As Logic of Assembly

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"New media objects assure users that their choices - and therefore, their underlying thoughts and desires - are unique, rather than pre-programmed and shared with others. As though trying to compensate for their earlier role in making us all the same, today descendants of the Jacquard's loom, the Hollerith tabulator and Zuse's cinema-computer are now working to convince us that we are all unique." [1] - Lev Manovich

Logic of Digital Media

In his book *The Language of New Media*, Manovich theorizes variability as the epitome of digital media and consequently the reflected logic of post-industrial society. He equates historical changes in media technologies to be correlated to changes in industrial mass society as a philosophy of conformity brought about by mass production, and thus deducing the logic of digital media as governed by variability to be reflected in central values of individuality within post-industrial society. [2] In contrast, I will argue that the logic of assembly governs digital media and mass production, and is intrinsic to the social logic of industrial and post-industrial society, where variability along with numerical representation and modularity exponentially enhance the means of assembly. Both digital media and the assembly line rely on two main principles, the standardization of parts (Binary, CPU, Hard Drive, Operating system) and discrete units performing specific repetitive and sequential tasks (in essence programmable) without having to comprehend the totality of the process,

The Computer as Assembly

At the core of digital media lays a simple rule that governs all processes, on and off. This method of on and off is called Binary, and is constructed by an electronic device called the transistor. The state of on and off of the transistor constructs one Bit of data (1 or 0). On its own, one Bit of data has very little significance in terms of conveying information. It is through the assembly of multiple Bits where the totality of these states of on and off constructs significant value. By

assembling Bits such as - 01001000 01100101 01101100 01101100 01101111 01110111 01101111 01110 010 01101100 01100100 00100001 - the phrase "Hello World!" is created. When a computer is turned on the microprocessor begins by executing a series of repetitive and sequential tasks from instructions stored in a microchip of read-only memory containing information on how to interface with different hardware devices called the basic input/output system (BIOS). The instructions on this microchip are written in a language called Assembly. An assembler translates word commands written by human programmers into sequences of Bits, and then the output of the assembler is placed in memory for the microprocessor to execute. From the BIOS the computer is able to locate the hard drive and fetches data from the boot sector of the drive, where it is then stored in random access memory (RAM) after reading it off the disk. The microprocessor then begins executing the boot sector's instruction set from RAM. The microprocessor continues to fetch data and execute commands from the boot sector until the entire operating system is loaded.

Computers are constructed with a combination of standardized interchangeable parts, each of which performs a specific task. On average, personal computers running in homes around the world today have processors ranging in speed from 100Mhz to 3Ghz, and hard drives of sizes from 200mb to 200GB. There are thousands of different manufactures, and thousands of different variations for each part, ranging from details such as capacity, speed, or materials. At any given time a consumer can add an additional part, remove a part, or replace a part. The list of parts that can be assembled within the computer keeps growing day by day as technology evolves. Through all of the possible combination of computer parts each computer has the potential to be unique.

The application program interface (API) of the operating systems allows software developers to write applications for different computers, even if they are unique. The main principle of the operating system is to manage the system resources of the computer (processor, device drivers, memory management, hard drive, etc), to provide a consistent way for applications to deal with the hardware without having to know all the details of the system, such as all the instruction codes, data types, and response codes for every possible hard disk on the market.

Identity as Assembly

"New media follows, or actually, runs ahead of a quite different logic of post-industrial society - that of individual customization, rather that of mass standardization." [3] "In a post-industrial society, every citizen can construct her own custom lifestyle and 'select' her ideology from a large (but not infinite)

number of choices. Rather than pushing the same objects/information to a mass audience, marketing now tries to target each individual separately. The logic of new media technology reflects this new social logic. Every visitor to a Web site automatically gets her own custom version of the site created on the fly from a database." [4] - Lev Manovich

The means of a custom interchangeable practice suited for unique individuals developed out of the invention of C. de Dunin's mechanical tailor's dummy. The mechanical dummy was fitted with over 6979 standardized parts, all of which were "dedicated to adjustments away from perfection toward the peculiarities of form of any individual" [5]. Once the dummies were mass-produced "with several [dummies], boasted Dunin, you could fit uniforms to an army of several hundred thousand men," [6] How does a custom version of a website aid to construct a unique individual in post-industrial society?
The method of customization in post-industrial society embodies the contradictions of made to measure individuality brought forth by the dummy in industrial society. A custom version of a website does not constitute individuality or uniqueness. It is method of integrating control over a user to integrate her within the system. Soldiers are fitted with custom uniforms set to the particularities of their body like users fitted with a custom website set to their demographics and personal interests. Here digital media employs the logic of mass standardization and conformity of an industrial society, in contrast to Manovich's claim that digital media has moved beyond conformity and constructs uniqueness. In this case, Individuality is that of a marketing ploy to try to push their objects/information to a mass audience. Uniqueness hence "freedom [comes] without interference, manipulation or supervision from anyone, especially from any large organization." [7] It is the assembly of thousands and thousands of choices consciously and subconsciously within one's daily life that defines an individual's ideology, rather than a single choice garnished from a source dictated by another entity.

It is in the realm of mass production and mass culture where ideologies as subcultures emerge as a response to the dominant cultural environment as a means of constructing an identifiable functional unity. In relation to their cultural surroundings the visual ensembles of subcultures are obviously fabricated. It is the way that mass-produced items are used in the construction of a subculture, which distinguishes it from more common cultural formations. As a means of making themselves distinct from the dominant culture the subculture takes "the rubbish available within a preconstituted market .[to] generate viable cultures, and through their work on received commodities and categories, actually formulate a living, lived out and concretized critique of the society which produces these distorted, insulting, often meaningless things." [8] It is through a system of connections between assembled elements, which allows for the construction of

meaning. "Together, object and meaning constitute a sign, and, within any one culture, such signs are assembled, repeatedly, into characteristic forms of discourse. However, when the bricoleur re-locates the significant object in a different position within that discourse, using the same overall repertoire of signs, or when that object is placed within a different total ensemble, a new discourse is constituted, a different message conveyed". [9]

It is through the selection and arrangement of objects were the values of the group are reflected. An ensemble thoroughly ordered from a plastic clothes peg, safety-pin, pogo, swastika, ripped T-shirt, and bin-liner served as a point of identification and unity of relations, situations, and experience for a group, and chaos, danger, and rebellion to those outside it. Once constructed, the subculture as an assembly is recuperated by the dominate culture in the form of commodity, then becomes codified and returned to the public sphere where they can be used in yet another construction.

Assembly as the Structure of the Mind

"When data of any sort are placed in storage, they are filed alphabetically or numerically, and information is found (when it is) by tracing it down from subclass to subclass. It can be in only one place, unless duplicates are used; one has to have rules as to which path will locate it, and the rules are cumbersome. Having found one item, moreover, one has to emerge from the system and re-enter on a new path." [10] - Vannevar Bush

Vannevar Bush believed that their must be a better answer to "how information would be gathered, stored, and accessed in an increasingly information-saturated world" than filing and searching through layers of classification, for as far as the act of combining records is concerned, "the creative aspect of thinking is concerned only with the selection of the data and the process to be employed and the manipulation thereafter is repetitive in nature and hence a fit matter to be relegated to a machine" . [11] In 1963 Ted Nelson, who was greatly influenced by Bush's article "As We May Think", coined the term *Hypertext*. [12] The hypertext "exist[s] as part of a much larger system in which the totality might count more than the individual document". [13] The process of assembling information via hypertext mirrors the structure of the mind by operating by association.
"With one item in its grasp, it snaps instantly to the next that is suggested by the association of thoughts, in accordance with some intricate web of trails carried by the cells of the brain. It has other characteristics, of course; trails that are not frequently followed are prone to fade, items are not fully permanent, memory is transitory. Yet the speed of action, the intricacy of trails, the detail of mental pictures, is awe-inspiring beyond all else in nature." [14] Hypertext

possesses an almost unlimited power to manipulate texts through its ability to constantly shift meaning by assembling networks of text into new contexts and juxtapositions.

Assembly within Contemporary Culture

The notion of assembly is at the forefront of net.art with Josh On's prestigious PrixArs award winning project *They Rule*. [15] The work is an interactive visualization of a database containing information on the board members of the most influential corporations in America. The hidden structures of social power are made visible by allowing the user to assemble visual maps of the different companies and their board members (Figure 1).

http://anemone.cx/writing/figure1.jpg
Figure 1.

The work reveals the magnitude of elitism among the most powerful people within the USA by openly illustrating visual linkages such as the domination 26 companies within the *Fortune 100* by six men and one woman, and networks of power among so called competitors Coca-Cola and Pepsi Co. This visual interactive form of assembly allows for the otherwise unapparent or obscure to become visible in a comprehensible form.

In *Flow My Blood* the DJ Said, contemporary artist/writer/musician Paul D. Miller (aka DJ Spooky) postulates that "To [Miller], assembly is the invisible language of our time, and DJ'ing is the forefront art form of the late 20th century". [16] His DJ'ing performances instigate the convergence and melding of the construction and re-mixing of discrete samples of sounds, text, and image to create a unique space which "mirrors the modern macrocosm of cyberspace where different voices and visions constantly collide and cross fertilize one another." [17] The process of assembly holds a strong foothold in contemporary culture due to its enhancement by the development of digital media and its mirrored logic of post-industrial society. Like their counterparts; Bits of data, workers of the assembly line, or mass-produced items, audio samples construct meaning only when assembled within the mix. Through digital media, the audio sample breaks from its physical bonds of tape and vinyl into a liquidous form of numerical encoding. The ability for samples to be copied without degradation, modified and assembled mathematically by algorithmic manipulation and automated processes - all the while retaining its original structure, and distributed across vast digital networks idealizes the sample as the ultimate element of assembly. The sample now knows no bounds, and the musician is now free to explore her process of assembly as assembly to infinite means. "[Miller] doesn't need an

orchestra; [He] can simulate one just fine. Technology hasn't changed [Miller's] compositional process, it's just extended it into new realms." [18]

Conclusion

Assembly is the fundamental logic of post-industrial and industrial society, whether particular elements are manually assembled by a human author in a fixed sequence or automatically assembled in infinite arrangements by a programmatic software application; the process and consequence is of assembly. Digital Media enhances and reinforces the dominant social logic of assembly from the basic level of assembling Bits of data in order to execute rudimentary electronic commands, to assembling samples of contemporary culture to form a new and unique voice. The process of assembly is freed of virtually any limitations through digital media's ability to encoding discrete elements numerically, which can then be infinitely copied; distributed, arranged, and manipulated. Digital media exponentially expands the means of assembly by its ability to digitize virtual anything from DNA sequences, census data, orchestras, the ancient city of Pompeii, to entire galaxies; constructing an infinite databank of elements of which human machines alike can put together in infinite combinations to construct meaning of unlimited magnitude.

Notes

[1] Manovich, Lev, *The Language of New Media*. MIT Press, Cambridge, 2001. p. 61.
[2] p. 60.
[3] Manovich, p. 51.
[4] p. 60.
[5] Schwartz, Hillel, *The Culture of the Copy*, Zone Books, New York, 1996. p. 111.
[6] *Ibid*.
[7] Kaczynski, Theodore John, *The Unabomer Manifesto: Industrial Society and Its Future*, Jolly Roger Press, Berkeley, 1995. p. 30.
[8] Willis, Paul E., *Profane Culture*, Routledge, Great Britian, 1978, p. 3.
[9] Hebdige, Dick, "Subculture: The Meaning of Style", in *The Subcultures Reader*. Eds. Ken Gelder and Sarah Thornton, Routledge, London, 1997. p. 136.
[10] Bush, Vannevar, "As We May Think", in *Multimedia: From Wagner to Virtual Reality*, Eds. Packer, Randall & Jordan, Ken, Norton, New York, 2001. p. 148.
[11] p. 144 & p. 136.
[12] Nelson, Ted, "Computer Lib/Dream Machines", in *Multimedia: From Wagner to Virtual Reality*, Eds. Packer, Randall & Jordan, Ken, Norton, New York, 2001. p. 155.

[13] Landow, George & Delany, Paul, "Hypertext, Hypermedia and Literary Studies: The State of the Art", in *Multimedia: From Wagner to Virtual Reality*, Eds. Packer, Randall & Jordan, Ken, Norton, New York, 2001. p. 210.
[14] Bush, p. 148.
[15] http://www.theyrule.net
[16] Mariotti, Francesco, "El pensamiento es un jardín hìbrido", Venezuela. http://av.celarg.org.ve/enlamira/articulos/pensamiento.htm
[17] Miller, Paul D., *Songs of a Dead Dreamer* (CD inlay), Asphodel Records, 1996.
[18] Glass, Philip, "Music and Technology: A Roundtable Discussion", Andante Corp., 2002. http://www.andante.com/article/article.cfm?id=17375

Biography

Eric Deis is an interdisciplinary artist from Vancouver, Canada. Deis received a B.F.A in Visual Arts from Emily Carr Institute of Art and Design. He is currently a Master of Fine Arts candidate at the University of California, San Diego, where he is studying under the guidance of New Media theorist Lev Manovich. Deis is also a graduate student researcher for Centre for Research in Computing and the Arts at UCSD and a research fellow for the California Institute for Telecommunications and Information Technology. His work has been exhibited in Canada, USA, Denmark, Ireland, Brazil, and Germany where he most recently won the City of Stuttgart Award for New Media (2002).