

# ecoLonomics

*Paul Mobbs' newsletter of thoughts, ideas and observations on energy, economics and human ecology*

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## ***When You're Windows are Broken don't be Surprised if you Feel the Cold Draught of Distress***

The phone rings; against the background noise of a call centre a young man says, *"I am phoning about your Windows computer"*. I reply casually, "I don't have a *Windoze* computer" (I always make an effort to nasally sound the 'z' consonant). He apologises and rings off. Later his simple statement begins to bother me; *why would anyone assume an automatic connection between the concepts "Windows" and "computer" when clearly Windoze is one of the worst operating systems that you can load onto a computer in order to use it creatively?*

*Banbury, Thursday 23<sup>rd</sup> December 2010.*

*I'm sitting in my office below the skylight. This pretty much typifies my existence for the last few months. However, whilst usually I'm labouring here on behalf of someone else today I'm labouring here for myself. It's nearly Christmas and, as usual (it's the quiet point in the year), I'm conducting my annual systems back-up, re-stall and reload pantomime.*

*I am sitting in front of three flat panel screens, each connected to a computer; a fourth computer, my main file server, sits in the corner of the room without a screen attached; a fifth computer elsewhere in the house is also connected into this digital menagerie. Together these computers and the cabled network that connects them make up my "critical information infrastructure"; one main work machine, one general data processing purpose machine, one slave machine and a file server. The total hard disc storage capacity on the network is just over four terabytes, but as part of this refit cycle I'm more than doubling that to over eight terabytes. At the same time I clean and de-fluff the fans, heat sinks and power supplies, and upgrade to the latest version of my chosen operating system. An annual chore, yes, and a few days of tedium whilst I'm waiting for data to move around the system, certainly, but it ensures reliable operation for the coming year.*

*As far as my computers are concerned 2011 is a special anniversary – it's a decade since I stopped using Windoze completely. I think I need to share a little information about why that makes me so happy, and question why people use Windoze at all!*

***I don't want to be here. There are so many other more interesting things I could be doing today; as I sit looking through my window on the snowy-white world I'd certainly rather be outside. I'm here for one simple reason – it's necessary.*** Whether I like it or not, I need computers to support my work; and, in order to provide that technical support, I have to keep my information systems organised, maintained and operating reliably. For that reason I continue to sit here when my desires would have me be elsewhere. When this job is done I'll have the rest of the year free to do other things.

Unlike many computer users around the world I have an intimate relationship with my equipment. I build, service, install and maintain it myself – I pretty much always have since I started using computers. We've recently bought a "new" machine for the family, but I've re-built it to make it a little more powerful and I'm now installing and configuring it to work within the network of machines it has now become a member of. The old "family" machine will be stripped down and turned into a new file server. Finally, in this shunting of roles, the old file server will be "put out to pasture", becoming the 'new' machine for my work teaching [computer recycling and maintenance](#)<sup>1</sup>.

For most people computers are a "black box"<sup>2</sup>. You turn them on, they beep, give you a pretty picture and – in perhaps the greatest deception of the computer industry today – they show you the *Windoze* splash screen (note, from now on I will use the term 'Windoze' deliberately in order to differentiate

Microsoft's™ [Windows™](#)<sup>3</sup> operating system from the word usually associated with the [fenestration elements](#)<sup>4</sup> of buildings and other structures). *Windoze* is not the only computer operating system; in my view it's not the best operating system; more importantly from the point of what follows, loading *Windoze* is possibly the worst operating system any person can use if they want to use their computer cheaply, reliably and securely to enable them to be a more expressive and creative individual.

I could talk about the Apple [Mackintosh](#)<sup>5</sup>, but I won't. For reasons I'll outline later, the development of Apple's operating system has taken an interesting twist in recent years. Instead I'll concentrate on *Windoze* because it raises questions about the role of technology within society, and the symbiosis between the latest trends in economics and employment and the development of computer software; perhaps more importantly, how individuals perceive their own selves and their potential within this greater technological system.

The launch, last year, of Microsoft's "[life without walls](#)"<sup>6</sup> media campaign was an attempt to turn *Windoze* into a lifestyle brand – rather like Apple, Sony or Virgin. It's "[I'm a PC](#)"<sup>7</sup> advertising campaign (interestingly, [created using Mackintosh computers](#)<sup>8</sup>) developed this association by directly identifying the use of PC computers with Microsoft's software products. Like many other forms of brand management (as I discussed in the last [ecolonomics](#)<sup>9</sup>), the information that brand advertising conveys is meaningless; it says nothing about the software, nor how well it performs the functions that people demand of it. Brand advertising is always self-referencing, or references an abstract or conceptual set of ideas that can never be realistically demonstrated. In a world where economists believe that we all make 'informed' judgements to keep the [market operating efficiently](#)<sup>10</sup>, is it any wonder that things have gone a little weird lately?

The reality is that Microsoft is marketing an approach to computer systems that's not 'pro the individual', but instead puts emphasis on corporate values above the creative desires of the individual. It is true that many responses to the *Windoze* versus Mac versus Linux issue can be [equally shallow](#)<sup>11</sup>, or [absurd](#)<sup>12</sup>, because in practice this isn't about the technology involved, or the programs, it's the economic and political paradigm within which these systems operate. ***How Windoze monopolises desktop operating systems, and the way in which the software influences people's ability to use the computer hardware, has far more value as a political and economic debate rather than a dispute over program code*** – it's all about civil and political freedom, and the ability to express yourself without



arbitrary restrictions being placed on your work, not simply a geeky debate over [proprietary code](#)<sup>13</sup> versus [free software](#)<sup>14</sup>.

As I wait for data to move around the network I'm typing these words on my main work laptop – a dual core two gigahertz laptop running [Fedora Linux 12](#)<sup>15</sup>. This will be the last job I carry out on this system as, once I've cloned it's file system onto a directory with in two terabytes of hard disc of the new "family" machine, I'll wipe the whole system and re-install with [Fedora 14](#)<sup>16</sup>. Apart from the time sat here, and the time to make a couple of DVDs and [download some programs](#)<sup>17</sup> from the 'Net, this will cost me *nothing*. Not only that, the DVDs I have created for this installation will be copied and freely distributed at computer training/recycling workshops over the coming year; and again, I will face no charge or sanction for doing so, and nor will the people who use that software. How can this be? Well, it's all about *freedom*.

***My first computer was a ZX80 kit***<sup>18</sup>. ***As a young teenager I liked to go "skipping"***<sup>19</sup> – ***rifling through the waste skips of the local industrial estates looking for bits and pieces I could use in my engineering projects, or take down to the scrap yard and sell for money (today people use the rather crude American phrase, 'dumpster diving')***. On one of these trips I found a half-assembled kit for a ZX80 computer. Getting it working, and later that year using the "new" [Apple II](#)<sup>20</sup> computers at school, and then getting the seemingly powerful technicolour [ZX Spectrum](#)<sup>21</sup> at home, launched me into the world of computers. What was important about this process was that the relationship I had to this technology wasn't simply 'consuming' the product; in order to do what I wanted to do with these new gadgets I had to understand the electronics within. Strangely I found that they were even simpler to manipulate than the radio and audio circuits I was also experimenting with at that time. They were like electronic stickle bricks – you connected circuit components together and they'd usually work.

Today I often teach novice computer users to assemble a PC computer – the essential first stage to being able to recycle and reuse older computer equipment to meet your needs or develop more technical/community projects. After I've given a short description and demonstration, in nine out of ten cases when they 'go solo' they get it right first time. Typically they'll spend a few minutes plugging boards and cables into the motherboard, and then connecting-up hard discs and DVD drives, and then they switch on. *Bleep*; the board springs into life and the display bursts forth with information.

A couple of years ago, following the beep and screen activity, a woman looked up to me and, with an astonished expression, said, "that's all it is?"

"Yep", I replied, "all the connectors are different so



### **Child's Play!**

*My son Wilf, aged 5, assembling his first computer...*

*...computers are technical, not complex!*

you have to be pretty ham-fisted to get them in the wrong place or the wrong way around”.

With a grave tone in her voice she then said, “I’ve been conned – I just paid someone £200 to replace my power supply... how much do these cost?” (she gestured to the power supply, the identity and function of which she now understood).

“About thirty quid; with practice you can swap it for a new one in about fifteen minutes”, I replied.

Her expression will always stay with me; the sudden realisation that all the mystique, the reverence, and the general exclusion zone that any “expert” system throws up to prevent public participation was in fact a very large confidence trick. An elaborate smoke screen not to shield the public from danger, or exclude them from an activity that required great skill, but rather a mechanistic activity that any five-year-old is potentially capable of carrying out (I’m not exaggerating – see the picture above).

Microsoft says “I’m a PC” – does that mean that people don’t have the first clue about how their life works, and thus have to regularly dispense with large chunks of hard-earned cash to keep their lives working? Clearly not. In selling *Windows* as a lifestyle accessory they’re not simply selling a computer operating system, they’re selling a dependency culture<sup>22</sup> which mirrors the general global structure of modern capitalism; a lifestyle that is not only enabled and maintained by remote actors, but the scope and detail of which is decided by those remote agencies too. It’s a dumbed-down, externally-mediated existence where we express our individuality through buying the banal, cloned accoutrements of the ideal lifestyle – sold to us as “high technology”<sup>23</sup>. The same can be said of many of the latest mobile communication devices, social networking services, and much of modern consumer electronics – in almost every case it’s style that dominates over substance, dependency over involvement, professionalised mysticism over individual knowledge and skill.

In contrast, if you want to really go into the “twilight zone” of the interaction of modern technology and human beings, from my own experience working with people in developing countries<sup>24</sup> they can understand the workings of “advanced” technology more easily than people in the UK. That’s because they’re already living in a social structure where practical interaction with the machines and gadgets

that surround your everyday life is essential in order to keep things working – maintenance, or even adapting or rebuilding the device to perform new functions, is an expected part of owning something. They already have the “involvement” mind-set, so, when something like a PC comes along, all they need to do is learn the basic functions of the elements involved. It’s not simply academic achievement that defines our ability to use complex equipment, our past experience interacting with all kinds of “tools” – be they physical or logical – confers knowledge too. In less developed societies “hands on” manipulation is the dominant form of learning; people watching other people carry out these activities and copying them. Skills are transferred as part of the general culture (especially between the generations) not as a technical discipline in their own right.

Of course not every person knows everything, and within many different human societies divisions of labour<sup>25</sup> inevitably evolve to allow individuals to specialise their skills – but those skills form part of a reciprocal relationship with those around them rather than being traded for their “value” in a competitive labour market. *The bonds of community are created through sharing, not exclusivity.* Unlike the deskilling inherent in the “advanced” economies, and which has been an essential element in both liberalising the labour market and breaking the collectivist tendency inherent in skilled crafts (from the guilds<sup>26</sup> of Medieval Europe to the trades unions of today), the division of labour in more traditional economies does not exclude participation behind the veil of “professionalism”. As Henry David Thoreau said in relation to house building in his book *Walden*<sup>27</sup> –

Shall we forever resign the pleasure of construction to the carpenter? What does architecture amount to in the experience of the mass of men? I never in all my walks came across a man engaged in so simple and natural an occupation as building his house. We belong to the community. It is not the tailor alone who is the ninth part of a man; it is as much the preacher, and the merchant, and the farmer. Where is this division of labor to end? and what object does it finally serve? No doubt another *may* also think for me; **but it is not therefore desirable that he should do so to the exclusion of my thinking for myself.** (my emphasis)

Of course, by lacking an appreciation of how the objects that surround our lives function – not so much the detailed scientific understanding but just a general, practical, or rudimentary understanding that informs our interaction with them – we lose something far more valuable; an appreciation of quality<sup>100</sup>. Without understanding the innate qualities of the tools we use, we can’t understand the value of what we are buying or utilising. We see this in the way

that cheap, low quality tools and gadgets are bought, used and disposed of rather than paying more for a higher quality, longer-lasting alternative. I noticed this trend in the street today. People had bought cheap plastic snow shovels that couldn't cut through the ice and quickly bent or broke as a result. My 1960s vintage cement shovel, inherited from my Granddad, cut straight through and I was very quickly able to clear path down the road. My shovel will go back into the shed until next year; theirs will probably go in the bin.

In the world of branding, where the surface features of the product are far more important to the perception of value than the actual qualities of what goes on within, too much knowledge is bad for business. If people really knew what they were buying, would they part with their money; or more relevantly, would they part with as much money as they do today if they could appreciate the lack of skill involved in its production? More importantly, how they react to the growing mesh of intellectual property controls that control not only the production of goods, but increasingly, and often restrictively, the way those goods function and interface with other devices.

Schlepp-splat – a large wad of snow-ice slides down the window and drops off the bottom. I get up and look out; it's lodged on top of one of my PV panels. I open the window and poke it off with a stick. My PV panels charge batteries that can run my work computer and, in emergencies, some lights around the house; or, e.g. when our electricity blew just before Christmas the year-before-last, the pump and control electronics on the central heating boiler. Again, like computers, cobbling together your own basic renewable energy system isn't necessarily complex, it's just technical; and like computers, many more people could do this if such activities hadn't been made illegal with the revision of [Building Regulations in 2005](#)<sup>28</sup> – *an example of the continued infantilisation of society mandated by law!* (luckily I installed mine before the change in the law).

A more economically advanced society is by its nature a more technical society, but at the same time the inherent divisions of labour and the deskilling of certain roles that arise make it a more simplified and hence less resilient society. With increasing specialisation and simplification comes general ignorance – people are so closely focussed on the problem in front of them that they miss the wider connections – or more generally the narrative context – of how their little piece of the puzzle fits into the whole. In ecological terms, as individuals we're inhabiting a [narrower ecological niche](#)<sup>29</sup> as our ability to practically support ourselves declines. If – *destabilised by resource depletion, high commodity prices that repeatedly derail the economic cycle, or eventually climate change* – the assumptions upon which the globalisa-

tion and simplification of economic roles are invalidated, the outcome might not be very pleasant for many who have opted to follow this mode of living. Our best way of avoiding this outcome is to be more involved in the operation of the world around us.

**I complete the post-install configuration on one of the boxes. I configure the [firewall](#)<sup>30</sup>, and the [SELinux](#)<sup>31</sup> operating options, and that's it; no further hassle, it will just work. However, it doesn't have virus protection software – it's not required for ordinary, everyday Linux systems!** (usually it's put on email and other public data servers primarily to stop virus propagation between *Windoze* users). There's a misplaced assumption that you [can't get viruses on a Linux system](#)<sup>32</sup>. Strictly speaking if you were to download a file, and then set permissions to allow it to be executed, and then run it, you could theoretically be allowing arbitrary code to be executed on your system – but even then it's only likely to affect that one user and, with the standard permissions (and especially if you're running SELinux too), it's unlikely to [affect the system as a whole](#)<sup>33</sup>. Or, as [Scott Granneman](#)<sup>34</sup> (columnist at *Security Focus* and *Linux Magazine*, and professor at Washington University St. Louis) puts it, “*To mess up a Linux box, you need to work at it; to mess up your Windows box, you just need to work on it.*”

*Oops, hang-on!* Sorry, there's a bit of a break in my train of thought at this point as 12 hours has elapsed since the end of the last paragraph. Linux puts all your files in your home directory, rather than scattering them around the system as *Windoze* is inclined to do. As a result one of the endearing features of Linux is that you can clone your home directory, containing all your work, onto a newly installed computer system (*or back it up to a DVD and then reload, as I just did*) and then carry on pretty much as if nothing had happened – apart from the fact that you really notice the new features and improvements to the programs you regularly use. I've just serviced my main work system; I wept the hard drive, re-installed, and, putting my home directory files back, I've re-opened this file and carried on from where I left off... *such ease, such simplicity; what bliss!*

Years ago, when I'd only recently got into using Linux, the Pentium-II motherboard I was using failed; I took out the hard disk and plugged it into a Pentium-III motherboard and it worked, first time, without any juggling of settings or reinstalling drivers required. In contrast a *Windoze* system of that era would have failed to locate and initialise the hardware, meaning that you'd have difficulties using the screen, sound and other functions of the computer; a more recent *Windoze* system would probably just refuse to work at all.

*Anyway, where were we?*

There are two aspects to how we can view the security of Microsoft's code: Firstly, there's the code

itself, and the way in which its design encourages [“malware”](#)<sup>35</sup>. Secondly there's the general philosophy that's behind the design of the system, and the increasing use of restrictive locks that [prevent your computer doing certain things](#)<sup>36</sup>; or, as it has also been characterised, the implementation of computer systems that, from the point of view of the user, are [“defective by design”](#)<sup>37</sup>.

As noted in my last [ecolonomics](#)<sup>9</sup> the best design is based upon incremental evolutionary development; nature being the greatest example. In an open environment we test many small changes, keeping the best ones where they exceed the value of the existing system and discarding the rest. With proprietary goods that's often not the case, and often design is driven by abstract targets rather than allowing systems to develop more slowly and organically.

In order to encourage people to renew or upgrade the product improvements are by and large system-wide, not incremental. One process that distinguishes proprietary from free software programs is free software allows incremental improvements which engender an evolutionary improvement in the system; in contrast proprietary systems often junk large parts of the code in order to create new “improved” versions. Of course no change takes place, even in nature, without mistakes being made. With evolutionary design those changes are often screened out by circumstance (they don't function/are not viable), or they're so minor they don't really matter. When you junk large parts of a computer operating system/program and start again you're creating an opportunity for a large number of errors to be created/re-created at the same time – and hence that code is less reliable and secure.

In computing there's what's known as the [“zero day” virus](#)<sup>38</sup> – a fault in the system that allows a wholly new and unknown method of attack from malware. It's the worst kind of malware incident because, being unknown, it has the capability to slip-past all the existing anti-virus software across the 'Net and create a widespread problem. This type of fault is something that both free and proprietary programs are potentially liable to suffer; however, because of the development cycle of proprietary software code, and its regular wholesale revision, such flaws are *more likely to occur* in market-driven proprietary than in free software projects. Within free software projects radical design changes take place less frequently, and so less faults are created.

The appearance of new major security flaws has been a standard feature of the post-launch phase of all *Windoze* operating systems and applications since the mid-1990s. Following the launch of *Windoze 7* there have been various warnings about [zero day viruses](#)<sup>39</sup> and other [security flaws](#)<sup>40</sup> in the system. More recently the new, “improved”



*Internet Explorer* has presented a whole [new set of problems](#)<sup>41</sup> for *Windoze* users to contend with. Although Linux is [not immune to malware](#)<sup>42</sup>, the experience to date suggests that that hazards presented by Microsoft's systems are orders of magnitudes greater than Linux.

**So, if Microsoft's products are by their nature not as good as the alternatives, how do they get away with selling them? That's the core of the 'general design philosophy' point noted earlier. Microsoft's corporate dominance of the software market allows them to abuse their power, both in restricting the creative abilities of computer users and in implementing practices that hinder the development of “good” design.** That's not just my opinion either; over recent years Microsoft have been the [subject of various investigations](#)<sup>43</sup>.

Microsoft, ever since the infamous [“open letter to hobbyists”](#)<sup>44</sup>, have always represented the interests of the copyright lobby rather than taking a more open view of how these new technologies redefine the [traditional property relationships](#)<sup>45</sup> operating within society. Intellectual property law has grown in parallel to developments within industrialisation generally, but in a world where non-physical 'information' now has domination over 'physical' goods there's a question over whether such restrictive distinctions are valid, or even appropriate to our future development.

This job takes hours, although as it's so involving you sometimes don't realise the pace of time passing; it's now dark, the gloom of the mid-Winter sunset slowly fading to night. The moon is now assing above my window; for the next few nights, an hour earlier each night, it will continue to do so as it wanes toward the new moon, marking the slow elapse of the days.

Although it hasn't hit the headlines in the mainstream media there's currently a battle for [ownership of the moon!](#)<sup>46</sup> It doesn't really make the headlines, because in truth it's all a bit absurd, and promoted by [‘entrepreneurs’](#)<sup>47</sup> bent on making a quick buck. Under US contract law they claim there's no barrier to individuals staking [claims to ownership](#)<sup>48</sup>, whilst at the same time the institutions of global governance (be it the issue of climate change/carbon emissions or indigenous rights) are having a real problem wrestling the definitions of what represents [public or private property](#)<sup>49</sup>. In reality this argument mirrors the present debate about intellectual property within the [“Information Age”](#)<sup>50</sup>; what can be owned, and, within changing times, as what point do traditional rights begin to interfere with people's everyday freedoms?

This distinction, between public interest and private property, has been at the heart of various investigations in to Microsoft's practices in the [USA](#)<sup>51</sup> and [Europe](#)<sup>52</sup>. In relation to malware, Microsoft might be

[tempting the ire of the courts again](#)<sup>53</sup> as they take on the anti-virus companies directly – with their *Microsoft Security Essentials* package. It poses some interesting questions about 'private interests' versus 'public well-being'. In the case of malware it's in the interest of the various companies involved to find, cure and publicise all the instances of malware that they find. However if Microsoft, using their market dominance to undercut the alternative providers, were to become the lead provider of anti-virus support to the consumer there would be conflict of interest between their marketing of computer systems, and their efforts to identify and publicise with speed the instances of malware.

There is of course a simple answer; *break-up Microsoft*. That was ordered by a US judge and then (on appeal) [over-ruled in 2001](#)<sup>54</sup>, but it's [back on the agenda this year](#)<sup>55</sup>, in part because the company as a whole [isn't doing that brilliantly](#)<sup>56</sup>. By dividing its operating systems, from its applications and consulting, from its consumer electronics divisions, you remove these conflicts. Most importantly, in the interests of efficiency for the business, you might end up with a former Microsoft applications business that started to create more open applications, and which stuck to international design standards rather than creating barriers to [interoperability](#)<sup>57</sup> by tweaking how programs operate (e.g. Microsoft's *Outlook* email program and the server systems they produce to go with it) in order to favour their own products. That might sound a bit pie-in-the-sky, but it's happened already – *to the Apple Mackintosh*.

Apple produced both operating systems and applications, using the same approach as Microsoft – and indeed during the 1980s and early 1990s they had a strong rivalry over the development of their systems. Then came *Darwin*<sup>58</sup>, a new operating system that was based on the [Unix standard](#)<sup>59</sup>, and contained open source elements from [Free BSD](#)<sup>60</sup>. Then Apple ended their historical use of Motorola chips and [opted instead](#)<sup>61</sup> for the Intel chips common to most PCs. In essence what Apple have done is spread the load of maintaining and developing a fully operational computer operating system. By working within the Unix model, making it broadly compatible to Linux and other similar systems, it's able to share development with other software projects. And, whilst Apple's [OS X](#)<sup>62</sup> isn't "free" in the same sense as Linux, the support that Apple brings to those other open source/free software projects strengthens them.

Whilst we might dream of Microsoft going properly "open source", in contrast to their misleading "[shared source](#)"<sup>63</sup> initiative devised to deflect some of the criticism resulting from the various court cases lodged against them, there's something more important working in the background here. As noted above, Microsoft have been strongly pro intellectual property rights, in part because this is what shores-

up their whole business model. Microsoft were an integral part of the [Trusted Computing Group](#)<sup>64</sup>, the attempt by the computer hardware/software and intellectual property lobby to create a "[trusted computing](#)"<sup>65</sup> platform that protected intellectual property rights. For many reasons that's been a little slow in developing, but [digital restrictions management](#)<sup>36</sup> – the core of this idea of the end-to-end control of the use of all [data by information systems](#)<sup>66</sup> – has been an increasingly pervasive, and some would say obstructive, element of Microsoft's *Vista*<sup>67</sup> and *Windoze 7*<sup>68</sup> systems.

It doesn't matter if we're talking about the moon or Microsoft, what we're seeing played out today is a political battle over the future of property. As the world globalises, but more importantly as the pace of human development begins to push up against the [ecological limits of the biosphere](#)<sup>69</sup>, the maintenance of a strongly growing economy becomes more difficult. Consequently, existing players will seek to consolidate control over the extant structures rather than taking a chance on going with the obvious and necessary direction of change. We've seen already that within the computer industry the certainties of [Moore's Law](#)<sup>70</sup> have begun to look suspect; the problems of keeping the high returns of high technology have been discussed for the [last five years or so](#)<sup>71</sup>, and today there's real doubt that the scale of growth in the industry [can be maintained](#)<sup>72</sup>.

Microsoft's re-branding – *creating an identity between computers and Microsoft products using the concept of "I'm a PC"* – is one example of how these pressures are beginning to play out. In order to strengthen their future position they look towards a strong control over their product. Their whole-hearted refusal to be broken up into different businesses represents one aspect of this control culture; the continued use of their market dominance to dictate how their systems will be used (be that through their shared source control over competing applications, or the introduction of new products that seek to control segments of the market – e.g. *Windoze Media Player*, *Internet Explorer* or their latest offering, *Security Essentials*).

As I ponder this the computer to my right begins to play a tune – the 2-hour job I've given it must have finished. I've got five computers connected together, their operating systems running programs across the network. This program (a little script I cooked up in 20 minutes that has saved quite a few hours of manual work) tells me that I've got 1,389 gigabytes of unique data files that need moving to a single location ready to be transferred to the new file server.

It's an interesting question; would I'd be able to do this if my system was locked with full 'digital restrictions management'. I might not be able to write little programs so easily; I might have problems moving files around my system as easily because of needing

to authorise/match digital fingerprints to “prove” it was a valid file; perhaps most importantly, some of my files date back to the late-1980s and they’d probably not be compatible with the latest *Windoze* software. My children have only used Linux at home; they hate using the *Windoze* machines at school because, even for their limited needs, they’re finding that the system keeps getting in the way. I hope that [Linux never gets hobbled](#)<sup>73</sup> by the digital control freaks.

**Of course, all this prognostication is skating around the subtext to the whole control of information technology/digital restrictions management issue – intellectual property rights and their roles in supporting the modern global economy.** Computers are an excellent example of how a complex technology, developed in the West, has been exported to Asia as a means of reducing costs; but which has, as a result, reduced the powers of the wealthy nations as the upstart “[BRICS](#)”<sup>74</sup> begin to dominate the global economic stage.

The hyper-specialisation of roles in the global economy has now reached a stage where global divisions are beginning to eat away at the structure of human society – both in the developing world, where rapid industrialisation is creating social strife, as well as the developed world where groups unable to accommodate themselves within this new reality are swelling the ranks of the [‘underclass’](#)<sup>75</sup>. In this system you either fit or you do not. In the developed world the implication of “not fitting in” is that you live an unproductive life supported by varying standards of public welfare; in the developing world it entails landless poverty and dispossession.

In this system, one of the few remaining strengths of the “developed” nations is that the structures of global governance have enacted measures that support their interests – the global system of [intellectual property rights](#)<sup>76</sup> being the highest form of global specialisation that still works in favour of the most wealthy states. For that reason many states have escalated the protection given to intellectual property rights to a level incomparable (and certainly one that was never anticipated) to the system that existed before the 1960s. However – given that in this system of specialisation within technologically mediated systems of capital, consumption and communications there are many who cannot or do not wish to participate – why should those who do not fit into this new global order obey it’s most economically exploitative rules?; it’s clearly not in their best self-interest to do so.

[Charles Colton](#)<sup>77</sup> said that “imitation is the sincerest of flattery”. If we look at the evolution of human society it’s something far more significant than that – *it’s what we’re hard-wired to do*. As noted earlier, before there was any formal technical education skills were transmitted, through culture, by one gen-

eration watching and learning from the previous generation. We observe, we remember, we conceptually model, *and then we imitate – and once a skill is perfected we can then improvise in order to improve it*.

Before writing human culture was oral, with one generation memorising and copying the words of the previous generation. Knowledge is the observation or remembrance of what has past; wisdom is the abstraction of knowledge to provide a framework of meaning for the future. In an [Orwellian sense](#)<sup>78</sup>, if we control people’s intellectual creativity then we take away the ability for them to control their future because we arbitrarily restrict their access to the base of human knowledge.

This is also what Thoreau observed in *Walden*. The specialisation of human skills, and the division of labour that results, facilitates the development and extension of the general base of knowledge. At the same time the true value of those skills only becomes apparent when they are spread widely through society – by, as noted, observation, copying and communication. The strength and resilience of Thoreau’s vision of society is that the sum of human skills are shared horizontally across the population. In contrast, the restrictions of intellectual property rights confer exclusivity, and a vertical relationship where one group defines the access to knowledge for another. In contrast the legal sanctions created by recent changes in the law on intellectual property mean that it’s [unlawful to disassemble, study and modify gadgets](#)<sup>99</sup> that you have legally purchased – *this has nothing to do with safety, and is purely aimed at restricting access to knowledge*.

In the global economy, intellectual property acts to restrict the movement of technology and knowledge between [the rich and the poor](#)<sup>79</sup>; from [indigenous crops](#)<sup>80</sup> to [modern medicines](#)<sup>81</sup>, they perpetuate the historically exploitative relationships between the North and the South. At the national level it reinforces the traditional division of wealth within society; but at it’s most insidious level intellectual property restricts the potential for change because it restricts our ability to use past knowledge to plan for the very different type of future that is evolving out of the ecological and resource difficulties of today.

This is the economic reality of why intellectual property is so important within globalisation; it’s also why adherence to the strict and widespread measures to protect intellectual property is something that we should all seek to avoid, and to disavow its coercive use through our actions... *Which, of course, brings us back to Windoze...*



The traditional restrictions of intellectual property, before the global push for world intellectual control

over human creative expression began in the late 1960s (following the establishment of the [World Intellectual Property Organisation](#)<sup>76</sup>), always related to a physical artefact – a book, a machine, a picture, etc. The restrictions that could be placed on the information and knowledge contained in these artefacts were in turn limited by their physical nature – a book can be read by anyone, although copying it can be a bit of a chore. In contrast the restrictions over digital information are absolute – a digital book can have access controlled completely because technology intermediates between the “user” and the resource; encryption ensures that, without permission, the content is available to no one.

Windows is the embodiment of this control system, far more effectively than any admonition from any political dictator. Through its compliant enforcement of restrictive intellectual property, even when the [law does not require it](#)<sup>82</sup>, it's working to usher in a restrictive and controlling system of technological mediation. Under copyright law people are permitted certain ['fair dealing rights'](#)<sup>83</sup> (albeit they have also been severely restricted in recent revisions to copyright law), but Windows and various other proprietary systems cannot be used in a way that preserves these rights – *the default position is that use of the information is always protected irrespective of the legal rights of the person using it*. Rather perversely, there have also been occasions when Microsoft's digital restrictions management has even locked out copyright owner from [accessing their own material](#)<sup>84</sup>.

To be fair this isn't solely Microsoft's show; others are jumping on the DRM bandwagon too, but, as a market leader, Microsoft's participation has the greatest effect. Even so, there have been some strange cases lately. Amazon remotely deleted books from its [Kindle e-book readers](#)<sup>85</sup>, *that had been paid for, and without the owner's knowledge or consent*, because of a rights dispute – including, ironically, [George Orwell's 1984](#)<sup>86</sup>. Apple is now getting in on the act too, including [similar DRM capabilities in their new products](#)<sup>87</sup>. Even the public service oriented BBC has begun to use DRM restrictions [within its digital services](#)<sup>88</sup>, even though (for actions such as private study) recording programmes for off-air viewing is 'fair dealing' under the law. In parallel, in part as a result of the myriad of lobby groups now operating as an [“intellectual property mafia”](#)<sup>89</sup>, we're also seeing the rise of [copyright](#)<sup>90</sup> and [patent](#)<sup>91</sup> “trolls” – companies who produce nothing, and instead buy intellectual property and make an income by suing people in court for infringing their proprietary rights. Not forgetting of course that all this added DRM complexity creates more holes and flaws that [allow your digital technology to be exploited](#)<sup>92</sup> (and we haven't even got to the digital manipulation and privacy issues inherent in mobile phone usage yet!).

***My work machine is nearly complete! As I write this about 300 gigabytes of 'essential' files are being written back to the hard disk from around the network. This machine will now do pretty much anything I want to do with a computer, and there's a lot more application that I could use if I had the time to do it.*** What's more, all the systemic complexity, insecurity, and financial costs associated with using proprietary systems doesn't affect me at all; more importantly, my computer operates more easily and cheaply than any piece of Microsoft infected hardware that I could afford to buy. I'd really like to explain it all, but there's so much I'm not sure where to begin.

My computer doesn't just word process; it comes, [as standard](#), with programs such as [GIMP](#)<sup>93</sup> (that many think is better than *Adobe Photoshop*); it has a fully function web server, meaning I can create complex web sites without having to be connected to the Internet; it has a plethora of programming languages to allow me to automate repetitive tasks and process large quantities of data; it has video, music and editing programs that allow me to manipulate just about any common form of audio or visual data; oh yeah, apart from the fact that this comes without all those annoying digital rights restrictions, *have I already mentioned that you can download this for free or get it on a magazine for a few quid?*

With the last few gigabytes transferred my [Intranet](#)<sup>94</sup> comes on-line; quite apart from having just about everything I've written since the late 1980s at my fingertips, the Intranet provides thousands of government reports, technical reference manuals and other useful information that I've collected over the years – all of which is word indexed so that I can quickly digest all those thousands of pieces of 'data' into useful 'information'. These are the “essential” files; I've got another terabyte or so of files that will have the same indexing applied to them, and which I will access over the network from the re-built file server when it's complete.

It's been nearly a decade since I gave up Windows. For all their protestations about caring about their users, or about producing the [world's leading software](#)<sup>95</sup>, Microsoft's products are not designed to serve the needs of ordinary people, but instead support the command and control structures of global corporate enterprises. Given the [multiplicity of evidence](#)<sup>96</sup> it's very easy to rant about Microsoft, and their deliberate campaign to run the computer industry according to their [own desires rather than the standards agreed](#)<sup>97</sup> by the various interested groups around the globe. Instead I always promote one simple metric to evaluate the performance of any technological system – *does it work for me?* On that count I'll retell the reason why I switched to Linux a decade ago:

I write; writing takes a lot of thought. When I used

Windoze in the 1990s I'd work for five or six hours (if I was lucky!), get a [blue screen](#)<sup>98</sup> or a system freeze and, whilst rebooting, and assuming I could recover my data, I'd lose my train of thought and have to stop work. In short, *the machine kept falling over*. With Linux, the opposite is the case. I can work, and work, and, one day, after twenty-odd hours working at the

computer *I dozed-off and fell off the chair!*

Computers are meant to support you; you are not meant to work to support the computer! Do yourself a favour; learn to use Gnu/Linux on an old machine and then, when you're ready, *wipe you Microsoft system and switch to a system that's devoted to developing your creativity, not fencing it in.*

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