Strategic Implications of the Segment of one TV
The Evolution of the Personalised Television Structure

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Introduction

Since the beginning of the television era, advances in technology have always had an enormous impact on the television industry. Due to technological developments it became possible to transmit noise-reduced radio signals and to sell television sets at a reasonable price. As a consequence, television became a mass medium in most countries in the 1950s (Brown-Kenyon, Miles & Rose 2000, p. 73), which was the foundation for development of the television industry. Another example one can consider is the development of recording devices for television programmes. The invention of the video cassette recorder (VCR) meant the first rudimentary form of time schedule independent programme composition. Video rental stores enabled their customers to rely less on television programmes only but on movies not broadcast by television as well.

Most recently, advances in digital technology, deregulation and individualisation of customer relationships have enabled the convergence of telecommunication, media and information technology industries (Wirtz 2000c, pp 291–4). As a first product of this convergence process, a new technological innovation has been introduced into the American television market in March 1999, the digital personal television receiver (DPTR). Developed independently from two different companies (Tivo and Replay), the DPTR is essentially a video recorder with huge storage capacities based on digital technologies. It combines traditional television as part of the media industry with the digital storage facilities as a product of the information technology industry. Based on the digital technology, further enhancements such as internet access is possible, which also means the integration of a telecommunication product. In so far, the DPTR is not only a product but also an enabler of the convergence process.

From the DPTR’s introduction into the US American television market in March 1999 until June 2000, about 100,000 DPTRs have been sold without any major marketing expenditures (Lewis 2000, p. 3). Expected by the end of 2002, up to seven million DPTRs will be sold to US American households, with increasing growth rates in the following years (Lewis 2000, p. 3). For Europe, there are similar forecasts. As illustrated in Figure 1, estimates indicate that in 2005, about 25 per cent of the households of the European Union will own a DPTR, and in 2010, this percentage will raise to 75 per cent (Whittingham 2000, p. 6).

Due to the DPTR’s features, vast opportunities especially for the individual programme content management are available. As a result of its rapid diffusion in the markets, it is most likely this innovation will change the existing television market. This article explores how the television industry is affected by this latest technological development. The second section describes the main driving force for the diffusion of the DPTR and illustrates its effects on the television indus-

Figure 1: Estimated market diffusion of the DPTR in the European Union

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>2005</td>
<td>25%</td>
</tr>
<tr>
<td>2007</td>
<td>50%</td>
</tr>
<tr>
<td>2010</td>
<td>100%</td>
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Source: Values taken from Whittingham (2000), p. 6

CAGR: Compound Average Growth Rate
try. The third section gives an overview over the American television market, discusses several theoretical strategic options for the US American television industry and the already observed strategic responses. The fourth section gives a summary and implications.

The main diffusion force for the DPTR and its effects on the television industry

The main diffusion force shall be defined as the main driving force, that pushes the market diffusion of the DPTR. The discussion begins with a description of the main technological features of the DPTR. Then the main diffusion force, the proposed customer advantages shall be discussed taking into account how the technological features enable the DPTR to deliver these advantages. An overview over the technological features and the proposed advantages shall be given in Figure 2.

The DPTR is essentially a huge hard disk with capacities of about thirty gigabytes, where audio and video data can be stored. One hour of packed video needs about one gigabyte of storage capacity. The main advantage of a hard disk compared to a video cassette is the non-linear accessibility that is the ability to access to any stored programme or part of a programme in virtually no time compared to a video cassette which needs rewinding time. Other advantages are the better recording quality of the programmes, no quality loss due to the digital storage technology (Pagani 2000, p. 26) and easier handling of the DPTR.

Furthermore, DPTR has very flexible recording and playing features. For example, advertisements can be skipped, and the same programme can be recorded and watched simultaneously, or even with viewer interruption, i.e. pause in view, recording can continue. For live broadcasting, if the viewer is interrupted, the DPTR records the live broadcast and continues playing it exactly from the point where the programme was interrupted.

A third feature is the ability to be equipped with computer software, which analyses viewing habits. Based on this analysis, the DPTR is able to choose and independently record exactly those programmes preferred by viewers. So whenever a viewer turns on his television, the DPTR has an individual programme composition ready for him.

Besides the features provided only by the DPTR, there are interesting synergies with set-top boxes. The set-top box provides access to the internet via the television screen using cable and satellite networks. As it is agreed that the DPTR will be integrated into set-top boxes (Wallstreet-online 18 Dec 2000), the viewers will also have access to the internet and all its possibilities such as browsing, electronic mail, and so on. Of course, these are no specific features of the DPTR, but combined with the huge storage capacity they yield most interesting proposed advantages for the viewers, which will be presented in detail below.

The technological features described above are just precursors of other features and developments that could be possibly added to make the DPTR even more attractive. It is not unlikely that the DPTR will be integrated into television sets which will lead to one multifunctional device.

The proposed advantages for the viewer lie mainly in the DPTR’s ability to manage the programme content shown on the television screen. This management of programme content basically consists of three characteristics directly resulting from the technological features. A characteristic derived from the third technological feature is the DPTR’s ability to independently compose an optimised individual programme for the viewer. This means independence from television programme schedules. The viewer does not need to search for interesting programme formats himself. This can be widely taken over by the DPTR. An interesting side effect is the skipping of advertisements, which results from the flexible recording and playing features. The DPTR is able to completely exclude any interruptions of the programmes making viewing far more convenient.
Besides the independently scheduled programming and advertisement-free television, the complete independence from any given time schedule is also an important characteristic of the programme content management. Television programmes can be watched at any time preferred by the viewer. This is actually not a new feature, because a video cassette recorder offers a similar service. Yet a video cassette, in contrast to the DPTR, has lower storage capacity and storage quality. Furthermore, a video cassette recorder is not able to record different television programmes at the same time nor can the viewer watch a recorded programme while recording another programme without a second video cassette recorder. These technical restrictions are now removed, making the independent time schedules a major advantage of the DPTR.  

A third major characteristic of the programme content management results from the integration of the DPTR into the set-top boxes. Access to the internet combined with the huge DPTR storage capacities has the potential to push the video-on-demand, which was introduced in the United States in the early 1990s. Video-on-demand enables its customers to rent movies from a virtual library via television. In its early stage video-on-demand was rather expensive due to missing local storage facilities and to high expansion costs of the existing hybrid fiber/coax cable networks. The demanded videos had to be transmitted at the same time as they were being watched. Therefore, the provider had to keep huge transmission capacities ready, which are needed only at prime time. Assuming that 25 per cent of all cable subscribers in a community acquired cable modems, the cost would be about $135 per cable modem user to extend fibre to the point where 160 homes shared a common coaxial line, versus 580 homes prior to the upgrade (Katz 1998, p. 24). The DPTR and its huge local storage capacity could mean an alternative to such expansion costs, because the transmission can be done during a period when there is less traffic on the network. This relief though will not be significant, unless many subscribers ask for the same titles, which is realistically not the case. The potentials of the DPTR for video-on-demand still should not be underestimated. The flexibility of the transmission times could push the demand for movies and other programme formats; with higher demands, an expansion of the existing network infrastructure could be economically sensible. Results from empirical research indicate that video-on-demand has already been highly demanded (Albers et al. 1999, pp. 277–8), so its further facilitation could be a major advantage of the DPTR.

Taking the three characteristics of the programme content management into account, the proposed advantage for the viewer is his ability to be his own programme manager. He can put up his own programme, his own time schedules and receive the programme formats from virtual libraries via the internet. This may finally result in a future, where there is only one individual television channel for each viewer (Noam 1996, p. 15).

The DPTR’s ability to provide an individualised programme content management will probably have a significant effect on the existing television market. This can be reduced to basically two properties derived from the main diffusion force. First, identifying the programme content management itself, which represents a segment of the television industry value chain indicating its importance. This segment of the value chain, up to now completely under the control of the broadcasters, is now threatened to be taken over by the viewer. As the loss of a complete segment of the value chain always comes along with a loss of power, it is unlikely that the broadcasters will give in so easily. This situation is illustrated in Figure 3.
With the programme content management becoming partially obsolete, a further consequence could be that there will be no need for customer specific, topic specific or any of the other numerous channels. It will not be necessary to transmit television programmes following a given time schedule, which could possibly mean the end of the prime time. For the broadcasters, it may be more efficient to have the programme formats ready to be downloaded by the DPTR, of course, could mean a shift in the existing network infrastructure. On the one hand, since programme formats could be downloaded for local storage and later watching, there are no fast transmissions and thus not even broadband networks are necessary. On the other hand, as any programme format can be downloaded at any time, the total traffic on the networks could increase enormously. This would mean particular requirements on both transmission capacity and transmission rate. More recent developments in data compression formats such as MPEG or JPEG have reduced the amount of digitised data to be transmitted, and broadband networks enable transmission rates of 2 Mbps and more. This could push the present rather slow market diffusion of broadband networks (Martin 2000, p. 122). Not just transmission rates but also storage capacities for content ready for transmission will be important.

A possible significant effect could have the second property – the ability to completely omit the advertisements. Because it is highly unlikely that advertisements will be watched if they can be easily skipped, especially broadcasters with an advertising based revenue model will need to reconsider their strategy. If no potential customer is reached by any visual advertisement, there will be no reason for their placements which means the cannibalisation of the advertising based revenue models. Of course this is not only a problem for the broadcasters with an advertising based revenue model but for the advertisement-placing companies as well. The television is the medium with the highest nationwide market diffusion and with the highest possible number of potential customers reached with just one advertisement. The potential loss of this medium leads to significantly higher marketing costs in order to reach the same number of potential customers.

The DPTR does not only have the potential for a severe impact on the broadcasting industry, the impact on related areas such as the television set industry, the video cassette recorder industry and the video rental stores could also be of high significance. After the DPTR’s integration into the set-top boxes, further integration into television sets to develop one multifunctional apparatus is also possible. For the video cassette recorder industry, however, the difficulty could be competing with features such as easy handling, the non-linear accessibility or the huge storage capacity. The integration of the DPTR into the set-top boxes and the resulting possible emergence of video-on-demand could also have consequences for the video rental industry. Traditional video rental stores could face severe competition with online video libraries.

These possible impacts on the broadcasting industry and related areas will not be abrupt but gradual, since they are dependent on the market diffusion of the DPTR. An important consequence is, that established companies, in the existing structures, have some time to develop proper strategies to deal with the new competitors. An example are the traditional video rental stores. They could expand their services to online video libraries hindering new competitors to enter their market. Nevertheless, the effects should not be underestimated, since they are most likely to take place if there is no proper strategic response of the established companies in the existing structures. The development outlined above should be understood as a possible worst-case scenario.

The first sign of this development can already be observed in the United States, where there are already 100,000 owners of a DPTR. Figure 4 is an overview of the DPTR impact from Tivo on the behaviour of early US adopters (Whittingham 2000, p. 15).
Although it is just an estimate, there is strong evidence for a shift to primarily watching recorded television instead of scheduled television. Furthermore, only 12 per cent of the advertisements are watched (Lewis 2000, pp. 3–4). The development outlined above has most likely begun with the United States as the forerunner. Thus in the following section, the strategic options discussed will consider the American market.

**Strategic developments in the US American television market**

As outlined above, the focus of this section is on the American broadcasters. The first subsection contains a short description of the US American television market, followed by the second subsection containing a theoretical discussion of strategic options for the broadcasters’ response to the DPTR. Strategic responses of the major American television companies to the DPTR will be outlined in the third subsection.

Due to the fact that the United States has a larger television market than any other country in the world, it is necessary to find an appropriate categorisation in order to give a rough overview. The categorisation shall be based upon the main transmission technologies, which yields two groups (Figure 5): traditional broadcasting and cable television. Other categorisations are also possible, i.e. into commercial and non-commercial television, but they are not sufficiently suitable for the further discussion.

The first group consists of about 1,500 television stations, which are mostly owned by or are affiliations of one of the seven larger programming networks. First, there are the three traditional programming networks ABC, NBC and CBS. Together, they have a market share of about 50 per cent after a severe decrease during the last years. In 1987, the Fox Broadcasting Company launched its Fox Network, whose successful diffusion in the early 1990s motivated other companies to launch their own television networks. The result were four television networks mainly launched in the 1990s, which are also summarised in the first group: Fox Network, Warner Brothers Network, UPN Network, and, most recently, Pax TV. Presently, there are still about fifty stations (Dominick, Sherman & Messere 2000, p. 101) remaining, which are not affiliated nor owned by one of the seven large programming networks. These so-called independent stations form the rest of the first group.

The second group consists of the cable services. According to Dominick, Sherman and Messere (2000, pp. 105–6), the more than 200 programme services shall be categorised into three subgroups: advertiser-supported basic cable services, pay services, and speciality services. The leading networks in the first subgroup are CNN, Headline News, and Turner Network Television (TNT), all three provided by the Turner Broadcasting Systems. Other networks are the Black Entertainment Network (BET), the Arts and Entertainment Network (A&E), and many others. The second subgroup mainly consists of Home Box Office (HBO, with a subscription of thirty million households) and Cinemax (fifteen million households), both offered by AOL Time Warner; Showtime (fifteen million households) and The Movie Channel (eight million households), both offered by Viacom. A strong and growing segment of pay-television are also regional sports services, many of which are offered by the

![Figure 5: The structure of the American broadcasting industry](https://www.medjournal.org)
Fox Broadcasting Company. The third subgroup consists of some speciality services such as regional news channels, local governmental channels, shopping channels and even a channel devoted to state lotteries.

One important aspect regards the ownership of the cable services. While there are federal caps on the number of broadcast stations owned by one single network, there are no such limits on cable ownership. Therefore, the cable business is marked by a large number of multiple cable system operators. These are operators owning at least two cable services. Other operators owning only one cable service are named ‘single cable system operator’ or simply ‘cable system operator’. The largest multiple cable system operator is AT&T with nearly twelve million subscribers in 1999. The second-largest multiple cable system operator is Time Warner Cable with about seven million subscribers. Other large multiple cable system operators are MediaOne, Time Warner Entertainment – Advance/ Newhouse, Comcast, Cox Communications, Cablevision Systems and Adelphia Communications, all having at least two million subscribers (Dominick, Sherman & Messere 2000, p. 108).

The largest single cable system operator is Time Warner’s operation in New York, who has more than one million subscribers. Other large single cable system operators are Cablevision’s on Long Island, Time Warner’s in Orlando and the Cox Cable System in San Diego (Dominick, Sherman & Messere 2000, p. 108).

Considering the market impact of television in the United States, about 98 per cent of the American households, that is nearly 100 million households, have at least one television set, which receives forty-five different channels on average (Dominick, Sherman & Messere 2000, p. 97; Walker & Ferguson 2000, p. 158). About two thirds of the households receive cable television, and one third of the households have subscribed to at least one pay-television service (Dominick, Sherman & Messere 2000, p. 107; Walker & Ferguson 2000, p. 158). The broadcasters, in the first group, generate their revenues mainly by selling broadcasting time for advertisements, which sums up to total sales of about 14.5 billion dollars (Dominick, Sherman & Messere 2000, p. 157) after an estimated twelve billion dollars in 1995 (Brown & Quaal 1998, p. 375). Cable television revenues depend on whether free- or pay-television is offered. The revenues generated by advertisements for example were close to ten billion dollars in 1998 (Dominick, Sherman & Messere 2000, p. 157) after about four billion in 1995 (Owen 1999, p. 123).

Since programme content management, a feature of the DPTR, threatens both the channel variety and the advertising based revenue models, the broadcasters could face a severe threat, jeopardising their activities in substantial fields. Especially the threat for programming television channels could mean an essential loss for the broadcaster’s importance, due to the fact, that a whole segment of the value chain is at stake. Therefore, broadcasters would need to think about proper strategies to deal with the new competitors. Basically, the strategic choice is between competition or an arrangement with the new competitor.

For discussing competition strategies, illustrated first would be the meaning of competition for market shares and revenues for the broadcasters in the television market. The broadcasters’ competition for market shares is equivalent to attracting as many viewers as possible, in order, to generate revenues either by placing advertisements (free-television) or by subscription fees (pay-television). Thus, the generation of revenues is dependent on the broadcasters’ ability to attract the viewers. Due to the fact, that viewers are not attracted by broadcasters but by programme formats, competing for market share means competing for attractive programme formats. ‘Programming is crucial […] in the competition for market shares’ (translated from Wirtz 1994, p. 115). However, it is not sufficient just to offer attractive programme formats. Proper programming, e. g. the latest movies not in the early afternoon but on prime time, when most people watch television, is crucial for the market share especially for the free-television broadcasters (Wirtz 2000a, pp. 160–6). The DPTR’s ability to compose viewer optimised programmes makes the programming redundant. This overturns old competition rules, since programming attractive formats is no longer an option. However, an approach to competition with the DPTR must start with the viewer and his attraction (loyalty) to the broadcasters’ programme formats. It is reasonable to consider viewers as customers, therefore it is possible to transfer strategies for the generation of customer loyalty to the present situation. This implies generally two ways to generate viewer loyalty: one can either generate viewer satisfaction or one can create barriers. The discussion starts with the latter.

First, the DPTR is dependent on both the programmes of the existing broadcasters and its variety to develop its full use for the viewer. The more programmes are available, the more programmes the DPTR has to choose from, in order, to compose an individual viewer optimised programme. Therefore, to create barriers, a natural point to start from is to restrict the DPTR from the variety of programmes. A reasonable example is the development of some kind of a disturb signal. The DPTR is dependent on the signals transmitted by the broadcasters to recognise the programmes. If some kind
of digital disturb signal preventing or disturbing the recognition of pro-
grammes is also transmitted, the DPTR will be useless. But besides the fact, 
that the development will consume time and money, every television set 
needs a feature which neutralises the disturb signal. Probably no one would 
accept to pay for having his television set equipped with such a new feature. 
Therefore, the development of a dis-
turb signal is not suitable as a perma-
nent barrier. Furthermore, as long as 
there is only one broadcaster who does 
not erect barriers for the DPTR, all the 
possible strategic options for erecting 
barriers are futile.

Clearly, there seems to be no economi-
cally reasonable way to generate per-
manent viewer loyalty by erecting bar-
riers. According to existing customer 
loyalty theories, the only way to gener-
ate permanent customer loyalty is to 
generate customer satisfaction (Blümel & 
Eggert 1998, p. 42)\(^{11}\) by presenting 
substantial advantage for them (Wirtz 
2000d, p. 31). Viewer satisfaction could 
be generated by programming more 
attractive programme formats than the 
DPTR, which is however impossible. 
So the application of concepts of cus-
tomer loyalty to the present situation 
yields that it is not possible to success-
fully compete with the new competi-
tors in the long run. The only remain-
ing option is the forming of some type 
of arrangement or co-operation with 
the DPTR.

A first approach could be the embed-
ding of advertisements into the pro-
gramme formats instead of broad-
casting separate advertisements. This 
would prevent the cannibalisation of 
advancing based revenue models, 
without forming an explicit alliance 
with the DPTR. For example soap 
operas, financed by companies whose 
products will be presented during the 
show by the actors. This approach is 
rather limited to the kind of product 
or service to be advertised and to the 
kind of programme format.

What remains is co-operation in the 
form of an alliance or a participation 
under the condition, that the broad-
casters change their existing structure. 
Due to the fact that the DPTR can take 
over the programme content man-
germent, broadcasters are likely to 
change to programme format suppli-
ers. The revenues would not be gen-
erated mainly by advertisements or 
subscription fees, but by providing pro-
gramme formats for the DPTR.\(^{12}\) How-
ever, this does not imply that there 
will no longer be advertisements. Pos-
sibly there will be specialised advertise-
ment providers whose contents will 
be included in the individualised pro-
gramme composition. Another con-
ideration is that the traditional 
broadcasters offer packages containing 
programme formats and advertise-
ments. This of course means that the 
feature of the advertisement skipping 
will be omitted.

Since data about viewer’s habits are 
available, it is possible to divide the 
viewers into groups with homogene-
ous watching habits within each group. 
Of course, this has consequences for 
the offered programme formats, since 
it makes economically no sense to pro-
duce and offer programme formats for 
groups with only a small minority of 
viewers. Accordingly, although there 
will be only one individual channel for 
each viewer, the specific programme 
formats will be chosen from a small 
variety of programme formats.

Taking this into account and assum-
ing broadcasters will change to pro-
gramme format suppliers, there are 
three possible ways to change. Either 
each broadcaster focuses on one viewer 
programme formats will be generated 
for this specific group only. Let us con-
sider television news. Groups with a 
main interest in politics or business will 
both get their specific television news 
produced by different programme 
format suppliers. Given the structures 
outlined in section two and taking into 
account the production of programme 
formats is profitable just for a few 
viewer groups, it may be reckoned that 
the consequence could be a far-reaching 
consolidation. Most likely there are 
not enough different profitable viewer 
groups for each broadcaster.

Focussing on a specific programme 
format suggests, that every broadcaster 
produces only one programme format, 
e. g. serials or documentary movies, 
with different versions according to 
the different viewer groups. This can 
be regarded as a further development 
of the already existing sports or news 
channels. Compared to the first stra-
egic option, it is possible to realise eco-
nomies of scope. If for example different 
television news for different viewer 
groups are produced, the necessity 
would be to produce many different 
news pieces, which will be composed 
according to the group’s preferences. 
Focussing on special events is the third 
strategic option mainly for already 
existing pay-television channels. The 
suppliers of live sport events or the 
latest movies have the advantage of 
offering programme formats with high 
actuality justifying a special price. A 
special rate to the DPTR owners for 
these special events is also plausible 
meaning a transformation of the pay-
television channels into pay-format 
suppliers.

In order to adapt to the DPTR, broad-
casters have the choice between the 
three options. The adoption of just one 
strategy without regard to the other 
two however is not a palatable choice 
for the broadcasters. Also, likely, are 
hybrid forms with main focus on one
of the three strategies. There will be broadcasters who focus mainly on specific viewer preferences, on specific programme formats, and those who focus on special events.

This strategy holds for the alliance, as well, as for the participation option. Participation, however, enables a larger degree of control in key areas such as advertisement and programme content management. The companies, Replay and Tivo, are rather new on the market, so that a participation is affordable. A summary of all strategic options is given in Figure 6.

The remaining theoretical discussion is, which strategy seems to be the most appropriate. As outlined above, the generation of revenues is dependent on the number of viewers a broadcaster can attract. The strategic options to generate customer loyalty imply, that competition is possible for only shorter periods of time and is, therefore, futile. Thus, a reasonable strategy in the long run is a co-operation strategy. Broadcasters adopting other strategies are most likely to disappear, unless they change to co-operation strategies in time. Among the co-operation strategies, the participation is the most preferable, as outlined above. This result is according to existing theories which claim that the new entrants’ threat for the value chains of traditional market participants should be countered with integration strategies (Wirtz 1999a, pp. 19–22). Participation is a possible integration strategy.

Concisely stated there would be a shift in the structure of the television industry. The DPTR will take over a part of the broadcasters’ role in programme content management. The broadcasters could degenerate to mere programme format suppliers with only a few other revenues than the payments received by the DPTR companies. But if they offer packages containing programme formats and advertisements, they can retain a form of an advertising based revenue model. The shift would be of a different intensity in the two groups. The seven large programming networks and the independent television stations in the first group would be most severely affected. Besides the fact, that their revenue model faces the threat of collapse, the ubiquitous effect of DPTRs presents an opportunity for outside programme producers to disintermediate the networks. While sports and news are produced by the programming networks themselves, especially the serial entertainment programming, an important part of the programme formats shown on television, is mostly produced by outside producers. The programming networks add value by appropriately aggregating and packaging programmes such that the audience flow is promoted from one programme to another, and by distributing them via their affiliated television stations. Neither source of added value is relevant in a world with ubiquitous DPTR usage. Therefore, the outside producers are likely to disintermediate the networks. Rather quickly in order not to be left behind, the programming networks and the independent television stations of the first group would need to adopt one of the new strategies. In contrast, the situation is different for the cable television services in the second group. Advertising based services will face the same problems as the programming networks in the first group. The pay-television services however are most likely to be
less severely affected. The fact, that special events and recent movies are of higher value and, therefore, only available for an extra charge, is not changed by the DPTR. For the speciality services forming the third subgroup, the DPTR could even result in an improvement of their situation. Due to the special nature of these services they are likely to be overseen by the viewer. If the DPTR organises the programme content management, the speciality services can and will attract more attention.

The current development on the American television market confirms, that traditional programming networks are already adopting co-operation strategies. In August 1999, just half a year after the DPTR’s introduction into the American television market, Time Warner, The Walt Disney Company, NBC and others invested altogether an estimated fifty-seven million dollars in Replay, while TiVo received about forty-five million dollars from CBS, NBC and others (Lewis 2000, p. 3). This early strategic response to the new competitor is remarkable, because at that time probably no reliable figures about the market diffusion of the new entrants were available. So even without any figures, it has been assumed the new entrants are a major threat to the traditional participants in the market and that an early reaction is appropriate. Further investments are to come. In October 2000, AOL, now AOL Time Warner, announced its plans to invest up to 200 million dollars in TiVo (Wallstreet-online 18 Dec 2000). A summary of the broadcasters’ investments in at least one of the companies, for TiVo or Replay, is given in Figure 7.

Besides the fact, that some traditional broadcasters responded very quickly to the new competitors, there are still some who have not reacted yet. An example is the Fox Broadcasting Company. Although its subsidiary of the TV Guide Inc., which has invested in TiVo, the Fox Broadcasting Company itself has not invested neither in TiVo nor in Replay. Another observation: the former ability to completely skip the advertisements has been reduced to a fast wind, so that at least an impression of the advertised products is left. This could be regarded as a first step onto omitting the skipping feature.

**Summary and implications**

The aim of the present article is a discussion of the possible changes of the television market initiated by the DPTR. After a description of the main diffusion force, the programme content management facility of the DPTR was identified to initiate the changes of the television market structure. Since broadcasters are faced with the threat of being reduced to mere programme format suppliers, with partly vast consequences for their revenue models, they are forced to rethink their competitive strategies, in order, to cope with the new situation. On the basis of the American television market, different strategic options were discussed with the result, that a co-operation by participation would potentially be the most successful strategy for the established broadcasters.

The change of the television market structure could go much further than just the broadcasters’ becoming programme format suppliers. Because vast capacities to store the programme formats ready for download are needed, there is the necessity to extend the infrastructure. Given the situation that viewers can download programme formats at any time, the existing network capacities are most likely to be overloaded, initiating the diffusion of the broadband networks. Another possibility is a restriction of the arbitrary download.

Having the programme formats ready to download raises the question of protection from unauthorised access. Appropriate protection and coding methods would need to be developed. Progress is already made by Quantum (Wallstreet-online 18 Dec 2000). However, as the DPTR will be integrated into set-top boxes, encryption methods already available for set-top boxes can be carried over to the DPTR.
However, it should be remarked, although first changes of the viewer habits could be identified on the American television market, it is still unclear if the majority of the viewers are ready to change their viewing habits. Keep in mind when dealing with any forecasts, as it is always with a new product: those who are really keen on using the DPTR will buy it as soon as it is available, while others take on a more sceptical and expectant attitude. Considering the German market as the second largest television market in the world, there are still no reliable data available, since the first version of the DPTR is on the market just since the end of October 2000 (Dettmar & Kunde 2000, p. 4).

The integration of the DPTR into the set-top box can be considered as a first step towards the development of one single multifunctional device for several multimedia applications (Wirtz 1999b). Combined with the possibility of video-on-demand, every consumer is able to compose his own individual television programme consisting of both programme formats supplied by the broadcasters and videos rented from the virtual video libraries. Further enhancements are possible. The multifunctional device could have a video game console, where the video games could be received via the Internet from virtual video game libraries or virtual stores. A similar enhancement is possible for music. Integrated high-quality speakers could enable the full pleasure such as classic music also received via the internet. As already outlined in the introduction, the DPTR can be regarded as both a product of the convergence of multimedia industries and an enabler of this convergence.

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