

The Language of New Media

o

The Forms

August 5, 1999. I am sitting in the lobby of Razorfish Studios, which was named by *Adweek* one of the top ten interactive agencies in the world for 1998.¹ The company's story is Silicon Alley legend. It was founded in 1995 by two partners in their East Village loft; by 1997 it had forty-five employees; by 1999 the number grew to six hundred (this includes a number of companies around the world that Razorfish acquired). Razorfish projects range from screen savers to a Charles Schwab online trading Web site. At the time of my visit, the studios were housed on two floors of a building on Grand Street in Soho, between Broadway and Mercer, a few blocks from Prada, Hugo Boss, and other designer shops. The large, open space houses loosely positioned workspaces occupied mostly by twenty-something employees (although I notice one busy programmer who cannot be older than eighteen). The design of the space functions (intentionally so) as a metaphor for computer culture's key themes—interactivity, lack of hierarchy, modularity. In contrast to traditional office architecture, where the reception area acts as a gateway between the visitor and the company, here the desk looks like just another workstation, set aside from the entrance. On entering the space you can go to the reception desk, or you can directly make your way to any workstation on the floor. Stylishly dressed young employees of both genders appear and disappear in the elevator at regular intervals. It is fairly quiet, except for the little noises made by numerous computers as they save and retrieve files. One of the cofounders, still in his early thirties, gives me a quick tour of the place. Although Razorfish is the established design leader in the virtual world of computer screens and networks, our tour is focused on the physical world. He proudly points out that the workers are scattered around the open space regardless of their job titles—a programmer next to an interface designer next to a Web designer. He notes that the reception area, composed of a desk and two semicircular sofas, mimics the Razorfish logo. He talks about Razorfish's plans to venture into product design: "Our goal is to provide a total user experience. Right now, a client thinks that if he needs a design for buttons on the screen, he hires Razorfish; but if he needs real buttons, he goes to another shop. We want to change this."

The original 1970s paradigm of the Graphical User Interface (GUI) emulated familiar physical interfaces—a file cabinet, a desk, a trash can, a control panel.

1. <http://www.adweek.com>.

After leaving Razorfish Studios, I stop at Venus by Patricia Field, a funky store on West Broadway where I buy an orange and blue wallet that has two plastic buttons on its cover, an emulation of the forward and reverse buttons of a Web browser. The buttons do not do anything (yet); they simply signify “computer.” Over the course of twenty years, the culture has come full circle. If with GUI the physical environment migrated into the computer screen, now the conventions of GUI are migrating back into our physical reality. The same trajectory can be traced in relation to other conventions, or forms, of computer media. A collection of documents and a navigable space, already traditional methods of organizing both data and human experience of the world itself, became two of the forms that today can be found in most areas of new media. The first form is a database, used to store any kind of data—from financial records to digital movie clips; the second form is a virtual interactive 3-D space, employed in computer games, motion rides, VR, computer animation, and human-computer interfaces. In migrating to a computer environment, the collection and the navigable space were not left unchanged; on the contrary, they came to incorporate a computer’s particular techniques for structuring and accessing data, such as modularity, as well as its fundamental logic—that of computer programming. So, for instance, a computer database is quite different from a traditional collection of documents: It allows one to quickly access, sort, and reorganize millions of records; it can contain different media types, and it assumes multiple indexing of data, since each record besides the data itself contains a number of fields with user-defined values.

Today, in accordance with the transcoding principle, these two computer-based forms migrate back into culture at large, both literally and conceptually. A library, a museum—in fact, any large collection of cultural data—is replaced by a computer database. At the same time, a computer database becomes a new metaphor that we use to conceptualize individual and collective cultural memory, a collection of documents or objects, and other phenomena and experiences. Similarly, computer culture uses 3-D navigable space to visualize any kind of data—molecules, historical records, files in a computer, the Internet as a whole, the semantics of human language. (For instance, the software from plumbdesign renders an English thesaurus as a structure in 3-D space.)² And, with many computer games, the human ex-

2. <http://www.plumbdesign.com/thesaurus/>.

perience of being in the world and the narrative itself are represented as continuous navigation through space (think, for example, of *Tomb Raider*). In short, the computer database and the 3-D computer-based virtual space have become true cultural forms—general ways used by the culture to represent human experience, the world, and human existence in this world.

Why does computer culture privilege these forms over other possibilities?³ We may associate the first genre with work (the postindustrial labor of information processing) and the second with leisure and fun (computer games), yet this very distinction is no longer valid in computer culture. As I noted in the introduction to the “Interface” chapter, increasingly the same metaphors and interfaces are used at work and at home, for business and for entertainment. For instance, the user navigates through a virtual space both to work and to play, whether analyzing scientific data or killing enemies in *Quake*.

We may arrive at a better explanation if we look at how these two forms are used in new media design. From one perspective, all new media design can be reduced to these two approaches; that is, creating works in new media can be understood as either constructing the right interface to a multi-media database or as defining navigation methods through spatialized representations. The first approach is typically used in self-contained hypermedia and Web sites—in short, whenever the main goal is to provide an interface to data. The second approach is used in most computer games and virtual worlds. What is the logic here? Web sites and hypermedia programs usually aim to give the user efficient access to information, whereas games and virtual worlds aim to psychologically “immerse” the user in an imaginary universe. It is appropriate that the database has emerged as the perfect vehicle for the first goal while navigable space meets the demands of the second. It accomplishes the same effects that before were created by literary and cinematic narrative.

3. According to Janet Murray, digital environments have four essential properties: They are procedural, participatory, spatial, and encyclopedic. As can be seen, spatial and encyclopedic can be correlated with the two forms I describe here—navigable space and the database. Janet Murray, *Hamlet on the Holodeck—The Future of Narrative in Cyberspace* (Cambridge, Mass.: MIT Press, 1997), 73.

Sometimes, one alone of these two goals, information access and psychological engagement with an imaginary world, shapes the design of a new media object. An example of the former would be a search engine site; an example of the latter would be games such as *Riven* or *Unreal*. However, in general these two goals should be thought of as extreme cases of a single conceptual continuum. Such a supposedly “pure” example of an information-oriented object as a Yahoo, Hotbot, or other search site aims to “immerse” the user in its universe, prevent her from going to other sites. And such supposedly pure “psychological immersion” objects as *Riven* or *Unreal* have a strong “information processing” dimension. This dimension makes playing these games more like reading a detective story or playing chess than being engaged with traditional literary and film fictional narrative. Gathering clues and treasures; constantly updating a mental map of the universe of the game, including the positions of pathways, doors, places to avoid, and so on; keeping track of one’s ammunition, health, and other levels—all this aligns playing a computer game with other “information processing” tasks typical of computer culture, like searching the Internet, scanning news groups, pulling records from a database, using a spreadsheet, or data mining large data stores.

Often, the two goals of information access and psychological engagement compete within the same new media object. *Along with surface versus depth, the opposition between information and “immersion” can be thought of as a particular expression of the more general opposition characteristic of new media—between action and representation.* And just as is the case with the surface and depth opposition, the results of this competition are often awkward and uneasy. For instance, an image that embeds within itself a number of hyperlinks offers neither a true psychological “immersion” nor easy navigation because the user has to search for hyperlinks. Appropriately, games such as *Johnny Mnemonic* (SONY, 1995) that aspired to become true interactive movies, chose to avoid hyperlinks and menus altogether, instead relying on a keyboard as the sole source of interactive control.

Narratology, the branch of modern literary theory devoted to the theory of narrative, distinguishes between narration and description. Narration is those parts of the narrative that move the plot forward; description is those parts that do not. Examples of description are passages that describe the landscape, or a city, or a character’s apartment. In short, to use the language of the information age, description passages present the reader with descrip-

tive information. As its name itself implies, narratology paid most attention to narration and hardly any to description. But in the information age, narration and description have changed roles. If traditional cultures provided people with well-defined narratives (myths, religion) and little “stand-alone” information, today we have too much information and too few narratives that can tie it all together. For better or worse, information access has become a key activity of the computer age. Therefore, *we need something that can be called “info-aesthetics”—a theoretical analysis of the aesthetics of information access as well as the creation of new media objects that “aestheticize” information processing*. In an age when all design has become “information design,” and, to paraphrase the title of the famous book by the architectural historian Sigfried Giedion,⁴ “the search engine takes command,” information access is no longer just a key form of work but also a new key category of culture. Accordingly, it demands that we deal with it theoretically, aesthetically, and symbolically.

4. Sigfried Giedion, *Mechanization Takes Command, a Contribution to Anonymous History* (New York: Oxford University Press, 1948).

The Database



The Database Logic

After the novel, and subsequently cinema, privileged narrative as the key form of cultural expression of the modern age, the computer age introduces its correlate—the database. Many new media objects do not tell stories; they do not have a beginning or end; in fact, they do not have any development, thematically, formally, or otherwise that would organize their elements into a sequence. Instead, they are collections of individual items, with every item possessing the same significance as any other.

Why does new media favor the database form over others? Can we explain its popularity by analyzing the specificity of the digital medium and of computer programming? What is the relationship between the database and another form that has traditionally dominated human culture—narrative? These are the questions I will address in this section.

Before proceeding, I need to comment on my use of the word *database*. In computer science, *database* is defined as a structured collection of data. The data stored in a database is organized for fast search and retrieval by a computer and therefore, it is anything but a simple collection of items. Different types of databases—hierarchical, network, relational, and object-oriented—use different models to organize data. For instance, the records in hierarchical databases are organized in a treelike structure. Object-oriented databases store complex data structures, called “objects,” which are organized into hierarchical classes that may inherit properties from classes higher in the chain.⁵

5. “Database,” *Encyclopaedia Britannica Online*, <http://www.eb.com:180/cgi-bin/g?DocF=micro/160/23.html>.

New media objects may or may not employ these highly structured database models; however, from the point of view of the user's experience, a large proportion of them are databases in a more basic sense. They appear as collections of items on which the user can perform various operations—view, navigate, search. The user's experience of such computerized collections is, therefore, quite distinct from reading a narrative or watching a film or navigating an architectural site. Similarly, a literary or cinematic narrative, an architectural plan, and a database each present a different model of what a world is like. It is this sense of database as a cultural form of its own that I want to address here. Following art historian Ervin Panofsky's analysis of linear perspective as a "symbolic form" of the modern age, we may even call database a new symbolic form of the computer age (or, as philosopher Jean-François Lyotard called it in his famous 1979 book *The Postmodern Condition*, "computerized society"),⁶ a new way to structure our experience of ourselves and of the world. Indeed, if after the death of God (Nietzsche), the end of grand Narratives of Enlightenment (Lyotard), and the arrival of the Web (Tim Berners-Lee), the world appears to us as an endless and unstructured collection of images, texts, and other data records, it is only appropriate that we will be moved to model it as a database. But it is also appropriate that we would want to develop a poetics, aesthetics, and ethics of this database.

Let us begin by documenting the dominance of the database form in new media. The most obvious examples are popular multimedia encyclopedias, collections by definition, as well as other commercial CD-ROM (or DVD), that feature collections of recipes, quotations, photographs, and so on.⁷ The identity of a CD-ROM as a storage media is projected onto another plane, thereby becoming a cultural form in its own right. Multimedia works that have "cultural" content appear to particularly favor the database form. Consider, for instance, the "virtual museums" genre—CD-ROMs that take the user on a tour through a museum collection. A museum becomes a database of images representing its holdings, which can be accessed in different

6. Jean-François Lyotard, *The Postmodern Condition: A Report on Knowledge*, trans. Geoff Bennington and Brian Massumi (Minneapolis: University of Minnesota Press, 1984), 3.

7. As early as 1985, Grolier, Inc. issued a text-only *Academic American Encyclopedia* on CD-ROM. The first multimedia encyclopedia was *Compton's MultiMedia Encyclopedia*, published in 1989.

ways—chronologically, by country, or by artist. Although such CD-ROMs often simulate the traditional museum experience of moving from room to room in a continuous trajectory, this narrative method of access does not have any special status in comparison to other access methods offered by CD-ROMs. Thus narrative becomes just one method of accessing data among many. Another example of a database form is a multimedia genre that does not have an equivalent in traditional media—CD-ROMs devoted to a single cultural figure such as a famous architect, film director, or writer. Instead of a narrative biography, we are presented with a database of images, sound recordings, video clips, and/or texts that can be navigated in a variety of ways.

CD-ROMs and other digital storage media proved to be particularly receptive to traditional genres that already had a database-like structure, such as the photo album; they also inspired new database genres, like the database biography. Where the database form really flourished, however, is the Internet. As defined by original HTML, a Web page is a sequential list of separate elements—text blocks, images, digital video clips, and links to other pages. It is always possible to add a new element to the list—all you have to do is to open a file and add a new line. As a result, most Web pages are collections of separate elements—texts, images, links to other pages, or sites. A home page is a collection of personal photographs. A site of a major search engine is a collection of numerous links to other sites (along with a search function, of course). A site of a Web-based TV or radio station offers a collection of video or audio programs along with the option to listen to the current broadcast, but this current program is just one choice among many other programs stored on the site. Thus the traditional broadcasting experience, which consists solely of a real-time transmission, becomes just one element in a collection of options. Similar to the CD-ROM medium, the Web offered fertile ground to already existing database genres (for instance, bibliography) and also inspired the creation of new ones such as sites devoted to a person or a phenomenon (Madonna, the Civil War, new media theory, etc.) that, even if they contain original material, inevitably center around a list of links to other Web pages on the same person or phenomenon.

The open nature of the Web as a medium (Web pages are computer files that can always be edited) means that Web sites never have to be complete; and they rarely are. They always grow. New links are continually added to what is already there. It is as easy to add new elements to the end of a list as

it is to insert them anywhere in it. All this further contributes to the anti-narrative logic of the Web. If new elements are being added over time, the result is a collection, not a story. Indeed, how can one keep a coherent narrative or any other development trajectory through the material if it keeps changing?

Commercial producers have experimented with ways to explore the database form inherent to new media, with offerings ranging from multimedia encyclopedias to collections of software and collections of pornographic images. In contrast, many artists working with new media at first uncritically accepted the database form as a given. Thus they became blind victims of database logic. Numerous artists' Web sites are collections of multimedia elements documenting their works in other media. In the case of many early artists' CD-ROMs as well, the tendency was to fill all the available storage space with different material—the main work, documentation, related texts, previous works, and so on.

As the 1990s progressed, artists increasingly began to approach the database more critically.⁸ A few examples of projects investigating database politics and possible aesthetics are Chris Marker's "IMMEMORY," Olga Lialina's "Anna Karenina Goes to Paradise,"⁹ Stephen Mamber's "Digital Hitchcock," and Fabian Wagmister's ". . . two, three, many Guevaras." The artist who has explored the possibilities of a database most systematically is George Legrady. In a series of interactive multimedia works ("The Anecdoted Archive," 1994; "[the clearing]," 1994; "Slippey Traces," 1996; "Tracing," 1998) he used different types of databases to create "an information structure where stories/things are organized according to multiple thematic connections."¹⁰

Data and Algorithm

Of course, not all new media objects are explicitly databases. Computer games, for instance, are experienced by their players as narratives. In a game,

8. See *AI and Society* 13.3, a special issue on database aesthetics, ed. Victoria Vesna (http://arts.ucsb.edu/~vesna/AI_Society/); *SWITCH* 5, no. 3, "The Database Issue" (<http://switch.sjsu.edu/>).

9. <http://www.teleportacia.org/anna>.

10. George Legrady, personal communication, 16 September 1998.

the player is given a well-defined task—winning the match, being first in a race, reaching the last level, or attaining the highest score. It is this task that makes the player experience the game as a narrative. Everything that happens to her in a game, all the characters and objects she encounters, either take her closer to achieving the goal or further away from it. Thus, in contrast to a CD-ROM and Web database, which always appear arbitrary because the user knows additional material could have been added without modifying the logic, in a game, from the user's point of view, all the elements are motivated (i.e., their presence is justified).¹¹

Often the narrative shell of a game ("You are the specially trained commando who has just landed on a lunar base; your task is to make your way to the headquarters occupied by the mutant base personnel . . .") masks a simple algorithm well-familiar to the player—kill all the enemies on the current level, while collecting all the treasures it contains; go to the next level and so on until you reach the last level. Other games have different algorithms. Here is the algorithm of the legendary *Tetris*: When a new block appears, rotate it in such a way so that it will complete the top layer of blocks on the bottom of the screen, thus making this layer disappear. The similarity between the actions expected of the player and computer algorithms is too uncanny to be dismissed. While computer games do not follow a database logic, they appear to be ruled by another logic—that of the algorithm. They demand that a player execute an algorithm in order to win.

An algorithm is the key to the game experience in a different sense as well. As the player proceeds through the game, she gradually discovers the rules that operate in the universe constructed by this game. She learns its hidden logic—in short, its algorithm. Therefore, in games in which the game play departs from following an algorithm, the player is still engaged with an algorithm albeit in another way: She is discovering the algorithm of

11. Bordwell and Thompson define motivation in cinema in the following way: "Because films are human constructs, we can expect that any one element in a film will have some justification for being there. This justification is the motivation for that element." Here are some examples of motivation: "When Tom jumps from the balloon to chase a cat, we motivate his action by appealing to notions of how dogs are likely to act when cats are around"; "The movement of a character across a room may motivate the moving of the camera to follow the action and keep the character within a frame." Bordwell and Thompson, *Film Art*, 5th ed., 80.

the game itself. I mean this both metaphorically and literally: For instance, in a first-person shooter such as *Quake* the player may eventually notice that, under such and such conditions, the enemies will appear from the left; that is, she will literally reconstruct a part of the algorithm responsible for the game play. Or, in a different formulation of the legendary author of Sim games, Will Wright, “playing the game is a continuous loop between the user (viewing the outcomes and inputting decisions) and the computer (calculating outcomes and displaying them back to the user). The user is trying to build a mental model of the computer model.”¹²

This is another example of the general principle of transcoding discussed in the first chapter—the projection of the ontology of a computer onto culture itself. If in physics the world is made of atoms and in genetics it is made of genes, computer programming encapsulates the world according to its own logic. The world is reduced to two kinds of software objects that are complementary to each other—data structures and algorithms. Any process or task is reduced to an algorithm, a final sequence of simple operations that a computer can execute to accomplish a given task. And any object in the world—be it the population of a city, or the weather over the course of a century, or a chair, or a human brain—is modeled as a data structure, that is, data organized in a particular way for efficient search and retrieval.¹³ Examples of data structures are arrays, linked lists, and graphs. Algorithms and data structures have a symbiotic relationship. The more complex the data structure of a computer program, the simpler the algorithm needs to be, and vice versa. Together, data structures and algorithms are two halves of the ontology of the world according to a computer.

The computerization of culture involves the projection of these two fundamental parts of computer software—and of the computer’s unique ontology—onto the cultural sphere. If CD-ROMs and Web databases are cultural manifestations of one half of this ontology—data structures—then computer games are manifestations of the second half—algorithms. Games (sports, chess, cards, etc.) are one cultural form that require algorithm-like

12. McGowan and McCullough, *Entertainment in the Cyber Zone*, 71.

13. This is true for a procedural programming paradigm. In an object-oriented programming paradigm, represented by such computer languages as Java and C++, algorithms and data structures are modeled together as objects.

behavior from players; consequently, many traditional games were quickly simulated on computers. In parallel, new genres of computer games such as the first-person shooter came into existence. Thus, as was the case with database genres, computer games both mimic already existing games and create new game genres.

It may appear at first sight that data is passive and algorithms active—another example of the passive-active binary categories so loved by human cultures. A program reads in data, executes an algorithm, and writes out new data. We may recall that before “computer science” and “software engineering” became established names in the computer field, this was called “data processing”—a name which remained in use for the few decades during which computers were mainly associated with performing calculations over data. However, the passive/active distinction is not quite accurate because data does not just exist—it has to be generated. Data creators have to collect data and organize it, or create it from scratch. Texts need to be written, photographs need to be taken, video and audio material need to be recorded. Or they need to be digitized from already existing media. In the 1990s, when the new role of the computer as a Universal Media Machine became apparent, already computerized societies went into a digitizing craze. All existing books and videotapes, photographs, and audio recordings started to be fed into computers at an ever-increasing rate. Steven Spielberg created the Shoah Foundation, which videotaped and then digitized numerous interviews with Holocaust survivors; it would take one person forty years to watch all the recorded material. The editors of the journal *Mediamatic*, who devoted a whole issue to the topic of “the storage mania” (Summer 1994) wrote: “A growing number of organizations are embarking on ambitious projects. Everything is being collected: culture, asteroids, DNA patterns, credit records, telephone conversations; it doesn’t matter.”¹⁴ In 1996, the financial company T. Rowe Price stored eight hundred gigabytes of data; by the fall of 1999 this number rose to ten terabytes.¹⁵

Once digitized, the data has to be cleaned up, organized, and indexed. The computer age brought with it a new cultural algorithm: reality→

14. *Mediamatic* 8, no. 1 (Summer 1994), 1860.

15. Bob Laird, “Information Age Losing Memory,” *USA Today*, 25 October 1999.

media→data→database. The rise of the Web, this gigantic and always changing data corpus, gave millions of people a new hobby or profession—data indexing. There is hardly a Web site that does not feature at least a dozen links to other sites; therefore, every site is a type of database. And, with the rise of Internet commerce, most large-scale commercial sites have become real databases, or rather front-ends to company databases. For instance, in the fall of 1998, Amazon.com, an online bookstore, had three million books in its database; and the maker of the leading commercial database *Oracle* has offered *Oracle 8i*, fully integrated with the Internet and featuring unlimited database size, natural-language queries, and support for all multimedia data types.¹⁶ Jorge Luis Borges's story about a map equal in size to the territory it represents is rewritten as a story about indexes and the data they index. But now the map has become larger than the territory. Sometimes, much larger. Porno Web sites exposed the logic of the Web at its extreme by constantly reusing the same photographs from other porno Web sites. Only rare sites featured the original content. On any given date, the same few dozen images would appear on thousands of sites. Thus, the same data would give rise to more indexes than the number of data elements themselves.

Database and Narrative

As a cultural form, the database represents the world as a list of items, and it refuses to order this list. In contrast, a narrative creates a cause-and-effect trajectory of seemingly unordered items (events). Therefore, database and narrative are natural enemies. Competing for the same territory of human culture, each claims an exclusive right to make meaning out of the world.

In contrast to most games, most narratives do not require algorithm-like behavior from their readers. However, narratives and games are similar in that the user must uncover their underlying logic while proceeding through them—their algorithm. Just like the game player, the reader of a novel gradually reconstructs the algorithm (here I use the term metaphorically) that the writer used to create the settings, the characters, and the events. From this perspective, I can rewrite my earlier equations between the two parts of

16. <http://www.amazon.com/exec/obidos/subst/misc/company-info.html>, <http://www.oracle.com/database/oracle8i/>.

the computer's ontology and its corresponding cultural forms. Data structures and algorithms drive different forms of computer culture. CD-ROMs, Web sites, and other new media objects organized as databases correspond to the data structure, whereas narratives, including computer games, correspond to algorithm.

In computer programming, data structures and algorithms need each other; they are equally important for a program to work. What happens in the cultural sphere? Do databases and narratives have the same status in computer culture?

Some media objects explicitly follow a database logic in their structure whereas others do not; but under the surface, practically all of them are databases. In general, creating a work in new media can be understood as the construction of an interface to a database. In the simplest case, the interface simply provides access to the underlying database. For instance, an image database can be represented as a page of miniature images; clicking on a miniature will retrieve the corresponding record. If a database is too large to display all of its records at once, a search engine can be provided to allow the user to search for particular records. But the interface can also translate the underlying database into a very different user experience. The user may be navigating a virtual three-dimensional city composed from letters, as in Jeffrey Shaw's interactive installation "Legible City."¹⁷ Or she may be traversing a black-and-white image of a naked body, activating pieces of text, audio, and video embedded in its skin (Harwood's CD-ROM "Rehearsal of Memory").¹⁸ Or she may be playing with virtual animals that come closer or run away depending upon her movements (Scott Fisher et al., VR installation "Menagerie").¹⁹ Although each of these works engages the user in a set of behaviors and cognitive activities that are quite distinct from going through the records of a database, all of them are databases. "Legible City" is a database of three-dimensional letters that make up a city. "Rehearsal of Memory" is a database of texts and audio and video clips that are accessed through the interface of a body. And "Menagerie" is a database of virtual animals, including their shapes, movements, and behaviors.

17. <http://artnetweb.com/guggenheim/mediandscape/shaw.html>.

18. Harwood, *Rehearsal of Memory*, CD-ROM (London: Artec and Bookworks, 1996.)

19. <http://www.telepresence.com/MENAGERIE>.

The database becomes the center of the creative process in the computer age. Historically, the artist made a unique work within a particular medium. Therefore the interface and the work were the same; in other words, the level of an interface did not exist. With new media, the content of the work and the interface are separated. It is therefore possible to create different interfaces to the same material. These interfaces may present different versions of the same work, as in David Blair's *WaxWeb*.²⁰ Or they may be radically different from each other, as in Olga Lialina's Last Real Net Art Museum.²¹ This is one of the ways in which the principle of *variability* of new media manifests itself. But now we can give this principle a new formulation. *The new media object consists of one or more interfaces to a database of multimedia material.* If only one interface is constructed, the result will be similar to a traditional art object, but this is an exception rather than the norm.

This formulation places the opposition between database and narrative in a new light, thus redefining our concept of narrative. The "user" of a narrative is traversing a database, following links between its records as established by the database's creator. An interactive narrative (which can be also called a *hypernarrative* in an analogy with hypertext) can then be understood as the sum of multiple trajectories through a database. A traditional linear narrative is one among many other possible trajectories, that is, a particular choice made within a hypernarrative. Just as a traditional cultural object can now be seen as a particular case of a new media object (i.e., a new media object that has only one interface), traditional linear narrative can be seen as a particular case of hypernarrative.

This "technical," or "material," change in the definition of narrative does not mean that an arbitrary sequence of database records is a narrative. To qualify as a narrative, a cultural object has to satisfy a number of criteria, which literary theorist Mieke Bal defines as follows: It should contain both an actor and a narrator; it also should contain three distinct levels consisting of the text, the story, and the fabula; and its "contents" should be "a series of connected events caused or experienced by actors."²² Obviously, not

20. <http://jefferson.village.virginia.edu/wax/>.

21. <http://myboyfriendcamebackfromth.ewar.ru>.

22. Mieke Bal, *Narratology: Introduction to the Theory of Narrative* (Toronto: University of Toronto Press, 1985), 8.

all cultural objects are narratives. However, in the world of new media, the word *narrative* is often used as an all-inclusive term, to cover up the fact that we have not yet developed a language to describe these new strange objects. It is usually paired with another overused word—*interactive*. Thus a number of database records linked together so that more than one trajectory is possible is assumed to constitute an “interactive narrative.” But merely to create these trajectories is of course not sufficient; the author also has to control the semantics of the elements and the logic of their connection so that the resulting object will meet the criteria of narrative as outlined above. Another erroneous assumption frequently made is that, by creating her own path (i.e., choosing the records from a database in a particular order), the user constructs her own unique narrative. However, if the user simply accesses different elements, one after another, in a usually random order, there is no reason to assume that these elements will form a narrative at all. Indeed, why should an arbitrary sequence of database records, constructed by the user, result in “a series of connected events caused or experienced by actors”?

In summary, database and narrative do not have the same status in computer culture. In the database/narrative pair, database is the unmarked term.²³ Regardless of whether new media objects present themselves as linear narratives, interactive narratives, databases, or something else, underneath, on the level of material organization, they are all databases. In new media, the database supports a variety of cultural forms that range from direct translation (i.e., a database stays a database) to a form whose logic is the opposite of the logic of the material form itself—narrative. More precisely, a database can support narrative, but there is nothing in the logic of the medium itself that would foster its generation. It is not surprising, then, that databases occupy a significant, if not the largest, territory of the new media landscape. What is more surprising is why the other end of the spectrum—narratives—still exist in new media.

23. The theory of markedness was first developed by linguists of the Prague School in relation to phonology, but subsequently applied to all levels of linguistic analysis. For example, “rooster” is a marked term and “chicken” an unmarked term. Whereas “rooster” is used only in relation to males, “chicken” is applicable to both males and females.

Paradigm and Syntagm

The dynamics that exist between database and narrative are not unique in new media. The relation between the structure of a digital image and the languages of contemporary visual culture is characterized by the same dynamics. As defined by all computer software, a digital image consists of a number of separate layers, each layer containing particular visual elements. Throughout the production process, artists and designers manipulate each layer separately; they also delete layers and add new ones. Keeping each element as a separate layer allows the content and the composition of an image to be changed at any point—deleting a background, substituting one person for another, moving two people closer together, blurring an object, and so on. What would a typical image look like if the layers were merged together? The elements contained on different layers would become juxtaposed, resulting in a montage look. Montage is the default visual language of composite organization of an image. However, just as database supports both the database form and its opposite—narrative—a composite organization of an image on the material level (and compositing software on the level of operations) supports two opposing visual languages. One is modernist-MTV montage—two-dimensional juxtaposition of visual elements designed to shock due to its impossibility in reality. The other is the representation of familiar reality as seen by a film camera (or its computer simulation, in the case of 3-D graphics). During the 1980s and 1990s, all image-making technologies became computer-based, thus turning all images into composites. In parallel, a renaissance of montage took place in visual culture, in print, broadcast design, and new media. This is not unexpected—after all, this is the visual language dictated by the composite organization. What needs to be explained is why photorealist images continue to occupy such a significant space in our computer-based visual culture.

It would be surprising, of course, if photorealist images suddenly disappeared completely. The history of culture does not contain such sudden breaks. Similarly, we should not expect that new media would completely replace narrative with database. New media does not radically break with the past; rather, it distributes weight differently between the categories that hold culture together, foregrounding what was in the background, and vice versa. As Frederick Jameson writes in his analysis of another shift, that from modernism to postmodernism: “Radical breaks between periods do not generally involve complete changes but rather the restructuration of a certain

number of elements already given: features that in an earlier period of system were subordinate become dominant, and features that had been dominant again become secondary.”²⁴

The database/narrative opposition is a case in point. To further understand how computer culture redistributes weight between the two terms of opposition in computer culture, I will bring in the semiological theory of syntagm and paradigm. According to this model, originally formulated by Ferdinand de Saussure to describe natural languages such as English and later expanded by Roland Barthes and others to apply to other sign systems (narrative, fashion, food, etc.), the elements of a system can be related in two dimensions—the syntagmatic and paradigmatic. As defined by Barthes, “The syntagm is a combination of signs, which has space as a support.”²⁵ To use the example of natural language, the speaker produces an utterance by stringing together elements, one after another, in a linear sequence. This is the syntagmatic dimension. Now let us look at the paradigmatic dimension. To continue with the example of the language user, each new element is chosen from a set of other related elements. For instance, all nouns form a set; all synonyms of a particular word form another set. In the original formulation of Saussure, “The units which have something in common are associated in theory and thus form groups within which various relationships can be found.”²⁶ This is the paradigmatic dimension.

Elements in the syntagmatic dimension are related *in praesentia*, while elements in the paradigmatic dimension are related *in absentia*. For instance, in the case of a written sentence, the words that comprise it materially exist on a piece of paper, while the paradigmatic sets to which these words belong only exist in the writer’s and reader’s minds. Similarly, in the case of a fashion outfit, the elements that compose it, such as skirt, blouse, and jacket, are present in reality, while pieces of clothing that could have been present instead—different skirt, different blouse, different jacket—exist only in the viewer’s imagination. Thus, syntagm is explicit and paradigm is implicit; one is real and the other is imagined.

24. Fredric Jameson, “Postmodernism and Consumer Society,” in *The Anti-Aesthetic: Essays on Postmodern Culture*, ed. Hal Foster (Seattle: Bay Press, 1983), 123.

25. Barthes, *Elements of Semiology*, 58.

26. Quoted in *ibid.*, 58.

Literary and cinematic narratives work in the same way. Particular words, sentences, shots, and scenes that make up a narrative have a material existence; other elements that form the imaginary world of an author or a particular literary or cinematic style, and that could have appeared instead, exist only virtually. Put differently, the database of choices from which narrative is constructed (the paradigm) is implicit; while the actual narrative (the syntagma) is explicit.

New media reverse this relationship. Database (the paradigm) is given material existence, while narrative (the syntagma) is dematerialised. Paradigm is privileged, syntagma is downplayed. Paradigm is real; syntagma, virtual. To see this, consider the new media design process. The design of any new media object begins with assembling a database of possible elements to be used. (Macromedia Director calls this database "cast," Adobe Premiere calls it "project," ProTools calls it a "session," but the principle is the same.) This database is the center of the design process. It typically consists of a combination of original and stock material such as buttons, images, video and audio sequences, 3-D objects, behaviors, and so on. Throughout the design process, new elements are added to the database; existing elements are modified. The narrative is constructed by linking elements of this database in a particular order, that is by designing a trajectory leading from one element to another. On the material level, a narrative is just a set of links; the elements themselves remain stored in the database. Thus the narrative is virtual while the database exists materially.

The paradigm is privileged over syntagma in yet another way in interactive objects presenting the user with a number of choices at the same time—which is what typical interactive interfaces do. For instance, a screen may contain a few icons; clicking on each icon leads the user to a different screen. On the level of an individual screen, these choices form a paradigm of their own that is explicitly presented to the user. On the level of the whole object, the user is made aware that she is following one possible trajectory among many others. In other words, she is selecting one trajectory from the paradigm of all trajectories that are defined.

Other types of interactive interfaces make the paradigm even more explicit by presenting the user with an explicit menu of all available choices. In such interfaces, all of the categories are always available, just a mouse click away. The complete paradigm is present before the user, its elements neatly arranged in a menu. This is another example of how new media make

explicit the psychological processes involved in cultural communication. Other examples include the (already discussed) shift from creation to selection, which externalizes and codifies the database of cultural elements existing in the creator's mind, as well as the very phenomena of interactive links. As I noted in chapter one, new media takes "interaction" literally, equating it with a strictly physical interaction between a user and a computer, at the expense of psychological interaction. The cognitive processes involved in understanding any cultural text are erroneously equated with an objectively existing structure of interactive links.

Interactive interfaces foreground the paradigmatic dimension and often make explicit paradigmatic sets. Yet they are still organized along the syntagmatic dimension. Although the user is making choices at each new screen, the end result is a linear sequence of screens that she follows. This is the classical syntagmatic experience. In fact, it can be compared to constructing a sentence in a natural language. Just as a language user constructs a sentence by choosing each successive word from a paradigm of other possible words, a new media user creates a sequence of screens by clicking on this or that icon at each screen. Obviously, there are many important differences between these two situations. For instance, in the case of a typical interactive interface, there is no grammar, and paradigms are much smaller. Yet the similarity of basic experience in both cases is quite interesting; in both cases, it unfolds along a syntagmatic dimension.

Why does new media insist on this language-like sequencing? My hypothesis is that they follow the dominant semiological order of the twentieth century—that of cinema. As I will discuss in more detail in the next chapter, cinema replaced all other modes of narration with a sequential narrative, an assembly line of shots that appear on the screen one at a time. For centuries, a spatialized narrative in which all images appear simultaneously dominated European visual culture; in the twentieth century it was relegated to "minor" cultural forms such as comics or technical illustrations. "Real" culture of the twentieth century came to speak in linear chains, aligning itself with the assembly line of the industrial society and the Turing machine of the postindustrial era. New media continue this mode, giving the user information one screen at a time. At least, this is the case when it tries to become "real" culture (interactive narratives, games); when it simply functions as an interface to information, it is not ashamed to present much more information on the screen at once, whether in the

form of tables, normal or pull-down menus, or lists. In particular, the experience of a user filling in an online form can be compared to precinematic spatialized narrative: in both cases, the user follows a sequence of elements that are presented simultaneously.

A Database Complex

To what extent is the database form intrinsic to modern storage media? For instance, a typical music CD is a collection of individual tracks grouped together. The database impulse also drives much of photography throughout its history, from William Henry Fox Talbot's *Pencil of Nature* to August Sander's monumental typology of modern German society *Face of Our Time*, to Bernd and Hilla Becher's equally obsessive cataloging of water towers. Yet the connection between storage media and database forms is not universal. The prime exception is cinema. Here the storage media support the narrative imagination.²⁷ Why then, in the case of photography storage media, does technology sustain database, whereas in the case of cinema it gives rise to a modern narrative form par excellence? Does this have to do with the method of media access? Shall we conclude that random-access media, such as computer storage formats (hard drives, removable disks, CD-ROMs, DVD), favor database, whereas sequential-access media, such as film, favor narrative? This does not hold either. For instance, a book, the perfect random-access medium, supports database forms such as photoalbums as well as narrative forms such as novels.

Rather than trying to correlate database and narrative forms with modern media and information technologies, or deduce them from these technologies, I prefer to think of them as two competing imaginations, two basic creative impulses, two essential responses to the world. Both have existed long before modern media. The ancient Greeks produced long narratives, such as Homer's epic poems *The Iliad* and *The Odyssey*; they also produced encyclopedias. The first fragments of a Greek encyclopedia to have survived were the work of Speusippus, a nephew of Plato. Diderot wrote novels—and also was in charge of the monumental *Encyclopédie*, the largest publishing

27. Christian Metz, "The Fiction Film and Its Spectator: A Metapsychological Study," in *Apparatus*, ed. Theresa Hak Kyung Cha (New York: Tanam Press, 1980), p. 402.

project of the eighteenth century. Competing to make meaning out of the world, database and narrative produce endless hybrids. It is hard to find a pure encyclopedia without any traces of a narrative in it and vice versa. For instance, until alphabetical organization became popular a few centuries ago, most encyclopedias were organized thematically, with topics covered in a particular order (typically, corresponding to the seven liberal arts.) At the same time, many narratives, such as the novels by Cervantes and Swift, and even Homer's epic poems—the founding narratives of the Western tradition—traverse an imaginary encyclopedia.

Modern media is the new battlefield for the competition between database and narrative. It is tempting to read the history of this competition in dramatic terms. First, the medium of visual recording—photography—privileges catalogs, taxonomies, and lists. While the modern novel blossoms, and academicians continue to produce historical narrative paintings throughout the nineteenth century, in the realm of the new techno-image of photography, database rules. The next visual recording medium—film—privileges narrative. Almost all fictional films are narratives, with few exceptions. Magnetic tape used in video does not bring any substantial changes. Next, storage media—computer-controlled digital storage devices—privilege databases once again. Multimedia encyclopedias, virtual museums, pornography, artists' CD-ROMs, library databases, Web indexes, and, of course, the Web itself: The database is more popular than ever before.

The digital computer turns out to be the perfect medium for the database form. Like a virus, databases infect CD-ROMs and hard drives, servers and Web sites. Can we say that the database is the cultural form most characteristic of a computer? In her 1978 article "Video: The Aesthetics of Narcissism," probably the single most well-known article on video art, art historian Rosalind Krauss argued that video is not a physical medium but a psychological one. In her analysis, "Video's real medium is a psychological situation, the very terms of which are to withdraw attention from an external object—an Other—and invest it in the Self."²⁸ In short, video art is a support for the

28. Rosalind Krauss, "Video: The Aesthetics of Narcissism," in John Hanhardt, ed. *Video Culture* (Rochester: Visual Studies Workshop, 1987), 184.

psychological condition of narcissism.²⁹ Does new media similarly function to play out a particular psychological condition, something that might be called a “database complex”? In this respect, it is interesting that a database imagination has accompanied computer art from its very beginning. In the 1960s, artists working with computers wrote programs to systematically explore the combinations of different visual elements. In part, they were following art world trends such as minimalism. Minimalist artists executed works of art according to preexistent plans; they also created series of images or objects by systematically varying a single parameter. So when minimalist artist Sol LeWitt spoke of an artist’s idea as “the machine which makes the work,” it was only logical to substitute the human executing the idea with a computer.³⁰ At the same time, since the only way to make pictures with a computer was by writing a computer program, the logic of computer programming itself pushed computer artists in the same directions. Thus, for artist Frieder Nake, a computer was a “Universal Picture Generator,” capable of producing every possible picture out of a combination of available picture elements and colors.³¹ In 1967 he published a portfolio of twelve drawings

29. This analysis can also be applied to many interactive computer installations. The user of such an installation is presented with her own image; the user is given the possibility to play with this image and also to observe how her movements trigger various effects. In a different sense, most new media, regardless of whether it represents to the user her image or not, can be said to activate the narcissistic condition because they represent to the user her actions and their results. In other words, it functions as a new kind of mirror that reflects not only the human image but human activities. This is a different kind of narcissism—not passive contemplation but action. The user moves the cursor around the screen, clicks on icons, presses the keys on the keyboard, and so on. The computer screen acts as a mirror of these activities. Often this mirror does not simply reflect but greatly amplifies the user’s actions—a second difference from traditional narcissism. For instance, clicking on a folder icon activates an animation accompanied by sound; pressing a button on a game pad sends a character off to climb a mountain; and so on. But even without this amplification, the modern GUI functions as a mirror, always representing the image of the user in the form of a cursor moving around the screen.

30. Quoted in Sam Hunter and John Jacobus, *Modern Art: Painting, Sculpture, and Architecture*, 3d ed. (New York: Abrams, 1992), 326.

31. Frank Dietrich, “Visual Intelligence: The First Decade of Computer Art (1965–1975),” *IEEE Computer Graphics and Applications* (July 1985), 39.

that were obtained by successfully multiplying a square matrix by itself. Another early computer artist Manfred Mohr produced numerous images that recorded various transformations of a basic cube.

Even more remarkable were films by John Whitney, the pioneer of computer filmmaking. His films such as *Permutations* (1967), *Arabesque* (1975) and others systematically explored the transformations of geometric forms obtained by manipulating elementary mathematical functions. Thus they substituted successive accumulation of visual effects for narrative, figuration, or even formal development. Instead they presented the viewer with databases of effects. This principle reaches its extreme in Whitney's early film *Catalog*, which was made with an analog computer. In his important book on new forms of cinema of the 1960s entitled *Expanded Cinema* (1970), critic Gene Youngblood writes about this remarkable film: "The elder Whitney actually never produced a complete, coherent movie on the analog computer because he was continually developing and refining the machine while using it for commercial work. . . . However, Whitney did assemble a visual catalogue of the effects he had perfected over the years. This film, simply titled *Catalog*, was completed in 1961 and proved to be of such overwhelming beauty that many persons still prefer Whitney's analogue work over his digital computer films."³² One is tempted to read *Catalog* as one of the founding moments of new media. As discussed in the "Selection" section, all software for media creation today arrives with endless "plug-ins"—the banks of effects that with a press of a button generate interesting images from any input whatsoever. In parallel, much of the aesthetics of computerized visual culture is effects-driven, especially when a new techno-genre (computer animation, multimedia, Web sites) is first becoming established. For instance, countless music videos are variations of Whitney's *Catalog*—the only difference is that the effects are applied to the images of human performers. This is yet another example of how the logic of a computer—in this case, the ability of a computer to produce endless variations of elements and to act as a filter, transforming its input to yield a new output—becomes the logic of culture at large.

32. Gene Youngblood, *Expanded Cinema* (New York: E. P. Dutton and Co., 1970), 210.

Database Cinema: Greenaway and Vertov

Although the database form may be inherent to new media, countless attempts to create “interactive narratives” testify to our dissatisfaction with the computer in the sole role of encyclopedia or catalog of effects. We want new media narratives, and we want these narratives to be different from the narratives we have seen or read before. In fact, regardless of how often we repeat in public that the modernist notion of medium specificity (“every medium should develop its own unique language”) is obsolete, we do expect computer narratives to showcase new aesthetic possibilities that did not exist before digital computers. In short, we want them to be new media specific. Given the dominance of the database in computer software and the key role it plays in the computer-based design process, perhaps we can arrive at new kinds of narrative by focusing our attention on how narrative and database can work together. How can a narrative take into account the fact that its elements are organized in a database? *How can our new abilities to store vast amounts of data, to automatically classify, index, link, search, and instantly retrieve it, lead to new kinds of narratives?*

Peter Greenaway, one of the few prominent film directors concerned with expanding cinema’s language, once complained that “the linear pursuit—one story at a time told chronologically—is the standard format of cinema.” Pointing out that cinema lags behind modern literature in experimenting with narrative, he asked: “Could it not travel on the road where Joyce, Eliot, Borges and Perec have already arrived?”³³ While Greenaway is right to direct filmmakers to more innovative literary narratives, new media artists working on the database-problem can learn from cinema “as it is.” For cinema already exists right at the intersection between database and narrative. We can think of all the material accumulated during shooting as forming a database, especially since the shooting schedule usually does not follow the narrative of the film but is determined by production logistics. During editing, the editor constructs a film narrative out of this database, creating a unique trajectory through the conceptual space of all possible films that could have been constructed. From this perspective, every filmmaker

33. Peter Greenaway, *The Stairs—Munich—Projection 2* (London: Merrell Holberton Publishers, 1995), 21.

engages with the database-narrative problem in every film, although only a few have done so self-consciously.

One exception is Greenaway himself. Throughout his career, he has been working on the problem of how to reconcile database and narrative forms. Many of his films progress by recounting a list of items, a catalog without any inherent order (for example, the different books in *Prospero's Books*). Working to undermine a linear narrative, Greenaway uses different systems to order his films. He wrote about this approach: "If a numerical, alphabetic color-coding system is employed, it is done deliberately as a device, a construct, to counteract, dilute, augment or complement the all-pervading obsessive cinema interest in plot, in narrative, in the 'I'm now going to tell you a story' school of film-making."³⁴ His favorite system is numbers. The sequence of numbers acts as a narrative shell that "convinces" the viewer that she is watching a narrative. In reality, the scenes that follow one another are not connected in any logical way. By using numbers, Greenaway "wraps" a minimal narrative around a database. Although Greenaway's database logic was already present in his "avant-garde" films such as *The Falls* (1980), it has also structured his "commercial" films. The *Draughtsman's Contract* (1982) is centered around twelve drawings in the process of being made by a draftsman. They do not form any order; Greenaway emphasizes this by having the draftsman work on a few drawings at once. Eventually, Greenaway's desire to take "cinema out of cinema" led to his work on a series of installations and museum exhibitions in the 1990s. No longer obliged to conform to the linear medium of film, the elements of a database are spatialized within a museum or even a whole city. This move can be read as the desire to create a database in its most pure form—as a set of elements not ordered in any way. If the elements exist in one dimension (the time of a film, the list on a page), they will inevitably be ordered. So the only way to create a pure database is to spatialize it, distributing the elements in space. This is exactly the path that Greenaway took. Situated in a three-dimensional space that does not have an inherent narrative logic, the 1992 installation "100 Objects to Represent the World" by its very title proposes that the world should be under-

34. Quoted in David Pascoe, *Peter Greenaway: Museums and Moving Images* (London: Reaktion Books, 1997), 9–10.

stood through a catalog rather than a narrative. At the same time, Greenaway does not abandon narrative; he continues to investigate how database and narrative can work together. Having presented “100 Objects” as an installation, Greenaway next turned it into an opera set. In the opera, the narrator Thrope uses the objects to conduct Adam and Eve through the whole of human civilization, thus turning one hundred objects into a sequential narrative.³⁵ In another installation, “The Stairs, Munich, Projection” (1995), Greenaway put up a hundred screens—each representing one year in the history of cinema—throughout Munich. Again, Greenaway presents us with a spatialized database—but also with a narrative. By walking from one screen to another, one follows cinema’s history. The project uses Greenaway’s favorite principle of organization by numbers, pushing it to the extreme: The projections on the screens contain no figuration, just numbers. The screens are numbered from 1895 to 1995, one screen for each year of cinema’s history. Along with numbers, Greenaway introduces another line of development: Each projection is slightly different in color.³⁶ The hundred colored squares form an abstract narrative of their own that runs in parallel to the linear narrative of cinema’s history. Finally, Greenaway superimposes yet a third narrative by dividing the history of cinema into five sections, each section staged in a different part of the city. The apparent triviality of the basic narrative of the project—one hundred numbers, standing for one hundred years of cinema’s history—“neutralizes” the narrative, forcing the viewer to focus on the phenomenon of the projected light itself, which is the actual subject of this project.

Along with Greenaway, Dziga Vertov can be thought of as a major “database filmmaker” of the twentieth century. *Man with a Movie Camera* is perhaps the most important example of a database imagination in modern media art. In one of the key shots, repeated a few times throughout the film, we see an editing room with a number of shelves used to keep and organize the shot material. The shelves are marked “machines,” “club,” “the movement of a city,” “physical exercise,” “an illusionist,” and so on. This is the database of the recorded material. The editor, Vertov’s wife, Elizaveta Svilova, is shown

35. <http://www.tem-nanterre.com/greenaway-100objects/>.

36. Greenaway, *The Stairs, Munich, Projection 2*, 47–53.

working with this database—retrieving some reels, returning used reels, adding new ones.

Although I pointed out that film editing in general can be compared to creating a trajectory through a database, this comparison in the case of *Man with a Movie Camera* constitutes the very method of the film. Its subject is the filmmaker's struggle to reveal (social) structure among the multitude of observed phenomena. Its project is a brave attempt at an empirical epistemology that has but one tool—perception. The goal is to decode the world purely through the surfaces visible to the eye (natural sight enhanced, of course, by a movie camera). This is how the film's coauthor Mikhail Kaufman describes it:

An ordinary person finds himself in some sort of environment, gets lost amidst the zillions of phenomena, and observes these phenomena from a bad vantage point. He registers one phenomenon very well, registers a second and a third, but has no idea of where they may lead. . . . But the man with a movie camera is infused with the particular thought that he is actually seeing the world for other people. Do you understand? He joins these phenomena with others, from elsewhere, which may not even have been filmed by him. Like a kind of scholar he is able to gather empirical observations in one place and then in another. And that is actually the way in which the world has come to be understood.³⁷

Therefore, in contrast to standard film editing that consists of selection and ordering of previously shot material according to a preexistent script, here the process of relating shots to each other, ordering, and reordering them to discover the hidden order of the world constitutes the film's method. *Man with a Movie Camera* traverses its database in a particular order to construct an argument. Records drawn from a database and arranged in a particular order become a picture of modern life—but simultaneously an argument about this life, an interpretation of what these images, which we encounter every day, every second, actually mean.³⁸

Was this brave attempt successful? The overall structure of the film is quite complex, and at first glance seems to have little to do with a database.

37. Mikhail Kaufman, "An Interview," *October* 11 (Winter 1979): 65.

38. It can be said that Vertov uses "the Kuleshov's effect" to give meaning to the database records by placing them in a particular order.

Just as new media objects contain a hierarchy of levels (interface—content, operating system—application, Web page—HTML code, high-level programming language—assembly language—machine language), Vertov's film contains at least three levels. One level is the story of a cameraman shooting material for the film. The second level consists of the shots of the audience watching the finished film in a movie theater. The third level is the film itself, which consists of footage recorded in Moscow, Kiev, and Riga, arranged according to the progression of a single day: waking up—work—leisure activities. If this third level is a text, the other two can be thought of as its metatexts.³⁹ Vertov goes back and forth between the three levels, shifting between the text and its metatexts—between the production of the film, its reception, and the film itself. But if we focus on the film within the film (i.e., the level of the text) and disregard the special effects used to create many of the shots, we discover almost a linear printout, so to speak, of a database—a number of shots showing machines, followed by a number of shots showing work activities, followed by different shots of leisure, and so on. The paradigm is projected onto the syntagm. The result is a banal, mechanical catalog of subjects that one could expect to find in the city of the 1920s—running trams, city beach, movie theaters, factories . . .

Of course, watching *Man with a Movie Camera* is anything but a banal experience. Even after the 1990s, when designers and video-makers systematically had exploited every avant-garde device, the original still looks striking. What makes its striking is not its subjects and the associations Vertov tries to establish between them to impose “the communist decoding of the world,” but rather the most amazing catalog of film techniques contained within it. Fades and superimpositions, freeze-frames, acceleration, split screens, various types of rhythm and intercutting, different montage techniques⁴⁰—what

39. Linguistics, semiotics, and philosophy use the concept of metalanguage. Metalanguage is the language used for the analysis of object language. Thus a metalanguage may be thought of as a language about another language. A metatext is a text in metalanguage about a text in object language. For instance, an article in a fashion magazine is a metatext about the text of clothes. Or an HTML file is a metatext that describes the text of a Web page.

40. We should remember that various temporal montage techniques were still a novelty in the 1920s; they had the same status for viewers then as “special effects” such as 3-D characters have for viewers today. The original viewers of Vertov's film probably experienced it as one long special-effects sequence.

film scholar Annette Michelson has called “a summation of the resources and techniques of the silent cinema”⁴¹—and of course, a multitude of unusual, “constructivist” points of view are strung together with such density that the film cannot simply be labeled “avant-garde.” If a “normal” avant-garde film still proposes a coherent language different from the language of mainstream cinema, that is, a small set of techniques that are repeated, *Man with a Movie Camera* never arrives at anything like a well-defined language. Rather, it proposes an untamed, and apparently endless, unwinding of techniques, or, to use contemporary language, “effects,” as cinema’s new way of speaking.

Traditionally, a personal artistic language or a style common to a group of cultural objects or a period requires a stability of paradigms and consistent expectations as to which elements of paradigmatic sets may appear in a given situation. For example, in the case of classic Hollywood style, a viewer may expect that a new scene will begin with an establishing shot or that a particular lighting convention such as high key or low key will be used throughout the film. (David Bordwell defines a Hollywood style in terms of paradigms ranked in terms of probabilities.)⁴²

The endless new possibilities provided by computer software hold the promise of new cinematic languages, but at the same time they prevent such languages from coming into being. (I am using the example of film, but the same logic applies to all other areas of computer-based visual culture.) Since every software comes with numerous sets of transitions, 2-D filters, 3-D transformations, and other effects and “plug-ins,” the artist, especially the beginner, is tempted to use many of them in the same work. In such a case, a paradigm becomes the syntagm; that is, rather than making singular choices from the sets of possible techniques, or, to use the term of Russian formalists, devices, and then repeating them throughout the work (for instance, using only cuts, or only cross-dissolves), the artist ends up using many options in the same work. Ultimately, a digital film becomes a list of different effects, which appear one after another. Whitney’s *Catalog* is the extreme expression of this logic.

41. Ibid., 55.

42. David Bordwell, “Classical Hollywood Film,” in Philip Rosen, ed., *Narrative, Apparatus, Ideology: Film Theory Reader* (New York: Columbia University Press, 1987).

The possibility of creating a stable new language is also subverted by the constant introduction of new techniques over time. Thus the new media paradigms not only contain many more options than old media paradigms, but they also keep growing. And in a culture ruled by the logic of fashion, that is, the demand for constant innovation, artists tend to adopt newly available options while simultaneously dropping already familiar ones. Every year, every month, new effects find their way into media works, displacing previously prominent ones and destabilizing any stable expectations that viewers might have begun to form.

And this is why Vertov's film has particular relevance to new media. It proves that it is possible to turn "effects" into a meaningful artistic language. Why is it that in Whitney's computer films and music videos effects are just effects, whereas in the hands of Vertov they acquire meaning? Because in Vertov's film they are motivated by a particular argument, which is that the new techniques of obtaining images and manipulating them, summed up by Vertov in his term "kino-eye," can be used to decode the world. As the film progresses, straight footage gives way to manipulated footage; newer techniques appear one after another, reaching a roller-coaster intensity by the film's end—a true orgy of cinematography. It is as though Vertov restages his discovery of the kino-eye for us, and along with him, we gradually realize the full range of possibilities offered by the camera. Vertov's goal is to seduce us into his way of seeing and thinking, to make us share his excitement, as he discovers a new language for film. This gradual process of discovery is film's main narrative, and it is told through a catalog of discoveries. Thus in the hands of Vertov, the database, this normally static and "objective" form, becomes dynamic and subjective. More important, Vertov is able to achieve something that new media designers and artists still have to learn—how to merge database and narrative into a new form.