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From Technology to Services: Videotex in Banking and Retailing

Abstract

Videotex, developed during the 1970s and operating in several European countries during the 1980s and 1990s, was one of the first open information and communication systems. It was based on a set of linked databases. Data was transmitted over the telephone network and displayed on a TV screen. Home and business users could utilize their private equipment and only had to buy a decoder, a modem, and a keyboard to gain access to the innovative services offered through the system. Despite considerable technical difficulty and the fact that Videotex has vanished today, we will not draw a simple story of failure. Videotex technology changed the firm's opportunities for action. Videotex triggered a range of novel services. In our case study, we will focus on banking and retailing in Switzerland. Banking firms aimed at externalizing services to their customers with this early interactive real-time service. Retailing firms used Videotex as an in-house information- and communication system. The two examples demonstrate the development of the Videotex system in the complex interplay with social, technical, economic, and material factors.

Introduction

In the last 150 years, the employment structure of the western economies shifted from the primary agricultural sector to the secondary industrial sector, and then over to the tertiary sector. Banking and retailing firms belong to this tertiary sector, which is also called the service sector. This transition in the employment structure and the resulting changes in western economies are usually interpreted as symptoms of the upcoming service economy. The growth of the tertiary sector seems to be linked to technological changes, particularly since the end of World War II. Especially, the increased importance of digital telecommunication technologies since the 1960s is often claimed to be a crucial factor for the emergence of the service economy.¹

Particularly, digital telecommunication technologies let the vision of an information society appear in a not too distant future. These technologies raised visions of equal accessibility and quick availability of information. The computer was a hidden tool behind the upcoming service economy that made this kind of societal organization possible. Technologies like Videotex were welcomed as "an enchanted, magical 'window' that opens up to all oceans, all nations."² Videotex opened up the opportunity for firm to launch new products. These products were not new industrial products but novel services.

At this point, it is worth to think about the meaning of services. There is hardly literature available that defines this term.³ In this paper, we understand services as goods that are not storable and cannot be transferred. Production and consumption of services coincide temporarily but not geographically. Services can refer to consumption or to production, e.g. input for industrial output. For the production of services consumer's participation is inevitable. The success of services is therefore tied to certain social preconditions. Accordingly, the question of the emergence of services and the question of sociotechnical change have to be posed together.

¹ Hipp, Christiane (2000). Innovationsprozesse im Dienstleistungssektor. Eine theoretisch und empirisch basierte Innovationstypologie. Heidelberg.

² SVIPA, Bulletin Nr. 7, March 1981. p. 84.

³ For Exceptions in the German speaking literature see: Rück, Hans R. G. (2000). Dienstleistungen in der ökonomischen Theorie. Wiesbaden; Stille, Frank, Brigitte Preissl, et al. (2003). Zur Dienstleistungslücke. Dienstleistungsmuster im internationalen Vergleich. Berlin; Licht, Georg and Norbert Janz (1997). Innovationen im Dienstleistungssektor. Empirischer Befund und wirtschaftspolitische Konsequenzen. Baden-Baden.

By connecting approaches of business history and history of technology, we study the process of the emergence of new services in an entrepreneurial environment. We are not interested in the innovation of new products, we want to analyze how new technologies, in our case study Videotex, change the options for firms and society. How do firms perceive the opportunities offered by Videotex? What kind of visions is linked to Videotex? We ask for the legitimization process in the development and implementation of Videotex, and we focus on the outcomes of these processes in terms of services. What kind of learning and adaptation processes can be observed? We investigate the technological, entrepreneurial, and social accessibilities for these processes.

The question for the emergence of services in an entrepreneurial environment helps to reveal the mechanisms of the technology's implicitness. The inquiry into the processes of mechanization discloses the implicitness of these processes and sheds light on the possibilities and limits of sociotechnical change.⁴ In order to scrutinize the mechanization process, mechanization itself has to be analyzed in its specific local context of development and usage. This makes case studies an appropriate approach for answering the above mentioned questions.

These research questions are studied by taking Videotex in banking and retailing in the 1980s as an example. The case of Videotex in Switzerland suits because the development of Swiss Videotex runs parallel to the progression of Videotex in other European countries.⁵ Our research founds on investigations in the business archives of the Swiss National Bank, the Swiss PTT and Migros, the biggest Swiss retailer.

We present and discuss our preliminary findings in three parts. In the first section, the Videotex technology and its development in Switzerland are central. Then, the focus is on our examples of Videotex in banking and retailing. In this section, we show how Videotex was used as a technology for novel kinds of services relating to external and internal information and communication systems. The third part summarizes our findings and draws some conclusions.

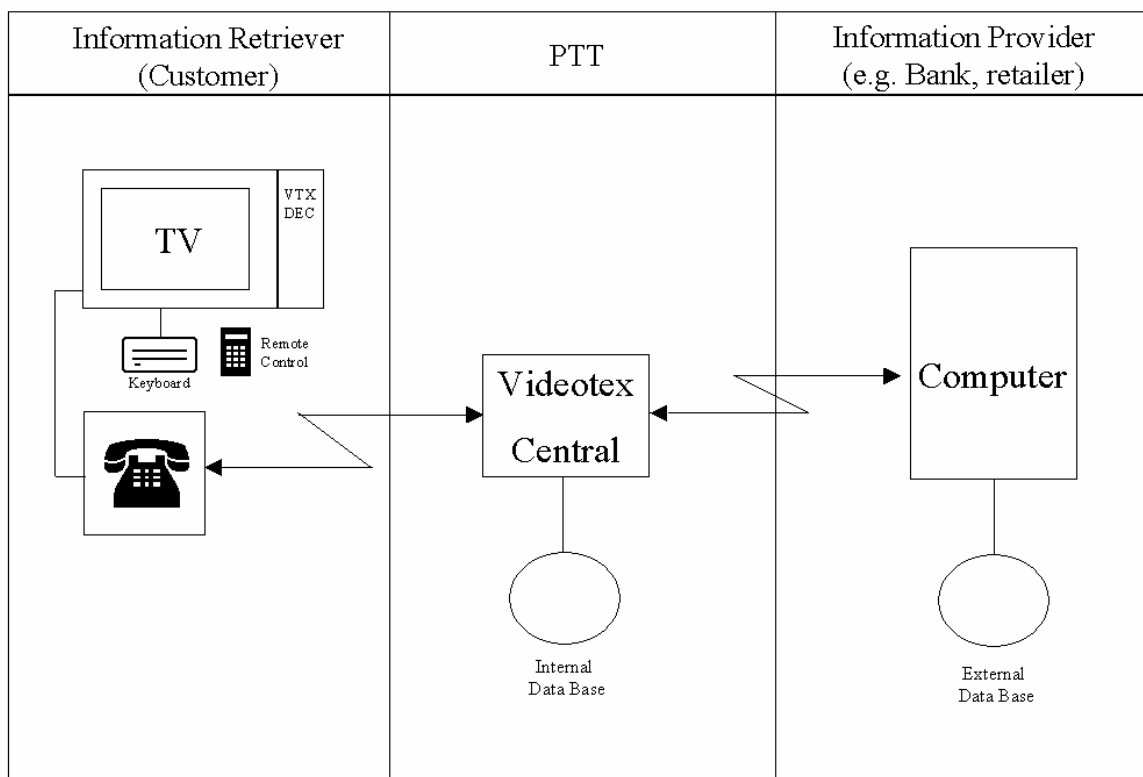
⁴ Gugerli, David (1999). "Soziotechnische Evidenzen. Der «pictorial turn» als Chance für die Geschichtswissenschaft." *Zeitschrift für Geschichte* 6(3). p. 131-159.

⁵ The case of the successful French Videotex system, Minitel, is an often studied, tough, special case that is not exemplarily for the development in Europe. See: Abadie, Michel (1988). *Minitel story les dessous d'un succès*. Lausanne.

Contribution

The Videotex system

The Videotex system was first presented under the name of 'Viewdata' in England in 1975.⁶ The system consisted of a new combination of existing, well-known, and distributed technical devices: Videotex based on the telephone network as a data transporter and used the TV set as a monitor with the aid of an adaptor. It was basically an interactive information-retrieval system. With Videotex people could retrieve news, send messages, conduct financial transactions over their bank account, and do their daily shopping. Videotex was claimed to be a universally usable technology. The decentralized structure of the system allowed the connection of unlimited external computers and information providers.



Source: own illustration.

⁶ Schmidt, Susanne K. and Raymund Werle (1998). Coordinating Technology: Studies in the International Standardization of Telecommunications. Cambridge, MA.

The driving force behind the diverse Videotex projects in Europe were the state-owned post, telephone and telegraph firms (PTT). These institutions sought to generate new services on their telephone networks in order to increase their profits. In other European countries as well, but particularly in France, these Videotex projects were initiated and financed by the state as part of national industry promotion programs. The development of the Videotex system was seen as a first step towards a telecommunication industry independent from the US.⁷

Being presented as a ubiquitous information service, Videotex surmounted the shortcomings of existing databases, which were too specialized, too expensive, and too complicated for the average consumer. Furthermore, the Videotex system was promised to become the backbone of mass information services. Thus, the significance of the various Videotex projects was closely related to the anticipation of an imminent societal transformation with the coming of the information society. The prognoses about its diffusion were ambitious. Soon however, the slow adaptation of the service in many countries frustrated these expectations.⁸

The Swiss Videotex system

At the end of the 1970s, the Swiss PTT noticed the activities in England, France and Germany concerning the development of the Videotex systems.⁹ The aim of the Swiss PTT was to keep up with these developments but it had no intention of taking the risky lead. The PTT observed the advantages and disadvantages of this new technology by studying the Videotex systems in the other European countries.

The PTT decided – as the technology seemed to be of some complexity – to proceed in three phases. The first phase was a pilot trial with only some carefully selected participants as information providers. The second phase was the official practical trial with a wider circle of information providers and private information retrievers. The final phase opened the official Videotex system to every information provider and information retriever.

⁷ Nora, Simon and Alain Minc (1979). *L'informatisation de la société. Rapport à M. le Président de la République*. Paris.

⁸ The French Videotex system is not exemplarily for the development of Videotex in Europe. See: Abadie, Michel (1988). *Minitel story les dessous d'un succès*. Lausanne.

⁹ Bonadelli, Heinz (1992). *Switzerland: A modest Success in tiny pragmatic Steps*. In: *Relaunching Videotex*. Harry Bouwman and Mads Christoffersen. Dordrecht. p. 69-77.

The PTT restrained its activities to the technical development of the system: The PTT was responsible for the technology, the private information providers for the content of the system.¹⁰

The PTT announced the start of the pilot trial of the Swiss Videotex system in 1979.¹¹ Some dozen firms provided information displayed on Videotex. In March 1984, the first Videotex central stations were operating. This marked the start of the second phase of the Swiss Videotex: the official trial.¹² In January 1987, at the start of the official system, Swiss Videotex had 4,660 users. Three years later, in 1990, 73,000 users had signed up for Videotex.¹³ This was rather a slow increase regarding to other European countries.

Legal changes made that the Swiss PTT sold their part of the Videotex system, the Videotex centrals and other hardware, to private investors in 1994.¹⁴ Under the name 'Swiss Online', these former information providers founded a private firm to operate the Videotex system.

The zenith of Swiss Videotex was reached in 1996 with 129,057 users.¹⁵ From that moment on, the decline of the Videotex systems in Europe seemed unavoidable. The upcoming of the faster, graphical more attractive internet revealed the weaknesses of the Videotex systems. It could only transport data at a limited speed and was weak at displaying pictures and diagrams.¹⁶ Users began to switch to internet service. In 2000, the Swiss Videotex system was shut down.

¹⁰Lutz, Hans-Peter. Die Rolle der PTT-Betreibe. In: Technische Mitteilungen der PTT. October 1984. p. 370-373.

¹¹ Padrutt, Jürg. Die Videotex-Pilotanlage. In: Technische Mitteilungen der PTT. December 1979. p. 453-464.

¹² Freiburghaus, Kurt. Der Videotex-Betriebsversuch. In: Technische Mitteilungen der PTT. July 1983. p. 229-233.

¹³ Bonadelli, Heinz (1992). Switzerland: A modest Success in tiny pragmatic Steps. In: Relaunching Videotex. Harry Bouwman and Mads Christoffersen. Dordrecht. p. 69-77.

¹⁴ Cop, Richard (1993). Im Netz gefangen. Telekommunikation in der Schweiz - Geschichte und Perspektiven einer Technik im Wandel. Zurich.

¹⁵ Wemans, Guido A. (2000). Das Ende des Anfangs. Videotex, ein Vorläufer des Internet, stellt den Betrieb ein. Neue Zürcher Zeitung. Zurich. p. 83.

¹⁶ Schneider, Volker (1997). Evolution im Cyberspace: Die Anpassung nationaler Bildschirmtext-Systeme an das Internet. In: Modell Internet? Entwicklungsperspektiven neuer Kommunikationsnetze. Raymund Werle and Christa Lang. Frankfurt a. M., New York. p. 133-156.

Everywhere in Europe, the expectations for Videotex ran very high. As in other European countries, the Swiss PTT expected Videotex to become a commercial success, which would stimulate a better utilization of their existing communication system. Videotex offered new possibilities with new effective information channels. On one hand, these new information channels opened communication between firms and their customers, as will be shown with the example of banking. On the other hand, the channels created communication possibilities inside firms, as the example of retailing demonstrates.

Videotex in Banking and Retailing

At the beginning of the 1970s, the Swiss banking and retailing firms faced, despite their different structures, similar problems. Costs were rising while labor productivity leveled. As the labor market was drained and competition was fierce, there was a strong incentive to invest in means for automation and rationalization.

This decade was not only for the firms full of changes, customer's habits also changed. The increasing individualization and flexibilization of social structures altered the customers' need. The opening hours of shops and counters met their needs no longer, but law prohibited the necessary adaptations.

Facing these challenging changes, the characteristics of Videotex – mainly interactivity and the universal usage – made this technology attractive for banking and retailing firms. The following two case studies show how firms in the banking and retailing branch adapted Videotex according to their needs. Banking firms used Videotex as a novel external service while retailing firms used it as a mean for internal information and communication.

Videotex and Banking

The Swiss banks had tried to rationalize and modernize their payment transactions since the 1970s. The enormous costs of transactions – estimated two billion Swiss francs – and structural changes in the payment transactions were mentioned as reasons for this effort.

Particularly telecommunication technologies received attention for future payment procedures. Already during the 1960s, conceptions of a 'paperless', 'checkless' or 'cashless'

society filled pages in the banking branch magazines.¹⁷ Among the often cited technologies were Automatic Teller Machines (ATM) and Electronic Funds Transfer at the Point of Sale (EFT/POS). The most promising technology, though, was Videotex because it allowed interactive communication as well as data retrieval from data banks.

All these new payment procedures were based on one condition: a private bank account for everybody. In the 1960s, most of the working population, however, was not getting wages and salaries paid through a banking account. Generally, their employers remunerated them in cash or in checks. Consequently, first of all, the large masses of the population had to be integrated into the system of commercial banking. Within two decades only, at the end of the 1970s, the large majority of wages and salaries passed through commercial banks. Hence, not only the technology but the imagined customer as well had to be produced.

Due to the implementation of private bank accounts, the customer's structure changed heavily. Banks were confronted with a mass business they did not know before. At first, this mass business was operated manually. But the physical transport of information on paper was too time-consuming and too costly. Banks tried to deal with these disadvantages by efforts for automation. The combination of electronic data processing and Videotex technology allowed the banks to integrate their customers into the payment's service. To name an example, customers had to collect data in order to conduct their financial transactions. In this way, banks automated their mass business as customers assumed functions formerly done by the bank. Thus, customers got integrated into the service. This novel service for the conduction of payments was called Telebanking. Hence, Videotex met the demands for self service, temporarily and locally unlimited access to the private account, electronic data processing, and information transport. In addition to their Telebanking service banks also offered on the Videotex system general information and advertising.

Telebanking was a commercially interesting service for banks because Videotex was regarded as a cheap technology. Infrastructure on the customer's side – telephone and TV set – was already available. On the bank's side, though, considerable investments were

¹⁷ Humes, Kathryn H. (1978). "The Checkless/Cashless Society? Don't Bank on it!" *The Futurist*(October 1978). p. 301-306.

necessary in order to make data centers accessible for the customers. However, the gains of rationalization were expected to outweigh these expenses.

The implementation of private bank accounts for everybody was the cornerstone for the bank's electronic payments. Therewith, banks were competing with the long existing payment service of the Swiss PTT. Since the beginning of the 20th century, the PTT was already handling the whole Swiss (cashless) payments with their postal check system.

In 1984, when banks realized the possibilities of the Telebanking service on Videotex, the PTT was far from offering its customers their own Telebanking. The conditions for such a service with the PTT were not fulfilled: the account management was not automated. The PTT detected the automation of account processing as the crucial condition for Videotex and its resulting Telebanking services. The firm saw itself confronted with the direct competition of banks in the field of cashless payment. All the same, the PTT was not able to set up an own Telebanking platform until the start of the official Videotex system in 1987.

Consequently, in 1987, the PTT had to admit that the banks controlled the market. The banking firms had grasped at an early stage the possibilities offered of Videotex technology and had made a profitable market with their Telebanking service. Despite this backwardness, the PTT tried to compete with the bank's electronic payments system by creating a Telepostcheque account in the late 1980s.

With respect to the banking firms' success in Telebanking, the PTT was increasingly unsettled. The technology initiated by them shook "the former stable building of costs, competition and demand."¹⁸ The question what had to be provided by the state-owned PTT and what was open to competition of private firms got more and more urgent. From this perspective, the reciprocity between the developments of open telecommunication systems like Videotex and increasingly liberalized markets is obvious.

Retailing and Videotex

In the course of the economic upturn in the post war years and the development of a society of mass consumption, the range of products on the supermarket's shelves increased perpetually. Quantity and specification of products diversified enormously. Self-

¹⁸ PTT Archive, Report of the Board of Directors to the Head Office of the PTT, 14 August 1987, p. 4.

service led to a first rationalisation of distribution. No more than the 1960s, self-service was an established sales method in Europe. Based on its capabilities of rationalisation, Migros, the biggest retailer in Switzerland, was one of the pioneers in promoting self-service in Europe.

The establishment of supermarkets with self-service did not mark “the last step in a row of fundamental measures of rationalizing the retailing branch”¹⁹, as is often argued by scholars. Although self-service was widely spread by the 1960s, the retailer’s administration remained to the larger part unrationalised. The common methods of administration and stocktaking were not appropriate for the flood of products. Quick and accurate information concerning stock and sales grew increasingly important. Merchandise management, marketing, and advertising had to be coordinated more precisely. As costs had to be reduced in order to raise the retailer’s profit, economies of scales were crucial, and the need for automation was felt.

Trying to keep up its image of an innovative firm, Migros was actively engaged into several trials with Videotex. The firm involved itself already in the pilot trial in order to secure presence and knowledge concerning this new technology. Videotex technology – Migros was certain of that – would impose serious changes on the environments in which Migros was doing its business. Migros based its positive perception on the capability of Videotex as an external advertisement system for the firm’s customers and as an efficient internal communication and information system.

Despite this positive perception of Videotex, there was uncertainty relating to the manpower requirements for the operation of Videotex. Experiences concerning the personnel expenditures for such a system were still lacking at that time. Skilled labor for that kind of work was not available on the labor market. This is evidence of the shifts in qualification requirements due to a novel technology.

There was also difficulty in investment planning because the costs for the Videotex system were for a long time incalculable; the PTT did not hurry to fix the fees for Videotex. These uncertainties did not weaken the Migros’ optimism concerning the performance of Videotex. Migros saw Videotex as a “varied medium, which is apt to influence accounting

¹⁹ Brändli, Sibylle (2000). Der Supermarkt im Kopf. Konsumkultur und Wohlstand in der Schweiz nach 1945. Wien. p. 44.

and ordering systems, and therefore in the longer run will cause changes on the existing structures in retailing.”²⁰

Migros perceived Videotex as an information and communication technology that could inform customers about sales promotions, and could function internally to coordinate production, stock, sales, and promotions. We will have a closer look at the example of Videotex as an internal communication and information system.

Migros assumed that Videotex would establish itself as an in-house system for firm within the next ten years. EPOS (Electronic Point of Sale Ordering System) was an example of such an in-house system. EPOS was an information and ordering system for display material. It consisted of a Videotex central belonging to Migros over which users in the various branches could communicate. Basing on Videotex a cost-saving in-house communication system was built up. The user’s access resulted directly from the internal Videotex central – bypassing the centrals of the PTT.

Typical for such internal communication systems, this novel in-house service were ideally expected to facilitate paperless administration and thus allow a quick and accurate distribution of information. These systems could assure better clarity in the overflow of information. Furthermore, the interaction of involved divisions could gain in efficiency and speed. Delivery time could be shortened and therefore the reaction time to changes as well. Savings on paper, telephone costs and postal charges were mentioned for the longer run.

Migros’ EPOS system was a successful, rapidly realizable pilot project with low cost that showed the possibilities of Videotex in retailing. It established a basis for other more ambitious and commercially more interesting applications. EPOS was simple in its basic structures, but in the long run, it could be expanded to efficient intra-corporate information and communication system. Soon, it was clear to the Migros’ managers that EPOS was “only one pillar of a ramified network of several in-house systems.”²¹ Thus, the EPOS system assigned the start for a new in-house communication era within the Migros.

²⁰ Migros Archive. Minutes of the 116th Conference of the Store Managers, 29 March 1984. p. 4.

²¹ Migros Archive. Minutes of the 116th Conference of the Store Managers, 29 March 1984. p. 13.

This system basing on Videotex was the first step towards a company-wide communication network for the upcoming personal computers.

Conclusion

Videotex, developed at the end of the 1970s, was a universal interactive information and communication technology that triggered novel services provided by firms. In this paper, we analyzed the emergence of new services in banking and retailing. These novel services usually drew on the interactivity and the queries of data bases. Banking firms based a service called Telebanking upon these features. This Telebanking service enabled customers to conduct their financial payments electronically and to look up the actual balance of their bank account. Banks used Videotex as a technology to externalize routine activities which were formerly done by them. Hence, Videotex led to an automation and rationalization in the payment transactions.

The example of Migros showed that retailing firms also perceived Videotex as an attractive technology for their growing need for quick and accurate information and communication. These in-house systems based likewise on the interactivity and access to data bases. The described EPOS system made the internal ordering system for display material more efficient and quicker.

These internal and external information and communication systems based on Videotex were hoped to contribute to an information society – a society without paper or cash. Reality, however, was slightly different because Videotex could not fulfill all these expectations. Videotex could not display graphs and pictures adequately. These poor displaying possibilities also dashed the vision of a paperless ordering system for advertising material with the Migros. Hence, the EPOS system consisted not only on the Videotex system but also on papers presenting the needed pictures.

As this example shows, Videotex had severe technical shortcomings. They could have been improved easily, but the tide had turned for Videotex. The uncertainty concerning the future of this technology and the high costs of further investments deterred such attempts.

Videotex was often coined the first open information and communication system. This is only partly true. Because of the monopoly of the Swiss PTT, it was forbidden for the private

firms to develop further the Videotex technology according to their needs. As the collaboration between PTT, information providers, and retrievers was difficult, further innovations concerning the Videotex technology was hindered heavily. The rigid constraint to the technological aspect of Videotex did surely contribute to the fact that the PTT hardly listened to the firm's need concerning Videotex. Consequently, the PTT's role had its share on the frustrated expectations of Videotex.

In fact, the PTT found itself in a difficult position: On one side, it was the driving force in this technology's development. On the other hand, it was a monopolist setting prices for telecommunication services like Videotex. Furthermore, the PTT was competing with private firms that were offering services based on Videotex that once were its genuine business. The cashless transactions offered with the banks' Telebanking service was a strong competitor for the PTT's payments system. This competition revealed the weakness of the monopolist. The delay in automation could not easily be made up. At the end of the 1980s, the banks were the strong players in the market for electronic banking. From this perspective, in-house systems based on Videotex, like Migros' EPOS system, are another example for a firm's effort to establish internal information and communication systems partly independent from the network of the PTT. Hence, the technology of Videotex put PTT under increasing pressure towards the liberalization of networks.

In addition to the usage of Videotex as an external and internal information and communication system, it was also used as a marketing mean. Videotex was expected to constitute an "electronic market hall." Nevertheless, for the first time a larger part of the population could participate in what was called the advent of the information society.

At the beginning of the 1990s, the upcoming internet technology with its higher speed and displaying features supplanted Videotex. Even when the technology of Videotex is regarded as a failed technology, its basic idea was successful. Most of the services then displayed on Videotex system are run today on the Internet. Videotex combined an innovation in the telecommunications infrastructure, an innovation in the supply of new services, and a social innovation in the way users fulfill their specific communication and information need. Therefore, Videotex can really be seen as an anticipation of an imminent societal transformation with the coming of the information society.

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