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Academics, new media artists, and journalists have been writing extensively about "new media" since the early 1990s. In many of these discussions, a single term came to stand for the whole set of new technologies, new expressive and communicative possibilities, and new forms of community and sociality which were developing around computers and the Internet. The term was "digital." It received its official seal of approval, so to speak, in 1996 when the director of MIT Media Lab Nicholas Negroponte collected his ***Wired*** columns into the book entitled ***Being Digital***. Thirteen years later, this term still dominates both popular and academic understanding of what new media is about.

When I did Google searches for "digital," "interactive," and "multimedia" on August 28, 2009, the first search returned 757 million results; the other two only returned between 235 and 240 million each. Doing searches on Google Scholar produced similar results: 10,800,000 for "digital", 4,150,000 for "web," 3,920,000 for "software," 2,760,000 for "interactive", 1,870,000 for "multimedia." Based on these numbers, Negroponte appears to be right.

I don't need to convince anybody today about the transformative effects the Internet and the web have already had on human culture and society. What I do want to point out is the centrality of another element of the computer revolution which so far has received less theoretical attention. This element is software.

I want to suggest that none of the new media authoring and editing techniques we associate with computers is simply a result of media "being digital." The new ways of media access, distribution, analysis,

generation and manipulation are all due to ***software***. Which means that they are the result of particular choices made by individuals, companies, and consortiums who develop software. Some of these choices concern basic principles and protocols which govern the modern computing environment. The "cut and paste" commands built into all software running under Graphical User Interface and its newer versions (such as iPhone OS), for instance, or the one-way hyperlinks as implemented in World Wide Web technology. Other choices are specific to particular types of software (e.g. illustration programs) or individual software packages.

If particular software techniques or interface metaphors which appear in one particular application become popular with its users, we may often see it appearing in other applications. For example, after Flickr added "tag clouds" to its interface, they soon became a standard feature of numerous web sites. The appearance of particular techniques in applications can also be traced to the economics of software industry – for instance, when one software company buys another company, it may merge its existing package with the software from the company it bought.

All these software mutations and "new species" of software techniques are social in a sense that they don't simply come from individual minds or from some "essential" properties of a digital computer or a computer network. They come from software developed by groups of people and marketed to large numbers of users.

In short, the techniques and the conventions of the computer meta-medium and all the tools available in software applications are not the result of a technological change from "analog" to "digital" media. They are the result of software which is constantly evolving and which is subject to market forces and constraints.

This means that the terms "digital media" and "new media" do not capture very well the uniqueness of the "digital revolution." Why? Because the new qualities of "digital media" are not situated "inside" the media objects. Rather, they exist "outside" – as commands and techniques of media viewers, authoring software, animation, compositing and editing software, game engine software, wiki software, and all other software species. Thus, while digital representation enables computers to

work with images, text, forms, sounds and other media types in principle, it is the software which determines what we can do with them. So while we are indeed "being digital," the actual forms of this "being" come from software.

Accepting the centrality of software puts into question a fundamental concept of modern aesthetic and media theory – that of "properties of a medium." What does it mean to refer to a "digital medium" as having "properties"? For example, is it meaningful to talk about unique properties of digital photographs, or electronic texts, or web sites? Strictly speaking, it is not accurate. Different types of digital content – images, text files, 3D models, etc. – do not have any properties by themselves. What as users we experience as properties of media content comes from software used to create, edit, present and access this content.

It is important to make clear that I am not saying that today all the differences between different media types – continuous tone images, vector images, ASCII text, formatted text, 3D models, animations, video, maps, sound, etc. – are completely determined by application software. Obviously, these media types have different representational and expressive capabilities; they can produce different emotional effects; they are processed by different groups and networks of neurons; and they also likely correspond to different types of mental processes and mental representations. These differences have been discussed for thousands of years – from ancient philosophy to classical aesthetic theory to modern art to contemporary neuroscience. What I am arguing is something else. On the one hand, interactive software adds a new set of capabilities shared by all these media types: editing by selecting discrete parts, separation between data structure and its display, hyperlinking, visualization, searchability, findability, etc. On the other hand, when we are dealing with a particular digital cultural object, its "properties" can vary dramatically depending on the software application which we use to interact with this object.

Let's look at one example - a photograph. In the analog era, once a photograph was printed, whatever this photograph represented/expressed was contained in this print. Looking at this photograph at home or in

an exhibition did not make any difference. Certainly, a photographer could produce a different print with a higher contrast – but the result was a physically different object, i.e. a new photographic print.

Now, let's see what happens with a digital photograph. We can take a photo with a digital camera or a mobile phone, or scan it from an old magazine - no matter how. In every case, we end with a file containing an array of pixels which hold color (or gray scale) information and a header which may specify image dimensions, information about the camera and shot conditions (such as exposure), and other metadata. In other words, we end up with what is normally called "digital media" – a file containing numbers that mean something.

However, unless you are a programmer, you never directly deal with these numbers – instead, you interact with digital media files through some software. And depending on which software you use, what you can do with one and the same digital file can change dramatically. MMS software on your phone may simply display this photo – and nothing else. Free media viewers/players which run on desktops or over the web usually give you more functions. For instance, a desktop version of Google's Picassa 3.0 (2009) includes crop, auto color, red eye reduction, variety of filters (soft focus, glow etc.) and a number of other functions. It can also display the same photo as color or black and white without any changes to the file itself. It also allows me to zoom into the photo many times examining its details in ways that my mobile phone software cannot. Finally, if I open the same photo in Photoshop CS4, I can do even more. I can instruct Photoshop to automatically replace some colors in a photo with others, make visible its linear structure by running edge detection filters, blur it in a dozen of different ways, etc. In short, depending on the software I am using, the "properties" of a media object can change dramatically.

To summarize this discussion: there is no such thing as "digital media". There is only software – as applied to media (or "content"). To put this differently: for users who can only interact with media content through application software, "digital media" does not have any unique property by itself. What used to be "properties of a medium" are now operations and affordances defined by software.