The HD-DVD Business Ecosystem

Individual Assignment for course MoT9591
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Summary
In this paper we examine the case of the HD-DVD ecosystem. A business ecosystem is defined as “a network of suppliers and customers around a core technology, who depend on each other for their success and survival” [7]. HD-DVD was one of the two competing high-definition DVD standards, positioning itself as the successor of DVD. After a few years of lobbying and changing alliances, HD-DVD lost the format war to its rival, Blu-ray. The case is interesting because both standards were technologically equivalent, and the outcome was determined by ecosystem governance of the key players in each camp (namely Toshiba and Sony).

In this paper we start by identifying the ecosystem and its actors; then we analyze the connections, dynamics, and health of the ecosystem. Finally, we look at the strategies and governance mechanisms used in the HD-DVD business ecosystem. My colleague, Amin Tavahen, takes a similar look at the Blu-ray ecosystem.

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1. The Business Ecosystem

Clearly defining the boundaries of a business ecosystem is a pre-requisite for a successful study of any ecosystem. We define the HD-DVD ecosystem as consisting of the network of organizations committed to supporting the HD-DVD standard and were involved in developing, manufacturing, and selling players, discs, or components*. This network includes a diverse range of firms from the electronics industry, IT sector, content producers, and wholesalers.

A very brief history

HD-DVD, or High-Definition/Density DVD, was originally developed by Toshiba in 2002, for both data and video. Toshiba envisaged it as a success of standard DVDs and proposed it to the DVD-forum. The DVD-forum adopted the format as a standard - but some members, including Sony, refused to endorse the standard. Instead they pushed for their own high-definition optical disc format, called Blu-ray. Table 1 compares the two technologies.

Table 1 - Comparison of HD-DVD and Blu-ray [8]

<table>
<thead>
<tr>
<th></th>
<th>HD-DVD</th>
<th>Blu-ray</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical breakthrough</td>
<td>Blue laser</td>
<td>Blue laser</td>
</tr>
<tr>
<td>Capacity</td>
<td>15 GB (single layer)</td>
<td>25 GB (single layer)</td>
</tr>
<tr>
<td></td>
<td>25 GB (dual layer)</td>
<td>50 GB (dual layer)</td>
</tr>
<tr>
<td>Manufacturing process</td>
<td>Cheaper – existing productions lines can easily be converted</td>
<td>Costier – needs major changes</td>
</tr>
<tr>
<td>Codecs</td>
<td>MPEG-2, VC1, H.264, Dolby Digital, DTS-HD</td>
<td>MPEG-2, VC1, H.264, Dolby Digital, DTS-HD</td>
</tr>
<tr>
<td>Security</td>
<td>HDCP, AACS, volume-id</td>
<td>HDCP, AACS, BD+, ROM-Mark</td>
</tr>
<tr>
<td>API</td>
<td>HDi (WinCE)</td>
<td>BD-J (Java)</td>
</tr>
<tr>
<td>Backward compatible with DVD</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

The major difference between the two formats is that Blu-ray has more capacity and HD-DVD is easier to produce. The HD-DVD camp believed that the capacity they provided was adequate enough, while the Blu-ray camp believe that they could lower productions costs to comparable levels.

From the consumer’s point of view, the technologies did not differ in any relevant way (same picture quality, etc)*. The deciding factor for consumers would be which disc format has more movie titles or games, and for the entertainment industry, the deciding factor would be which format has more users, a classic catch-22. Both camps tried hard to reach a critical mass first, by aggressively recruiting other firms into their ecosystems and forming alliances. Although HD-DVD and Blu-ray players hit the market in 2006, yet by the end of 2007 the market was still in a deadlock. Neither format had a landslide lead over the other. As a result, consumers were unwilling to adopt either of the formats (choosing to wait & see). At this point, both ecosystems had spent enormous sums of money on development and marketing, without any returns. The balance tipped in favour of Blu-ray when movie studio Warner Bros decided to solely support Blu-ray. A chain of events started and finally on 19th of February 2008 Toshiba announced the “discontinuation” of its HD-DVD business [9].

One might well ask why the HD format war happened in the first place. Why didn’t the giants agree on one standard and avoid all the costs. Various reasons have been cited, one of which is patent royalties. For

* We regard necessary software as a component too.

† Some analysts such as Forester - who predicted the format war outcome with great accuracy early on - believed that the increased capacity of Blu-ray was an attraction for studios, as it enabled them to provide extra features [4]. Additionally, the HDi format in HD-DVD is mentioned as a turn-off for manufacturers because it requires Windows CE.
standard DVDs the reduced patent royalty fees are approximately as follows: 4 cents per disc, $4 per player, and $1 per PC [10] – a huge sum of money. Sony receives very little of this value, as it is not a major patent owner on DVDs. Not wanting to make the same mistake twice, it used all its experience in staging format wars to ensure its success.¹

**Central actors**

The main actors of the HD-DVD ecosystem are listed in Table 2. The total number of actors was much higher. Before dissolving, the “HD-DVD Promotion Group” listed 133 member firms [11]. We provide more detailed explanation about each of the species below.

Table 2 - Central Actors of HD-DVD Ecosystem

<table>
<thead>
<tr>
<th>Species</th>
<th>Central Actors</th>
<th>Interests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer Electronics</td>
<td>Toshiba, NEC, Memory Tech, Sanyo</td>
<td>Selling players, discs, components. For main players, gaining royalties.</td>
</tr>
<tr>
<td>PC Industry</td>
<td>Microsoft, Intel, HP</td>
<td>Selling hardware, software, and strengthening existing platform.</td>
</tr>
<tr>
<td>Movie Studios</td>
<td>Universal, Paramount, Warner Bros</td>
<td>Jump starting home video sales</td>
</tr>
<tr>
<td>Standards Groups</td>
<td>HD-DVD promotion group, DVD forum</td>
<td>Promotion of HD format, standardization</td>
</tr>
<tr>
<td>Others (non members)</td>
<td>Retailers: Walmart, Netflix</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td></td>
</tr>
</tbody>
</table>

**Standards Groups:** The HD-DVD promotion group charter states “promoting the HD DVD format, enhancing development and establishing market of compliable content and hardware” as its main goal [29]. The organization was formed on 27th of September 2004 and dissolved on 28th of March 2008, a little over three years. All major ecosystem players were members of the foundation.

**Consumer Electronics:** These firms were interested in selling of new players, components, and discs; earning royalties; and additionally, increased sales of HD-TVs.

**PC Industry:** Hardware manufacturers were to benefit from sales of new PCs and laptops. Microsoft in particular was interested in having its VC1 codec adopted (and succeeded), and additionally in getting all HD-DVD players in the world to run Windows CE (and failed). Moreover, Microsoft had benefits in Blu-ray’s failure: putting pressure on Sony’s PlayStation 3.

**Movie Studios:** The most influential of all players (the founding fathers aside), the studios saw the adoption of new video technologies a push for home video sales (having the right copy protection mechanisms of course). As you can see in Figure 1, sales of DVDs were already falling in 2007. In addition, the studios wish to embrace high-def videos sooner to pre-empt against an iTunes-like service for movies from happening.⁹

As stated, availability of movie titles on HD-DVD was a pre-condition for users to buy these players. Toshiba and Sony, well aware of this issue, try to do all in their power so that studios would sign exclusive deals to use their format. For the movie studios themselves, the choice of high-def format did not matter much, as the video quality was indistinguishable. This gave them the liberty to act “politically” in choosing and switching sides. Figure 2 shows which side each of the major studios supported, at the end of 2007. Table 3 provides some further information. When Warner Bros made the decision to shift its weight exclusively behind Blu-ray, two cited reasons include prestige; and Microsoft’s refusal to use its power to broker a deal [1]. Interestingly enough, Toshiba later admitted that it never intended to enter a format war and was dragged into it by the sequence of events [2].

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¹ Other cited reasons include prestige; and Microsoft’s refusal to use its power to broker a deal [1]. Interestingly enough, Toshiba later admitted that it never intended to enter a format war and was dragged into it by the sequence of events [2].

⁹ Due to increases in end-user bandwidth such a service is becoming feasible.
it spelled the end of the format war. With 70% of the movie market behind Blu-ray, other undecided and actors (such as the retailers) followed the lead.

### Table 3 - Allegiance of Studios

<table>
<thead>
<tr>
<th>Allegiance</th>
<th>Important Actors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blu-ray Camp</td>
<td>• Sony/Columbia and MGM/UA are owned by Sony and would naturally support Blu-ray.</td>
</tr>
<tr>
<td></td>
<td>• Steve Jobs, CEO of Apple, a Blu-ray supporter, is the biggest shareholder of Disney. So they too have a natural tendency to support</td>
</tr>
<tr>
<td>HD-DVD Camp</td>
<td>• Paramount received a generous $150M to support HD-DVD [12]</td>
</tr>
<tr>
<td>Fence-Sitters</td>
<td>• Warner Bros supported both format for a long time (and even tried to reconcile the standards). In the end, it shifted behind Blu-ray, a key move.</td>
</tr>
</tbody>
</table>

### Figure 1 - US consumer spending on DVDs [7]

### Figure 2 - Allegiance of Studio’s to HD-DVD / Blu-ray [13]

**Retailers (not part of ecosystem):** Usually retailers shouldn’t be included in the ecosystem – as they support most brands equally. In the high-definition format war they however played a role: after Warner Bros casted its vote for Blu-ray, Walmart & Netflix announced that “to avoid consumer confusion” they will not sell HD-DVD equipment anymore. This decision cut Toshiba’s access to consumers and led to its decision to discontinue HD-DVD. [14]

**End users (not part of ecosystem):** Due to uncertainty of who would win the high-definition war, consumers decided not to embrace either technology. This outcome is forced studios and retailers to take sides, and hence these exogenous actors had a huge impact on the ecosystem.
2. Ecosystem Structure & Dynamics

Structure
The HD-DVD business ecosystem contains a diverse group of actors, the majority of which are connected to the HD-DVD promotion group. Actors also have some direct connections with each other. Hence the network structure is medially connected, as can be seen in Figure 3.

In the figure, the main species and actors are shown. At the centre lies the HD-DVD promotion group, with its relations to all the main actors**. The HD-DVD PG group coordinated marketing efforts and symbolically showed who was supporting the standard. However the actual standard is owned by the DVD-Forum. The alliance types are mostly of the non-equity type†† (i.e. through consortium membership).

The four companies shown as core are the managing directors of the promotion group, and in a sense, the founders of the ecosystem. Toshiba, HD-DVD PG, and Microsoft are all hub nodes, meaning that they are central points in the network that connect many other nodes. Hubs play an important role in reducing the complexity of the network so that not all nodes need to be connected to each other. [15]. Warner Bros, HP, LG, and Samsung are brokers, meaning that they connect to multiple business ecosystems, simultaneously backing the Blu-ray ecosystem.‡‡

** Retailers are shown in a dotted line to emphasize their relation but are not part of the ecosystem or the HD-DVD PG.
†† A notable exception is Memory-Tech, a joint venture of Toshiba, Mitsubishi, and others [3]
‡‡ LG & Samsung supported dual-head high-definition drives that read both HD-DVD and Blu-ray. Warner Bros on the other hand, intended to create an optical disc that could be read in both drives. At another instance it tried to force the two camps to negotiate a truce with each other. Both projects were deemed unfeasible.
Dynamics

Volatility

Between 2004 and 2008, the HD-DVD alliance network changed quite frequently. Table 4 shows the membership count of the HD-DVD Promotion Group in various intervals during this time. (We take membership in this group to be a rough equivalence of the network alliances.) As can be seen, there was initially a gradual increase in members, until Microsoft announced its backing of HD-DVD. At this point a sudden surge in the numbers occurs. Before Microsoft's decision the network around Blu-ray was stronger, but afterwards, firms such as HP followed suit - due to their other business relations with Microsoft [16]. This shows the complexity of the relations between the firms in the ecosystem (due to parallel dependencies).

During 2005 and 2006 an attempt to reconcile both formats failed, and while both high-definition camps were rushing to introduce their initial models, the ecosystem grew only moderately. In summer 2007 an important event occurs. At this time thanks to the PlayStation 3, the number of Blu-ray players had significantly outnumbered the number of HD-DVD players. This is illustrated in Figure 4 and Figure 5. A momentum was building up around Blu-ray and had to be stopped. Luckily, two exclusive deals with Paramount and Dreamworks are signed, and the companies switch sides. This causes the war to enter a deadlock again. The deadlock was broken in January 2008 when Warner Bros decided to exclusively back Blu-ray, and which was followed by many other companies.

Table 4 - Member count of HD-DVD Promotion Group [17,18,19]

<table>
<thead>
<tr>
<th>Date</th>
<th>Managing Members</th>
<th>General Members</th>
<th>Associate Members</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 Dec 2004</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>Group founded. 4 studios pledged allegiance but not member</td>
</tr>
<tr>
<td>1 Feb 2005</td>
<td>4</td>
<td>33</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>1 Apr 2005</td>
<td>4</td>
<td>44</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>19 Oct 2005</td>
<td>4</td>
<td>56</td>
<td>49</td>
<td>Microsoft, Intel, Warner, Paramount join</td>
</tr>
<tr>
<td>31 Dec 2005</td>
<td>4</td>
<td>58</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>31 July 2006</td>
<td>4</td>
<td>60</td>
<td>64</td>
<td>HP joins</td>
</tr>
<tr>
<td>31 Dec 2006</td>
<td>4</td>
<td>63</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>2 Aug 2007</td>
<td>4</td>
<td>57</td>
<td>70</td>
<td>Paramount and Dreamworks announce HD-DVD exclusive deal</td>
</tr>
<tr>
<td>1 Feb 2008</td>
<td>4</td>
<td>57</td>
<td>74</td>
<td>Warner does not endorse HD-DVD anymore but still member</td>
</tr>
<tr>
<td>28 Mar 2008</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Group dissolved</td>
</tr>
</tbody>
</table>

![Blu-ray vs HD-DVD Installed Base](image.png)

Figure 4 - HD DVD / Blu-Ray market shares in August 2007 [20]

This is despite the fact that in non console player sales the figures were more equal. Sony’s gamble to equip PS3 with Blu-ray paid off - while for XBOX 360, HD-DVD remained an optional add-on.

*** Statistics from Home Media Research show that in 2007, Blu-ray outsold HD-DVD players by three to one in the US. In Europe, the ratio was 10 to one in Blu-ray’s favour and in Japan the ratio was 100 to one.
Looking at these changes in the business ecosystem dynamics, with major players switching sides back and forth \[21\], we can classify the ecosystem as *volatile* (albeit not in the most extreme sense).

**Development stage**

If we draw the number of ecosystem members with respect to time in a graph, we get a curve similar to Figure 6. This figure shows that the HD-DVD ecosystem encountered death during the *expansion phase*.

According to Moore \[22\], the competitive challenge of *defeating the alternative implementation* (Blu-ray) must be overcome in the expansion phase - if the ecosystem is to survive. This can be accomplished in two ways:

- Dominate key market segments
- Tie up critical lead customers, suppliers, and channels.

Toshiba was initially counting on HD-DVDs lower costs and speed to market to gain *critical mass* and defeat Blu-ray. However, due to unavailability of content\[†††\], its players entered the US market only in 2006 and it did not gain any first user advantage. Sony on the other hand was rather capable in executing the two activities suggested by Moore: it tied customers by pre-installing Blu-ray on each PlayStation 3 drive\[‡‡‡\]; and it dominated key-market segments by buying *Metro-Goldwyn-Mayer* studios in 2005, having previously bought *Columbia Pictures* in 1989. \[23\]

\[†††\] Studios refused to publish high-def content because copy-protection was not complete - AACS became ready in 2006 \[6\]

\[‡‡‡\] It is interesting to know that Sony did this at the expense of cutting out other feature of the PS3. \[5\]
3. Ecosystem Health and Performance

Iansiti and Richards [24] define ecosystem health as durable growth of opportunities for members. They provide a measurement for health based on the factors shown in Figure 7: Robustness against disruptions related to financial metrics; innovation (or capacity to explore) related to diversity of the constituents; and Productivity. Combined, these factors impact partner health and network health, which make up ecosystem performance (see Figure 8). We shall take a look at these factors.

Financial analysis

All the major actors in the ecosystem are established, major firms in some market – meaning that they are more or less financially healthy (or at a minimum resilient). To get a better picture of the financial situation we provide several key metrics for selection of the firms in Table 5. As can be observed from the table, all the firms have positive income and positive growth rates, showing that they are more or less healthy. The leverage ratio for Toshiba is higher than average (6.3), but it poses no risk as its current ratio is sufficient (1.0).

Table 5 – Financial metrics for selected firms [25]

<table>
<thead>
<tr>
<th>Measure</th>
<th>Toshiba Corp</th>
<th>Sony</th>
<th>Microsoft</th>
<th>HPs</th>
<th>Time Warner (Warner Bros)</th>
<th>Viacom (Paramount)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figures</td>
<td>Sales</td>
<td>$78.1 B</td>
<td>$90.1 B</td>
<td>$61.7 B</td>
<td>$113 B</td>
<td>$47.3 B</td>
</tr>
<tr>
<td></td>
<td>Income</td>
<td>$432.7 M</td>
<td>$2.9 B</td>
<td>$17.7 B</td>
<td>$8.4 B</td>
<td>$3.5 B</td>
</tr>
<tr>
<td>Margins</td>
<td>Gross Margin</td>
<td>23.9%</td>
<td>21.6%</td>
<td>80.9%</td>
<td>24.5%</td>
<td>11.8%</td>
</tr>
<tr>
<td></td>
<td>Pre-Tax Margin</td>
<td>1.5%</td>
<td>4.1%</td>
<td>38.2%</td>
<td>9.3%</td>
<td>7.4%</td>
</tr>
<tr>
<td></td>
<td>Net Profit Margin</td>
<td>0.73%</td>
<td>2.6%</td>
<td>28.8%</td>
<td>7.4%</td>
<td>11.7</td>
</tr>
<tr>
<td>Growth</td>
<td>Sales Growth</td>
<td>6.71%</td>
<td>3.49%</td>
<td>13.4%</td>
<td>13%</td>
<td>4.63</td>
</tr>
<tr>
<td></td>
<td>Net Income Growth</td>
<td>47.1%</td>
<td>26.2%</td>
<td>18.6%</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Dividends Growth</td>
<td>31.9%</td>
<td>0</td>
<td>40.6%</td>
<td>0</td>
<td>NA</td>
</tr>
<tr>
<td>Returns</td>
<td>RoE</td>
<td>4.1%</td>
<td>8.2%</td>
<td>54.1%</td>
<td>22.2</td>
<td>5.9</td>
</tr>
<tr>
<td></td>
<td>RoA</td>
<td>0.9%</td>
<td>1.8%</td>
<td>27.2%</td>
<td>9.3</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>RoC</td>
<td>2.2%</td>
<td>2.7%</td>
<td>42.5%</td>
<td>16.5</td>
<td>2.9</td>
</tr>
<tr>
<td>Condition</td>
<td>Debt / Equity</td>
<td>1.84</td>
<td>0.32</td>
<td>0.06</td>
<td>0.27</td>
<td>0.67</td>
</tr>
<tr>
<td></td>
<td>Leverage Ratio</td>
<td>6.3</td>
<td>3.8</td>
<td>1.9</td>
<td>2.5</td>
<td>2.3</td>
</tr>
<tr>
<td></td>
<td>Current Ratio</td>
<td>1.0</td>
<td>1.1</td>
<td>1.5</td>
<td>1.2</td>
<td>1.3</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Asset Turnover</td>
<td>1.3</td>
<td>0.7</td>
<td>0.9</td>
<td>1.2</td>
<td>0.4</td>
</tr>
<tr>
<td>Shares</td>
<td>Current P/E</td>
<td>30.3</td>
<td>8.4</td>
<td>11.8</td>
<td>11.9</td>
<td>10.5</td>
</tr>
<tr>
<td></td>
<td>Book Value / Share</td>
<td>2.99</td>
<td>34.8</td>
<td>3.74</td>
<td>15.74</td>
<td>16.58</td>
</tr>
</tbody>
</table>
### Partner health: Toshiba vs. Sony

When looking at the companies in the table we see large differences, due to the fact that the companies are in different industry sectors. Hence comparing an IT cash-cow like Microsoft with a manufacturing firm like Toshiba is not meaningful. However the comparison between Toshiba & Sony seems reasonable and is presented in Table 6.

**Table 6 – Financial comparison of Sony and Toshiba**

<table>
<thead>
<tr>
<th>Sales</th>
<th>The sales figure for both companies is rather large, showing that both companies have huge market share and are approximately the same in size.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profitability</td>
<td>Sony’s income is much higher than then Toshiba’s. In fact, Toshiba’s Net Profit Margin of 0.7% is extremely low. The returns for Toshiba are also about half of Sony’s. Overall Sony is more profitable.</td>
</tr>
<tr>
<td>Leverage</td>
<td>If we take a closer look at margins, we see that Toshiba’s Gross Margin is quite good, indicating that it has either high operating costs or high interest costs. The higher Debt/Equity and Leverage ratios point to the latter - Toshiba has borrowed considerably and is consequently paying high interest.</td>
</tr>
<tr>
<td>Efficiency</td>
<td>In the efficiency figures Toshiba wins; the high P/E indicates the shareholders confidence in Toshiba’s long-term gains.</td>
</tr>
</tbody>
</table>

In conclusion from the financial comparison, it appears that Sony has *resources for innovation* (money-wise). On the other hand, Toshiba is more efficient (*strength of management*) and shareholders seem to trust its financial capabilities more.

### Network health: HD-DVD vs. Blu-ray

Although in terms of network health, the rival ecosystems performed relatively well, but in total Blu-ray did slightly better:

- **Market visibility:** As parties of a format war, both ecosystems enjoyed an enormous amount of press coverage, and can be regarded as equal in this factor. They also spent considerable cash on attending trade-shows and running marketing campaigns.

- **Variety of partners:** Both camps had all the main species enlisted, and were again chiefly equal.

- **Number of partnerships:** In this factor, Blu-ray outperformed the HD-DVD ecosystem considerably, as presented in Table 7.

**Table 7 - Companies listed as members of HD-DVD PG and BDA in early 2008 [8]**

<table>
<thead>
<tr>
<th></th>
<th>HD-DVD Promotion Group</th>
<th>Blu-Ray Disc Association</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managing members</td>
<td>18</td>
<td>4</td>
</tr>
<tr>
<td>Other members</td>
<td>160</td>
<td>127</td>
</tr>
</tbody>
</table>
4. Strategies and Governance

Strategies

The various actors in the business ecosystem used different alliance strategies. Hoffmann [26] categorizes these strategies as shaping, adapting, and stabilizing. Furthermore he states that the choice depends on two contingencies: the uncertainty surrounding the ecosystem (very high in the case of HD-DVD), and the shaping potential of the focal firm (See Figure 9). We have identified strategies for the various actors in Table 8.

![Figure 9 - Types of alliance strategies [26]](image)

Table 8 - Strategies used by different actors in HD-DVD ecosystem

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Actors</th>
<th>Notes about this strategy</th>
</tr>
</thead>
</table>
| **Shaper** | • Level 1: Toshiba (keystone), HD-DVD PG  
• Level 2: Consortium managers (NEC, MT, Sanyo); the Microsoft, Intel duo | • Create standards / management of expectations  
• Network governance  
• Partnering (network of complementary products)  
• High risk / high pay-off |
| **Follower** | • The big studios (highly influential)  
• HP, LG, Samsung *playing both sides*  
• Retailers | • Adhere to the dominant network  
• Complementarity / compatibility are essential  
• Limited risk / limited pay-off |
| Wait and see | Small studios |

Keystone

In their article, Iansiti and Levien argue that just like their biological counterparts, business ecosystems have keystones as well. These keystone firms provide a stable platform for the benefit of the ecosystem as a whole[27]. This is particularly true if the environment is turbulent and complex (see Figure 10).

In the HD-DVD ecosystem, Toshiba clearly provided the role of the keystone. In the keystone strategy, the goal is to **maximally explore** new business opportunities and empower continuous renewal of the partner ecosystem. By co-developing the ecosystem, By co-developing the HD-DVD format, standardizing it, and then actively licensing it all interested parties, it hoped to parties, it hoped to establish a platform that would enable many applications to be developed on top of it (see Figure 11). These applications include optical drives, raw discs, high-definition movies, games, etc. Toshiba had no intent on developing any of these applications itself. This is in contrast with the dominator role, which
prefers to own as many of the applications as possible. It can be argued that Toshiba had no choice but to pursue such a strategy, as had it wanted to exploit others, the partners would have flocked to the rival.

![Image](image1.png)

**Figure 10 - Matching ecosystem strategies to environment**

![Image](image2.png)

**Figure 11 - Users, Applications and Platforms [24]**

In a more limited manner, Microsoft can also be identified as a keystone firm in the ecosystem, since it was providing the software foundations necessary for the platform, namely the V1 codec and HDi menu API.

**Governance**

In a loosely networked business ecosystem such as the HD-DVD, *strict management* is not possible and instead keystone firms resort to *governance* mechanisms. Moore states that “ecosystems internalize the system of firms and the markets that connect them under the guiding hands of community leaders” [22]. Using Moore’s definitions, we can identify the HD-DVD promotion group as a form of *quasi-democracy*. It coordinates the activities of the consortium, and its managers (the community leaders) are elected. However during the life of organization the managing members never changed. Figure 12 shows the organization chart of the group.

![Image](image3.png)

**Figure 12 - Organizational chart of HD-DVD promotion group [29]**

Vos [28] on the other hand describes business ecosystem governance as “1) providing network members with an incentive and vision to strive for a common goal; 2) giving them the freedom to reach that goal; 3) using steering mechanisms to ensure this”. Using this approach, the incentive and vision of the HD-DVD business
ecosystem are the ones stated in group charter. The freedom in reaching this objective is granted by two mechanisms. First, obtaining the HD-DVD logo and license is a relatively straight-forward process, meaning that anyone can apply. Second, membership in the promotion group is “open to any company or organization that is, or will be, engaged in the development and/or manufacture of any HD DVD content or hardware products” and subject to a small membership fee of 30,000 Yen. In other words, a firms autonomy is not jeopardized by supporting HD-DVD in any way. Finally, we come to the steering mechanisms. These are more hidden, and partly achieved by using patent rights to steer the direction of technical development (this was done by both Toshiba and Microsoft). It is also achieved, by providing various incentives (such as financial rewards) for parties to join, and actively pursuing these partnerships.

If we look at the outcome of the war and in hindsight, we can see that the governance mechanisms used by the key players in the HD-DVD camp were not as strong as the ones used in the Blu-ray camp. According to a report published by Forester in late 2005, Sony understood the needs of the studios better, and even opted to have equity alliances with them. It also had a much bigger number of companies on the managing board of the Blu-ray Disc Association, guaranteeing their interests. And it put its money where its mouth was (by bundling Blu-ray with the PS3), providing much energy to other members of its network. The combination of these factors gave the Blu-ray camp the edge to finally win the war.

**Conclusion**

We will conclude this report by briefly reviewing our findings. We defined the HD-DVD ecosystem as all firms who pledged allegiance to the HD-DVD format. The ecosystem was officially formed with the creation of the HD DVD Promotion Group in December 2004. It was disbanded in February 2008, when Toshiba announced the discontinuation of its HD-DVD business. The main species in the ecosystem included firms from the consumer electronic, PC industry, and movie studios, and others. The ecosystem was rather diverse, medially connected, and the relations between the firms complex. The environment was rather volatile, with some studios and manufacturers repeatedly switching sides, and the ecosystem as a whole in the expansion stage. The actors pursued various strategies, with Toshiba itself implementing the shaper/keystone strategy. The partners in the ecosystem were financially healthy, yet the network performance was worse than the rival ecosystem, Blu-ray’s. Finally, we had a look at the governance mechanism and identified it as a form of quasi-democracy. In hindsight, Toshiba’s governance proved detrimental in the high-definition war.

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555 As mentioned before, it is “promoting the HD DVD format, enhancing development and establishing market of compliable content and hardware”.

**** The complete procedure can be found at http://www.dvdfllc.co.jp/license/l_howto.html
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