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Working of Blu-ray & HD-DVD discs

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Abstract:

Winning over customers becomes one of the most important corporate fights when competing new technologies exist and only one is thought to survive. This study provides the results of a poll given to 1,495 people during the initial phases of the DVD format war, testing their understanding of HD-DVD and Blu-ray. Initially, HD DVD had more audience familiarity than Blu-ray, according to the findings. We develop a model that predicts consumers' familiarity with various formats based on four demographic and four characteristic dimensions.

Keywords:

Blue-ray, Cronbach alpha, Hd-DVD, Technology, VCR (Video Cassette Recorder).

1. Introduction:

DVD players have replaced VCRs since their appearance in the 1990s (Anderson and Tushman, 1990). When it came to consumer electronics, the initial generation of DVDs experienced "the quickest growth ever" (Arthur, 1989). Both Blu-ray and HD-DVD are mismatched blue laser high-definition large capacity DVD disc technologies that competed to become the next generation optical standard.

Blu-ray Discs are a type of DVD that make use of blue laser technology, while High Definition DVDs (HD-DVDs) for "High-Definition Digital Versatile Disc." As with Sega and Nintendo, VHS and Betamax, the Xbox and PlayStation, and plasma and LCD screens, market difficulties can linger after a technology war (Cozzarin, Koo and Lee, 2011). Blu-ray has won the DVD setup war as of this paper's writing with Toshiba's announcement that it will "no longer develop, manufacture, and market HD DVD players and recorders" (Carpenter and Nakamoto, 1989).

1.1. Research aim:

This article analyses and explains which format (Blu-ray or HD-DVD) had improved consumer awareness at the start of the DVD format war, or how customer comprehension for these set-ups connected to customer attributes then demographics.

1.2. Research objectives:

1. To analyse consumers' familiarity with new DVD recording formats and
2. To identify consumer variables that influence familiarity.

1.3. Research questions:

1. Where do Blu-ray and HD DVD most significantly differ from one another?
2. What factors do you believe have contributed to the internet and tangible media's (CDs, DVDs, and Blu-rays) continued ability to coexist for as long as they have?

2. Literature review:

2.1. The blu-ray:

The Blu-ray Disc (or BD) is a digital disc storing technology that can store and play back vast amounts of data in high definition, much like the CD and DVD. Its primary function is to hold high-definition video files, which cannot be held on a standard DVD.

Blu-ray gets its name from the fact that a blue laser is cast-off to read the disc, allowing for a greater data density than that of DVD's red laser. It was designed for and tested with HD video. Blu-ray discs can hold up to 25GB of data in a data layer. Compared to older disc formats, it is a noticeable increase in size., Blu-ray discs are almost the same size as Compact discs before them, but they cannot be played on regular CD or DVD players; instead, a Blu-ray disc drive is required. Though not all Blu-ray players are backwards compatible, the best ones can play CDs and DVDs.

2.2. HD-DVD:

NEC and Toshiba created HD DVD to replace DVD. High-density DVD, or HD-DVD, is a data-storage optical disc. Single- and double-layer HD-DVDs hold 30 GB. Microsoft began releasing HD DVD drives as an Xbox add-on in 2006. Intel, Microsoft, RCA, Sanyo, and Toshiba backed HD DVD; however it lost the format fight to Blu-ray. Toshiba stopped making HD DVD players and discs after declaring their decision on February 19, 2008.

2.3. Competing technologies:

Marketers must grasp the variables that influence consumers' final selections when they must pick between competitor commodities or brands (Cooper, 2000). While research has been done on innovation distribution and customer behaviour before a purchase (Fershtman, Mahajan, & Muller, 1990), competing technical versions vying to become the standard complicate the process (Behrens, 2006). In this setting, technological diversity, industry standard selection, and standard retention through gradual technological change extension occurred (Cozzarin, Koo, & Lee, 2011). Numerous studies demonstrate that being first to market with an innovation is crucial for design market dominance (Kalyanaram and Urban, 1992). However, there take been positive late arrivals as well (Fischer, 1987). Digital Video Disc (DVD) is a floppy disc format for storing high-quality video and audio recordings, such as movies. The first DVD player then discs were sold in Japan in November 1996, the US in March 1997, Europe in 1998, then Australia in 1999. DVD rentals eclipsed VHS rentals in June 2003, and by 2005, numerous outlets planned to point out VHS. Sony's Blu-ray disc was the culmination of intense picture quality research, while Toshiba's HD DVD is a next-generation system. Both are based on azure laser technology and can carry significantly more data than a standard DVD. Blu-ray is thinner and costs more than ray, but carries more data (Fischetti, 2007).

2.4. Difference between Blu-ray and HD-DVD:

Table. 1: Difference between Blu-ray and HD-DVD

Comparisons	Blu- Ray	HD-DVD
Objective	A Blu-ray is an optical disc format to store digital data including HD videos	A HD DVD is also an optical disc storage format that can store HD videos easily
Storage Capacity	25 GB (single layer), 50 GB (double layer), 100/128/200 GB (BDXL)	15 GB (single layer), 30 GB (double layer)
Usage	Data storage, High-definition video (1080p) High. Definition audio, Stereoscopic 3D, PlayStation 3 games, PlayStation 4 games, Xbox One games	High-Definition Video (1080i) with some high-end players 1080p
Developed By	Blue-ray Disc Association	DVD Forum Toshiba
Dimensions	120 mm (4.7 in) diameter, 1.2 mm thickness	120 millimeters (4.7 in diameter, 1.2 mm thickness
Laser Wavelength	405 nm (Blue-Violet Laser)	405 nm (Blue- Violet Laser)
Numerical aperture	0.85	0.65
Maximum Bitrate (Raw Data)	53.95 Mbit/s	36.55 Mbit/s
Hard Coating	Mandatory	Optional
Cost	More expensive than HD-DVD	Less Expensive than Blu-Ray
Data Transfer Speed	4.5 MB/Sec	4.5 MB/Sec
Maximum Resolution	Supports HDTV formats 720p, 1080i and 1080p	Same formats as supported by Blu-Ray disc
Audio Formats (or Audio Codecs)	DTD-HD, Uncompressed PCM 5.1 Dolby Digital, DTS-ES, Dolby True HD, Dolby Digital Plus.	DTS-ES, DTD-HD, Dolby Digital Plus, Dolby Digital, Dolby True HD
Video Codecs	MPEG-2, SMPTE VC-1, MPEG-4 AVC	MPEG-2
Gaming Compatibility	PlayStation-3	XBOX (via add-on drive)

2.5. Benefits and drawbacks of the formats:

Both HD-DVD and Blu-ray Discs come with their own set of benefits and drawbacks. The video and audio quality of HD-DVDs is exceptional. Due to the large cloud storage capacity of HD-DVD discs, it is possible to play back a variety of resolutions on these discs, including HD. Low prices for discs. Since DVD hardware and software are very inexpensive when compared to HD-programming. The Blu-ray format is more sophisticated than the DVD format. The technology behind DVD is also utilised in HD-DVD. When using the previous operating system, HD-DVD was quite simple to operate. HD-DVDs come with bonus features that are

unavailable on regular discs. The advantages include high engagement levels, access to the network at all times, permanent storage, and supplementary codecs (Wilkening, 1963).

HD-DVDs are no longer available. The format was not well received by cinemas. When it came to promoting their disc formats, Toshiba depended on Warner Bros. The HD-DVD format was discontinued by Warner Bros. at the end of 2007, which contributed to a decline in sales. Other studios have also distributed their films on Blu-ray. HD-DVD was rejected by the computer industry. HD-DVD has a storage capacity of 15 gigabytes, while Blu-ray has 25 gigabytes (Wilkening, 1963). The superior capacity of the Blu-ray disc makes it the most popular choice for a disc format. There is no assurance that HD-DVD will include featurettes, commentaries, or longer extras. The bandwidth of HD-DVDs is significantly lower than that of Blu-rays. Because of their lower bandwidth, HD-DVD discs are inferior to Blu-ray.

3. Methodology:

3.1. Data collection:

In 2005, 1495 online panellists were polled about Blu-ray and HD-DVD. This research will focus on respondents' knowledge with DVDs, not new formats. After data collection, statistical methods were used to evaluate all instruments' psychometric properties. Cronbach's alpha values between 0.67 and 0.90 show all measures' reliability. Exploratory and confirmatory factor analyses showed four factors with fairly excellent scale fit.

3.2. Data analysis:

After examining the four measures' capacity to collect the needed information, we looked at the underlying structure between consumer attributes, demographic data, and DVD format knowledge. This survey assessed people's knowledge about a new DVD recorder brand. Table 1 reveals that individuals familiar with Blu-ray (32.46%) were more numerous than those familiar with HD-DVD (10.14 percent). 64.8% this suggests that HD-DVD is more well-known than Blu-ray. H1 is accepted.

The second goal was to determine if consumer attributes may predict who is familiar with new DVD recording formats. Table 2 illustrates respondent's familiarity with the 2 DVD formats.

31.25% of those asked did non-know Blu-ray or HD-DVD, 39% knew only one, and 29.65% knew both. Ordered logistic regression (Shankar, Carpenter, & Krishnamurthi, 1998). We created extensive profiles of the three groups aware of this phenomenon.

Table. 2: Paired t-test results comparing blu-ray and hd-dvd awareness

Awareness	Blue Ray	HD-DVD	T value	Df	P value
Had you Previously heard of this feature?	32.46% Y	64.83%	-21.49	1253	0.00

The contribution of psychographic components was examined by generating two hierarchical logistic regression copies, one with only demographic data and another with both demographic variables. Table. 2's Model 1 reveals that demographic variables predict consumers' acquaintance with new DVD formats (chi-square = 149.13, p 0.01, DF=10). Males knew better about sophisticated DVD technology than females (p 0.01, t = 9.98) Students had a considerably greater level of knowledge of the most recent DVD formats (p 0.05, t = 2.20) than housewives (p 0.05, t = -1.99). Those with higher salaries knew more about DVD formats than those with lower incomes, and those under 30 knew more than those over 60.

The income effect was non-linear (p 0.01, t = -2.95), indicating that awareness grows more slowly as wealth increases. After adjusting for demographic parameters, the prospect ratio chi-square test comparison Model 2 vs. Model 1 was very significant (chi-square = 175.06, p 0.01, df=4), suggesting that the four psychographic variables contributed to overall model fit. Exam results (p 0.01, t = 3.93), consumer interest (p 0.01, t = 3.23) and technological expertise all affected exposure. Consumer independent evaluation did not predict consciousness (p > 0.10, t = 0.76). In Model 2, age no longer mattered. H2 and H3 are OK.

4. Findings and discussion:

In this finding, we can see that the most significant difference between Blu-ray and HD DVD is the amount of data each format can store. The amount of information that can be kept on a single HD DVD is 15 gigabytes, while the size of a dual-layer HD DVD is 30 gigabytes. The maximum amount of time that may be stored on an HD DVD is either eight times of high-definition video or twenty-four times of standard-definition video.

Table. 3: Three segments of awareness: a psychographic analysis

Model 1: Demographic Variables Only	Coefficient	S.E.	t-value	p-value	Sig
Intercept 1	-1.0764	0.1279	-8.42	0.0000	***
Intercept 2	0.7551	0.1255	6.02	0.0000	***
Effects coded gender for male	0.6121	0.0613	9.98	0.0000	***
Effects coded gender for female	-0.6121	0.0613	-9.98	0.0000	***
Effects coded employment status for full time	-0.1776	0.1154	-1.54	0.1238	n.s.
Effects coded employment status for part time	-0.1529	0.1491	-1.03	0.3052	n.s.
Effects coded employment status for students	0.4255	0.1930	2.20	0.0275	**
Effects coded employment status for employed	0.2774	0.2466	1.12	0.2607	n.s.
Effects coded employment status for retired or pensioner	0.0189	0.1782	0.11	0.9155	n.s.
Effects coded employment status for others	-0.3913	0.1964	-1.99	0.0464	**
Age linear effect	-0.0134	0.0052	-2.60	0.0093	***
Age quadratic effect	0.0001	0.0004	0.29	0.7751	n.s.
Income linear effect	0.0381	0.0154	2.48	0.0131	**
Income quadratic effect	-0.0068	0.0023	-2.95	0.0031	***
Chi-Square Test Comparing Model 1 with Intercepts Only Model	149.1252	Df	10	0.0000	***
Model 2: Demographic Plus Psychographic Variables	Coefficient	S.E.	t-value	p-value	Sig
Intercept 1	3.8177	0.5853	6.52	0.0000	***
Intercept 2	5.8717	0.6011	9.77	0.0000	***
Effects coded gender for male	0.3415	0.0661	5.17	0.0000	***
Effects coded gender for female	-0.3415	0.0661	-5.17	0.0000	***
Effects coded employment status for full time	-0.1386	0.1189	-1.16	0.2440	n.s.
Effects coded employment status for part time	-0.0185	0.1542	-0.12	0.9046	n.s.
Effects coded employment status for students	0.4949	0.1989	2.49	0.0128	**
Effects coded employment status for employed	0.1030	0.2549	0.40	0.6862	n.s.
Effects coded employment status for retired or pensioner	0.0210	0.1846	0.11	0.9093	n.s.
Effects coded employment status for others	-0.4620	0.2051	-2.25	0.0243	**
Age linear effect	-0.0018	0.0054	-0.33	0.7419	n.s.
Age quadratic effect	0.0001	0.0004	0.33	0.7430	n.s.
Income linear effect	0.0264	0.0158	1.67	0.0941	.
Income quadratic effect	-0.0059	0.0023	-2.50	0.0123	**
Consumer novelty seeking	0.2830	0.0876	3.23	0.0012	***
Consumer independent judgment making	0.0554	0.0724	0.76	0.4444	n.s.
Perceived expertise in technology	0.6546	0.0882	7.42	0.0000	***
DVD knowledge test score	0.5179	0.1318	3.93	0.0001	***
Chi-Square Test Comparing Model 2 with Model 1	175.0616	Df	4	0.0000	***

p<0.10; ** p<0.05; *** p<0.01

5. Conclusion:

This research coincides with the start of Blu-ray and HD-war DVD's of attrition. This study reveals that more users are familiar with HD-DVD than Blu-ray, despite HD-DVD being first to market. The technological advantage and relationship with the sector branded product (DVD) benefit HD-DVD, however our research did not control for media attention or brand recognition (such as HD-DVD existence sponsored by Toshiba whereas Blu-Ray backers included Sony). When releasing a new skill, marketers must select a memorable brand name. In light of Blu-recent ray's victory over DVD, businesses should remember that the future of competing

technologies isn't just determined by the products themselves, but also by external variables like marketing landscape alterations, product availability, compatibility (e.g. Blu-ray with PS3), and so on. In this scenario, choosing between two competing techniques wasn't based purely on their features. More research is needed to discover how price, features, and availability affect consumers' buying decisions.

6. Reference:

- (1) Anderson, p. and tushman, m., 1990. Technological discontinuities and dominant designs: a cyclical model of technological change. *Administrative science quarterly*, 35(4), p.604.
- (2) Arthur, w., 1989. Competing technologies, increasing returns, and lock-in by historical events. *The economic journal*, 99(394), p.116
- (3) Behrens, r., 2006. August sander: people of the 20th century directed by reiner holzemer. First run/icarus films, brooklyn, ny, u.s.a., 2002. vhs/dvd, 44 mins. *leonardo*, 39(5), pp.497-498.
- (4) Carpenter, g. and nakamoto, k., 1989. Consumer preference formation and pioneering advantage. *Journal of marketing research*, 26(3), pp.285-298.
- (5) Cooper, l., 2000. Strategic marketing planning for radically new products. *Journal of marketing*, 64(1), pp.1-16.
- (6) Cozzarin, b., koo, b. and lee, w., 2011. sony's redemption: the blu-ray vs. hd-dvd standards war. *ssrn electronic journal*,.
- (7) Cozzarin, b., koo, b. and lee, w., 2011. sony's redemption: the blu-ray vs. hd-dvd standards war. *ssrn electronic journal*,.
- (8) Cershtman, c., mahajan, v. and muller, e., 1990. Market share pioneering advantage: a theoretical approach. *Management science*, 36(8), pp.900-918.
- (9) Cischer, c., 1987. Understanding technology: an agenda: the social construction of technological systems. *New directions in the sociology and history of technology*. wiebe e. bijker, thomas p. hughes, and trevor j. pinch, eds. mit press, cambridge, ma, 1987. Xiv, 405 pp., illus. \$35. From a conference, de twente, the netherlands, july 1984. *Science*, 238(4830), pp.1152-1153.
- (10) Fischetti, m., 2007. blu-ray vs. hd dvd. *Scientific american*, 297(2), pp.98-99.

- (11) Kalyanaram, g. and urban, g., 1992. Dynamic effects of the order of entry on market share, trial penetration, and repeat purchases for frequently purchased consumer goods. *Marketing science*, 11(3), pp.235-250.
- (12) Shankar, v., carpenter, g. and krishnamurthi, l., 1998. Late mover advantage: how innovative late entrants outsell pioneers. *Journal of marketing research*, 35(1), pp.54-70.
- (13) Wilkening, e., 1963. *Diffusion of innovations*. By everett m. rogers. New york: the free press of glencoe, 1962. 367 pp. \$6.50. *Social forces*, 41(4), pp.415-416.