
Opinion Paper:**Why videotex is (still)
a failure****Opinion:****Pourquoi le videotex est
(encore) un échec**

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1. Introduction

The following article by Margaret Munro appeared in the August 16, 1978 issue of the Ottawa *Citizen*:

Computer-TV net unveiled

Television sets are about to make amends for warping many a Canadian mind. By the early 1980s electronic mail delivery, news coverage, and a myriad of entertaining pastimes will be available on the new communications network unveiled by the department of communications (DOC) Tuesday.

The network, known as videotex, will link television to sophisticated computers and massive data banks for a mere \$200 or \$300, says Doug Parkhill, assistant deputy minister for communications research. Anyone willing to fork out the money for a television converter and typewriter keyboard will have access to the network and its electronic libraries containing everything from want ads to lectures in high energy physics.

Hundreds of mailmen, paperboys, and information service people will be put out of work by the service. But a viable industry, employing about 32,000 people, is expected to evolve with the network, he said. Five million Canadians are expected to subscribe to the service in the early 1980s, producing \$1.25 billion in revenues. Similar systems evolving in Europe and a British pilot project have homeowners doing their banking, shopping, and letter writing on the service.

Bill Sawchuk, videotex project leader, said the Canadian system has several advantages over the other networks. The [sic] videotex will be compatible

with new technology and home computers as they evolve, he said. The European systems are based on a rigid central computer system. Most important, the Canadian system can produce detailed maps, charts, and drawings such as cartoons. The system has the built-in potential to relay photographs and movies which might be stored in the digital electronics network.

A small team of DOC researchers have been working on the system for 10 years, and worked on a shoe-string budget of \$1 million over the last two years. They have had the distinct advantage of learning from the Europeans' mistakes and having the [sic] Canada's world famous telecommunication and satellite systems to base the network on, Parkhill said.

The videotex modules developed in the department are very basic, consisting only of the equipment needed to gain access to the computer channel available. Mark Norton, president of Norpak Ltd., an electronics firm in Pakenham, said much more sophisticated modules with built-in computing power "will undoubtedly evolve once the industry gets established." His company has been awarded a \$245,000 contract to develop interactive equipment to be used on the network. He says the \$15,000 cost of the prototypes will drop to a few hundred dollars when the project is refined and the demand grows.

Meanwhile, officials fear the Canadian electronics industry will not be able to exploit the technology fast enough and foreign suppliers will run off with the market. Joe Halina, director-general of research policy and planning, says only one-third of the \$3 billion worth of electronics equipment purchased in Canada in 1977 was produced in this country. "Equipment will have to be pouring out of Canadian factories by 1980 to meet demands of the five million consumers who will be using the system regularly," said Halina. "It's up to private enterprise to do what it can as fast as it can. Not in building more branch plant warehouses, but in getting on with the adventure – probably building our destiny."

The North American videotex experience has been quite different from the hopeful future described in this and many other articles of the late 1970s. Far from displacing thousands of workers and producing billions in revenue, videotex has failed even to survive except in special circumstances. How is it that a system designed expressly for low-cost, mass-market use has been ignored? This failure is especially intriguing when contrasted with the success of the home computer, a comparatively costly device initially designed by and for hobbyists and technicians.

I want to propose an explanation for the failure of videotex to meet the expectations of its proponents. A major theme of this article is that the analysis of electronic phenomena such as videotex often incorporates simplistic economic assumptions which result in plausible-sounding but vacuous explanations of the

demand for such phenomena. A secondary observation is that inaccurate analysis is abetted by definitions of electronic phenomena which simply enumerate components. Instead, I will define videotex according to the motives and methods of its developers, thereby pointing directly to the reasons for its failure.

2. Some non-explanations of the failure of videotex

I refer to some of the arguments that have been adduced for the failure of videotex as “non-explanations,” because they seem to me superfluous or unenlightening. I do not claim that these factors have no role in the videotex problem, or that they are unimportant in every circumstance. However, it is difficult to accept that any of them (or even all of them together) constitute sufficient reason for the failure of videotex. Though they may be contributors to this failure, they are not explanatory of it.

For example, consider the argument I label “cost-of-decoders,” which can be roughly stated as “sales of videotex services will increase when the cost of videotex decoders is reduced” (Lapointe 1984). The underlying axiom is that the sales of decoders (and hence the demand for videotex) is inversely related to cost. If costs decrease due to economies of scale and increased miniaturization, then sales should increase. An older version of this argument was that system design should be adjusted to permit a low decoder cost and hence ensure a large demand from the start. The PRESTEL system revolved around a simple encoding scheme, not because the British were incapable of designing a more complex one, but in order to facilitate inexpensive decoders.

Though this rather simplistic economic argument seems reasonable, I do not think it explains the failure of videotex. Disregard for a moment that the “cost of decoders” is not a single value, that the argument does not indicate how one evaluates the complex trade-off between functionality and cost, that the systems are not terribly popular even when the decoders are “free” (as is the case in public access videotex systems), and that the cost of hardware decoders is generally increasing rather than decreasing,¹ as they incorporate additional functionality. The main problem with this argument is that it assumes decreases in cost will always release a proportional amount of a (presumably) infinite demand. Though demand can drive cost down, lower cost does not necessarily produce increased demand. It was the explosive sales in expensive videocassette recorders and expensive prerecorded tapes that made it possible to offer budget recorders and programs, not the existence of the budget recorders that produced the sales.

Miniaturization and mass production can make low cost possible. However, lowest comparative cost need not be the deciding factor among a group of related products at similar price levels. The lost cost of CED videodiscs and players relative to prerecorded videotapes and VCRs did not result in a larger market for the videodisc. Similarly, public transit systems must actively and continuously

extol the virtues of public transit in order to maintain ridership, despite cost advantages. The cost-of-decoders argument is unsatisfactory because it fails to explain the source of the assumed demand.

A second non-explanation for the failure of videotex is *lack of desirable services* (Lane 1985). According to this argument, people are not interested in buying a videotex service to learn about the weather or the sports results; they require an important application, preferably one that cannot be easily obtained without the service. The isolated and minimally successful videotex applications seem to buttress this argument, since they typically offer some useful service to a specific group such as farmers or stock brokers. Commonly suggested applications for the general public are telebanking, teleshopping, and home travel agent services.

This second argument is based on the same simplistic economic axiom: demand for videotex is inversely related to its cost. This argument differs only in suggesting an adjustment to the product utility – in effect shifting the purchaser's indifference curve for videotex. There are again several minor problems with the argument, such as the dubious extra utility of teleshopping over the traditional catalogue-and-phone method, or the probability that there are already too many related services competing for the customer's attention (as is likely the case with the sluggish pay television market) or the possibility of misjudging the consumer's probable use of the product.² The main problem with the argument for better services is its assumption that demand is significantly moderated by fiscal or rational value returned by the product. The fiscal advantages of catalogue-and-phone-shopping have not affected the popularity of personal shopping, despite its inconveniences and costs. The home computer is quite popular despite the fact that there are (yet) few fiscal advantages in owning one.

Electronic consumer goods are purchased for their psychological or emotional benefits as much as for their fiscal or economic benefits. The service provided by the personal computer is often purely psychological. Its existence in your home reassures you that your children will not be eclipsed by those next door, and that you can keep up with younger co-workers. Even the most modest successes in getting a machine to do the things you want convey a distinct sense of power, and subtly communicate the message that you can control modern technology. However, I feel none of these things when I use a videotex system, especially a public access system. By its very nature, it is simple to use and accessible to everyone, hence there is no more distinction conferred upon me when I use it than there is when I use an ordinary dial telephone. The argument for lack of services fails because its notion of "service" is too narrow.

A third non-explanation for the failure of videotex is the *difficulty of data access* (Raymond 1984). This argument proposes that people are unable or unwilling to use videotex systems because the index system is too tedious or

time-consuming. I am personally susceptible to this argument since I think that complaints about hierarchical menu systems are symptomatic of important flaws in the design of information retrieval systems. Though such flaws are important to me and to other researchers in information retrieval, they are not explanatory of the failure of videotex.

As we have done for the other arguments, we can make a few troublesome observations about the data access argument. Hierarchical menus as used in videotex are no more tedious to use than the arcane operating systems supplied with the first generation of personal computers, nor are they more difficult to understand than the instructions for programming all but the latest crop of VCRs, nor do they hide information from the average user any more than the Yellow Pages – but all these products are more successful than videotex. The argument is again a variant of the simple cost-benefit axiom, and differs only in emphasizing the human cost of using the service rather than the monetary cost of the device. Since lowering costs does not necessarily result in increased demand, an improved query method does not necessarily imply increased usage.

3. What is videotex?

Any explanation of the failure of videotex implicitly presupposes its adequate characterization. Videotex belongs to the class of activities that involve computer-based information processing, but what distinguishes it from others in that class? Videotex is commonly defined by enumeration of a set of features or components common to videotex systems, or by identifying the types of information processing that occur. Hence definitions often include phrases such as “uses the home television set,” “communication by telephone,” “information organized in pages,” “simple interface,” “public access,” “graphics encoding,” “low cost.” For example:

The Telidon Videotex system is a method by which information and transactional services can be accessed from information sources by the general public. By the use of a domestic home television receiver typically augmented by a micro-computer controlled interface device, a user can access pages of graphical and textual information over public common carrier communications facilities including the telephone network, a cable television line, or encoded into unused space in a broadcast television signal (O'Brien 1982).

Such featural definitions are poor at distinguishing closely related systems, and are quickly rendered obsolete by rapid technological change. For example, if only textual information (i.e., ASCII) is transmitted and the display device is a computer terminal, is the result videotex? If a NAPLPS decoder is used for presentation of page-oriented information but the system is standalone, is the result videotex? If word processors are augmented with graphics decoders and connected by modems, do they then constitute a videotex system? And how is

videotex to be distinguished from the SCOREBOARD Information Network and other computer-controlled public billboards, whose main function is to advertise but which also provide “information” (e.g., date, time, weather, sports results)?

I suggest that the characteristics which identify videotex have little to do with the format of the information or the technology employed in its delivery. Instead, more fundamental characteristics are due to the motives and directions of the system’s promoters. This kind of definition is not new.

The epitome of the bureaucratic world was to be found at a very large company called International Business Machines – IBM. The reason its computers were batch-processed hulking giants was only partially because of vacuum tube technology. The real reason was that IBM was a clumsy, hulking company that did not understand the hacking impulse. If IBM had its way ... the world would be batch-processed, laid out on those annoying little punch cards, and only the most privileged of priests would be permitted to actually interact with the computer (Levy 1985, 41).

On the other hand, the companies which built personal computers in the late ’70s and early ’80s were quite different.

Currie later remembered Ed, in the most excited cadences he could muster, speaking of building a computer for the masses. Something that would eliminate the Computer Priesthood once and for all. He would use this new micro-processor technology to offer a computer to the world, and it would be so cheap that no one could afford not to buy it (Levy 1985, 188).

The irony was that Marsh and the other hacker-run operations were not setting up to be huge businesses. They were looking for a way to finance their avocation of playing with electronics, of exploring this new realm of little bitty computers (Levy 1985, 208).

Table 1 compares the motives and directions of videotex promoters to those prevalent in the personal computer industry during the ’70s.

The personal computer industry began as a rather motley collection of hobbyist startup companies. Entrepreneurs were less motivated by sage market analysis or fond hopes of impressive profits than by a fascination for computers. Many expected only small or moderate sales, so they immediately started producing machines, software, and accessories of all kinds on the smallest possible budgets. Though they were at a disadvantage in terms of cash flow, they had no need to support existing business structures or customers. Not until IBM entered the personal computer market was there an institution in that industry as large and as well-established as those that dominated videotex.³

Products developed by the personal computer industry reflected the motives and goals of its companies, which were quite different from those of the tradi-

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Table 1. Comparison of videotex and the PC industry

Videotex	PC Industry
large institutions	small institutions
client-server model	individual user model
needs large user community	intended for hobbyists
use existing technology	develop new technology
set standards, then obtain volume	volume determines standards

tional firm. The personal computer companies favored technology over management and marketing, were heavily individualized, not vertically integrated, lacking in service and support personnel. The products they designed were also individualized, appealed to the technically minded, and required the customers to find their own uses for the products. Marketing and service were handled by simple methods – mail order, telephone, word-of-mouth, and the computer hobbyist magazines that were starting to flourish.

You buy the Altair, then you have to build it, then you have to build other things to plug into it to make it work. You are a weird-type person. Because only weird-type people sit in kitchens and basements and places all hours of the night, soldering things to boards to make machines go flickety-flock (Levy 1985, 191).

The customers of the early personal computer companies were a select group, comprising hobbyists, technicians, and hackers who understood and valued the technological features of the products. This user community handled most of its own education, debugging, and repair, hence the companies were able to operate without a large service organization. The individualized nature of the market implied that companies could indulge in rapid technological change with little problem. Completely new and incompatible systems were frequently introduced, as companies were confident that there would always be a customer for a faster, smaller, cheaper, or better product. The large number of players in the market and the diversity of products they offered meant that no one player could maintain hardware or software standards by brute force; instead, the standards were determined by market forces.

The videotex experience was quite different. From the beginning, videotex was created, promoted, and dominated by governments, publishing and communications companies, and other large institutions whose main goal in pursuing videotex was to integrate their current operations with the well-publicised advent of high tech.⁴ These large institutions approached technology in a manner that reflected their internal structure and goals – that is, in a centralized manner. Videotex was from the start oriented to a *client-server* model; one large server

(the institution) would accumulate data that would then be offered piecemeal to its clients (the customers). The one-way nature of this model reaches its most extreme form in *teletex* systems, where interaction is an illusion: the server cyclically broadcasts a fixed set of information pages, and clients can choose only from this fixed set.

Large institutions tend to prefer large markets and large sales, hence videotex systems were oriented to serving large communities. A large group of users would be the best way to ensure the acceptance and participation of important sub-institutions such as the marketing and service departments. The larger the market, the better the amortization of costs for both client and server; conversely, the smaller the market, the less useful and profitable would be the service to both client and server. Hence videotex would not be cost-effective unless it reached a critical threshold size. The “chicken-and-egg” problem is the question of who provides the investment to reach the threshold.

The need to attract a large market in a very short time and the desire to keep costs low led to strategies that maximally employed existing services and hardware. This meant that the systems were determined both by the lowest common denominator in existing equipment and by fuzzy predictions for technological developments in the near term. The most effective amortization would result if the system was completely homogeneous, both geographically and temporally. As a result, videotex promoters attempted to design systems which were consistent over national and international boundaries, and to be both upward and downward compatible with future systems. These concerns led to a protracted squabble over encoding systems and the various tradeoffs which they represented, in a futile attempt to arrive at a single, permanent standard.

The short analysis I have provided is highly simplified and has avoided or completely missed many subtleties, but I hope the distinction between the videotex and personal computer industries has become clearer. It should be obvious that coding standards and television sets are symptomatic rather than definitive of videotex. The identifying characteristics of videotex are not these symptoms but instead those organizations which saw in videotex a potential for success, and the methods by which they pursued that success. In the information industry, videotex is a manifestation of the institutional need to centralize resources.

4. An explanation for the failure of videotex

I have discussed some non-explanations for the failure of videotex, and have briefly investigated the motives and methods of its proponents. The root cause of the failure of videotex is in part due to a misperception of the source of demand, as suggested by the non-explanations given earlier. More importantly, the methods and goals of videotex promoters (and hence the defining characteristics of videotex) are fundamentally hostile to the source of demand that was tapped by the home computer industry.

The development of mass market phenomena often exhibits a bandwagon effect (Brown, 1981) consisting of an *aficionado* phase and a *trend* phase. The aficionado phase revolves around a group of people who share a common interest, activity or behaviour, which is facilitated by the use of a good or family of goods, e.g., cameras, stereos, or popular music. Aficionados are often individualistic, opinionated, and single-minded in devotion to their interest. The goods purchased by aficionados need not be the primary focus of their interests, but are at least indispensable in the pursuit of these interests. Why such groups of aficionados should arise, and what motivates their interests, is not within the scope of this article.

The aficionados of the computer industry are commonly referred to as “hackers.” The behaviour, goals, and history of the hackers has been well documented, both favorably and otherwise (Levy 1985; Weinberg 1971; Weizenbaum 1976). Like other aficionados, they revel in a common interest whose source they rarely bother analysing. Aficionados often congregate in groups, and in so doing develop notions of status. The common interests of the group implicitly define goals or activities which are generally approved by the aficionados, and which distinguish them from non-aficionados. Those who adhere most closely to the group’s goals and methods, and especially those who show uncommon creativity or endurance in doing so, are accorded special status within the group. Status is also conferred on specific goods or services which are deemed to incorporate or exemplify those characteristics which the group extols.

The *trend* phase of demand begins when the status originally derived from the goals and activities of the aficionados becomes a characteristic of the goods and services they prefer. Status can then be obtained by merely acquiring the goods. In the trend phase, large numbers of non-aficionados attempt to obtain status by acquiring those goods the aficionados deem appropriate (and less commonly by emulating the behaviour of the aficionados).

An aficionado-trend progression can be discerned in the demand for goods such as calculators, 35 mm cameras, videocassette recorders, personal stereos, home computers, and perhaps soon in satellite dishes and stereo television sets. Such products were originally desired only by cognoscenti, but the status conferred by ownership soon developed a broad market. As the market increased, prices dropped, but sales continued only so long as ownership of the product conferred significant status upon the owner. This status inevitably dropped as the good became common.

The aficionado-trend progression is quite reminiscent of the Veblenian urge to “keep up with the Joneses.” In Veblen’s theory of the leisure class (Veblen 1953), the desirability of goods is directly related to their ability to demonstrate the pecuniary prowess of the owner. Utilitarian or inexpensive goods are not sufficient evidence of pecuniary status, partly because of their utility. Goods which contain wasteful excesses or have dubious utility are prized above purely

utilitarian goods, since their ownership implies pecuniary strength above that needed for subsistence. The goods which appropriately demonstrate pecuniary strength are chosen by the wealthiest class of all, the leisure class. The less wealthy classes emulate the leisure class as fully as possible by acquiring leisure goods.

Veblen's account of the source of demand rests on the need for status and consequent emulation of the leisure class by ownership of sufficient leisure goods. Since status is not judged according to an objective scale, such a source of demand is nearly infinite. I suggest that groups of aficionados in effect define new leisure classes. The "leisure" of such classes is not the lack of participation in industrial activity (since often the most revered aficionados are those that have made a commercial success of the group's goals), but rather the singlemindedness with which they pursue the objectives deemed worthy by the group. Though the status attendant on this singlemindedness originally derived from the interests of the aficionados, the status eventually becomes a characteristic of the goods and hence purchaseable.

The failure of videotex is that its developers created a system which is antagonistic to this basic source of demand. At every turn videotex developers made choices which would discourage aficionados. The attempt to obtain the lowest possible cost simultaneously reduces the value of the videotex as a means of conspicuous consumption and reduces the base which might attract the technically curious. Rather than demonstrating conspicuous leisure, videotex services attempt to be "useful" or "cost-effective." Rather than enhancing their customers' prowess by providing at least the appearance of power and complexity, videotex is boringly simple. Rather than provide variation and attendant status, videotex is the same vanilla flavour everywhere. Rather than permit rapid change and development, videotex concentrates on "standardization." Rather than permit individualism and distributed control, videotex centralizes. In effect, videotex is an attempt to start a trend without aficionados.

The attention of potential aficionados was not captured by videotex, but instead by the home computer industry. The motivations and methods of the home computer industry appealed strongly to aficionados simply because the industry was in large part made up of aficionados. Since it encouraged aficionados, it laid a solid foundation for the trend phase of the home computer. Those institutions which undertook videotex as an "experiment" in merging their activity with high technology conducted a hopelessly biased investigation, since it ignored the salient characteristics of the demand for high technology goods, and hence one of the basic driving forces of the high technology industry.

In this analysis, videotex emerges as a kind of "public transit" of information systems – common, unglamorous, necessarily a monopoly, unable to pay its own costs or attract sufficient subscribers, even though it might provide them with significant fiscal advantages. North Americans own and drive cars rather

than take the bus because, as Veblen might say, a certain amount of wasteful expenditure is necessary to maintain one's social standing.⁵ Similarly, people will prefer to use their own computers rather than publicly available ones regardless of potential advantages in cost or services.

Can videotex ever succeed? My definition of videotex is of a system which is in fundamental contradiction to a basic source of demand. There are two alternatives: change videotex to harness this source of demand, or find another means to promote videotex. About the former I will say little other than that significant changes to make videotex more appealing to consumers will probably result in a system that looks very little like videotex, and a lot like a home computer. The latter solution can be observed in the attempts of promoters to employ videotex in office automation and in the French videotex experience (Gallagher 1985). Although it is too early to judge, the chances of a profitable service seem higher here than in most other cases. The French have completely removed the element of demand by providing free terminals instead of free telephone directories. Here videotex has replaced an existing service by fiat rather than by choice of free market. This type of "success" is outside the bounds of this article. Success in the French experience is the success of an enforced monopoly, which in fact may be the only success that videotex can ever hope to claim.

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Author's note

This paper was written near the end of a videotex project and, seemingly, at the end of videotex. My motive was a cathartic expression of disrespect not for videotex, but for superficial analysis of computer systems. At the time I did not anticipate videotex's phoenix-like reappearance in the ALEX trials now being conducted by Bell Canada, nor did I expect the opportunity to test my contention that videotex is (still) a failure.

Notes

- 1 I refer here particularly to the cost of decoders in North America. Presumably the increased cost also incorporates additional inflation, but in any case higher cost conflicts with the public's perception that every new electronic device ought to become cheaper in absolute as well as in real terms, as was the case with electronic calculators.
- 2 For example, a major use of home VCRs seems to be *time-shifting* (Videodisc 1984)

(i.e., restructuring network program schedules) not just playback of prerecorded tapes. The poor sales of the playback-only videodisc system are due to its inability to time-shift, its (initial) playback cost advantage notwithstanding.

- 3 Apple may be considered an early “big” player in the personal computer market, though it also had humble beginnings. The main point to be drawn here is that the personal computer market (and many of its associated companies) grew spectacularly *before* the entrance of large institutions. By contrast, videotex was entirely the creation of large institutions.
- 4 There were (and are) small companies in videotex, much like pilot fish, who diligently follow the sharks of the industry about in the hopes of feeding on the remnants of the shark’s prey, while attempting to avoid consumption themselves. These companies neither significantly influence the direction of videotex nor would they be likely to survive if the major players lost interest.
- 5 It is clear that there are often significant fiscal advantages to owning an automobile, e.g., many places are not well served by public transit, “time is money,” and so on. Yet even given these reasons, people typically choose vehicles with a significant element of conspicuous consumption.

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