
MICROSOFT
AT WORK

REQUIREMENTS OF A ROBUST FAX SOLUTION

Fax products today are good at doing one thing: sending fuzzy pages virtually anywhere. In order for fax to become a high quality, reliable and secure way to communicate, the following requirements need to be met:

Ease of Use

A strong fax solution should provide users with easy access to a variety of features, allow for customization for specific usage patterns and integrate with existing technology. Many features that are provided in fax machines today are not used, primarily because users don't know how to use them. A good example is delayed send. This is a cost saving feature that allows users to send non-urgent faxes at night when the rates are lower. User surveys suggest that this feature is rarely used, not because it isn't beneficial, but because the implementation of the feature is too confusing for most users. Changing system settings and speed dialing are other examples of existing but hard to use technology.

Customization is the ability to program or adapt fax technology to work the way you do. Users should be able to design easy ways to perform actions that are frequently used. If a sales manager regularly faxes monthly sales reports to his sales force, he should be able to set up an application that regularly pulls the report from a server and faxes it to a predefined distribution list.

Finally, part of making fax technology easy to use is having the ability to leverage a user's knowledge in other areas. Instead of being a separate communications technology, faxing should be integrated with other messaging technologies so that users can learn one way to send and receive information.

Rich Data Transfer

For faxing to become a more critical communications technology, it needs to become for than just a method for transferring images. Currently, when a document is being reviewed or co-authored by geographically separated groups, editors have to hand write recommended changes, and authors have to make these changes manually. This process is prone to error and very time consuming. While products like Optical Character Recognition (OCR) are designed to convert images to editable documents, they are also dependent on the quality of the original to be reliable.

The greatest power of fax is the ability to send information to almost anyone, anywhere quickly. Products that support the transfer of rich data across this medium will allow users to work together across phone lines as if they were all on the same network, or linked via electronic mail. Also, since binary data is approximately have the size of an equivalent scanned fax image, the transmission costs of this data is much cheaper than that of a lower quality image.

Any implementation of binary file transfer needs to be intelligent enough to understand when binary information can and cannot be sent. Most existing fax machines have no capability to work with an electronic document. Therefore, the addition of binary file transfer should not prevent or make it more difficult for a user to send a fax as they do today.

Security

Contracts, internal correspondences, purchase orders, and other sensitive materials are among the most frequently faxed documents. However, faxing today is completely unsecured. Anyone can read a fax. There is no way to make sure it goes to the right recipient. There's no way to guarantee the document's contents have not been changed. This is why security is one of the most requested features of corporate fax users.

A strong security implementation should include a powerful encryption method and an ability to verify the sender, recipient and contents of the message. If passwords are being used, they cannot be sent unaltered with the transmission.

Compatibility and Integration with Existing Technology

Fax technology needs to become better integrated with other parts of a company's information systems, particularly messaging and network systems. For networks: Fax machines should live on the network, and users should be able to use them from the desktop just as they do with printers today. Faxes should be routed along existing networks before being transmitted over more expensive phone lines. MIS departments should be able to centrally administer fax devices and be notified automatically of problems.

Fax with binary file transfer and security is just another form of messaging. Since over 80% of all documents today are created on PCs, users should be send them from the desktop, not print and scan them as most people do today. Similarly, users shouldn't have separate software for faxing versus other forms of communication. Ideally a user should have one application that they use to send and receive all forms of communication, independent of how that information is transferred.

The Microsoft At Work architecture for fax was designed to address these requirements so that faxing will become a powerful anywhere to anywhere communications medium for corporate or stand alone users.

MICROSOFT AT WORK FAX ARCHITECTURE

Microsoft At Work for Fax is a broad industry initiative to create fax products that provide rich, secure messaging between users over standard phone lines. As part of this initiative, Microsoft is enabling all future versions of Windows with software that will allow users to send high quality printed and editable documents securely via industry-standard fax boards, enabled high volume fax boards, enabled fax servers, and enabled fax machines.

All of the Microsoft At Work fax products that are released will provide the following set of common capabilities:

Binary File Transfer

Microsoft At Work fax products will be able to transmit documents or files in their native format. So, if a user creates a Word document and wants to provide the document to someone else to edit, all they have to do is fax it. The recipient will receive the actual *.doc file, as if it had been sent on a disk. Any type of information can be transferred this way. A vendor could even fax an application or a product update to a user, instead of sending disks.

Binary file transfer is implemented as a non-standard facility on top of the standard T.30 protocol used by fax products today. This way, Microsoft At Work fax products can communicate with all existing fax devices (these are Group 3 devices), but also transmit richer information, like binary files, between any two Microsoft At Work enabled devices.

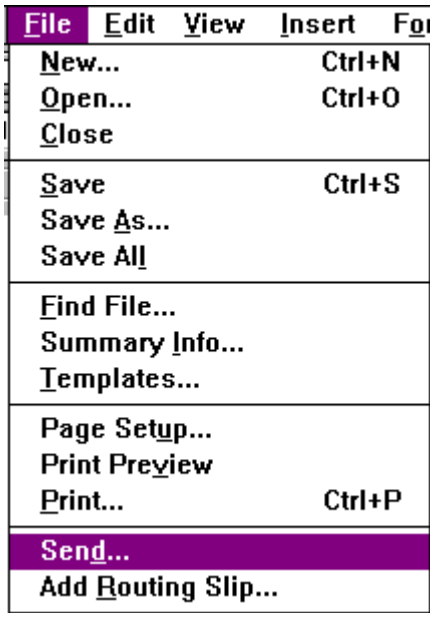
Security

Microsoft At Work-based fax machines and desktop software implement unbreakable RSA security software that allows users to encrypt messages, authenticate senders and recipients before delivery, and ensure that the contents of a message have not been altered. This security will be included in all Microsoft At Work fax machines and in all Windows based PCs, so that in the future, all sensitive business communications will be secure. Other Microsoft At Work fax devices, such as servers and fax boards will have the ability to transmit these secured faxes as well.

High Quality Images and Printing

Part of the Microsoft At Work architecture is printing or “rendering” technology. This technology is capable of creating high quality published or image formats of documents for printing and for faxing. Because a Microsoft At Work published document is four to ten times smaller than the Group 3 images transferred today, Microsoft At Work devices will be able to send higher quality images for a fraction of the transmission costs. Also, Microsoft At Work-based fax machines, copiers and printers will be able to print directly from this format.

This is just a short list of the common capabilities. The desktop software and the different types of enabled devices are described in detail below.



Microsoft At Work fax software in Windows

The fax software in Windows is integrated with Microsoft Mail to provide one unified application for both electronic messaging and faxing. The first implementation of this technology is part of Windows for Workgroups version 3.11. The software provides the following additional capabilities to those described above:

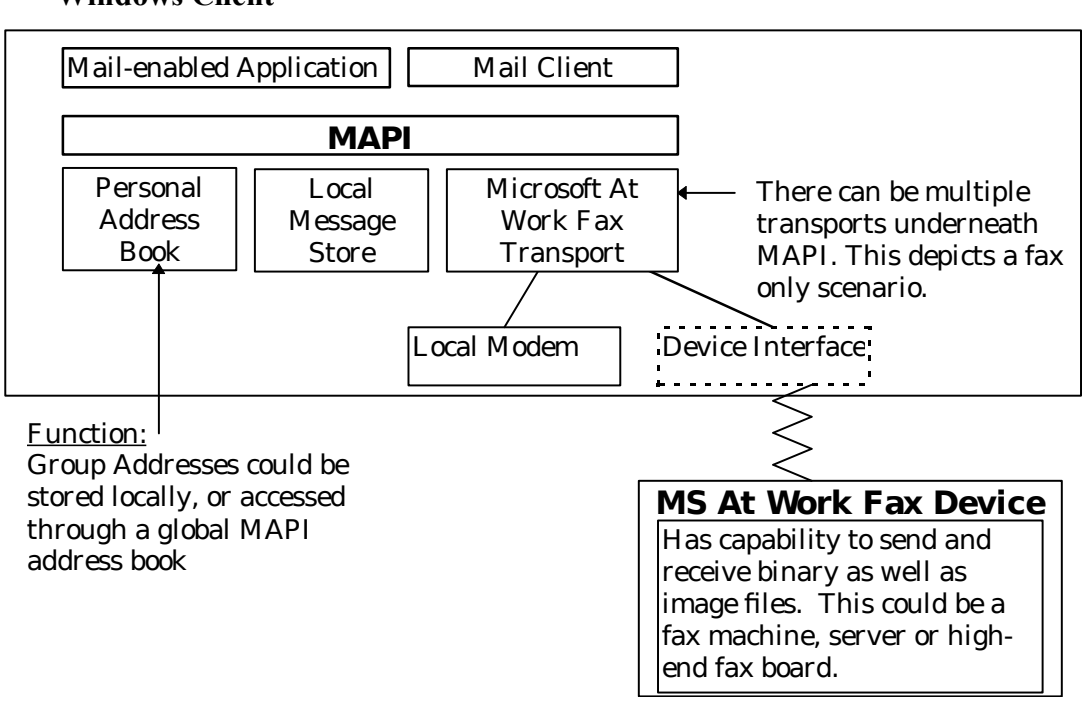
- *Ability to send to email and fax recipients simultaneously.* Microsoft At Work fax software integration with Mail allows a user to save fax and email addresses in a personal address book. When a message is addressed, any combination of users can be chosen. Distribution lists can also be made that combine both fax and email addresses. And, with the binary file transfer capability of Microsoft At Work, any files that can be sent via email can also be sent via fax.

- *Support for any MAPI or CMC (Common Mail Calls) mail-enabled application.* The Microsoft At Work fax software is implemented as a MAPI (Messaging Application Program Interface) transport. This means that any application that supports MAPI is not only email enabled, but also fax-enabled. When a user selects “Send” from the File menu of an application, the document is attached to a Mail message. This message can be faxed just by addressing it to a fax recipient. Many workgroup applications such as forms software or electronic data interchange (EDI) are no longer limited to working over a network.

- *A unified inbox for all communications.* Having one communications application means that all correspondence will arrive in the same location. Instead of having to check fax software for faxes, an email client for email, or call up to get your voicemail, all correspondence can arrive in one location and be managed from one application. MAPI allows many different types of transports to be connected to a single application. By being a MAPI transport, Microsoft At Work fax brings faxing into the mainstream of computer communication, instead of isolating it as a separate medium.

- *Connectivity to any Microsoft At Work-based fax device.* One of the great benefits of Microsoft At Work technology is that Windows users can interact with Microsoft At Work devices. The fax software in Windows can work in a single machine environment with a local modem, or Windows for Workgroups users can share a modem within the workgroup. But, for users that send larger volumes of faxes and want to better use the printing and scanning functionality of a fax machine, the fax software can be set up to use a Microsoft At Work fax device for sending and receiving faxes. The technology is described below.

How it works:



A document is created and is sent either from the mail client or directly from within an application (using FILE: PRINT), or from within a mail-enabled application (using FILE: SEND). The user selects recipients for the message from their personal address book. These recipients are translated into full fax addresses (from their "friendly names") when the message is submitted to MAPI. Note that friendly names can also translate into a group of recipients for broadcast sending.

Once the message has been addressed and composed, the user can select how they would like to send the information. Options include printed form (rendered--this is sending as an image or a standard fax), editable form (binary file--sending the actual file), or best available for (editable if possible; otherwise printed). Once the message has been submitted, the transport will determine what type of recipient the message is intended for as follows:

- If it is a traditional fax recipient and the user has selected "printed form" or "best available", it will render the document into the standard Group 3 image format. This can be used by standard fax machines and software. If the user selects editable, an error message will be returned.

- If the recipient is a Microsoft At Work-enabled recipient and the user has selected printed form, then it will render the document into the Microsoft At Work rendered format. This format provides high quality images of smaller size than standard Group 3, and is used between Microsoft At Work devices including fax machines, printers and copiers.

- If the recipient is a Microsoft At Work recipient and the user has selected editable, no rendering is required.

- If there is a mix of recipients, and the user has selected “best available”, then Group 3 and editable versions of the document are packaged in the message.

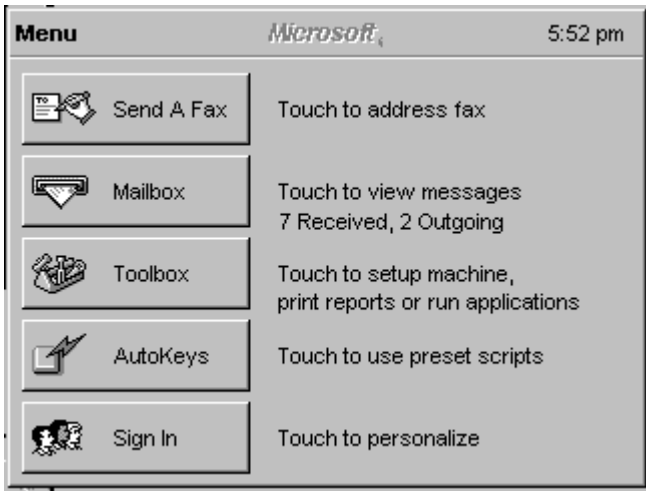
- If the capabilities of the recipient are unknown, it will create multiple formats so that it is assured of having the proper format available upon connect.

Next, if the user has selected security, then this is applied. All security is applied before the message is passed to the modem or connected fax device. The fax software supports standard Class 1, 2 and CAS modems as local modems, although binary file transfer is only possible with a Class 1 modem. This is true for shared modems as well.

A user could also configure the fax software to work with a Microsoft At Work-based fax machine, fax server or high volume fax board. These products send and receive fax messages for the user. These products are described in more detail below.

Microsoft At Work-based fax machines

Today's fax machines are less cost effective investments because they aren't upgradable or scalable. This causes two problems. First, when users outgrow their machine's capacity, they have to buy a new one. Second, while companies need a family of compatible machines to address different usage patterns within their company, they cannot find a family of products that work the same way. Every machine has a different user interface, feature set, and set up procedure. Microsoft At Work-based fax machines will provide a standard set of features to make them more cost effective and easier to use than standard fax machines. In addition to support of binary file transfer and security, these devices may also provide the following technology:



- *Graphical User Interface.* Microsoft At Work-based fax machines deployed in shared, departmental settings use a graphical, touch sensitive display that makes every feature simple to use. Microsoft has used its experience in developing easy to use PC applications and operating systems to make our user interface completely intuitive. In addition, we've added context sensitive help, which guides the user through the specific task they are trying to accomplish. For example, if the paper path is jammed, the fax machine can display a picture showing the user how to clear it.

  We have done extensive testing of the user interface in our usability lab with both naive and experienced users. We test them on both complex and simple tasks and compare their task completion time against old style fax machines. In most cases, there is a significant decrease in the time to complete tasks and in the number of times tasks are done improperly.

While departmental machines will most often deploy a graphical user interface on the device itself, single user desktop fax machines can make use of the rich user interface that they already have on their desktop, namely their PC. All features of the fax machine can be accessed remotely from the PC, eliminating the need for a graphical user interface on the device itself.

- *Cost Savings.* A Microsoft At Work-based fax machine also provides a wide set of advanced cost reduction features. For example,
  - In addition to providing laser quality faxing, our advanced rendering technology actually decreases transmission times, reducing toll charges.
  - There is a "Send at Discount Rates" feature that is simple to access and use. We also allow system administrators to set this up as the default setting, while still allowing users to easily override the feature when needed.
  - Machines will be able to provide an advanced document relay capability that allows users to send a single copy of a document and distributed it to locally multiple recipients. In fact, a document could be sent to Chicago, delivered to 100 recipients there, and then sent on to New York for further distribution. This flexibility, coupled with ease of use, allows companies to implement true lowest cost fax routing.

- Integration with corporate data networks allows users to send fax messages at a fraction of current toll charges. For example, if a company has a LAN bridge between their New York and Los Angeles offices, they can route all west coast traffic via that bridge.

- *Support for MIS.* Microsoft At Work-enabled fax machines are all designed to let MIS manage fax the same way they do other corporate communications resources:
  - They are all centrally administrable. This means that a system administrator can remotely add users and change system settings. Corporations can create a corporate-wide address book and download it to all machines. Updates can be made automatically.
  - They can automatically send trouble reports to system administrators when they encounter a problem or are out of supplies.
  - Fax messages can easily be transported over corporate data networks. This allows MIS to utilize high speed leased lines.
  - Administrators can establish default user settings. For example, they can set up machines so that all faxes after 4 p.m. are delayed until rates decrease. These settings can easily be overridden if required.
  - Activity reports are generated and automatically sent to accounting, where they can be rolled up and electronically entered into the accounting system. Users can enter accounting codes for every transmission.
  - Microsoft At Work-based fax machines provide a rich development environment to allow MIS to create customized applications to automate mission critical communications. For example, purchasing could completely automate their purchase order and invoice communications with subsidiaries and suppliers.
- The Microsoft At Work-based fax machine is also a platform for corporations to develop mission critical applications. For example, a corporation could use the fax machine to automate purchase order and invoice distribution to suppliers. Our authentication features will guarantee that these documents are received by the correct recipient. Editable document transmission would allow both the corporation and suppliers to automatically enter received documents into the accounting and ordering systems.

- *Machine compatibility and upgradability.* All Microsoft At Work fax machines are compatible and upgradable. Compatibility means that users will see a consistent user interface across all machines and that MIS will have a consistent maintenance process for all machines. Upgradability means that when usage increases, owners can increase system memory, add a bigger hard disk, or add a faster modem to increase system capacity. Also, because the technology is software based, new functionality can be added to existing machines just by updating the software.

Microsoft At Work fax machine software is designed with strong PC connectivity built in. Users can easily send and receive faxes directly from their PC. These capabilities are integrated into Microsoft Mail or their favorite mail-enabled applications. This integration means that users have a single environment for sending all messages regardless of the physical media used to reach the recipient.

They no longer have to go to their fax application to send faxes and their email applications to send email. In fact, they can send a single message to both kinds of recipients. The sender doesn't even have to know how the message got there. Its simply a characteristic of the recipient that's stored in the address book.

When combined with our high quality document rendering, this integration of email and fax allows companies to automate the document distribution process. When an author has completed their document, they can select the "Publish" command from their word processor. A simple macro would access the documents cc: list and send a copy to each recipient either via email or fax. A copy can also be stored on the Microsoft At Work-based fax machine, so that others who wanted a copy of the document could call up the machine, provide the document title and password, and receive a copy. A message could then be sent to the author, suggesting that they add the new recipient to the document's distribution list.

This tight level of integration also means that received faxes are automatically delivered into the users mailbox - the same mailbox where they receive email and, in the future, voice mail messages. This allows them to go through all their correspondences in a single session. They can even forward received fax messages to coworkers in the same way they forward email today.

Microsoft At Work-based fax servers

Fax servers are designed for companies with large volumes of faxes that want to centralize sending and receiving of faxes. Fax servers allow multiple lines to be connected into the server so that multiple messages can be sent and received at the same time. These servers also supply centralized administration for MIS.

Microsoft At Work-based fax servers will have many advantages over standard fax servers:

- They can send and receive binary files, even those that are secured.

- They can serve as the “modem” for multiple users by connecting to the desktop software in Windows, as described on page 7. Also, Microsoft At Work-based fax servers support inbound routing of messages, so these can be delivered directly to a users inbox.

- Servers will be able to directly use the Microsoft At Work published format and send messages directly to a printer when specified. This will allow users that do not have desktop connections to the server to receive hard copies of faxes at a local printer.

- Since many automated processes may be implemented using Microsoft At Work technology, such as a fax-on-demand application, these servers will have the ability to create messages on the server, without user interaction, for distribution. This functionality will support the sending of binary files, as well as facsimile images.

Microsoft At Work-based enhanced fax services

Microsoft is working with service providers to enable the sending of fax broadcasts via Microsoft At Work technology. Users will be able to send faxes from the desktop, using the fax software in Windows, and have this distributed to large volumes of

users via an enhanced fax services provider. With Microsoft At Work, an enhanced fax service will be able to distribute live, binary information to users. Now, enhanced fax services can be used as a form of software distribution, not just document distribution. Also, because binary files and Microsoft At Work published files are smaller than traditional faxes, the transmissions costs associated with these broadcasts will be decreased.

Microsoft At Work-based high volume fax boards

Microsoft At Work fax software supports standard Class 1 modems for full binary file transfer today. But, for large corporate configurations where the volume of faxes is higher, or multiple lines are needed, high volume, multi-channel fax boards may be needed. Microsoft At Work-based high volume fax boards will have the ability to work directly with the desktop software in Windows, or support Microsoft At Work-based fax servers or enhanced fax services. These products will implement the Microsoft At Work fax protocol directly on the board for the fastest possible transmissions.

DEVELOPING APPLICATIONS AND PRODUCTS FOR MICROSOFT AT WORK

In addition to adding new end user functionality and intelligent devices to the fax market, Microsoft At Work will transform fax into an integral part of a corporation's wide area communications automation strategy. The following are a few of the activities that could be automated using this capability:

Forms Entry: While forms software is experiencing strong growth in LAN environments, there has been no good way until now to extend these capabilities to individuals beyond the corporate LAN environment. A few companies have tried to transmit forms using traditional fax bitmaps, but this requires inaccurate OCR (Optical Character Recognition) software on the receiving side to convert the image back to its original binary form. By providing a binary transmission capability, Microsoft At Work eliminates this error-prone step. Moreover, by integrating with MAPI, the Messaging API for Windows, forms packages that are mail-enabled are automatically enabled with this wide-area forms automation capability.

The applications for this capability are broad. For example, an insurance agency could equip each of their offices with compatible hardware and, with the software built into Windows, automatically submit insurance claims to the claims processing center, where they would be automatically entered into the claims database. While this capability previously required lots of special software development by special VARs, this can now be done with off-the-shelf hardware and software.

EDI: The security built into the transport also makes it an ideal EDI platform. Companies can automate billing, ordering, and other transactions using the standard capabilities built into Windows. If customized software is required, this software can be sent to users as their first Microsoft At Work fax message.

Broadcasting Live Data to the Field: Today, time-sensitive information such as pricing and product information is often sent in printed form via fax, where it often must be reentered by the recipient. For example, loan rates are faxed to regional banks each week but must be manually reentered into the bank's own loan spreadsheets. Using the Microsoft at Work fax technology, the spreadsheet itself could be broadcast directly to the desktop in usable form. Product information could also be sent in this fashion. Using MAPI, an application could automatically pull the received information out of the inbox and integrated it into an on-line product catalog.

On-line databases: A rich document polling capability will also be built into the software being shipped with Windows. This will allow users to dial up a service, query for available documents, and retrieve documents of interest, either in printed or in editable form. All without the cumbersome voice prompts currently associated with today's fax-on-demand systems.

Mailboxes Accessible Anywhere: The architecture allows service providers to access servers remotely, so that users on the road can retrieve received messages.

Obviously this is only a small portion of the tasks that can be automated when vendors can count on an anywhere-to-anywhere messaging system built into Windows and office devices. Microsoft will work with third party software developers to help create applications, such as those described above, that will provide workgroup technology via the fax. For Windows developers, there is nothing new- just interface to MAPI and you can reach any Windows user anywhere. We will also be shipping a Microsoft At Work fax machine software developers kit for ISVs writing applications that reside directly on the machine.

For more information

For more information on Microsoft At Work fax technology, MAPI or the Windows SDK, please call the Microsoft Developer Services Team toll-free at (800) 227-4679. If you require TDD/TT (text telephone) services for the deaf and hard of hearing, call (206) 635-4948. Alternatively, you can write to:

Microsoft Developer Services Team
Microsoft Corporation
One Microsoft Way
RWF
Redmond, WA 98052-6393

You can also contact Microsoft by fax at (206) 93MSFAX (that is, 936-7329). Specify Developer Services Team, RWF, on your cover sheet. Outside the 50 United States, please contact your regional Microsoft subsidiary for information on MAPI or additional literature. In Canada, call (800) 563-9048. Outside the United States and Canada, call (206) 936-8661 for information about your nearest subsidiary.

OVERVIEW OF THE MICROSOFT AT WORK™ SOFTWARE ARCHITECTURE

On June 9th, 1993, Microsoft Corporation announced the Microsoft At Work™ software architecture, a set of modular software technologies designed to bring ease of use, compatibility, and an enabling platform to devices in the workplace such as copiers, telephones, fax machines, printers, and handheld systems. These software components will be embedded inside these devices and in Microsoft® Windows™ based PCs to address many key problems that exist in the workplace today - devices are difficult to use, they don't connect with Windows based PCs directly, and they cannot be easily programmed or customized to meet the needs of individuals and businesses.

Users will realize these benefits by using graphical user interfaces on devices such as copiers and telephones that make all features easy to access and use, and by having control of and connections to devices from Microsoft Windows based PCs. The Microsoft At Work software architecture offers full compatibility with the Microsoft Windows operating system, ensuring that data can move freely between Microsoft At Work based devices and the PC. This compatibility also allows the over 300,000 developers in the world today to use their existing development tools and knowledge to write applications that run on the Microsoft At Work platform.

Since the June 9 announcement, Microsoft has delivered the first Microsoft At Work software in Microsoft Windows™ for Workgroups v3.11, and multiple office equipment manufacturers are expected to ship devices based on Microsoft At Work software in 1994. Over 60 companies from the telecommunications, office automation, and personal computer industries are working with Microsoft to develop compatible hardware and software products.