Customer Selection within Competitive Consumable Commodity Markets – An Investigation of the Video Cassette, DVD, High Definition Video Markets

by

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ABSTRACT:

Proper product design plays in important role in the success within a marketplace. In order for a product to succeed within a competitive consumable commodity market, the product must focus on specific attributes. This paper examines three historical case studies - the video cassette, the DVD, and the high definition markets. Through these three examples, trends amongst product features, consumer knowledge, brand, and the quality of technology were explored.

To further examine what influences consumers' decision within a consumable commodity market a survey was designed to evaluate consumer choice. The survey consisted of a fictitious product that shares many of the same traits as a consumable commodity device. Correlation amongst the data was examined to help discern what might drive such markets.

While numerous factors were observed within this study, the most significant results were observed regarding consumer knowledge and technology's role. Consumers tended to pick the products which they felt were most useful. Such a choice often did not correspond to the technologically superior product. As such, within a competitive consumable commodity market, it is important to design a product to focus on features that the consumers believe to be the most valuable.

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Introduction:

Consumable commodity markets constantly develop as new technologies enter the marketplace. It is important to understand how two such comparable technologies will play out in the market such that a product can be properly designed. In order to understand what drives consumer adoption, historical examples can be examined. While there are a plethora of such examples, this thesis will focus its attention upon the recordable media market because the customer base is fairly similar amongst them. The first case study examined is JVC's Video Home System (VHS) versus Sony's Betamax. After the VHS established itself in the market, it began to be replaced by DVD technology. Once again, a standards war emerged amongst the types of DVD media. The main products in this situation were DVD-RAM, DVD-R/W, and DVD+R/W. The third final case surfaced when DVD technology began to become surpassed by high definition video. The two major competitors within this standards war were Toshiba's HD DVD and Sony's Blu-Ray. This thesis examines common trends - regarding technology's implications, product design focus, consumer knowledge, and brand recognition - in all three case studies to help show how one technology is able to establish itself as the primary device.

Additionally, a survey of an imaginary consumer-focused technology product is conducted to further explore how consumers make decisions and to see if their choices were consistent with the trends found in the case studies. Using the results of this survey combined with a proper understanding of the recordable media case studies, one can improve his understanding of how to properly design a product for a consumable commodity market.

The Videotape Standards War:

One of the most famous and longest consumer product technology wars was the fight between JVC's Video Home System (VHS) and Sony's Betamax. The format war lasted over ten years. Although there were many factors that contributed to the standards war, the significant aspects of the competition will, as discussed later, continue to repeat themselves throughout future similar situations. It is important for companies to learn from the VHS-Betamax conflict such that another wasteful ten year war does not wreck havoc on consumers, manufacturers, resellers, and the general industry for prolonged periods of time.

Sony began development of the Betamax in the early 70's. At the time, Sony was completely unaware of any development of the VHS. Sony entered into a partnership with Matsushita Electrical Industrial Company, which has since grown into Panasonic and other major brands, to bring the Betamax to market. Meanwhile, JVC, a subsidiary of Matsushita, had been working on the hidden development of the VHS. After discussing with JVC, Matsushita called a meeting with Sony executives asking them to abandon the Betamax so as to avoid a standards war. However, the Betamax was on the fringe of release, and it was hard for Sony to justify calling off the project. Tempers of Sony executives flared because Matsushita had been dealing behind Sony's back. As a result, Sony refused to embrace the VHS. [9] [10]

The Betamax was released in 1975. One year later, after watching the mistakes of Sony, JVC released the VHS. Each technology had advantages and disadvantages between them. The two most significant features were picture quality and recording time.

Betamax had superior picture quality which was demonstrated through higher horizontal resolution, lower video noise, and reduced crosstalk. [18]

Betamax enthusiasts often argue that Betamax should have been the victor due to its superior technology. However, such an argument is flawed. In the video market, people cared about recording length. The initial release of the Betamax included 1-hour tapes while the initial release of the VHS operated with 2-hour tapes. Although both technologies raised recording lengths, the initial release helped define who would be the clear champion in the market. Since Betamax tapes were unable to record a full-length feature movie on a single tape, consumers were reluctant to buy it, despite the higher quality. Consumers wanted to be able to record a movie without having to sit at their TV to change out tapes midway through. [17]

By focusing on what really mattered to customers, recording length, VHS managed to control 70% of the market in 1980. Betamax's market was mostly comprised of high quality enthusiasts. Unfortunately for Sony, Betamax's market share continued to decline with the introduction of Philip's V2000 in 1980. The V2000 was a third standard superior to Betamax in terms of quality. As a result, the VHS remained strong while Betamax's market share was partially eaten away by V2000. [17]

In markets where it is clear there will be one victor and one loser standard, market share is very closely correlated to growth. The more dominant one technology becomes, the easier it is to retain and gain customers. A consumer is more likely to buy the technology that appears to be winning the standards war, than the product that is faltering – even if the failing product is superior technologically. As such, the VHS won the early

market due to recording length thus securing their dominant position despite Sony's later improvements to the Betamax recording length.

The DVD Standards War

Another major standards war erupted in the late 90s regarding DVD media. The standards war was between DVD-RAM, DVD-R (pronounced DVD dash R), and DVD+R. Before any of these technologies had been released, a group was formed called the DVD Forum. The Forum consisted of ten of the major manufacturers that would play key roles in the development and sale of DVDs. It was the goal of such a group to pick a specific technology and thus avoid any standards war. [14]

In 1996 the DVD Forum picked two standards, DVD-RAM (Random access memory) and DVD-R. DVD-R's operated on a simple one-time use dye technology. Individuals could only burn onto a DVD a single time. However, due to the simplicity of the DVD, it was much more compatible with standard DVD players. Thus, the DVD-R was targeted at the movie market. [14]

DVD-RAM, on the other hand, was targeted at the data storage market. Using a rewritable phase changing dye, DVD-RAMs could be rewritten numerous times with little degradation of quality. Random access technologies allow for fewer errors than simple sequential data storage. There is a tradeoff between speed and quality. However, normal movies can tolerate much more error in data than most data disks. As a result, DVD players expect to read data off sequentially, and thus, are not able to cope with random access. As such, DVD-RAM's could not be played on most home DVD players. [4]

The DVD Forum's selections left consumers with two technologies each with drastically different uses and markets. However, one year later, Pioneer came out with the first DVD-RW. DVD-RW's operated similar to a DVD-R except they could be rewritten multiple times. Although they still performed much worse than DVD-RAM's in terms of data storage and had a smaller chance of being able to play on a DVD player, they allowed consumers the opportunity to achieve multiple uses with one technology. [14]

Since the software for the pirating and home movie markets were still emerging, it would often take several attempts to burn a movie. At $5 an attempt, it often was not financially wise to try to pirate movies. As a result, the DVD-RW greatly increased the attractiveness to customers because it offered the ability to try to burn a movie with multiple attempts. [4]

In 2003, a group of companies formed the DVD+RW Alliance. This group was primarily led by Philips and Sony. Sony, which was previously part of the DVD Forum, helped develop and produce the DVD+R and DVD+RW. The "plus" was a marketing ploy to convince consumers that DVD+R/W was superior to DVD-R/W (pronounced dash R). [4]

DVD+R/RW was aimed as both an improvement over DVD-RW as well as an integration of some of the random access capabilities of DVD-RAM. Firstly, DVD+RW was proposed to be rewritable 100 times more than DVD-RW. However, since DVD-RW already had the ability to be rewritten 1,000, consumers did not really care. As a result, development ceased to improve the number of rewrites and DVD+RW failed to deliver on a significant increase in rewritability. [4] [20]

The second major improvement was at offering the ability to have DVD+RWs that could operate both on random access as well as sequential storage. This would allow them the data storage abilities of DVD-RAMs while still allowing movie burning. In order to make this a possibility, DVD+ players contained two technologies – constant angular velocity (CAV) for random access and constant linear velocity (CLV) sequential playback. [4]

Unfortunately for the DVD+RW Alliance, users did not really care or understand very much about the data storage improvements. In fact, a DVD+ burner that contained both CAV and CLV was significantly more expensive, thus greatly detracting customers. As a result, the production and sale of CAV DVD+ burners was short lived. [4]

Overall, the DVD+RW Alliance faltered because they targeted improvements that consumers did not understand and did not care about. In the pirate and home movie markets, the number of attempts at burning a playable movie was crucial. Once users had a burning method that worked, they did not want to try anything new. Since consumers cared very little about the improvements in DVD+RW it greatly failed to take the market.

The DVD+RW Alliance's saving grace was due to the invention of hybrid drives that could handle both formats + and -. However, barring these new drives, DVD+R/W would have likely gone the way of the Betamax. As with the video cassette industry, the same lessons regarding what features users actually care about guided the fate of DVD technology more than the quality of the technology itself. Even if the DVD+RW Alliance were able to pull together an improved DVD choice at an equivalent cost, customers would not have switched since the improvements were essentially unimportant to most users.

The High-Definition Video Standards War:

Only a couple years following the DVD standard wars, the next generation format, high-definition DVDs began to enter discussion. Sony and Pioneer began the development of a new DVD technology that involved a blue-violet laser instead of the standard red laser used in previous DVD players. Due to the shorter wavelengths of the blue laser, more data could be stored onto a disc. In 2000, Sony released the first prototype. In 2002, Sony officially dubbed the program the "Blu-Ray" and, with the help of eight other major companies, formed the Blu-Ray Disc Association. [6]

One month later, a counter-proposal was presented by Warner to the DVD Forum to compress HD video onto DVD-9's instead of pursuing a new blue laser based technology. The DVD Forum approved this proposal, yet its leading members still decided to pursue their own solutions. Five months after the DVD forum approved Warner's proposal, Toshiba and NEC announced their own blue-laser standard, later to be renamed the HD DVD. One year following Toshiba and NEC's announcement, the DVD Forum decided to back the HD DVD technology instead of the Blu-Ray disc. [3] [6]

In 2005, realizing that a repeat of the Betamax-VHS or DVD+/- standards war was eminent, both the Blu-Ray Disc Association and DVD Forum underwent numerous negotiations in an attempt to reach a compromise. Unfortunately, these negotiations failed and a new standards war emerged. [11]

The two technologies differed primarily because of their track pitches. Both Blu-Ray and HD DVD's use the same lasers, but the Blu-Ray discs contain a more tightly

packed spiral of information. As such, this allows Blu-Ray discs to contain 1.6 times more data than HD DVD. However, the tighter pitch of a Blu-Ray disc also means that the laser must be able to have a closer focus. In order to accomplish this, the plastic surface coating has to be significantly thinner. HD DVD's have a wide enough pitch that the same surface coating as normal DVD's can be used. As a result, HD DVD's could be made on current manufacturing equipment whereas Blu-Ray discs must be made on brand new equipment. The final result of the technological differences is a tradeoff between price and storage capacity. [3]

In March 2006, the first HD DVD player was released. Three months later, Sony took their first Blu-Ray player to market. While both players were around the same average cost, the Blu-Ray discs were significantly more expensive. [7]

HD DVD had a much better early entry into the market due to its cheaper discs. Each side began to form alliances with movie studios, manufacturers, and resellers. Early on, the movie studios split amongst both competitors. Neither side had a significant advantage as many of the major movie studios held off on taking sides. [3]

June 2007 marked the first turning point in the standards war. Blockbuster announced it would only carry Sony's Blu-Ray DVDs. Sony was likely able to leverage its position in other electronics markets to gain Blockbuster's support. Blockbuster has been attempting to move into the market of selling high end TV's and other electronics. [2]

By gaining Blockbuster's support of Blu-Ray, Sony gained a very large amount of visibility over HD DVD. One of the most important factors in choosing which high definition technology is whether or not movies are available. When consumers, who may

otherwise be unfamiliar of a standards war even occurring, enter into a Blockbuster and see only Blu-Ray, it greatly promotes the technology over HD DVD. Following Blockbuster's announcement, more movie studios began siding with the Blu-Ray Disc Association.

The next major victory for Blu-Ray came about due to Warner. In early January 2008, possibly still bitter with Toshiba from earlier, Warner decided to stop production of HD DVDs and support Blu-Ray completely. With such a major movie studio backing Sony, the HD DVD began into some really hard times. [3]

Eventually, Netflix also decided to help the Blu-Ray victory along by announcing it would stop buying new HD DVDs. With this development, HD DVD was finished. With no foothold in either of the major rental stores, Blockbuster and Netflix, HD DVD had very little chance with consumers. Numerous retailers, in particular Walmart and Best Buy, quickly followed up Netflix's decision by also announcing they would stop selling any HD DVDs or players. [5]

Sony lost tremendous amounts of money due to their reluctance to give up Betamax despite its obvious loss. Toshiba was wise enough to quickly abandon HD DVD when it was clear that the end was near. Less than a week following Netflix's announcement, Toshiba announced that they would no longer continue production of HD DVD. [16]

As with the videotape market and the DVD market, the high definition video market was determined by what customer's perceived as being the most useful functionality. Although Blu-ray was more expensive the cost did not have too significant of an influence within the competition. Blu-ray was also superior technologically due to

its tighter track pitches, but that also had very little effect on the market choice. The technological differences tended to only be known by the tech-savvy consumers. Many of those purchasing a high definition video player did not necessarily fit into such a category. [5]

What mattered to the consumers was whether or not they could buy and rent movies. Although many argue that Warner's decision was the turning point in the high definition war, Sony's early negotiations with Blockbuster paved the way because they acquired a significant portion of the rental market. By making the choice clear to blockbuster consumers, Sony gained a huge advantage over Toshiba. It was only a matter of time before other companies such as Warner and Netflix fell into line alongside Sony.

Market Survey:

In order to fully investigate user preferences in new emerging consumable commodity markets such as video cassettes and DVDs, a market survey was designed and carried out. The market being investigated is one in which a user must adapt a specific technology. Once an initial investment is put forth, the user must then purchase a disposable or reusable medium (depending upon the technology) in which they are able to properly use their device.

A fictitious product, a problem-set solver, was chosen for use within the survey. The target market was Massachusetts Institute of Technology (MIT) students. These customers have to regularly do problem sets (p-sets) for a large portion of their curriculum. Students on average typically have around twenty p-sets per semester, varying fairly greatly depending on the curriculum.

There were many factors and issues involved within this survey, and this paper will document the findings within. To begin, every surveyee was presented with a survey statement as follows:

> Imagine having a device that will automatically do your p-sets for you. Each device consists of a USB port and cable with which you may connect to your computer to upload a p-set. Every device has a small display screen with which you may view the worked out solution to the problems on the p-set.
>
> You are given the option of buying several such fictitious devices. If these all existed, please sort them in the order of preference. Please put the device that you would be most likely to buy on top. Put the pink card directly above the most preferential product that you would *not* buy. In other words, everything above the pink card you would buy (even if only one existed), everything below you would not.
>
> There is no right answer.

Each surveyee then proceeded to rank the results of eleven fictitious devices of this theme. The devices each had different features and aspects which would appeal to different types of people. The survey was carefully designed to achieve a sense of uneasiness in selection choice amongst the candidates such that there was no obvious solution.

The first feature was manufacturer. There were three manufacturers spread amongst the cards – Sony, Apple, and Arital. Arital was a fictitious company whose purpose was to represent the "no-name" brand often seen when shopping. The no-name brand options shared common features and performance as one of the brand name options, but were priced slightly less. Each product statement was then pasted onto an index card of a specific color depending on the manufacturer. Sony, Apple, and Arital made products were pasted on blue, green, and yellow index cards respectively. The color

visualization was an attempt at emulating a packaging psychological effect upon consumers that is often felt when browsing aisles of products at a retailer. However, packaging is not the goal of this study, so although the index cards do not fully represent the phenomenon, they achieve a level of success required of this survey. A sample such card can be seen in Figure 1:

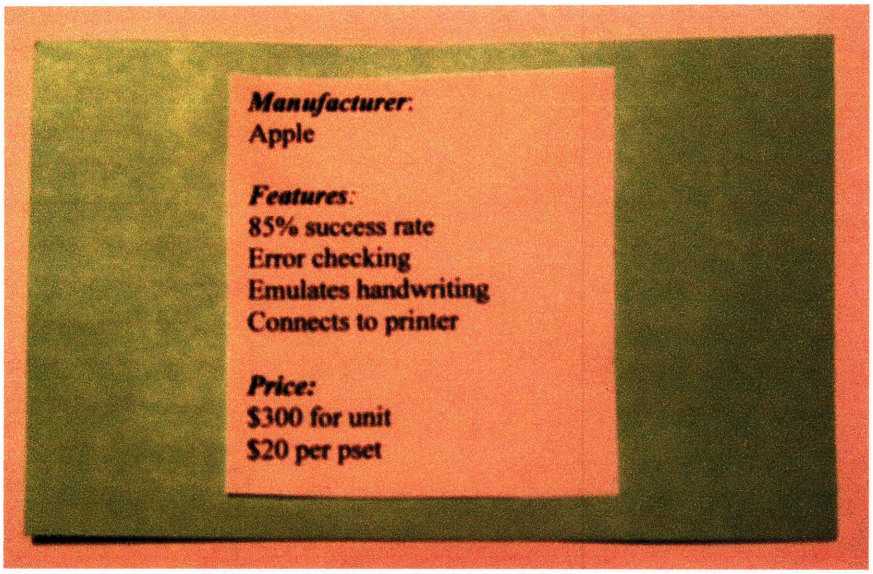

Figure 1: One of eleven cards used within the survey

As seen in Figure 1, a couple of features are listed on every card. The first feature of every single card was success rate. The success rate consisted of one of four options:

60% success rate
85% success rate
95% success rate
High success rate

If a surveyee questioned about what the success rate meant, they were told it was how often an answer to a problem would be solved successfully. If they asked what "High success rate" meant, they were told to "use their own judgment". The fourth category of ambiguous success rate will be discussed later in the results section.

Following success rate, a careful selection of other features was included. Some products contained a few features while others contained a plethora. The possible features contained on cards were:

Automatically downloads p-sets
Automatically submits online
Connects to printer
Double errata buffering
Emulates handwriting
Error checking
Reminder notifications
SLDK technology
Triple bit encoding

Similar to consumable commodity markets, most of the features do not offer very much for the consumer. Several of the features were in fact fabricated – such as double errata buffering, SLDK technology, and triple bit encoding. Likewise, some of the other features were ambiguous – such as error checking. If the surveyee asked about what any of the fabricated technologies, they were told once again to use their own judgment.

In a consumable commodity market, people often do not understand the long list of features on the side of the label. Very commonly, the label has become a joke of listing out numerous features that do not actually mean anything. For example, constant angular velocity (CAV) technology is very commonly marketed on DVD+ labels despite being a non-existent technology.

The last section on every product index card was the price. The price consisted of a fixed cost and sometimes a charge per p-set. The fixed price, which represents the adoption of a technology such as purchasing a VCR, ranged from as cheap as $100 to $1300. Additionally, some of the products included a charge-per-use ranging from $5 to $25 per p-set.

Each surveyee's year in school was recorded since people might choose differently based upon their previous interaction with p-sets and the amount of future use they would anticipate in the remainder of their academic career. For example, a freshman is likely to have much different opinions than a junior would. Seniors were omitted from the survey since they would likely not have a use of the product and their results might be skewed.

Lastly, every surveyee was qualitatively asked to describe what drove their choices. These responses provide a good sense as to what the consumer is thinking, while the survey shows how their choices actually unfold. What consumers say and how they pick choices might vary and such results will be discussed later.

Table 1 presents a detailed list of all eleven products used within the survey and their corresponding manufacturer, features, and prices:

Table 1:

	Sony	Apple	Arital	60%	85%	95%	High success rate	Automatically downloads	Automatically submits	Connects to printer	Double errata buffering	Emulates handwriting	Error checking	Reminder notifications	SLDK technology	Triple bit encoding	Fixed price ($)	Price per p-set ($/p-set)
Product A	X					X				X		X	X	X			500	25
Product B		X				X		X	X	X	X	X			X	X	1300	-
Product C			X			X				X		X	X	X		X	800	5
Product D	X				X			X	X	X				X			500	-
Product E		X			X					X		X	X				300	20
Product F			X		X						X			X	X	X	300	10
Product G	X			X				X		X							100	10
Product H		X		X									X	X			200	-
Product I			X	X									X	X			180	-
Product J	X						X	X		X		X	X				200	15
Product K		X					X	X		X		X	X	X	X	X	700	25

Survey Results:

Twenty people participated in the survey. The full results are attached in Appendix A. While most of the results varied, similar groups of choices emerged amongst certain people. The first grouping was on a fairly high level look of the data and how people chose their selections as a whole. They can essentially be broken into the following groups:

Money Conscious
Light Users
Money and Feature Conscious
Performance Driven
Not Interested

Money Conscious:

These users represented 25% of the surveyed students. The money conscious consumers tended to select the least expensive options. When asked how they evaluated their choices, all of their responses related to choosing based upon the best cost per performance. This is despite their choices usually being the least costly choices.

Light Users:

The light users consisted of 15% of the observed consumers. These users all expressed that they would only use the product occasionally, but when they did use it, they wanted decent performance. They often did not have any quarrels with paying a small amount for each p-set in exchange for a lower fixed price.

Money and Feature Conscious:

There was only one user (5% of population) that fit into this category, but it was unique and needed to be mentioned. This one person had a mixed concern between price,

performance, and features. While the surveyee only wanted fixed priced options, they strayed towards their next decisions based upon what features were included.

Performance Driven:

This was the largest group representing 35% of the surveyees. Within this group, they can be broken into two sub-groups. The first subgroup (10%) represented two people who were only concerned about performance, features, and brand name. Both of these people completely neglected price. It was also interesting to see that both of these surveyees are early adopters to other technologies thus explaining their neglect of price. The remaining 25% consisted of performance driven people who still took cost into consideration slightly. Most of the performance driven people ranked all of the 60% success rates near the very bottom. The rankings selected by performance driven people were almost exactly opposite than the money conscience group.

Not Interested:

Three of the twenty students, 15% of the market sample, expressed no interest in any such products. All three of these students justified their choices with the fact that they would do the p-set on their own and that it was not worth the money to them to use it to check their solutions. As with any market, there are always people who would not purchase the product. All of their rankings fell into one of the above categories, but they were separated out of the survey results due to their likely different attitudes.

Discussion:

Knowledge of technology:

There are several interesting findings within these results. The most significant result is how class year affected people's rankings. Of the seven freshman interested in purchasing the product, only a single one of them fit into the performance category. Thus, nearly all of the performance category candidates were upperclassmen. While freshman price sensitivity might be accounted to the amount of money they have in the bank, it should not vary greatly between freshman and sophomores due to similar financial status. As the study shows, there is a great divide in choices between freshman and sophomores.

However, the counter example did not hold true. The non-freshman surveyees had a very weak correlation between their selections. This brings to light some important considerations about how the "student p-set" market operates.

Upperclassmen are likely "more informed" consumers when it comes to evaluating the products. As a result, they are more likely to valuate the importance of performance more than a freshman would.

This is comparable to how other consumable commodity markets operate. The heavy users who are more knowledgeable about a market or product tend to be people who are performance driven. These people tend to be early adopters and people willing to pay a little bit more for performance. In the video cassette study, these people would have tended to be the people who bought Beta-max due to the higher quality video tapes. In the DVD market, these consumers would have likely purchased DVD+ early on before it became apparent that CAV technology would not become a reality. In the high definition video case, these early adopters tend to be represented by Blu-Ray candidates. [12]

As can be seen in all of three of these case studies, the early adopters' selection does not necessarily win or lose. In a consumable commodity market, most of the consumers tend to fit into the unknowledgeable category as the freshman did in the p-set market survey. They are the consumers that drive a large portion of the market growth. As such, the technology should be designed in order to reach out to this group of people.

While it is nice to have the technologically superior product, and thus its corresponding market, a product's technology is only a small aspect of what actually drives its success. [8] For a consumable commodity market, the features of a product must revolve around what is most important to the consumer. For the video cassette market, length of recording was the most important such that users could record a movie while they were away from their TV. For the DVD market, users did not understand all of the fancy reasons for why to adopt DVD-RAM or DVD+, thus, they avoided those technologies and stuck with the least expensive technology that they knew worked, DVD-. In the high definition video market, people cared about whether or not they could rent movies. Lastly, in the p-set market, the ill-informed users, freshman, only wanted to use the device to help them out, instead of completely solving the assignment for them – as such, they did not care too much about performance but did not want to pay a significant price.

Brand Recognition:

In 35% of the surveyees, or seven of twenty people, brand seemed to influence their results. For most of these people, however, the ranking usually only presented itself when faced between two nearly equal choices with a slight price increase on the brand

name. For example, Product H and Product I are very similar. Product H, made by Apple, was $20 more expensive than Product I, made by Arital.

It is also interesting to note that the most brand-influenced surveyees were both of the two people who completely ignored price. One of these two consumers actually ranked all three Arital products as his least favorite. When questioned about his selection, this surveyee responded that he was not willing to buy such an expensive product from a brand he had never heard of.

Overall, brand played a fairly minimal role in this survey and in all three case studies. Although VHS won, few people would be able to name the manufacturer, JVC, whereas most people know that Sony manufactured Betamax. If asked to name DVD manufacturers, most people will name Phillips and Sony – the two major companies backing DVD+. Very few people will name Pioneer, the company backing the most successful format, DVD-. Although the well-branded technology won out in the high definition market, the brand was not the leading reason. The survey demonstrated that the well-informed customers typically fall for brand more, but as all the case studies show, these customers are not crucial to the eventual adoption within a competitive consumable commodity market.

Pay Per Use:

In observing the surveyees, it was a common trend for people to express disgust at paying per p-set. When asked about how they did their rankings, surveyees almost always responded that they only wanted the fixed cost products. However, despite these verbal responses, the results of the survey tend to suggest that people are not totally opposed to such a system.

Product A vs. Product C and Product D vs. Product E are useful in investigating people's feelings on the pay-per-use model. A and C differ in manufacturer and pricing model but have equivalent features. D and E are both made by brand name manufacturers but vary on non-success rate features and price. As such, if a surveyee selects both Product A above Product C and Product E above Product D, then they do not mind a pay-per-use option if the fixed cost is reduced.

Seven, or 35%, of the twenty surveyees scored positive on both of these situations. Most of these candidates all expressed that they formed their selections such that they did not want a price-per-use model. Despite their verbal concern, their selection completely contradicts such an argument. As such, it was found that in a consumable commodity market, a price-per-use model might stimulate bad press, which in turn might affect customer adoption, but the pricing model alone will not directly affect sales.

Unknown Features:

In a consumable commodity market, very few consumers understand many of the features offered on a product. For example, DVD cases are filled with numerous features that very few people, even tech-savvy people, can explain. As such, many of these markets have grown into the practice of filling their product label with a long list of features that few people understand.

The survey included three fictitious features (SLDK technology, triple bit encoding, and double errata buffering) and one ambiguous feature (Error checking). It is interesting to note which surveyees questioned as to what the features did. Nearly all of the performance driven people asked about one or more of the unknown features while the money conscience group occasionally asked.

This is on par with what occurs in the consumable commodity market. If a DVD+ label advertises CAV technology very few people are actually going to ask about what it means. Additionally, most of the people who do ask are likely to fit into the performance driven category. Thus, the market winner will likely not be determined by who has more unknown features.

In addition to the unknown features, Product J and Product K both had a "High success rate" instead of a defined number. Most surveyees questioned as to what it such a statement actually meant and were usually frustrated to not receive an answer. Despite their frustration and their dislike of the hidden performance, many people still ranked these two products somewhat high – in particular Product J. Product J appeared in the top 50% of the majority of surveyees.

The price conscious group tended to rank according to price so they paid little heed to the neglected success rate metric. However, only a single person of the performance driven group selected one of the 60% success rate products over either of the high success rate products. Thus, despite people's displeasure of the withholding of information, the people who look at performance tended to select the unknown product over the poor performance product. As such, in a consumable commodity market, withholding such information with an ambiguous phrase is likely better than marketing the actual performance. Overall, since most people do not fall into the performance driven group and thus do not pay much attention, such a marketing tactic should not make a huge effect, but it should not make a "poor performing product" any worse.

Conclusion:

Through studying the markets wars for video cassettes, DVDs, and high definition video, one can gain a better understanding of what drives consumer choices in a consumable commodity market. In all three cases, one of the products was always marketed as the superior technology. Despite this marketing effort, the competitor who focused on what was important to the consumers always won out. In the video cassette market, JVC won because the VHS's tape was initially released with a longer recording time. Consumers wanted a tape with which they could record a full movie from start to finish while being away from the television. In the DVD market, DVD- was the most successful because it took the movie market first. Consumers did not care to adopt a secondary technology for "performance upgrades" in which they had no desire for. As such, DVD+ faltered greatly in attempting to seize the market away from DVD-. In the high definition market, Blu-Ray was successful because it strived for a monopoly within the movie rental market. Without an option for renting HD DVDs, the technological victor of the high definition video market became very clear.

The survey conducted helped reinforce many of these principles in understanding how customers make decisions in consumable commodity markets. Whether or not a consumer is knowledgeable about the potential of the technology greatly effects user adoption. In most cases, such as the three case studies, consumers are not aware of the benefits of such technologies. As such, their choices get driven by what they perceive as being most useful to themselves, whether that value be cost or a specific aspect of the product.

Brand recognition also played little to no role in both the survey, as well as, the three case studies. Brand recognition can offer a lot in high tech markets, but when faced with a consumable commodity market, only performance driven people tend to be the only ones swayed by brand.

Pay-per-use did not seem to have a significant influence on people's decisions despite large amounts of negative commentary. When given an option between a high fixed cost choice or a low fixed cost alternative with a pay-per-use fee, surveyees selected both options. While such pricing was not important in the video cassette market, it was a big issue in the DVD market. Every time someone burned a DVD-R or DVD+R, they could not reuse the medium. As such, cost per blank DVD was always on the forefront of people's minds. The solution to this was DVD-RW and DVD+RW. Even with these technologies, people continued to buy DVD-R and DVD+R because they offered a better chance of playing in a DVD player. Despite the consumer complaints of DVD costs, people were still willing to pay more per use in order to minimize their time spent burning and the amount of frustration in getting a movie to play.

Lastly, non-essential features also proved unimportant in user decisions. In the video cassette market, the only feature that was important was recording length. Few people cared about the differences in resolution, video noise, and crosstalk. Likewise, in the DVD market, most people did not understand what many of the features did. Thus, Sony and Phillip's attempt at seizing the market with DVD+ and CAV technology was flawed. Lastly, the high definition market proved no different. While Blu-Ray had better technological features, Sony won because of its focus on the monopolizing the rental market.

Overall, through these three cases and the conducted survey, it is apparent that in a consumable commodity market the most important driving factor in consumer adoption is what the consumers actually value as being the most useful. This could be price or performance, but more often it is some minor detail regarding how consumers plan on using the device. By properly designing a product to address these consumer uses, a technology has a better chance of surviving a competitive standards war.

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Appendix A – Survey Responses

Class Year											
1	D	I	H	B	J	F	G	E	C	A	K
1	C	A	B	K	J	D	E	I	G	H	F
1	D	C	B	I	G	H	F	A	J	E	K
1	D	I	H	C	B	J	G	A	K	F	E
1	D	I	H	F	C	E	G	J	A	K	B
1	J	C	A	D	F	E	K	B	G	I	H
1	J	E	F	D	A	I	H	G	K	C	B
1	J	F	E	A	D	H	I	G	K	C	B
2	B	C	D	J	F	E	A	K	G	I	H
2	C	A	D	F	J	B	K	E	G	H	I
2	C	B	A	D	F	E	J	K	I	H	G
2	I	H	D	G	F	J	E	C	B	A	K
3	A	C	B	J	K	F	E	D	I	G	H
3	B	A	C	D	F	E	H	G	I	J	K
3	B	K	J	A	E	D	H	G	C	F	I
3	C	A	E	D	F	B	K	J	G	I	H
3	D	I	H	F	G	J	E	C	A	K	B
3	F	H	E	I	G	J	D	A	K	C	B
3	H	I	G	F	E	D	A	C	K	B	J
3	J	E	A	F	D	K	C	B	G	H	I

Responses listed in order of preference from left to right. Black indicates that the user was willing to purchase that particular product while blue represents a product they were unwilling to buy.