

The Path from Pixels to Prints

The Challenge of Bringing Digital Imaging to the Mass Market



Introduction

At the end of 2002 approximately 23 million U.S. households – nearly 20 percent – owned digital cameras. During the life cycle of a technology, a new product is often considered to have reached the early majority – or the mass market – after achieving 22 percent penetration. Digital cameras are close to reaching this point. In addition, the changing demographics of digital camera users are critical to the movement of these products into the mass market. As the most photo active households – generally women and families with young children – begin to use digital cameras, the technology moves closer to becoming a mainstream product. The challenge, of course, will be providing the infrastructure for these consumers to print their digital images and to successfully market these services.

Key points:

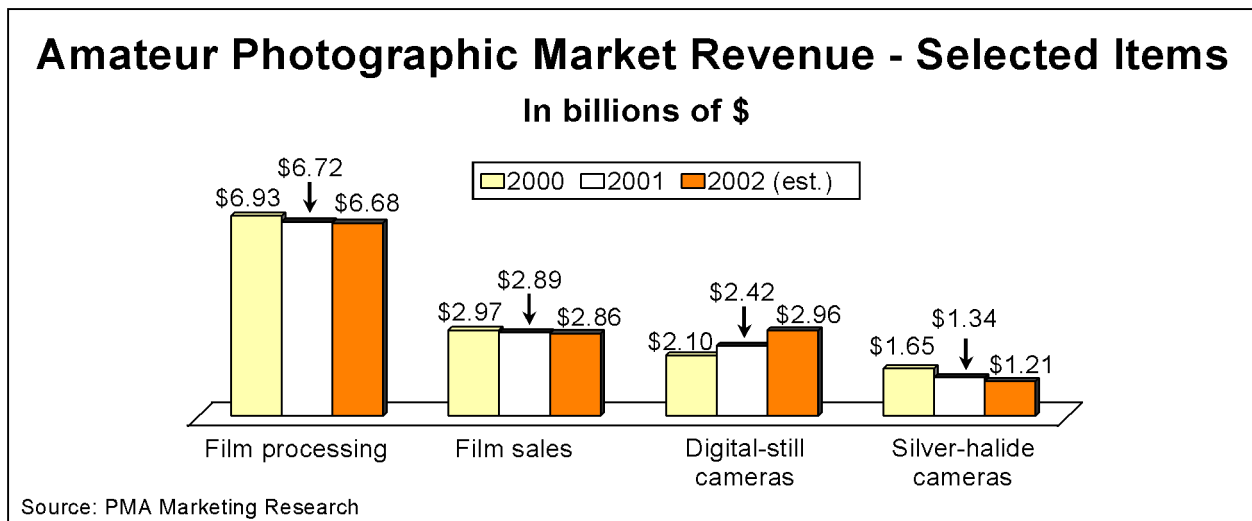
- The increased sales of high-resolution models will contribute to consumer interest in the printing of digital images. Forty percent of digital cameras sold in 2002 featured 3 megapixels or more.
- Sixteen percent of digital cameras sold in 2002 were purchased as a replacement for a film camera. If their film camera were to break, 50 percent of households indicated they would replace it with a digital camera.
- Preservation of memories overtook sending photos by e-mail in 2002 as the top reason for taking pictures with a digital camera.
- Twenty percent of digital images taken in 2002 were printed. The vast majority of these images were printed via home printers, although interest in retail printing continued to increase during 2002.
- While the volume of conventional prints made in 2002 declined by 700,000 over the prior year, the volume of digital prints made grew by 1.3 million. Digital images accounted for 6.1 percent of the total volume of prints made in 2002.
- Following 2002, households with digital cameras indicated their overall level of picture taking with their film cameras had declined by 19 percent since the acquisition of a digital model.
- Sales of film rolls and film processing declined by 1 percent and 2 percent respectively during 2002.
- The projected declines for 2003 are 4 percent and 3 percent respectively. Sales of one-time-use cameras, however, are expected to continue to grow at a rate of 8 percent.

Methodology

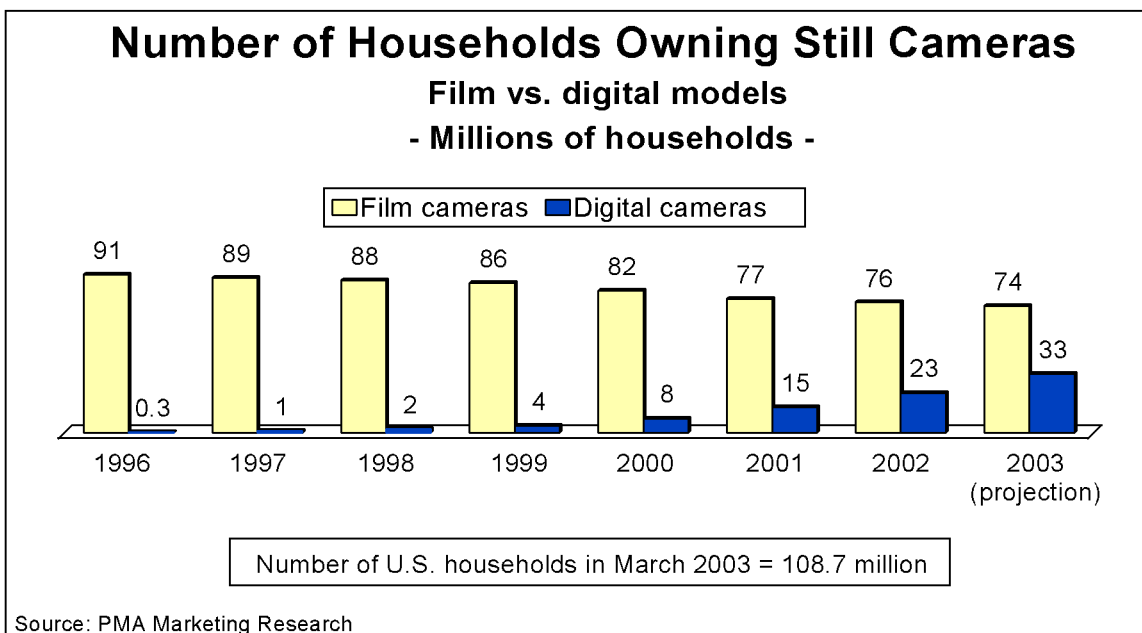
The information contained in this report is based on the *PMA Camera/Camcorder and Digital Imaging Surveys*. This annual survey measures consumer purchases of new cameras and camcorders, as well as usage of digital-imaging products and services. The survey was most recently conducted in January 2003, when it was distributed to 10,000 U.S. households and yielded a response rate of 65 percent (6,523 households). The respondent panel was balanced to reflect the U.S. census household distribution across the nine U.S. geographic divisions, major market-size categories, as well as age, income, and household size. The survey questionnaire was designed by the PMA Marketing Research department.

Digital camera sales

Digital-still cameras have taken on a great deal of significance with regard to industry revenue in recent years. Revenue generated by digital cameras reached \$2.96 billion in 2002, an increase of 22 percent over the prior year. The growth of digital camera sales, however, has been partially responsible for revenue declines in the film processing, film sales, and film camera segments.

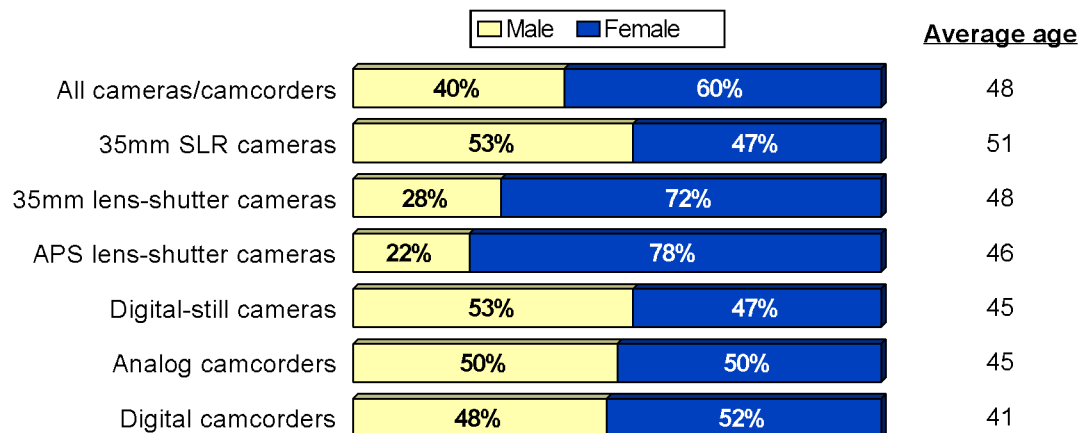


The growth of digital camera sales has been incredibly strong in recent years. More than 23 million households owned digital cameras at the end of 2002, representing a 57 percent increase over the prior year. By the end of 2003, 33 million households are projected to own digital cameras. Concurrently, the number of households with film cameras has fallen, declining by 2.6 percent in 2002 to approximately 75 million households. A similar decrease is projected for 2003. This decline is attributable in part both to the growing demand for digital models and the rising popularity of one-time-use cameras. In fact, at the end of 2002, 11 percent of households were using one-time-use cameras exclusively for their picture-taking needs.



Marketing digital cameras and related technology to women will be one of the keys to the success of digital imaging. Women are the primary picture takers in most households and are generally regarded as the keeper of the family photo album. Among all cameras and camcorders in use, women are the primary users in 60 percent of households. Among 35mm and APS lens-shutter cameras, women are the primary users in more than 70 percent of households. These latter models are generally selected by consumers for their ease of use and are seen frequently at many a birthday party, holiday celebration, or family vacation. Women, particularly mothers, use these cameras to preserve their family memories. Therefore, future increases in the female-to-male ratio of digital camera users should serve as an indication of the use of digital cameras for preserving memories, and thus the demand for digital printing services. Currently women are the primary users of digital cameras in 47 percent of households owning them.

Primary Users of Cameras/Camcorders in 2002 By gender and age

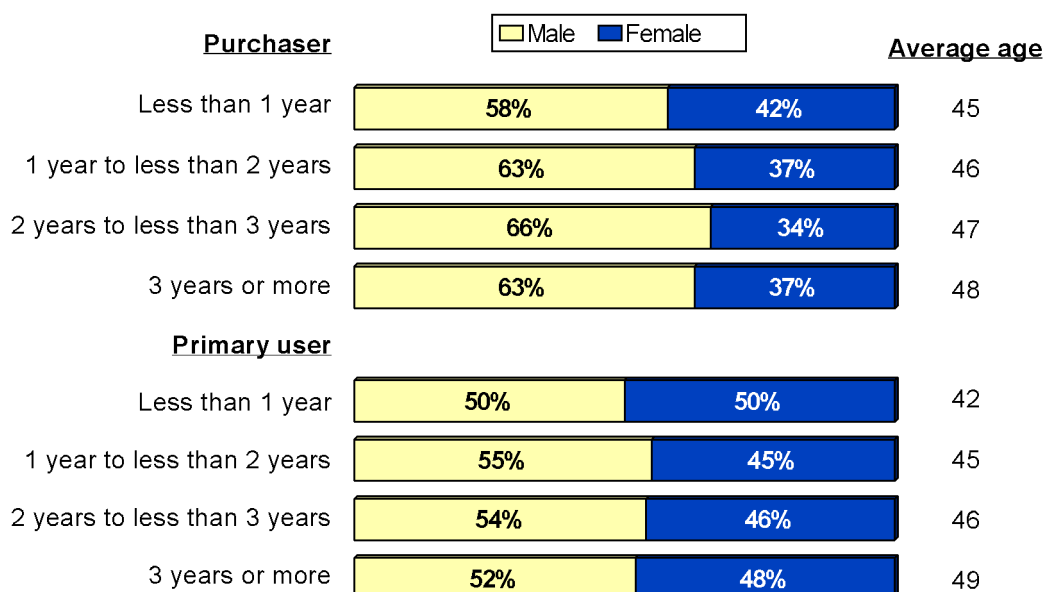


Source: 2003 PMA Camera/Camcorder, Digital Imaging Survey

The day women outnumber men as the primary users of digital cameras is approaching. Women are purchasing a greater share of digital cameras than in the past. Women purchased 42 percent of the digital cameras owned for less than one year, compared to only 37 percent of cameras owned for one to two years. Women are the primary users of an even greater share of recent digital camera purchases. Fifty percent of digital cameras owned for less than one year are primarily used by women, a figure which is higher than among those cameras owned for longer periods of time. The disparity between purchasers and primary users suggests although men have a greater interest in acquiring new gadgets, women are more involved with taking pictures.

Purchasers and Primary Users of Digital-Still Cameras by Length of Camera Ownership

By gender and age



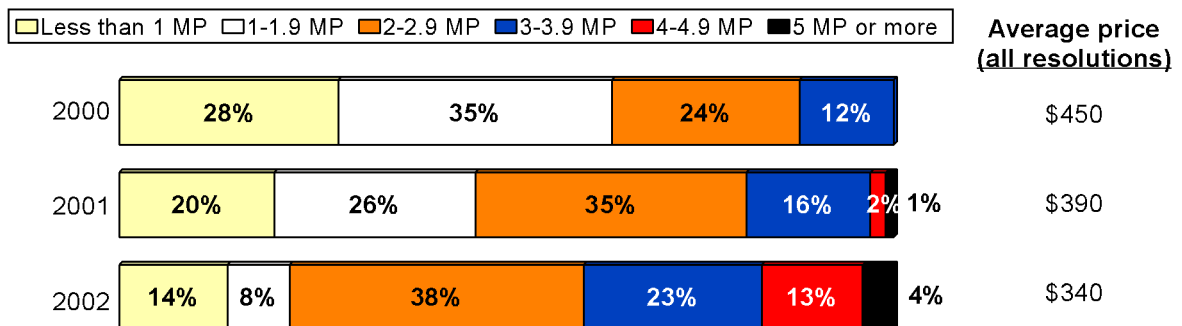
Source: 2003 PMA Camera/Camcorder, Digital Imaging Survey

Two of the major trends affecting digital camera sales are a shift in resolution and a decrease in the average selling price. Lower prices have enabled more households to purchase digital cameras, lowering the average age of digital camera users in recent years. As a result, more families with young children – typically the most photo active consumer segment – are now able to purchase digital cameras.

Even as prices decline, the mix of digital camera products is shifting towards higher resolution models. Seventy-eight percent of the cameras sold in 2002 featured 2 megapixels or more – generally the resolution at which quality 4-by-6-inch prints are possible. Some consumers are opting for even higher quality resolution. The 4-megapixel and higher category, almost unheard of in prior years, accounted for 17 percent of total sales volume in 2002.

Distribution of Digital-Still Cameras Sold by Resolution

Percent of sales volume

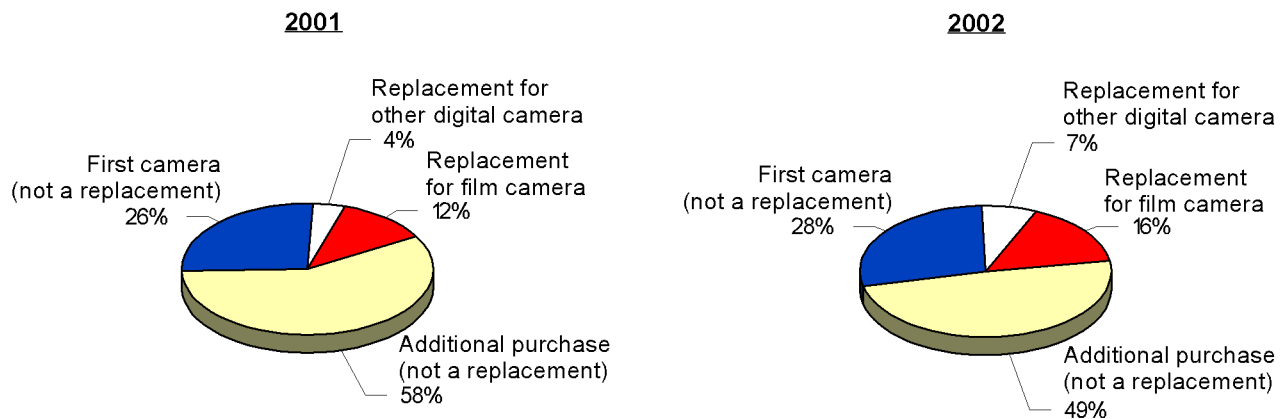


Note: Data collected since Sept. 2001 excludes Wal-Mart.
Source: NPD Intellect Market Tracking

As the quality of digital cameras improves, a greater share of consumers are purchasing them to use as their primary camera. Whereas in 2001, 58 percent of households purchasing digital cameras intended for these products to supplement their existing camera, only 49 percent indicated this was the case in 2002. Digital cameras are increasingly being purchased as a replacement for a film camera, as the household's first camera, and even as a replacement for another digital camera.

Reason for Purchasing Most Recently Acquired Digital-Still Camera

Percent of households



Base: Households owning digital-still cameras

Source: 2002 and 2003 PMA Camera/Camcorder, Digital Imaging Surveys

Digital printing trends

During recent years, sending photos by e-mail had consistently been cited by consumers as the number one reason for taking pictures with digital cameras. Although this capability is still important, for the first time it was supplanted by the preservation of memories. Seventy-eight percent of digital camera users indicated in 2002 they use their cameras for preserving memories. This shift in consumer behavior is important because the preservation of memories usually involves the making of prints. As more consumers consider digital images as a viable means for preserving memories, demand for making prints of these images should increase.

Primary Reasons for Taking Pictures with a Digital-Still Camera

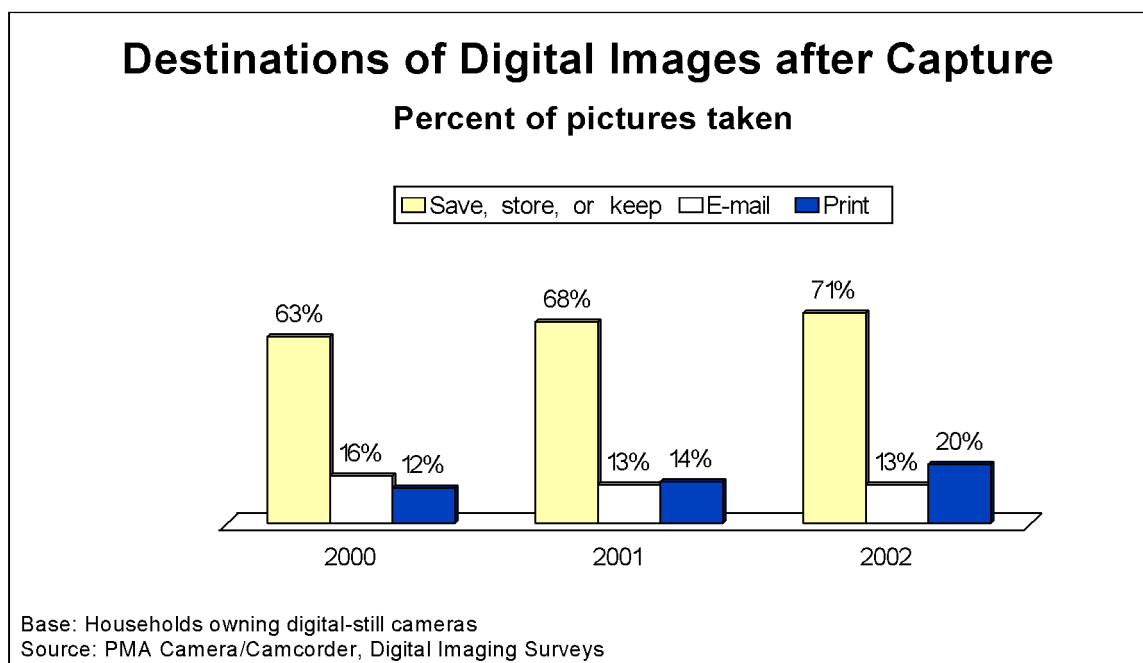
Percent of households

	2000	2001	2002
To preserve memories	68%	68%	78%
To send photos by e-mail	77%	69%	73%
To share later with others	67%	68%	69%
For pure enjoyment	63%	61%	62%
Like to take photographs	41%	44%	45%
To use photos in a computer for hobby	32%	35%	32%
To give away as gifts	17%	17%	18%
To use photos for business	17%	14%	16%
To use photos in a computer for business	19%	15%	15%
To master the skills involved	15%	16%	14%
As artistic expression	12%	12%	10%
To earn income on a moonlighting job	3%	3%	2%
To earn income for a regular job	1%	2%	1%
Other	5%	7%	4%

Base: Households owning digital-still cameras

Source: PMA Camera/Camcorder, Digital Imaging Surveys

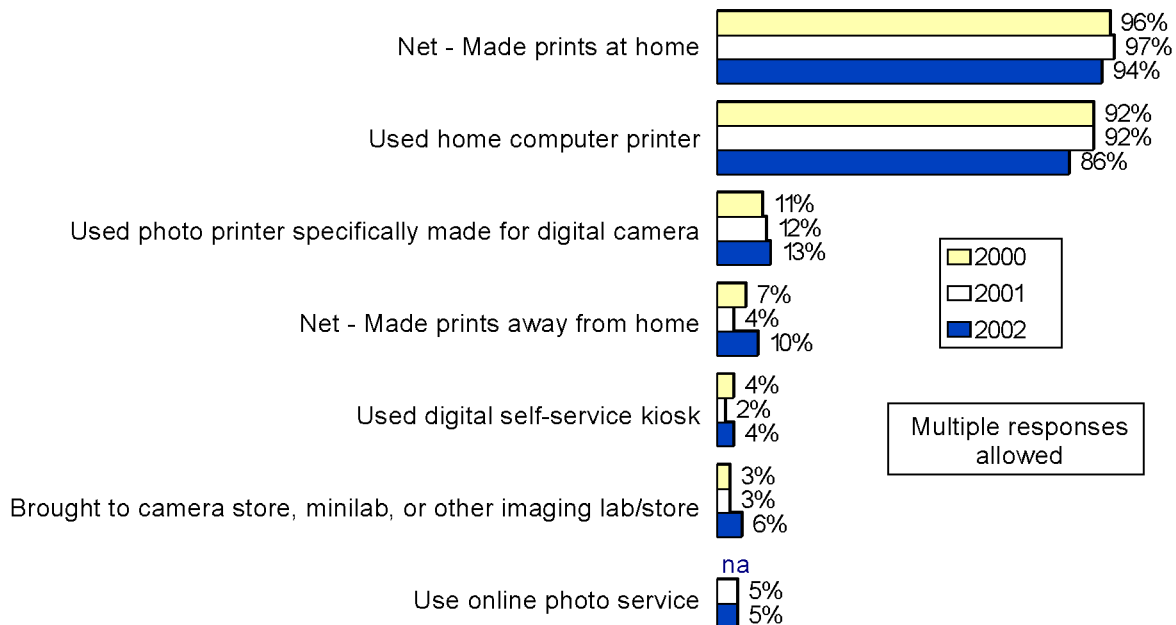
The manner in which consumers use their digital images following capture of them supports the idea that preservation of memories is becoming more important. Seventy-one percent of the digital images taken in 2002 were saved, compared to 68 percent in 2001 and 63 percent in 2000. The share of digital images printed in 2002 grew tremendously as well, reaching 20 percent of images taken, compared to 14 percent in the prior year. As demand for printing digital images continues to increase, photographic retailers have both the challenge and the opportunity of marketing their digital printing services to consumers. Marketing digital printing services to women, particularly young mothers, will be an important strategy, as members of this group tend to be among the most photo active consumers and tend to take pictures for the purpose of preserving memories in the family album.



Convincing digital camera users to have their prints made in a retail environment truly could be a challenge. Digital camera users are overwhelmingly utilizing their home printers for output of their images. Although the share of consumers having some prints made away from home is on the rise, it remains small at only 10 percent. Six percent of consumers printing digital images have utilized the services of a camera store or other imaging store, 4 percent have used a digital self-service kiosk, and 5 percent have purchased prints from an online photo service. One of the greatest obstacles to boosting retail digital printing sales is the lack of awareness of these services generally believed to exist among consumers.

Methods Used for Printing Images Taken with Digital-Still Cameras

Percent of households



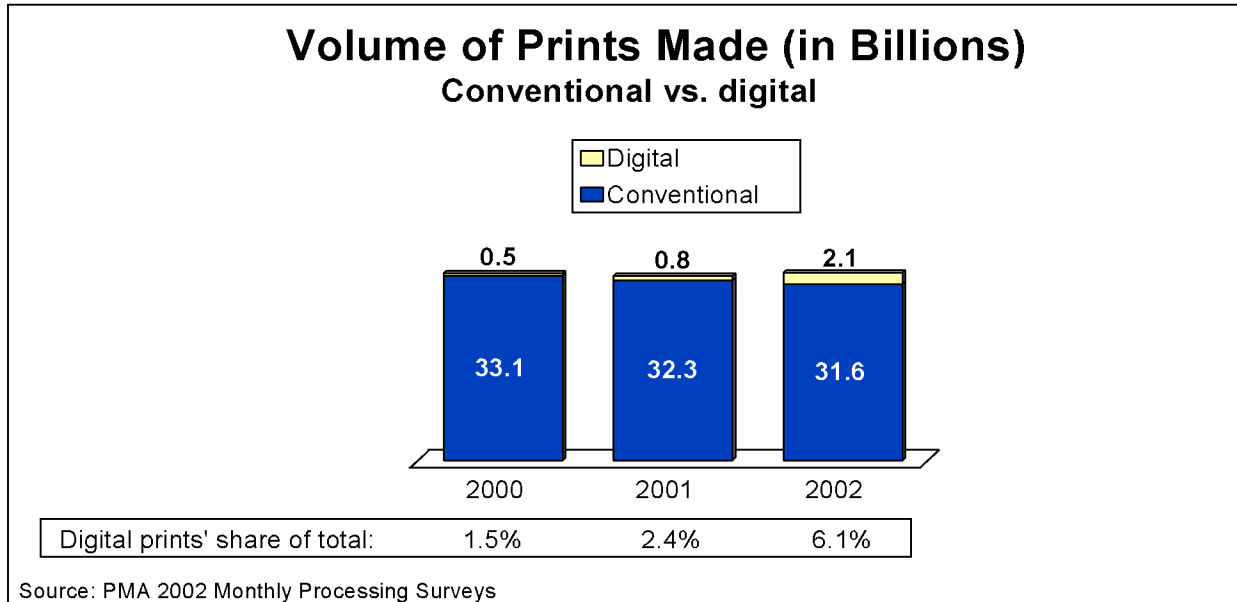
Base: All households that printed images taken with digital cameras

Source: PMA Camera/Camcorder, Digital Imaging Surveys

The outlook for selling retail digital services to the most photo active households is promising, however. Families with young children, which tend to take more pictures than any other demographic group, are the most likely to have made digital prints away from home. Sixteen percent of households with children under age 3 and 18 percent with children ages 3 to 5 have made prints away from home, compared to 10 percent of all households. These groups of consumers are more likely than the general population to have brought images to a camera store or other imaging store for processing, to have made prints using a kiosk, and to have ordered prints from an online photo service.

Methods Used for Printing Images Taken with Digital-Still Cameras By presence of children - Percent of households -							
	All households	Children under 3 years	Children 3-5 years	Children 6-11 years	Children 12-17 years	Children 18-21 years	No children 21 years or under
Net - Made prints at home	94%	89%	92%	92%	94%	93%	96%
Used home computer printer	87%	81%	85%	86%	88%	90%	88%
Used photo printer specifically made for digital camera	13%	11%	13%	11%	13%	9%	15%
Net - Made prints away from home	10%	16%	18%	10%	9%	6%	8%
Used digital self-service kiosk	4%	5%	8%	5%	5%	1%	3%
Brought to camera store, minilab, or other imaging lab/store	7%	11%	11%	5%	5%	4%	6%
Use online photo service	6%	10%	10%	7%	4%	6%	5%
Multiple responses allowed							
Base: All households that printed images taken with digital cameras Source: 2003 PMA Camera/Camcorder, Digital Imaging Survey							

As consumer interest in digital printing has increased, the volume of digital prints made has grown significantly. In 2002, 2.1 million digital prints were made, compared to 0.8 million in the prior year. Digital prints accounted for 6.1 percent of total prints made during 2002, compared to 2.4 percent of printing volume in 2001. The rising volume of digital prints has paralleled the decline in conventional prints, which have been adversely impacted by both the growth of digital imaging and economic concerns.



The barriers to printing more digital images include time, quality, price, and ease-of-use factors. More than half of digital camera users indicated they would print more digital images if they could make high-quality prints on their home printers. Almost as many also indicated the printing of digital images at home would need to be easier and less time-consuming. Price is a concern to 38 percent of digital camera users, who indicated the price of digital printing would need to be comparable to that of processing a roll of film. A significant share of respondents also indicated they would make more prints if the price of camera memory cards was lower, if they could have prints made at local retail outlets, or if the operation of digital cameras was simpler.

In the Future, what would be Required for you to Print More of your Digital Camera Images? Percent of households	
If I could print the images in a high-quality format on my own printer	51%
If the printing of digital camera images at home becomes easier and less time-consuming than it currently is	46%
If the price of digital processing was comparable to processing a roll of film	38%
If the price of digital camera memory cards was somewhat lower than it currently is	31%
If I could take digital camera memory cards to any local photo processing outlet and have them processed into prints like film now	31%
If the operation and usage of digital cameras became simpler	30%
If I could e-mail your pictures to a store or upload to a store's website for pick-up later	15%
If I would not be required to leave my digital camera memory card at the store	14%
Other reasons related to cost	4%
If the designs of digital cameras were unique and different from analog cameras	3%
If I had more time/a less busy schedule	1%
Not interested in printing images taken with a digital camera	3%
All other reasons	8%

Base: Households owning digital-still cameras
Source: 2003 PMA Camera/Camcorder, Digital Imaging Survey

Digital camera owners expressed there are similar barriers that may prevent them from using their camera more or purchasing another one. More than half indicated the price of digital cameras, the ability to print high-quality digital images on a home printer, and the price of camera memory cards would deter them from purchasing another camera or using their camera more. A significant share of digital camera users also indicated they would like a simple means for managing and storing images, the ability to have digital images printed at a local retailer, and a simpler means to edit and modify their images.

In the Future, what would Digital Cameras and the Surrounding Environment have to be Like for you to Purchase Another Digital Camera or Use your Camera More?

Among digital-still camera owners

- Percent of households -

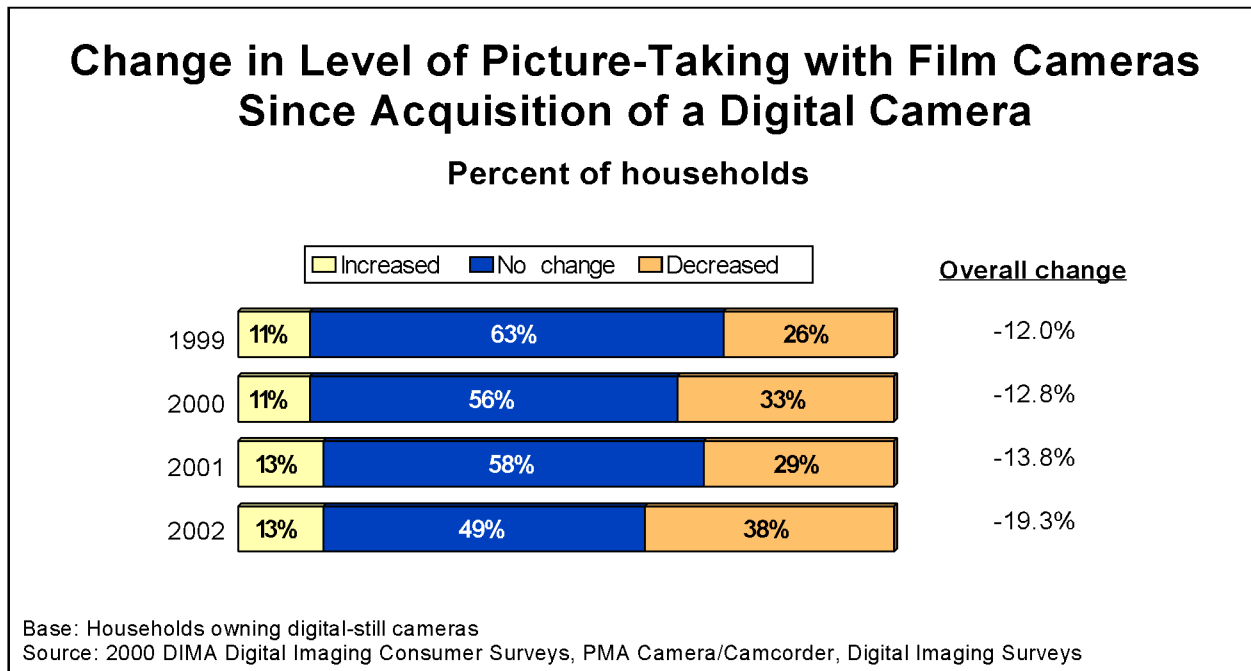
If the price of digital-still cameras was somewhat lower than it currently is	54%
If I could print the images in a high-quality format on my own printer	54%
If the media (memory cards) for storing images became less expensive	50%
If there was a simple means by which I could manage and store images	37%
If I could take images to any local photo processing outlet and have them processed into prints	37%
If the editing and modification of images became simpler	36%
If methods of transmitting images (e-mail, etc.) became simpler	32%
If the operation and usage of digital-still cameras became simpler	30%
If I could use online photo services and have my images processed into prints	29%
If it was not necessary to upload the images onto a computer	28%
If everyone started using digital-still cameras	6%
If the designs of digital-still cameras are unique and different from analog cameras	5%
Under no conditions would I consider buying a digital-still camera	1%
Other	7%

Base: Households owning digital-still cameras

Source: 2002 PMA Camera/Camcorder, Digital Imaging Survey

Impact of digital imaging on the use of film

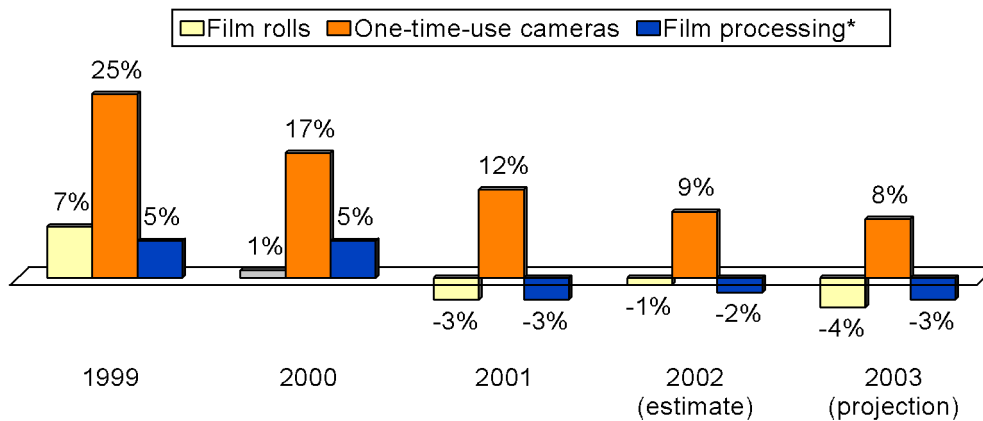
Although half of digital camera owners have not changed their level of picture-taking with film since acquiring digital cameras, the share of households reporting a decrease in activity has risen. Thirty-eight percent of households owning digital cameras have now indicated their level of traditional picture-taking has decreased. Among all digital camera owners, the level of picture-taking with film cameras has decreased by more than 19 percent since acquiring a digital camera. This trend coincides with the declining volume of film and film processing sales experienced within the past couple years.



The overall decrease in the use of film among digital camera owners, along with general economic concerns, has led to a decrease in both the volume of film roll and film processing sales in recent years. Sales of film rolls were down by 3 percent in 2001 and 1 percent in 2002, while processing declined by 3 percent and 2 percent respectively during those years. Film sales are projected to decline by 4 percent during 2003, with film processing sales falling by 3 percent. One-time-use cameras remain a growth product in the film market, however, with consumers being attracted by their convenience. In fact, by the end of 2002, 11 percent of households were using one-time-use cameras for all of their picture-taking activity. The level of growth among these models has slowed in recent years, though, with an 8 percent volume increase projected for 2003.

Annual Change in Unit Sales of Film Rolls, One-Time-Use Cameras, and Film Processing

Trends: 1999 through 2003

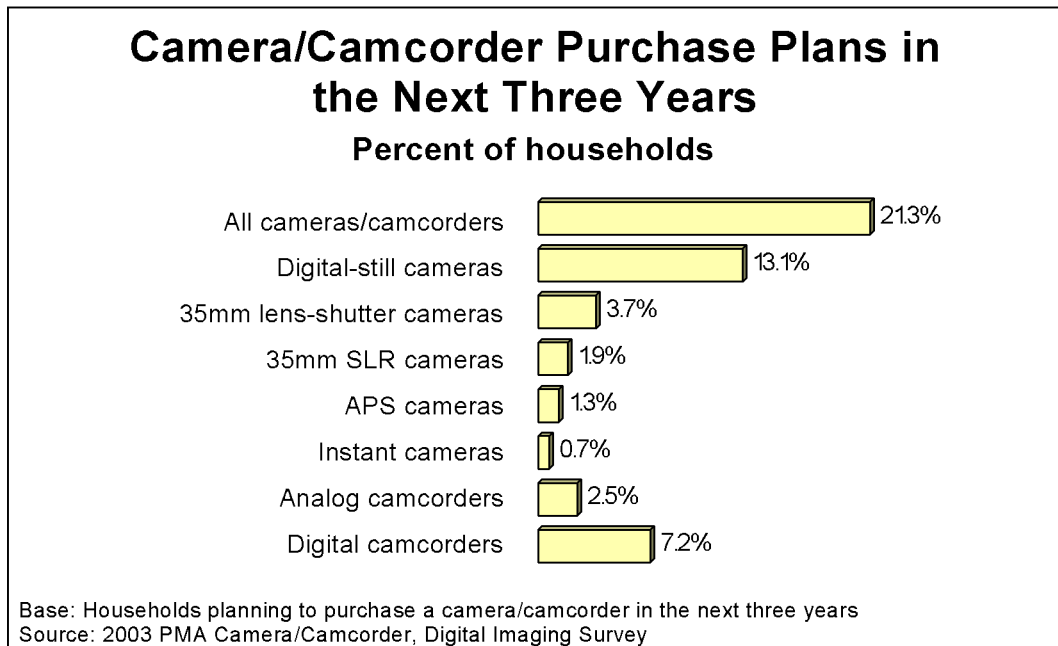


Note: *Film processing includes both film rolls and one-time-use cameras.

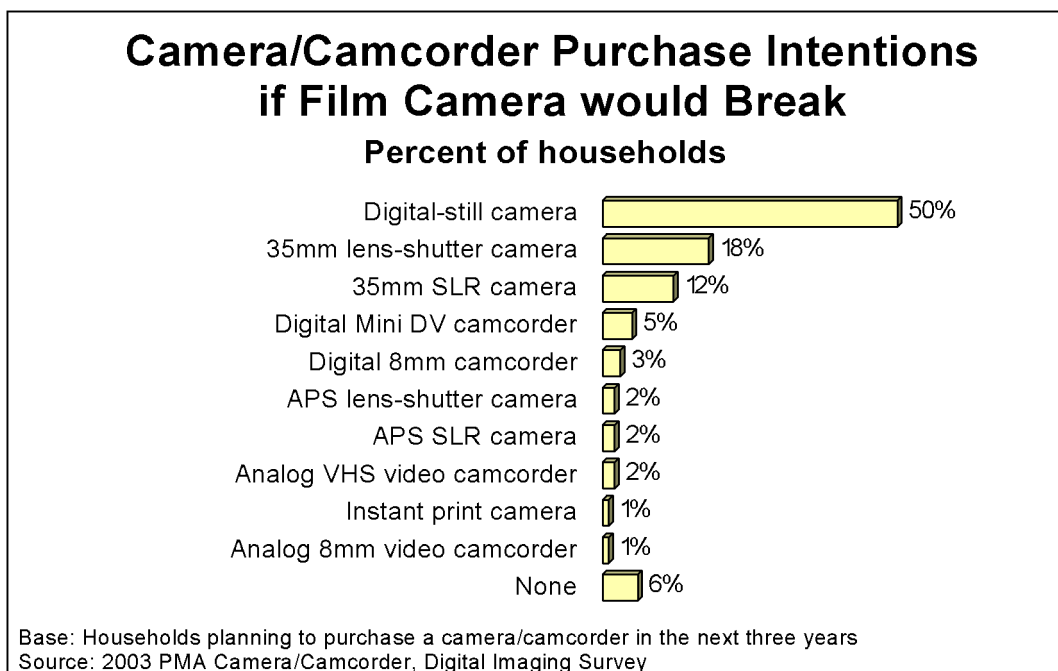
Source: PMA Monthly Processing Surveys

Future camera purchase intentions

Digital-still cameras top the list of models consumers plan to purchase within the next three years. Twenty-one percent intend to purchase some type of camera or camcorder, with 13 percent expecting to acquire a digital-still camera. A significant share – 7 percent also plan to purchase a digital camcorder. Sales growth among digital models will come at the expense of 35mm and APS cameras and analog camcorders. A comparatively small segment of households expect to purchase these models in the coming years.



If their film camera would suddenly break, half of households with purchase plans in the next three years would acquire a digital-still camera. 35mm lens-shutter models are a distant second, with only 18 percent of households indicating they would purchase one.



Conclusion

This year will be a critical one for the industry. There is no doubt digital photography is here to stay. Sales of digital cameras continue to be strong, and the number of digital camera users is rising accordingly. Concurrently, traditional picture-taking activity is declining. Thus, it is imperative to both establish the infrastructure for retail digital printing services and to convince digital camera users they have a need for these services.

There are indications this can be accomplished. More women and families with young children – the most active picture takers – are using digital cameras. In addition, preservation of memories was the number one reason for using digital cameras in 2002. If consumers wish to preserve their memories, they will want to print them. Many consumers, however, have expressed disappointment with the ability to attain prints from their digital images. They are dissatisfied with the quality and the hassle of printing images at home, and have expressed they would use their digital cameras more if printing images at home was easier. Many have also indicated they would use their cameras more if they could have images printed at local retail outlets at a price similar to film processing. The fact they view this factor as a barrier to using their cameras more suggests many consumers are either unaware of digital printing opportunities in their area or view the per-print price as being too expensive.

Establishing a digital printing infrastructure is key to attracting the early majority to digital cameras and for retailers to develop digital printing revenue as traditional film and processing sales continue to decline. There are signs amateur digital photography is approaching the mass market, but progress could be limited if consumers feel digital cameras do not meet their needs. Thus, providing the infrastructure for printing digital images is a key for developing the digital printing market.



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