

Chapter 5. The Fourteen Messages of “New Media”: An Overview

5.0 Differences between the “New Media” and Mass Media

The focus of this chapter is to identify the characteristics of the “new media” and contrasts them with the electric mass media that McLuhan dealt with. According to McLuhan the medium is the message so we begin our analysis by identifying the characteristics or messages of the “new media”, which will help us understand how they differ from electric mass media.

I actually began this exercise back in 1996 when I first identified the five messages of the Internet (Logan, M. and Logan R.K. 1996), which subsequently appeared in the first edition of *The Sixth Language* in 2000 (Logan 2004b). Back then the notion of “new media” had not yet been formulated but already at that early stage in their development the following five messages were identified for the Internet:

1. two-way communication
2. ease of access to and dissemination of information
3. continuous learning
4. alignment and integration, and
5. community.

Although one or two of these characteristics apply to electric mass media what is unique about the Internet is that all five of these characteristics apply and help define the impact of this medium. As it turns out all of these characteristics also apply to the general class of “new media”. Since formulating these five messages of the Internet my study of the “new media” revealed that there are also nine other additional properties or messages that characterizes most “new media”. They are:

6. portability and time flexibility (time shifting), which provide their users with freedom over space and time;
7. convergence of many different media so that they can carry out more than one function at a time and combine as is the case with the camera cell phone that operates as phone but can also take photos and transmit them;
8. interoperability
9. aggregation of content;
10. variety and choice to a much greater extent than the mass media that preceded them and the long tail phenomenon;
11. the closing of the gap between (or the convergence of) producers and consumers of media;
12. social collectivity and cooperation;
13. remix culture; and
14. the transition from products to services.

Although some of the electric media that McLuhan studied had one or two of these 14 characteristics by and large these properties apply primarily to the “new media”. The telephone permitted two-way communication but it was a stand-alone non-portable technology until the emergence of the cell phone. The very first form of the cell phone embraced two-way communication and portability but did not incorporate the other 12 messages of “new media” as is the case with today’s cell phone. The cell phone of today because of interoperability and convergence with other media like the digital camera and the Internet now aggregates content, provides variety and choice and promotes social collectivity.

Manovich (2001, pp. 27-48) has a different way of characterizing “new media”. He identifies five characteristics that define “new media”, namely,

1. Numerical representation or digitization;
2. Modularity;

3. Automation by virtue of the fact that once information is digitized it can be manipulated by a computer and hence the creation, manipulation and access of media can be automated;
4. Variability made possible by digitization and modularity and results among other things in interactivity and individual customization instead of standardization; and
5. Transcoding or translating content from one format to another.

Manovich's five properties partially overlap with the fourteen properties or messages of "new media" that I have identified. For example ease of access to information is due to digitization, modularity and automation. Alignment and integration, on the other hand, depend on variability and transcoding while convergence is a product of digitization, automation and transcoding. Transcoding parallels McLuhan's notion that the content of a new medium is some older medium. Manovich (*ibid.*, p. 47) hints at this idea when he writes, "On one level new media is old media that has been digitized." In fact the parallel between McLuhan's notion of transcoding and that of Manovich is even closer. Way back in 1964 before the concept of "new media" existed McLuhan wrote in *UM* about transcoding without actually using the term:

Today computers hold out the promise of a means of instant translation of any code or language into any other code or language. The computer, in short, promises by technology a Pentecostal condition of universal understanding and unity. (1964, p. 79)

The two sets of properties overlap, however, they reflect the fact that my focus is on effects while Manovich is concerned with the mechanisms that make "new media" possible. He is concerned with the production, distribution and access aspects of "new

media” and their relation to cinema. His approach is motivated by his belief that cinema together with computing gave rise to the “new media” phenomena. For example he writes: “Chapters 1-5 use the history and theory of cinema to map out the logic driving the technical and stylistic development of new media (ibid., p. 287).” The approach we will pursue, on the other hand, is a media ecology one where we focus on the social and cognitive impacts of “new media.” Another difference will be our key concern with the way in which the gap between producer and consumer has closed.

Curt Cloniger has developed another interesting set of characteristics of the “new media” through his description of the World Wide Web at www.lab404.com/media. He describes “six media characteristics (strengths) of the Web”. They are: “A. many-to-many networking; B. multimedia; C. database; D. automation (programmability); E. live and/or time-shifted and F. location-independent and/or device-independent. Cloniger’s many-to-many networking feature parallels my two-way communication. His automation feature is the same as Manovich’s and is similar to the point I make about ease of access to information. His multimedia feature parallels my convergence feature. My continuous learning feature is similar to his database characteristic. And my portability and time flexibility feature is similar to his points E. and F respectively.

As Manovich, Cloniger and I have pointed out some of the characteristics we use to identify “new media” are also characteristics of a number of old media. For example the spoken word and the telephone entail two-way communication media; books and their organization in libraries promote ease of access to information and continuous learning; and the village, the neighborhood, churches, social organizations promote community. With respect to the characteristics Manovich identifies, the alphabet provided a form of digitization in that the continuous phonemes of spoken language came to be represented by a small

number (20 to 30) of signs, which can be ordered as is the case with numbers. Music has been digitized with musical notes. Modularity is a feature of the industrial mode of production that features the assembly line. Automation began with certain mechanical manufacturing devices and certainly with mainframe computers, neither of which can be classified as “new media.” To a certain extent the making of movies and television shows based on stage plays, musicals, and books involves a form of variability and transcoding.

Given all of these historic precedences what is it that distinguishes the old media from the new. I believe there are two factors. First of all with the “new media” the characteristics that Manovich and I identify are not marginal but are very pronounced. And secondly, whereas the old media might feature one or two of the characteristics we have identified, the “new media” possess them all. It is also the way these characteristics work together which makes the production and the impact of “new media” so unique.

I believe that what distinguishes the “new media” from the mass media that McLuhan studied are the 14 messages identified above. With the possible exception of community these characteristics are unique to the “new media” and almost completely absent in the mass media with a few exceptions like the two-way communication of the telephone. It is these properties or “messages” of the “new media” which give them their unique power and which allows them to both promote and be compatible with literacy instead of pushing literacy out as was the case with electric mass media. In fact some of the properties of the “new media”, namely access to information and continuous learning are also characteristic of the literary media of the written and the printed word.

One can argue that a form of digitization began with the alphabet in which the variable and continuous sounds of spoken language,

which vary in a continuous way from one speaker to another and from one language to another were represented by a set of 20 to 30 meaningless visual signs. “Converting continuous data into a numerical representation is called digitization,” according to Manovich (2001, p. 28). The letters of the alphabet like the numerals are unique and can be ordered in a cardinal fashion so that it is not a large step to move from alphabetizing a spoken language to digitizing data. In fact the digitization of texts for most languages depends on the alphabet. For the exceptions like Chinese Unicode must be used. The letters of the alphabet have also been used to represent numbers so that digitizing using a numerical representation is not so different from alphabetizing.

Because of the compatibility of literacy with digitization I believe that the “new media” represent a distinct phenomenon and usher in a new era, the era of interactive digital media. Digital media are quite different from mass media and I predict that they will save literacy from the ravages of television. The two classes of media, electric mass media and interactive digital “new media” have some common features as we have shown above. They both create community but different kinds of community. The mass media bring together people who can share a common emotional space whereas the “new media” bring together people who can share a common cognitive space. We now turn to a description of each of the 14 messages of “new media”.

5.1 Two-way communication

Mass media are one-way thoroughfares of information that turn the viewer or listener into a passive recipient of information. The “new media” in general and the Net, the Web, the blog and email in particular all permit two-way communication that allows the user to interact with the information they are accessing or with the producer of the information. Two-way communication makes dialogue and knowledge sharing possible through the medium of a

shared visual or audio space. Two-way communication also provides those accessing information a chance to test the reliability of that information. One of the unique aspects of the two-way communication that the Internet makes possible is the speed with which the communication takes place. Although this was true of the telephone, what makes the Internet unique is the fact that written messages can be transmitted at the speed of light. The open source movement and the development of wikis (51.9), Web-based collaboration tools and video conferencing (Chapter 46) are other examples where the two-way communication of information is paramount.

5.2 Ease of Access to and Dissemination of Information

The viewers or listeners of mass media have no control over the flow of information except to shut it off. The ease of access to and control of information is one of the chief advantages of the “new media” for delivering and receiving information, fomenting dialogue and sharing knowledge. Hypertext and search engines, a feature of many of the “new media,” especially the World Wide Web, facilitates accessing information and often leads to avenues of exploration where unexpected gems are found. As the term hypertext implies it amplifies literacy and hence reverses the negative impacts on literacy of electric mass media like TV that concerned McLuhan. The cell phone provides ease of access to individuals who can be tracked down wherever they roam. Digital radio and TV provides access to a range and variety of programming that was never possible with broadcast radio and TV even after the introduction of cable.

The ease with which information can be disseminated using the “new media” has contributed to closing the gap between producer and consumer, which we will address in Section 5.11. For now we will focus on how the ease of dissemination has created a whole new environment in the news media and contributed to placing

limits on repressive and aggressive governments. M.J. Akbar writing in the Asian Age (11/21/05) in an article entitled Vice President of Torture points out that the ease with which information about government's repressive actions such as torture, violations of human rights and illegal military actions serves as a damper on these unacceptable forms of behavior.

Media used to be merely the message. But that was once upon a time, when a Canadian professor of literature, Marshall McLuhan, coined the phrase. We have moved on from the Sixties. A new dictum rules. History is media.

Media disseminates information, triggers reaction, further shapes response, and creates new facts. Media thereby becomes the vehicle of change and the procreator of history. Truth was never a simple fact, but it could be hidden in an establishment cupboard till the time of accountability... had passed. Now, truth can evolve almost on a daily basis, once it is out; the genes of this evolution lie in media.

The interesting point that Akbar is making is that governments are finding it harder to cover up their insidious deeds because they can no longer control the media and as a result are not as free to act in the cavalier manner they once did. McLuhan made a similar point a long time ago when he predicted in conversation that the Soviet Union would eventually succumb to the ease with which information can be disseminated with electricity. Although the political right credits President Reagan with the fall of the Soviet Union, others credit Solidarity and some Pope John Paul II, I personally believe an important factor was the emergence in the early 1980s of one of the earliest forms of "new media", namely the microcomputer. I also concur with the conclusion reached by Mr. Akbar in his article:

Modern media's greatest service to contemporary civilization is that it has made injustice that much more difficult to hide.... Once facts emerge they develop a life and power of their own and create new facts. Reaction overpowers action.

5.3 Continuous Learning

Mass media provide a steady stream of information but the user is passive and because they cannot interact with the medium or the information it mediates very little learning can take place. The viewer or listener can become informed but there is no cognitive development as is the case with the interactive “new media” whether one is communicating with email or text messaging or surfing the Web. Even the playing of video games entails a form of cognitive interaction and hence development.

The Internet, whether accessed through the Web or through a listserv, is a natural medium for continuous learning because of its two-way communication and its ease of access to information. It also easily combines visual and audio aids with text. It promotes dialogue, which is a more effective form of learning than rote learning. It is also, if properly designed, able to provide instant feedback to a learner thereby reinforcing the learning experience.

The Internet promotes continuous learning because it is so easily accessible and hence users can pursue educational activities at any place and any time whenever they have free time and are in the mood for learning something new. They do not have to conform to a schedule not of their own making, as is the case with classroom learning. They can pursue an almost unlimited number of topics depending on their interests and their needs.

The Internet has great appeal for the post-TV generation. Surfing the Net is not a substitute for the learning that takes place through reading, doing or dialoguing face to face, but it is another channel

that can provide a true learning environment because of its interactivity and two-way communication possibilities, especially when making use of Web-enabled collaborative tools like WebEx or NetMeeting.

Educational Web sites are registering millions of hits per day and hence represent the most important breakthrough in educational media since the invention of the printing press and the inauguration of public education. The Net far surpasses educational television or filmstrips in their effectiveness since the users of the Net are not passive consumers of information but rather active participants in command of their interactive learning experience.

5.4 Alignment and Integration

The mass media provided its viewers and listeners with unrelated bits of information that could not be assembled cognitively into a learning experience. The unrelated bits of information that the user gleaned from the mass media were extremely useful for playing the game of Trivial Pursuit, which is also an apt description of watching television. Each medium operated in more or less complete isolation from the other media. And the programming or content within each medium were more or less independent of each other. While it is true that broadcast journalist might report on what appeared in the newspapers or a late night television entertainment fare might refer to a news item of the day in their nightly monologue these crossovers are more the exception than the rule.

The “new media,” on the other hand, operate as a semantic web in which items refer to each other and are often linked by hypertext. In this way the content of the “new media” become aligned and integrated within the single medium of the World Wide Web, an ongoing email correspondence or the ongoing dialogue of a listserv conversation. The information flows with the “new media” are

integrated and aligned. The information flow in the mass media is discontinuous even with a weekly television series like the Sopranos, a highly entertaining artifact but hardly an experience that contributes to one's cognitive development.

An example of alignment is provided by the success of Web site developers for commercial sites, which combine their Web development skills with their understanding of marketing, which results in eetailing, i.e. retail sales that are fulfilled online. "Clients are shifting from niche digital specialists to hire full-service shops able to provide an integrated service" of both Web design and online consumerism according to Greg Brooks writing in the May 5, 2005 edition of Marketing.

Two factors that contribute to alignment and integration are hyperlinking and convergence because they bring so much information into close proximity. They will be treated below.

5.5 The Creation of Community

Perhaps the most important of all the features of the Internet and other "new media" is the way in which they create community. They do so through the exploitation of the other four messages of the Internet, namely two-way communication (which makes people feel involved), the ease of the access and dissemination of information (which provides a medium for dialogue and a common body of information and knowledge upon which to build common cognitive structures), continuous learning (which allows people to grow together) and alignment (which integrates the needs of those communicating with each other through the "new media"). The "new media" become a knowledge-based network available twenty-four hours a day, seven days a week that is always there for those who want to take advantage of their resources. They provide an environment for learning, knowledge creation and sharing and the development of new ideas and projects.

I am not alone in suggesting that the “new media” create community. Alan Mendelson writes,

Marshall McLuhan’s work is often derided as hokum by people who see television as offering sheer diversion. Yet I’ve often thought that if one took *Understanding Media* and inserted some catchall term for “electronic communication” in every place where he mentions “television,” his observation that the new technology enables a sense of community would be quite relevant for today.

<http://chronicle.com/jobs/2005/06/2005060601c.htm>

We showed above how the other four messages created the environment for the creation of community but the impacts move in both directions. The sense of community that the “new media” create stimulates more two-way communication, continuous learning and alignment. The five messages basically reinforce each other. The messages are autocatalytic in the sense that they reinforce each other.

In addition to the five messages of the Internet, which are shared by the “new media” there are nine other features or messages of the “new media” that need to be addressed. We begin with portability.

5.6 Portability

Another unique feature of the “new media” particularly devices like the notebook, WIFI, the cell phone, the Walkman, the MP3 player or I-pod, and a PDA (personal digital assistant) like the Blackberry or Palm Pilot is their portability, which translates into ubiquitous computing. Electric mass media of the past like telegraph, telephone, radio, and television bridge the physical gap between the producers of information and the receivers of that

information but the receiver of information was always tied down to a fixed location at home or at work. Now with the “new media” the receiver and even the producer of information can be anywhere because of the portability of these devices.

The most successful example of the power of portability is Apple’s iPod and iTunes. Joe Wilcox, a senior analyst, at Jupiter Media attributes their mega-success to portability, which they sold to the public through mass marketing: “Apple didn’t market a new technology -- they talked about how you could take your music with you...That’s a benefit.”

Portability provides freedom over space or where but the “new media” also provide freedom over time or when. Examples include TiVo, the most popular brand of video recorders, television on demand, podcasts, Web radio and satellite radio. All of these media provide the freedom of choice as to when one will listen to or view their favorite programming. Today’s consumer does not wish to conform to the broadcasters’s schedule. They want to access content when and where they want.

With portability, however, a new danger arises namely the loss or theft of a portable computing device containing valuable information. To protect against this kind of problem Mobile Armor has developed security software, which prevents unauthorized entry into a computer that might fall into the hands of a thief.

5.7 Convergence

One more unique feature of the “new media” is their ability to combine different media in one device. Examples include the cell phone that takes and transmits photos, provides text messaging, serves as an Internet port, etc, etc. Another example is the notebook, which is a computer and at the same time is an Internet port, a CD and DVD player and burner and sometimes an iChat or

VOIP telephone. Convergence allows many tasks to be accomplished on the same device resulting in a level of alignment and integration of media never before experienced.

The World Wide Web is another example of a convergent medium (the medium of media) which integrates text, audio, video, graphics and allows for conferencing, chatting, telephoning, videophoning, and online versions of selling, buying, auctioning, banking, searching, researching, learning, attending seminars and trade shows, and gaming to mention the most common applications.

Aspect Magazine, a DVD-based magazine for the display of DVD-based art combines the media of the DVD and the magazine. Aspect, first issued in the fall of 2002, is now collected by private subscribers and museums.

Another example of convergence is the success some cable TV operators are experiencing in increasing revenue and profits by offering three additional services, namely digital video, Internet protocol telephony (VOIP) and high speed data (Hollywood Reporter, May 10, 2005).

Intel has developed a new technology called Viiv, which result in the convergence of television and the Internet (31.13). Internet content can now be shown on television. But the convergence of the Net and TV goes in both directions. Through iTunes TV fare can be accessed for replay on an iPod or a cell phone. It was at the Consumers Electronics Show in January of 2006 that all kinds of deal were announced between content providers like the television networks and production companies like Disney and MTV with the “new media” companies like Apple, Google, Intel, Microsoft, and Yahoo. Oser and Klaassen reporting on these deals in AdAge (1/18/06) suggested that “2006 is destined to be the year of convergence.”

Although convergence is an important aspect of the “new media” this does not mean that eventually some day in the future all of today’s media will converge and merge into one single medium, which incorporates all the features of today’s various media. Boczkowski (2004, p. 17) based on his study of the “new media” and newspapers found that “different combinations of initial conditions and local contingencies have led to divergent trajectories” of converging media. In other words we should not anticipate a world in which only one media appliance incorporating all media forms will prevail but rather there will be a great variety of different devices serving different needs and emphasizing different kinds of media.

Boczkowski (2004, p. 181) suggests that the neat boundaries that once separated “print, broadcast and telecommunications” will not disappear but they will shift and there will be “different boundaries and more cross-boundary work.” For example the boundary between newspapers and broadcasters has become leaky. Newspapers have Web sites that use audio and video forms of information and broadcasters have Web sites that make use of text. But because the core businesses of these two media are so different, they will never morph into each other but they will each retain their distinct character. One can expect mergers, however, such as the Time-Warner AOL one. But not all mergers will be successful as the recent spin off of Viacom and CBS in 2005 just five years after they merged illustrates.

In addition to the convergence of the different media of text, graphics, audio and video in “new media” there is also the convergence of old media and “new media” as the following examples illustrate:

- the computer animated movie;

- Monster.com represents a convergence of the classified ads of newspapers with the World Wide Web;
- radio and television programming on the Web and on cell phones;
- word processing represents the convergence of writing, the typewriter and print;
- Internet as the convergence of computing and telephony
- SMS (Short Messaging Service), as the convergence of the cell phone and the postal service;
- IM (Instant Messaging) and email as the convergence of the Internet and postal service.

Although convergence is a characteristic of “new media” it is not unique to “new media” as the following examples of convergence with old media illustrate:

- writing as the convergence of speech and graphics;
- place number system as the convergence of the alphabetic representation of numbers and the concept of zero;
- block printing as the convergence of the mechanical press and writing;
- Gutenberg movable type printing press as the convergence of the mechanical press, block printing and the alphabet;
- analytic geometry as the convergence of algebra and geometry;
- teletype as the convergence of the telegraph, the telephone and the typewriter;
- the automobile as the convergence of the carriage and the motor
- the airplane as the convergence of the bicycle and the motor.

While attending a conference of the Media Ecology Association in June 2004 at the Lincoln Square campus of Fordham University and walking to and fro from the conference to my hotel in the heart of Times Square I realized that this district of New York City represents a geographic convergence of media. The square gets its name from America’s pre-eminent newspaper the New York

Times. Is it a coincidence that Times Square and its environs are also home to Broadway theaters, movie theatres, Carnegie Hall, the Lincoln Centre, Radio City Music Hall, several radio and television network HQs (ABC, NBC and CBS)? I do not think so!

5.8 Interoperability

The 9th edition of the Concise Oxford Dictionary defines the adjective interoperable as “able to operate in conjunction”. The Wikipedia defines interoperability as “the ability of products, systems, or business processes to work together to accomplish a common task” and points out that interoperability “can be defined in a technical way or in a broad way, taking into account social, political and organizational factors.” “New media” are interoperable in the technical sense but as such they also promote social, political and organizational interoperability, which is one of their strong points and the reason for their rapid and wide spread adoption by individuals, businesses, government agencies and NGOs. It is the digital nature of “new media” and that makes for the interoperability and hence convergence by allowing different “new media” to talk to each other as the following examples, to cite a few, demonstrate: the PC and the iPod (28.3), CDs (28.2), and DVDs (29.2); the cell phone (36.1) and the Internet (40.1); the PC, servers, the Internet, the Web and blogs (44.1); the iPod, the Web and the PC and hence podcasting; the telephone and the Internet and hence VOIP (27.4). The Internet and the Web, each of which we define as the medium of media (40.1) is built on the foundation of interoperability. The Internet provides a common infrastructure that contributes to the interoperability of many different media as the above list demonstrates.

What distinguishes the interoperability of “new media” and makes them unique is that they entail the interoperability of different media whereas the interoperability of traditional media only meant that different operators of the same medium could work together

sharing their content interchangeably. Examples include the railroads where in the early days of their operation they agreed to use the same gauge for their tracks so that their railroad cars and engines could operate on each other's tracks. The agreement of standards within any industry allows and promotes interoperability. The telegraph and telephone industries were perhaps the first industries to achieve global interoperability. Interoperability of the television industry has broken down into one for North America and another for Europe and Asia. The interoperability of "new media" is a global phenomenon as the backbone of the "new media" system is the Internet and the World Wide Web, which operate (or should I say interoperate) on a global scale.

The interoperability of PCs is still a problem, however. While the Internet allows PC using the MS Windows and Macintosh operating systems to talk to each other direct communication between these two operating systems is only a one-way street. Macintosh files can operate on a Windows machine but not vice-versa.

It is the interoperability of "new media" that is responsible for many of its defining characteristics that we have already covered such as its : two-way communication capability (5.1), ease of access to and dissemination of information (5.2), alignment and integration (5.4), promotion of community (5.5), portability (5.6), and convergence (5.7). It also contributes as we shall see to the other characteristics of "new media", namely aggregation (5.9), variety and choice (5.10), the closing of the gap between producers and consumers of media (5.11), social collectivity and cooperation (5.12), remix (5.13) and the transition from products to services (5.14). It is the ease with which digital information can flow between interoperable media that gives rise to these other properties of "new media".

5.9 Aggregation of Content

One of the properties of “new media” like the Internet, the World Wide Web, and search engines in addition to the convergence of different media is that they aggregate content. One factor that promotes aggregation of content is that the ease of access to digitized information that “new media” make possible also makes it easy to collect content from different sources.

Computers themselves are aggregators in that they allow easy storage and access to information files so one tends to collect all of one’s output on a computer plus the output of others that one finds convenient to have easy access to. For example I have McLuhan’s *Understanding Media* in a digital form on my hard drive, which has facilitated inserting quotes from UM in this text. The various media that reside on the Internet also aggregate content because of the storage and access capability of the servers that form the Net.

The aggregation of content has led to a large number of commercial successes of Web-based businesses. Yahoo and AOL were successful because they were able to aggregate and organize information freely available on the Web. Tripod (4.1) was another aggregator. It collected information of interest to a young audience and subsequently became a publisher and aggregator of content generated by its subscribers. The providers of search engines like Google (Chapter 45) are also aggregators in which they make it possible to access the entire content of the Web (or at least a good percentage of it). Web radio and more recently satellite radio (30.2 & 30.3) are two examples of how two new media were created by aggregating the content of an older medium, namely broadcast radio. For a fascinating account of the start-up of one of the first radio aggregators, broadcast.com, which was later purchased by Yahoo and integrated into its range of services (30.3). The co-founder of broadcast.com, Mark Cuban is attempting the same kind of trick once again but this time with high definition TV

instead of radio with the Web site www.hd.com. iTunes is another example of a service that built its business on its ability to aggregate from the world of recorded music.

Another successful digital entrepreneur who is basically an aggregator is Bob Young co-founder of Red Hat Software who created a viable business by redistributing and supporting the open source Linux operating system. Young (1999) summarized Red Hat's operating philosophy succinctly as follows:

At Red Hat, our role is to work with all the development teams across the Internet to take some four hundred software packages and assemble them into a useful operating system. We operate much like a car assembly plant -- we test the finished product and offer support and services for the users of the Red Hat Linux OS.

The "unique value proposition" of our business plan was, and continues to be, to cater to our customers' need to gain control over the operating system they were using by delivering the technical benefits of freely redistributable software (source code and a free license) to technically oriented OS consumers.

A second business that Bob Young founded, Lulu.com, a Web-based print on demand self-publishing company also operates on the digital aggregation principle. Lulu.com publishes books, images, music, and audio files on demand by aggregating the creative output of its suppliers who are writers, poets, composers, photographers and visual artists looking for a market for their creative wares. The artists who are Lulu's suppliers are also partners in that they share the profits of their sales with Lulu and they are often customers of Lulu purchasing the various services that Lulu has aggregated that will help the artists promote their literature and works of art. Lulu through its aggregation creates a

market for professional and amateur writers and artists who might not otherwise find an audience or clientele for their work. As such Lulu.com also embraces three of the other characteristics of “new media” to be discussed below, namely they increase variety and choice (5.10), they close the gap between consumers and producers (5.11) by providing an outlet for amateur artists and they facilitate social cooperation (5.12) by helping artists find an audience.

Aggregators are also playing an important role in increasing the reliability of information one obtains on the Internet. Because information posted on the Internet is not vetted by any gatekeepers there has always been the fear that one could encounter unreliable or slanted information when using the Internet. Janet Sternberg has a simple solution to this problem, namely cross-checking. “In today’s networked digital culture, cross-checking is believing... with the overabundance of information available to us nowadays, cross-checking is one of the main strategies available to help us act as our own gatekeepers. In my view, cross-checking is the new epistemology for the digital age (private communication on the Media Ecology Association listserv).” Cross-checking as Janet proposes is facilitated by the aggregators whether they are search engine providers or Yahoo News RSS (Really Simple Syndication) service or Google’s Alert service which notifies users of new information appearing on the World Wide Web re their favorite topics.

An interesting Web site based on the aggregation of common words used in the English language as cited by British National Corpus® is Wordcount.org which “presents the 86,800 most frequently used English words, ranked in order of commonness.” The creator of Wordcount, Jonathan Harris, describes his effort as “an artistic experiment and plans to eventually aggregate, present and rank all the English words on the Internet.

Another interesting aggregation by Jonathan Harris is the Web site 10x10.org which operates as follows:

Every hour, 10x10 scans the RSS feeds of several leading international news sources, and performs an elaborate process of weighted linguistic analysis on the text contained in their top news stories. After this process, conclusions are automatically drawn about the hour's most important words. The top 100 words are chosen, along with 100 corresponding images, culled from the source news stories. At the end of each day, month, and year, 10x10 looks back through its archives to conclude the top 100 words for the given time period. In this way, a constantly evolving record of our world is formed, based on prominent world events, without any human input.

5.10 Variety, Choice and the Long Tail

All media have increased variety and choice. When literate society made the transformation from hand written manuscripts to printed books there was an explosion of variety and choice as it was so easy to produce a book in multiple copies that could be easily transported. A similar explosion is taking place with the “new media” because of the ease with which media products whether they are text, audio or video can be duplicated and transmitted. As a result material for which there is little demand can still be made available by the operator of a Web site and still turn a profit. This phenomenon has been identified by Chris Anderson (Wired, Oct. 2004), who has given it the name of “The Long Tail.”

Until the Internet came along the number of information and entertainment products like records/CDs, movies/VCRs/DVDs, and books that could be made available to the public was limited by the cost of operating the sales venue like shelf space or a movie theater. With the sale of these products over the Internet this factor

no longer presented a limitation as the cost of display and distribution of these products plummeted.

What was discovered was that the sale of the items that could not be stocked in brick and mortar operations actually out sold the “best sellers” when one integrated the sales of the “slow movers” and compared them to the sales of the “best sellers”. Although each best seller out sold any individual slow mover, the number of “slow movers” was so much greater than the best sellers that when their total sales were aggregated they exceeded the aggregated sales of the “best sellers.” If one were to make a plot of the sales versus the rank of the product’s sales where one plotted the amount of sales on the y-axis of the graph and the rank of the product in terms of its sales on the x-axis then the curve would slope down very rapidly (exponentially) but it would have a long tail, hence Anderson’s name for the phenomenon. These plots have been made for book sales on Amazon, the sale of audio tracks streamed by Rhapsody, Netflix rentals of movies, the revenue generated by advertisers on Google, eBay sales, and visits to Wikipedia articles and they all show the same trend with a very profitable and healthy “long tail.”

Another example of the “long tail” effect is the role of online news.

In addition to the local and national emphasis on most news reported in print and broadcast media, online news also appears to present a micro-local focus, featuring content of interest to small communities of users defined either by common interests or geographic location or both (Boczkowski 2004, p. 186).

As a corollary to Anderson’s “long tail” phenomenon he also has collected data on the sales and viewership of mainstream media and finds that while they still maintain a very healthy market share

their numbers are trending down with the exception of movies both in terms of theater and DVD sales. The media trending down range from music sales, newspaper circulation, magazine readership, book sales, to network TV and radio audienceship. One explanation of these trends is that there is increased competition from the “new media” especially videogames and the Web, whose revenues and audience are growing by leaps and bounds.

This is really a repeat of a standard media ecology effect, namely, that as new media become available audience share is spread out among more players and hence some of the so-called “mainstream” media will decline. For example according to a Carnegie Corp. study 4 out of 5 Americans read a newspaper on a daily basis in 1964 compared to only half today and the decline is even more pronounced in the 18 to 34 year-old demographic where 19% use a newspaper daily compared with 44% who use the Web to get the latest news.

This does not mean that newspapers will be obsolesced in the same way that word processing obsolesced the typewriter, it just means that the role that they play in the ecology of media will change and in most cases will decline. There are the exceptions, however, as seems to be the case with the movies, which are stronger than ever. But movies no longer depend exclusively on revenue from movie theaters. Instead they have a number of revenue streams including DVD sales and rentals, on demand TV, and broadcast or cable TV.

Another manifestation of the increase in variety with “new media” is the phenomenon of narrowcasting versus the mainstream phenomenon of broadcasting to a mass audience. Digital TV, satellite radio and podcasting each provide a vehicle for narrowcasting or catering to specialized tastes.

5.11 Reintegration of the Consumer and the Producer

Before the industrial age there was no division of labor and consumers and producers were one and the same. With the rise of the mechanical form of organization that industrialization brought about a division of labor emerged along with a division of producers and consumers. “Division of labor always creates a separation between producer and consumer, even as it tends to separate the place of work and the living space. (McLuhan 1964, p. 100)” According to McLuhan (ibid., p. 349) this trend reversed itself with computing, “Automation affects not just production, but every phase of consumption and marketing; for the consumer becomes producer in the automation circuit.”

The reintegration of producer and consumer with computing and its acceleration with the “new media” is just an extension of the decentralization, which is another characteristic McLuhan identified for electric media (2.20). As we examine different forms of “new media” we will discover that these media empower their users to create their own content reversing their role as the passive consumers of content. Examples of consumers becoming producers with “new media” include the creators of Web sites and blogs (44.1), podcasters who create their own radio shows for other MP3 users (30.4), iMovies users who can create their own movies from raw video footage (29.3). Not only do the “new media” provide a greatly enhanced ability to produce media content they also provide the means of distribution of content to a world-wide audience through the Internet and the World Wide Web.

The most popular sites on the Web like MySpace, YouTube, Wikipedia, Blogger.com, Thefacebook, LinkedIn and Flickr are ones in which the users provide the content or have a medium to chat like Yahoo!, MSN or AOL or have an outlet sell their products like eBay.

Another way the gap between the producer and the consumer closes with “new media” is that the choice and variety that new

media provide results in the consumer being able to choose from all the information out there is cyberspace those things that better reflect their needs and desires. With “new media”, the user is the content to use McLuhan’s phrase (A36) in the sense they can control what they consume. With mass media they could only consume what the gatekeepers of information, the editors and producers of mass media, allowed them to consume. The “new media” allow the user or consumer to become the editor or producer of the content they consume from the incredible stockpile of information in cyberspace as this description of Internet use from the Inet conference in 1996 argues:

The user is the content" takes on a whole new meaning on the Net. Every Internet user brings his or her own experience to the medium and transforms the content according to his or her own needs. Furthermore, the Internet user has a completely different profile than the television viewer, who is a passive consumer of information who has been desensitized by the continuous barrage of unwanted messages. Internet users, on the other hand, are actively seeking specific information and do not welcome unsolicited information. In creating messages and information for Internet users, it is useful to regard them as hunters and gatherers who have a low tolerance for the pollution of their information environment. Television viewers, on the other hand, live in mental junk piles and are constantly scavenging for bits of information, usually in the form of sound bites that might keep them amused while they relax. (Logan and Logan 1996)

5.12 Social Collectivity and Cyber-Cooperation

All media from the spoken and written word to the telephone have played a role in creating collective action and cooperation, but the “new media” have amplified this effect and often on an unprecedented global level. Another feature of this cooperation that makes it unique is that in most cases it takes place among individuals who have never met each other. This section owes a lot

to two sources: Howard Rheingold's Web site: Rheingold.com and Robert D. Hof's (2005) article The Power of Us.

One of the first to identify cyber-cooperation was Howard Rheingold (2002) in his book *Smart Mobs: The Next Social Revolution*. "Smart mobs emerge when communication and computing technologies amplify human talents for cooperation and collective action of both beneficial and destructive kinds." The "new media" create what Tim O'Reilly terms an "architecture of participation". Alvin Toffler (1980) identified the emergence of participatory structures and producer/consumers or "prosumers" as far back as 1980 in *The Third Wave* based on the agency of mainframe computers. Toffler's Third Wave has been superseded by the fourth wave of "new media" which amplify and extend the trends he was able to precociously identify over 25 years ago.

The social collectivity of the "new media" parallels the alignment we reviewed in Section 5.4, but differs in that alignment takes place among people already engaged in a joint activity such as co-workers, whereas the social collectivity we will examine takes place between strangers.

The Internet, the World Wide Web, blogs, podcasts and cell phones are examples of "new media" which give rise to collectivity because they combine both communication and computing functions.

The collective forms of cooperation that "new media" make possible can be divided into the following categories: collective interests, collective judgments, collective resources and collective projects. A number of Web sites allow people sharing common interests to identify each other and where possible to meet up and share experiences and/or organize offline joint activities (43.7).

Collective judgments take a number of different forms including the following:

1. Book reviews on Amazon.com and other online booksellers;
2. Product and service evaluation by customers of online retailers such as eBay, uBid and Amazon (no longer restricted to the sale of books only);
3. Google collects the usage patterns of its users to order the most relevant items for any particular search;
4. Use of the Net to create a prediction market for the desirability of a product or a publication as well as forecasting sales and profits. A number of large corporations are operating prediction markets including Eli Lilly, Hewlett Packard, LEGO, Proctor and Gamble and Dow Chemical.

An example of collective resources is the way Skype.com has created a VOIP (Voice over Internet Protocol) network by making use of the spare computing power of its users' computers (27.4).

BitTorrent.com is another Web-based service, which makes use of the computing power of those using their service to facilitate the transfer of large files such as a software, video or music file. They achieve their

scaleable and robust distribution through cooperation. With BitTorrent, those who receive" (a) "file tap into their upload capacity to give the file to others at the same time. Those that provide the most to others get the best treatment in return. ("Give and ye shall receive!") Cooperative distribution can grow almost without limit, because each new participant brings not only demand, but also supply. BitTorrent has been embraced by numerous publishers to distribute to millions of users (BitTorrent.com).

Other collective projects some of which we will discuss later include the following:

1. Open source development of software and operating systems (51.9);
2. Wikis and in particular the Wikipedia, which are online sources of information created by their users (51.9);
3. The contribution of “citizen journalists” to print newspapers or online news services (21.3);
4. A “collective online brain trust..., Lilly company InnoCentive Inc. in Andover, Mass..., a network of 80,000 independent, self-selected ‘solvers’ in 173 countries who gang-tackle research problems for the likes of Boeing Co. (BA), DuPont (DD), and 30 other large companies (Hof 2005).”
5. LEGO brought members of an online LEGO enthusiasts group to their New York office to help critique and design a new product (ibid.)
6. Social Webs on the World Wide Web (43.7)

Hof (ibid.) has identified the collectivity and cooperation that the “new media” have created. During the industrial era economies of scale were achieved through large capital investments that were required to purchase manufacturing equipment. Pools of capital were often achieved by joint stock ownership firms whose risks were mitigated by shared liability insurance companies (Rheingold 2002). In today’s world of cooperative and collective action made possible by the “new media” a new economic age is coming in to being by the pooling of the “new capital” of knowledge and in some instances through the pooling of computer power.

As McLuhan pointed out every technology provides both service and disservice. Rheingold picks up this theme by noting that “smart mobs” can work together for both beneficial and destructive

action. Unfortunately the Internet has sometimes been used by terrorists for evil purposes. Another danger of the collectivity of “new media” is that they can give rise to “group think”. Despite these caveats, in my opinion, the overwhelming impact of the collectivity spawned by “new media” has been beneficial.

5.13 Remix Culture

The record, not the remix, is the anomaly today. The remix is the very nature of the digital. – William Gibson

The Wikipedia article on Remix defines a remix as “an alternate mix of a song made using the techniques of audio editing...” In this article we will expand this definition to incorporate the contemporary practice of creating new cultural artifacts by remixing prior cultural elements to create something new. This article itself is a remix of many things I have read but is in a certain sense a remix of a research project that Mathew Lincez conducted at the Beal Centre for Strategic Creativity housed in The Ontario College of Art and Design. Matt was addressing the question of “How will participatory remix processes within dataspace enable cultural, economic and intellectual progress. Dataspace originally defined by Alexander Manu, the founding director of the Beal Centre, is the sum of all the signals from “smart tags” like RFID tags, for example, that are affixed to objects, buildings and places (Chapter 50). “Smart tags” by the way may be considered as a remix of radio and bar codes. Dataspace, on the other hand, is a remix of cyberspace and physical objects.

It was Matt who brought to my attention the importance of remix in the digital age not only for dataspace, but also for “new media” in general. Remix is not really a new phenomenon. Biologically individual humans are a remix of their many human ancestors. We humans as a species are also a remix of the ancestral species from

which we evolved. If we go back even further in our biological evolution to the transition from single cell organisms, prokaryotes, to multicell organisms, eukaryotes, this event was also a form of remixing. The eukaryotes emerged after mitochondria (originally a simple single cell organism) crawled into more complex prokaryote cells and combined to form the first eukaryote cells. These mitochondria were originally endosymbiotic prokaryotes. As a result all multicell organisms are derived from a remix of two primitive unicell organisms.

Culture is a remix of all the accomplishments past and current of the members of a society. Hip-hop as Matt points out is a remix culture but it is an old trick. Stravinsky is purported to have said that all composers steal and the great composers steal the most. All cultural accomplishments take place within the context of a tradition where the achievements of the past are remixed with the insights of the innovator. Scientists, writers and composers emerge in societies with a scientific, literary and musical tradition respectively.

Although remix has always been an aspect of human culture the phenomenon takes on more significance in the digital age, because of the ease with which a creator of a new cultural artifact can “steal” to use Stravinsky’s terminology. Music, text and images are easily transferred from one digital device to another especially because of the Internet which allows this phenomenon to take place on a global scale.

There is a certain overlap between convergence and remix. The Internet for example is both a convergence and a remix of the telephone and the computer. The Web is a remix and the convergence of GUI and hypertext. All convergence is a remix. Remix and convergence converge and overlap. The closing of the gap between consumers and producers is a remix.

Matt asks the question why do we have a remix culture? Is it dissatisfaction he asks? I think he is right. Because of dissatisfaction with the status quo the consumer remixes the work of producers and thereby also becomes a producer. Remix allows the latent creativity of a person to emerge.

The remix is an interesting metaphor that can be applied to other phenomena than “new media” Data mining is a form of remix. One can even apply the notion to sociology. The traditional family was a remix of generations. The nuclear family does not possess this remix and hence the source of some of its problems.

5.14 The Transition from Products to Services

One of the trends with “new media” is the transition being made from products to services. Instead of a product like a music or software CD-Rom shrink wrapped in a box the same functionality is being provided as a service through cyberspace. Software is now more often being down loaded directly from its producers rather than being bought in a shrink wrapped box containing the software on a CD-Rom. This form of software distribution has the advantage that the updating of software becomes a continuous process. iTunes is serving a market that wants to buy songs one at a time that can be download to their computer and from there to their iPod or mp3 player.

Another example of the transition from products to services is the farming out of an organizations IT department to a third party which provides all the services and equipment of an IT department including personnel, hardware, and software through the Internet. In other word's instead of operating a company-wide or organization-wide LAN or WAN on site with the company's or organization's personnel this entire operation is farmed out to another organization. There is also the possibility of a similar development happening for individual users whose computer

would not require a hard drive or a very small one and the operating system and software would sit on a server and be delivered via the Internet (45.12).

5.15 A comparison of media old and new vis-à-vis the fourteen messages of the “new media”

The fourteen properties or messages of the “new media” that we have just identified and described are contained in other older media, but each of the “new media” is unique in that each possesses so many of these properties. The traditional media might possess one or two of these properties but none possess them all as is the case with the Web. For example the telephone was a two-way communication medium and an aggregator to some extent but it was not portable until the advent of the cell phone.

Ease of access to information was a property of some reference books such as dictionaries and encyclopedias and to libraries, but nothing compared to the Web, PDAs, and cell phones for example. Very few traditional media created community other than those that permitted face-to-face communication with the possible exception of local newspapers.

Portability was a property of a few traditional media like printed books. One of the innovation of Aldus Manutius was to print a folio book in a size that could be easily transported unlike the large books that were characteristic of manuscript books, which were chained to the tables of the libraries in which they were housed. In modern times paperback pocket books, magazines, and newspapers gave rise to extremely portable reading matter. The next development of portable media began with battery powered radios and later evolved into boom boxes and portable TVs. None of these portable traditional media have the scope of information and services associate with PDAs, cell phones, and notebooks

especially those with wireless Internet connections using WiFi technology (51.8).

Some traditional media featured convergence like opera, the church, and movies with the introduction of sound and Technicolor, but none of these examples have the level of convergence associated with either home entertainment computers or the Web. The variety that “new media” make possible is an order of magnitude greater than the variety of a library or cable TV. The home production of media content that was possible with typewriters, still and movie cameras and tape recorder is no where near what is possible today with “new media” like multimedia software, video editing software, podcasting, blogs, vlogs (video blogs), and self publishing on the Net. Even when amateur producers could create traditional media productions they still had the problem of distribution, i.e., reaching their potential audience, which today presents no barrier because of the distributive powers of the Net and the Web. Because of the “long tail” effect the producers are able to find their audience.

Remix was a feature of recorded music long before “new media” appeared but has grown in importance because of the ease with which digital content can be remixed.

The fourteen messages or properties of “new media” are not independent of each other. As we already pointed out remix (5.13) and convergence (5.7) overlap. Remix (5.13) and the closing of the gap between consumers and producers (5.11) also overlap because of the capability of the consumer to remix the artifacts of producers, a capability that is facilitated by the digital character of “new media” and hence the ease of access to information (5.2). The ease of the dissemination of information (5.2) also contributes to the closing of the gap between producers and consumers (5.11) because “new media” potentially makes every person a producer. The aggregation of content (5.9) leads directly to variety and choice (5.10) and contributes to continuous learning (5.3). The

two-way characteristic (5.1) of “new media” allows the consumer to indicate or select the content they wish to access and this motivates aggregation of content (5.9) and leads to variety and choice (5.10). Because of variety and choice, two-way communication and the ease of access to information multiple communities of interest (5.5) are able to form often leading to social collectivity and cooperation (5.12). Portability and time flexibility (5.6) are facilitated by two-way communication (5.1), ease of access to information (5.2) and the transition from product to service (5.14) and in turn provide more choice and variety (5.10) as to when and where one can access content. Convergence (5.7) and alignment (5.4) mutually supports each other. The fourteen messages form an autocatalytic web of effects and causes.