender a well-functioning economy. Economists generally have much sympathy with this perspective, while

bodies such as the UK's OFT and Competition Commission are tasked with upholding it in practice.

Then there is the goal of ensuring access to materials that have a civic or educational function. We argue that copyright and patents already play an important role in upholding the norms of the 'public sphere'. Copyright enables the publishing industry to function, which, in turn, ensures wide distribution of content. And, because a patent involves the publication of information about the innovation concerned, it prevents excessive secrecy in the market. However, there are worrying instances of valuable information being protected that ought not to be, of academic researchers feeling unduly constrained by IPRs, and of DRM threatening to encroach upon fair-dealing rights of consumers. Where market openness has a cheerleader in the form of the OFT, it is not at all clear whose responsibility it is to speak out against these latter constraints and threats to a healthy public domain.

Finally, there are the interests of heritage organisations, archives and libraries. These bodies have the weightiest task of all, that of ensuring preservation of knowledge and culture from one generation to the next. While they must be sympathetic to the interests of rights-holders, they must also seek to operate according to much longer time horizons. The task of making heritage available to the public is made substantially easier thanks to copyright exceptions such as library privilege and fair dealing, although these do not extend far enough to enable reproduction of archived content online, except where it can be proven to lie in public domain. However, the problem of 'orphaned works', that is content whose rights-holder cannot be identified, means that preserving heritage can be inhibited by the current IPR system because of the fear of costly legal proceedings.

An IP system that is credibly built around the public interest is one that recognises the legitimate claims of all four of these groups. In this chapter we seek to lay out empirical evidence of how well knowledge performs each of its four roles in the UK, and to investigate the part that IPRs play in supporting or inhibiting these roles. Those who already privilege one above the other three are unlikely to have their views changed by this. But there is much to be gained from developing a common understanding of the realities of IPRs, and to lay out the strengths and weaknesses of our current system in this interdisciplinary fashion. How one weighs up economic against cultural or moral value is another question altogether, but we begin by collecting the available evidence.

IPRs as incentives to innovate

The economic justification for IPRs is very simple. The opportunity to attain monopoly rights to an invention or creation creates an economic incentive

to produce them that might otherwise be lacking. By solving this incentive problem, copyright and patents aim to increase the overall rate of innovation for the benefit of society and the economy, while ensuring that the relevant firms and individuals are rewarded along the way. Where IPRs are used simply to extract rent on a certain product, they perform no useful economic function, but where they affect innovation overall, they perform a crucial role in our industrial make-up.

The economic importance of the UK's knowledge- or creativity-based industries has repeatedly been recognised politically. The Culture Secretary Tessa Jowell has said that "our economic future lies in high-value, knowledge intensive industries" (Jowell 2006), while Lord Sainsbury, Parliamentary Under Secretary of State for Science and Innovation, has noted that, in today's economic climate, "we have to compete head-to-head with countries like China which have wage costs which are five per cent of ours. In this new world innovation has to be central to our economic success" (Sainsbury 2006: 3). IPRs are a factor in achieving this, but the precise role is difficult to specify.

This account of the importance of innovation has a long history. As far back as the 'virtuous circle' of Adam Smith, knowledge and information, leading to innovation and improvements in technology, have been key to growth and productivity. But, while previous theories had left much of the process of innovation outside of government's or indeed anyone's control (Solow 1956), in the late 20th century, endogenous growth theory began to outline a process whereby a number of actors – including firms, workers and, crucially, governments – could influence innovation.

This is particularly relevant to the UK, given it already has a high rate of employment, exceeding those of comparator nations such as the US, Germany and France. The inclination of government has, therefore, been to focus on other areas that could be improved to enhance the UK population's standard of living, and the competitiveness of the nation as a whole. Most attention has been focused on improving productivity, with one of the key indicators to measure improvement being levels of innovation.[4]

Innovation itself is difficult to measure and to increase directly. Since knowledge and information tend to lead to behavioural innovation, the Government seeks to increase knowledge in a number of ways. It invests in education and skills, publicly funds research and development (R&D) activity (primarily through the higher education funding councils, but also through R&D it commissios, often in the area of defence), and aims to ensure that best practice is disseminated to SMEs through Regional Development Agencies and similar bodies. Most relevant to this discussion, the Government attempts to influence private institutions and companies to invest similarly in R&D through providing IPRs.

IPRs have taken on new importance in the UK over the last decade with

repeated talk, in the UK and Europe, of the importance of the 'knowledge economy'.[5] In 2002, the UK was still the sixth largest manufacturing nation in the world, accounting for just over four per cent of worldwide value added in manufacturing. However, this is behind not only the US, Japan, Germany and France but, perhaps more importantly, China, which accounted for six per cent of worldwide value added, and is generally considered as only just beginning to realise its economic potential.

As manufacturing declines in the UK, 'value added' services, skills and innovations consequently become more important to the economy. What enables these to add value to the national economy, rather than contributing to a pool of general knowledge with no direct economic term, are IPRs. These enable the privatisation of knowledge, where otherwise it would be a public good.

Private investment in R&D, backed by IPRs, is seen as the key component in a flourishing knowledge economy because of both the lack of resources governments have to invest in other areas, such as education and public R&D, or the fact that such investments are not 'tied' to the national economy.

While the UK has an extremely successful existing science and innovation knowledge base, ranking first out of G8 countries for research productivity (DTI 2006), the UK also suffers from a substantial 'brain drain', with graduates frequently leaving to seek employment or engage in further research overseas (Schiff and Ozden 2005). In such instances, knowledge is contained in the individual graduate or researcher, and is transferred as they move to different companies, or countries. To ensure the UK benefits from its strong science and research base, the Government has sought to strengthen links between universities and business (the subject of the Lambert Review 2004), using IPRs as a tool to encourage businesses to fund collaborative or contractual research undertaken in universities, as our Plastic Logic case study illustrates.

Public investment in R&D declined during the 1990s, chiefly because of cuts in defence spending (DTI 2005), and it is not considered a priority to increase it. While the Government's 10-year framework for investment in science and innovation aims to increase R&D spending to 2.5 per cent of gross domestic product (GDP) by 2014, only 0.8 per cent is intended to be public investment. The remainder is expected to come from businesses (HM Treasury 2004). While being only one part of the knowledge creation system, IPRs are the key economic instrument to generating investment beyond that afforded by taxes.

Knowledge-driven industries

The proportion of a country's GDP contributed by knowledge-driven industries is difficult to measure, as it would involve calculating the knowledge-

based component of every single product and service produced. The OECD defines a number of sectors as knowledge-based industries:

- High-technology and medium-high-technology manufacturing industries (henceforth referred to as 'higher technology manufacturing industries'), such as aerospace and computer equipment manufacturers.
- Knowledge-based services, such as telecommunications and finance.

In 1998, the UK lagged behind Germany, Japan and the US among the G7 countries for share of total output accounted for by higher technology manufacturing industries leading the UK Government to launch a global competitiveness strategy (DTI 1998). Between 1995 and 2001, value added by these industries increased by 15 per cent in the UK, compared to 46 per cent in the US, 22 per cent in Japan and 10 per cent in Germany. Growth in knowledge-based services has been much more impressive. Value added increased by 56 per cent in the UK between 1995 and 2001, compared to 40 per cent in Germany, 44 per cent in the US and 33 per cent in Japan (Trade and Industry Select Committee 2005).

However, levels of patenting activity in the UK have continued to be characterised as 'average' (OECD 2005). In 2004, the UK Patent Office received 28,223 applications and granted 10,541 patents to innovators across the world. UK innovators were granted 36 per cent, with the USA receiving 28 per cent. The UK's share of patents registered at the Japanese Patent Office, the US Patent Office and the European Patent Office, commonly called triadic patents, was just four per cent in 2002, having seen a slight decline since 1991. This is compared to 35.6 per cent for the US, 25.6 per cent for Japan, 14.1 per cent for Germany and 4.8 per cent for France (OECD 2005). In terms of patents per population, the UK does perform at roughly the same level as France, though below that of Germany and the US (DTI 2005).

The UK's R&D intensity[6] is only 1.9 per cent, below that of key competitors, such as Japan (3.2 per cent), Germany and the US (2.6 per cent), as well as being below the EU average. While decline in the 1980s is attributed to decreases in government spending, the fall in the 1990s is mainly due to reductions in industry-sponsored R&D (DTI 2005). Attempts to increase this have focused on the IP regime and improving this in order to make it more attractive for companies to invest.

The creative industries

Since copyright is not a registered right, it is difficult to assess how much value copyright itself transfers to the creative industries. Surveys tend to focus on the creative industries in general, defined as those industries whose wealth creation is dependent on copyright.

In the UK, the creative industries accounted for 7.8 per cent gross value

added (GVA)[7] in the UK in 2003 (approximately £56.5 billion), and grew by an average of six per cent per annum between 1997 and 2002. This is faster than the economy as a whole, which grew at an average of three per cent per annum over the same period (DCMS 2005). These figures are above average for the EU, and compare favourably with key comparators such as the US (Media Group 2003).

The creative industries are important in the national and international context. In the UK, exports by the creative industries contributed £11.6 billion to the balance of trade in 2003, accounting for 4.1 per cent of all goods and services exported (DCMS 2005). Given that the UK experienced a net deficit of trade in goods (-£14.9 billion) in the first quarter of 2005, but a net profit of trade in services (+£0.5 billion) during the same period (IMF 2005), the importance of protecting these assets internationally is clear. It is further emphasised by the size of the global creative industries market, which increased from $831 billion in 2000 to $1.3 trillion in 2005 (NESTA 2006).

In the UK, the largest contributors to the creative industries sector are: software and databases, which generate 2.8 per cent of GVA (a growth of 11 per cent between 1997 and 2003); publishing, which generates 1.2 per cent of GVA; and TV and radio, which generate 0.9 per cent of GVA. Music and advertising contribute 0.5 and 0.8 per cent of GVA respectively (DCMS 2005). While music is not one of the largest creative industries, it is often the one given the most political focus because of its cultural value, and the fact that the UK is home to the second largest music industry in the world, after the US. It is also seen as one of our most successful creative exports.

However, since 2002, the number of businesses within the creative industries sector has declined by 5.8 per cent, with only the radio, TV and architecture sectors continuing to grow. Total GVA contributed by the creative industries has declined by 0.3 per cent over the same period, although export values have continued to grow (DCMS 2005). Concern has arisen over the recent decline in the creative industries' prosperity, and the failure of UK productivity to improve dramatically. The IP regime, in providing a key incentive to innovate and formal protection for creative works, has come under increased inspection in order to see how it could be improved to boost the UK's global competitiveness.

The size and contribution of the key IP-producing industries is displayed in Table 2.1. Individual companies operating within these industries have spoken out in favour of defending the current IP regime as protecting significant levels of investment in R&D (Phelps 2005). For example, speaking at an ippr event, Chris Parker of Microsoft argued, "the importance of a strong and vibrant IP system is at the heart of innovation" (Parker 2006).

The British Phonographic Industry (BPI) has argued that the current level of IP protection should be extended, arguing that, "British music is

one of Britain's greatest ambassadors, but failure to extend term [for sound recordings] could turn an export into an import" (Culture, Media and Sport Select Committee 2006). The table is indicative of the types of industrial practices that IPRs are intended to bolster, and which any weakening of the IP regime potentially undermines.

Table 2.1: Size and contribution of key IP-producing industries

	Employment generated (to the nearest 1,000)	GVA (%)	Exports
Pharmaceuticals	73,000	0.9%	+ £3.4 billion
Software	594,000	2.8%	£3.9 billion
Book publishing	30,000	0.2%	£1.36 billion
Newspaper publishing	55,000	0.5%	-
Music industry	244,000	0.5%	£240 million
Radio and television			
111,000	0.9%	£1 billion	
Advertising	200,000	0.7%	£1.13 billion
Film	47,000	0.3%	£800 million

Source: DCMS (2005); ONS (2004)

Yet, as we are about to explore, the fact that these industries produce IP is not the same thing as saying that they are entirely dependent on IP. Their ability to commercialise their knowledge depends on relationships, skills, speed to market and various other factors, in addition to IP.

What do we know about IP's role in the economy?

IP is intended to give companies the confidence to invest in R&D activity, safe in the knowledge that, depending on the commercial value of their innovation or creativity, they will be able to secure financial return on this investment. The incentive provided by IPRs is likely to be higher in industries that tend to have higher upfront investment costs. Patent protection has been found to have a stronger influence on the willingness to invest of pharmaceutical firms than on the willingness of firms operating in the generic chemicals industry, for example (Taylor and Silberston 1973). The removal of patents has been shown to reduce distribution of knowledge as innovators instead turn to secrecy (Moser 2003).

Although we acknowledge that the incentive offered by copyright is harder to quantify, it has clear benefits where upfront investment is required to develop a project: films are often financed by selling a proportion of the future rights in return for financial investment, for example. In addition, prior to the Statute of Anne, many authors died in poverty – Milton and Shakespeare, for example – as no mechanism existed for them to generate income from their endeavour.

When looking at ways to make the IP regime more attractive, the focus

is often on strengthening rights, and, in general, an assumption has been made that stronger rights necessarily provide a stronger incentive. This is not the case. Previous increases in patent protection have shown "no evidence of an increase in either level of research and development spend or innovative output that could be attributed to patent reform" (Sakakibara and Branstetter 2001: 1), while the value of copyright extension has also been shown to be very small indeed. The extension for protection of sound recordings in the US, from 70 to 95 years, is estimated to bring a mere 0.1 per cent increase in revenue (Akerlof *et al* 2002). Proposals for a similar extension in the UK are currently under review.

Determining the value of intangible assets

An increasing use of IP is to secure financing. This is particularly the case within SMEs, who may experience a 'finance gap' as they attempt to develop their idea and bring it to market. Typically, SMEs also have fewer tangible assets available for use as collateral, so they must seek to trade on their intangible assets, either by licensing production to another company, thus limiting risks in investment, or by approaching venture capitalists that may finance a project in exchange for a share of the IP.

As a result, being able to attach a value to intangible assets is important. However, it is very difficult to do. Products will have little track record and, particularly in the hi-tech market, may be subject to high rates of obsolescence.

Value of protection is not exponential: it does not necessarily increase with length or breadth of term, but is very much dependent on the product or service the IPR is protecting. Studying the period between 1883 and 1964, when copyright in the US was set as a once-renewable term of 28 years, Landes and Posner found that fewer than 11 per cent of copyrights registered in literary works for this period were actually renewed (Landes and Posner 2003). Meanwhile, more than half of the patents granted are voluntarily cancelled within 10 years of the date of application (Cornelli and Schankerman 1996).

However, being able to use IP to raise funds is important, and is likely to become more so if the UK is to expand its knowledge-driven and creative industries, particularly within the SME sector.

Piracy

A further impact on the value of IP protection is the efficacy of this protection, which has been put under pressure with changes in technology. The internet and advances in digital technology have undoubtedly made unauthorised copying and distribution of goods easier, enabling individuals to share digital goods, such as software or music, with millions across the globe whether they are protected by IP or not.

Piracy is typically thought of as a problem for copyrighted goods, though, of course, it is of equal concern where counterfeits of designer or trademarked goods are concerned. IP crime more generally is a problem for all types of IP, and, despite being provided with patent protections, many innovators find their goods are imitated, and often very soon after patent protection is granted. However, while it is true that patents are regularly infringed, they also slow down, and increase the cost of, imitation, providing the original investor in knowledge more time and space to recover their costs (Mansfield 1981).

The Recording Industry Association of America (RIAA) estimates that the recording industry loses $4.2 billion each year to piracy. The Business Software Alliance and IDC found that 27 per cent of software in use in the UK was pirated (BSA 2005). At its peak, the most popular file sharing network, KazAa, was estimated to have been downloaded onto 140 million machines (BBC News, June 2005).

Halting the illegal activity of sharing music online became a major focus of record industry organisations, with both the RIAA and the BPI seeking to fine or prosecute the most prolific uploaders of copyrighted music, and investing in DRM technologies to prevent such misuse in the first place. The Government itself has produced the National IP Crime Strategy, which aims to bring together different parts of government, industry stakeholders, policymakers and enforcers, to create a coordinated approach to intellectual property enforcement (Patent Office 2004).

DRM technologies are important for combating piracy, and are intended to regulate this flow of information, and to provide secure markets for IP producers to distribute their goods. While their role in limiting access or sharing of information has been given the most focus and been the most controversial topic of debate, DRM technologies also play an important role in managing rights and, in turn, enabling differential markets for goods. For example, they can enforce pricing structures that differ depending on the intended use of the product.

A film can be distributed to cinemas, DVD rental outlets, broadcast TV, and via streaming or digital downloads. Each market is likely to demand a different pricing structure, and licence, for the same good, because they have such varying uses, and are intended for either individual or mass consumption. DRM has a clear role in managing such markets, in particular for differentiating between streaming and download, rental and ownership.

The role of other protections

Copyright and patents are not the only protections available; indeed, they may not even be the most important ones. The recent Community Innovation Study undertaken by the DTI shows that the most popular forms of protection used by businesses are individual measures such as

trade secrets, confidentiality agreements and the like (DTI 2004). Whether this is because the cost of enforcing formal IP rights is too high, because of a lack of confidence in the IP regime, because existing rights are not flexible enough, or merely because of differing business models, it remains the case that IPRs are not the only tool available. Within the creative industries, for example, almost 50 per cent count lead time – that is, entering the market before their competitors – as providing a strategic advantage and enabling financial return from their investment (DTI Innovation Report 2003).

Regardless of the different value of protection, some products retain their value for much longer than protection provided. The compositions of Mozart, the paintings of Van Gogh and the plays of Shakespeare are key examples of goods that remain capable of generating economic value hundreds of years after their creation, and, on this basis, it has been argued that protection should be provided indefinitely and used, or surrendered, as necessary. However, the flipside to private IP protection is public domain, which potentially provides significant economic value. Extending protection means sacrificing this economic contribution. We now turn to considering what this potential economic value is, and how we can calculate it.

The economic value of public domain

Publicly available resources perform a variety of important functions in the economy, from which individual businesses, consumers and citizens all benefit. The unrestricted circulation of information helps to bridge information asymmetries between buyers and sellers, which enables the former to take more informed decisions about the value of a product. Vibrant public cultures can also generate new businesses, because entrepreneurs can find one another more easily, and networks between sectors can be established with greater trust. In the creative industries, it is through the performing and sharing of art that reputations can develop, new opportunities arise, and economic growth can then happen.

Economists believe these things to be true, but have a far harder job demonstrating them, or evaluating the value of public domain in quantitative terms. Measuring the value of public domain is enormously difficult, not least because it contains such a diverse and diffuse amount of information, creative goods and data. It would involve creating a model under which all information currently in public domain were privatised, and assessing the impact of this on creativity and innovation today: a practically impossible task.[8] To a great extent, we must simply accept its place as the inspiration, or building blocks, of future scientific and artistic developments.

There are, however, other ways to determine the value of openness as opposed to IP protection. We can look at specific examples where informa-

tion in the public domain has been used to great effect, or where rights-holders have chosen not to enforce their rights for various reasons, to provide some evidence. The benefits of these approaches are often only quasi-economic. In many cases, such as the World Wide Web, their economic benefits are indirect ones: it is very difficult to say what the value of the World Wide Web is itself, but possible to recognise the innovative potential it unleashes. In other cases, the benefits have to be captured in terms of non-economic utility: things that are quantifiable and desirable, but not strictly economic in nature.

Where does public domain add economic value?

Perhaps the most obvious point at which public domain contributes to the economic growth of the country is in public education. The open teaching and circulation of knowledge in this environment produces a skilled and educated workforce who may go on to be successful innovators. It also increases a country's absorptive capacity (Cohen and Levinthal 1990), that is, the ability of workers and firms to recognise the value of new information and innovations and apply them to commercial ends.

Recent research has shown that raising the education attainment levels of the adult population can have a direct and positive impact on GDP and employment (Leitch 2005).[9] One international study found that, if investment in skills and education (as a share of GDP) is increased by a tenth, output per worker will rise by six per cent, and, if this investment doubles, output per worker will eventually rise by about 50 per cent (Mankiw *et al* 1992).

Beyond this, knowledge in open circulation can add value in numerous ways. When knowledge is created, positive externalities occur. These are benefits that accrue to either the economy at large or related industries besides those private benefits that may be experienced by the knowledge creator. Measuring these spillovers is notoriously difficult, unless we have strong *a priori* notions about who are the potential beneficiaries of research (Grilliches 1992).

But evidence for private spillovers does exist, and most of it seems to play out at a regional or local level. Jaffe found that firms received more patents per dollars spent on R&D activity in clusters of industries where more R&D was performed by others. He also found a positive association between industry R&D and university research (Jaffe 1989). University research also has value in encouraging a communality of scientific inquiry, which assists in the "rapid validation of findings and a reduced excess duplication of research efforts" (David 2003: 19). It encourages work towards collaborative research and the development of complementary discoveries.

Recently there has been a campaign to recognise the value of providing

open access to public sector data, that is, data that has ultimately been paid for by the taxpayer. Public bodies are by far the largest providers of information in Europe. They collect a large amount of information and raw data that can stimulate the development of numerous value-added products, for example mapping information, environmental and meteorological information and census-based services. The opportunities for using this information have been heightened by technological developments, with services such as UpMyStreet (www.upmystreet.com), which uses publicly available data to provide new and innovative services to consumers.

However, most European governments claim copyright on the information they produce and have targets for operating cost recovery pricing on uses of data. In the UK, the Government's investment in public sector information in 2000/01 was £758 million (Euro 1.25 billion). Around 57 per cent of this accounts for the acquisition of geographical data: mapping, land registration, meteorological services, environmental data and hydrographical services. The UK is the most consistent within the EU for setting high cost-recovery goals for its public agencies, and some even make a profit. The Land Registry recorded 119 per cent cost recovery and the Meteorological Office 107 per cent for the period 2000/01 (Pira International 2000).

An analysis by the European Commission suggests that, if the UK Government were to relinquish copyright and input such information into the public domain, the estimated benefit to the UK economy would be Euro 11.2 billion (Pira International 2000). Since the majority of the data is national rather than global in nature, it follows that subsequent investment should be to provide UK-based services, hopefully stimulated by UK entrepreneurs.

There are international precedents that the UK could follow. The US does not have government copyright, and fees for public sector information reuse are limited to recouping costs on dissemination, not acquisition. Looking at the particular impact of meteorological and related environmental information, Weiss (2003) identifies a collection of weather-sensitive service industries, which contribute $3 trillion to the US economy, that rely on information produced by a large and growing meteorological industry. This industry itself contributes half a billion dollars annually. In comparison, the European commercial meteorological sector, despite offering a similar size market and economy, is smaller by a factor of 10.

In offering the building blocks of science, innovation and creativity, the public domain offers great input to industries with a high degree of 'cumulativeness' – those industries in which each inventor builds on previous developments and discoveries. Such industries include biotechnology, computer software and computer hardware, all of which are of significant economic importance to the UK. Indeed, incidences of networks and collabo-

rations provide one of the UK's favoured indicators for measuring innovation. This is because it is increasingly true that firms do not innovate alone. Instead they rely on formal or informal networks of other companies, universities, and government research laboratories, as well as input from their suppliers and customers.

Creative content where copyright protection has expired can also provide opportunities for economic return. Brooks' report comparing the re-release of sound recordings in the US, which has a longer duration of copyright in sound recordings, to Europe, where many of the works are now in the public domain, shows that, for every five-year period prior to 1945, non-rights-holders have issued more historical recordings than rights-holders at a ratio of close to two to one (Brooks 2005).

Openness over private protection

There are instances where being open with one's discovery or freely distributing the fruits of one's creative or innovative endeavour can be of positive *private* benefit to the company or individual concerned. Openness can create sampling and network effects that can result in positive economic impacts for producers (Pollock 2006).

Sampling effects

Commercial industries have often used free sampling, or giveaways, to create demand for a product. For example, marketing strategies often include the free distribution of a sample of shampoo within the pages of a magazine, or the provision of free tasters of new food products in supermarkets. Movie trailers provide a similar chance to sample the good before one chooses to purchase it: they allow the viewer to see a section of the film for free before demanding payment for the whole movie. The iTunes Music Store allows customers to listen to a 30-second sample of a track before they are required to pay for the entire download.

Many emerging bands have used the internet to market their product virally, and have allowed downloading or streaming of certain tracks for free in order to stimulate a wider market for their commercial product. The Arctic Monkeys allowed fans to share tracks via CDs and social software sites such as MySpace.com, while later reaching number one with their debut single, and achieving the fastest-selling debut album of all time.

Despite the music industry's hostility towards peer-to-peer (P2P) file sharing, some have argued that it offers similar sampling effects, allowing consumers to try before they buy, and that the net gains to society – by allowing 'public domain' type access to music – is around $45 dollars per person (Rob and Waldfogel 2004). A fuller discussion of the benefits, or otherwise, of P2P file sharing for music is available in Pollock (2006).

Recent evidence shows that illegal downloaders of music do, in fact, purchase significantly more music than the average fan: they spend an average of £5.52 a month on legitimate online music sites, compared to £1.72 a month from those not illegally file sharing (Gibson 2005). A survey by the Canadian Recording Industry Association (CRIA) found that only 25 per cent of respondents said they never bought music after listening to it as a P2P download track (Pollara 2006).

In a similar way, creators or innovators will choose to release their discoveries openly in order to gain reputation rather than direct financial reward. This approach to innovation and discovery is most apparent within the scientific and academic communities (see Merton 1973). These communities rely to a large extent on reputation as an incentive for academic advances.

However, contrary to what some believe, sampling or exposure strategies still rely heavily on IPRs for their success. In the case of the Arctic Monkeys, providing free access to their music did not equate to relinquishing copyright. By using copyright as an asserted right, they merely chose not to exercise these rights in certain situations and under certain conditions. Had other music acts attempted to pass off Arctic Monkeys' material as their own, or a record label attempted to release the original recordings without agreement from the band, the group would have been able to seek recompense for copyright infringement. This degree of choice that copyright grants the rights-holder is one of the system's main strengths.

Network effects

In a similar fashion to sampling effects, network effects can also occur where, as a result of a product gaining new users, the value of that product to existing users goes up. For example, the value of a telephone very much depends on how many people you can call using this technology. Likewise, social software, such as an Instant Messaging application, is more valuable the more people who use it.

There have been repeated claims that certain industries have been helped by enforced openness, or piracy, particularly with respect to software companies where network effects exist (Connor and Rumelt 1991). Others (Tze and Poddar 2001) have denied that such statistical modeling can represent actual markets, and state that protection is always optimal. Regardless, preventing piracy, or enforcing one's IPRs, clearly has a cost. Where such costs are high, there will be a point where it is uneconomical to prevent piracy (King and Lampe 2002).

As well as direct network effects, openness can also enhance indirect network effects. Indirect network effects occur when the increased use of one product, such as printers, pushes up the value and usage of other related, complementary products, such as printer cartridges.

Indirect network effects are often used to increase demand for services or hardware. So, for example, the amount of information available online has a positive network effect on search engines, such as Google, which become more important for those seeking to navigate their way around the internet. Open source software is often distributed at no or low cost, with firms offering subscription support services in order to gain financial return from the product.

This type of service industry is a crucial part of the UK's industrial make-up. Like the creative industries, these businesses involve the sharing of information and content, but make money through associated products, advice and guidance services, rather than on the back of IPRs.

This business model can be particularly successful in local or specialised markets, for example by offering a trusted service providing support for educational software. However, the success or otherwise of such services can also be dependent on other factors, particularly reputations.

Access and inclusion

Rights-holders have certain obligations to facilitate legitimate civic and educational uses of copyrighted material, which are laid down in the concept of fair dealing. This is the term for uses of content that are not considered to infringe copyright, primarily because they do not involve copying the entirety of the work in question. They are exceptions to copyright, and provide a legal defence against claims of copyright infringement.

Users are allowed to copy small sections to allow for non-commercial research and private study, for criticism or review, for reporting current events, judicial proceedings and for teaching in schools. Fair dealing is not intended to have an impact on the incentive to innovate that IPRs provide. Instead, it enables open and free discussion of copyright works since, as long as the use is 'fair', prior approval of rights-holders is not required.

Actions that constitute fair dealing, and those that do not, are not explicitly defined in UK law. Instead, there is a list of general activities that are provided as exceptions to copyright. When new technologies emerge that give greater flexibility for individual users of content – for example, the tape recorder in the 1960s and the video recorder in the 1980s – the question of whether the actions such technologies enable constitute fair dealing has often had to be interpreted by the Courts, and direction is provided by case law rather than in copyright law itself.

It is worth bearing in mind that the UK has no private right to copy set out in law, although this practice has been undertaken by consumers since the advent of the tape-to-tape recorder many decades ago. Such behaviour has traditionally been excused because it was both hard to stop – especially with the introduction of cassettes, video recorders and photocopiers – and

because the transaction costs involved in such minor infringements were too high. Rights that users of content have long assumed have, in fact, been exercised because of a market failure rather than an exception to copyright.

Although such actions remain illegal, the BPI has recently stated that it would not pursue individuals for copying CDs on to their digital music players (Murray Watson 2006).

Fair dealing in the digital world

The move from analogue to digital content has had similarly profound consequences for the concept of fair dealing as it has for other aspects of the IP regime. While it is generally agreed, by the WIPO and the British Library, for example, that digital is not different, there is something fundamentally different about digital content in the context of copyright law. Copyright provides a right to copy and this right is restricted to rights-holders. In the analogue world, avoiding making a copy is simple. In the digital world, every time you access digital content, you make a copy. Reading an eBook on your computer at home, accessing it on a PDA on the way to work, lending it to a friend, all involve making copies of the material. So every single use needs to be justifiable under copyright exceptions.

Added to this, the market failure that existed with previous technological advances has now been eradicated. Providers of digital content can now control the manner, location and frequency with which users are able to access content with a high degree of sophistication.

Access control

Licences and contracts

Increasingly, rights-holders have attempted to make explicit what they consider to constitute 'fair dealing' by providing contracts and licensing agreements, which set out specific users' rights. Such contracts usually exist for accessing academic journals online, eBooks and other downloadable multimedia content, such as digital music and films.

The iTunes Music Store interprets fair dealing as allowing five copies of a bought song to be burnt, or copied, onto a CD, and unlimited play on up to five authorised computers. Licences that accompany eJournals and eBooks often stipulate how many times the content may be accessed over a given period. For example, the British Library references one journal for which the contract accompanying a year-long subscription allows 365 instances of access, regardless of the date and length of these.

In the UK, licences and contract trump copyright law, and can override fair dealing exceptions. A British Library survey found that, out of 30 licences surveyed at random, the vast majority did not give provisions as generous as those that would be provided under fair dealing or library priv-

ilege in copyright law. Restrictions included limiting the extent of the material that could be copied: one licence stated that 'misuse includes… reproducing in any way copyright material', a clear barrier to conducting research or criticising works (British Library 2006).

The Australian Copyright Law Review Committee commented, in its review of online licences, that many "contained items which explicitly or implicitly purported to modify the exceptions to the exclusive rights of owners set out in [Australia's] Copyright Act" (Copyright Law Review Committee 2002: 129). Such restrictions can cause problems in the short and long term, inhibiting the work of researchers and educators, and, therefore, the growth of our knowledge economy, and the archiving and preservation activities of libraries, which we turn to in the next section.

Digital Rights Management

The importance of DRM in enabling the creative industries to continue to have a market for their goods has been noted. But, as well as providing this necessary function, DRM can also provide a technological barrier to fair dealing. Since the protection given in law applies not only to DRM technologies that prohibit copying but also those that control access, there is scope for them to override copyright exceptions. Circumventing any technological protection measure is illegal, regardless of whether copyright law provides you with a legitimate defence to engage in activities the DRM is restricting. This can cause problems for consumers, where there is a lack of interoperability between proprietary DRM systems, for libraries in their preservation and archiving activities, for researchers, and for those with specific access requirements.[11]

At present, only a very small number of published titles find their way into any format accessible for the visually impaired. Assistive technologies have been developed that enable eBooks, in particular, to be translated into an accessible format, often by adding audio description or enabling the book to be read aloud. The problem is that many DRM technologies react defensively to assistive technologies as if they were trying to perform an infringing act, so often prevent them from working. Such problems have been frequently identified by organisations such as the Royal National Institute of the Blind (RNIB 2006), and were raised during the All Party Internet Group's inquiry into DRM technologies (APIG 2006).

We are not suggesting that the creative industries wish to exclude the disabled and the visually impaired from accessing works, but this issue highlights one of the main problems with DRM technologies. While the fair dealing exceptions and library privileges provided in copyright law are purposefully vague so that they can be interpreted on a case-by-case basis, DRM technologies are not yet sophisticated enough to mirror this approach, nor is it clear they ever will be. Private companies are now in the business of

defining citizens' rights with respect to fair dealing, a role previously left to the courts.

Current legal recourse provided to those in the UK who feel their rights have been restricted is to complain to the Secretary of State. Several organisations have commented on the potential failures of this approach (RIN 2006; APIG 2006). The Secretary of State may issue a direction in favour of the user, but has no backstop powers to ensure the rights-holder complies. It remains essentially a reactive measure with no provision to monitor deployment of DRM with the rights and expectations of citizens in mind.

Balances of power – large and small rights-holders

It has been said repeatedly that creative works build on past efforts. Likewise, a flourishing public sphere relies on the ability of individuals and creators to criticise, parody and provide general comment on existing creative works. Documentary film-makers, for example, will often require access to news footage, clips of films or music to illustrate their subject more fully. Researchers similarly require access, and often limited uses, of material for their purposes of their work.

The complexity of copyright, the vagueness of fair dealing exceptions, and the difficulty of negotiating licensing agreements mean that non-experts are very often at an informational disadvantage when they come to use copyright works, or, on the flipside, allow their works to be used by others. In either situation, access to legal advice and the financial wherewithal to defend one's position is key, and this is more commonly found with larger rather than smaller players.

Such an imbalance of power can have a detrimental effect on the public sphere. An academic's claim to a monopoly of rights in the poet John Clare's unpublished works has severely restricted literary research of his work (Goodridge 2000) while documentary film-makers have often faced high costs to clear rights for incidental uses of well-known works (Aoki *et al* 2006).

In the academic community, fear of the financial and reputational costs of litigation have apparently led to barriers to effective scholarly communication as librarians and researchers play more than safe in their own interpretation of their rights (RIN 2006). On the other side of the equation, the National Union of Journalists has complained on behalf of its members about the cost of pursuing infringers, which is out of the financial reach of the majority of working journalists (NUJ 2006).

This problem is mirrored in the patent world, where smaller patent-holders often find themselves unable to enforce their rights against infringers because of the financial resources such action would require. A recent European Commission study found that 49 per cent of patenting SMEs stated fear of the cost of patent litigation had a 'very big' or a 'signif-

icant' impact on their investment decision. The same study found that, while two-thirds of SMEs had experienced attempts to copy their patent, only one in five had used the court system to defend their rights (European Commission 2001).

Commercial and non-commercial research

A further confusion exists in the distinction between commercial and non-commercial research, which has become key for the everyday operations of libraries. The European Union Copyright Directive stipulates that librarians and archivists are only allowed to create copies of research that result in no direct or indirect economic or commercial advantage. Not only is this incredibly hard to distinguish, but it is the case that non-commercial research, in the immediate sense, may easily present some future economic gain initially unforeseen.

The Libraries and Archives Copyright Alliance (LACA) reports that at least one library has considered that the majority of requests for library document supply would be for commercial purposes, but that, because of the confusion over what constitutes commercial or non-commercial research, most would be requested under library privilege. Rather than engage in potentially infringing behaviour, the library has decided not to offer any library privilege copying whatsoever, and to supply everything copyright-cleared under a document delivery licence, regardless of the user's purpose (LACA 2006).

Digital preservation and heritage

Libraries, museums and national archives have long served countries' needs to maintain a cultural heritage. Public libraries also provide important points of access for those unable or unwilling to pay for content themselves. The content that libraries provide access to is changing. The British Library recently estimated that, by 2020, 40 per cent of UK research monographs will be available in electronic format only, while a further 50 per cent will be produced in both print and digital. They estimate a mere 10 per cent of new titles will be available in print only.

Digitisation of existing hard-copy content provides opportunities for libraries to facilitate wider access to their collections. They can scan important historical documents and make copies available online. The British Library's 'Turn the Pages' initiative provides digital access to precious books, including Leonardo Da Vinci's personal notebook and a transcript of *Alice in Wonderland* illustrated by Lewis Carroll, while keeping the original copies safely behind glass.

Digitisation can provide greater access to more mundane publications without the scarcity of supply that comes with hard copies. Provision of

electronic versions of works also means that users are able to access information remotely, without having to visit the library itself. For distance learners, people with limited mobility, and researchers who may be working in different parts of the country from one day to the next, this offers great opportunities to overcome previous exclusions.

Archiving digital content

Museums and archives are charged with managing our national collective cultural memory. Enabling access to and preservation of works in digital format is therefore a necessary exercise for such public bodies if they are to fulfil their statutory role (British Library 2005). While provisions exist in copyright law to enable archiving of most analogue content (making copies of films, sound recordings or artistic works, either digital or analogue, is not covered by copyright law exceptions), it is not clear that the law extends to archiving digital content, for reasons relating to how it is accessed, stored and copied, which are outlined below. This causes confusion over the legal status of librarians and archivists wishing to either provide digital access to existing analogue content, or archive and provide access to 'born digital' content.

The manner in which libraries and archives are increasingly accessing digital content is also providing confusion. Rather than a library actually owning a physical copy of a work, they often merely provide access to content hosted by a publisher or an intermediary. It is unclear whether remotely accessed items are considered part of the libraries 'permanent collection'. This distinction is important. If they are part of the permanent collection, then the library or institution concerned has considerably more scope for activities seeking to preserve permanent access to such content. If not, where a journal subscription expires, or a publisher goes out of business, the library may lose access to back catalogue content they have paid significant subscription fees for in the past.

There are also other barriers that could prevent libraries from successfully carrying out their activities. Storing and archiving digital content is fundamentally different to storing analogue content. For printed material to be stored successfully, all that is usually required is a benign environment. Copying such content is the exception not the rule.

The pace of development in digital technologies is rapid. New formats emerge regularly, and upgrades for both software and hardware are released just as often. Old software and hardware can also become obsolete, which causes problems for information retrieval. Libraries may, therefore, need to reformat material in order to ensure it can be preserved successfully. Copyright law allows libraries to make a copy from any item in the permanent collection in the library: this is currently interpreted as allowing a single copy, and is no longer considered sufficient. Such a restriction is in

comparison to allowances given in Japanese or Danish law, which limit the number of copies to a reasonable amount. Reformatting material may also require circumvention of DRM technologies.

Orphaned works

As the length of copyright term has been extended significantly since its introduction in the 18th century, and, because copyright is an unregistered right, it is perhaps inevitable that the problem of orphaned works arises. Essentially, orphaned works are works that are still protected by copyright, but for which the rights-holder cannot be located. The percentage of copyright works that are orphaned is disputed; however, the British Library provides a conservative estimate of 26.5 per cent, while two studies conducted by the Carnegie Mellon University estimated rates of 21 and 31 per cent (British Library 2006; George 2000).

This impacts the ability of researchers to do their work, particularly that which involves photographs, since these rarely come with any authorial information at all. Projects that provide collective histories of local communities or events have often encountered this problem when compiling pictorial stories. It also poses a significant problem for those seeking to provide comprehensive access to archived collections of material. The British Library's Sound Archive has experienced several problems with orphaned works where it has sought to provide access to recordings of bird sounds or oral history recordings. An extension in copyright term for sound recordings would exacerbate this problem considerably.

It is worth pointing out, however, that the problem of orphaned works only exists where a researcher wishes to use a work in a context that would infringe copyright. This means that orphaned works are a constant problem for archives and digitisation initiatives, where copyright exceptions are not considered sufficient to cover such activities and permission of the rights-holder is required, but may be less so for academic researchers.

The US recently produced a report on orphaned works, which many libraries and archives, as well as their representative bodies, have recommended (US Copyright Office 2006). The report argues that, if the user has performed a "reasonably diligent" search for the copyright owner, but fails to locate him or her, then the user should be protected by limits on the compensation that a copyright owner could be awarded if they turn up at a later date and decide to sue for copyright infringement.

In summary

At the beginning of this chapter we set out the four roles that an IP regime needs to undertake, recognising the legitimate claims of each in order to build credible policy that actively takes account of the long-term public interest.

As far as IPRs as an incentive to innovate are concerned, we have seen the increased prominence of this as a major focus of the IP regime in political dialogue, not least because of the increasing reliance of the UK economy on intangible goods.

The size of the creative and knowledge-driven industries is large, and compares somewhat favourably with competitor nations. However, both stagnation in growth and the UK's relatively low R&D intensity indicate there is room for improvement.

Current orthodoxy usually takes this to indicate a need for stronger, or longer, rights, however there is little evidence to suggest that longer rights increase the incentive IPRs can provide. What should be of greater focus is improving the quality of protection currently offered. Where quality is low it can limit the length of protection IPRs such as copyright or patents provide, and instead move innovators to use other available protections such as trade secrets and confidentiality agreements, which have less of a public purpose.

On the flipside, there is certainly less political focus on the value of open information and public domain. In part, this may be because of the relative difficulty of quantifying this value. While there is no definite account, there are a number of ways in which the public domain or open information contributes economic value, not least through education.

There is undeniably a potential tension between public domain and the economic incentive of IPRs, particularly where there have been moves to lengthen term, which, by their very nature, diminish the public domain. The lack of a consolidated attempt in policy circles to give value to openness, while simultaneously promoting the strength of IP protection, has increased this tension, and can also tend to limit the perceived legitimacy of extensions of terms.

The balance between rights-holders and citizens is most immediately played out through the certain types of access that IPRs are intended to facilitate, for example fair dealing for copyright and disclosure for patents. It tends to be in the rights-holders' best interests to enable such access, if only because it can promote and improve sales of works, and also serve to increase a work's cultural impact and importance.

We have seen that fair dealing in copyright is vague, and left open to interpretation by rights-holders and users alike. The attempts by private companies to define fair dealing has increased risks that certain actions that have previously been considered by citizens as 'fair' are now restricted. In particular, there are demonstrable problems with contracts and licences and, in enforcing these, with DRM. This creates negative impacts for society in general, but also in particular for disabled people, academic researchers and consumers, where problems arise with interoperability and access.

Similar situations and problems are occurring for libraries and heritage

organisations in the course of their activities. Digital technologies have, of course, provided great opportunities for libraries as much as they have for creators, but there are definite challenges. The confusion over what counts as a work in a permanent collection is likely to become more crucial as creative goods are increasingly supplied in digital format, while licences and contracts threaten to limit preservation activities.

In many cases, it would be possible to strengthen the claims of one aspect of the IP regime without limiting the claims of others. In the next chapter, we consider how these aspects work in practice through four case studies, and the way in which knowledge is created, distributed and accessed in each.

3. The practice of innovation and dissemination: case studies

The previous chapter laid out an evidence base for how our IP regime is affecting four different aspects of the UK's economy and society. These were distinguished for analytical purposes, and they correspond, to some extent, with the claims of existing interest groups. While it is important to get an empirical grip on the types of benefits that need to be balanced, and occasionally traded off against each other, this evidence tells us little about how the balance works in practice.

As we have previously identified, IP does not offer a one-size-fits-all method of protection; the optimal model of IP depends largely on what it is protecting. So, for example, taken in isolation, the commercial longevity of the Beatles' catalogue may justify copyright term in sound recordings lasting 95 years, but evidence referred to in the previous chapter indicated that this is not the best model for sound recordings in general. The examples through which we analyse IPRs play a significant role in any conclusions that are then drawn. It is important that we have a clear idea of what we consider typical and why.

In this chapter, we use four case studies to highlight the day-to-day implications of our current IP framework, both its benefits and limitations. The four case studies are Ordnance Survey mapping data; Plastic Logic, an up-and-coming plastic electronics firm based in Cambridge, UK; a film, The Road to Guantanamo, produced by Revolution Films; and the British Library Sound Archive.

Why should these be suitable examples? IP is an issue that straddles traditional public/private distinctions, and cannot be analysed purely in economic terms, any more than it can be analysed purely in cultural terms. It is for this reason that we have deliberately chosen case studies that sit at the interface between public and private interests, organisations that have both economic and cultural goals. Clearly, a case study of an organisation that had unambiguously economic goals (such as a strongly shareholder-oriented publisher) or one that had unambiguously cultural goals (such as an artists' collective) would result in a very different picture of our IP framework. Because our case studies explicitly seek to balance public and private interests, the extent to which the current IP system enables or hinders them is of particular significance.

Each case study aims to do three things. Firstly, it gives an indication of the importance of the respective organisation or project, in economic and cultural terms. This will always depend partly on perspective, and the

importance of any given industry or activity to the UK is never self-evident – if one is against strong IPRs, for instance, the size of a certain industry is never likely to sway one's view.

Secondly, it looks at how successfully private interests are upheld by IPRs, and what mechanisms are used to do this. Thirdly, it examines how public interests are upheld by the organisation or project concerned, and the role of the IP system in facilitating or inhibiting this. In doing so, we aim to illustrate how the IP regime is working in these four case studies to meet the four societal needs identified earlier, and demonstrate how the regime functions in situations where tensions are likely to be highest.

Case study 1: Ordnance Survey

The Ordnance Survey (OS) is one of the oldest national mapping agencies in the world. Founded in 1791 in response to the threat of invasion from Revolutionary France, it published its first map in 1801. The collection, packaging and provision of geographic information is both a national and international industry of critical significance for trade, security and international affairs. Global powers such as the UK, France and the US have traditionally mapped not only their own territories but the seas and those of other countries.

The OS is a non-ministerial government department responsible for the collection, maintenance and provision of national geographical information for Great Britain (the National Geographic Database, or NGD). As a civilian organisation that is a global leader in the research, development and production of mapping products, and a wholly state-owned corporation, it is a key public asset. It is estimated that over 80 per cent of all public sector information is geo-specific, and that this percentage increases with each year. As public sector information becomes increasingly enmeshed with geodata, the role of the OS will become ever more critical to the everyday life of citizens and public officials.

At its core is the OS's role in the world of Geographic Information Systems (GIS) in the UK. As the primary source of geodata for the UK, the OS's primary business is in licensing this to other governmental and corporate users, either for internal uses or as the basis of commercial products. Almost all publishers of maps in the UK license OS data, as do many of the online web-mapping services, such as Streetmap.co.uk and multimap.com. Even the free Google Maps service uses data licensed from the OS via TeleAtlas, whose data is also found in many satellite navigation systems covering the UK.

The OS's dataset is one of the richest and most comprehensive of any country anywhere in the world, and has been built up over 200 years, the majority of which OS spent as a government agency for mapping services for central and local government. Thus the dataset is a product of substan-

tial public investment: no other organisation has the resources or time to match the quality of its data so the OS exists as an effective monopoly.

Today, the OS has trading fund status. Trading funds are part of government, but do not seek general funding from Parliament each year.[12] As a trading fund, the OS is required to be self-funded through the licensing of its own crown copyright material (geodata and products) and the sale of traditional paper maps. This model is designed to give the OS responsibility for its own finances and planning along with more freedom to develop new initiatives. It can reinvest profits and plan for the longer term, rather than on a year-to-year basis. It operates along business lines, but has public accountability reporting to Parliament through a minister in the Department for Communities and Local Government (DCLG).

How private interests are upheld in this project

The OS is required to generate its entire income from exploitation of the National Geographic Database. HM Treasury and the DCLG have set a revenue target for the organisation, meaning it should aim to achieve a return of at least 5.5 per cent in the form of a surplus on ordinary activities. It is estimated that 95 per cent of the OS's total revenues are dependent on formal IPRs, since all users must acquire licences before using OS geodata, whether they are from the public or private sector. In this sense, the organisation operates as a commercial entity.

However, despite its trading fund status, the OS continues to receive finance from the taxpayer in two ways. Firstly, it receives direct public subsidy through the National Interest Mapping Services Agreement (NIMSA), which is designed to help fund specific mapping activities that are vital to the public interest, but which cannot be justified on purely commercial grounds: the OS continues to map rural and sparsely populated areas for the benefit of the emergency services, for example. This agreement is costed on a not-for-profit basis, and covers around 13 per cent of the costs of maintaining the NGD (NIMSA 2004).

Secondly, it receives large amounts of public money, accounting for around 47 per cent of its total income, from licensing revenues from other public sector agencies (such as the NHS), central government departments and local authorities. Many local authorities have found that their existing systems and much of their own public sector information is already geo-referenced with OS data, and a change in GIS service provider could have severe copyright implications. The OS itself has acknowledged that, although it now has to tender for government contracts, in its core markets it has no competitors.

How public interests are upheld by this project

The OS defines its primary focus as the maintenance and development of

the National Geographic Database, which is strongly in the public interest, not the maximisation of revenues. It also provides essential support for non-commercial mapping activities through NIMSA.

It has a successful history in relation to education. Since 2001, Year 7 pupils across the UK have been given a free OS Explorer map, linking directly to geography studies in the national curriculum and their own interest. It is estimated that over three million maps have been distributed in this way. There are additional free interactive resources on the OS website. In higher and further education, the EDINA service, a networked national datacentre, has enabled direct access to OS mapping data and tools for students and academics.

The reuse of public sector information has come under increased scrutiny over the past few years, and questions have been raised as to whether the current model of cost recovery is the best for the economy as a whole. As the OS operates as a monopoly, it has been accused of stalling innovation in the private sector and the Office of Public Sector Information (OPSI) has agreed that there is "substance to complaints from commercial mapping firms that the OS has been 'obstructive and slow' in licensing its data" (Cross and Mathieson 2006).

The legacy of 200 years of state funded activity means that the OS is unlikely to face any direct competitors in the foreseeable future: matching the level of OS data would require investment too steep for most commercial operators. This can slow down innovation where costs for the use of data are out of the reach of many companies seeking to develop new and innovative services. It can also prevent innovation in other non-government public uses, as cost recovery demands that data be licensed and paid for, whether directed toward public or commercial ends.

There is also the problem of government bodies using taxes to effectively 'buy back' data that was funded, in the first place, by taxpayers. However, the OS denies this is an accurate portrayal, saying that, since it gained trading fund status in 1999, it has relied entirely on receipts rather than legacy funding to maintain the NGD, which requires approximately 5,000 changes a day to stay up to date (Ordnance Survey 2006).

Case study 2: Plastic Logic

In the 1990s, a series of serendipitous intellectual and financial relationships developed across Cambridge University and the surrounding region, which eventually resulted in the scientific breakthrough upon which Plastic Logic was built.

In 1999, two Cambridge physicists, Professor Sir Richard Friend and Dr Henning Serringhaus, discovered a way of printing transistors on plastic, offering the possibility that display screens, such as those used in computers or mobile phones, could be made out of wafer thin, flexible plastic

sheets. Technologies capable of producing such displays could also become produced cheaply, enabling individual organisations to create their own electronic screens using printers. Friend identified this possibility early on, and immediately made moves to establish a company that could develop the innovation, and eventually take it to market. That company was founded as Plastic Logic in 2000, and it hopes that this technology will be a component part of consumer products by 2009. Products such as foldable e-Newspapers and stick-on LCD screens are plausible outcomes from this development.

Four patents were filed by Friend in 1999 to protect the innovation, and a contract was drawn up between the university and the company to ensure that respective interests were upheld, before venture capital (VC) was sought. Plastic Logic itself has raised around £20 million of VC, and currently employs around 50 people.

The plastic electronics sector has the potential to transform the electronics industry, by enabling display screens to be printed onto flexible plastic as easily as print is currently applied to paper. This could potentially bring about a merger of the display technology industry with the computer printers industry. The first of these is currently worth around £65 billion globally, and the latter around £400 billion globally. UK Displays and Lighting, a trade body with expertise in the sector, estimates that the plastic electronics market could be worth £400-650 billion within the next 10 to 15 years.

This sector is still nascent, and Plastic Logic's chief competitors Philips and Siemens are both researching a similar area. It is possible that they will make the identical breakthrough at some point, but, as yet, they are behind. The Cambridge region is the UK's leading high-tech hub, with around 900 companies employing around 35,000 people, over 5,000 of which are in start-ups. Of these companies, over 300 have direct links to Cambridge University. In 2004, the most recent year for which we have figures, the Cambridge cluster received over 25 per cent of total UK VC, or eight per cent of all European VC.

How private interests are upheld in this project

In cases such as this, patents are a necessary, though far from sufficient, means of transferring knowledge out of universities and into the marketplace. In particular, patents play three roles in the process.

Firstly, the four patents that were filed in 1999 provided both the university and the surrounding entrepreneurs with some breathing space, as they set about planning the development and commercialisation of the innovation. The period during which this sort of protection is necessary can be as little as a few months. In any case, this sort of knowledge will remain tacitly anchored in the relationships and culture that spawned it. But, if the innovation had been immediately published, rather than patented, there is

no reason why the ensuing development would have happened in any proximity to the university, or in the UK at all.

Secondly, Plastic Logic could point to its initial four patents as assets when seeking investment. In this respect, patents play an important symbolic role in the relationship between innovation and finance, even if they do far less real 'work' in securing value for investors.

All those involved in the launching of Plastic Logic agreed that the social relationships binding the university to the company play a stronger role than pieces of paper. For instance, the physics laboratory also offered a ready stream of potential employees for Plastic Logic as it grew, which investors were made aware of. The fact that Friend had prior experience of transforming a university innovation into a successful company (Cambridge Display Technology) meant that those on the commercial side of the venture did not experience the same cultural and psychological gulf that sometimes seems to separate entrepreneurs from academics in the UK. Without such predispositions on both sides, there is little that patents can offer in terms of achieving trust between the two sectors.

Any tensions or conflicts that exist within this model of innovation tend to be dealt with informally as venture capital is being raised. It is evident that scientists operate according to different time horizons than venture capitalists, with the latter usually seeking to extract profit from a venture as soon as is viable. However, experienced academics and entrepreneurs are capable of withstanding this pressure to an extent, and Plastic Logic is an example of differing interests being negotiated with great success, thanks to a long-standing culture of co-operation in the region.

It is possible to conceive of alternative business models and cultures that would not have been reliant on patents, but they have their own deficiencies. For instance, huge US corporations traditionally relied on the advantage of keeping all their research and innovation in house. This precludes the need to transfer knowledge from one sector to another, and brings associated efficiency gains through lower transaction costs (Arrighi 1994). This model underpinned the success of giant innovators such as IBM, Bell Labs and Hewlett Packard. But this model is being superseded by the networked and open innovation model manifest in the Plastic Logic case.

Equally, a company such as Plastic Logic could be established under cover of secrecy: if the Cambridge physicists had neither published *nor* patented, they could have sought to spin the innovation out to the private sector without alerting either academic or commercial competitors. This would, however, have undermined the opportunities for attracting investment.

The enforcement of a patenting system is not the Government's only contribution to innovations such as this one. Plastic Logic has benefited from R&D tax breaks over the past six years. Meanwhile, the public sector has been a critical part of Plastic Logic's networks by providing researchers

from Cambridge into the firm, boosting its innovative potential.

The most complicated aspect of a relationship such as this lies in the contract details between the university and the company. In this instance, an agreement was drawn up that gave Plastic Logic first refusal on subsequent breakthroughs that the university made in the same field of research. Without some degree of exclusivity around its access to the university – and to the particular physicists concerned – Plastic Logic would have been unable to offer the assurances that VCs were looking for. The Government's Lambert Review sought to offer best practice in drawing up precisely these sorts of contracts, although there tends to be sufficient knowhow around Cambridge to develop effective contracts on a case-by-case basis.

How public interests are upheld by the project

The patenting system has in-built means for balancing the interests of investors and innovators against those of competitors and the public. Filing a patent requires a degree of disclosure as to what the innovation consists of, potentially offering competitors valuable information. Equally, the 20-year term of patent protection means that competitors eventually receive full disclosure. Leaving to one side the question of where the appropriate balance actually lies in patent policy, the fact that Plastic Logic has made use of patents (as opposed to trade secrets, say) offers a higher level of transparency than might otherwise have been the case.

In December 2005, the university approved a new IP policy to uphold its interests in its commercial collaborations. To produce greater clarity over IP, all patents resulting from university-based research now remain with the university, unless individuals can make a strong case for taking the innovation forward in their own name. Individuals still have the right to publish their work, rather than register it, and the ruling does not affect copyright or other non-patent-based forms of IP or knowhow. The ruling was intended to create uniformity of decisions as to whether patents should be registered in the names of scientists or in that of the university, and a formal process exists to resolve disputes that arise.

Plastic Logic was established too early to be affected by this ruling. Under the new ruling, Friend would have been obliged to register the patent in the university's name, unless he could have made the case that he was best placed to develop the innovation, which he likely would have done.

Critics of university-business relationships such as the one embodied in Plastic Logic may argue that the public vocation of academics is watered down by the introduction of commercial concerns and skills into academic life. Were the physicists in this instance entirely dedicated to the greater good of physics, then they would have published their finding immediately, rendering it unpatentable. On the other hand, this might plausibly have reduced the chances of it being developed towards a useful product at all, regardless of the market. The ability of academics to network effectively

with commercial and non-commercial sectors, while not becoming distracted from their core research concerns, is, therefore, a critical basis for the UK's wealth creation in the long term.

Case study 3: Revolution Films – *The Road to Guantanamo*

The Road to Guantanamo, directed by Mat Whitecross and Michael Winterbottom and produced by Revolution Films, follows the story of the 'Tipton Three' – Shaliq Rasul, Ruhel Ahmed and Asif Iqbal – as they travel from the West Midlands to Pakistan to attend the wedding of a friend. From Pakistan they journey to Afghanistan where they are captured, transferred to the custody of the US Marines and eventually transferred to Guantanamo Bay, where they are imprisoned for almost three years. After their release in March 2004, they are flown back to the UK where they are released without charge.

The film is a docudrama, attempting to portray real events using actors and actual footage, where available. It is a "damning indictment of both Guantanamo Bay and the US Government's insistence on detaining prisoners there without trial" (Hennigan 2006) or a film in which "reality and make-believe get more than mixed: they get muddled" (Williams 2006), depending on your point of view.

On 9 March 2006, *The Road to Guantanamo* became the first film to be simultaneously released in cinemas, on DVD and via the internet. It was also shown on Channel 4 the same day. This represents a departure from the typical scheduling sequence that usually follows a pattern of cinema, pay for TV, home video/DVD and then free to air broadcast television. It represents the emergence of new business models in film that seek to capitalise on the economics of consumer demand to access content when, and where, they want it.

The global film industry is worth around £75 billion a year. Much of this is concentrated in North America: according to the Motion Picture Association of America it accounts for just over 40 per cent of the $25.2 billion gross box office made worldwide. The UK film industry is significantly smaller, but it nonetheless contributed £3.1 billion to the economy in 2004. It directly employs 31,000 people and supports a further 97,500 jobs.[13] In 2003, total exports of the film industry were £633 million, with a net contribution of £95 million to UK balance of payments (Oxford Economic Forecasting 2005).

However, the US also dominates the UK theatrical market: of all the films released in 2004, 40 per cent were of US origin and accounted for over 73 per cent of box office earnings. It is therefore unsurprising that public subsidy dominates film financing in Europe in a way that it does not in the United States, with European governments supplying 50 per cent of the investment into the European film industry in 2004. The main body

charged with distributing public funds in this manner in the UK is the UK Film Council, which is chiefly funded by the Department of Culture, Media and Sport (DCMS), but is also a designated National Lottery distributor.[14]

The Road to Guantanamo was, in part, funded directly by public money: it received £150,000 from the Screen West Midlands regional screen fund, which is itself funded by the UK Film Council, and has a remit to support, promote and develop the screen media industry in the West Midlands. The rest of the film's £1.45 million budget was funded by Channel 4 television. While it does not distribute public money, Channel 4 does have a public remit in return for its broadcasting licence, to fund the production of content that is not as avowedly commercial as that provided by typical commercial broadcasters, such as ITV and Sky One, and that would not be developed if left to market forces alone.[15]

How private interests are upheld in the project

Film productions are protected by copyright for the life of the director, scriptwriter or composer of any music specifically created for the film (whichever is the longer) plus 70 years. Copyright is used to generate and protect investment in the film production. Shares of the future income from sale of rights in the creative product are sold to financers or distributors in the pre-production stage[16] to finance the cost of making the film, and copyright is used in distributing the film in the market place, to protect it from free-riders and pirates.

Rights are typically transferred along a 'window' sequence, with each window subsequently bringing a certain amount of financial return back to the film production and its financers. The windowing sequence of a film's release is usually determined by the principle of the 'second best alternative' (Vogel 2001), with films distributed first to the market that is capable of generating the highest investment over the shortest amount of time: the cinema. After this, they cascade to other markets that return lower revenues per unit time.

However, in the case of *The Road to Guantanamo*, simultaneous release meant that rights were also distributed simultaneously. This practice is called 'day in date', and has been increasing in prominence in the film industry. It has even been adopted by established Hollywood players, with King Kong being released on DVD and available for download via the internet at the same time. This practice has come about, in part, because DVDs are capable of generating higher revenues over a shorter amount of time than are garnered by the cinema box office, and there is significant pressure to recoup costs sooner rather than later,[17] but also because such measures can help to reduce piracy by satisfying consumer demand to access content across a range of platforms.

The shares of rights to *The Road to Guantanamo* were distributed as follows: 15 per cent to Channel 4 television; 15 per cent to the sales company

(the film seller charged with promoting the film to ensure it is bought by the various distribution channels); 9 per cent to the Tipton Three; and 61 per cent to Tipton Films.

A percentage of that received by Tipton Films is transferred to Screen West Midlands until the £150,000 grant is repaid. The sale of rights has so far recouped £800,000 of the £1.5 million costs.

When distributing films via DVD, internet downloads and internet streaming, copyright tends to be enforced using technology. The DVD for *The Road to Guantanamo* has region 2 encoding, which means it is playable in Europe, Japan, South Africa and the Middle East. Importantly, it is not available in a format compatible for North America. This is in order to protect the revenue stream from a planned US cinematic (and subsequent DVD) release. The internet download-to-keep or download-to-rent options are both backed by a licence and DRM technologies that apply certain restrictions to the user's consumption of the content, and prevent sharing and copying.[18]

How public interests are upheld by this project

The Road to Guantanamo could not be considered a 'mass market' blockbuster film. As such, it is unsurprising that the film is funded with public money and through Channel 4. Generally, the film can be seen as representing an important contribution to our public sphere, not least by raising the debate on the continuing existence of Guantanamo Bay and the treatment of individuals held there. This purpose of the film is referenced in several reviews which commend it for feeling "as immediate and authentic as a news report" (Eagan 2006) and for providing "a snapshot of how the world changed for average Arab and Muslim men after 9/11" (Morris 2006).

There is also evidence to suggest that there are cultural benefits to enabling indigenously-made productions, beyond those benefits experienced by consumer enjoyment and through box office takings. Indigenous films are said to boost national confidence and may have an educational component. Such externalities are difficult to measure in specific terms; however, studies have placed the overall private cultural value of UK film at £38 million a year for the period 2000-2004, with the additional private cultural value for each film standing at £500,000 (OEF 2005).

This demonstrates how the public interest is upheld in having the film made. However, how the public interest is upheld in the film being distributed is another matter. *The Road to Guantanamo* was available on free to air television for one showing and received viewing figures of 1.7 million, equating to a 10.4 per cent share of the TV audience at that time. Since then, it has been available to download to own, or stream on demand, via the Tiscali film service, which has been used for this particular purpose over 1,000 times. There has been no subsequent public broadcast, or any option

to access the content via Channel 4, despite the significant funding the corporation provided.

Thus, except for the single public broadcast of the film on Channel 4 on 9 March 2006, the public interest is no more explicitly upheld in this instance than in a Hollywood blockbuster.

The value of different rights windows, and the fear that each may cannibalise revenue from the other, is likely to prevent significant public distribution of content where a commercial model is available. So, while it may have been technically able to, Channel 4 could not offer streaming or download of the film subsequent to broadcast, as this would have massively affected the value of the rights window sold to Tiscali: it would have provided direct, and free, competition.

A fundamental tension exists between the need to generate finance to make the film in the first place, which often requires maximum exploitation of rights, and the desire to make the film available to the public to the greatest extent possible.

Case study 4: The British Library Sound Archive

The Sound Archive at the British Library began as the British Institute of Recorded Sound in 1955, becoming part of the British Library in 1983. The archive now holds approximately 3.5 million sound recordings: an international collection featuring works of music, drama, literature, oral history and wildlife sounds. The recordings are stored in a range of formats, from 19th-century cylinders to CDs and DVDs.

The Sound Archive stores copies of commercial recordings issued in the UK as well as selected recordings from overseas. Currently, access to the Sound Archive is mostly available onsite, at the British Library, to holders of a British Library reading pass. A searchable catalogue of recordings is available online, however, and is updated daily. A limited number of recordings are available digitally: 800 recordings are available online on the Sound Archive web pages and a further 1,250 on the British Library's 'Collect Britain' web pages. This totals approximately one-twentieth of one per cent of the Sound Archive's total holdings.

The British Library's Archival Sound Recordings Project will digitise a further 12,000 recordings, raising the total proportion available digitally via the internet to one-third of one per cent. Onsite, 4,000 digital sound recordings are available via the Library's SoundServer facility. This is available without appointment to all holders of a British Library reading pass, and includes the Sound Archive's most frequently requested items. The British Library is also engaged in a number of digitisation projects to enable wider access to the literary works it stores: in partnership with Microsoft, the library is currently scanning 100,000 out-of-copyright books, which will be put online and searchable by anyone. This is part of an exercise to build

a National Digital Library, which will "provide sophisticated storage, preservation and access to the nation's digital content" (British Library 2005: 2).

The British Library's Sound Archive is one of the largest in the world, eclipsing the Recorded Sound Reference Centre in the US Library of Congress, which holds just over two million items. The Sound Archive is an operational department of the British Library and receives a portion of the annual Grant in Aid the Library receives from the DCMS. It also receives specific funding from the Joint Information Systems Committee (JISC) (an agency of the UK Further and Higher Education Funding Councils). A small amount of designated income is also received from trust funds.

In 2005/6, these figures were:

- Grant in Aid £1,317,016
- JISC project funding £474,997
- Trusts (estimate) £73,000
- Total £1,864,013

The majority of these costs cover staff salaries (£1,229,214).

How private interests are upheld in the project

The majority of musical sound recordings were issued within the past 50 years, and are, therefore, covered by copyright. Likewise, radio performances will usually be protected under some form of copyright, given copyright for dramatic works lasts for the life of the author plus 70 years. Nearly every piece of material the British Library Sound Archive deals with is, therefore, protected under copyright in some form or another. The British Library must factor in the rights and interests of copyright holders when providing these works in archival form.

Making digital copies of sound recordings is not covered by library privileges or fair dealing exceptions in copyright law, unless consent is received from the rights-holder. Tracing, gaining clearance from and negotiating with rights-holders is costly. Since summer 2004, the Archival Sound Recordings project (providing access to just over one-third of one per cent of the Archive's total holdings) has spent £29,778 on such activities. It is estimated that, by the time the project comes to an end in September 2006, the costs will have risen to £32,450. This is despite the fact that access to the recordings provided by this project will be restricted to accredited members of the further and higher educational community in the UK, and that many of the holdings are of limited value for commercial exploitation (for example, oral history interviews).

The Library also provides a commercial service selling copies of sound recordings to users. However, users must be able to obtain copyright clearance from the copyright holder first.

How public interests are upheld by the project

The British Library is set objectives by the DCMS in return for public funding (DCMS 2003). These include: ensuring comprehensive coverage, recording and preservation of the national published archive; providing ready access to the Library's collections and the world's knowledge base for the researcher and business communities to underpin UK competitiveness and research excellence; and to promote wider understanding, appreciation and enjoyment of the Library's collections to the general public, schools and lifelong learners.

In order to promote further accessibility and modernisation, the Library also has a target, set by the DCMS, to achieve a certain level of digitisation of works (the target for 2004/05 was to create 636,000 digital images), to encourage high viewing levels of digital materials over the web (4,250,000 in 2004/05), and to deliver a certain level of material electronically (22 per cent).

The digitisation of protected works is restricted under copyright. However, libraries do have special exceptions in the form of 'library privilege'. In the case of the Sound Archive, the restrictions over making copies of audio material mean that these are of little assistance. There are further rights restrictions when libraries seek to provide remote access to digital material.[18]

However, copyright does allow libraries to make copies of textual works, and it also allows on-site access to all library-held materials. In the case of the Sound Archive, seven per cent of users access the Sound Archive onsite at the British Library, while 93 per cent access it remotely, albeit to a much narrower range of materials.

These figures show there is clearly a demand for a more comprehensive digital sound archive, and, in view of the Library's objectives identified above, it is arguably a demand the Library should seek to meet. However, the figures involved in providing access to a limited amount of content for the Archival Sound Recordings project demonstrate that the rights clearance procedures involved are likely to be costly. If remote access were widened to an audience beyond the academic community, the cost would be even larger.

Locating the public interest

These case studies display complex cross-currents of economic and cultural imperatives. In no instance is the system broken to the point of inaction, but nor is there ever a complete absence of tension, and trade-offs are being made in each case. Due to the strategic significance of these four examples, they are as good a test case for our IP regime as any. Because they *explicitly* seek to balance public and private interests, the role of IPRs in these case studies is of particular significance.

Earlier on, we subdivided the public interest into four categories, argu-

ing that the IP regime should seek to balance four corresponding priorities. We now go through these to examine how successfully they are defended in the case studies.

Incentive to innovate

Both the Plastic Logic case study and The Road to Guantanamo indicate that there is sufficient incentive to innovate for such a project, and that this incentive is provided, at least in part, by IPRs. The presence of the British Library Sound Archive has had no demonstrable negative impact on this incentive, operating as it does within copyright law; indeed, the number of CDs released every year continues to remain steady.[20]

Only in the OS case study is the incentive to innovate hindered, or lost. This scenario perhaps most adequately demonstrates the complexity of the relationship between competition and IP. The pursuit of fair and open competition in markets, undertaken in the UK by the OFT and the Competition Commission, can, at first glance, seem at odds with the monopoly of the IP right. This is a conflict summed up by Kaplow (1985: 1817):

> A practice is typically deemed to violate the antitrust laws because it is anticompetitive. But the very purpose of the patent grant is to reward the patentee by limiting competition in full recognition that the monopolistic evils are the price society will pay.

In theory, IPRs and competition regulation have the same aim: to promote innovative activity. However, there are efficiency trade-offs to be made between the need to provide protection against free-riding, in the form of IPRs, and the fact that firms are more likely to innovate where they face competition. There is considerable empirical evidence that past incumbents have delayed the introduction of new technology where it has threatened their existing business model: Bell was reluctant to roll out DSL technology in the 1980s, while BT has repeatedly been criticised for its lack of progress on local loop unbundling, which would enable competitors to enter the broadband ADSL market.

However, Schumpeterian theories of 'creative destruction' – where new innovations emerge to make older inventions obsolete – provide not only the incentive for new firms to innovate but also for old firms to continue to develop products that improve on their last offering. For Schumpeter, competition comes from "the new commodity, the new technology, the new sources of supply, the new type of organisation… [it provides] competition which ... strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives" (Schumpeter 1942: 84).

The problem with OS data is that it is unlikely to face any such competition able to shake its foundations: there is no like-for-like substitute avail-

able for the OS's geodata that could lessen their market dominance. OS is able to set the licence terms, including price, for their product in the absence of competition. In this instance, an IPR has conferred market power, which has a massive impact on others' ability to operate, and compete, in surrounding markets.

It is estimated that, if the OS were to relinquish copyright on this data, significant economic benefits would be experienced by the economy (Weiss 2003). The value of opening up all public sector data in the UK is estimated to be £8 billion, while receipts for cost recovery stand in the region of £900 million. A European Commission study concluded that meeting the diverse needs of citizens demands entrepreneurial and publishing skills that are more evident in the private sector (PIRA 2000). It argued strongly that current licensing difficulties not only hamper innovation but also impact governments financially, by reducing the available returns from tax and employment that could be experienced. Such benefits are expected to greatly eclipse the cost of maintaining the OS's NGD, which, without the option of cost recovery, would have to be borne by the Treasury.

Public domain

Since each of our case studies uses IPRs, we would expect them each to contribute to the public domain in various ways. The British Library is, perhaps, the clearest example of a project seeking to enhance the public domain by providing easier and more convenient access to content, much of which has exhausted its commercial worth but remains of value to researchers. However, attempts to enable wide-scale access are limited both by the application of the IP regime and the impact wider access could have on the incentive to innovate.

As far as non-commercial works are concerned, the current IP regime is clearly impeding the public domain, not because IPRs are intrinsically restrictive, but because the process of clearing rights is costly and time consuming, especially in relation to orphaned works.

Through its broadcast on Channel 4 television, *The Road to Guantanamo* contributed to the public sphere in the various ways highlighted in the case study, but its contribution to public domain was again limited because of the commercial concerns this would have caused suppliers of the same content via different platforms, such as Tiscali.

In deciding whether the current IP model provides the right balance between providing an incentive to innovate while also supporting a flourishing public domain, it is useful to consider what the impact would be should the scales be tipped in favour of a more open approach and more explicit support of public domain.

If library privilege were widened to encompass audio-visual material and allow digitisation of this material without first negotiating with the rights-holder, or if regulations were introduced to deal with the problem of

orphaned works, the cost of digitising the British Library's Sound Archive would be reduced by £9.7 million. If the Sound Archive remained accessible on-site only, the impact on the commercial music industry would be negligible, since, if the user wanted to make a copy of the material, they would have to gain clearance from the rights-holder. In this instance, regulatory support of public domain would not impact the incentive to innovate in any real sense.

But what would happen if we allowed this content to be distributed as widely and openly as the internet allows? We have seen that feature films rely heavily on the sale of future rights, backed by IP law, to enable production to go ahead, and that even so-called 'niche', independent films typically have budgets of £1 million or more. If protection were denied completely, the current film funding model could not be sustained, and for a UK film culture to thrive, significant public funding would be necessary. Likewise, the British Library's Sound Archive does contain recordings that continue to generate revenue for their creators today. Making the Archive available for downloads on-demand would create unfair, free competition for the music industry.

In both scenarios we would have tipped the balance too far. Of more interesting consideration is whether we can strive for a middle ground, between the commercial model utilised by large Hollywood studios and the recording industry, and providing no protection at all. A recent example is the BBC initiative, the Beethoven Experience, which took place in 2005 and allowed free downloads of Beethoven's symphonies for a seven-day period. Beethoven's works exist clearly in the public domain. However, they are frequently re-recorded and released by record companies who would hope to generate some commercial return from their investment. The BBC initiative was criticised by some in the music industry who feared the commercial impact of such a service would be huge. However, the BBC took steps to limit this impact, for example by offering the downloads for a limited period only.

Further limits on the convenience of public domain material could be made by restricting content to streaming, rather than download services. Thus Channel 4 could have supplemented its broadcast of *The Road to Guantanamo* with the option to stream the film from their website, for free, for a limited period. Here, public domain may be defined in terms of time rather than space: its validity lies in *how long* it remains freely accessible for, rather than *from where* it is freely accessible. This sits in contrast to schemes currently in place in the BBC such as the Creative Archive that offer free online access to UK internet users only.

It is not clear what impact this model would have on commercial markets, since the possibility to offer large-scale downloads of this kind has only recently presented itself. But it is clear that commercial concerns could be lessened by restrictions on access and convenience, which would con-

tinue to provide space for a market to thrive.

Access and inclusion

We now turn to how IP affects access and inclusion in the public sphere. In the case of the Sound Archive, access for researchers is restricted directly; fair dealing exceptions do not apply to sound recordings in the same way as they do to other creative works. Equally, fair dealing rights apply whether the rights-holder can be traced or not, since they exist as exceptions in copyright law, rather than as privileges afforded by the rights-holder personally.

Libraries also have limited ability to make available such works in the first place. As we have discussed above, the IP regime clearly limits libraries in this regard by placing restrictions on the digitisation of audio-visual content. If the copyright term on sound recordings were extended, it would bring almost the entire collection of works held in the Sound Archive under copyright protection, increasing the costs of the project substantially, and limiting wide scale access and reuse by researchers.

Concerns are often expressed at the restrictions DRM may place on users accessing content in ways that are within their rights under copyright law. The Road to Guantanamo was released for download and streaming via the internet with a licensing agreement backed up by DRM. This licence agreement trumps copyright law. It clearly limits the rights of consumers, since it attaches the content to the instrument used to view it; any modification in the configuration of the hardware means the licence is retracted and the content can no longer be viewed. The content cannot be transferred to other players, or to other people in the same way we might wish to lend a DVD to a friend. Neither do these restrictions expire with the expiration of copyright protection.

We have already discussed commercial access to public sector data, and the economic benefits that could be achieved if this were opened up by removing Crown Copyright. Beyond these, further benefit could be received by enabling other, non-governmental public uses of such data, which are currently impossible due to the financial cost involved.

Preservation and heritage

At some point, all the goods created within and for each of the case studies will fall into the public domain, and become fully available to the public via a range of channels. But, in order to secure this heritage, archivists and librarians need adequate freedoms to preserve new works as and when they are produced. The manner in which copyright is now exploited and protected on the ground means that this role cannot be performed as confidently as it was in the digital age.

Perhaps the most fundamentally divisive issue as we progress into the digital age will be how long something is deemed to be of commercial value. The long tail (the back catalogue of artefacts that continue to be

bought by niche audiences over time) suggests that investments in creative industries may be recouped over longer time horizons than in the past, and revenues will be less clustered around a product's initial launch, although creators of investment heavy content are still likely to want to get return from their investment sooner rather than later. So film releases will continue to be backed by heavy advertising and promotion in the hope of reaching a mass market in a short space of time.

Nonetheless, freely available archives can imperil emerging business models, at the same time as having tremendous public benefit. Various bodies have recently joined together to form the Creative Archive Licence Group and have designed a Creative Archive Licence, which will be attached to archive content made available for download. The organisations, including the BBC, the British Film Institute, Channel 4 and the Open University, are seeking to provide greater access to content in order to promote further creativity. The Licence stipulates that use of archive material must be for non-commercial purposes, allow further sharing of work, and is limited to the UK only.

Since the Archive delivers only clips of material, it is a vastly different service to that provided by the BBC's Integrated Media Player, an on demand service allowing downloads of full programmes up to seven days after their initial broadcast. In one sense, all the Archive does is provide an easier way to exercise fair dealing rights by collecting useful material into one place, making it available digitally and providing explicit direction as to what activity is and is not allowed.

Again, the possibilities of offering a full archive of material are tempered by the impact this could have on commercial markets, particularly those companies willing to repackage out-of-copyright material, but, increasingly, original rights-holders themselves, who will seek to exploit the long tail to its full potential. There is a clear trade-off, since, as commercial opportunities extend, current orthodoxy stipulates that public opportunities should retract: this is seen most clearly in the BBC where new services offerings are expected to prove they do not adversely impact existing or future market opportunities.

But we must ask ourselves whether we trust commercial entities with the responsibility of maintaining a national archive. Most likely the answer will be no. As such, some commercial opportunities will necessarily have to be lessened in the name of the public interest at large.

4. Conclusions: a progressive model for information policy

Our society sits on the threshold of an important opportunity. While the problem of digital exclusion is far from solved at a national level, and remains immense at an international level, we are seeing the first signs of a society with the technological means to meet the informational needs of people regardless of status or geography.

At the risk of crystal-ball gazing, it looks safe to say that within the next few years, the only barriers preventing UK citizens from accessing any type of information or content will be legal and political in nature, rather than the result of technological scarcity. It will remain the case that some individuals are more literate than others, that some have a greater proclivity to learn than others, and that some are more culturally engaged than others. But beyond these educational and psychological obstacles, the only others that exist at all will be of our own making.

What will these other barriers consist of? On what grounds will it be legitimate to prevent someone from accessing, sharing or manipulating digital artefacts? By no means do we take the view that such grounds do not exist at all. But these are the questions that a valid IPR system must be capable of answering.

The way in which information is privatised and publicised is a matter of the highest cultural importance, both in terms of why and in terms of how. In the first case, the *justifications* for suppressing the sharing of information need to be robust and valid ones, be it the needs of the economy or the interests of the public in having effective editorial filters around artistic expression. Secondly, the *means* of suppressing information sharing are no less important: whether monopoly rights to information are granted by law or merely asserted through DRM is a matter of profound political significance.

In this chapter, we set out the ippr's vision of what a progressive information policy framework looks like, and the role of IPRs in achieving it. What we have attempted to make clear throughout is that the 'best' model of IPRs is not something that economics alone can specify, nor can it be identified using a simple model of evidence-based policy. There are moral, cultural, political and economic factors to be weighed up, as we demonstrated through the case studies in Chapter Three.

The chapter proceeds as follows. Firstly, we offer an analysis of four models of information policy, borrowing from the 'models of capitalism' analyses. Secondly, we make the case for our preferred model, and pre-empt the criticisms that this will be subject to. And finally, we make our conclusions and policy recommendations.

Four models of information policy

Where economic, political, cultural and moral factors are densely interwoven, policy frameworks need to be recreated to recognise this fact. An interdisciplinary analysis is required, with a hybrid notion of what government's goal should be. Economic analysis alone will not suffice, and it is worth noting that, where purely economic analyses are attempted, their conclusions diverge radically. A more suitable approach is one that accepts the complexity of the problem, and seeks to assess rival IP systems as integrated models of information policy. Each model represents a different way of balancing competing priorities, and each has its own overarching consistency.

This approach is loosely modelled on the 'models of capitalism' approach that held sway in the 1990s, which sought to explain disparate economic phenomena as belonging together, usually with the models being categorised in terms of the nation most associated with them (Coates 2000; Hall and Soskice, 2001).

The German or Rheinish model of capitalism, for instance, was characterised by high use of debt finance, widespread employer and employee organisation and a strong welfare state. Meanwhile, the US model was defined by high use of equity finance, low employee organisation and a weaker social safety net. The advantage of this approach is that it helps to locate individual policy decisions within a broader vision of the economy and society, and provide a goal around which diverse political agencies can unite.

The key issue when distinguishing different information policy models is in attitudes to knowledge. Certain things have to be accepted, no matter which model one subscribes to. In particular, the growing ubiquity of digital technologies as a means of sharing information with increasing ease, and the growing reliance that developed economies have upon intangible assets in creating wealth and jobs. These are facts, not judgments.

Against this backdrop, however, knowledge has to perform the dual roles of public resource and private commodity simultaneously, and our four different models are defined in terms of how they achieve this balancing act. While left-right divisions may not map very easily on to this policy agenda (for instance, the libertarian right tend to be very anti-IP), these can broadly be represented as sitting on a spectrum, starting with the most restrictive, and concluding with the most open.

1. American conservatism: knowledge as asset only

Where IPRs are understood as comparable to conventional property rights, public domain could potentially disappear altogether, just as the enclosure movement eradicated common land all over the UK in the late 18th Century. Property that is entirely private has no (or very few) positive pub-

lic spillovers, and very few exceptions are granted to the exclusive rights of the owner. Where policy is constructed with a view of knowledge as an asset only, the public domain – indeed, the public *sphere* – receives no consideration at all.

The key features of this model are:

- Policy developed around interests of industry shareholders
- Profits of creativity returned to shareholders
- Copyright and patent terms are maximised
- Consumer rights are restricted
- DRM trumps fair-dealing.

A recent example of this model in action comes in the form of the US television documentary series 'Eyes on the Prize: American's Civil Rights Years/Bridge to Freedom 1965', which detailed the civil rights movement in the US from 1954 to 1964 and included events of historical importance, such as the Montgomery bus boycott and the 1963 March on Washington. The 14-part series was originally broadcast on PBS in 1987, and included interviews with civil rights leaders and eye witnesses to the events, as well as footage from news reports, clips from local television stations, and still photographs and music.

The production demanded extensive rights clearances. But, because documentary films are often made with small budgets, film-makers can often only afford to buy rights for a limited amount of time, and for geographically limited distribution. Although worldwide rights in perpetuity may be the favoured option, the high costs of clearances may mean that a significantly limited position is eventually agreed on.

The rights for 'Eyes on the Prize' were cleared for broadcast on PBS and overseas on the BBC. However, they began to expire in the mid 1990s, and the cost of renewal is estimated to be in the region of $500,000. Until rights are renegotiated, the only way to access this seminal series, which won several Emmys and was nominated for an Oscar, is to find a copy on VHS. To all intents and purposes, the programme is not accessible to the vast majority of the US population, despite its historic importance and recognised value as a quality production.

Unwarranted term extensions are another example of this US model. Extension of copyright term on sound recordings is the most celebrated example of protections being increased against economic logic. But the US has also extended patent protection, introducing business-method patents in 1998, thus granting protection over a particular way of doing business to the holder. Such patents are applicable in several fields, but the most high-profile example has been Amazon's patent for its 'one click' shopping system, delivered in the field of e-commerce.

These patents are necessarily very wide, since a patent for a particular

sales method can affect all the sectors in which that sales method might be used. Thus, Amazon's patent applies not only to a method of purchasing books online, but any other e-commerce. Traditionally it was assumed that patents for business models were not necessary since enough incentive would be provided by the potential commercial advantage an innovative business model could have over competitors. Nor are business models presumed to require the same level of investment in R&D.

2. UK knowledge economy: knowledge as asset first, public resource second

The UK's knowledge economy strategies have tended to focus heavily on IPRs as a means of translating knowledge into an asset. The default assumption has been that innovation and creativity are in the service of the market, rather than vice versa.

This is not to say that innovation and creativity have not been taken seriously – far from it: New Labour's public expenditure on education and the arts demonstrates a strong concern for the public character of knowledge and culture. Equally, the positive public spillovers of IPRs receive far greater recognition in the UK than in the US, with no copyright term extensions in recent years. But, due to the nature of the policymaking process, the interests of rights-holders are invariably represented in more tangible terms than those of the public and consumers. Hence, the strategies of rights-holders have received statutory protection suitable for the digital age, thanks to the European Copyright Directive, but this has not been matched with equal protection for the rights of consumers and researchers.

The key features of this model are:

- Policy developed around interests of producers
- Profits of creativity split between reinvestment and shareholders
- Term either stable or extended
- Consumer rights upheld in principle
- Relationship between DRM and fair dealing unresolved.

Within this model, IPRs are viewed primarily as restraining mechanisms, rather than as sharing mechanisms. DRM is respected in and of itself, rather than viewed as a tool to achieve certain legal ends, and is protected regardless of whether it enforces copyright, or a much wider set of rights. Contract law trumps copyright and allows restrictive licences, such as those experienced by the British Library, to impact activity that would otherwise be undertaken in the name of the public good.

In many senses, the UK's approach may be seen as providing an optimistic view of businesses' ability to address market failure. There is a sense that consumer demand and preferences will move content providers to be more flexible in their provision of goods, that there is no need to intervene to ensure interoperability of DRM systems because this will be decided by

the market, and that infringements of citizens' rights can be monitored on a 'wait and see' basis, with relatively little provision of recourse should such infringements occur. In short, the approach fails to recognise the freedoms fair dealing provides, which the market may be unable to give.

The recent consideration of extension of copyright term for sound recordings, undertaken as part of the UK Government's Gowers Review, indicates the high priority the Government places on the creative industries, and its belief that stronger, and longer, rights may provide the necessary protection, even if it is at the expense of greater economic value that can be created once copyright expires (Brooks 2005). The public purse continues to fund massive inputs to the public sphere, with the BBC and spending on education being two obvious examples, but, increasingly, they are asked to justify themselves in commercial terms.

3. A learning society: knowledge as public resource first, asset second

The economic logic that underpins the idea of the knowledge economy does not point automatically to privileging the private role of knowledge over its public role. If anything, the opposite is the case. Because information sharing is understood as the enabler of competitive marketplaces, and education as the basis for innovation, knowledge is understood by economists as a public resource first, and an asset second. It is something that should be invested in and shared as a good in its own right, and not simply something that is generated in order to be commercialised. And yet, inadvertently, this may lead to higher levels of economic performance than the conventional knowledge economy model.

It should be stressed that this is not a model that ignores the role of knowledge as a private asset, merely one that identifies the collective production and use of knowledge as, in principle, more efficient *and* more equitable. The Open Access movement in academic publishing is representative of this model because it is intended to ensure the widest possible access to research findings while still operating on a commercial basis.

The key features of this model are:

- Policy developed with appeal to the public interest
- Profits of creativity split between reinvestment and public
- Term remains the same
- Consumer rights actively defended
- Fair dealing trumps DRM.

Although practices that fit this model vary from country to country, and can often be divided into public policy exceptions and private exceptions, there are specific examples to be found in Member States' implementation of the EU Copyright Directive.

Denmark, for instance, took what has been called a 'minimalist'

approach and limited the extension of regulation in several ways. DRM technologies are only protected if they are used to prevent copying of, rather than access to, a work that is protected by the law. This means that, where protection has expired or does not apply, circumvention is legal. It also allows users to circumvent access control technologies that do not explicitly protect copyright, for example region encoding on DVDs.

It is worth noting that, prior to the Directive's implementation, Danish Copyright law was even more liberal, providing a private copying exception that applied to copying in a social circle, for example between families and friends. Rights-holders were compensated with a flat rate tax on blank digital and analogue audio.

There are also more generous provisions for libraries, including a legal licence to allow libraries to distribute articles and text excerpts to users in digital form, an element of document supply that the British Library has recently been struggling with. Library exceptions were also widened to cover all published works, including radio and television. However, the distinction between commercial and non-commercial research remains, since this is stipulated in European law.

In practice, markets for creative goods in Denmark appear to be more democratic. A recent decline in music sales has given the Nordisk Copyright Bureau fewer royalties to distribute among artists. However, the period of sales decline has seen the number of artists in receipt of royalty payments increase, particularly among the lower earners. The number of high earners (for example, those receiving over 150,000 Danish Krone a year) has declined, as has their average income, while those earning below this amount have seen their earnings increase (Pederson 2006). This introduces interesting questions about how celebrity-orientated we want our creative industries to be.

There has been a recent furore in France surrounding attempts to extend private exceptions, and to move copyright legislation in such a way to more favour the rights and expectations of consumers, in particular to legalise file sharing and thus prevent the effective criminalisation of thousands of youths who commonly indulge in this practice. Later, attention turned to the proposed amendments to the French anti-circumvention provisions, which provided clauses to ensure the interoperability of DRM systems: a move predictably not welcomed by Apple. While this addresses a large element of consumers' concerns with DRM technologies, it also stems from French concern regarding domination of their software industry by foreign giants, such as Microsoft and Apple, and is, in part, intended to assist the French software industry to compete.

The relationship between copyright law and contract has been explored by the Australian Copyright Law Review Committee, commissioned by an Australian Government concerned with maintaining a copyright balance in the changing digital and legal environment. The conclusion was that

"agreements are being used to exclude or modify the copyright exceptions. It is the Committee's view that, should such agreements be enforceable, there would be a displacement of the copyright balance in important respects" (Copyright Law Review Committee 2002: 8). This problem is addressed in Irish law, which allows copyright, and, therefore, the fair dealing exceptions provided, to trump contract agreements.

Given the level of international legislation, and the practical impacts of derogating from such treaties and agreements, there is no one shining example of copyright legislation introduced in a single country. Rather, elements from each can be seen as providing a way forward, indicating ways in which balance can be shifted towards a more default position of sharing by providing the necessary assurances in national legislation.

4. Cyber-socialism: knowledge as public resource only

The final model is one that believes fundamentally in the virtue of sharing information as much as is technologically possible. While the ethic of the public sphere may have something in common with this, inasmuch as it values debate and information exchange, this more radical philosophy of openness has gone hand in hand with the development of the internet.

Precisely because the internet is a space without any intrinsic barriers, and because its networked structure facilitates mass sharing of information at no marginal cost, various groups have developed a belief that there is no possible rationale not to share information as much as possible. From this perspective, those who attempt to limit the sharing of information, be it for economic, cultural, political or moral reasons, are all culpable of inhibiting the progress of the digital commons. As Pekka Himanen has argued, a whole new ethic of playfulness and voluntarism underlies this sphere of production, which makes it hostile to the traditional capitalist ethic of hard work in exchange for financial reward (Himanen 2002).

The key features of this model are:

- Policy developed around interests of internet users
- All profits of creativity returned to public
- IPRs cut or abolished
- Consumers are also producers; producers are also consumers
- DRM intrinsically immoral.

This philosophy has been a motivating factor for many of the most successful internet-based projects, and, most notably, the development of open source software such as Linux. It is very hard to fault the dedication and public spiritedness of such communities, and we should also recognise the work they do in underpinning commercial work. Open source is by no means anathema to commerce – a large industry exists on the back of implementing and consulting on free software. As Himanen puts it, "one might say that the ethical dilemma facing businesses in the new informa-

tion economy is that capitalist success is possible only as long as most of the researchers remain 'communists'" (Himanen 2002: 60).

Various open source models now exist across the globe, but perhaps two of the most high profile are Linux and the online encyclopaedia Wikipedia. Each follows general open source methods of development: they are mainly volunteer movements, with no commercial gain offered for participation and their participants are geographically dispersed. Wikipedia hosts over one million entries in several different languages, and is now larger than the Encyclopaedia Britannia. All users are able to access and amend entries, although it is stipulated that entries should be written from a neutral point of view. While it continues to be a major internet success story, the accuracy of Wikipedia articles has recently been called into question (Orlowski 2006), while the number of people who contribute regularly is remarkably low.

The latter phenomenon typifies many open source approaches: generally, a limited number of the group does the vast majority of the work. While such an approach can be very effective under certain conditions, and, in many senses, represents an internet-empowered enhancement of the older, accepted process of expert peer review for research, it is not clear how such a model could be used to fit investment heavy models of innovation and creativity, such as the development of drugs or films.

Formalising UK public domain

We suggest that it is the third of these models that provides a template for a progressive model of information policy, and the model towards which the UK should be seeking to move. This is a model that has a clear notion of the public interest built into it, based on a realistic appreciation of the role of markets in supporting innovation, but that pushes other non-commercial public voices to the forefront of the debate where they belong. Knowledge should be perceived as a public resource first, and as a private asset second, for a cluster of economic, cultural and moral reasons.

There will inevitably be a large number of voices that deem this to be 'anti-business' or idealistic. The first rejoinder to this should be that the distinction between 'pro'- and 'anti-business' is a meaningless one. While it makes sense for governments to think about what *kind* of industrial base they wish to nurture, through strategic fiscal policy, public investment and incentives, the goal of a policy framework that suits business *in general* is an illusory one.

Competition policy does not get assessed on whether it is pro- or anti-business, but on whether it upholds an appropriate model of the market that is fair and consistent, and IPRs should be treated in the same way. Notions of what is an appropriate model will differ, depending on the extent to which one seeks to defend market incumbents or new market entrants, but there is no particular model that should be deemed to be in

the interests of industry in general.

Secondly, economic logic is instructive here. Economics may prove less than useful in specifying exactly which model of IPRs is 'best', but it reminds us of why we have IPRs in the first place, in the following way. Knowledge has all of the qualities of a public good, and therefore suffers from an associated problem of producer incentive: why should I produce this innovation or artwork if everyone gets to benefit? The common policy solution to this problem, as with national defence, is for government to produce the public good on behalf of all us, but this is scarcely an appealing option when it comes to literature, and increasingly impractical when it comes to science. IPRs therefore act as an incentive to produce and release knowledge that would otherwise fail to be produced or fail to be released. Their economic purpose is to *benefit the rights-holder in order to benefit the public*.

The benefit of thinking in terms of socio-economic models is that it diverts our attention away from what rights-holders define as our 'economic interest'. The model we propose can be understood as analogous to the Scandinavian social model, which is famous for both its very high level of public service provision and its high productivity and international competitiveness.

Investment in human capital and social cohesion produces the intangible assets that Swedish and Finnish capitalism have thrived on for several decades, even though this investment does not happen *in order* to benefit business. But if that model were split into its component parts – a strong social compact on the one hand, and strong business dynamism on the other – the strong social dimension would start to be perceived as 'anti-business' and an *impediment* to international competitiveness. Only through recognising the coherence of the whole model can it be properly valued and defended.

Building the progressive model of information policy that we outline would require a similar recognition of its overall coherence. It will not be accurately valued if only assessed in terms of its net effect on incumbent rights-holders. The structure of government makes this difficult, not only because of the lobbying pressures of powerful businesses, but because of the difficulty in producing a policy that cuts across the goals of the Treasury, the Department of Trade and Industry (DTI), the DCMS, and the Department of Education and Skills (DfES). Effectively, what is needed is to create as strong a political voice for public domain as currently exists for particular businesses. This will be difficult, both for empirical and for political reasons.

Empirically speaking, we have already explored how difficult it is to calculate the precise benefits of public domain and the public sphere. This does not mean that they do not exist, as Chapter Two explored. However, our current policy climate is such that legitimacy tends to be won by the

interest group that can produce the most convincing evidence, not only in terms of its content, but in terms of its look and feel.

The hard numbers that an incumbent rights-holder can point to have the quality of hard evidence, whereas any description of the benefit of public knowledge will invariably be more qualitative and intuitive, even if it can occasionally be packaged in hybrid utilitarian metrics, such as public value. This problem will never entirely recede, and so it falls to politicians and policymakers to become more confident in constructing policy on the basis of principle and qualitative evidence, and less on the basis of quantitative evidence. Different types of quantitative evidence, such as user surveys, may also offer additional balance here.

Politically speaking, and following from the above point, IPRs offer the UK Government a tough challenge. As we discussed above, there have been a number of steps taken on the continent to defend individual rights and uphold certain values in the context of DRM. In the UK, this has never been the default option.

To shift the UK from the second of our four models to the third, the Government will need to start valuing certain rights and public institutions in and of themselves, and not as means to certain economic ends. This requires a difficult reorientation in the mechanisms of policymaking, and, at the very least, a greater recognition of IPRs as a cultural and moral issue. The inadvertent economic pay-offs (positive externalities or network effects) that will result from a more closely tended and better-defended public domain will only be achieved once the *intrinsic* merit in pursuing this is understood.

Conclusion and recommendations

Our recommendations are intended as steps towards building the progressive learning society that we have modelled above. This includes exploiting the full potential of our creative and technology industries, particularly within the SME sector, as well as describing how a richer, more inclusive public sphere can be built, and public domain be invested in, to take full advantage of the capabilities of digital media. These recommendations should not be taken as hostile to our existing IP framework, but mostly as supplementary to it.

We began this report by observing that knowledge must now play two contradictory roles at once in our society: as private asset and as public resources or social glue. It would be wrong to think that any policy programme can resolve this contradiction, but these recommendations aim to make it more manageable.

Continuing with the four categories we established in the second chapter, we theme our recommendations under those that further support: the economic incentive to innovate; the economic value of public domain;

access and inclusion; and digital preservation and heritage activities. Finally, we introduce recommendations that refer to the overall policy infrastructure and that are aimed at ensuring that future policy does not give weight to the claims of one section to the unjustifiable detriment of another.

IPRs as an incentive to innovate

We recognise the economic value of IP protection, particularly in incentivising the creation and distribution of knowledge and creativity. We are concerned that, despite recent focus on the value of creative industries in particular, there still exist barriers to businesses exploiting their intellectual assets by these means.

We make the following recommendations to strengthen the ability of SMEs and creative individuals to successfully use the IP regime.

- Patent registration is made excessively costly and complicated for UK businesses by the need to translate the patent for all European languages. This is an obstacle to patent registration by SMEs, who may prefer to work secretively as a result. We recommend that the EU use English as the single language for patent registration.
- The cost of pursuing infringements can be prohibitive for SMEs and creative individuals alike. A speedier, and cheaper, system of recourse should be available for such constituents in order that their rights may be protected and the efficacy of the IP regime increased. We support the recommendation of the NUJ that a small claims court for IP infringements be introduced, dealing with claims below a financial limit (say, £10,000). We see no reason to limit such a court to copyright infringement claims, and argue that equal access to justice is required by patenting SMEs. Such a system would be adjudicated by experts in IP law and prevent cases of small financial value spiralling in cost as they are moved to County Court level.
- There is a distinction between profit-maximising and profit-making firms. Creative industries policy currently fails to distinguish between shareholder-owned global content industries and smaller or more vocational creative businesses. Digital technologies, in tandem with DRM, are enhancing the power of global content publishers, and are opening up opportunities for amateur creators. But there is a risk that this emerging model squeezes out the retailers and publishers that sit in the grey area between commercial and non-commercial publishing. This would be particularly damaging for the book industry. Creative industries policy, together with competition policy, needs to be refocused on this middle tier to seek ways of defending independent businesses.
- Better access points to creative content can benefit creators both in terms of reputation and commercially, as Google has argued with respect to its

new book search tool. The model adopted by Google has broader applicability: wherever content is made more searchable and accessible, it must also be made more purchasable.

- One of the great strengths of our current IP framework is that it underpins knowledge sharing, within certain limits. But we believe that government could do more to support UK industry, both through increasing education about and awareness of IP and the rights protections confer, and through exploiting the network effects of open access models of production.
- SMEs' lack of awareness with regard to the IP regime is mirrored in creative individuals' lack of understanding of their rights. While we welcome efforts made by the DTI, Patent Office and others in this area, we maintain there is still a gap in the provision of inexpensive expert advice to inform such companies and individuals how they can best utilise their intellectual assets.

  Valuing intangible assets is important if SMEs within the knowledge-driven and creative industries are able to overcome the 'finance gap' that may be key to their survival. There is a need for more information on how SMEs can best utilise their IP portfolios, and, in particular, the importance of third party valuation.
- As our Plastic Logic case study shows, transfer of expertise through local connection is a key factor in innovation. We encourage Regional Development Agencies to become more involved in promoting education and awareness to the sectors existing in their locale, as well as collaborating further with the DTI's Knowledge Transfer Network programme to facilitate cross-industry collaboration on a local level.

While we respect the value of IP to the UK economy and in protecting the rights of individual creators and innovators, we have not seen any evidence to suggest that current protections provided in law are insufficient. We feel that to extend terms any further than their current length is economically illogical and anti-competitive.

The economic value of public domain

The emergence of digital technology has led to legislative changes to further strengthen and protect IP, in particular by defending DRM systems from circumvention measures, but without parallel government interventions to defend public domain. We see no reason why both goals cannot be pursued simultaneously, despite the conflicts that will periodically arise as a result. Our recommendations are as follows:

- Public domain currently exists only as a negative category: a loosely used term to describe works that are not protected by existing forms of IP. In order to clarify its conceptual position, and give meaning to dis-

cussions of its value and the impacts of policy on this value, as a first step we recommend that greater recognition be given to the concept of public domain in law.

- Although libraries, public service broadcasters and educational institutions may make their views known on IPR, there is no institution in the UK with responsibility for defending public domain in general, as an economic and cultural resource. The majority of research undertaken on the public domain exists in the US, where the Centre for the Study of the Public Domain, at Duke University, contributes a great deal. We understand that, for the public domain to be afforded due political attention in the UK, it must be able to demonstrate its worth in economic as well as cultural terms. It is important that the UK begins to invest in producing research in this area, not least so that IP policy can be made with a wider understanding of the economic and cultural trade-offs involved.
  We recommend that the Government invites tenders from consortia to establish a UK Centre for the Advancement of Public Domain, and offers to match all funding that the consortia raises or puts forward. Such a centre would encompass both an advocacy and research role. It would be well-placed to represent and present the public interest in considerations of information policy, stimulate and provide a focus for research in this area, and recognise and applaud investments in the public domain. Such a body could then represent public domain in a reformed IP policy.
- The Government should take steps to ensure that the practices of our best open access institutions, namely universities and other public research centres, are safeguarded. The optimal economic model requires as much defence of non-commercial research practices as of commercial ones. Government should, therefore, ensure the distinction between commercial and non-commercial researchers does not mean the latter are constantly threatened by the former. At present, there is a fear that any research may be of commercial value at some point in the future, and so the notion of non-commercial research is under attack. Upholding the concept requires confronting another temporal conundrum: how much time must elapse between a piece of research being undertaken and a profit being returned, before the research can be deemed non-commercial? This question has no one-size-fits-all answer, but a line must be drawn in the sand, nonetheless.

The UK's Creative Economy is fortunate to include a number of unique socio-economic models, such as the BBC and Channel 4. The Creative Archive Licence Group, which is setting out to release publicly funded content to the public on terms similar to those Creative Commons, is to be celebrated, and we would hope there is scope for larger commercial organisations to become involved also. There are ways in which such activities can

be enhanced further:

- Ofcom is exploring the establishment of a Public Service Publisher (PSP), to create additional public service competition for the BBC and Channel 4 for the digital age. We would recommend that this operate on the basis of a specially tailored rights model, which would aim to publicise and share creativity first, and to commercialise it second. Creators commissioned by the PSP would need to accept that they were being remunerated heavily in terms of reputation and not in terms of maximum IPRs. Where possible, the PSP should seek to buy rights in perpetuity from creators, with a focus on newcomers and grass-roots production, and to release content publicly under licences such as those used by the Creative Archive.
- Opening up public sector information would present dramatic opportunities for entrepreneurship in the UK, without unduly benefiting overseas competitors. We support a recommendation related to us by Giles Lane from creative studio Proboscis that the functions of OS be split into two different components: one part being responsible for maintaining the National Geographic Database (NGD) and providing access to it on a 'cost of reproduction' basis to all who wish to use it, and another part that continues the OS's legacy of innovation and product development, but that derives no commercial or competitive advantage from controlling the NGD.

Access and inclusion

As we have set out in the report, facilitating public access to content and knowledge is an essential element of the IP regime, which can benefit cultural and educational development, academic research, and free speech, as well as promoting wider dissemination of creative content for economic gain.

The access that the IP regime affords is an important element of maintaining public acceptance and perceived legitimacy of the IP regime. It provides a useful balance against claims of anti-competitive or monopolistic practices, and can protect consumers as well as civic values. While providing a good in and of itself, rights-holders should equally recognise that concepts such as fair dealing mesh consumer and user practices with the IP regime and can ensure ideological 'buy in' to maintain public faith and support of the system.

For this reason, we believe that the benefits afforded to citizens and consumers should be further emphasised, and afforded the necessary clarifications and protections in the face of a changing technological environment. Our recommendations are as follows:

- We are concerned that opportunities for fair dealing activity and library

privilege are not being adequately translated into the contracts and licences that are, more often than not, attached to digital content. We recommend the Government facilitates a discussion between content providers and user representative bodies to develop a clear set of principles to further guide the interpretation of fair dealing in this context.

- Furthermore, as an indication of the importance of commercial players facilitating this activity, we recommend the Government introduce stronger incentives to comply with such principles. The current system for complaints regarding restriction of fair dealing should be replaced with a clearer, more accessible system, with the potential to hand out stronger, defined penalties for rights-holders who fail to take account of users' needs in this regard.
- Both of these activities are likely to improve public perception of DRM technologies, which currently gain press attention more often than not for where they restrict use, rather than where they facilitate consumer and user needs.
- At the same time, content users, whether creators, consumers, academics, librarians or archivists, must be made much more aware of their rights, and of what they can and cannot legally do with content. Current efforts to stem pirate activity are being won on practical, rather than ideological, grounds. Consumer education in this area should be focused on what benefits legitimate content provides.
- Beyond this, in seeking to limit pirate activity, emphasis should be on commercial harm to the rights-holder, rather than the act of sharing itself. As such, we recommend UK law be amended to include a private right to copy. Again, this will serve to increase legitimacy of the IP regime by legalising actions that thousands of individuals already undertake without significant harm to the rights-holder.
- Moving forward, the IP regime must take actual practices of consumers into account, particularly where they become so prevalent. We recommend Ofcom take responsibility for collecting evidence and representing consumers needs in this area, either by extending the remit of the Ofcom consumer panel to focus more widely on access to content, rather than just access to technology, or by introducing a new panel with this specific remit in mind. Responsibility for monitoring the problems experienced by disabled people in their interaction with DRM-protected content should also be placed with this body.

Digital preservation and heritage

The danger of the UK's current legal framework is that IP protection has increased without due regard to allowing the continuation of activities that ensure our cultural, digital heritage is preserved and accessible. In particular, there are concerns that DRM is protected, regardless of what it is being used for. We believe there is greater scope to govern behaviour according to

ethical principles, rather than allowing technology to dictate what is permissible. This will further strengthen public perception of the legitimacy of DRM, provide greater guidance for commercial companies operating in this area, and ensure the public good inherent in preserving our cultural life is protected. Our recommendations are as follows:

- The protection afforded to DRM technologies by UK law effectively removes copyright from the equation. Circumvention of DRM technology is likely to remain illegal, even after copyright term has expired. This is part of a wider issue regarding a policy decision to protect technologies that limit access, as well as those that limit copying; however, in this regard, it has important ramifications for the public domain and our digital heritage. We recommend, therefore, that anti-circumvention provisions provided in UK law cease to apply once copyright protection has expired.
- The British Library has urged that it is supplied with DRM-free copies of digital works, once digital deposit begins in earnest. We recommend this be a feature of digital deposit regulations and urge content providers to respect the value of libraries' activities in this area.
- We recommend it is clarified that libraries are able to take more than one copy of digital works for the purposes of preservation, particularly given the threats of technological obsolescence and the need for copying to allow for format migration. We recommend it be clarified that access to this copy is legally allowed, since there is no point preserving content only for access to be entirely restricted. Furthermore, we urge that library privileges be extended to audio-visual material for these purposes.
- Again, contracts and licences should be duty bound to ensure libraries are able to undertake relevant preservation activities. If stakeholder discussion fails to bring agreement in this area, we recommend Library Privilege trump contract for the purposes of preservation.

Reforming our IP policy infrastructure

As this report has highlighted, IPRs are an issue of high economic and cultural importance. However, they had been dealt with as a mere technicality, and with little public consultation until the Treasury's Gowers Review of 2006. We would like to see the mechanisms of IP policy development brought further into the public eye, and a greater variety of interests recognised as valid.

The Patent Office's current mission, to "stimulate innovation and enhance the international competitiveness of British Industry and commerce" (Patent Office 2006: 5), fails to encapsulate the public interest. In particular, its connection to the DTI, as an Executive Agency and part of the Innovation Group, excludes formal links to the DCMS and the creative

industries more specifically.

To develop formulation of IP policy, a new approach to IP is required, through which divergent interests can be factored in, and complaints formally made. The Patent Office should be renewed to provide an institution modelled on the Office of Fair Trading. This would be a more suitable basis to construct IP policy in a way that would deal with the conflicts that necessarily arise in this area. Whereas the OfT seeks to make markets work well for consumers, the Patent Office should seek to ensure IP policy works well for the public interest, and reflects the four components of the public interest that we have identified – the interests of producers in having an incentive to innovate; our collective economic interest in having a strong public domain; the duty to make information available for non-commercial purposes; and the interests of those preserving artefacts for the future.

In addition, the Patent Office should seek to be proactive in analysing how public policy is working in the market, to ensure that government laws and regulations are working towards the public interest so defined. It should also take a role in communicating and consulting with relevant stakeholders, including the UK Centre for the Advancement of the Public Domain and Ofcom, and to explain regulation and to improve awareness.

Finally, the organisation should publish recommendations to government for enhancing and improving the IP regime.

Note: web references correct at September 2006

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Notes

1. Kitch (1977) argues that, without private property rights, nobody would willingly cover the costs of prospecting on land, since, if they did, others would quickly join in and overuse the resource. Eventually, there would be little profit left to be made by anyone. Analogously, without patents, few companies would invest in the R&D activity necessary to innovate, as this R&D would also be left unprotected and open to overuse.
2. Most favoured nation treatment is intended to ensure trading rights between countries do not depend on an individual nation's political or economic clout. It extends the best access conditions provided to one country in a trading system to all participants of that system, meaning that everyone can benefit from the concessions that may have been agreed between two large trading partners.
3. See the Peer to Patent project blog at http://dotank.nyls.edu/communitypatent/
4. Others are: investment in physical capital (machinery, equipment and so on), skills, enterprise and competition.
5. At a European level, the 2000 Lisbon Agenda is a major source of policy development in this area.
6. R&D intensity is used to express the level of spending on R&D as a percentage of GDP.
7. Gross Value Added is defined as the difference between the value of goods and services produced and the cost of raw materials and other inputs that are used up in production.
8. A more detailed attempt to give an account of this value is provided in the ippr research paper 'The Value of the Public Domain' (Pollock 2006).
9. The recent interim report of the Leitch Review of Skills modelled some scenarios of increasing levels of skills in the UK. It compared the contribution to GDP of training an additional 3.5 million adults to gain qualifications to the equivalent of five GCSEs at grade A* to C; 'upskilling' the same number of adults to an intermediate level equivalent to two A levels; and increasing the number of adults with at least degree-level qualifications. The first option, concentrating on low-skilled adults, translated to a 0.3 per cent contribution to GDP, accompanied by an increase of 375,000 to 425,000 employed adults. The second and third options provided increases in GDP of 0.4 and 0.45 per cent respectively (Leitch 2005).
10. For example, Apple's FairPlay DRM system attached to all music downloaded

from the iTunes Music Store is incompatible with any MP3 player other than Apple's iPod. A format war is also brewing between providers of high definition DVD technologies, HDVD and Sony Blu Ray.

11. A detailed account of DRM's impacts in these areas can be found in the All Party Internet Group Report on DRM, available at www.apig.org.uk.

12. Other trading funds include the Meteorological Office, United Kingdom Hydrographic Office, Land Registry, Driving Standards Agency and Patent Office.

13. There are a number of ways in which the film industry has an effect on the UK economy. It has direct impacts: for instance, it employs a number of people in the different stages of film production in the UK, and in the distribution and exhibition of UK films. It also has indirect impacts, for example employment and activity that is supported along the supply chain and generated as a result of film companies purchasing goods and services from UK suppliers. It can also have wider economic and non-economic spillovers in promoting tourism (economic), UK culture (non-economic) and also through related sales of merchandising and film-related goods.

14. In 2004/05, grants from these organisations were £24.1 million and £31.8 million respectively. The Film Council offers a number of grants to film-makers, as well as distributing funds to nine Regional Screen Agencies, responsible for promoting film production and other activities within their regions, to the tune of £7.5 million in 2004. UK cinema audiences for the 133 Film Council-supported films in 2004/05 were 34.6 million, generating box office takings of £127 million.

15. Channel 4 is recognised as a public service broadcaster whose schedule seeks to provide "high quality and diverse programming which.. makes a significant contribution to meeting the need for the licensed public service channels to include programmes of an educational nature and other programmes of educative value" (Communications Act 2003; Schedule 9) In addition, the channel provides public service and creative competition for the BBC.

16. This is the point at which the estimated production budget based on script, shooting the film, post-production expenses (for example, for special effects and sound), and star salaries, is drawn up.

17. Sales of DVDs alone increased 35 per cent on the previous year. Sales of UK films on video and DVD accounted for £200 million, while rentals of UK films accounted for £112 million (Oxford Economic Forecasting 2005).

18. As part of the download-to-own option (which costs £4.99), you are able to watch the film as many times as you like, for as long as you like, but are only able to watch the film on the PC on which you bought it. The licence in this case does not expire, unless the hardware configuration of your PC is modified. The download-to-rent option costs £2.99. After purchasing, you have 10 days to start watching the film, then 48 hours to watch it as many

times as you like. After this point, the licence expires. Both options are only available to users based in the UK.

19. In 2005, there were approximately 1,350 onsite listeners, who accessed approximately 13,500 items. Public access to audio files on the Sound Archive pages of the British Library website were running at an average rate of 15,371 hits monthly, in the period from August 2005 to February 2006, rising to 67,378 in March 2006 (coinciding with a change of format to Windows Media Player).

20. The growth of the UK music industry over this period is phenomenal, and it is now one of the UK's largest creative industries. UK music sales were £1.176 billion in 2005, while the industry contributes 0.5 per cent to UK GVA, and accounts for £240 million in exports per annum.