# On Digital: an introduction to digital media and networking for legislators

**Introduction**

**It is our concern that if appropriate legislation regulating digital copyright is to be drafted, it is first necessary to properly understand the nature of digital media and digital networking.** Here is a contribution from photographers on this subject - one with which we are intimately familiar.

Statements have been made by the Government to the effect that regulation of digital copyright is too complex for primary legislation, because too much remains unknown and powers must be granted in advance to regulate unpredictable future developments. This after more than four years of research and "consultation", starting with the Gowers Review in 2006 and continuing with the Lammy Review in 2009.

That is a patronising and lazy attitude unworthy of the intellects who took part in Clause 43's gestation and drafting. **The primary characteristics of digital data, digital media and digital networking have been widely known, well understood and straightforward to describe for nearly thirty years.** The current spread of Internet and email use, social networking and file sharing is simply a manifestation of the lowering of the barriers to entry to digital networking and the origination, sharing and recombining of digital media afforded by more powerful and smaller computing devices, more capable, easier-to-use software, and pervasive digital networks. There is good reason to believe that this trend will continue.

**1. Digital data can be copied exactly.**

This is the first primary characteristic of digital media, and what distinguishes it from conventional "analogue" media. Copies of digital files are exact copies, identical in every way, with no quality loss. This is why software works, why the spreadsheet you send to a colleague still calculates correctly, and why exact backups of your work are possible. Because of this characteristic there is really no such thing as a unique digital master file; there is only either a single copy of the data, or multiple identical copies. Of course it is also possible to derive functionally-similar copies from an original digital file. Resized digital images, images with their metadata stripped, and images saved in different file formats can all be visually identical and functionally similar to an original, but comprise different data structures.

**This gives rise to the first point of confusion for consumers and other users of creative intellectual property**. Unlike stealing a physical object and thereby depriving its owner of its use, the unauthorised copying of a digital data file leaves the original in place for its owner to continue unsuspectingly to enjoy. Unauthorised copying therefore appears to be a “victimless crime”. It is not. The unauthorised “orphan” copy reduces the original data file’s value to its owner because the unauthorised copy can go on to be freely duplicated and used elsewhere by others who might otherwise have bought an appropriate licence to use it at the proper market rate from its owner, or

who might go on to use it in ways that its owner would not sanction. Law recognising this fact in relation to illegal file sharing was enacted in the Digital Economy Act 2010, and yet its antithesis, this false and sloppy "victimless crime" thinking, remained codified in the Digital Economy Bill Clause 43.

**2. Digital data is separate from its storage medium.**

A digital data file can exist stored on a hard disk, memory stick, CD or DVD, data backup tape, in random access or flash memory or any other physical storage medium and be copied freely between them. When you replace your worn-out old computer you copy your data from it to a new one: the storage medium changes but the data itself remains unchanged.

**This gives rise to the second point of confusion for consumers and other users of creative intellectual property**: they think that they have "bought" a CD, DVD or data file. In fact they have bought and own a copy of the physical storage medium, but only paid for a licence to use the intellectual property stored upon it; they have not bought its copyright. **Consumers do not "buy" stories, articles, music or films; no-one need "buy" photographs. In all cases an appropriate licence to use is sufficient.**

**3. Digital data must be copied and transformed in order to use it.**

Unlike viewing a photographic print, painting, drawing or sculpture; listening to live speech or music; or watching a film projection it is not possible to experience digitally-stored data at first hand. A digital data file resident on a physical storage medium must first be loaded by software into a digital device's random-access memory and then transformed into pixels on a screen to be viewed, or streamed to a digital-to-analogue converter and fed to an amplifier and transducer to be heard. These are transformative copying operations. This both proves the veracity of the first characteristic of digital data and introduces its fourth characteristic.

**4. A digital network is no more than an extension of a digital device.**

Any digital device consists of functionally-discrete modules such as data input, storage, processing and display, joined by internal communications conduits. A digital network is no more or less than the extension of these internal communications conduits beyond that device to other devices. Data travels through these conduits accompanied by identification and routing metadata. In so travelling its digital format might be transformed to comply with the technical requirements of the conduit, but on arriving at its destination it can be transformed back again to become an exact copy of the data on the originating device. **That really is all there is to it.** WiFi, Ethernet, cellular networks, IP addresses, MAC addresses, TCP/IP and the rest are merely digital plumbing.

**5. All digital data transmission can be logged.**

Your itemised mobile phone bill is a testament to this fact. Identification and routing metadata can be and is routinely logged. Such logging has been legislated for in the Digital Economy Act. This

is the basis of all digital billing, accounting and auditing systems. Authorial metadata is no different from any other digital data and can be similarly logged.

**It is significant that UK publishers accept, use and benefit from digital logging as a means of doing business when selling their wares, and yet object to the digital logging of the authorial metadata of their contributors' submissions as "unacceptably onerous and expensive".** The same software and computer systems can easily carry out both functions simultaneously, and this is exactly what they do, by law, in Germany. Germany appears to enjoy a thriving publishing industry.

**6. All digital copy-protection and digital rights management mechanisms can be subverted.**

In transforming a stored digital file into pixels for viewing or sound waves for listening to, all encryption and Digital Rights Management mechanisms must be unlocked. Herein lies their weakness: the unlocking process can be reverse-engineered. The fact that these mechanisms *can* be subverted does not imply that they *always will be* every time a digital rights managed file is used. DVD copy protection was "cracked" within weeks of release of the format, but contemporary commercial DVDs remain copy-protected and sales healthy.

**The subversion of digital rights management mechanisms can properly be compared to losses suffered by high street retailers as a consequence of shoplifting.** Most shoppers do not steal; retailers remain profitable despite the activities of shoplifters. Retailers deploy measures to minimise shoplifting but regard the costs of those measures and the stolen stock as costs of doing business. They could reduce their losses by making their shops less consumer-friendly but know that in so doing they would reduce their overall sales and thereby suffer. Their measures limit their losses through shoplifting to a commercially-manageable level. In this regard, Digital Rights Management is no different. Many large, successful digital network businesses such as Apple iTunes are built upon digital rights-managed data distribution in the full knowledge that a commercially-acceptable proportion of that data will be "cracked" and illegally shared.

**Future Legislation**

Future digital copyright legislation has only to recognise these six primary characteristics of digital data and networking to be effective no matter what developments the future might hold by way of its proliferation and usage. It is quite wrong to assert that the future is unpredictable in this way. **It is perfectly possible to word concise, comprehensible and effective primary legislation that takes into account the six primary characteristics of digital data and networking. Photographers intend to participate in exactly that.**

*(The author of this article has been directly professionally involved with digital data and networking for thirty years as a professional musician, R&D researcher for a major Japanese electronics manufacturer, professional photographer, and latterly, Apple Macintosh computer consultant to commercial and advertising photographers.)*