

The Canon Cat Computer: Jef Raskin's "Work Processor"

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***** DRAFT *****

This paper was originally written for **Historically Brewed**, the newsletter of the Historical Computer Society of El Paso, Texas. Refer to issue # 6, July/August 1994, for an earlier version of this paper. Contact Mr. David Greelish at Internet address historical@aol.com if you're interested in old computers and want to read fascinating stories about these computers and the people behind them. For additional information about HCS see the article "Machine Dreams" as published in **Texas Monthly** magazine, July 1994, pp. 46+.

*If many faultes in this paper you fynde,
Yet think not the correctors blynde;
If Argos heere hymselfe had beene,
He should perchance not all have seene.*

Paraphrase from Richard Shacklock (1565)

Special thanks are due to the following people:
Jef Raskin, Doug McKenna, Paul Baker, Owen Linzmayer, Hugh Hazelrigg

Note: The Shacklock paraphrase was "borrowed" from the Apple INTEGER BASIC manual that Jef Raskin wrote around 1978. Jef Raskin credits Brian Howard, a skilled and long-time writer at Apple Computer, with discovering this quote.

- do - mention where I found "work processor", in leap paper, p. p170
- add more info on leap usage from leap paper (search, move)
- design awards for Cat - ask raskin for list, same for patents (get actual patents)
- get venture vultures and cat history from raskin

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Note: All of the figures within this paper were scanned using the Thunderscan scanner.

INTRODUCTION

In 1987 Canon USA Inc. released a new computer named the Canon Cat. This computer was targeted at low-level clerical workers such as secretaries. After six months on the market and with 20,000 units sold Canon discontinued the Cat. The Cat featured an innovative text-based user interface that did not rely upon a mouse, icons, or graphics. The key person behind the Cat was Mr. Jef Raskin, an eclectic gadgeteer, who began the design of the Cat during his work on the first Macintosh project at Apple Computer in 1979.

The design and history of the Canon Cat is a fascinating story which this paper attempts to tell. I am not a Cat owner nor have I been fortunate enough to have used a Cat. All facts within this paper are based on various documents relating to Jef Raskin and his work at Apple Computer and Information Appliance, Raskin's company that created the Cat.

• 2 •
CAT HARDWARE

The Cat was a 17-pound desktop computer system containing a built-in 9-inch black-and-white bit-mapped monitor, a single 3.5-inch 384K byte floppy disk drive (early systems came with a 256K disk drive), and an IBM Selectric-style keyboard.

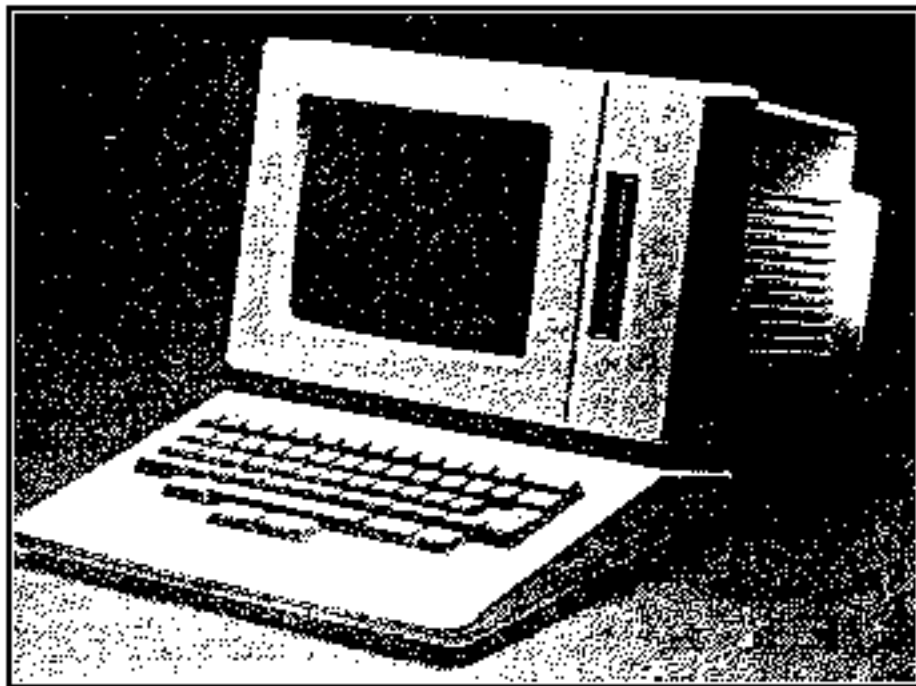


Figure 1 - The Canon Cat hardware
(Source: *A Spiritual Heir to the Macintosh*, BYTE, Oct. 1987)

The product specs follow (Mainly from BYTE's *A Spiritual Heir to the Macintosh*):

Size	Dimensions	10.7 by 13.1 by 17.8 inches
	Weight	17 pounds
Components	Processor	Motorola 68000 running at 5 MHz
	Memory	256K bytes
	Mass storage	One 384K byte internal 3.5-inch floppy drive
	Display	9-inch black-and-white built-in, bit-mapped
	Keyboard	IBM Selectric-style plus several special keys (e.g. UNDO and two LEAP keys)
	I/O Interfaces	One Centronics parallel port, one RS-232C serial port (DB-25 connector), two RJ-11 jacks (for telephone connections)
	Modem	Internal 300/1200 bps, Hayes compatible, auto-answer, auto-dial
	ROM	256K bytes
Price	\$1495	Canon lowered the price to \$795 after a few months

The disk drive was used to store all the Cat's memory data. Though the disk supported a capacity of 384K, only 256K of the disk was actually used by the Cat. Paul Baker, a key Cat designer, had the

following to say about the benefit of storing all the Cat's memory on the disk (personal letter, 03 Oct 1994):

The operating paradigm of the Cat (and the Swyft and SwyftCard) was that the disk was simply an image of the memory. Thus the disk capacity matched the memory size - if the RAM was 256K, then the disk had to be the same size. Since the Cat had no concept of files, there was no need for the disk to have any different capacity than the RAM. One advantage of recording the entire memory to disk was that we could recall the data that was on the screen first, so it seemed like the user's data loaded instantly, when it actually took about 15 seconds.

For additional information about the Cat's hardware see section *Information Appliance, the SwyftCard, and the Canon Cat* and Baker's letter.

• 3 •
CAT SOFTWARE

The Cat came with an extensive collection of applications stored in ROM. These applications supported word processing, spell checking, spreadsheet abilities, mail merging, calculator calculations, communications, data retrieval, and programming in the FORTH or 68000 assembly languages. Also present in the ROM was a spelling dictionary based on the 90,000 word American Heritage Dictionary. System setup information and a small personal user dictionary were stored in 8K of battery-backed up RAM.

The Cat's user interface made this computer unique when compared to other computers. The user interface was based on a simple text editor in which all data was seen as a long stream of text broken into pages, which could also be broken into documents. Special keyboard keys allowed the user to invoke various functions. An extra key titled "Use Front" acted as a control key. You pressed Use Front and then a special key to activate a specific feature. For example, the L key was marked Disk on the front facing part, the J key was marked Print, and the N key was marked Explain (Cat's context-sensitive help facility). Other commands existed which let you change the system's various parameters (Setup key) and reverse your last action (Undo key).

When you powered on the Cat you were presented with a display that looked like a typewriter with a sheet of paper. Black characters appeared on a white background. A ruler bar appeared at the bottom of the screen. The Cat's memory held around 160K of data which was equivalent to 80 single-spaced printed pages.

You moved through your data using two extra keys called Leap keys located in front the spacebar key and by typing strings of characters. The Cat jumped to the next occurrence of that string. Raskin claimed that the Cat's Leap-key search method to scroll from the top to the bottom of a page took 2 seconds, a mouse took 4 seconds, and cursor keys took 8 seconds. Larger documents increased these search ratios.

The Leap keys also controlled text selection (indicated by highlighting), deletion, copying, and moving. If the selected text was a mathematical formula one keystroke with a special key calculated the mathematical result and the answer appeared on the screen with a dotted underline overlaying the original formula. If the selected text was a computer program written in either FORTH or 68000 assembly language, then a special key let you execute the program (since the Cat was marketed towards clerical workers, it's doubtful that programming was a common activity). The ability to program directly in the interface was designed for third-party developers, so that they would not have to buy a special development program (this made the Cat "programmer-friendly"). You performed mail merges by selecting columnar text data and pressing another special key. Repetitive command sequences could be automated by assigning commands and text strings to the Cat's numeric keys. One special key let you dial a selected telephone number either for voice or modem communications. Data received from the built-in modem flowed into your text as if you had typed it.

The Cat used a 384K floppy disk for storage. Each disk held the entire contents of the Cat's memory in addition to system configuration parameters, the user's personal spelling dictionary, and the bit-map for the screen. When you inserted a disk the Cat read the disk's entire contents into the Cat's memory including the last saved screen image. This feature allowed users to transfer their entire Cat environment to another Cat by just taking their disk from one Cat and inserting it into another Cat. One unique feature of the Cat's floppy disk handling was its ability to automatically format as much of the disk as was needed to save the current work.

The Cat's simple but powerful user interface received many plaudits. For example, Bruce Tognazzini, a computer user interface guru who worked for Apple (he now works for Sun Microsystems, as do a fair number of former Apple people), had the following to say about the Cat (**TOG on Interface**, p. 182):

There are some really good abstract interfaces, ... Jef Raskin's Canon [Tog incorrectly had Cannon here] Cat interface is another. ... Before he left the [Macintosh] project, Macintosh was far more dependent on the keyboard, and Raskin knew what to do with the keyboard, too. For example, the Find function on the Canon Cat is some 50 times faster than the same function on the Macintosh. Raskin didn't use "Command-key equivalents": he designed a true keyboard interface from the ground up.

Ezra Shapiro in his A Spiritual Heir to the Macintosh article had the following to say about the Cat:

The Cat represents an eye-opening new approach to data storage and retrieval; it will surprise anyone who thought that interface design was a dying art. Though the basic configuration appears on the surface to be a flexible word processor, the Cat's computational, macro, and programming capabilities make it quite possible to build data structures that emulate spreadsheets and databases.

Raskin had the following to say about the Cat and the Apple Macintosh (personal letter, July 1987):

It is as advanced (in terms of human interface) over the Mac as the Mac was an advance in its day.

Raskin's thoughts on the Cat's user interface and other user interfaces from the perspective of 1994 follow (The Mac and Me: 15 Years of Life with the Macintosh):

The current paradigm of using application programs is inherently wrong from an interface design point of view. This is widely recognized, but the solution offered is to make them interoperable, which solves some of the problems but by no means all. GUIs as presently designed and used are an interface dead end. Though they can be patched endlessly, a large jump in usability can only come from a completely different approach. The Cat computer, which I developed for Canon, demonstrated that my alternate approach is implementable and both more productive and more pleasant than GUIs.

JEF RASKIN AND THE FIRST MACINTOSH

One can say that Jef Raskin began designing the Cat before and during his tenure at Apple Computer. Before Apple Raskin had been involved with the computing industry xxxxxxxxxxxxxxxxxxxxxxxx He started at Apple in January 1978 as head of its publications department. From 1979 to 1982 Raskin was responsible at Apple for a research project called Macintosh. He resigned from Apple in February 1982 when he was Manager of Advanced Systems over a disagreement with Steve Jobs, one of Apple's founders, concerning the Macintosh's direction. Steve Jobs took over Macintosh development and the Macintosh became a mini-Lisa computer which was substantially different from Raskin's original and less complex Macintosh ideas.

Owen Linzamayer, author the wonderful book **The Mac Bathroom Reader**, had the following to say about the Cat's relationship to the Macintosh (p. 112):

In 1987, Jef Raskin finally got his chance to more fully realize the embodiment of his original Macintosh design goals with a "work processor" called the Can Cat, which had word processor, spreadsheet, and telecommunications features built in.

In Raskin's paper **The Genesis and History of the Macintosh Project** he provided his thoughts on the main software design criteria for the Macintosh:

My concepts in designing the software were extreme ease of learning, rapid (and thus non-frustrating) response to user desires, and compact and quickly developable software. Key elements in designing such a system are freedom from modes, the elimination of "levels" (e.g. system level, editor level, programming level), and repeated use of a few consistent and easily learned concepts. Such software also leads to simple and brief manuals without having to sacrifice completeness and accuracy. The editor is similar to the LISA editor but does not require the expensive mouse. A careful study showed that it is probably faster to use than a mouse-driven editor -- although it is probably not as flashy to see when demonstrated in a dealer's showroom.

In 1994 Raskin had the following to say about the original Macintosh's software design (**The Mac and Me: 15 Years of Life with the Macintosh**, draft):

My unifying software originally was to be a graphics-and-text editor within which applications could run as additional commands (via menus), all input and output being through the interface designed for the editor. Later, the PARC desktop metaphor was adopted from the Lisa group (and that from the Xerox Alto and Star computers). Due to the incredible work of the Mac software team, the necessary code was designed and squeezed into a Toolbox that fit into a relatively small ROM (Read Only Memory) that we could afford to put into the product.

Raskin also had some interesting comments to say in one of his many Macintosh design memos concerning the intended users of the Macintosh (**Design Considerations for an Anthropophilic Computer**, 28-29 May 1979):

This is an outline for a computer designed for the Person In The Street (or, to abbreviate: the PITS); one that will be truly pleasant to use, that will require the user to do nothing that will threaten his or her perverse delight in being able to say: "I don't know the first thing about computers".

The Macintosh's early hardware design was very similar to the Cat's design. One early Macintosh design from around January 1980 provided a small screen, a keyboard, and two vertical built-in disk drives. Also present in this early Macintosh design was a built-in printer.

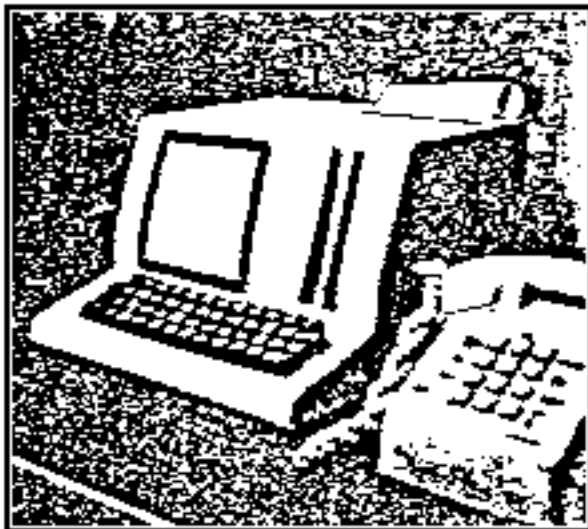


Figure 2 - A Photo of one of dozens of preliminary Mock-ups of the Macintosh computer, circa January 1980

(Source: Raskin's **The Macintosh Project: Selected Papers**, Feb. 1980)

It is interesting to note that Raskin's contributions to the Macintosh design are not well known to most people. I believe this is due to a scarcity of published accounts concerning Raskin's many projects at Apple. For example, John Sculley in his book **Odyssey: Pepsi to Apple** (1987, p. 83) mentioned Raskin only once (and incorrectly described Raskin as a programmer):

Steve [Jobs] had been in charge of the [Macintosh] project, originally conceived by an Apple programmer named Jef Raskin, since 1981.

Apple recognized Raskin's Macintosh contributions in 1987, 5 years after he had left Apple, by giving him a special Macintosh. Randall Stross had the following to say about this gift (**Steve Jobs and the NeXT Big Thing**, 1993, pp. 69-70):

The one-millionth Macintosh was sold in early 1987, a mere three years after the machine's introduction. The Apple Macintosh division -- sans Steve Jobs -- used the occasion to honor Jef Raskin. At a party to commemorate the sales milestone, Raskin was presented with a machine that was designated as Number One Million. It was the first and only [official] recognition that Raskin received for his early contribution to the Macintosh's birth.

Apple also in 1987 gave Raskin credit for the Macintosh's conception in the Apple-sponsored photo-essay book **So Far: The First Ten Years of a Vision** which was written by Apple's Creative Services Department. This book had the following to say about Raskin and the Macintosh (p. 89):

Macintosh was an accident that wasn't supposed to happen (and at any other company, it probably wouldn't have). It started in 1980 as just a bit of "Gee, wouldn't it be neat if ..." banter between an engineer named Jeff Raskin and a handful of coworkers. Maybe a little tinkering after hours, no big deal -- this sort of backroom hacking was always going on around Apple. For quite a while, nobody outside of a small circle of friends even knew about Macintosh. And it began to look as if it might stay that way.

This account contains two errors; 1) "Jeff" should be Jef, and 2) the Macintosh project began informally in 1978, not 1980 (it was called Annie until September 1979). See Raskin's Apple memos **The Macintosh Research Project -- Progress Report of July 1980** and **Macintosh Project: Introduction and Preliminary Conventions** (11 Sep 1979) for additional early history details.

Raskin's contributions to the Macintosh are noted by the Macintosh itself. If you open either a Macintosh 128K, Macintosh 512K, or an early model Macintosh SE computer you can see on the inside of the back part of the plastic case the names of the people who in early 1982 worked on the Macintosh. Raskin's name appears here.

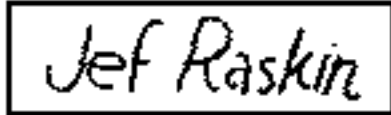
A rectangular box containing the handwritten signature "Jef Raskin" in black ink. The signature is written in a cursive, slightly slanted style.

Figure 3 - Jef Raskin's signature on the inside of early Macintosh cases, dated 10 Feb. 1982
(Source: **The Mac Bathroom Reader**, p. 284)

INFORMATION APPLIANCE, THE SWYFTCARD, AND THE CANON CAT

The company that Jef Raskin founded in 1984 to implement his computing ideas was named Information Appliance, Inc. In 1987 it was located in Menlo Park, California (1014 Hamilton Court). In 1989 it was located in Palo Alto, California (3530 West Bayshore Road). In 1992, after an existence of 8 years, Information Appliance closed its doors. Information Appliance produced 4 computer systems: Swyft, Cat, SwyftCard, and Cat laptop. Only the Cat and the SwyftCard were released to the public.

Raskin's ideas about computers and the basic concepts for this company are summarized in his 1986 white paper **Information Appliances: A New Industry:**

One of the prophets of the personal computer industry, Alan Kay, has said that the true personal computer has not yet been made. I disagree. We have, as the ancient curse warns us, gotten what we asked for. We do indeed have computers being bought by individuals for themselves; they are "personal computers". The problem is that many of us didn't want computers in the first place -- computers are merely boxes for running programs -- we wanted the benefits that computer technology has to offer. What we wanted was to ease the workload in information-related areas much as washing machines and vacuum cleaners ease the workload in maintaining cleanliness.

By choosing to focus on computers rather than the tasks we wanted done, we inherited much of the baggage that had accumulated around earlier generations of computers. It is more a matter of style and operating systems that need elaborate user interfaces to support huge application programs. These structures demand ever larger memories and complex peripherals. It's as if we had asked for a bit of part-time help and were given a bureaucracy.

One reviewer of this article, Hugh Hazelrigg, made an astute observation in October 1994 about Raskin's previous comments. Hugh asked, "Why do people accept this bureaucracy?" My reply, which may be wrong, was that people use computers that are more available and don't want to bother using tools that are not readably available or that are not from the major players in the computing industry, e.g. IBM, Apple. Also, many computer users, especially the typical office worker, are not normally given a choice of what computers they use at work.

Information Appliance's goal was to create a computer system that would be both powerful and easy to use. The company developed a prototype Cat system code-named "Swyft". Doug McKenna, a former company director and now the key person behind the Macintosh development tool Resorcerer, said he proposed that "SWYFT" be read as "Superb With Your Favorite Typing" (phone call, 15 June 1994). Paul Baker, Information Appliance's VP of Engineering, described the Swyft as follows (letter, 03 Oct 1994):

On the earlier Swyft, the original design used a 6502 (same processor as the Apple //), but when I joined the company we redesigned to use the 68008 because it was at least 4x the performance and only cost a few dollars more [than the 6502]. The 68008 also has a 1 Mbyte address space vs the 64K address space of the 6502 and using the 68K let us get away from any sort of RAM/ROM banking which made the code more efficient and also allowed us to have a larger memory, which improved the product.

When Information Appliance developed the Cat the Cat designers changed processors again. The new processor was the 68000 which could run 68008 object code and which I believe cost less than the 68008.

Funding for Information Appliance came from around a dozen venture capitalists.
????? vc names ??? funding amounts ???

Raskin's plan was to create and market the Cat using only Information Appliance. But this goal was not achieved by Raskin because the Cat prototype, the Swyft, had taken longer to develop than expected. Paul Baker, VP of Engineering at IAI, had the following to say about this (personal letter, 03 Oct 1994):

Although the Cat was produced on schedule, the reason that we had to sell the product to Canon in the first place was that our original product, the Swyft, was about a year late and our investors refused to invest the several million dollars that would have been required to launch the Swyft under IAI's own name.

Canon was responsible for giving the Swyft computer the product name "Cat" (Doug McKenna, phone call, 15 June 1994).

Bob Johnstone in his article **Canon, Lone Wolf** (Wired magazine, October 1994) had the following to say about how Canon became involved with Raskin's Cat system:

A huge success in computer peripherals, Canon's dissident strategy has repeatedly bombed in computers themselves. But, as [Hajime] Mitarai [Canon's President] points out, at least the failures have been honorable ones. "We're always trying," he says. "Not for the mediocre, but for something different, something interesting." The company's first shot at the personal computer market was the Cat, launched in 1987. This was a machine designed by Jef Raskin, one of the parents of the Apple Macintosh. The Cat's most distinctive feature was two "Leap" keys in front of its space bar, to enable rapid document searches. But the machine was mismarketed -- it was priced at \$1,495 instead of the \$795 originally planned -- then hastily cancelled.

While the Information Appliance engineers developed the Cat the company's venture capitalists thought it would be beneficial for the company to release some of the Cat's technology as a small board-based product. The result of this was an add-on plug-in board for the Apple //e computer. This card was called the SwyftCard, a name which obviously was based upon the Cat's code name. The SwyftCard's retail price was \$90. It is interesting to read Raskin's comments concerning the origins of the SwyftCard (**Programmers at Work**, p. 237):

We didn't get into business to produce a board for the Apple //e, but it seemed like such a good idea that I would have felt very bad not to have released the product. I saw a lot of good products at Apple and Xerox pass from desktop to desktop, and never get to the market.

Information Appliance wrote the SwyftCard's on-board software in FORTH, a computer language which Raskin saw as ideal for this product since it was compact and inexpensive to implement. Raskin's comments about how he hired a FORTH programmer show the distance Raskin had traveled from Apple, at least from a legal perspective (**Programmers at Work**, p. 238):

I went out and hired a FORTH programmer and a few other people, mostly personal friends of mine. Nobody from Apple. I didn't touch the company. I didn't want to get into any legal hassles, and Apple was nasty enough then that I worried about such things.

The SwyftCard was well received by those who used it. One magazine reviewer had the following to say about the SwyftCard (David Thornburg, **The Race goes to the Swyft**, p. 86):

SwyftCard is a small, multipurpose circuit board that plugs into slot 3 on an Apple //e, turning it into one of the most useful tools you could ever want for word processing, information retrieval, calculation, BASIC programming, and -- if you have a modem -- communication. SwyftCard has accomplished something that I never knew possible. It not only outperforms any Apple II word-processing system, but it also lets the Apple //e outperform the Macintosh.

The SwyftCard reviewer also had the following to say about the philosophy behind the SwyftCard (p. 89):

SwyftCard was the result of extensive thought about how people might want to use computers if they had a choice in the matter, and as a result is a spectacular piece of programming.

The SwyftCard's hardware was based on the 6502 microprocessor. This processor supported only 64KBytes of memory access which caused the SwyftCard designers to implement a bank-switching mechanism so the SwyftCard could access more than 64KBytes of memory. Bank-switching caused development problems with the SwyftCard as discussed by one of its designers (Paul Baker, letter of 03 Oct 1994):

The SwyftCard used banking (because it ran on the Apple //e which had a 6502 and small memory space). This was a constant source of bugs and it also made it more difficult to develop the code. We were glad to have a single address space in both the Swyft and the Cat.

CANON AND INFORMATION APPLIANCE

xxx

THE CAT'S DEMISE

After six months as a product, Canon discontinued the Cat in 1987. Around 20,000 units had been sold during this time which was an impressive number for a small computer company. *** verify this number with JR **

Bruce Tognazzini, a computer-human interface guru, had the following to say about the Cat's demise (**TOG on Interface**, p. 182):

The Canon Cat did not sell well, but this should be attributed to the hardware on which it ran, as well as Canon's decision to target this ideal interface for professional writers almost exclusively to low-level clerical workers, who didn't need its functionality and were confused by its "invisible" interface. The interface was ideal for intuitives in general, and it is sad that so few of its innovations have yet to be picked up by the HI [Human Interface] community.

Some people have said that the reasons for the Cat's demise were political. One story says Canon's electronic typewriter and computer divisions fought for control of the Cat. Canon's president learned of this fight and ordered the divisions to resolve the matter soon. The matter was not resolved and the president canceled the Cat to teach the divisions a lesson. Another story contends that when Canon wanted to invest in Steve Jobs' new post-Apple company, NeXT, Jobs told Canon that it could invest only if Canon dropped the Cat. Jobs supposedly was very hostile toward Raskin since Raskin had created the Macintosh and Jobs could not stand to be associated with him in any way. It is interesting to note that Canon did buy around 16% of NeXT stock in June 1989 for \$100 million. (These last two reasons were told to me by Owen Linzmayer, the author of the Macintosh book **The Mac Bathroom Reader**, who heard these from Jef Raskin and says Raskin has not been able to verify either story).

Raskin's thoughts on the Cat's demise follow (**The Mac and Me: 15 Years of Life with the Macintosh**, 1994):

Canon, possibly because the moribund Electronic Typewriter Division had been given the task, failed to market the product effectively, and it is now a dead Cat.

When interviewed in 1986 Raskin answered the interview question "What do you think is the biggest problem your business faces?" (**Programmers at Work**, p. 239):

How in the world do you sell something that's different? That's the biggest problem. The world's not quite ready to believe. It's like in the early days at Apple, they said, "What's it good for?" We couldn't give a really good answer so they assumed the machine wasn't going to sell. But I do know the way I plan to sell my product is by word of mouth. Some people will try it and say, "This product really gets my job done. It doesn't have fifteen fonts. I can't print it out in old gothic banners five feet long, but I sure got that article finished under the deadline." That's how I can sell it. Later, people will understand it.

In retrospect, it appears that most computer users just didn't "get it" when it came to the Cat.

Paul Baker, Information Appliance's VP of Engineering, had the following to say about the Cat's demise (personal letter, 03 Oct 1994):

With the wisdom of looking back, it is easy to see that the Cat was doomed more by the advance of other technologies. The product was ideally suited to the task of word processing and communicating. But the Macintosh, and now Windows, with their graphical user interface have made more powerful computers more approachable for users and relegated text only systems like [MS-] DOS and the Cat obsolete. I suppose you could say that the current "pocket organizer" type products are the legacy of the Cat - text only, limited

function, low cost products. These products would probably benefit greatly from the "leap" function which makes it very easy to find things in a computer.

After reading Baker's letter, Raskin had the following to say about the above comment (e-mail, 31 Oct 1994):

I, of course, disagree with Paul about the idea that the Cat was "doomed." He seems to have forgotten that it was a fully-bit-mapped system, and had Canon exploited that and kept the product going until third-party software started developing. It may or may not have prospered had not Canon abruptly dropped it, but it was not necessarily doomed.

In 1992 Information Appliance ended. Doug McKenna, one of the company directors, claimed that the venture capitalists behind Information Appliance no longer wanted to be part of what they considered a risky venture so they pulled out their financial resources causing the company to close its doors (phone call, 15 June 1994).

Information Appliance also produced at the time of its demise a 2-lb. Cat laptop prototype. Only two of these were ever built. Jef Raskin currently has two of these laptop prototypes, one still works. These laptop systems were far ahead of their time. They came on instantly when you starting typing and like the present EPA suggestions for "green machines" they turned themselves off when not in use. In the software area the prototypes sported a a version of the Cat software that was a few versions past the Cat's software and supported a better leap technology called Hyperleap.

Jef Raskin currently owns the patents that formed the Cat's core technology. These include a patent for the Cat's LEAP method and the saving and loading of all the Cat's RAM to disk and from disk. Information Appliance licensed several of these patents to other computer companies, but as of mid-1994 nothing has been done with this technology. Raskin claims that in a year or two some products may appear with Cat-like technology (e-mail, 29 June 1994).

In the area of bugs Raskin had the following to say (e-mail, 29 June 1994):

An interesting fact about both the Swyft-products and the Cat is that they were essentially bug-free, which I attribute to the methods we used for managing software development. As far as I know, no customer has ever reported a bug in either.

One reason for the Cat's bug-free software was Raskin's use of a chief-programmer development methodology. He described this in detail as follows (e-mail, 09 Jul 1994):

Our software development methods included detailed and specific specifications (which sounds redundant but isn't), reading each other's code, having a test routine for every subroutine (Forth Word in this case), and very extensive commenting in the programs, which often reads like an essay with an occasional line of code thrown in. We used a chief-programmer organization and worked by "contract" (the programmers chose which parts of the task they wanted to do, and estimated how long it would take. The tasks were broken down into very small pieces that could be coded quickly and understood readily, there were no sections of heroic size).

Concerning financial matters, Raskin claimed that the development of the Cat was made on budget and on schedule, a claim that is very rare in the computing industry (**The Mac and Me: 15 Years of Life with the Macintosh**). Paul Baker, a key Cat designer, had the following to say about the financial costs of this project (personal letter, 03 Oct 1994):

One fairly amazing thing about IAI was that it was in business for around 8 years total and the investors really only lost about \$3 million over that whole period - there have been many startups that burned that much money in one year!

???????? dev cost for Cat / SwyftCard ??????
??? iai expenses ??

From a financial perspective, Information Appliance lost very little money when compared to other computer companies. For example, when compared to the amount of money that Steve Jobs' post-Apple company, NeXT Inc., spent, the \$3 million that Information Appliance lost would have been welcomed by NeXT's backers (its a shame that a wealthy person like Ross Perot backed NeXT, when an investment in Information Appliance would most likely have produced a productive and profitable company). Doug McKenna related the financial end of Information Appliance as follows (e-mail, 07 Mar 1994):

Some of us made loans to keep the thing [IAI] going for a little while longer, and Jef was very meticulous about keeping everything aboveboard, which is always a good thing when money is being lost :)

THE CAT'S SECOND LIFE?

Though the Cat has not been a commercial product since 1987 ***?*** there are indications that Cat-like technology may be resurrected in the near future.

Raskin indicated that several companies which licensed Cat technology may do something with it (e-mail, 30 Jun 1994):

It is also not the case that companies that licensed some of the Cat technology did nothing with it. There are still active projects at various companies which may turn out products in the next year or two.

Raskin also had the following to say about the possibility of a second Cat (e-mail, 31 Oct 1994):

The great interest in the book I am working on, "The Humane Interface, Essays on Post-GUI Interface Engineering," the sudden interest in my articles on the subject, and the many invitations that I have recently gotten for talks about it make me suspect that perhaps Cat-like interfaces were not doomed but just a decade ahead of their time.

xxx

THE PEOPLE BEHIND THE CAT'S HARDWARE AND SOFTWARE

Approximately a dozen people at Information Appliance designed and implemented the Cat's hardware and software.

Jef Raskin, whose photo follows, was the focal point of this small but talented group and was involved in all aspects of the Cat's development.



Figure 4 - Jef Raskin in 1984
(Source: *Macintosh's Other Designers*, BYTE, Aug. 1984, p. 352)

Paul Baker and **Mino Taoyama** headed the hardware design. Others involved were **Charlie Springer** and **Ralph Voorhees**. Baker currently works for Apple Computer (in the early 1980's Baker was one of the chief hardware architects for the revolutionary Apple Lisa computer). Taoyama may also work for Apple.

The Cat's software was written mostly in FORTH by **Jim Straus** (now at Global Village). Parts of the software were written in 68000 assembly language by **Jim Bumgarner**. The 68000 assembler was itself written in FORTH. Other Cat software people were **Terry Holmes** and **Jonathan Sands**.

Several other people contributed to the Cat development. **Jim Winters** was one of the originators of the leaping concept. **Scott Kim** designed fonts and did other graphic and software design (he was more involved with the Swyft than the Cat). **Doug McKenna**, one of Information Appliance's more technically inclined investors, evaluated design options throughout the project.

Canon's project leader for the Cat was **Susumu Takase**.

The names of other people at Information Appliance who contributed to the development of the other IA systems follow:

David Alzofon wrote most of the SwyftCard user's manual.

MAIL AND E-MAIL ABOUT THE CAT

This section contains mail and e-mail that the author sent and received concerning the Canon Cat. This e-mail section exists because I think these raw comments are important and provide a cornucopia of Cat and Information Appliance information.

22 Jun 94 - DOUG McKENNA (CompuServe 70521,1114) to DAVID CRAIG (CompuServe 71533,606)

David -

Paul Baker was the main hardware designer, along with Mino Toyorama (spelling). Paul is back at Apple now, as (the last time I heard) is Mino.

A variety of people wrote the CAT software. Most was written in Forth, but there was a 68000 assembler (written in Forth) that was used pretty extensively also. Jim Strauss (now at Global Village) wrote a lot of the Forth stuff; Jim Bumgardner [Bumgarner] (don't know where he is) worked on the low level assembler stuff.

Doug McKenna
Mathemaesthetics, Inc.

30 Jun 94 - JEF RASKIN (Internet raskinjef@aol.com) to DAVID CRAIG (CompuServe 71533,606)

Subject: Cat Article

29 June 1994

Dear David, <71533.606@compuserve.com>

I got your document and sent some comments into the ether. I have no idea why they didn't get to you. It is great that you are documenting the Cat, and aside from a few specific details, it gives a good overall impression of what we did and what happened. Congrats.

The paper version is a little bit different than what I remember reading (this may be due to differences or a fading memory), and I will comment anew. First of all, your quote from Shacklock (you have changed at least one word in the quote, by the way, and should call it a paraphrase...), you might be pleased to learn that we used the same quote in one of the Apple manuals I wrote with Brian Howard many years ago. Is that where you found it or did you dig it up elsewhere?

Comments on the content:

If you are ever in the bay area, you should try the Cat. I would not call it "The Real Macintosh" as it had many ideas that were invented after I left Apple as well as some invented before that did not apply to the Mac or which Apple was not interested in.

The floppy drive on most Cats held 384K bytes, not 256 kbytes. A few at introduction had the smaller memories.

The keyboard was not quite compatible with a Selectric, it had a number of keys (such as UNDO) as well as the LEAP (TM) that were not on the Selectric, and some of the keys were not in the same location.

The modem was an auto-answer, auto-dial modem. The initial price was \$1495, but the design price was \$795 and Canon lowered the price to that level after a few months.

In the list of software abilities you omit the all-important spreadsheet abilities.

The stream of text was not just broken up into pages but also into documents. Your description of how Leap works is not quite right. My 1989 article “Systemic Implications of an Improved Two-Part Cursor,” in the Proceedings of the Computer Human Interface Conference, 30 April 1989, has exact details. Many people think that it worked the same as the EMACS find, but there are significant differences that strongly decreased the error rate vs. the EMACS method.

The ability to program directly in the interface was designed for third-party developers, so that they would not have to buy as special development program. Third-party software expansion was a very important part of the design and our Technical Documentation manual had details on how to do it.

I don’t think you mean “platitudes” on page 3. Platitudes are hackneyed expressions, and I think you mean expressions of praise, or “plaudits”.

It is certainly not the case that the Mac that came out was “totally opposite of Raskin’s ideas.” For example, I designed click-and-drag to replace PARCs (and, earlier, Sutherland’s) method, which was click one button, move the mouse, and then click another button. Of all the things I ever invented, click-and-drag for moving and selecting (adapted by Atkinson so that it also served to pull down menus) is the most widely copied. On the other hand, the Cat was designed to be used with a graphic input device once Canon allowed its dealers and marketers to admit that it was graphic-based. You quote a paper, The Mac and Me, where did you see it? Did I send you a copy of the draft? More recent versions (which I have not let out of my computer) are more accurate as I learn more details from documents I keep on finding or get sent. A big difference between the Mac and the Cat is that the former was designed to feel like a computer, the latter like an appliance.

My use of the PITS is from a short story about T.C. Pits (The Celebrated Person In The Street), and you should cite that source. I will see if I can remember who wrote it (Thurber?).

Your photo of a mock-up of an early Mac should have a caption mentioning that that was just one of dozens of mockup, lest it give the impression that it is a definitive expression of where the team thought we were going.

An interesting fact about both the Swyft- products and the Cat is that they were essentially bug-free, which I attribute to the methods we used for managing software development. As far as I know, no customer has ever reported a bug in either.

It is not the case that none of the laptop cats exist. I have two, one is still working. Did you mention that it came on instantly when you started typing and that, like the present EPA suggestions for green machines, it turned itself off when not in use? Another way that it was far ahead of its time was in its strong object orientation. It also had what is now called a “suite” of business applications long before the term was invented.

It is also not the case that companies that licensed some of the Cat technology did nothing with it. There are still active projects at various companies which may turn out products in the next year or two.

I do not wish to give the impression by listing these detailed comments that I do not think well of your article. For someone who has never tried the product, it is surprisingly good and accurate. Your

research is commendable. I will have to dig up the article on the Cat that I wrote a few years ago which tells the same story from my inside perspective. And you really should read the one technical article I published about the Cat (cited above) before publication of your history; it is a primary source for technical details on the interface. My view of the business side of the story of the Cat was told in an article I wrote in Midnight Engineering magazine, another reference you need to complete your research. (1990 "Venture Vultures" Midnight Engineering Vol. 1 No. 2, pg. 55 ff Mar/Apr).

I do have tons of documentation and all the manuals. It would cost quite a bit to reproduce the tForth manual and the Technical Documentation, and the User Manual, perhaps 500 to 700 pages in all. Let me know what you want to do.

30 Jun 94 - DAVID CRAIG (CompuServe 71533,606) to JEF RASKIN (Internet raskinjef@aol.com)

Dear Jef: 30 June 1994

Thanks for the extensive replies to my Cat paper. I will try and get your comments and corrections in the paper before its publication in the Historically Brewed journal. Some replies to your replies follow:

> Shacklock

I "borrowed" this from your Apple Integer BASIC manual which I've had since 1978 or so when I owned an Apple II.

> If you are ever in the bay area, you should try the Cat

I would like that very much. I've corresponded with Owen Linzmayer, a Mac book writer from SF, who said when he spoke with you about your role in the Mac project, he also saw your Cat. FYI, he was very impressed with both the Cat and you. His book The Mac Bathroom Reader should appear in August, you may want to get a copy since from the drafts I've read it is very accurate.

> The ability to program directly in the interface was designed for third-party developers, so that they would not have to buy as special development program

Great way of having a machine "programmer friendly"! Question: How many 3rd party developers wrote anything for the Cat? I assume very few given the Cat's short life.

> I don't think you mean "platitudes"

Thanks for catching this - a big error on my part!

> It is certainly not the case that the Mac that came out was "totally opposite of Raskin's ideas."

Correct (again). I guess I was being too general, a vice I believe your Mac 15 year history paper takes exception to.

> You quote a paper, The Mac and Me, where did you see it?

I was sent a copy by a person with an interest in computer history. If what he did was wrong I will tell him. If you really want his name I can provide it, but don't want to cause any problems.

> I learn more details from documents I keep on finding or get sent

I have a rather extensive collection of Apple materials which I've collected since the Apple II heydays. If you have any areas in mind that you want concrete info I may have something. Eg I have extensive

Lisa info ranging from the Lisa Product Introduction Plan to various technical materials such as Bruce Daniel's 1984 paper The Architecture of the Lisa Personal Computer for the IEEE.

> Your photo of a mock-up of an early Mac should have a caption mentioning that that was just one of dozens of mockup

FYI, this is from your wonderful Selected Mac Project Papers: Feb 1980. Question: Do you have any drawings or other photos of the various Macs you mocked-up? I think these would be fascinating to see.

> Swyft- products and the Cat is that they were essentially bug-free, which I attribute to the methods we used for managing software development

Great fact! Few computers can claim this. What methods did you use for your s/w management? I've spoken with Doug McKenna who told me that the h/w and s/w teams at IAI were very small, somewhere around 4-5 people in each group. Is this correct? Concerning cat h/w and Apple, I recall reading that you said you stayed away from Apple people due to legal reasons. How did you end up with Paul Baker as h/w designer? I know of his role in the Lisa's h/w dev.

> laptop cats

Doug McKenna said none existed, thanks for the correction. It sounds like these were well ahead of their time.

> not the case that companies that licensed some of the Cat technology did nothing with it

Good to hear this. Again, Doug McKenna told me that the licenses expired recently on these patents and that nothing had been done. Can you say anything in general about what these companies are doing with Cat technology?

> For someone who has never tried the product, it is surprisingly good and accurate

Thanks. I work as a computer programmer, on the Mac in Santa Fe New Mexico, and as such try and deal only with hard facts. I also like history and think that historical reporting should be based solely on facts which can be documented. I'm always surprised how many factual errors technically-oriented books contain (Steve Levy's books spring to mind). Most of these errors can be fixed before publication by just contacting the people involved in whatever you are writing about. That's why I contacted you.

> I do have tons of documentation and all the manuals

I would love copies of anything you can spare. I would prefer the real thing, ie not photocopies, but if you can't spare any of these items I would be willing to purchase photocopies from you. Naturally, I would pay for the copies and the postage. What about machines themselves? If you have a Cat or SwyftCard that you don't want I would gladly take them off your hands. I would pay for the postage of this stuff.

Thanks again for the reply and I will try to get what you've said into the final paper. Good luck with your computing interests.

-- DAVID T CRAIG

09 Jul 94 - JEF RASKIN (Internet raskinjef@aol.com) to DAVID CRAIG (CompuServe 71533,606)

1. I can send you a SwyftCard, send a self-addressed stamped package for a 3 X 5 or so PC board.
2. Two of the three Cat manuals are huge. I have only one copy of each and am loathe to let them out of my hands. Then there are all our internal development notes. This is a bookshelf full of stuff. If you have a friend in this area who would want to copy them locally, I would be happy to cooperate. I also have a filing cabinet with lots of early Mac stuff as well.
3. Our software development methods included detailed and specific specifications (which sounds redundant but isn't), reading each other's code, having a test routine for every subroutine (Forth Word in this case), and very extensive commenting in the programs, which often reads like an essay with an occasional line of code thrown in. We used a chief-programmer organization and worked by "contract" (the programmers chose which parts of the task they wanted to do, and estimated how long it would take. The tasks were broken down into very small pieces that could be coded quickly and understood readily, there were no sections of heroic size).

Lastly, give credit to **Brian Howard** for turning up the Shacklock quote in the first place.

10 Jul 94 - DAVID CRAIG (CompuServe 71533,606) to JEF RASKIN (Internet raskinjef@aol.com)

Jef: 10 July 1994

Thanks for the continued Cat and Macintosh correspondence. FYI, I've updated the Cat paper per your prior comments and will send you a copy of the printed article in *Historically Brewed*. Due to a deadline I was unable to look at your Cat LEAP paper or your vulture paper. I plan to update the Cat paper one more time and provide copies to the Historical Computer Society (the maker of *Historically Brewed*) and the Computer History Associated of California. I may send a copy of the final to the Apple Library so that your "alma mater" will have some knowledge of what you did with your Post-Apple life.

> I can send you a SwyftCard, send a self-addressed stamped package for a 3 X 5 or so PC board.

Will do. Would this include a SwyftCard manual? If not, I know someone with a SC who could let me borrow the manual to make a copy.

> If you have a friend in this area who would want to copy them locally

I understand your reluctance to part with originals. I will see if I can get someone in the SF area to maybe copy some of what you have.

> I also have a filing cabinet with lots of early Mac stuff as well

If you have your original Pascal memos I would like to see those. FYI, I have the source code for UCSD P-System 1.5.

> software development methods

It sounds like you knew what you were doing. I've spoken with Doug McKenna who mentioned a few of the Cat developers, his comments follow:

The Cat's software was written mostly in FORTH by Jim Straus (now at Global Village). Parts of the software were written in 68000 assembly language by Jim Bumgarner. The 68000 assembler was itself written in FORTH.

Of these names who was the “chief-programmer”? I know Paul Baker was head of h/w design. Who else was involved in the h/w and s/w design? I’m curious to know what you had made in terms of technical docs. Do you have any h/w theory or s/w theory docs on the Cat? I believe your SwyftCard manuals have this type of info. I assume you have Cat h/w schematics. From your description of the Cat development process it seems that the Cat s/w could be an excellent example of how to write software. Have you given any thought to making this s/w public? It seems to me that this software could provide some valuable lessons for other programmers. When I worked for a s/w dev company for several years I produced a short paper on the lessons I and the company learned. Do you have something like this?

Concerning MAC AND ME, will this be a book? What is your schedule? From what I’ve read so far you’ve done a great job and the stories you have to tell are fascinating.

Thanks again for the feedback. I hope my questions aren’t a waste of your time.

-- David T. Craig

10 Jul 94 - DAVID CRAIG (CompuServe 71533,606) to JEF RASKIN (Internet raskinjef@aol.com)

Jeff: 10 July 1994

Concerning your software development methods do you have any metrics on this software? I’m curious to know a little about the architecture of this code since from what you’ve said about this being bug-free it sounds like this is a great piece of software.

I’m looking for the following s/w info:

- FORTH object code size
- 68000 object code size
- FORTH word count

Some other not as technical questions follow. I hope you can answer these since some may pertain to confidential/proprietary info.

- How long did it take to design the Cat s/w? Same for h/w?
- Was the Cat s/w-h/w original design followed closely? I.e. was the final Cat what you had planned to make?
- Do you have any planning docs you can make available?
- How much did it cost to create the Cat s/w? Same for h/w? How does this compare to other projects that you’ve been involved with (e.g. Apple projects)?

Do you have a listing of the word names from the source code? I’m looking for something that something like the Pascal ProcNames utility would have produced for FORTH.

-- David T. Craig

12 Jul 94 - JEF RASKIN (Internet raskinjef@aol.com) to DAVID CRAIG (CompuServe 71533,606)

David,

Doug McKenna gave you a good start, here’s the rest of the Information Appliance programming team: The Chief Programmer was Jim Straus, to be sure. A major part of the code was written by Forth expert Terry Holmes, along with John Bumgarner and Jonathan Sand. I think that most of the code was written by Holmes and Straus.

The contract for the Canon Cat was signed about 11 months before the product first appeared. The hardware development, including three custom chips, was done in this time. Paul Baker led an extraordinary effort. The software was written in this time though it had a head start via the SwyftCard development. I had a lot of ideas about how reliable software could be developed quickly, this project gave me a chance to test my theories of software management, and they seemed to work very well in practice.

Your other questions will have to wait for a day when I have more time to sort through the documents; if I spend too much time looking back I will hardly have time to move forward with new work (which is much more exciting). It was important to my reputation and potential for moving the field ahead that I help correct the misleading reports that minimized my work at Apple, but that is partly accomplished (thanks to people like yourself who are digging out the facts).

As I said in my last note, I would be glad to cooperate in making files available to serious historical research, but I probably should wait until I retire if I am to do such myself. The problem with The Mac and Me is that it seems to be too long for an article, too short for a book. I shall seek a place for it in the next few months.

By the way, I hate CompuServe's use of numbers as names. Totally unmemorable. We shouldn't have phone numbers either, but that's another discussion. Did you see my review of Stross's book in this month's IEEE Spectrum? It has a bit of history in it.

-- jef

12 Jul 94 - DAVID CRAIG (CompuServe 71533,606) to JEF RASKIN (Internet raskinjef@aol.com)

Jef: 12 July 1994

Thanks again for rehashing what you may consider "ancient history". Given that my Cat paper is "officially" done (i.e. its text has been added to the next addition of Historically Brewed's files) there is no rush on anything I may ask for relating to the Cat. I do want to produce version 1.1 of this paper which would include your many helpful comments and facts from your articles on the Cat and the venture vultures (I've ordered these from my local library via inter-library loan -- I obtained your QuickDraw paper from Penn State this way). If you can find your Cat history paper I would very much like a copy. I plan to place this paper on the various info systems such as CompuServe and America On-Line.

> here's the rest of the Information Appliance programming team

Thanks. FYI, I've written Baker at Apple about the Cat and have yet to hear from him.

> It was important to my reputation and potential for moving the field ahead that I help correct the misleading reports that minimized my work at Apple, but that is partly accomplished (thanks to people like yourself who are digging out the facts)

Glad I can be of some help in setting the historical record straight.

> The Mac and Me ... I shall seek a place for it in the next few months

I understand your reluctance to spend too much time on M&M. You may want to serialize it in the Computer History Association of California. It produces a regular journal (The Analytical Engine) covering California-based computing history. M&M may fit in well here. You would retain the rights to your story. If interested, contact Mr. Kip Crosby at CompuServe address 72341,2763. His home

phone in El Cerrito CA is 510-527-7355. I'm a member of this group and have enjoyed the AE issues (4 so far).

> I hate Compuserve's use of numbers as names

I totally agree. I use CIS' Information Manager which provides me with a list of names that I click on. The address then appears in its box. As such, this lets me ignore these numbers. Your INTERNET address is also in my CIS "phone book" so I don't need to remember it either.

> see my review of Stross's book [Steve Jobs & the NeXT Best Thing, 1993] in this month's IEEE Spectrum

I haven't seen this, will check it out. I've read some of your copy in Wired and have liked the reviews.

Concerning the Cat and what I believe is called "SWYFT Technology" why did you not market the Cat after its Canon demise? I assume you held the rights to this technology while Canon served basically as a seller.

-- David

13 Jul 94 - JEF RASKIN (Internet raskinjef@aol.com) to DAVID CRAIG (CompuServe 71533,606)

I will answer your last question now, and return to the others another day it is late: Canon was building the product in Japan. We didn't have the marketing or financial resources to have them build it for us.

21 Jul 94 - HUGH HAZELRIGG (Internet wiggoney@aol.com) to DAVID CRAIG (CompuServe 71533,606)

Thanks for the article. It is indeed a fascinating story, and I enjoyed reading it.

One of the most important messages is conveyed in a quote from Raskin: "It's as if we had asked for a bit of part-time help and were given a bureaucracy." The power of this statement hits home. I have often asked myself why I and others like me are predisposed toward using a computer to accomplish a task when a simpler tool, like pencil and paper, would suffice. I don't have an answer.

27 Sep 94 - DAVID CRAIG to JEF RASKIN - Letter

Dear Mr. Raskin:

Enclosed is a photocopy of the Canon Cat article that I wrote for the Historical Computer Society. The printed article is much better than the draft that you saw. Thanks for your help.

Unfortunately, I was unable to obtain copies of all of your various articles concerning the Cat and Information Appliance. I did finally receive your LEAP paper from my local public library via inter-library loan, but the library could not locate your Venture Vulture paper. I received the LEAP paper after I had sent in the final Cat paper for publication so was not able to correctly document LEAP's technology.

In an e-mail to me from at least a month ago you said that if I sent you an envelope large enough for a SwyftCard and return postage that you would send me one. Please use the envelope that I've sent this letter in for this purpose. You should also find here self-sticking stamps for the postage and a mailing label with my mailing address. I would also very much like, if possible, to obtain a user's manual for

the SwyftCard. From your comments in Microsoft's book *Programmers at Work* this manual seems to be very well written. There is no rush in returning this envelope so please take your time.

I am slowly updating my Cat paper to add a correct description of LEAP and more information about the people behind the Cat and its hardware and software. As such, if you could be kind enough to copy for me your *Venture Vultures* and the history of the Cat that you mentioned I would be very appreciative. I've enclosed \$5 for these copies which I assume will cover the actual photocopies; the balance is for your time. Also, I would like to know if the following list of patents is complete in terms of the patents Information Appliance created. I used CompuServe's patent search facility with your name as the inventor and obtained the following:

- o METHOD AND APPARATUS FOR CONTROLLING A KEYBOARD OPERATED DEVICE
- o METHOD AND APPARATUS FOR CONTROL OF AN ELECTRONIC DISPLAY; VIDEO AND/OR
COLOR GRAPHIC IMAGES
- o COMPUTER DISPLAY WITH TWO-PART CURSOR FOR INDICATING LOCI OF OPERATION

Enclosed is a Macintosh disk with a wonderful history of the Apple][computer, Apple Computer, and its other major systems. I came across this a year or so ago and enjoyed reading this history very much. The author, Steven Weyhrich, has obviously put forth a great deal of accurate research in producing this history. Last I heard Weyhrich was updating his history as a commercial book. I think you will enjoy this history. Weyhrich's e-mail address is s.weyhrich@genie.geis.com

Thanks again for the Cat feedback and good luck with your current endeavors.

Sincerely,

David T. Craig

03 Oct 94 - PAUL BAKER to DAVID CRAIG - Letter

The following is a letter from Paul Baker, the chief engineer behind Information Appliance. Paul Baker currently works for Apple Computer. He worked on the Apple Lisa computer in the early 1980's and also worked on Apple's family of Low Cost (LC) Macintosh computers.

Hi David,

I received your letter some time ago, but have had a fun summer and not kept up with my mail. Sorry it has taken me so long to respond.

I did indeed work at Information Appliance and worked on the Canon Cat as well as the earlier product of IAI, which we called the Swyft and the plug-in card for the Apple //e, which was called SwyftCard.

Once I left IAI, I didn't keep any of the Cat or other documents that I had, but I think I can answer your questions.

0- How many people worked on the Cat hardware and who were they?

At IAI, we had myself, **Mino Taoyama**, **Charlie Springer** and **Ralph Voorhees**. There was also a large staff at Canon, but I can't remember all their names. The project leader at Canon was **Susumu Takase** and there was a team member named **Suzuki**, but that's all I remember.

There was also a software team composed of four individuals: **Terry Holmes, Jim Straus, John [Jim] Bumgarner, Johathan [Jonathan] Sands**. There were a few other individuals in the company who contributed to the product, one was Jef's friend **Jim Winters** who was one of the originators of the leaping concept and **Scott Kim** who designed our fonts and did other graphic and software design (although he was more involved in the Swyft than the Cat). Also, **Doug McKenna**, who was actually one of our investors, is very technically competent and provided us with help in evaluating design options throughout the project.

1- Why did we choose the 68K [68000] CPU?

Well, the first reason was probably that we had built the Swyft with a 68008, so we could easily port the code from the older product to the Cat. However, since almost all the code for the Cat was rewritten, really the big part of the code that transferred was the FORTH development environment and interpreter. On the earlier Swyft, the original design used a 6502 (same processor as the Apple II), but when I joined the company we redesigned to use the 68008 because it was at least 4x the performance and only cost a few dollars more [than the 6502]. The 68008 also has a 1 Mbyte address space vs the 64K address space of the 6502 and using the 68K let us get away from any sort of RAM/ROM banking which made the code more efficient and also allowed us to have a larger memory, which improved the product. I think the Cat also had a 256KB main memory. We had 128KB of ROM as well.

The SwyftCard used banking (because it ran on the Apple IIe which had a 6502 and small memory space). This was a constant source of bugs and it also made it more difficult to develop the code. We were glad to have a single address space in both the Swyft and the Cat.

2- Why did you choose a disk size of 256K vs a larger size?

The operating paradigm of the Cat (and the Swyft and SwyftCard) was that the disk was simply an image of the memory. Thus the disk capacity matched the memory size - if the RAM was 256K, then the disk had to be the same size. Since the Cat had no concept of files, there was no need for the disk to have any different capacity than the RAM. In fact the disk drive we used was a regular FM 80 track 3.5" floppy, so the capacity of the drive was actually 360KB, but only 256K was used. The floppy drive had only one head, so it was half the capacity of the standard floppy used on IBM-compatible PC's at the time. We did not use the GCR encoding that is used by Apple computers, which meant that we would not have had the 400KB capacity available to us.

[DTC: Raskin read this section and had the following to say in his 31 Oct 94 e-mail: The last version of the Cat had 384K in both memory and on the drive. So Baker can't be exactly correct about a 360K limit.]

One advantage of recording the entire memory to disk was that we could recall the data that was on the screen first, so it seemed like the user's data loaded instantly, when it actually took about 15 seconds.

3- How far in the development phase was the Cat laptop?

While I was there we built a model with Swyft (not Cat) software which worked. After I left the company, Mino produced a much better model which was based on Cat software. I think they were trying to productize the laptop when the company ran out of money and was closed.

I did enjoy reading your article and thought that it presented the Cat and IAI in a very favorable light. I worked there three years and enjoyed the work, although there were many long hours and we were ultimately unsuccessful in producing a commercial product.

With the wisdom of looking back, it is easy to see that the Cat was doomed more by the advance of other technologies. The product was ideally suited to the task of word processing and communicating. But the Macintosh, and now Windows, with their graphical user interface has made more powerful computers more approachable for users and relegated text only systems like [MS-] DOS and the Cat obsolete. I suppose you could say that the current “pocket organizer” type products are the legacy of the Cat - text only, limited function, low cost products. These products would probably benefit greatly from the “leap” function which makes it very easy to find things in a computer.

Although Canon may not have been successful in selling the Cat I would say that **Takase-san** with whom I worked very closely was a pleasure to work with and the several trips I made to Japan to work with the Cat team were very enjoyable because of the quality of the engineers working on the project on Canon’s behalf.

Although I was closely involved in the hardware design of the Cat, my actual title at IAI was Vice President of Engineering (which is pretty meaningless in a company of 12 people), but what I did was serve as the project leader - working on both hardware and software as well as coordinating the specification for the project. This responsibility fell to me largely because **Jef** did not like to work with the Canon people. They had several features that they absolutely required (for example spell checking) which **Jef** felt made the system more complex than the original simple system he and **Jim Winters** had conceived. Thus it fell to me to negotiate between **Jef** and Canon to resolve the final spec as well as its implementation.

Although the Cat was produced on schedule, the reason that we had to sell the product to Canon in the first place was that our original product, the Swyft, was about a year late and our investors refused to invest the several million dollars that would have been required to launch the Swyft under IAI’s own name. One fairly amazing thing about IAI was that it was in business for around 8 years total and the investors really only lost about \$3 million over that whole period - there have been many startups that burned that much money in one year!

Thanks for your earlier letter. I was suprised that anyone would be interested in the Cat or IAI so many years after it was out of business.

Regards,

Paul Baker

04 Oct 94 - DAVID CRAIG (CompuServe 71533,606) to JEF RASKIN (Internet raskinjef@aol.com)

Jef: 04 Oct 94

I assume you’ve received the envelope I sent you recently for the SwyftCard. If so, I’m requesting another SC if you have one to spare. A friend of mine [Erick Wagner] in Dallas TX has an Apple //e and after reading my Cat article and its SC info he thought that trying the SC would be great. As such, I would send him the extra SC. What will I do with my SC? Find a //e and try it.

If you need another envelope and postage just say the word.

Have you seen the Cat comments in Owen Linzmayer’s new book THE MAC BATHROOM READER? I would think he would have sent you a copy since I believe he visited you in Pacifica. What do you think about the accuracy of the history in this book? FWIW, I’m a Lisa owner and have written a retrospective paper for this machine. If you would like a copy I can send one. I’m also in the process of updating this paper and am looking for any Lisa info. So, if you have some of your Lisa user interface memos handy I would love copies (and would gladly pay for the copying and mailing). BTW,

if you have Linzmayer's book, the Lisa screen shot was from my Lisa (note the icon labeled "DTC Paper").

What's the status of MAC AND ME? I found it a great "read" and think others will also. Have you given any thought to publishing it (as is) as a serial in CHAC?

Many thanks in advance.

Sincerely,

David T. Craig

14 Oct 94 - DAVID CRAIG (CompuServe 71533,606) to DOUG McKENNA (CompuServe 70521,1114)

Doug: 14 Oct 94

Recently Paul Baker wrote me a detailed letter about his work with the Cat. If you would like a copy of this letter send me your mailing address in CO. He mentions you favorably.

David Craig

14 Oct 94 - DAVID CRAIG to PAUL BAKER - Letter

Mr. Baker:

Thank you very much for your detailed letter from the beginning of October concerning the Canon Cat. I found your letter fascinating and plan to incorporate some of your comments into a revision of my Cat paper.

Sincerely,

David T. Craig

14 Oct 94 - DAVID CRAIG to JEF RASKIN - Letter

Mr. Raskin:

Recently I obtained a letter from Mr. Paul Baker concerning his work with the Canon Cat. I've enclosed a copy of this letter which you may find interesting reading.

Good luck with your various interests.

Sincerely,

David T. Craig

15 Oct 94 - DOUG McKENNA (CompuServe 70521,1114) to DAVID CRAIG (CompuServe 71533,606)

David -

Thanks for the offer of a copy of Paul's letter. I would be pleased to receive a copy.

Doug McKenna
Mathemaesthetics, Inc.
P.O. Box 298
Boulder CO 80306-0298

15 Oct 94 - DAVID CRAIG to DOUG McKENNA - Letter

Doug McKenna
Mathemaesthetics, Inc.
P.O. Box 298
Boulder CO 80306-0298

Doug:

Here's Paul Baker's letter concerning his work with the Canon Cat.

Good luck at Mathemaesthetics in your new state.

Sincerely,

David T. Craig

15 Oct 94 - DAVID CRAIG to OWEN LINZMAYER - Letter

Owen Linzmayer
2227 15th Ave.
San Francisco, CA 94116-1824

Owen:

Here's a copy of Paul Baker's letter to me concerning his work with the Canon Cat. Baker was the technical head of hardware and software development for Information Appliance. You may find some of his comments interesting.

Good luck with your writing.

Sincerely,

David T. Craig

15 Oct 94 - DAVID CRAIG (CompuServe 71533,606) to JEF RASKIN (Internet raskinjef@aol.com)

Jef: 15 Oct 94

Here's some feedback from a person who read my Cat article. He works in the computer business. I think you will enjoy this comment.

From: HUGH HAZELRIGG to DAVID CRAIG - wiggoney@aol.com 21 Jul 94 20:46:23 EDT

Thanks for the article. It is indeed a fascinating story, and I enjoyed reading it.

One of the most important messages is conveyed in a quote from Raskin: "It's as if we had asked for a bit of part-time help and were given a bureaucracy." The power of this statement hits home. I have

often asked myself why I and others like me are predisposed toward using a computer to accomplish a task when a simpler tool, like pencil and paper, would suffice. I don't have an answer.

Regards,
David Craig

16 Oct 94 - DAVID CRAIG (CompuServe 71533,606) to OWEN LINZMAYER (CompuServe 71333,3152)

Owen: 16 Oct 94

I would like to include a copy of your Mac Bathroom Reader Canon Cat comments in my Cat paper. These are found on pages 112-113. Is this OK?

I think your comments are great and think they would make my paper better. I would also credit you with writing this material.

David Craig

16 Oct 94 - OWEN LINZMAYER (CompuServe 71333,3152) to DAVID CRAIG (CompuServe 71533,606)

"I would like to include a copy of your Mac Bathroom Reader Canon Cat comments in my Cat paper. These are found on pages 112-113. Is this OK? I think your comments are great and think they would make my paper better. I would also credit you with writing this material."

I have no objections whatsoever, but Sybex might. Where will this paper be published?--OWL

16 Oct 94 - JEF RASKIN (Internet raskinjef@aol.com) to DAVID CRAIG (CompuServe 71533,606)

Sender: raskinjef@aol.com
Received: from mail02.prod.aol.net by arl-img-1.compuserve.com (8.6.4/5.940406sam)
id RAA29928; Sun, 16 Oct 1994 17:40:42 -0400
From: <RaskinJef@aol.com>
Received: by mail02.prod.aol.net
(1.38.193.5/16.2) id AA20892; Sun, 16 Oct 1994 17:40:41 -0400
Date: Sun, 16 Oct 1994 17:40:41 -0400
Sender: RaskinJef@aol.com
Message-Id: <9410161740395068693@aol.com>
To: 71533.606@compuserve.com
Subject: swyftcard

I am digging out a SwyftCard and will send it in the envelope you sent. I have seen the Mac Bathroom reader. It is probably the most accurate account yet of the chronology of the Mac and Lisa projects, and contradicts a lot of earlier publications!

I'd love to see your Lisa paper. I don't have time right now to try to dig through my old papers, but I will always keep you in mind when evidence turns up.

Remind me in a couple of weeks and I will send you a copy of the MAC and ME, in its latest incarnation, for serial (nonexclusive) publication in CHAC.

-- jef

16 Oct 94 - DAVID CRAIG (CompuServe 71533,606) to JEF RASKIN (Internet raskinjef@aol.com)

Jef:

Thanks for the reply.

> I am digging out a SwyftCard and will send it in the envelope you sent

Looking forward to it. Thanks for going to the trouble to find this when I know you must have better things to do than rehash ancient computer history :)

> I have seen the Mac Bathroom reader. It is probably the most accurate account yet of the chronology of the Mac and Lisa projects, and contradicts a lot of earlier publications!

Owen Linzmayer spent a lot of effort on checking all of his facts for this book. I'm cognizant of his efforts for the Lisa chapter since he sent me several drafts of this chapter and was very meticulous about the comments I made. I attribute his accuracy to his willingness to communicate directly with those people whose projects he wrote about (e.g. you and the Macintosh).

> I'd love to see your Lisa paper. I don't have time right now to try to dig through my old papers, but I will always keep you in mind when evidence turns up.

Will send a paper copy in a week or so when I have the time to go to the post office. I think any Lisa materials you could dig up would be great since I know you were involved with the Lisa's early formative years than what has normally been written. FWIW, I have copies of the LISA PRODUCT INTRODUCTION PLAN and the LISA MARKETING REQUIREMENTS DOCUMENT (mainly written by Trip Hawkins in April 1980). The MRD is great since it shows Apple's original plans for the GUI Lisa. Were you involved with the MRD preparation?

> Remind me in a couple of weeks and I will send you a copy of the MAC and ME, in its latest incarnation, for serial (nonexclusive) publication in CHAC.

Great to learn that you've decided to place M&M in CHAC. How many issues will this serial encompass?

Thanks again for the reply, please take your time with whatever you plan to send me.

Regards,
David

17 Oct 94 - OWEN LINZMAYER (CompuServe 71333,3152) to DAVID CRAIG (CompuServe 71533,606)

"It has already been published in the Historical Computer Society's journal, but I'm updating it to include more info (e.g. your Cat comments). As such, I don't plan on publishing it anywhere officially. I may put it on CompuServe or AOL. If these places are a problem for Sybex then I would like to get permission first from Sybex if possible. If it says no, then I won't include your full text comments."

David,

As long as it's not going into a "real book" I don't think it's a problem. If you want to lift the two pages of the Canon Cat stuff from my book, just make sure you put it in quotes and insert a note that it's copyright 1994, Owen W. Linzmayer and Sybex. Include the full name of the book and the ISBN #. That should make everyone happy.--OWL

17 Oct 94 - DAVID CRAIG (CompuServe 71533,606) to OWEN LINZMAYER (CompuServe 71333,3152)

Owen:

Will add the info.

DTC

17 Oct 94 - DAVID CRAIG (CompuServe 71533,606) to OWEN LINZMAYER (CompuServe 71333,3152)

Owen: 17 Oct 94

Recently I corresponded with Jef Raskin via the Internet (raskinjef@aol.com) and I asked him if he had seen your Mac Bathroom Reader. He responded with the following:

“I have seen the Mac Bathroom Reader. It is probably the most accurate account yet of the chronology of the Mac and Lisa projects, and contradicts a lot of earlier publications!”

I thought Raskin’s comments may interest you.

David

29 Oct 94 - DAVID CRAIG (CompuServe 71533,606) to JEF RASKIN (Internet raskinjef@aol.com)

Jef: 29 Oct 94

I came across a reference recently to the Cat which said that the Cat received several design awards. If possible, I would like a list of these awards for my Cat paper. There is no rush, so please take your time.

Also, I think having some software metrics for the Cat’s software would make very interesting reading in my Cat paper. I would like to get the text size of the Cat source code files and the number of “procedures” contained within (by “procedure” I mean FORTH word).

I’m very interested in obtaining copies of your Venture Vulture article and your Cat history paper (which I believe you said was unpublished). If you have copies that I can have I would be very appreciative. If you don’t have copies, I will search harder on my end to find them (my local library could not get VV via inter-library loan).

Recently I obtained a letter from Bill Schottstaedt, now at Stanford’s music department, which contained some interesting comments. I had written him since I knew of his involvement with the writing of several technical manuals for the Lisa and was wanting to obtain some details about the Lisa publication group for my Lisa paper. Here are some of his comments:

“My main impression of work at Apple was one of amazement at the quality of the people they attracted -- I especially remember David Casseres, Nellie Connors, Steve Clark, Charlie Kellner, Rich Page, and Pat Marriott. Smart, idealistic, productive people.

Raskin’s claim to fame, in my opinion, is that he encouraged the writers to write clear and truthful documentation. Jobs’ claim is similar -- he and [Steve] Wozniak provided a work environment that left people free to take chances. I don’t remember any [Lisa] input from Raskin.”

I plan to incorporate a scanned photo of you in my Cat paper. Is this OK with you? The photo I plan to use is from the BYTE article from 1984 in which you, Tribble, and Howard are interviewed about the Macintosh's early history.

Thanks in advance.

Regards,
David

29 Oct 94 - DAVID CRAIG (CompuServe 71533,606) to DOUG McKENNA (CompuServe 70521,1114)

Doug: 29 Oct 94

Just a reminder that if you have some of the Cat info I asked about a few weeks back, I'm still interested. This included the IAI business plan and development cost information. There's no rush here, so please take your time.

Concerning Paul Baker's letter, what did you think about his comments?

Thanks in advance.

Regards,
David

30 Oct 94 - JEF RASKIN (Internet raskinjef@aol.com) to DAVID CRAIG (CompuServe 71533,606)

Sender: raskinjef@aol.com
Received: from mail02.prod.aol.net by arl-img-2.compuserve.com (8.6.4/5.940406sam)
id BAA11315; Sun, 30 Oct 1994 01:19:45 -0500
From: <RaskinJef@aol.com>
Received: by mail02.prod.aol.net
(1.38.193.5/16.2) id AA02941; Sun, 30 Oct 1994 01:19:44 -0500
Date: Sun, 30 Oct 1994 01:19:44 -0500
Sender: RaskinJef@aol.com
Message-Id: <9410300118455639186@aol.com>
To: 71533.606@compuserve.com
Subject: Re: Canon Cat

Of course Schottstaedt didn't remember any Lisa involvement on my part, he came after that time.

I don't care much what photo you use. If you want a current one to scan, last month's UPSIDE has a photo. But I think that the magazines own the copyrights, so you would probably have to ask them and not me.

I am puzzled by Bill's statement that my "claim to fame, in my opinion, is that he encouraged the writers to write clear and truthful documentation."

I certainly did do that, and, of course, wrote some of the early documentation myself. Including the early BASIC and Pascal manuals. But does he not mention the Mac? I would think that starting that project is more of a claim...

-- jef

30 Oct 94 - DAVID CRAIG (CompuServe 71533,606) to JEF RASKIN (Internet raskinjef@aol.com)

Jef: 30 Oct 94

Thanks for the reply.

> I don't care much what photo you use.

I will use the BYTE photo since I have the issue. I assume I will need to obtain BYTE's permission to use this.

> I am puzzled by Bill's statement that my "claim to fame, in my opinion, is that he encouraged the writers to write clear and truthful documentation."

I had written Schottstaedt about Lisa documentation and as such think that his reply above was aimed at the documentation area in general without any regard to other work that you did at Apple.

Regards,
David

30 Oct 94 - JEF RASKIN (Internet raskinjef@aol.com) to DAVID CRAIG (CompuServe 71533,606)

Sender: raskinjef@aol.com
Received: from mail02.prod.aol.net by dub-img-1.compuserve.com (8.6.4/5.940406sam)
id SAA25080; Sun, 30 Oct 1994 18:38:29 -0500
From: <RaskinJef@aol.com>
Received: by mail02.prod.aol.net
(1.38.193.5/16.2) id AA17855; Sun, 30 Oct 1994 18:38:28 -0500
Date: Sun, 30 Oct 1994 18:38:28 -0500
Sender: RaskinJef@aol.com
Message-Id: <9410301834515922906@aol.com>
To: 71533.606@compuserve.com
Subject: Re: Canon Cat

If he is referring to Lisa documentation, he is entirely correct. I did not manage or write any, and my only influence (if any) was precisely as he said.

Thanks.

Incidentally, I still run into him at CCRMA.

-- jef

31 Oct 94 - JEF RASKIN (Internet raskinjef@aol.com) to DAVID CRAIG (CompuServe 71533,606)

Sender: raskinjef@aol.com
Received: from mail02.prod.aol.net by arl-img-1.compuserve.com (8.6.4/5.940406sam)
id SAA15185; Mon, 31 Oct 1994 18:52:27 -0500
From: <RaskinJef@aol.com>
Received: by mail02.prod.aol.net
(1.38.193.5/16.2) id AA05013; Mon, 31 Oct 1994 18:52:26 -0500
Date: Mon, 31 Oct 1994 18:52:26 -0500
Sender: RaskinJef@aol.com

Message-Id: <9410311831236576358@aol.com>
To: 71533.606@compuserve.com
Subject: re baker

David:

Thanks very much for sending me Paul Baker's letter. It is very helpful. "Johathan" should be "Jonathan" of course.

The last version of the Cat had 384K in both memory and on the drive. So Baker can't be exactly correct about a 360K limit.

The working laptop (I still have it) has software that was a few versions beyond the Cat. It had Hyperleap and some other amenities that the Cat didn't.

I, of course, disagree with Paul about the idea that the Cat was "doomed." He seems to have forgotten that it was a fully-bit-mapped system, and had Canon exploited that and kept the product going until third-party software started developing. It may or may not have prospered had not Canon abruptly dropped it, but it was not necessarily doomed.

Puzzling is his statement that I "did not like to work with the Canon people." I enjoyed working with them a great deal, including my trips to Japan and their visits. I often disagreed with them--especially when they made decisions based on a lack of understanding of interface principles; their moving the UNDO key to the normal location for the DELETE key was a disaster; they claimed they did it for "marketing" reasons, but it made touch typing a nightmare unless you used a Cat and only a Cat. Like Paul, I also found Canon's Takase great to work with. On the spelling-checker our memories differ; we had to use the one that Canon had a license for and I did not like the way we had to interface to it as a consequence of its design (you had to LEAP to find spelling errors), but I recall wanting a spelling checker. I also disagree that our first Swyft was a year late. We had an iterative, testing-based schedule; I could not and did not give a fixed schedule to our investors. Though they had agreed to the concept and though we had budgeted for it, they continually pressed for a fixed schedule, impossible when work is partly research-based. I will admit that I would give one due date to our engineers and a different, later one, to our investors. But I think that such "fudge factors" are wise from a management point of view.

I was continually amazed that they could agree to something in writing and then demand something else. I am pleased that Paul was impressed by our low-cost, high-productivity environment. And was perpetually surprised that the investors didn't recognize how cost-effective IAI was.

I don't know if I mentioned it, but the work Paul did for Information Appliance was superb. He is extremely hard-working, organized, and capable.

The great interest in the book I am working on, "The Humane Interface, Essays on Post-GUI Interface Engineering," the sudden interest in my articles on the subject, and the many invitations that I have recently gotten for talks about it make me suspect that perhaps Cat-like interfaces were not doomed but just a decade ahead of their time.

Re: design awards. One that I was able to find was the Industrial Designers Society of America's Industrial Design Excellence Award. SwyftWare got a number of magazine citations also.

31 Oct 94 - DAVID CRAIG (CompuServe 71533,606) to JEF RASKIN (Internet raskinjef@aol.com)

Jef: 31 Oct 94

Glad you found Paul Baker's letter enjoyable.

> make me suspect that perhaps Cat-like interfaces were not doomed but just a decade ahead of their time

Hopefully you are correct here. Given that the Cat was a commercial system in 1987 I can extrapolate from your comment that Cat features will appear around 1997. Do you have any concrete evidence to support your claim? E.g., IAI patent usage?

> the work Paul did for Information Appliance was superb. He is extremely hard-working, organized, and capable

I've heard this from others who have worked for him at Apple. They think he did a great job managing the hardware development of the Lisa and his work with the LC Mac line was also supposed to be very good.

Thanks for the design award feedback.

Regards,
David

Oct 94 - EZRA SHAPIRO to HISTORICAL COMPUTER SOCIETY - Letter

(The following is a letter that Ezra Shapiro, the author of BYTE's Oct. 1987 Cat article, wrote to the Historical Computer Society. See the Sep/Oct 1994 issue of HCS' journal *Historically Brewed*, p. 2. Shapiro's comments about Raskin and the Canon Cat were based upon my Cat article for HCS. See HB issue 6 from July/Aug 1994, pp. 11-13)

Hey there HCS and HB,

So I finally got your issue, read it, and enjoyed it! The Raskin piece did bring up some thoughts, though. You have to understand that Jef at times has espoused a kind of interface fascism that has gotten him in trouble. For example, the Mac had no cursor keys in order to force users to cope with the mouse, and the Cat had no cursor keys in order to force users to learn the operation of the leap key. While effective as a training system, this is pretty painful when you're actually trying to use the machine. Cursor keys came in with the Mac Plus, which was really the first Mac to be widely accepted by businesses. And after a long battle within Information Appliance, they were incorporated into the design of the Cat laptop (I saw it, by the way. It was a beautiful machine!). In both instances the lack of cursor keys had apparently slowed public acceptance, and I know there was a lot of public screaming.

I still think the cursor key thing was one of the major factors in the downfall of the Cat. A salesperson could not demo the Cat by showing that you could type, move around on the screen, and print. Moving around requires an explanation of the leap key, which is not easy, as you now know having tried to write about it (By my third or fourth Cat article I actually got good at it!). Take your average customer for a word processor or a typewriter and throw search/navigation concepts at him or her, and you've got problems.

Neither Canon nor Jef wanted the Cat to be positioned as a computer, no matter what anybody has said later. This always struck me as a little odd, because out of the other side of his mouth Jef was voicing hope that people would write Forth applications for the Cat, like spreadsheets and such.

In fairness to Canon, their philosophy was typical of many Japanese firms: put a product on the market, see if the public likes it, and only if there's good acceptance do you apply advertising dollars.

At the time of the Cat, Canon had *no* presence in the computer market and no computer distribution channel. It was quite logical for them to sell through the office automation channel, where they were a big player due to copiers. Admittedly, typewriter salespeople didn't know how to sell it, but I doubt ComputerLand employees would have done much better.

Take care!

Ezra Shapiro

03 Nov 94 - HUGH HAZELRIGG (Internet wiggoney@aol.com) to JEF RASKIN (Internet raskinjef@aol.com)

Sender: wiggoney@aol.com
Received: from mail02.mail.aol.com by arl-img-1.compuserve.com (8.6.4/5.940406sam)
id AAA24372; Thu, 3 Nov 1994 00:35:01 -0500
From: <Wiggoney@aol.com>
Received: by mail02.mail.aol.com
(1.38.193.5/16.2) id AA12505; Thu, 3 Nov 1994 00:34:57 -0500
Date: Thu, 3 Nov 1994 00:34:57 -0500
Sender: Wiggoney@aol.com
Message-Id: <9411022110147975637@aol.com>
To: RaskinJef@aol.com
Cc: 71533.606@compuserve.com
Subject: non-GUI

Even though I cut my computer teeth on UNIX in the '80s, today I love pointing and clicking.

The proliferation of GUI across most of today's popular platforms amply demonstrates that there are many like me in this way.

My colleague, David T. Craig, has told me that you are investigating the non-GUI interface for information devices.

Can a non-GUI benefit me?

I believe that you are probably a true visionary.

Please let me know how I can get more information on the results of your investigation.

Thanks.

Hugh Hazelrigg
Rt. 1 Box 15A
Santa Cruz NM 87567

Cc: David T. Craig (71533,606@compuserve.com)

05 Nov 94 - DAVID CRAIG (CompuServe 71533,606) to JEF RASKIN (Internet raskinjef@aol.com)

Jef: 05 Nov 94

Re: Inclusion of your e-mail in my Cat paper?

I would like to include all of the e-mail that you've sent me in my Cat paper as an appendix. I think having this "raw" information would make the paper better and would provide your exact comments about IAI and its systems for this paper's readers.

Is this OK with you?

Regards,
David

05 Nov 94 - DAVID CRAIG (CompuServe 71533,606) to DOUG McKENNA (CompuServe 70521,1114)

Doug: 05 Nov 94

Re: Inclusion of your e-mail in my Cat paper?

I would like to include all of the e-mail that you've sent me in my Cat paper as an appendix. I think having this "raw" information would make the paper better and would provide your exact comments about IAI and its systems for this paper's readers.

Is this OK with you?

Regards,
David

OWEN LINZMAYER'S CAT COMMENTS

Owen Linzmayer, a San Francisco-based computer industry writer, included a concise description and history of the Cat in his wonderful book **The Mac Bathroom Reader** (published in August 1994, see pages 112-113 for the Cat information). If you want a well researched description of Jef Raskin's early involvement with the Macintosh's development, then this book is for you. Owen's Cat information follows:

"In 1987, Jef Raskin finally got his chance to more fully realize the embodiment of his original Macintosh design goals with a "work processor" called the Canon Cat, which had word processor, spreadsheet, and telecommunications features built in. Most people have never heard of the Cat, and with good reason. After only six months on the market, Canon abruptly dropped the Cat without explanation. It's not as if the Canon Cat was a dog, if you'll forgive the pun. The \$1,495 Cat was well received by the public, selling a respectable 20,000 units and winning many design awards. Why, then, did Canon put the Cat to sleep?"

Over the years, Raskin received two anonymous telephone calls from people claiming to be Canon employees. They offered conflicting motives for Canon's actions. One explained that the electronic typewriter division and the computer division were fighting for control of the Cat. The new president of Canon USA wanted to exert his power and told the two divisions to settle the matter quickly or he would do it for them. They continued to fight over the Cat, so he killed the project outright to teach them a lesson.

The second caller painted a more sinister scenario involving Raskin's old nemesis, Steve Jobs. Shortly after the Cat was introduced, Canon was exploring the possibility of investing in Jobs' new venture, NeXT. Unwilling to share the corporate attention of Canon with Raskin, Jobs told Canon that unless they dropped the Cat, he wouldn't allow them to invest in NeXT. Although Raskin has never been able to verify either story, Canon did pay \$100 million for 16.67% share of NeXT in June 1989. Kinda makes you wonder..."

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ISBN 0-7821-1531-4

INFORMATION APPLIANCE TIMELINE

This section contains a timeline of the important events surrounding Information Appliance's life.

xxx 84	Information Appliance founded
xxx	Swyft development begins
xxx	Cat development begins
xxx	SwyftCard development begins
xxx	Canon becomes involved
xxx 85	SwyftCard introduced
xxx 86	Cat introduced
xxx	Laptop development begins
xxx 92	Information Appliance closes its doors

• 13 •
REFERENCES

The following documents are useful in understanding Jef Raskin's work with the Macintosh computer, the SwyftCard, and the Cat computer. Document arrangement is by how useful I found them for this paper. Documents marked with * are present in the Historical Computer Society's library. The size in pages of each document or excerpted section appears at the end of each entry and is enclosed in ().

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