HEWLETT PACKARD: CONTINUING DOMINANCE IN THE PRINTER INDUSTRY

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1. EXECUTIVE SUMMARY

By the 2006, Americans will be printing 1.8 trillion pages and spending $15 billion a year on ink and toner. Printers are one of the most important complements to the PC, needed by users both at home and in the office to transfer any electronic document onto paper. Since the first dot-matrix printer was introduced into the market in the early 1980s, printer technology has rapidly evolved to become machines that are increasingly efficient in producing sophisticated looking documents both in color and black-and-white.

Hewlett Packard is a global leader in the industry of home and office printing. Even after merging with Compaq in 2002, HP's Imaging and Printing group accounts for about 30% of the companies revenues and is markedly the most profitable division with earnings 1.4 times that of the company as a whole. Recently HP has faced new challenges with the entry of Dell and the surge in inkjet cartridge refill kits. This paper explores the challenges that HP faces in maintaining its dominance in the printer industry with respect to the competitive landscape and its current business strategy.

2. BACKGROUND ON HEWLETT PACKARD

HP was founded in 1939 by Bill Hewlett and Dave Packard. The company has its roots in the electronics, microwave, and radio industries. World War II government contracts enabled the business to grow into a million dollar company by 1944. By the 1960s, HP had diversified into personal computing, starting with programmable calculators in 1972, and eventually entering the desktop market in 1980. HP first entered the printer industry in 1984 with the introduction of the first thermal inkjet printer and print cartridge. HP's ThinkJet printer was the first low-cost, mass-produced product that truly enabled a disposable inkjet cartridge that could be used in a wide variety of applications. This quiet, portable device was quickly established as being reliable with far superior printing quality compared to dot-matrix printers.

In 1988, HP introduced the DeskJet line of inkjet printers. These printers are still in production today, and have been the most successful printers in history. In 2003, HP

released over fifty new imaging and printing products. The value and ease of use associated with these products has helped HP retain its dominance in the inkjet market. Currently, HP is the most dominant force in printing solutions. HP has grown into a global company over the past ten years, generating 61% of its sales overseas in 2003.

3.   PRINTING TECHNOLOGIES

3.1   Inkjet printing technology

Inkjet printing is a non-impact method in which various colors of ink are squirted through microscopic nozzles to create an image on paper. The basic technology involves a print head scanning the page in horizontal strips as a motor assembly rolls the paper in vertical steps. HP, based on a technology developed by Canon, pioneered the thermal inkjet printer technology. This uses the pressure fluctuations that result from heat transfer to eject ink from the cartridge. The use of heat requires a temperature resistant ink and a lengthy cooling process, slightly decreasing the print speed.

Epson's inkjet technology employs a piezo-crystal at the back of the ink reservoir. The crystal flexes when an electric current flows through it, forcing a drop of ink out of the nozzle. This process allows better control over the shape and size of the ink droplet release. Smaller droplet sizes lead to higher nozzle density. Temperature independence allows great focus on improved ink absorption.

Continuous flow printers generate a steady stream of ink, deflecting drops electronically onto the printing medium. Considered the oldest inkjet technology, it is used in high-speed production lines to print small characters on product surfaces. However, image resolution is difficult to control and the complex ink-circulation system requires maintenance.

3.2   Laser printing technology

Laser printers are based on a technique used in photocopiers. Heat and pressure are employed to fuse dry toner to paper. Cyan, magenta and yellow can be combined to produce color images. Four passes are performed, generally placing toners on the page one at a time or building up the four-color image on an intermediate transfer surface. The

major limitation of the technology is that it must have all the information about a page in its memory before it can begin printing.

Light-emitting diode (LED) printing was invented by Casio, championed by Oki and also used by Lexmark. This technology replaces lasers and spinning mirrors with an array of LEDs. In the mid-1990s, it was touted as a milestone in laser printing as it had fewer moving parts they have longer lifetimes and are generally cheaper than laser printers. This comes at the cost of lower print resolution.

3.3   Cost-benefit analysis of inkjet v. laser printers

Inkjets have traditionally been more popular in the home market than laser printers as they are generally cheaper. There is no warm-up cycle or down time associated with inkjets. These printers are user friendly, requiring no special training and cartridges that are clean and easy to install.

While inkjets are cheaper to buy than lasers, they are more expensive to maintain. Cartridges need to be changed more frequently, and expensive paper is required to produce high-quality prints. This adds up to a per-page cost approximately ten times that of a laser printer.

Laser printers have several advantages over inkjet technology. They produce a high volume of pages per month at faster speeds, and are capable of producing extremely high-quality text and graphics. For this reason, laser printers have found greater success in the office and industrial markets.

4.   INDUSTRY ANALYSIS

The printer industry targets several different markets, including home and home office, small and medium businesses, large enterprise businesses, and professional printing services. The product is also highly differentiated, as there are a multitude of different printers including color inkjets, monochrome lasers, photo printers, mobile printers, and multifunctional all-in-one printers. HP competes in nearly every product category, developing printers to satisfy all specialty needs. Competitors have developed similar product lines, although each company tries to stand out by focusing on different segments of the market.

4.1   Competition

Epson holds the second largest share of the printer market (see Appendix I). Like HP, Epson sells inkjet printers, photo printers, as well as all-in-one printers. Epson's strategy does not focus on meeting office market's needs, as the company has chosen to focus on other unique niches to differentiate itself within the industry. It is the only company to still sell dot matrix impact printers marketed as a solution for high volume printing. Epson also targets the retail and banking markets by providing them with "point-of-sale" printers that have the ability of printing receipts, invoices and validations with ease. Furthermore, Epson has developed complete in-studio printers to serve the needs of professional portrait printing services.

Canon provides printers for two markets, the home and office users. For the home user market, they have a large selection of color all-purpose, photo and mobile printers. For the office users, Canon primarily focuses on laser printers to meet the business's document printing needs by providing large format color graphic printers, as well as black-and-white and color printers. Canon also offers a wide array of software and enabling technologies that support their office printers. These products focus on enabling document distribution and management, network management, and security data protection.

Lexmark, originally a spin-off of IBM, has developed into one of the largest printing companies in the world. Lexmark's primary focus is on small to medium businesses, but also seeks to meet the needs of home and home office users. It offers inkjets, monochrome and color lasers, dot matrix printers, as well as all-in-one printers and multifunctional printers for home and small business users. Lexmark clearly differentiates itself from some of its rivals, as it does not target the large enterprises and industrial printing services. They also do not offer mobile, photo, or large-format printers.

There are several other companies like Xerox, Ricoh, and Konica/Minolta who compete by focusing on the industrial and large enterprise markets. For example, Xerox found initial success with its photocopiers, and has now applied its technology to both monochrome and color laser printers.

4.2   Threat of entry

The threat of completely new entrants into the printer industry is highly unlikely because there are currently enough companies competing to satisfy the various niches within the industry. HP alone poses a huge deterrent to entrants in the home, small business, and large enterprise market segments. The other manufacturers have filled every other niche, like Epson with in-studio photo printing.

There are also relatively large start-up costs and technological barriers associated with entry. HP has spent billions of dollars in research to developing both patentable and proprietary technology. In addition, since initial units are expensive to produce and typically sell at their marginal cost, it requires an extraordinary large investment that is largely unprofitable until years later when ink replacement becomes a large business. At the present time the market is too uncertain to be appealing to yet another entrant.

While entry may be unappealing to a new printer company, there is a threat as computer manufacturers can enter the market through partnerships with existing printer manufacturers. These partnerships allow companies to bundle printers and computers together, an effective way of increasing replacement ink revenue. Currently, Dell has adopted this strategy through a partnership with Lexmark, a threat to HP that will be examined in a later section of this paper. If Dell is successful, HP could face competition from other similar associations.

4.3   Rivalry

The printer industry is generally rivalrous when it comes to selling the actual printers. This is partially driven by the fact that the industry is not at all rivalrous when it comes to the ink cartridges. Following the razor-blade model, printer manufacturers go to every length to get their printers into the hand's of the consumer. Once a consumer has a printer, the manufacturer has an effective monopoly on the supplies for that printer. Nevertheless, the fact that manufacturers have not yet stooped to selling printers at a loss indicates that the industry is not as rivalrous as it could be.

4.4 Complements

There are many complementary products used in conjunction with printers to transfer electronic media onto paper. The list encompasses a variety of electronic devices including personal computers, digital cameras, camera phones, scanners, and PDAs. There are also products that serve as complements to the printer itself, the most important of which are paper, ink and toner. Software and hardware that facilitate document and network management further augment the list of valuable complements to printers.

4.5 Substitutes

The printers themselves are the primary substitutes for one another. The integration of computers in society requires that the majority of computers be connected to a printer. However, in some cases, printing services can be a substitute for printers. For example, Kinkos offers both personal and business printing solutions. A home user could use Kinkos' online services to print personalized invitations, photo calendars and cards, as well as documents. Kinkos currently provides printing services in such industries as financial services, healthcare, education, telecommunications, and pharmaceuticals.

The photo printer has become increasing popular as it enables home users to print their own color pictures. These photo printers are often bundled with digital cameras or scanners. However, many of the photography companies like Nikon, Kodak and Olympia currently serve this photo printing market by offering online printing services.

4.6 Buyer power

Concentration among buyers and their internal competitiveness are both determinants of buyer strength. In a highly rivalrous printer industry, numerous companies have produced similar product lines that have subtle differences in their features. Due to this competition, price ranges are set for the different types of printers, and home and home office buyers do not have significant purchasing power. However, companies also serve larger business and enterprises, including large corporations, government agencies and educational institutions. This segment of customers is likely to gain some bargaining power from economies of scale.

4.7   Supply power

Input supplies can be divided into two main categories: raw materials and specialized components. Raw materials consist of the more structural components that construct the physical printer unit, whereas specialty components include most of the functioning parts of the printer. Since many of these input supplies for raw materials are not highly differentiated, the inputs from one supplier can easily be replaced by goods of another supplier. This lack of supplier power for such raw materials was further reduced after the merger with Compaq. More specialized components, such as ink, are often outsourced to gain from the expertise of others.

5.   HP'S STRATEGIES LEADING TO CURRENT MARKET POSITION

5.1   Superiority in technology

HP's success in the inkjet printing market has revolved around its superior technology, and the company's ability to continually improve both quality and price. The print quality currently rivals that of silver halide for photographic printing. HP has been able to maintain the highest price/performance ratios for digital printing across broad markets and applications. Moreover, the low overall system cost enables expanding opportunities for printing in the home, on the desktop and in professional applications. With around $1 billion a year devoted to R&D in their printing division, they have produced a large line of high quality printers and advanced inks. The company's engineering goal is to create a printing system that displays the best combination of features for a particular application, which has resulted in various successful product lines. For example, HP's DeskJet series was originally designed for home users, and the printers are noticeably quiet, unobtrusive and clean. HP OfficeJet series, targeted to home office users, has enabled the "All-in-One" performance category to expand rapidly. This product line provides all advantages of versatile printers along with color scanning, color copying and color faxing. HP's constant strive to improve their printers has resulted in a new brand, APOLLO. This product series possesses many of the features that made the DeskJet series successful, but also recognizes the style-conscious considerations of many users and is designed to fulfill the vision of "Great Value. In Style".

It is also interesting to note that technological development does not focus solely on the printer. HP has devoted some of its resources to improving the ink. Traditionally, laser printers have the ability to produce black-and-white documents that are far superior to inkjets. However, HP has developed a new black ink whose primary goal is to address this difference.

5.2   Meeting customer needs and maintaining loyalty

HP recognizes that customers have varying needs for image quality, print speed, cost, reliability, media flexibility, ease of use and new applications. To keep customers loyal, HP continues to add features to their printers that result in different types of multifunctional printers that have the ability to incorporate the advantages of current printers with color scanning, color copying and color faxing. HP's vision is to ultimately produce an integrated work environment such that all communication can be in color rather than just print.

HP further reaches customers through bundling deals. HP can easily bundle their printers with Compaq computers, expanding their product base. This kind of marketing is particularly important in the printer industry, where the consumer only has buying power when they actually purchase a printer. Few people will refuse a "free" printer that comes with the computer they are already buying. Once they have that printer, the cost of switching to another brand is relatively high, allowing HP to charge monopolistic prices on ink.

5.3   Identifying technology and market trends

One of the company's strengths is its ability to identify the technological and market trends while considering customer's evolving needs. First, the company believes it is important to make available photo quality printing at an affordable price for a broad customer base, including home users, office and even large format printing. HP also recognizes that telecommunication and internet are becoming the driving forces for the next decade (see Appendix III). For example, in a recent press release, HP announced that the color fax machine is becoming an affordable solution. The company

acknowledges that gradually there is a shift from the printer business to the printing business, as profits can be attained in both consumables and services.

5.4   Leverage from supply and manufacturing

HP has always been capable of leveraging their size and dominance in the printer market to attain low supply costs. However, this capability has vastly increased since the merger with Compaq. Once the merger was completed, HP decided to consolidate its supply chains to eliminate redundancy, thereby increasing volume leverage towards manufacturers. Since HP purchases $37 billion in direct materials every year, they rank as the largest customer in many industries. According to Jeff Clarke, executive VP of global operations, "there's nothing from an earnings perspective more important than the leverage we can drive off of our supply chain." This leverage was immediately felt by the manufacturers, as HP immediately renegotiated all contracts based on the new size of the company.

6.   THREATS TO HP'S CONTINUED SUCCESS

HP's printers yield huge profits annually. In second quarter 2004, HP reported profit margins for printing and imaging of 16%. Its dominance of inkjet and laser printing has put them in a great position to reap the rewards of the highly lucrative market for printer supplies. A loss of market share in this area would result in horrible repercussions throughout the company.

6.1   "Dellmark"

In 2002, Lexmark entered a partnership with Dell to make Dell-branded printers and ink cartridges. Dell, a company that has become a forefront in personal computing, has traditionally been a small player in the printer industry. However, HP executives now say that Dellmark is "enemy number one." As a printer company, Lexmark has established itself as a noticeable competitor. A simplified distribution method through Dell will result in lower prices. The printer market offers a strong compliment for Dell as bundling can act as an incentive for buying a new computer or simply a means of getting

their printers out into the general population. Currently, Dell has focused on selling mostly low-end inkjets, as well as all-in-one printers. Within the first year, Dell-brand printers captured 1.4% of the market. However, Dell's products will have to be considerably higher-end than its current line if it wants to challenge HP's dominance in the lucrative corporate printer market.

6.2 Increased Use of Ink Cartridge Refill Kits

The US market for toner and ink cartridges is about $15 billion annually, and is estimated to make up about 80% of the profits for printer manufacturers. HP has prevented competitors from entering its ink market through propriety technology that is necessary for compatibility with their printers. Nevertheless, there is nothing preventing a customer from refilling an HP ink cartridge that already contains the technology. Analysts expect these much cheaper substitutes to grow from 21% to 30% of the market by 2006. HP will continue to lose money as more and more consumers are educated about the substantially lower cost of this option.

7. STRATEGIES TO MAINTAIN DOMINANCE

7.1 Strategies against Dellmark

HP can enter a price war to try to beat Dell on printer prices, while continuing to reap profits from the ink cartridges. Since consumers are not extremely price sensitive, this might be a viable option. HP has to continue its strategy in maintaining customer loyalty. In a price war, HP has some additional value from their brand name and reputation for quality. HP has a further advantage in their wide variety of printers for every market niche. In contrast, Dell does not yet have the ability to meet those customers' specialized needs due to a smaller selection of Lexmark products.

HP has announced it is prepared to fight a price war, declaring its readiness to be "as aggressive on price as we need to." This is the opposite attitude that HP should be taking. The combination of Lexmark's printer experience and Dell's distribution capabilities will result in low marginal costs that are comparable to HP's. HP shouldn't be trying to make this a price war without any direct pricing advantage. While it is true

that they should be aggressive on price, they should instead promote their reputation for quality by publicly announcing little concern to be competing with an inferior product. They should use their brand to establish that, when on an equal price footing, an intelligent consumer will purchase the HP product.

7.2   Response to Ink Cartridge Refill Kits

There are several strategies that HP can consider implementing. First, they can ensure that their quality of ink remains superior to the refill ink. In developing ink, there are several key areas to consider (see Appendix IV). Non-HP inks have several limitations in terms of quality and reliability, both in terms of its output on the paper for posterity as well as its incorporation into the printer. Often times, non-HP inks can cause serious damage to the printers by causing ink spills. This results from an incompatible composition of the ink. For example, HP inks may be designed to have a specific boiling point to meet the printer's technology.

HP can work to develop disabling technologies to prevent the cartridge from being refilled when the ink runs out. This would effectively preserve HP's monopoly in cartridges. HP could also consider competing by providing consumers with a convenient alternative to replace the ink themselves. However, this alternative takes away large profits from the cartridges themselves, but continues to allow HP to extract profits from the ink.

Another solution is to customers with incentives to discourage the use of refill kits. Hp is currently testing a program in which they include postage paid boxes with new ink cartridges to encourage consumers to return them for recycling when they are emptied. Each returned cartridge is effectively a guaranteed sale of a new cartridge. This method of "recycling" the cartridges is a viable alternative to combat the refill kits, however, it is questionable whether customers would take the time out of their busy schedule to mail in cartridges.

**7.3   Other Strategies – Focus on Developing Markets**

HP is in a relatively good position to expand into developing markets. The company's size allows them the ability to employ a global sales force in regions where smaller companies simply cannot afford to target. In the Philippines, for example, HP has 79% of the market share in the laser printer business. This is a country that buys only ten-thousand units a year, yet HP has an entire regional division. Since HP ships over 1 million units a week, it has the revenues needed to reach far off in to developing markets. Analysts suggest that technology-related durable goods in developing Asian communities will grow on the order of 15 to 20% a year during this decade. Such economic growth is already starting to be seen as China led the Pacific economy with GDP growth of 9.9% in the first quarter of 2004. Considering that HP is well-positioned within these communities, it already has a monopolist type advantage as other companies began to enter and sell in these markets.

8.   CONCLUSION

It appears as though the rivalry between Dell and HP will contain yet another front for battle. Dellmark certainly appears to be HP's most challenging new threat, far more imposing than that of the cartridge refill. Despite Dell's success in nearly every market of consumer electronics they have entered, they are now entering the domain of HP, who has left its competition in the dust in the world of printing. Dell has decided to plant a sapling of a printing business next to HP. While they may make inroads, Dell will be relegated to the shadows of HP's deep-rooted ability to dominate the printing industry.
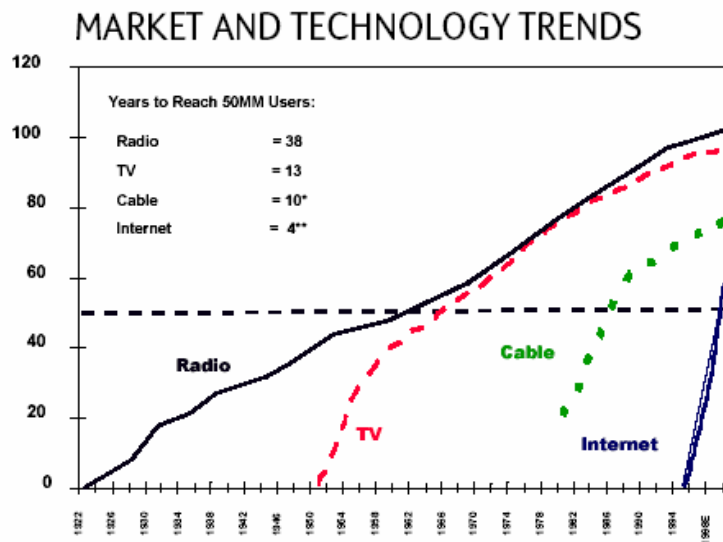
9. APPENDIX

Appendix I

Worldwide Printer Shipments 1Q03
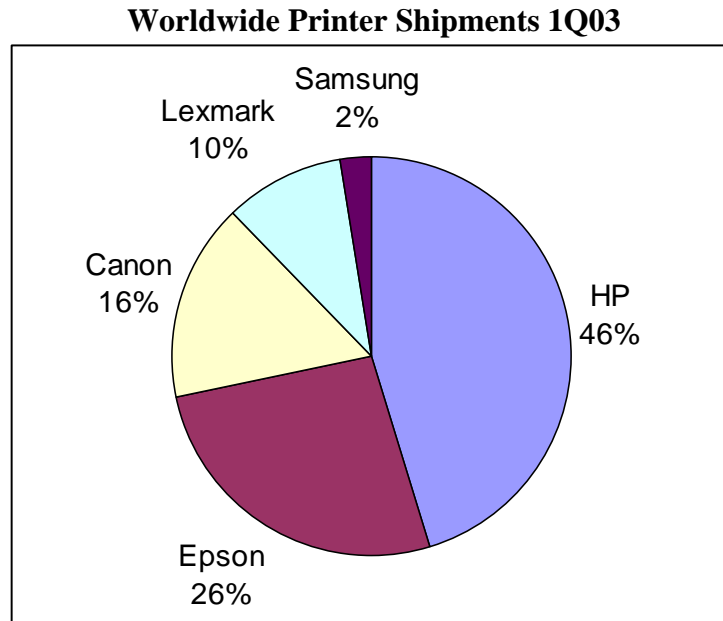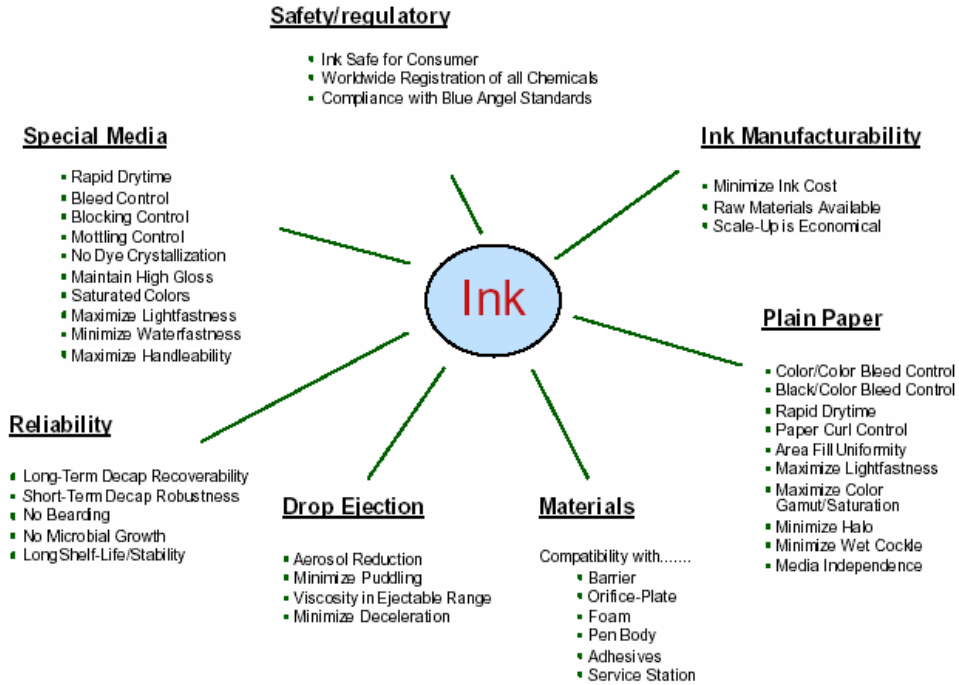

Source: Gartner Dataquest

Appendix II

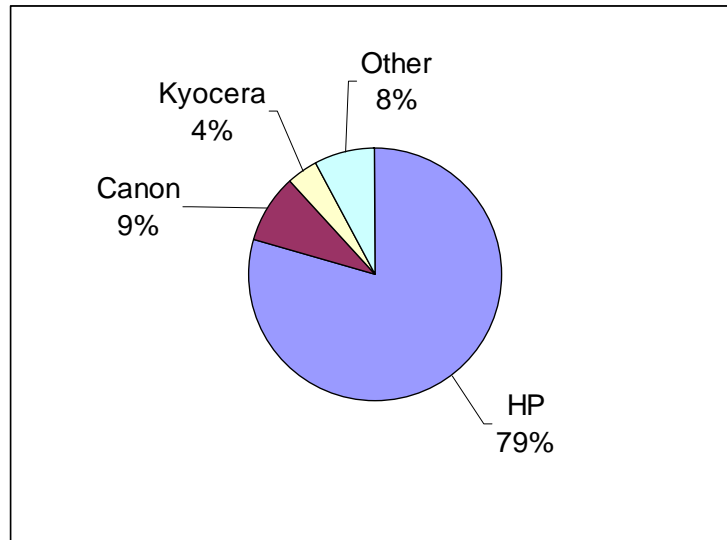http://www.hp.com/oeminkjet/reports/techpress_10.pdf

Appendix III

Primary areas of ink development:

http://www.hp.com/oeminkjet/reports/techpress_8.pdf

Appendix IV

Laser Printer Market Share in Philippines:

Source: INQ7.net

10. REFERENCES

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