

Total Cost of PC Ownership

August 1996



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Discussion Topics

- **Total Cost of Ownership -- A Growing Concern**
- **Addressing the TCO Issue**
- **Pentium® Pro processor based system is the ideal platform for reducing TCO**
 - **Optimized for 32-bit environment**
 - **Equipped with latest manageability features**
 - **A platform that lasts**

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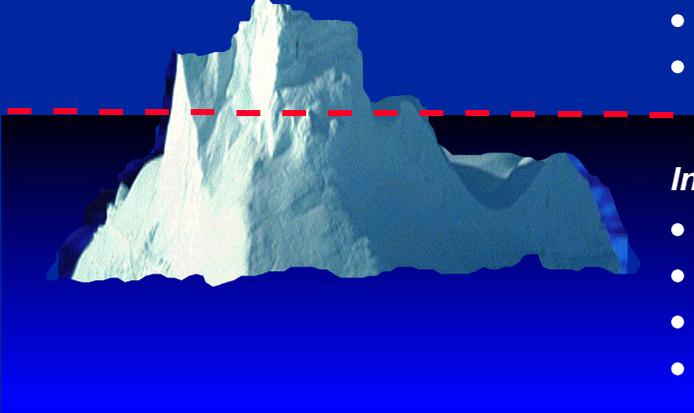
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Today, we'll discuss total cost of ownership, or TCO in short.

We'll show you why TCO is increasingly a concern for today's businesses. Then, we'll discuss how we can address the issue. We'll end with a discussion on why the Pentium® Pro processor based system is the best platform for reducing TCO.

The Iceberg Factor

The Cost of Owning and Supporting PCs



Visible Cost:

- Initial purchase price
- Training

Invisible Costs

- Support
- Admin services
- Technology refresh
- “People downtime”

Source: Intel, Dataquest

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To a CIO (Chief Information Officer) or IT (Information Technology) manager, TCO is the real cost that a business must pay for a PC during its usable life.

TCO is often referred to as the “iceberg factor”.

The visible portion of the cost of owning a PC is actually very small.

TCO

A Business Perspective

- The real budget cost of every PC.
- Between 1987 and 1993, TCO costs increased 108%. *1
- Current costs are greater than \$40,000 per PC. *2

TCO

A Historical Perspective

Year	TCO (Approximate)
1987	\$18,000
1993	\$38,000

1) Gartner Group Research Note, Policy G-140-01, W. Kirwin, May 24, 1993
2) Ibid.

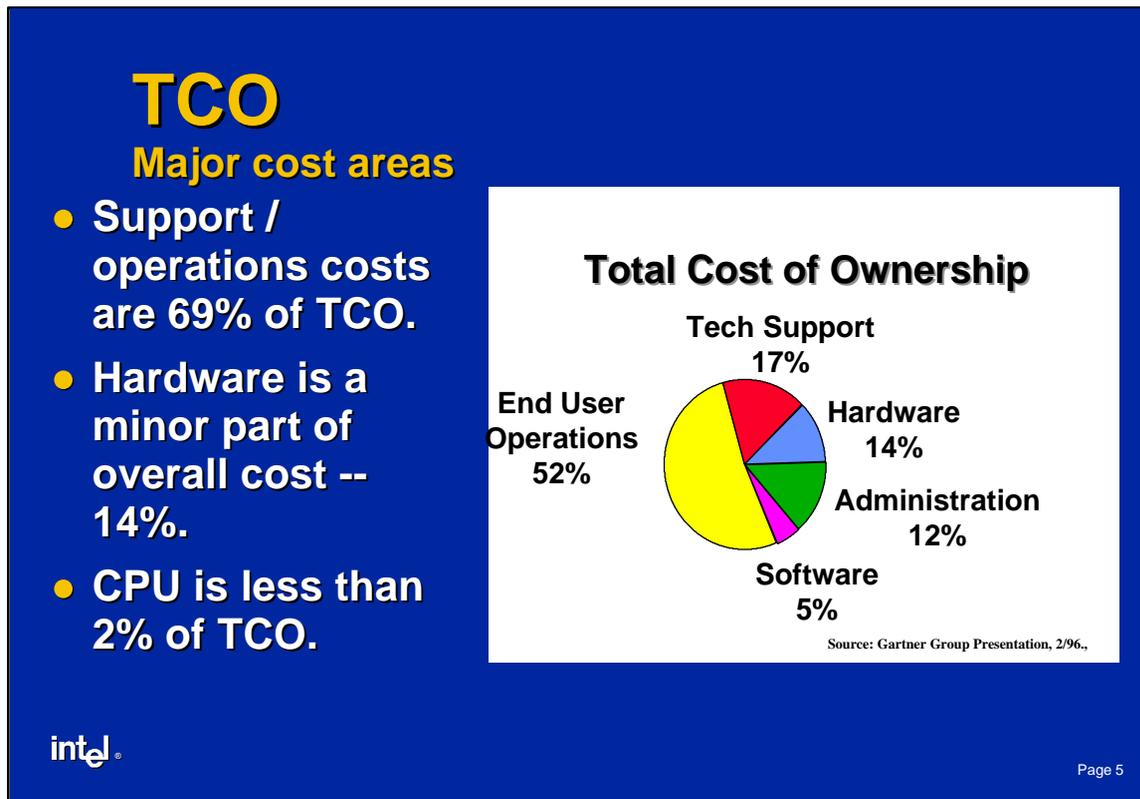
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Between 1987 and 1993, personal computer (PC) TCO climbed over 100%.

Companies today can expect to pay approximately \$40,000 over the life of the system for every computer they purchase. The magnitude of this cost is why so many companies are focusing efforts to reduce it.

The type of computer used in this comparison was a DOS based PC for both the 1987 and 1993 time periods. In 1987 DOS was the corporate desktop OS standard for most companies. Gartner Group used a DOS based PC in their 1993 study to maintain consistency.

As we will show later, the operating system used by the computer will have a very real impact on the TCO of a PC. In 1996, very few computers are sold with the DOS operating system.



Here is a closer look at the iceberg factor.

Contrary to popular opinion, the major areas of cost associated with a PC are due to the end user and support costs, not hardware or software.

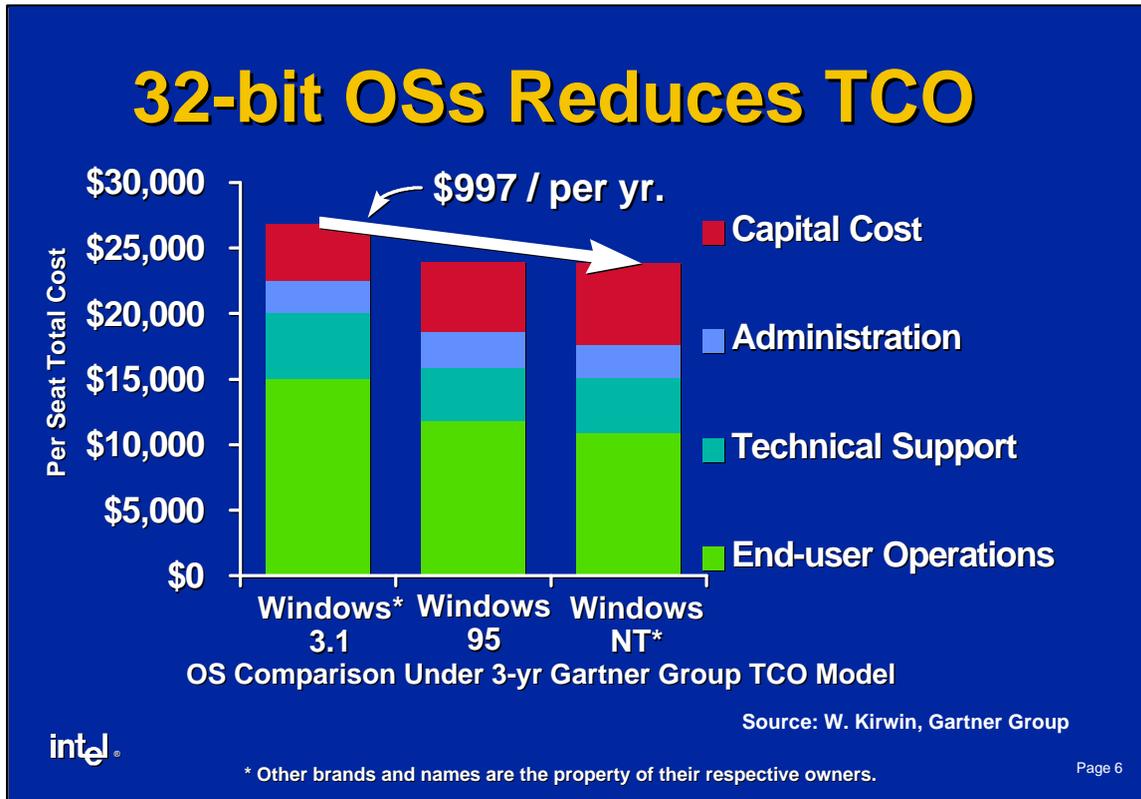
Hardware costs are relatively minor in comparison to the total TCO -- the 1996 Gartner Group study on TCO places only about 14% of the TCO cost with hardware.

The microprocessor is even less of a factor in TCO, account for two percent or less typically.

End Users Operations -- includes data management, application development, formal / causal learning, "futz" factor (the nonproductive time a user may spend on non-work related issues), peer support (users try to assist each other), and downtime

Tech Support -- includes help desk support, documentation, data extract, install / move / upgrade, service / preventive maintenance

Administration -- includes formal audit, installation, security, policies and procedures enforcement, purchasing, moves and changes

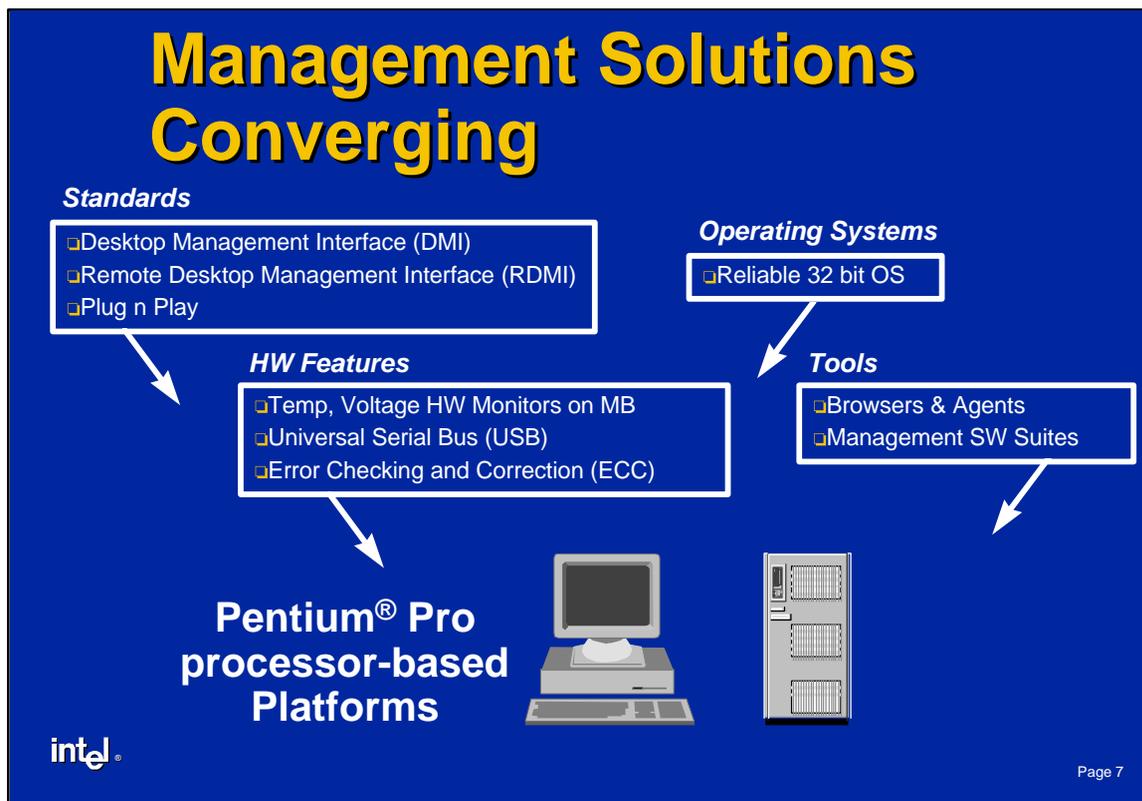


This chart shows that deploying Windows NT* can reduce TCO by \$997 per year. Although it is difficult to read in this chart, the delta between Windows* 95 and Windows NT is approximately \$146. As a single unit that may not sound like a lot but multiple that by the total number of desktop users in a corporation (e.g., 10,000 X \$146 = \$1.46 Million).

The 32-bit OS's are inherently more robust, cutting down time and increasing productivity through true multitasking. Also, 32-bit OS's support management features like Plug'n'play in Windows 95 and Remote access tools in Windows NT.

Windows NT provides the most savings while Windows 95 provides great savings. (Windows NT 4.0 was assumed in this analysis.)

*Other brands and names are property of their respective owners.



In 1996, we'll see the convergence of manageability solutions.

Standards -- Standards have been accepted for local and remote access to management information. e.g. Desktop Management Interface (DMI)

HW Features -- New capabilities directly on the hardware -- monitors to alert system failures, data security on servers through RAID (Redundant Arrays of Inexpensive Disks), and standardized attachments through universal serial bus to allow new capabilities to be added quicker and cheaper.

Operating Systems -- Deployment of more reliable, manageable Operating systems like Windows* NT and Windows* 95.

Tools -- Introduction of software management tools, from local browsers to remote enterprise suites, that help reduce the costs of managing the whole infrastructure down to the workgroup servers and desktops. An example is LANDesk® Manager software.

As business computing moves to 32-bit OSs and 32 applications and more manageable environments, the logical hardware platform will be the Pentium® Pro processor. This is because the Pentium Pro processor has been optimized for 32-bit code and because Pentium Pro processor based platforms will include the most up-to-date set of management features.

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Cost of opening the box

Buy the best: Get a PC that will last

“...every time you open the box (PC chassis), it costs your company at least \$100 to \$250 in support costs and lost productivity. That’s why you want to buy a PC that will make it to the year 2000...”

PC Magazine,
Bill Howard

3/12/96

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This quote refers to opening the chassis of a computer to upgrade the innards, ie. adding memory, installing a bigger hard drive, and upgrading the processor. If you buy the best system now, you won't have to upgrade as soon.

The BEST Platform to Address TCO

The diagram illustrates the integration of three key components for Total Cost of Ownership (TCO) reduction. At the top left is the **Pentium® Pro Processor**, represented by a photograph of the processor chip. To its right is **32bit OS & Applications**, with examples like *Windows NT** or *Windows* 95*. Below these is a computer monitor and keyboard icon labeled **System Manageability Tools**. White double-headed arrows connect the processor to the OS, and the processor to the system management tools. A single-headed arrow points from the OS to the system management tools. Below the diagram, three bullet points highlight the benefits: the processor is optimized for a 32-bit environment, processor-based PCs have the latest manageability features, and this provides headroom for future upgrades. The Intel logo is in the bottom left, and a disclaimer and page number are in the bottom right.

- **Pentium Pro processor** → **Optimized for 32-bit environment**
- **Pentium Pro processor based PCs** → **Latest manageability features**
→ **Headroom for the future**

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Whether businesses are migrating to a 32 bit environment today or tomorrow, Pentium® Pro processor based solutions offers the best long-term solution for your customers

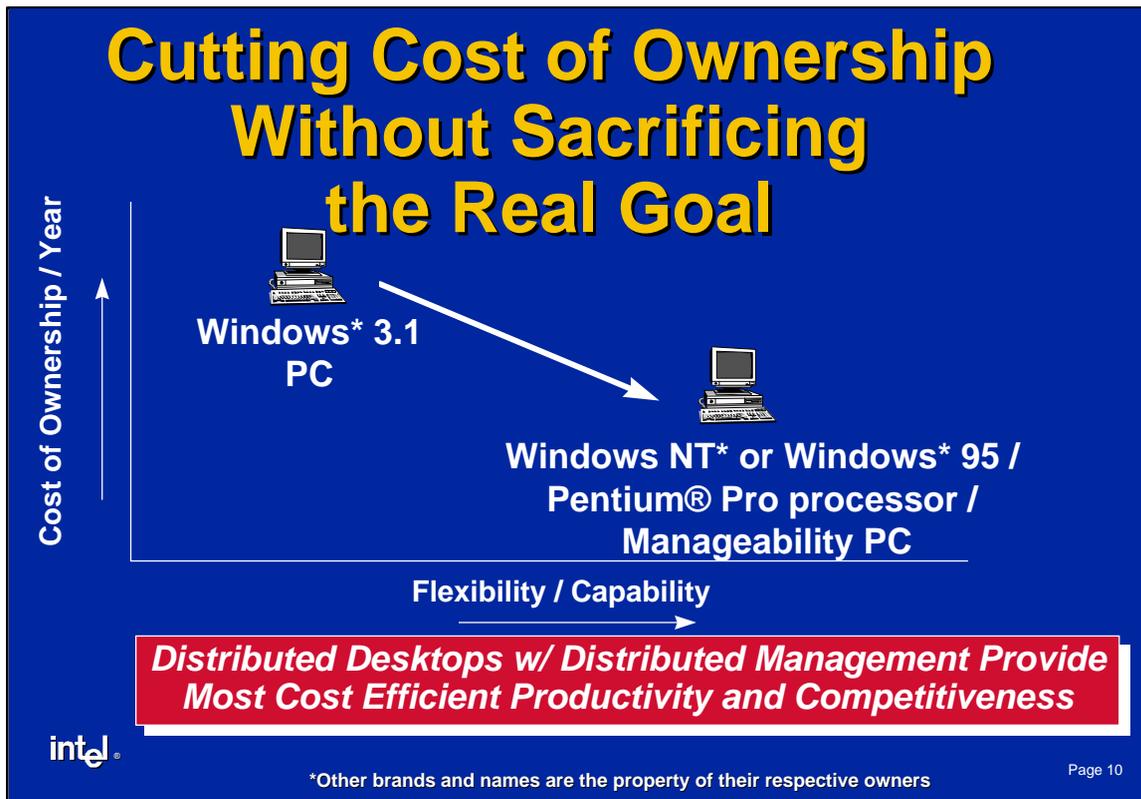
The BEST platform for business is Pentium Pro processor based systems, combined with 32 bit applications and operating systems and system management tools

This platform addresses TCO in 3 ways:

- It is optimized for the 32-bit environment
- These systems are most likely to have the latest manageability future
- It has headroom for the feature: no need to open up the box to upgrade in the near future

Not everyone will be moving to Windows NT* this year, despite analyst projections. Make sure it is clear to your audience that they should buy Pentium Pro processor based systems now, so that they will have the base ready to support the new environment and the future. It's investment protection for the future. Pentium Pro processor based systems are also great platforms for Windows* 95, which also addresses manageability and TCO in a major way.

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- One word of caution, remember that TCO itself is not the goal. You want to cut TCO without giving up the capability and flexibility offered to the end users.
- This is more of a concept foil. If you go from a PC (based on 486 or older with Windows* 3.1) to a manageable platform, you save cost AND gain capability at the same time.
- Note that a distributed environment, with a distributed management solution holds its own from a TCO perspective but at the same time, offers significant advantages in terms of what users can do with computers.
- There are talks about a diskless NC (Network Computer). The diskless NC will lower TCO on the client side, but you are giving up a lot of capabilities. The diskless NC also puts a lot more stress on the network, which will increase costs associated with network resources and network management.
- *Other brands and names are property of their respective owners.

TCO Observations

- Support / end user costs represent 7 of 10 TCO dollars
- New 32 bit OSs / new computer platform technologies can reduce these areas of TCO costs via manageability features
- Best platform for 32-bit software and manageability tools is Pentium® Pro processor based PC
 - End-user cost of buying the best today is small compared to the long-term benefits in productivity, manageability, and longer system life

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TCO Conclusion

- TCO are real costs to you.
- Adoption of 32-bit OSs and Pentium® Pro Processor technology are key to TCO reduction strategy
- Reduce your costs to gain / maintain competitive advantage



