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Venerating the Black Box: Magic in Media Discourse on Technology

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Arthur C. Clarke once wrote that "any sufficiently advanced technology is indistinguishable from magic." The language of magic is evident in much of popular discourse about computers. A content analysis of Time magazine reporting on computers and related technologies over a ten-year period revealed that 36 percent of all these stories used explicitly magical or religious language. Together with a qualitative analysis of implicitly magical themes, the patterns in Time’s reporting reveal how magic language was used as one strategy to stabilize and close the technological frame of personal computers in the mid-1980s.

Any sufficiently advanced technology is indistinguishable from magic.
—Arthur C. Clarke,
Profiles of the Future

Magic is a flower that grows only in impotence.
—Rubem Alves,
Tomorrow’s Child

Faust conjured spirits to give himself knowledge and power. In our century, we press buttons to do the same. The language of magic appeared to be a staple of popular discourse on computer technology in the 1980s. Computer products, advertising, and company names frequently used magical images or words. Magical language was particularly noticeable in media reporting on computers. As we move into the so-called information society, four hundred years after the scientific revolution began and two hundred years after the industrial revolution, why does the mass media’s discussion of computers and related technologies use language such as “magic” and “wizardry”? Is it just hyperbole and advertising hype or, for all our pride in science and technology, do the wonders and terrors of sorcery still haunt our souls?

To answer these questions I will examine the discourse surrounding the introduction of personal computers. The introduction of a major new tech-
Technology, like any other form of social change, is potentially threatening to many people. Many people ask themselves what do these changes mean and how will they affect me? One function of the mass media is to provide answers for these questions. The media play a crucial role in shaping perceptions, creating meaning, and directing the public’s response to technological change. But the media are not neutral conduits of information. They serve both their own institutional interests and the interests of the social groups that control them. So when we find the language of magic in media discussion of computers and related technologies, we have to ask what it means and why it is there.

In this article I will first describe technology and magic. Then I will analyze the contents of all the reports on computers and related technologies in *Time* magazine for a ten-year period, beginning with the advent of regular coverage of computers in 1979. I conclude by reflecting on some of the implications of this discourse.

**Technology and Magic**

Magical discourse seems to be alive and well in industrialized North America. During the ten-year period beginning in 1979, 36 percent of the 175 articles about computers in *Time* magazine used explicitly magical or religious language to refer to computers or to those who make, program, or use them (see Table 1). For example, the cover of *Time* for 16 April 1984 proclaimed “Computer Software: The Magic Inside The Machine.” Words such as magic, wizard, and wizardry appeared throughout the decade. Computers “conjure up” programs (*Time*, 31 January 1983, 65), and “teen age sorcerers” (*Time*, 3 May 1982, 54) used them for pranks or to practice the “secret arts of the computer age” (*Time*, 29 July 1985, 59). Sometimes the language was openly religious. Children “sit in communion” with their machines (*Time*, 21 September 1981, 60), while their elders, for whom “portable computers were gospel” (*Time*, 30 May 1983, 70), “like many other computer converts” recalled their “microelectronic baptism” (*Time*, 9 December 1985, 98). They struggled on “the long road to high tech heaven” (*Time*, 3 January 1983, 17) while awaiting the “Second Coming for Steven Jobs” (*Maclean’s*, 25 January 1988, 24). Even when explicitly magical or religious language was not used, sometimes what was described was implicitly magical, as when *Newsweek* proclaimed: “The pace of development is roughly akin to going from the Wright Brother’s first airplane to the space shuttle in a decade” (30 June 1980, 51). Now of course, such language did not dominate media coverage of computers, even in most of the stories in
which it appeared. Magic was not the only trope used in the media discussions of technology. But the question that should be asked is: why was it there at all? Why, in an industrialized, secular society should some of the most advanced technology be described with the images and metaphors of magic? To answer this question we will have to examine the role of magical and religious language in discourse about technology.

Technology is more than an ensemble of techniques and machines; it is a practice. It is the knowledge, tools, and procedures used in society to get work done and to achieve desired, practical ends. Arnold Pacey (1983, 6) defines “technology practice” as a human activity involving technical aspects (machines and the knowledge and skills of how to make and operate them), organizational aspects (the organizational structures and economics of using them), and cultural aspects (the goals, norms, beliefs, and values surrounding the machines and their use). All three of these aspects are interwoven, influencing and shaping one another. Technical changes bring with them changes in interpersonal relations and social organization. Cultural and organizational aspects shape technical change, whereas the limits and capabilities of the machines affect the organizations and people who use them. Questions of power and its organization are thus inherent in any discussion of technology. Indeed, all three aspects are so interwoven that recent literature (Bijker, Hughes, and Pinch, 1987; Bijker and Law, 1992) uses the term “seamless web” to describe their interaction.

The meaning of any technology is established by what Wiebe Bijker calls its technological frame, “a combination of current theories, tacit knowledge, specialized testing procedures, goals, and handling and using practice” (1987, 168). This frame provides “the goals, the thoughts, the tools for action. A technological frame offers both the central problems and the related strategies to solve them” (Bijker, 1993, 123). The rhetoric of a technological frame is an expression of the cultural aspects of technology practice. The frame provides a context with which groups of people, whom Bijker (1993) calls “relevant social groups,” contend to impose their definition and understanding of the technology. Each of these groups will follow one or more strategies in this conflict (Bijker and Law 1992). Should one of these groups be successful, we can say that they have “appropriated” that technology, or that their definitions, theories, tacit knowledge, and so on have prevailed. “Stabilization” and “closure” (Bijker 1993) occur when the victorious social group manages to impose its definition of the technology as the “universal” meaning of the technology and to define its practices as “normal” (Smith 1987). After this happens the debate “disappears,” and the prevalent view appears natural and consensual (Marvin 1986). Thus, the development of any technology occurs in the context of a struggle over that technology’s defini-
tion and its appropriation (Elkjaer 1989). The winners of the struggle define the “technical culture” and become the “experts” upon whom everyone else is dependent (Doniol-Shaw 1989).

Control or manipulation of the media is one strategy by which a social group may strive to define and appropriate a technology. The mass media are powerful ideological resources (Gitlin 1980; Lee and Solomon 1991; Parenti 1986). They provide a means by which contending social groups can “lengthen their networks” (Latour 1987) by recruiting new allies and appropriating further resources.

The ideological power of the media lies in their ability to perform two functions. The first is ontological—they help to create reality. Dorothy Nelkin explains:

For most people the reality of science is what they read in the press. They understand science less through direct experience or past education than through the filter of journalistic language and imagery. With the exception of an occasional television or radio notice, newspapers and popular magazines are their only contact with what is going on in rapidly changing scientific and technical fields, and their major source of information about the implications of such developments. (1987, 2)

Of course, not all people are influenced by the media in the same way. As Nelkin goes on to report, for issues about which people have little experience or prior knowledge the media “in effect [define] the reality of the situation for them” (p. 77). But in areas where individuals have experience or other sources of information, the media tend to either confirm pre-existing biases or have their influence tempered by other sources of information.

The second function of the media is to establish or to undermine legitimacy and authority (Meyrowitz 1985). By choosing who and what to cover and by adopting a particular language, the media bestow facticity on the relations of power so as to augment or to undercut authority. Generally, those involved with science and technology have had their legitimacy bolstered by the media. The context and background of individuals are important in conferring legitimacy and in defining reality. Research also shows that “the media portrayal of science and technology as esoteric and arcane yet a source of authority and broad-ranging expertise” is widely accepted by the public (Nelkin 1987, 76).

Whether defining reality or bestowing legitimacy, the media must maintain plausibility. An account that lacks plausibility for too many people will quickly lose credibility and may actually delegitimate its source. One way journalists protect their own credibility is through professional norms of “objectivity” (Tuchman 1978); another is to reflect what they perceive to be their audience’s preferences, concerns, and values (Nelkin 1987). Reporting
is thus a reflexive activity. The media both create and mirror reality. They try "objectively" to describe an actuality that they themselves have helped to construct.

The agency of this reflexivity is media frames, which Todd Gitlin defined as "persistent patterns of cognition, interpretation, and presentation, of selection, emphasis, and exclusion, by which symbol-handlers routinely organize discourse, whether verbal or visual" (1980, 7). A frame acts as a filter for reporters and editors. "This frame organizes the world for journalists," says Nelkin, "helping them to process large amounts of information, to select what is news, and to present it in an efficient form. Their metaphors, descriptive devices, and catch phrases are expressions of this frame" (1987, 9). A frame is also a focus for how the news is presented. The same metaphors that helped the reporter organize information become the means through which reality is created for the audience. Particularly potent images or metaphors, once part of a media frame, can go on reciprocally shaping the social world and the media accounts of that world for a long time.  

Although control or manipulation of the media may be an effective strategy for those contending to define and appropriate a technology, not all relevant social groups are equally able to use it: the ability to "make news" is an aspect of power (Logan 1977). Those who lack the power to access the "nodes" in the "news-gathering net" (Tuchman 1978) are much less likely to influence the shaping of media frames, or indeed, to be covered at all. This is particularly true in reporting on science and technology. Science reporters are especially dependent upon scientists, engineers, and the organizations for which they work as sources—much more so than, say, political reporters, who have a wider variety of "informed opinion" to draw upon (Nelkin 1987). With the exception of "media-wise" groups such as Greenpeace, media frames of technology are usually shaped by government, industry, and the large research institutions.

At this point technological frames and media frames begin to merge. The scientists' and technicians' "theories, goals, and tacit knowledge"—and particularly their images and metaphors—become part of the reporters' "pattern of cognition, interpretation and presentation." As the frames merge, media frames magnify technological frames. The rhetoric of those social groups that serve as sources (scientists, engineers, corporate and government public relations people) is amplified (and filtered and modified) through journalists to other social groups that make up their audience. This expansion of discourse enlarges technological frames by bringing more groups into the discussion. A media campaign is thus often an effective strategy for enlisting allies (especially, in the case of technology, potential customers). A successful
campaign can sway "public opinion," and thus also affect governments. Most significantly, powerful social groups can use the media to "set the agenda," that is, to focus public discourse on issues those groups want discussed. To use an example from Weart (1988), the nuclear industry wants the agenda to be the increasing need for energy whereas environmentalists want to frame the debate in terms of safety and pollution.

Analysis of media frames gives access to a fragment of a technological frame in the process of amplification, modification, and diffusion to a larger number of relevant social groups. Given the close relationship between reporters in this area and their sources, we should expect that stabilization and closure of the technological frame will be reflected in media coverage.

This is the context in which we examine the structure of *Time*'s reporting on computers and related technologies. As the continent's largest-circulation newsmagazine, *Time*, together with a very few other "flagship" publications, plays a particularly powerful ideological role, and it is second only to television in constructing social reality (Gitlin 1980; Tuchman 1978). Moreover, in the case of science and technology, the print media may be more important than television (Nelkin 1987). Although *Time* represents only a fragment of the total discourse on computers, it is certainly a significant one. I therefore expect to find that the use of magical language in *Time*'s coverage will in effect favor the interests of one or more powerful social groups even as it attempts to define the meaning of the new technology for the wider public.

To understand *Time*'s use of magical language, I examined its reporting from two perspectives. First, I attempted to estimate the extent to which magical language was used by performing a content analysis and counting all the occurrences of explicitly magical and religious language in *Time* reports on computers and related technologies between January 1979 and December 1988 (this period covers the crucial early years of the "personal computer revolution" through the stabilization of discourse in the mid- to late 1980s). A word was considered to be explicitly magical or religious if that was its ordinary, everyday meaning. For example, words like *magic*, *wizard*, *sorcerer*, and *conjured* are explicitly magical, whereas *gospel*, *communion*, *baptism*, and *heaven* are explicitly religious. Words that were not explicitly magical or religious in their everyday meaning (e.g., wondrous) were not counted. The emerging patterns reveal the structure of *Time*'s coverage. Second, this discourse was qualitatively examined through a detailed anthropological profile of magic to which media discourse was compared. The aim of this hermeneutical interpretation (Geertz 1973; Ricoeur 1976) was to discern how the use of magical images and metaphors helped to create
meaning. Together these two approaches should help us to understand how magical and religious language was used by *Time* to define the new technologies.

**Magic and Religion**

A trichotomy of science, magic, and religion was a significant issue for founders of the sociology of religion, such as Emile Durkheim, Max Weber, and Bronislaw Malinowski. According to Durkheim, magic and religion are closely related. He defined religion as "a unified system of beliefs and practices relative to sacred things, that is to say, things set apart and forbidden... which unite into one single moral community called a church, all those who adhere to them" (1915, 62). Magic is also a system of beliefs and rituals pertaining to sacred things, but in contrast to religion, "there is no church of magic" (p. 60). The magician serves clients, not a congregation or a moral community.

Although Weber discussed magic and religion extensively, he never presented a clear definition of either term. The key element of both was the possession of charisma. Weber defined charisma as:

A certain quality of an individual personality by virtue of which he is set apart from ordinary men and treated as endowed with supernatural, superhuman, or at least specifically exceptional powers and qualities. These are such as are not accessible to the ordinary person, but are regarded as of divine origin or as exemplary, and on the basis of them the individual is treated as a leader. (1947, 358-59)

To Weber, "the magician is the person who is permanently endowed with charisma" ([1922] 1963, 3), but like Durkheim, he distinguishes between priests who are functionaries of a cult and "magicians, who are self-employed" (p. 29). If the link between religion and magic is blurred in Weber's work, the distinction between them and science is not clear either. Both magic and religion are oriented to "this world," exhibit "relatively rational behavior," and their ends are "predominantly economic" (p. 1). For Weber, then, the possession of charisma, some form of extraordinary power, was the defining characteristic of both magic and religion, but the boundaries were indistinct.

Bronislaw Malinowski ([1925] 1948) also described a science-magic-religion trichotomy. The essence of magic is *mana* (like Weber's charisma, a manifestation of extraordinary power). This distinguishes it from science. At the same time, magic shares with science an orientation toward achieving some concrete goal or purpose. To Malinowski, this is the difference between
religion and magic. "In the magical act the underlying idea and aim is always clear, straightforward, and definite, in the religious ceremony there is no purpose directed towards a subsequent event" (p. 38). Magic relies upon extraordinary power, upon mana, but it is oriented solely to achieving practical, "this worldly" ends.

Today's definitions generally follow one or another of these "classic" definitions (Stark and Bainbridge 1985) or attempt a synthesis of them (O'Keefe 1982). Perhaps one of the best short definitions is offered by Joachim Wach: "Magic means to force the numen to grant what is desired" (1944, 353). Most take the view that magic is either a pseudo science or a deficient form of religion. For those with an evolutionary viewpoint (de Bolt 1969), magic represents a "primitive" form of belief, which was replaced by "modern" and certainly nonmagical ways of thinking. Evaluations differ. Some hold that "magic must rank among the greatest of men's delusions" (Webster 1948, 506), whereas others contend that early science was a continuation of the quests and methods of alchemists and magi (Eliade 1978; Merchant 1980; Seligmann 1948). Thus, according to most definitions, the difference between magic and religion is more a matter of institutional differentiation than of substance or function. Both address the numinous: religion within the context of the cult, magic outside of it. In this study, we are discussing discourse in the media rather than cultic practices. Institutionally grounded distinctions between magic and religion lose their significance. Sociologists of religion call this phenomenon an "implicit religion." While differences in vocabulary may be noticeable, what is significant for this study are appeals to the numinous. Expressions such as "the magic inside the machine" or "microelectronic baptism" may have different histories, but both speak of technology in the language of the numinous. For the purposes of this study, all appeals to the numinous will be equivalent.

Frame Analysis

*Time* began regular reporting on computers in 1979, two years after the first microcomputers became commercially available. Reporting was institutionalized when a "Computers" department was created in 1982. This department was discontinued in mid-1987 and replaced by a more general one called "Technology." From only three articles in 1979, the number of articles on computers increased dramatically and reached a peak in 1983, then trailed off (see Table 1; Figure 1). A better measure of the extent of coverage is the number of column centimeters devoted to a story. The total of column
centimeters that *Time* dedicated to computers increased by an average of 195.25 percent per year between 1979 and 1983, dropped sharply in 1984, and then, with a few fluctuations, drifted downward.

The intensity of coverage of a story can be measured by the average length of the articles allotted to it. Articles on computers averaged 65.4 column centimeters over the ten years studied, with a significantly higher average in 1979, 1980, 1982, and 1983. One measure of the prominence a magazine gives a story is the number of covers devoted to it. Seven of the nine cover stories *Time* did on computers during this period were published between 1980 and 1984, including the “Machine of the Year” cover in January 1983. These measures of the extent, intensity, and prominence of stories about computers suggest a period of growing awareness from 1979 to 1981 and a period of peak enthusiasm from January 1982 until April 1984, followed by a period of stabilization (see Table 2).6

*Time*’s coverage of computers between January 1982 and April 1984 was particularly intensive.7 Fifty-eight of the 175 articles on computers, or 33.14 percent of the total, appeared during those 28 months. In total, articles on computers during this period occupied 4,905 column centimeters, or 42.86 percent of the ten-year total. The average length of 84.57 column centimeters per story was well above the 65.4 column centimeter average for the ten-year total. Six of the nine covers devoted to computers during the ten years under study appeared during these 28 months. After April 1984, the number of articles declined slowly, but the average length of stories dropped sharply, and computers were never again given such prominence.
Figure 1. Time Magazine Articles on Computers

- Total Articles
- Uses Magic Language

Number of Articles


35 30 25 20 15 10 5 0
The magical and religious language used by *Time* in its stories about computers is part of this broader pattern. The number of articles using explicitly magical or religious language parallels the total number of articles on computers, rising sharply to a peak in 1983 and then trailing off (see Figure 1). Explicit magical language was found in 46 percent of all articles on computers from 1980 to April 1984 and then dropped sharply to an average of 28 percent of the articles between May 1984 and 1988. The amount of magical language found within these stories also varied. Sentences containing explicitly magical or religious language occurred on average 1.8 times per story in 1979-1981, rose to 2.92 per story between January 1982 and April 1984, and after that declined to an average of 1.7 per story. Thus, the use of explicitly magical and religious language was widespread but not intense and significantly more common during the period of peak enthusiasm than later.

There were also structural changes in how explicitly magical and religious language was used. If we think of a news story as a frame, it has both a “center” and a “rim.” The rim is what “frames” the story, bracketing the central text, placing it in perspective, and marking its boundaries with the surrounding context (Brown and Yule 1983; Gitlin 1980; Tuchman 1978). Words or images that appear on the rim connect the substance of the story to an assumed context, providing continuity with previously established meanings and a “flag” that alerts the reader to something new or different (the center of the story). In a magazine story, the rim usually consists of the headlines, subheads, and first and last paragraphs. When we examine the sentences in *Time*’s reporting on computers in which explicitly magical or religious language occurs, the ratio between the number appearing in the center of the story and on the rim varies from one period to the next.
the first period, 1979-1981, 39 percent of magical language is found on the rim of the story. In the second period, January 1982 to April 1984, the percent on the rim drops to 25 percent, while in the final period it rises to 52.17 percent.

All this indicates a changing function for magical language. During the first period, it signals change and novelty. During the second period, the more frequent use of explicit magical language and its predominant location in the center of the frame suggests that it plays a role in defining and giving meaning to the new technology. After April 1984, there is a relative scarcity of explicit magical language and it is more frequently located on the rim of the frame. The position on the rim apparently now has a different function. Personal computers are no longer "new"; their meaning has been established and now it is only necessary to make reference to previously accepted definitions. This implies that discourse has stabilized.

Structural analysis of *Time*'s reporting points out the small but not insignificant part that explicitly magical and religious language played in the frame, but it misses the actual function of such language in defining the new technologies.

**A Profile of Magic**

A useful profile of magic has been developed by anthropologists Rosalie and Murray Wax (1962). They describe an encompassing magical worldview in which beliefs and practices meld. According to their characterization, the magical worldview differs from the modern in four ways: its relationships, and its understandings of power, of logic, and the role of the person. In each of these areas, what Wax and Wax describe as magic bears intriguing similarities to the media's discussion of computers.

The first distinctive feature of the magical worldview is the nature of relationships within it. Wax and Wax cite H. and H. A. Frankfort: "For modern scientific man the phenomenal world is primarily an 'It'; for ancient—and also for primitive—man it is a 'Thou' " (Wax and Wax, 1962, 180). Humans and natural entities are bound together both socially and emotionally because "the intimate linkage between man and non-man is manifested in the fact that the former is not intrinsically distinguished from the latter in physical makeup" (p. 182). The magical world is one where humans and animals engage in all forms of social interaction, where plants speak and stones weep. In the industrialized world, we lack this sense of intimacy between humans and the nonhuman world (Merchant 1980). To us, the world is mere stuff. When we start speaking of nature as "overburden," the strip mines are not far behind. But computers are frequently spoken of differently. Perhaps because
computers sometimes seem to be made in our mind’s image, people react to them differently than to other machines. As Sherry Turkle found, children are often unsure whether computers are alive or not (1984, 29-63). Time magazine is not completely sure either.

Anthropomorphism is endemic to discourse about computers. Much of this comes from the industry’s jargon. Computers are said to be “smart” machines with “memories,” who “talk” to each other in “languages” and develop “artificial intelligence.” This kind of anthropomorphism was common throughout the 1980s. If computer professionals speak this way, we can expect that the popular media will do it as well. But the newsmagazines went well beyond this. Newsweek’s cover boldly proclaimed “Machines That Think” (30 June 1980). Time described computer toys as “clever new playmates” and “as teachers they can form bonds of a sort—friendships?—with their pupils” (10 December 1979, 68). One computer “pays imaginative court to details” (Time, 31 January 1983, 65), whereas others are “expert assistants” (Time, 2 September 1985, 43). The machines are endowed with emotions. The article on computer toys had them pondering, cheerful, and “becomes impatient within a couple of minutes when its opponent is thinking” (10 December 1979, 71). Teaching programs were said to be “very patient and non-judgmental” as well as polite (Time, 21 September 1981, 60). Reportedly, people responded to them just as emotionally. Time worried about “computer addicts” who “become obsessed with the machine, at least in the eyes of other family members” (15 October 1984, 103). Indeed, Time added, “the most successful machines have a built-in emotional component, something that connects the tools in the computer with the whims of its user” (24 October 1988, 76). In these human-machine relationships, the machine was frequently portrayed as the active partner. Computers were spoken of in the active voice, as if they had volition. In the military, microchips “perform such crucial tasks as aiming guns and navigating flights” (22 October 1984, 60) reported Time, and “computers have taken charge of the logistics of the Olympic games” (9 July 1984, 52). The machines also got sick. “Computer virus” is an industry term, but once again Time went well beyond the metaphor. According to Time, a computer virus is “a self-replicating organism” (26 September 1988, 54) that is “contagious” and may cause an “epidemic.” Help was near. A “vaccine program” may “protect an uninfected disk,” unless the machines “suffer a relapse” (26 September 1988, 55). All this kind of talk could lead one to ask—paraphrasing a Native American quoted by Wax and Wax (1962, 182)—“ain’t computers people?”

The second quality of the magical worldview is Power. Wax and Wax use the word (capitalized) to describe the dynamics of the magical world. Arising
out of the context of the relationships between humans and nature, Power is generated through rituals and, like electricity, may be accumulated and then employed or discharged. People with the modern worldview usually believe Power to be miraculous or supernatural, something involving the suspension of natural laws. According to Wax and Wax, this is not the case for those with the magical worldview:

Viewed by a person in the magical world, Power is awesome and wonderful but, at the same time, it is an intrinsic feature of the natural order, manifesting itself in much of what we (but not he) would consider "common" or "ordinary." Thus any activity of note or worth can only occur because of it. (1962, 182-83)

Magical power is neither mechanical nor permanent. People learned the rituals of Power from magical beings or ancestors. If they lose favor, or grow careless or arrogant, they may just as easily lose this power.

The quest for power is the great Faustian theme of modern civilization, and computers are very much a part of that quest. "Power" and "powerful" are among the words most commonly associated with them. Here again, media discourse went beyond industry jargon or advertising hype to an expression of Power as mana. Typical is a report of a 14-year-old boy saying: "I love these machines. I've got all this power at my fingertips. Without computers, I don't know what I'd be. With them, I'm somebody" (Time, 3 May 1982, 49). The computer is a talisman or focus through which all limits could be transcended. "In the hands of a professor who really believes," says a student at Drexel College, "it seems the computer can do miracles." (Time, 21 October 1985, 83). This Faustian quest to transcend limits may be trivial or world-shaking. An example of the former was Time's celebration of a new folk hero. A 15-year-old named Steve Juraszek achieved "what is very close to being impossible" (18 January 1982, 49), a 16-hour "enchanted run" (18 January 1982, 52) on the video game Defender, which scored a world record 15,963,100 points. But quests for Power may be more serious. A story on computer hackers reports on "the unspoken assumption among crack computer programmers and engineers that they could straighten out the world by dint of their intelligence if they could only get their hands on the control box" (Time, 3 December 1984, 71).

When Time discussed "this transformation of the young" (3 January 1983, 16) into the Agents of History, they did so for a specific reason. Young people know the ritual that puts them in touch with Power. It is called programming. Computers are mysterious things, full of "names that are as mystifying to an outsider as the secret password of an esoteric cult" (Time, 3 January 1983, 27). Time was quite willing to put its readers "in the know" by introducing
them to a little of the lore in the form of glossaries and even scraps of incantations:

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*Time, 16 April 1984, 74*

But with these tantalizing glimpses into the realm of Power came warnings that the rituals were only for the initiated. Those who would use magic must pay a price: “A programmer can frequently spend 18 hours a day at a terminal working on a difficult problem. That fanaticism allows very little time for ordinary human pursuits; programmers often wryly characterize themselves as ‘computer nerds’” *(Time, 16 April 1984, 73).* Adept—we call them hackers—were a people set apart. We should note that this kind of language parallels the use of explicit magic language, and after April 1984 it became uncommon in the newsmagazines’ coverage of computers.

Power was perhaps most manifest in *Time* on the business pages. Business successes or failures were portrayed as personal, inexplicable, and dependent upon Power. Entrepreneurs were regularly pictured as archetypal heroes. Exploding profits were invariably cited as confirmation of their magic; failure was a sure sign that Power had deserted them. Thus in the heady days of the early 1980s, a period of rapid growth in the computer industry, *Time* said of IBM, “the firm has always had a special mystique” *(24 August 1981, 44).* As IBM introduced its first personal computer, a *Time* source claimed “some people were convinced that IBM would be unveiling a new Holy Grail” *(24 August 1981, 44).* But when an industry shake-out occurred in the mid 1980s, the Power seemed to be gone. “The IBM label has lost some of its magic,” one analyst was reported as saying *(Time, 21 July 1986, 45).* Profitability returned to the industry in 1987, but magic language did not return to *Time*’s business pages.

Underlying Power in the magical worldview is a unique form of logic. According to Wax and Wax, the world of magic differs from our own in the very basis of understanding and explanation. Our world of genetics and quantum mechanics rests upon chance. We accept the logic of contingency. The magical world does not. Everything is controlled and explained through the causal dynamics of Power.

The magical world has a rigorous causal scheme of a pragmatic and retroactive character: Success demonstrates the presence of Power, failure its absence.
Life is not an accidental succession of chance occurrences, but exhibits the presence of varying kinds and extents of Power as affected by relationships among beings. (Wax and Wax 1962, 184)

In the magical world, illness, for instance, is not the result of a chance meeting with a microbe but the result of a malignant will. Perhaps the protective rituals were done improperly. Perhaps the victim was bewitched, or an evil spirit has proven more powerful. Recovery means determining the actual (magical) cause and performing the correct propitiatory or cleansing ritual. “Within the magical world,” say Wax and Wax, “ritual is the focal point of existence” (1962, 184). The aim may be to manipulate the world or it may be protective in nature, as O’Keefe also emphasizes (1982, 262ff.). But whatever form it may take, the aim of ritual is to put the person in contact with Power.

In most of its reporting, Time assumed the normal contingencies of modern life. But in those stories that discuss the ebb and flow of Power, a different logic comes into play. Events assume a great sense of inevitability and Power does not operate without cause:

Whatever its variations, there is an inevitability about the computerization of America. Commercial efficiency requires it, Big Government requires it, modern life requires it, and so it is coming to pass. But the essential element in this sense of inevitability is the way in which the young take to computers: not as just another obligation imposed by adult society but as a game, a pleasure, a tool, a system that fits naturally into their lives. Unlike anyone over 40, these children have grown up with TV screens; the computer is a screen that responds to them, hooked to a machine that can respond the way they want it to. That is power. (Time, 3 January 1983, 15)

With such a strong sense of inevitability, it is perhaps not surprising that discussion of future prospects was not scientific prediction or forecasting to be tested but prognostication based upon faith. When the prophecy failed, the logic of inevitability was applied retroactively. Thus when the companies that were touted as “up and coming” success stories in 1981 to 1983 failed in 1984 to 1985, Time took the loss of Power in stride by talking of the lessons of history and “the inevitable changes that come with rapid growth” (30 September 1985, 65). The logic of magic is unfalsifiable.

The fourth feature Wax and Wax see as characteristic of the magical worldview is the special place of the person. The magical world has no place for individualism. Myths and legends are populated by heroes, but they lack both individuality and character development as measured by modern standards. The heroes of magic are defined by the presence or acquisition of Power. “Many of the tales are success stories,” say Wax and Wax, “beginning with a young person whom folk consider a ne’er-do-well and ending with his demonstration of Power” (1962, 185). Character or morality are irrelevant,
only the presence or absence of Power matters. The actual magical world is thus populated by the likes of Coyote the Trickster or the Monkey King rather than Frodo the Hobbit.

In the pages of the newsmagazines, the people who make and use computers did not quite fit the profile. We were still presented with types—Time gave us mythologized heroes and villains—but the pattern of the myth was more modern than what Wax and Wax describe for the magical worldview. Still the magical language around these people was stronger and persisted longer than in other stories in the magazine.

The people whose portrayal in Time came closest to matching the magical profile were the young “whiz kids” and hackers. As we have already seen, Time gave young computer users a very special place. They became the Sorcerer’s Apprentice. In only a few cases did Time develop the personality or biography of the subject of the story, that is, make the person an “individual.” In all cases what makes Time’s subjects newsworthy—what made them a type—is the possession of Power. Computer virtuosos were invariably portrayed as young. Schoolchildren were shown as having a natural affinity for computing not shared by adults. As possessors of Power, they inverted traditional roles, “tasting the heady pleasure of teaching their own teachers” and “instructing their parents as well” (Time, 3 May 1982, 53). Hackers were a breed apart. By their dress and demeanor they were depicted as perpetual adolescents, no matter what their age (Time, 3 December 1984, 71-72). As a type, the Sorcerer’s Apprentice was a figure of both promise and menace—precisely the amorality discussed by Wax and Wax. They may use their Power for good, like Will Harvey, age 16, who “sat down with his Apple and an introductory music text and came up with a program that is making even professional musicians stand up and shout ‘Bravo’” (Time, 17 October 1983, 49). Or even more frequently, their Power may be devoted to pranks, crime, or the creation of viruses. What made them significant was the Power itself.

The other group to whom Time accorded mythic status was the entrepreneurs. There was a clear difference here between those who make computers and software. Scientists and engineers were routinely referred to as “magicians” and “wizards” right through the decade, but otherwise relatively little attention was paid to them. It was businessmen (and all of them were men) that Time celebrated. Some of them were inventors, programmers, or engineers as well, but it was their prowess in the marketplace that elevated them. While Time tried very hard to find some element of Horatio Alger in nearly every executive (3 January 1983, 20-21), the person who most fully achieved heroic status was Steven Jobs.

The successes and failures of Jobs created a saga extending over ten years. Early stories emphasized Job’s youth, “humble” origins (a college dropout
and "self-made engineer"), unusual lifestyle ("a confirmed fructarian"), and amazing financial success (Time, 5 November 1979, 65). By 1983, Time had grown rapturous over his "fairy-tale success" (3 January 1983, 17). While recognizing that Steve Wozniak was "the true technological wizard" (3 January 1983, 17) behind the Apple computer, Time portrayed Jobs as a religious visionary. Possessing a "smooth sales pitch and a blind faith that would have been the envy of the early Christian martyrs" (3 January 1983, 17), he "is positively hypnotic when he takes the computer gospel to the young" (3 January 1983, 19). Steven Jobs had Power. His success (as measured by his financial wealth and the price of Apple stock) were proof of it, overriding personality quirks. But the magic was not to last. Jobs lost the Power, his position, and the admiration of Time. Those personality traits that were colorful when he was successful now loomed large as the reasons for his failure. Time dismissed him with the words of a venture capitalist: "It's good news for Apple that he's out of their hair" (30 September 1985, 65). Bereft of Power, Jobs dropped from the magazine's pages for a while. When he resurfaced, his new company NeXT was seen as an attempt "to redeem himself." Jobs regained his Power. Time reported one industry editor as saying "I arrived a non-believer, and I came away a convert" (24 October 1988, 76). His new machine was "a computer with soul" (24 October 1988, 77). Jobs had returned, almost like a messiah.

The entrepreneurs as a group, and Steven Jobs in particular, were endowed with more of an individual personality by Time than Wax and Wax claim to be characteristic of the magical world. However, a sense of magic is there, and it would not be inconsistent with Weber's understanding of charisma. And in some respects, especially in belief that what really counts is Power, the people in Time do fit the profile. "If a person has obtained Power," claim Wax and Wax, "what he did was correct, and if he lacks Power, what he has been doing is incorrect" (1962, 185). This statement certainly applies to Time's coverage of the entrepreneurs.

Thus each of the features of the magical worldview described by Wax and Wax can be illustrated by examples drawn, not from ancient sagas or anthropologist's fieldnotes, but from the pages of North America's largest circulation newsmagazine. Although roughly parallel to the patterns uncovered for the use of explicitly magical and religious language, the implicit use of magical themes is far more extensive and integral to Time's discourse on computers and related technologies. Together the language and themes make up a part of computing's technological frame and play a role in creating and stabilizing the meaning of the new technology. The remaining question is why?
Machines as Metaphors

Why did *Time* use magical language to talk about computers and related technologies? The answer is complex. There are many interrelated levels of meaning in *Time*'s discourse.

At the most superficial level, magical language provides a lively and appealing way to talk about technological change to a mass audience. *Time*, after all, has a long reputation for vivid writing. It sells magazines. By building readership among the middle- and high-income males who were particularly interested in the new technology, *Time* was better able to sell space to its advertisers. But this superficial reading does not explain the patterns we uncovered or why the use of magical language increased and declined.

If, as Lakoff and Johnson write, "the essence of metaphor is understanding and experiencing one kind of a thing in terms of another" (1980, 5), by using magic as a metaphor for technology and the people around it, *Time* was constructing reality in a particular way. *Time* was telling us that technology was like magic. In what ways were they similar?

Technological change may create uncertainty. Few know how the new machines function. Their effects are unknown, especially when they change the everyday routines of work (or threaten to replace workers altogether). Conventional machines with which people are familiar and comfortable are not discussed in magical terms (indeed, they are not newsworthy at all). Computers may have been magical; toasters were not. Compounding the uncertainty inherent in any technological change was the perception that computers were machines that could think—the very quality that has often been used to define humanity. *Time* said as much. In an essay entitled "The Mind in the Machine," *Time* observed that, "When machines possess artificial intelligence, like computers, the human fear of being overtaken seems both more urgent and more complex" (3 May 1982, 60). To *Time*, the mind was itself "an enchanted thing" (3 May 1982, 61), so a machine seen to be built in the image of the mind was doubly so. Computers were powerful, but also mysterious. Their power was ours to use but not to understand. In a real sense Arthur C. Clarke's famous "Third Law" is true: "Any sufficiently advanced technology is indistinguishable from magic" (1973, 21). When technology is a "black box," it becomes magical.

As a magical black box, computers were portrayed as a source of hope amid fear. As the division of labor, and with it the information explosion, continue to intensify, there is more and more knowledge which we not only cannot master but for which we must trust some "expert" (Adorno 1974, 78). Extreme specialization means that we lack control over many aspects of our
lives. Computers and related communications technologies intensify this situation while promising individuals a means of coping with it. *Time*’s reporting reflected this. Vague anxieties were given focus through the magical language surrounding the new technologies. For example, *Time* reported: “Many Americans concerned about the erosion of the schools put faith in the computer as a possible savior of their children’s education, at school and at home” (3 January 1983, 15). At one level, this passage is yet another proclamation of a “technological fix.” But in using language like “faith” and “savior,” *Time* was invoking the numinous. Why? As Rubem Alves reminds us, “Magic is a flower that grows only in impotence” (1972, 81). When people feel powerless, they turn to magic. “The function of magic is to realize man’s optimism,” wrote Malinowski, “to enhance his faith in the victory of hope over fear. Magic expresses the greater value for man of confidence over doubt, of steadfastness over vacillation, of optimism over pessimism” ([1925] 1948, 90). Magic is a declaration of hope in the face of fear and powerlessness. *Time* seems to be telling its readers to have faith, no matter what anxieties you may feel, be confident in the future. The invocation of the numinous elevates this above a mundane prediction of a quick fix to an article of belief. In *Time*’s usage, both hope and fear are translated in a way that reinforces the status quo.

This can be seen particularly clearly in the way in which *Time* discussed young people and computing. As we have already seen, *Time* reported that young people had a natural affinity for computers; indeed, it presented them as a type—the Sorcerer’s Apprentice. In the most literal meaning of this metaphor, young people were real apprentices. They were understudies for the true magi, the entrepreneurs. Implicit in the discussion of a young person’s achievement was the possibility of commercial success. Students who were able to market their programs were given prominence (e.g., 2 March 1981, 43; 5 October 1981, 83; 3 May 1982, 59). The youth of Steven Jobs and Bill Gates of Microsoft were held out as an example. Implied in these stories was the message that your child could do it too. The new technology placed success within reach.

At another level, young computer users were threatening. Like the Sorcerer’s Apprentice, the menace of the teenage hacker was Power out of control. Like youthful street gangs, hackers represented the potential for random and meaningless destruction. (That most computer crime was committed by disgruntled employees rather than by irresponsible teenagers was not a fact that *Time* liked to report.) The message here was the need for control and discipline. Finally, young computer users represented the hope of the next generation. It has been a central American myth since the Depression and World War II that children will do better than their parents, making their
parents' sacrifices worthwhile. *Time* was tacitly telling parents threatened with loss of self-image or employment that you may not be coping with technological change but don't worry, your children will do well. However uncertain things may appear now, the future was bright. In all of these accounts, *Time*’s reporting focused discourse through widely available typologies and previously constructed definitions. The effect was to stabilize meaning and thus diminish the tensions and anxieties brought about by technological change.

This stabilization of discourse was to the advantage of those who were best able to appropriate the new technologies. As we have seen, stabilization is itself a sign that one or more social groups have been successful in appropriating a new technology. *Time*’s contribution to this discourse was to promote definitions and understandings favorable to business. In creating the entrepreneur as a type and endowing entrepreneurs with Power, *Time* invested them with authority. This is why *Time* bestowed charisma upon Steven Jobs. If Weber's theories (1947, 360-62) of charismatic authority are correct, *Time* was tacitly saying that the corporate elite were leaders who ought to be obeyed. They had the Power to augur the mysteries of the market. Others who may have possessed magic were subtly marginalized. Scientists were routinely referred to as wizards, but they never really escaped from the black box. They were wondrous, inexplicable—and marginal. Children were entrepreneurs-in-waiting so long as they were “well behaved,” and portrayed as threats when they were not. Indeed, of the various possible threats created by computers, *Time* paid far more attention to the potential damage caused by hackers and their viruses (which could be damaging to business) than it did to technology-caused unemployment or the invasion of privacy (which were largely caused by business). Similarly, the claims of other relevant social groups were generally ignored. The extensive debate about women and computing that took place in the mid-1980s, for example, received no coverage from *Time* during the period under study. If *Time* adopted the perspective of business, wrote about technological issues important to business, and helped to stabilize the meaning of computers around definitions acceptable to business.

As the meaning of the new technologies stabilized in *Time* in the mid-1980s, the language that the magazine used to describe computers changed. The language of magic and religion, which had first signaled that something new and wondrous was happening and then played a role in defining the new technologies, began to decline. The metaphors of magic did not disappear from the pages of *Time*, but they became less pronounced and more an invocation of already established meaning. As business successfully appropriated computers, the technological frame began to close.
Notes

1. Dorothy Nelkin (1987) documents many of the trends and images in reporting on science and technology. In addition to magic, technology was described in images of the “frontier,” the “cutting edge of history,” and “breakthroughs” that will decisively reshape the future. Military metaphors were common, as technological mastery was portrayed as a “struggle” or “battle.” Both the benefits and risks of technology were often described in apocalyptic terms. See also Corn 1986.

2. See Weart (1988) for an outstanding analysis of this in the field of nuclear technology.

3. As a control, I checked Time’s coverage against selected cover stories and articles in Newsweek and Maclean’s (Canada’s major newsmagazine) for the period under study. A random sample of their reporting on computers and related technologies for the same period revealed only a few significant differences. Newsweek appeared to use less explicitly magical language but to be even more utopian. Maclean’s coverage was much weaker and more slanted towards business.

4. Implicit religion is defined as those symbols and rituals directed to the numinous that are located outside formal religious organizations (e.g., churches) and that are often unrecognized, unacknowledged, or hidden. Arnaldo Nesti adds:

   Implicit religion is a request for meaning that originates in the subject’s life-world, expressing itself by means of a complex system of symbols and practices. These in addition to a series of paths replete with meaning have the effect of reassuring the subjects themselves on the unconditional relevance of their existence here and now. (1990, 432)

See also Bailey 1983, 1990.

5. For the importance of this kind of institutionalization in the news-gathering net, see Tuchman 1978.

6. These periods are an artifact of the discourse itself and are not connected to changes in personnel. An analysis of identified writers and reporters reveals no pattern associated with any particular individual. People came and went over the ten-year span, but their comings and goings are not associated with any change in the style or content of the discourse. This applies to the use of magical and religious language as well. The same individuals would use magic language in some stories but not in others. We should note that until 1985 all the identified writers on computers (as opposed to reporters) were men.

7. The “signposts” of this period are the cover stories on 18 January 1982: “Gronk! Flash! Zap! Video Games Are Blitzing the World” and 16 April 1984: “Computer Software: The Magic Inside the Machine.” One reviewer noted that the beginning of this period follows closely upon the introduction of the notoriously “user unfriendly” IBM PC, whereas its conclusion roughly corresponds to the introduction of the much more “user friendly” Macintosh from Apple. Although it is fascinating to speculate that this is more than coincidence, I can find nothing in the texts themselves to justify that conclusion.

8. The break in 1984 is quite pronounced. From January to April 1984 magic language appeared in 55.56 percent of stories on computers; from May to December it is found in only 33.33 percent of such articles. As was mentioned above, this break is not associated with any change in personnel.

9. Even when Time reported—rather late in the decade—that most computer crime was not committed by teenagers, two of the four specific examples cited did involve young people (17 February 1986, 49). This report did not seem to affect subsequent coverage of the issue.
10. The other newsmagazines were even more ebullient. *Maclean’s* headlined “Second Coming For Steven Jobs” (25 January 1988, 24); *Newsweek* devoted a cover to his new machine (24 October 1988).

11. By my own count, there were about 160 books and articles on women and computing published in English during the period under study. *Time* made no mention of any of them.

Acknowledgments

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References


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