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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 then 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.

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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 multimedia 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.

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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.

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

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]

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5. "Database," *Encyclopædia Britannica Online,* http://www.eb.com:180/cgi-bin/g?DocF=micro/160/23.html.

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,

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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

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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

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12. McGowan and McCullaugh, *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 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→

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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.

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17. http://artnetweb.com/guggenheim/mediascape/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

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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.

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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.