

Internet Appliance Market to Reach \$12.5 Billion in 2001

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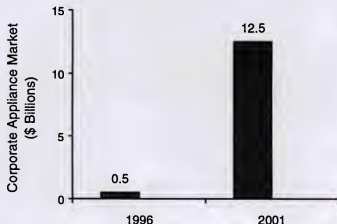
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Exhibit 1

- Appliances will be used by employees who currently have no desktop computing device, as well as existing mainframe terminal users.
- The success of appliances depends on the success of the underlying application migration.

The market for corporate Internet appliances worldwide will reach \$12.5 billion by 2001 (see Exhibit 1)

Worldwide Corporate Internet Appliance Market, 1996-2001



Source: INPUT

What is an Internet Appliance?

The idea of a \$500 diskless Internet access device, introduced at the end of 1995 by Larry Ellison, CEO Oracle, and Scott McNealy, CEO Sun Microsystems, has resulted in the Network Computer (NC) Reference Profile. This profile outlines the specification for a computer-like device designed to access the Web and to run Internet applications written in Java. The NC, as trademarked by Oracle, is unmistakably a computer, with attendant keyboard, mouse, and monitor.

INPUT uses the term 'Internet Appliance' to describe not only traditional computer-like devices but any electronic device that has built-in support for Internet networking, Java applets, Web browsing, and email. These devices will take many forms, from pager-like message display device, through personal organizer, to full desktop computer, and will be targeted at the home as well as at the corporate market.

The prerequisite for open Internet standards support ties these appliances together into a single environment, and is the major differentiator between them and traditional computing devices, which are reliant on a specific vendor's architecture and software.

Who Will Use Internet Appliances?

1. Corporate Users

INPUT has defined four categories of corporate information user:

- **Analyzer**—One who takes a meta-level view of content for high-level analysis, e.g. financial analyst.

- **Producer**—One who creates and publishes new content and who performs major updates of existing content, e.g. marketing employee.
- **Mover**—One who views and makes use of information and who is appointed to perform partial updates, e.g. personnel manager.
- **Consumer**—One who views and makes use of information but who does not update or create information, e.g. insurance claims adjuster.

The likelihood of each category using an Internet appliance increases from very unlikely at the information analyzer level, to very likely at the information consumer level.

Currently, many information consumers have no computing device. Instead, they work with paper-based systems, or printout-on-demand, or share a terminal with colleagues. These users do not have PCs today because of the high cost of supporting such devices.

2. Home Users

The ways in which Internet appliances will be marketed and sold to home users will differ dramatically from the ways in which PCs are sold.

There is essentially little difference between selling PCs to the home and corporate markets—the product, its design, and applications are very similar if not the same in many cases.

Appliance packaging and marketing of Internet Appliances will not be as homogeneous as PCs. For the home market, they will be sold more like consumer electronics than PCs—they

will be designed to fit into the home environment similar to video recorders and hi-fi units, and will be designed for specific applications such as phone and TV integration, home information management, game playing, and, in the future, domestic appliance control.

Low-cost, low-complexity Internet appliances targeted at the consumer will be bought by households that would not consider a PC. Internet Appliances may herald the consumer computing and communications revolution that has so far failed to achieve critical mass.

However, the consumer market will not take off until there is sufficient bandwidth available to the average home. Internet appliances need more than current modem speeds to work effectively, even for casual Web browsing. INPUT expects the U.S. home market to take off first as telecommunications companies offer low-cost, high-speed connection options.

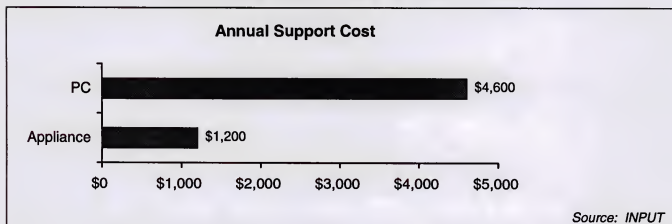
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Support Costs Major Factor in Appliance Deployment

Based on the number of users able to be supported by an individual system administrator, total administrator overheads to the corporation, and purchase cost amortization, INPUT estimates that the annual cost of support for a PC over a five-year lifetime is \$4,600, versus \$1,200 for an appliance (see Exhibit 2).

To put this difference in context, consider a company with 10,000 client PCs. That company's current PC support costs would total around \$46 million per year. By replacing 15% of those PCs with Internet appliances, client support costs would decrease by \$5 million per year. If that company were to migrate two-thirds of its PC users to appliances, it could halve its client support costs.

Client Device Support Costs Per User Per Year



No Death Knell for the PC

If we consider the types of device currently used by the four categories of information user, we see that information analyzers and producers typically use complex, general-purpose devices. Such users deal with many different types of data and application, including local applications such as word processors and spreadsheets, and networked applications such as groupware and database access.

The first wave of Internet appliances are not intended to serve the needs of users performing complex applications. Rather, they are intended to replace existing dumb and semi-intelligent terminals and to give application and network access to employees with no such access.

INPUT believes that by 2000, Internet appliances will take away 15% of PC sales—i.e., 15% of PC sales that would have been made had Internet appliances not existed will be appliance sales instead.

Desktop PCs will be hit harder than portables. While support costs for desktop and portable PCs are similar, portables are often used by managers and executives who will be unwilling to 'give up' their local processing resources.

Companies with large numbers of mobile information movers and consumers, such as claims adjusters within insurance firms and mobile sales representatives, often employ non-PC devices such as personal organizers for these functions, and the cost imperative to migrate from

these devices to Internet appliances is less than with PCs.

Appliances Rely on Application Migration

The issue of true cross-platform development has remained unsolved to this day. While it is possible to write portable software using, for example, POSIX-compliant C or platform-independent wrappers like ANDF (Architecture Neutral Distribution Format), the reality is that a high level of code portability is not trivial to obtain. Cross-platform development is practiced to a useful degree in a small proportion of the commercial market.

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Drafts

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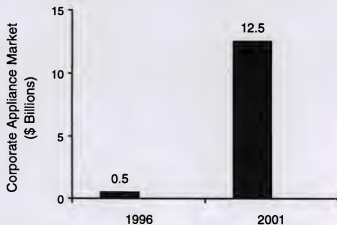
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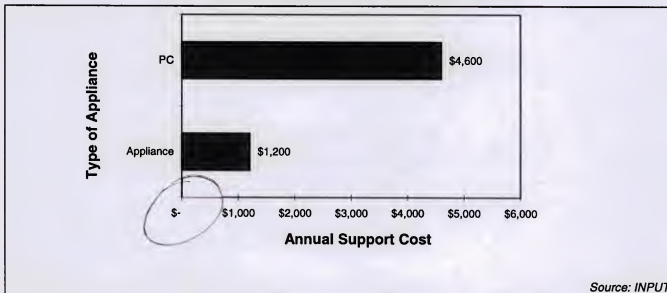
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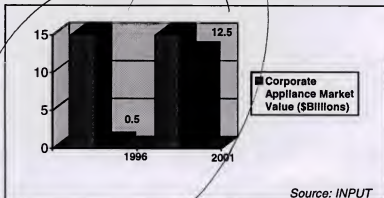
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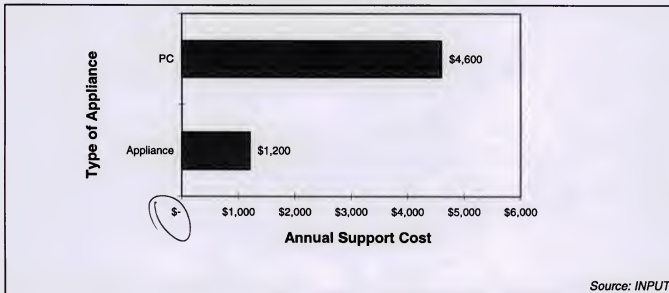
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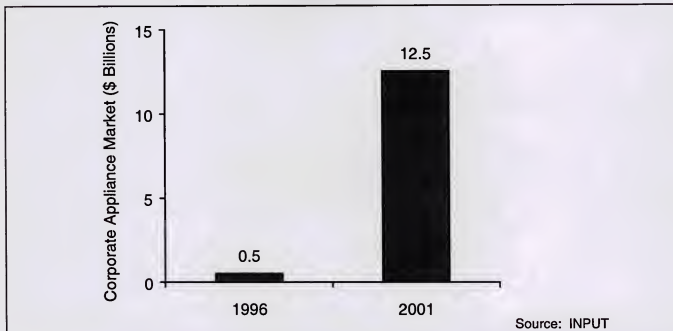
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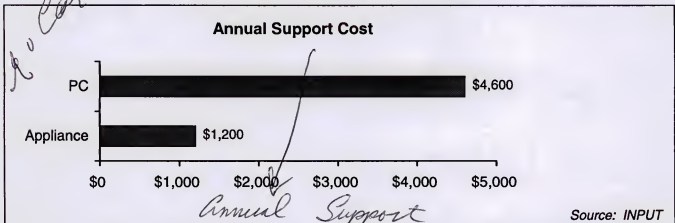
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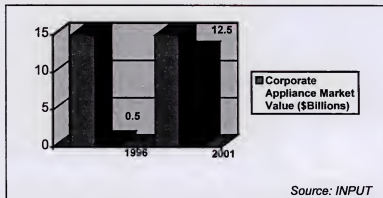
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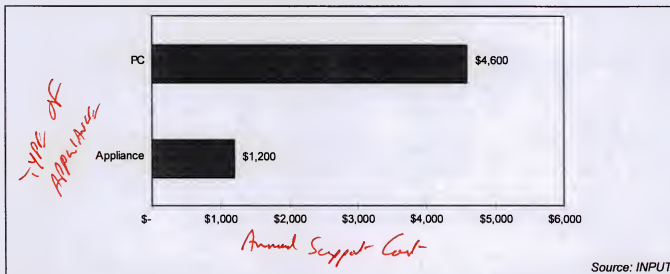
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Client Device Support Costs Per User Per Year





No Death Knell for the PC

If we consider the types of device currently used by the four categories of information user, we see that information analyzers and producers typically use complex, general-purpose devices. Such users deal with many different types of data and application, including local applications such as word processors and spreadsheets, and networked applications such as groupware and database access.

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Companies with large numbers of mobile information movers and consumers, such as claims adjusters within insurance firms and mobile sales representatives, often employ non-PC devices such as personal organizers for these functions, and the cost importative to migrate from

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The issue of true cross-platform development has remained unsolved to this day. While it is possible to write portable software using, for example, POSIX-compliant C or platform-independent wrappers like ANDF (Architecture Neutral Distribution Format), the reality is that a high level of code portability is not trivial to obtain. Cross-platform development is practiced to a useful degree in a small proportion of the commercial market.

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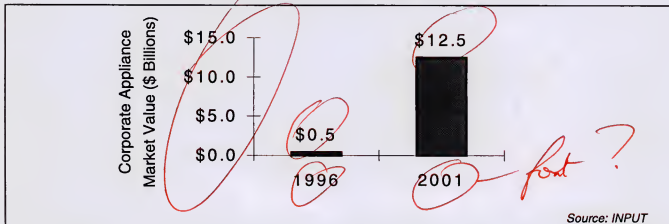
Internet Appliance Market to Reach \$12.5 Billion in 2001

Internet appliances (also known as network computers) are one of the hottest topics of 1996. Proponents claim they may replace the PC as the standard computing device in the corporation; skeptics say they are too limited to lure users away from their PCs. The truth lies somewhere in between. According to recent research, INPUT has found that:

- Internet appliances will not replace the PC, and will have only a moderate affect on PC sales.
- Appliances will be used by employees who currently have no desktop computing device, as well as existing mainframe terminal users.
- The success of appliances depends on the success of the underlying application migration.
- The market for corporate Internet appliances worldwide will reach \$12.5 billion by 2001 (see Exhibit 1)
-

Exhibit 1

Worldwide Corporate Internet Appliance Market, 1996-2001





What is an Internet Appliance?

The idea of a \$500 diskless Internet access device, introduced at the end of 1995 by Larry Ellison, CEO Oracle, and Scott McNealy, CEO Sun Microsystems, has resulted in the Network Computer (NC) Reference Profile. This profile outlines the specification for a computer-like device designed to access the Web and to run Internet applications written in Java. The NC, as trademarked by Oracle, is unmistakably a computer, with attendant keyboard, mouse, and monitor.

INPUT uses the term 'Internet Appliance' to describe not only traditional computer-like devices but any electronic device that has built-in support for Internet networking, Java applets, Web browsing, and email. These devices will take many forms, from pager-like message display device, through personal organizer, to full desktop computer, and will be targeted at the home as well as at the corporate market.

The prerequisite for open Internet standards support ties these appliances together into a single environment, and is the major differentiator between them and traditional computing devices, which are reliant on a specific vendor's architecture and software.

Who Will Use Internet Appliances?

1. Corporate Users

no italics

INPUT has defined four categories of corporate information user:

- Analyzer—One who takes a meta-level view of content for high-level analysis, e.g. financial analyst.

- Producer—One who creates and publishes new content and who performs major updates of existing content, e.g. marketing employee.
- Mover—One who views and makes use of information and who is appointed to perform partial updates, e.g. personnel manager.
- Consumer—One who views and makes use of information but who does not update or create information, e.g. insurance claims adjuster.

The likelihood of each category using an Internet appliance increases from very unlikely at the information analyzer level, to very likely at the information consumer level.

Currently, many information consumers have no computing device. Instead, they work with paper-based systems, or printout-on-demand, or share a terminal with colleagues. These users do not have PCs today because of the high cost of supporting such devices.

2. Home Users

The ways in which Internet appliances will be marketed and sold to home users will differ dramatically from the ways in which PCs are sold.

There is essentially little difference between selling PCs to the home and corporate markets—the product, its design, and applications are very similar if not the same in many cases.

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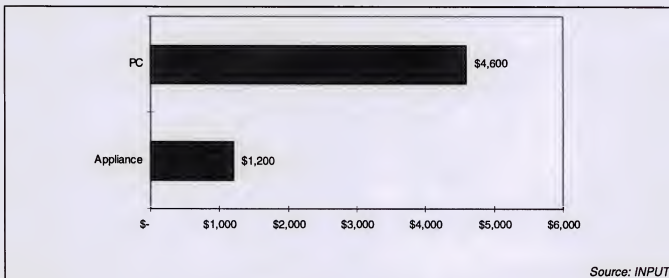
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Internet Appliances

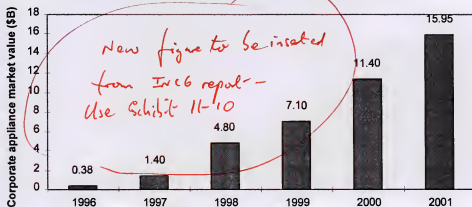
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- Internet appliances will not replace the PC, and will have only a moderate affect on PC sales.

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Source: INPUT



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specific applications such as phone and TV integration, home information management, game playing, and, in the future, domestic appliance control.

Due largely to the lack of speciality design and marketing, as well as to their complexity and relatively high cost, PCs have not become a mainstream household appliance to the extent that TV and phone have become. Low-cost, low-complexity Internet appliances targeted at the consumer will be bought by households that would never consider a PC, and may herald the consumer computing and communications revolution that has so far failed to achieve critical mass.

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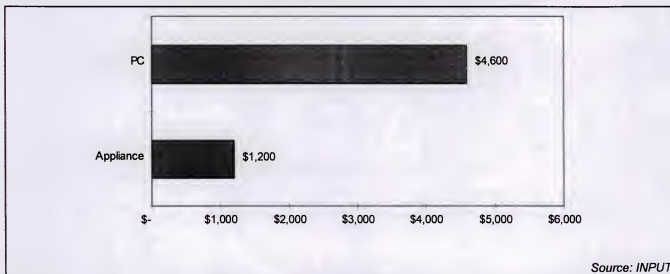
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112996	COMPUTER SCIENCES CORPORATION	Gail Lepard	INRB-C--Report	4
120034	COMPUTER SCIENCES CORPORATION	Van Honeycutt	INRB-C--Report-Comp Exec List	1
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120034	CSC CONSULTING	J. Mickel	INRB-C--Report-Comp Exec List	1
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120034	CSC CONSULTING	D. Catalano	INRB-C--Report-Comp Exec List	1



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3001014	DIGITAL EQUIPMENT CORPORATION	Ellen Gilliam	INRB-C--Report	2
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3000852	IBM ASIA PACIFIC SERVICES CORP.	William Zeitler	INRB-C--Report	1
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3000746	LEXMARK INTERNATIONAL	Lynn Goy	INRB-C--Report	2
3000956	LUCENT TECHNOLOGIES INC.	Ruth W. Wolfish	INRB-C--Report	2
3001045	MICROSOFT CORPORATION	Cindy Wilson	INRB-C--Report	2
3001065	NTT	Hiroshi Ymanaka	INRB-C--Report	2
120034	SAM ALBERT ASSOCIATES	Sam Albert	INRB-C--Report-Comp Exec List	1
3001117	SIEMENS BUSINESS SERVICES GMBH & CO. OH	Alexander Grueter	INRB-C--Report	1
3001117	SIEMENS NIXDORF INFO. SYS. AG	Friedrich Froeschl	INRB-C--Report	1

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3000960	TOSHIBA CORPORATION	Hidekazu Izumi	INRB-C--Report	2
3001118	TOYOTA DIGITAL	Shozaburo Tor	INRB-C--Report	2
120701	UNIVERSITY OF CALIFORNIA	Jim Dolgonas	INRB-C--Report	2
3001077	Z... INTERNAL - COMMERCIAL	Mike Dishman	INRB-C--Report	1
111024	ZZ... INTERNAL - COMMERCIAL	Sales Library	INRB-C--Report	1
111027	ZZ... INTERNAL - COMMERCIAL	Library	INRB-C--Report	2
121019	ZZ... INTERNAL - COMMERCIAL	Brad Meinert	INRB-C--Report	1
111028	ZZ... INTERNAL - FRANCE	Library - Sales	INRB-C--Report	5

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111038	ZZ... INTERNAL - GERMANY	Frank Solbach		
			INRB-C--Report	5
111034	ZZ... INTERNAL - JAPAN	Library		
			INRB-C--Report	4
111029	ZZ... INTERNAL - NEW JERSEY	Office Manager		
			INRB-C--Report	12
111030	ZZ... INTERNAL - UK	Library/Stock		
			INRB-C--Report	12
111031	ZZ... INTERNAL - VIRGINIA	Phantom Sales Person		
			INRB-C--Report	6
3000886	ZZ... INTERNAL COMMERCIAL	Nancy Hill		
			INRB-C--Report	1
111063	ZZ... INTERNAL REG. OF COPYRIGHT	Dep & Acq Div-LM438C		
			INRB-C--Report	2
Total:				137

