

## **Private eyes, public suffering, and how the IP system fails us.**

I have always been very uneasy with the way that intellectual property (IP), which includes copyright and patents, works. The argument that they are good for society usually runs like this: inventing or writing something takes time, effort and expense. If the inventor, or someone to whom that choose to sell their IP, is not entitled to a reasonable period of having exclusive control over their invention to profit from it, then nobody will invest in inventing in the first place and technological and artistic developments will cease. And the argument typically goes on to illustrate how copyright and patent laws were an essential foundation for the industrial revolution.

But I remain somewhat sceptical. To begin with, copyright has not always existed but works of art and music have, all the way from cave paintings. Clearly, one does not have to have copyright to be creative. The earliest examples of copyright-like systems arose following the invention of the printing press, suggesting to me that it was less about fostering creativity than about preventing people other than the creator profiting from the work. And true copyright began in 1710 (the Statute of Anne, in England): clearly the creative explosion of the renaissance could take place happily without it. The patent system arose in a similar period, its first examples from Italy (1470s) and its modern form in 1624 (England), though in both cases the system was introduced not so much to foster creativity as to prevent monarchs and others in power granting monopolies for nepotistic reasons or as a reward for donations to the monarch's own purse. Yes, there are examples of patents apparently fostering innovation in the industrial revolution, by providing a steady funding stream from early inventions to fund the development of later ones. But there are also many examples of innovation being badly held up by inventors being unable to use patented ideas of others - the history of the steam engine shows many examples. One famous was James Watt's use of unnecessarily complicated devices for turning linear motion into circular motion, which were built only because James Pickard had already patented the crank.

Sometimes, inventors operate a completely different way, and make designs publicly available and exploitable by anyone. Examples that have had a great effect on recent times include the architecture of IBM's Personal Computer, which led to vast numbers of PC clones and to the 'PC' becoming a nearly universal standard and therefore on the software systems it runs also becoming nearly universal it (I typed 'nearly' in both cases: there is no need to write in with exceptions!). Other examples include the architecture of the Internet and of the World Wide Web. One reason for the success of all these must be that anyone could join in without worrying about IP for the basic

ideas, even if there was IP in specific chips and applications that they chose to realize the ideas. Open Innovation is a way of working that is growing in competition to the traditional model.

My biggest dislike of IP-protected closed innovation is the secrecy that goes with it, all too frequently abused. A particularly annoying aspect of this is manufacturers not releasing information to help people repair their products or, in the case of some recent vehicles, of designing systems that detect if 'unauthorized repairs' have been made and shut the system down until the repair has been done by the company's own dealerships. This is made worse by companies declaring products obsolete and declining to repair them at all, forcing a customer to upgrade (or if they have any sense, to vow never to give a penny to those people again). The 'right to repair' movement has grown out of this, and it includes a call for information about devices to be made fully public so that, even if a manufacturer goes bankrupt, the things they build can be maintained forever.

The importance of this issue has just been underlined in a horrible way, by an article in IEEE Spectrum (see 'Links') about the collapse of a company that makes implanted 'bionic eyes' that restore crude vision to people with certain types of blindness. According to the article, the company, Second Sight Medical Products, produced a device, 'Argus', that has a camera mounted in the centre of dark spectacles. The camera connects to a battery-powered image processing box about the size of a Sony Walkman, usually worn on a belt. This creates a high contrast image of about 60 pixels, and sends it wirelessly to a receiver on the side of the spectacles, which transmits the image, together with power, to electronics implanted in the patient that lead to an electrode array on the retina itself. Thus the patient sees the image as a pattern of 'light'. The sense this provides is not sight as most of us fortunate sighted people understand it, but it is enough to help people walk around without collisions and to perform other basic tasks better than they would without it.

Or rather, it was... according to the article in IEEE Spectrum, the company hit financial hard times, and abandoned its work on Argus, auctioning off most of its equipment in early 2020. Patients were left wondering for how long their Argus eyes would continue working. One, interviewed in the article, had hers fail when she was on the subway, never to work again. Others have created communities rather like those of classic car enthusiasts, hoarding spare parts (such as the camera and video processor) so that they can be used to repair failed systems, and the company has said in response to questions from IEEE spectrum that it will make its remaining stock of external components available. But no more will be built (again according to the article), and no implants

will be built. And, as far as I can tell, the company has still not released full details of the system so that others can make replacement processors of cameras when the spares run out.

As medical discoveries are rolled out to real patients by small start-up companies, this kind of story is likely to repeat itself. Obviously no company sets out to run into financial trouble and to have to abandon its original line of work, but this happens. I feel genuinely sorry for the company: they did an amazing thing - making the blind see is the stuff of miracle stories - and in crude terms they deserved to succeed. But their problems have highlighted how critical it is that we develop IP systems that do not leave patients high and dry when a company folds.

As a reader (and an author, so on both sides of the copyright fence), I have long thought that while I do not mind copyright protecting the rights of an author and publisher during the time a book is in print, it is ridiculous for copyright to prevent dissemination of a work that is long out of print. Much better, I would have thought, would be a system that means that, once a publisher decides to cease publication of a work, they must make their pdf available to copyright libraries who can then do print-on-demand for anyone who wants a copy later (for a reasonable fee to support the service). Having read the IEEE article, I think the same should apply to patents: once a company stops making something, it should have to release all details (including software source code) to the public domain, so that anyone can maintain the devices and make spare parts for them. That way, if a medical company fails or for any other reason leaves patients high and dry, a body such as the NHS can commission another manufacturer to make essential spares.

The above is just my wish, and runs against the flow of most developments in IP, which seem to be toward greater and greater protection (for investors, not customers). Right now, the lesson for us, beavering away in our labs, is probably to think ahead hard about how our work is translated, by whom, and how stable they are likely to be. Having a commercial system that results in mobile phones becoming obsolete and unrepairable is annoying and wasteful, but having a commercial system that allows someone's artificial eyes to go the same way, when it would still be physically possible to maintain them if the parts were made, is unforgivable.

Jamie Davies, Edinburgh, February 2022

**Link:** The article in IEEE Spectrum - <https://spectrum.ieee.org/bionic-eye-obsolete>