The DVR Disruption in the Video Recording Industry

Can TiVo find its place in the market it created?

May 11, 2005
15. 912 Technology Strategy

Alberto Brause
Jesús Fernández
Mike Tsung
INDEX

1. Introduction .................................................................................................................. 3
2. Historical Evolution of the Video Recording Industry .................................................. 3
3. TiVo and the DVR disruption .......................................................................................... 5
4. TiVo’s strategy on the DVR era of ferment (1999-2003) .............................................. 7
   Digital media convergence and value chain transformation: ....................................... 9
5. DVR era of takeoff (2003-Present) ................................................................................. 9
6. Where can TiVo be headed in 2005? ............................................................................. 11
7. Concluding Remarks ..................................................................................................... 14
1. Introduction

Our interest in the video recording industry was spurred by two main events that defined the industry in the last 25 years. First, the video recording industry was the breeding ground for a classic example of value capture in a standards-driven market, during the raging war between the VHS and Betamax formats. Second, we wished to explore how an industry that has been characterized by an extremely long maturity era of incremental innovations could experience the sudden DVR disruption in 1999. TiVo, one of the most innovative start-ups of the late 90’s, will be the focus of much of this paper, which will explore its emblematic role in the DVR disruption. In particular, we will look at how the television industry’s radical moves toward digital convergence are preventing TiVo from capturing the value it has created. Since we believe that the DVR industry is currently at the inflection point in which it is leaving behind its era of ferment, we will analyze the strategic implications that this will have for TiVo and explore some of the alternatives that TiVo may have to maximize its value proposition in a rapidly changing industry.

2. Historical Evolution of the Video Recording Industry

Just after World-War II, several decades before the commercial launch of video cassette recorders, the first attempts to record video signals on magnetic tape were documented. Prototype machines were built in the early 1950s. The first practical, commercial broadcast quality video recorder was released by Ampex in 1956, primarily for professional use. Yet, it was not until 1975, when Sony released its Betamax video system, that the industry was ready for its take-off with widespread consumer adoption. Two years later, Victor Co. of Japan (JVC) released the competing standard VHS (Video Home Systems). Despite their common ancestry and technical similarities, Beta and VHS machines remained incompatible, because they used different tape-handling mechanisms and cassette sizes, as well as coding schemes for their video signals that varied just enough so that tapes were not interchangeable [1].

As can be seen in the industry S-curve (Fig. 1), with major network externalities under contention, the main characteristic that defined the industry take-off was the battle that Sony and JVC waged from 1977 to 1983 over who would emerge as the dominant standard. At stake was the entire global market, and the major battlefields were the US, Europe and Asia. Neither Beta nor VHS could gain a technological advantage in design or manufacturing that were sustainable long enough to establish a dominant market position. If one of the standards came up with new features, they would be mimicked four to five months later by the other. Rather than product features, pricing or picture quality, the crucial factor for tipping the market became global manufacturing and distribution capability.
Recognizing their limited global manufacturing expertise, JVC formed early alliances with key players such as Matsushita Electric, which had an extremely large global distribution network and could manufacture machines in larger quantities and shorter lead times than Sony. JVC also began supplying machines to Hitachi, Sharp, Mitsubishi, Panasonic and RCA, with the former being crucial to win early battles for VHS in the US. As the global market perceived that JVC/Matsushita had built a broader network of adopters, video cassette and color TV makers...
chose VHS standards over Betamax. As a result, VHS took off and by 1993 Sony was forced to discontinue production of video recorders with Betamax technology.

Once VHS established a dominant position in the main VTR markets worldwide, the industry went through an excruciatingly long period of maturity that lasted 20 years, during which the VTR segment found a steady place on the value chain of the television industry (shown in Fig. 2). The created value in the video recording industry was exploited in its entirety by consumer electronic companies, such as Sony, Matsushita or Phillips, who would extract their profits in this market from VTR product sales.

The age of incremental innovations in the video recording industry was broken in 1998, when Pioneer designed the first recordable Digital Video Disc (DVD-R) player in 1998. Although DVD technology was superior to the video recorder in terms of picture quality, high prices and the availability of (yet again!) several competing, incompatible formats, it did not entice consumers to rush out the door to buy their DVD-R equipment. Then, in 1999, TiVo entered the stage and an industry that had been dormant for two decades was shaken off the ground.

---

**Figure 2: Value Chain of the traditional Video Recording Industry**

### 3. TiVo and the DVR disruption

The Video Recording industry became once again a focus of attention in 1999, when TiVo and ReplayTV, both new companies focusing on digital video recording, introduced the first DVR models in the US market. Both systems were moderately priced (around $700) and
could record 14 hours of video in their 10GB hard drives\(^1\). Their products were not so much the result of ingenuous innovation requiring years of laboratory work, but of advances in commercially available computer processing power and storage capacity. The computer industry had naturally evolved to the stage in which it could emulate VCRs by digitally processing and storing video.

Since the first days of this new DVR industry, TiVo was clearly the leader in this new field. Although ReplayTV’s product and service offer were not so far behind TiVo from a technological point of view, their timid marketing and retail strategy (ReplayTV’s box could only be acquired online) significantly slowed down their introduction in the market. On the other hand, a very aggressive policy towards advertisement recording in their products (which, in practical terms, was close to allow users to skip ads in recorded programs) as well as towards file-sharing triggered a series of lawsuits from the media industry that brought the company to bankruptcy in 2001\(^2\). The erratic start of its only possible competitor at the time gave TiVo a golden opportunity to introduce their DVR system in exclusivity.

And TiVo did indeed enter with a product that was not going to disappoint the video recording market. TiVo had a sleek user interface providing access to a software platform that was to become a leap in customizability of video recording and in user experience. TiVo customers could, for example, choose to record all episodes of a given television show (using TiVo’s “Season Pass”\(^3\)) feature, filter by specific preferences such as favorite actor, or program type (using TiVo’s “Wishlist” feature) or just follow TiVo’s suggestions about shows that fit their viewing preference profile. Also included in the capabilities mix was the ability to fast-forward through commercials or do “live rewinds” of live television. All these features were enthusiastically adopted by a segment of TV consumers that had become increasingly overwhelmed by the ever expanding variety of channels in the US cable and satellite television market. In a very short time, TiVo users became fanatic supporters of the product, with 97% of them stating that they were very satisfied [2]. A well orchestrated and intensive marketing campaign served to amplify the buzz that early adopters were creating about the product in 1999.

The tremendous pay-off of this strategy on TiVo’s brand capital cannot be denied: the TiVo name in the US has nowadays attracted more awareness than the very DVR concept. In a short period of time, TiVo became considered by many to be the coolest product to have entered the television stage for decades. “To TiVo” became a verb of the new American culture [3]. This did not come cheap, however, with TiVo’s Sales and Marketing expenses reaching $115M in 2001 (an outstanding $1300 per newly acquired customer). See exhibit 1 for a summary of sales and marketing annual expenses.

---

\(^1\) Naturally, the capacity of TiVo DVRs has greatly evolved since 1999. For example, the modern Humax Series 2 DVR can record up to 300 hours of video.

\(^2\) After filing for Chapter 11, ReplayTV was acquired by Sonicblue, Inc, which went bankrupt itself in 2003. The ReplayTV assets were bought by the Japanese D&M Holdings, which, admirably in defiance of the ReplayTV curse, is still manufacturing ReplayTV boxes and continuing its service.

---

6

TiVo understood well the value that consumers would be willing to pay for its service and took value capture in the video recording industry to a new stage by actually charging for usage of its video recording technology. Consumers could opt to pay $12.95 on a monthly basis or a one-time up-front fee of $299. Starting home video recording as a service was a paradigm shift for an industry in which, during the long reign of VTRs, revenues were exclusively generated by hardware sales. In its initial stage, TiVo attempted to capture the value generated by its newly launched service by pursuing a growth strategy based on enhancing its uniqueness and optimizing speed of adoption.

Value Capture through Uniqueness

Although in 1999 DVRs were becoming a clear disruption in the video recording market, we have already mentioned how this technology was more the result of advances in computing processors and hard disks, than of breakthrough innovation. Essentially, a basic DVR was not much more than a hard disk attached to a TV, and it was clear from the beginning of the DVR age that Consumer Electronic manufacturers were not going to need any advanced expertise or R&D to implement the basic technology. In order to ensure its uniqueness in a new segment where the future possibility of cheap copycat was a clear threat, TiVo made sure that the first version of its product/service was fully loaded with all the innovative additional features that maximized the viewer’s experience. Moreover, TiVo’s R&D expenditure has remained relatively high in nominal terms after the introduction of the first model, which indicates that TiVo is looking to stay abreast of its copycat competitors through advanced product functionality (as shown in exhibit 1).

In addition, the company took IP protection very seriously, systematically filing patent applications for every single innovation on DVR technology that came out of its labs. Consistent with this IP-focused policy, TiVo has managed to build an impressive portfolio of DVR patents (over 70 patents so far), and it has not been shy to bring to court other DVR competitors over potential infringements throughout its young history. Yet, it was also very clear from the beginning that the core of DVR technology was so basic that its IP protection was essentially a “no man’s land” to which everybody and nobody could lay claim.

Value Capture through speed to market

In 1999, with only one competitor in ReplayTV who was especially prone to strategic missteps, TiVo could effectively benefit from its first mover’s advantage in this market. In order
to ensure a quick growth of its customer base in this green field, TiVo sought out partnerships with players owning the TV distribution pipelines that had already built substantial customer bases. In DirectTV, TiVo found a strong partner who was desperate to differentiate its value proposition in its ongoing war against cable companies. As can be seen in Exhibit 1, this partnership had a tremendous effect on the growth of TiVo’s customer base, with 288,000 new members in 2003 coming from the DirectTV ranks (this figure is slightly larger than TiVo-based subscriptions for 2003).

At the same time, TiVo could also increase its speed to market by focusing on developing its service and licensing its hardware technology to large Consumer Electronic companies, such as Toshiba or Pioneer. With this measure, TiVo could ensure the proliferation of TiVo products, while enhancing its presence in the retail channels. At the same time, a large variety of high-end TiVo boxes became available for the most demanding segments of the market.

**Sustainability of TiVo’s captured value in 2003**

The Uniqueness/Complementary Assets matrix can be an optimal tool to analyze TiVo’s performance at capturing value in 2003, at the end of the DVR industry stage of ferment and to assess how sustainable TiVo’s growth will be in the future.

We have seen that, in terms of uniqueness, TiVo has only achieved a moderate level of IP protection for some of the distinguishing features of its software platform, but none for the core digital recording technology. Furthermore, although the hype that the company has created around the DVR disruption was instrumental in building the company’s brand, it has also put this segment on the top of the radar screen of TiVo’s potential competitors. DVRs were certainly hot at the beginning of the century, and TiVo’s uniqueness due to its speed to market could not last very long. Additionally, contrary to what happened in the VTR age, the DVR software platforms are not tied to any specific or proprietary video standard to which early customers would be locked in, further reducing the advantage of being a first mover. In sum, with the peace of mind that comes from making an assessment in hindsight, we may diagnose that, although TiVo had a relative degree of uniqueness in 2003, this was not sustainable.

In terms of TiVo’s Complementary Assets, we believe that the only ones that TiVo has fully grown on its own are its brand (which has become synonymous with the concept of DVR) and the technological superiority of its software platform (which offers a larger variety of features than its competitors). These Complementary Assets are of significant value for TiVo to differentiate itself. This is of special importance if we consider that a critical Complementary Asset in the TV industry value chain seems to be the ability to bundle with other services (for example, bundling of cable, internet and telephone services), which will normally entail the existence of a previous customer base to which new services can be marketed. Even though TiVo did not possess this capability in 1999, it was available to content distributors such as Comcast, Time Warner Cable or Direct TV, who had already built bases of customers with the potential to become adopters of DVR services.
Although TiVo in 2003 was able to secure the bundling capability and potential customer base through its partnership with DirectTV, these assets were still tightly held by the satellite provider. What remained unproven at the time was to determine whether the value of TiVo’s brand and technology were high enough to offset the effect of the distributors’ service bundling capability. The question that was probably troubling TiVo’s management at the time was whether consumer awareness of TiVo’s technological superiority and brand were sticky enough to maintain the loyalty of its customers even if the channel distributors decided one day to provide DVR services themselves.

Taking all of this into consideration, we have placed TiVo in 2003 in the quadrant of tightly held Complementary Assets and easy to build Uniqueness as shown below.

![Complementary Assets/Uniqueness matrix for TiVo in 2003](image)

**Figure 3: Complementary Assets/Uniqueness matrix for TiVo in 2003**

5. **Digital media convergence and value chain transformation: DVR era of takeoff (2003-Present)**

There are clear signs that the digital media convergence age which scholars have been predicting for years is finally happening today. This is affecting the whole video recording industry as we have traditionally known it and radically transforming its competitive landscape. Undoubtedly, the digitalization of the TV industry will have a critical effect in the way profits are generated in the incipient DVR market. TiVo, in particular, has very good reasons to analyze two processes that are currently taking place in the television space.

**Integration in the Video Recording value chain and the commoditization of the DVR**

With DVR technology not being particularly difficult to produce, a uniqueness position only weakly defendable through IP protection, and important complementary assets in the hands
of the content distributors, it was not difficult to imagine that TiVo would have a hard time to keep competition off the newborn DVR market.

Unavoidably, it happened: competition is rushing into the DVR market, spurred by an increased digitalization of the TV industry (see Exhibits 2 and 3 for Jupiter Research’s projections on how Digital TV is penetrating the US market). As shown in Fig. 4 below, TiVo’s new competition comes from within the value chain. Indeed, the digitalization of content distribution technologies has shortened the technological distance between content distribution and content recording which existed in the VTR age. Consequently, beginning with Comcast, cable and satellite providers are providing their customers with sophisticated digital top-boxes whose software and user interfaces are not so unrelated with those of DVR technologies. This has meant a terrible blow for TiVo, when in early 2005 DirectTV announced that they did not intend to renew their current partnership with TiVo and that they were set to start their own DVR business.

The prices of the DVR services given by the new entrants are offered at a significant discount to that of TiVo ($9.95 for most packages, but going down to $4.95 for some premium packages). In anticipation to this, TiVo has already started offering a free basic DVR service for some of its models which has limited functionality. Undoubtedly, the conditions are set for a brutal price war.

Also in Fig. 4 we can notice how the content distribution channels are currently expanding in the TV industry, also as a result of digital media convergence. Indeed, the convergence of telephone, TV and computer into a single piece of equipment will mean a certain increase of complexity in the value chain dynamics of video recording. Significant competition is expected to enter from sectors that, until very recently, were unrelated to television. The large telephone companies, notably SBC Communications and Verizon Communications, are investing billions of dollars to deliver a nearly unlimited supply of broadcast and on-demand programming over their broadband optical-fiber networks. Most of them have announced their intentions to offer DVR services along with their TV offering.

Most importantly, Microsoft has already deployed DVR capabilities in its Windows XP MediaCenter OS for control of the Media PC and has been heavily involved in the development of software for table-top software and interactive TV (Microsoft TV, TV Foundation Edition, Ultimate TV), while developing joint ventures and alliances with Comcast, SBC and several other telecom companies. It has already been 12 years since Microsoft considered television software one of its priorities. If IP-based television becomes a significant distribution channel for the TV consumer of the future, Microsoft certainly has all the capabilities to become a rising star in the DVR market.

In sum, to mounting competition in the DVR market due to a recent vertical integration trend of the content distributors, we must add a potentially larger presence in this space of the telecoms and computing companies (notably Microsoft to an already competitive DVR landscape. Additional competitive pressure is certainly not good news for the expected profitability of the market in the medium term.
Figure 4: Value Chain of the Video Recording Industry in the digital convergence age

The end of linear television?

Another direct consequence of digital media convergence on the TV industry is the proliferation of on-demand video content, both through IP distribution channels and through cable networks. At the end of 2004, Comcast successfully started its Video On Demand service, which allowed viewers to watch “what they want, when they want it”. At the same time, Movielink and other online services are offering downloadable movies on the Internet that customers can download for a fee and watch at their computers or TV sets. The gradual adoption by the general consumer of these types of services under the concept of Interactive TV will mean the end of television as we know it today. Any type of video content will simply be available on-demand, including recorded versions of the very limited number of programs (news, sports events) that will be broadcasted on real time. Under these circumstances, who needs video recording? Will the DVR become obsolete before it reaches maturity by the same convergence forces that brought it to life in 1999?

6. Where can TiVo be headed in 2005?

This grim panorama of low long-term prospects for profitability in the DVR market (or even the possible disappearance of the video recording concept altogether) would indicate that
TiVo may yet become another textbook case of a company that may have become immensely successful at discovering a new market and creating value at it, but not so skilled at exploiting it.

Indeed, TiVo’s factors for uniqueness were not strong enough to prevent massive entry from all parts of the value chain into the DVR market, while the break-up of its partnership with DirectTV will certainly deprive TiVo from the benefits of the satellite company’s complementary assets. Only TiVo’s brand seems to be robustly resisting the hectic period through which the industry is going. TiVo’s software platform and features seem to still be technologically superior to that of its competitors, as proven by certain recent licensing agreements. Yet, it remains uncertain whether this advantage is only temporary, especially considering that Microsoft has already set foot on the TV stage.

Taking all of this into consideration, we have placed TiVo in 2005 in the quadrant of tightly held complementary asset and hard to maintain uniqueness as shown below.

Figure 5: Complementary Assets/Uniqueness matrix for TiVo in 2003

Yet, the future does not necessarily have to be pessimistic for TiVo. The company has gained its recognition not so much for being the first company to commercialize a DVR system, but for the value-adding features of its software platform, for which there is still room for growth. Additionally, the radical changes and convergence of the TV industry have revealed new possible niches for the expansion of digital technologies. Accordingly, we could envision a future in which TiVo can transfer its current capabilities from its present video recording niche to two more ambitious areas:

---

4 In March 2005, Comcast reached an agreement by which TiVo would provide its software platforms for Comcast’s DVR services. Comcast customers will be able to either use the Comcast DVR service or, for an extra fee, use the TiVo DVR platform.

5 Besides developing Windows XP MediaStation and Ultimate TV, Microsoft is currently working on several joint projects with Comcast.
• TiVo could position its software platform as the optimal tool to search for video content, regardless of format or distribution channel (cable, IP…)

The birth of Video on Demand services, coupled with the increasing availability of online video content will create a market for software user interfaces that search for films and programs based on the user’s preferences. TiVo has nowadays the best platform to do this, which does not have to be restricted to the realm of Video Recording.

In the last few months, the company has given very clear signs that this may indeed become their future strategy. In particular, TiVo has:

  o Increased the online capabilities of their latest Series2 models, allowing these products to be programmable through the Internet and to handle digital music and digital photos from the user’s computer.
  o Signed an agreement with Netflix to establish a partnership to develop a movies-on-demand service.
  o Acquired Strangeberry, a small but very successful start-up that has developed a software platform that can precisely search for video content, independently of format or distribution channel [4].
  o Begun conversations with Yahoo! and Google to bring web video files to the TV [5].

In its current state, TiVo’s software platform could be considered as the equivalent of the Internet search engine for TV programming. With the convergence of the TV and IP channels, it only makes sense to have an extended vision of TiVo as a search engine for video content.

• TiVo could position its software platform as a targeted advertising platform

One of the exciting hot topics that the digital convergence of TV has introduced is the new role of advertising in an age of on-demand television, when customer preferences can be measured and their responses can be collected and compiled into marketing data. Even though the technology would be ripe for precision advertising, by which every viewer would only receive those ads that targeted her, none of the providers of digital television (cable, satellite) has yet jumped into this arena. Their reluctance to do so can be understood by the fact that the advertisement segment has traditionally been one with a great degree of distance from the distribution channels in the TV value chain. Indeed, advertisers have traditionally had an exclusive relationship with the Content Aggregators (TV Stations).

Yet, TiVo, being the new player on this scene, has taken a more active approach towards advertisers, and included downloadable special advertisement segments designed for TiVo users as well as special banners that pop-up while the consumer is searching for TV programs. At the same time, although advertisers were not pleased with fast-forward characteristics of the
TiVo DVR, this was never close to the attitude of open hostility that advertisers took towards ReplayTV.

In our opinion, TiVo, with its superior platform, is in an enviable position to exploit the benefits of targeted advertising. In the same way that targeted advertising became the engine of profitability for the online search industry, this could also be the case for a future video search industry that TiVo would pioneer.

7. Concluding Remarks

In this paper, we have analyzed how the digitalization of video recording has revitalized the industry and brought renewed attention to a sleepy industry that had not experimented any major breakthroughs in two decades. Paradoxically, the same digital convergence forces that have awoken the industry may be the same ones that deal it its final blow in the coming years. Indeed, the sudden integration into the DVR space of a wide variety of large players in the content distribution layer of the value chain is occurring concomitantly with the announced death of linear television due to the emergence of On Demand video content. When thinking of this situation, the image of a group of large and strong farmers that are struggling and fighting to milk a newly found cow comes to our mind. It may not take too long for them to realize that the cow is already dead.

References


Exhibit 1

**TiVo’s key financial indicators (1999-2005)**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total TiVo Subscribers</td>
<td>21,500</td>
<td>114,500</td>
<td>144,000</td>
<td>230,000</td>
<td>492,000</td>
<td>n/a</td>
<td>1,300,000</td>
</tr>
<tr>
<td>- TiVo subscriptions</td>
<td>21,500</td>
<td>114,500</td>
<td>113,000</td>
<td>115,000</td>
<td>204,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- DirectTV subscriptions</td>
<td></td>
<td></td>
<td>31,000</td>
<td>115,000</td>
<td>288,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Revenues</td>
<td>(444)</td>
<td>(1,247)</td>
<td>359</td>
<td>19,397</td>
<td>96,010</td>
<td>141,080</td>
<td>172,055</td>
</tr>
<tr>
<td>(as % of Net Revenues)</td>
<td>n/a</td>
<td>n/a</td>
<td>3885%</td>
<td>541%</td>
<td>50%</td>
<td>13%</td>
<td>22%</td>
</tr>
<tr>
<td>R&amp;D Spend</td>
<td>10,158</td>
<td>25,070</td>
<td>2,544</td>
<td>27,205</td>
<td>20,714</td>
<td>22,167</td>
<td>37,634</td>
</tr>
<tr>
<td>(as % of Net Revenues)</td>
<td>n/a</td>
<td>n/a</td>
<td>709%</td>
<td>140%</td>
<td>22%</td>
<td>16%</td>
<td>22%</td>
</tr>
<tr>
<td>Net Income (Loss)</td>
<td>(66,565)</td>
<td>(204,840)</td>
<td>(18,590)</td>
<td>(157,705)</td>
<td>(80,596)</td>
<td>(32,018)</td>
<td>(79,842)</td>
</tr>
</tbody>
</table>

*Note 1: Net Revenues includes rebates and other payments to channel, for which they become negative in 1999-2000.
*Note 2: TiVo changed fiscal year-end from Dec. 31 to Jan. 31 to better capture the holiday season in its fourth quarter.

Exhibit 2

**Forecast for Digital TV penetration in the US (Source: Jupiter Research)**

![US DTV Households (in millions)](chart)

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of DTV households (MM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>41</td>
</tr>
<tr>
<td>2004</td>
<td>48</td>
</tr>
<tr>
<td>2005</td>
<td>55</td>
</tr>
<tr>
<td>2006</td>
<td>62</td>
</tr>
<tr>
<td>2007</td>
<td>66</td>
</tr>
<tr>
<td>2008</td>
<td>69</td>
</tr>
</tbody>
</table>
Exhibit 3
Forecast for Digital TV penetration in the US as a % of households owning a TV (Jupiter Research)