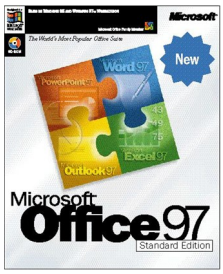
Microsoft® Office 97
Whitepaper

Published: October 1996 *For the latest information, see*
http://www.microsoft.com/office/



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Office 97 combines the ease of intelligent applications with the power of the intranet.IntelliSense in Microsoft Office 97

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Every time Microsoft conducts customer research, customers overwhelmingly indicate that they care most about the software's ease of use. Through IntelliSense™ technology, Microsoft Office software "understands" the context of an end-user's actions, recognizes the user's intent, and automatically produces the correct result. It helps to raise the bar on measures of ease of use. IntelliSense features fall into three main categories:

- Automating routine tasks.
- Simplifying complex tasks.
- Personalizing the software and enhancing discoverability.

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Microsoft first included IntelliSense in Office 4.0 in 1993. As each new version of Microsoft Office is developed, Microsoft looks for new ways to incorporate IntelliSense into the products. This whitepaper explores how IntelliSense in Office 97 makes it easier for users to get their work done.

Customer Research

To discover how to make Office easier to use, Microsoft looks for insights from its ongoing user-driven design and development process. Microsoft continually conducts four categories of user research:

- User Input
- Instrumented Versions
- Contextual Inquiry

- Usability Testing

Through these four areas of research, Microsoft collected essential information that helped developers determine which IntelliSense features to add to improve ease of use.

For more information on user research, visit the Office website at http://www.microsoft.com/office/.

Automating Routine Tasks

IntelliSense automates routine tasks — such as formatting, typing, and entering formulas — by allowing the user to delegate the task to the computer. IntelliSense features understand what the user wants to do, and the software intelligently produces the desired result. This reduces the number of steps required to complete a task, saves time, and reduces the number of features a user must learn to perform a task. In addition, some IntelliSense features work in the background, automatically correcting common mistakes or completing work for the user.

In Microsoft Word, Background Spelling and Grammar Checking check the document while the user works, leaving visual cues where there are errors, and allowing the user to correct the error with the click of the mouse. New to Microsoft Word 97, lead-in emphasis picks up mixed formatting and will apply it automatically to the next paragraph.

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- **1st Quarter Results:** These were up significantly from last year.

- **2nd Quarter Results:** Up 50 percent from last year.

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Lead-In emphasis example

Over 30 percent of the errors in formulas in spreadsheets are due to typographical errors. So Microsoft added Formula AutoCorrect to Microsoft Excel 97, which takes care of the 15 most common typographical errors. For example, if a user enters a formula and forgets to type the ending parenthesis, Microsoft Excel will add it, completing the formula accurately.

Microsoft Outlook™ desktop information manager has numerous IntelliSense features, from AutoPreview, which lets users preview the first three lines of every message in the Inbox and quickly deal with e-mail; to AutoName and AutoAddress in the Contact Manager, which take an entire address block and intelligently parses it into individual fields. With AutoName, the entire contact name can be typed in one field, and Outlook will put the first name in the First Name field, the middle initial in the Middle Initial field, and the last name in the Last Name field. This allows users to sort or do mail merges with any of these individual pieces of information without having to hit the TAB key three times just to enter a name.

In the PowerPoint® 97 presentation graphics program, new IntelliSense features streamline tedious tasks. For example, the Expand Slide feature takes a slide with too much text on it and creates several, easily readable slides.

Through the implementation of IntelliSense technology, Microsoft Access is easy to use for all levels of expertise. For example, Filter by Selection lets a user find all records for “The Terra Firm” by simply selecting that text somewhere in the database and clicking on the Filter by Selection button. This feature was implemented in response to Usability Lab research. When users were asked to find all records of a certain type, they would select one that matched and look for a button to click.

Not only are IntelliSense features present in each of the applications, but often the same IntelliSense features exist in more than one application. Examples include the ability to merge cells both horizontally and vertically, which is in Microsoft Word, Microsoft Excel, and PowerPoint. Another example is OfficeArt, which provides new drawing tools; it is in every Office 97 application.

This is just a small sampling of IntelliSense features in Microsoft Office 97.

Simplifying Complex Tasks

Wizards use IntelliSense to simplify complex tasks by guiding users through multiple steps and decisions. Rather than requiring users to learn and remember all the manual steps necessary to complete a complex task, wizards ask a series of questions and then execute the task for users.

Many complex tasks may be too challenging, too time-consuming, or include so many options that the average user might never take full advantage of the features designed to help with these tasks. In many cases, a task is performed so infrequently that it's hard to remember the sequence of commands from one use to the next. Wizards shield users from the complexity of such tasks, allowing them to focus on choices rather than on how the software works. In addition, wizards guide users through the high-end features that contain much of the software's power — features that a typical user might have avoided for fear they were too difficult to learn.

Microsoft Word 97's new Letter Wizard saves time and effort by simplifying the task of creating letters. It automates common letter elements, such as addressing and formatting, allowing users to focus on the content of the letter rather than the look of the structure.

In Microsoft Excel 97, the Chart Wizard was redesigned. Chart Wizard steps a user through creating a chart. With this new design, it takes fewer steps to complete creating a chart, but more options are actually available at each step. For example, at the step of choosing a chart type, the wizard now shows users how the data will look in that chart type. Users can use the Chart Wizard to edit an existing chart as well as create new ones.

In PowerPoint 97, the Pick A Look Wizard guides users through the decisions required to create a professional-looking presentation, automatically picking appropriate templates for the best look, and helping choose various display and output options.

A breakthrough wizard in Microsoft Access is the Table Analyzer Wizard, which turns a basic database into a fully normalized database that is efficient and properly designed.

Personalizing User Assistance

How do you write software for millions of users, while making it work as if it was designed for each individual user? You create software that can learn from the user and change its behavior based on what the user does.

User Assistance is the term Microsoft uses for product information provided online or in printed format to help users get the most out of their software. It is the area of IntelliSense that has probably changed the most in Office 97, and it is the area that contributes the most to personalizing Office 97 to each user's needs.

The role of user assistance in Microsoft Office has evolved over time. Initially, the goal was to document every feature and its use. However, since many people didn't have the time to read that documentation, Microsoft decided to integrate user assistance into the product. Microsoft put more information into online Help, making it easier to access or search for particular topics. Along the way, Microsoft added features such as Cue Cards, which are a form of online Help that stays on-screen while users use it, and Tips, which watch what users do and suggest an easier way to accomplish specific tasks.

While these innovations advanced users' abilities to work with Office, customer feedback and a series of research projects indicated the need for a fresh approach to online assistance. This approach needed to take into account the following trends in desktop computing use:

- Different levels of software users need different levels of support.
- More people are using software, and for a broader range of projects.
- Desktop computing is becoming a more integral part of people's jobs.
- People have not increased their desire to become technical experts.

User Assistance Research

The first indication that Microsoft needed to take a new approach to user assistance came from the ongoing analysis of customer suggestions contributed by the Microsoft Wish program. Users would frequently ask for features that were already in the product.

Further, one of the key findings from the Contextual Inquiry research was consistent with the Wish research. Customers typically did not have enough experience or did not receive sufficient training to take full advantage of the capabilities of their software. Features were available to solve customer problems, but went unused because the features were unknown or difficult to find. Corporate help desks were receiving many calls related to very simple questions because users weren't getting enough help from the help system. It was spread out all over the user interface, hard to use, and required prior knowledge of computer software lingo.

In the environments Microsoft researched, it was common for there to be a departmental software guru ("that computer guy down the hall"). The better gurus are easily approached, and eliminate the need to speak in "technobabble" as one usually has to do to interact with many online support systems. This guru provides quick answers, and can offer information and tips.

Academic Research

All of the Microsoft user research, and particularly the finding about departmental "gurus," suggests that user assistance is a social as well as a technical problem. Users want help that is tailored to them, and they want the help delivered in a way that is polite, accessible, and doesn't require extensive training to understand.

Interestingly, this is all quite consistent with basic science about the most fundamental ways that people interact with media and technology. A review of the academic literature revealed some surprising — and sometimes counterintuitive — findings. In particular, the research of Byron Reeves and Clifford Nass, at Stanford University's Center for the Study of Language and Information, found that individuals interact with computers and software in fundamentally social ways. People interact with computers in the same way that they interact with other people. They are polite to computers, they form perceptions and beliefs about the personality of the computer, and they even respond to computer information based on the personality they perceive their computer having. We've all experienced this to some degree, and have seen some of the more frustrating moments portrayed in popular cartoons such as *Dilbert*. Popular culture shows people having social interactions with computers all of the time, such as in commercials, *Star Trek*, or with HAL in *2001: A Space Odyssey*, and with droids in *Star Wars*. All of this fundamentally social interaction happens without the conscious recognition of computer users; they do it, but they don't realize they're doing it. The research Microsoft did with customers confirmed this same idea.

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"Nass and Reeves provide a critical set of guidelines for all of us who would design a humane technology. If the designers of media would only follow their guidance, Microsoft would all gain through enhanced social graces in our interactions with media and technology."

Don Norman
Vice President, Apple® Computer

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Reeves and Nass actually studied many facets of this interaction between people and computers. For example, they wondered whether a number of well-established "rules" regarding social interaction between people would also apply to interactions between people and computers. They studied experienced computer users, so misinformation about the capabilities of today's personal computer wouldn't skew the results. Contrary to what most people would think, every rule they tested worked the same between a person and a computer as it does between two people. People felt good when flattered by a computer, they were more polite in their feedback to a computer when interacting directly with that computer than when giving the feedback through a second computer, and they assigned gender to computers, even when there was absolutely no basis for this assignment.

This academic research provided a large body of results for us to draw on while designing and developing a solution to improve user assistance.

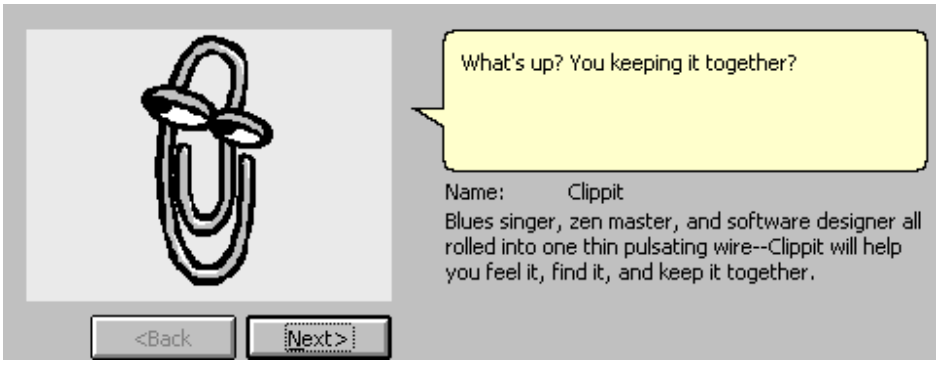
The Office Assistant

New to Office 97 is the Office Assistant. The Office Assistant builds on the existing dynamic of the departmental guru by providing quick and easy answers to customer questions and relieving the burden on local gurus and the central support staff. The Office Assistant is an animated character that is the intelligent center of the user-assistance system in Office 97. By adding a face to this intelligence, it is more concrete to the end user. The Office Assistant's role is to assist with Office — it is integrated with the rest of the interface, it does not replace the existing interface. There is one Assistant for the entire Office suite, with settings and preferences shared across all applications.

Implementation

Our developers discussed a number of designs. Some designs considered using the Office Assistant as an alternative interface to Microsoft Office's capabilities, similar to the social user interface in the Microsoft Bob™ product. But the breadth of the Office feature set and the ways in which end users use the Office product revealed a number of problems with the Microsoft Bob approach, so Microsoft chose a different implementation. Rather than replace the interface, the Office Assistant became focused on assisting with the existing interface and adding intelligence to the user-assistance system. While the Office Assistant can automate some aspects of the end-user's work, it more often serves as an aide. It shows the end user how to accomplish the desired task via the menus, toolbars, and dialog boxes of Microsoft Office. This approach is consistent with the way the local software guru interacts with others in the workgroup — the guru doesn't usually do the work in question, but shows the person how to accomplish the task. Consistent with the social-interface research, it was also an objective to make the Office Assistant fun.

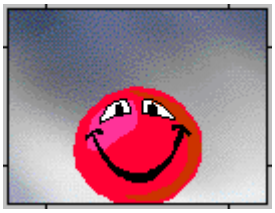
Microsoft created prototypes of the Office Assistant to test in Usability Labs, both in the U.S. as well as in other countries. In a series of tests the Office Assistant proved more popular with customers than a traditional dialog-box interface. Both interfaces provided access to the exact same information — the only difference was the animated assistant. Interestingly enough, not only was the Office Assistant preferable to customers, they perceived it as the more efficient interface, even though it sometimes required more steps. Although the interaction with the Office Assistant is social, the test participants' skill level, gender, and nationality did not significantly impact their assessment of the Office Assistant. In addition, Microsoft asked workgroups from a variety of companies to evaluate the Office Assistant. Participants from small, medium, and large companies thought the Office Assistant was appropriate for their environment.



Microsoft also tested the characters themselves, and the amount of control the end user would have over them. The tests revealed that having a choice of which Office Assistant to use was important to customers, so Microsoft conducted additional usability testing to construct the ideal cast of Assistants from which to choose. Testing in the United States, Europe, and Asia produced more surprising results. On the whole, Assistant preferences were strikingly similar worldwide. Microsoft tested the characters both generically and in Office. While some characters did well both by themselves and in Office, there were characters that users generally liked but not when used in Office. By testing a wide range of characters, Microsoft were able to assemble a cast so that virtually everyone would be able to find at least one character that they really liked. Since Microsoft provide characters that people will feel strongly about, positively or negatively, it's unlikely that anyone will like all of the characters.

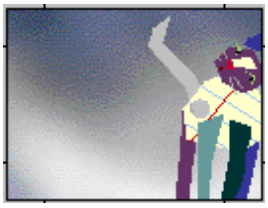
The Office Assistant Gallery

Office Logo

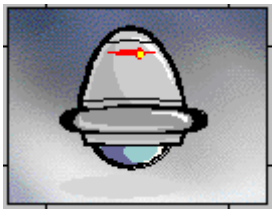


The Dot

The Genius

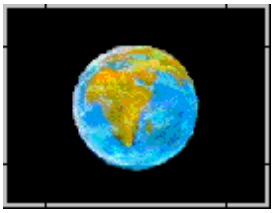


Scribble



Hoverbot

Will



Mother Nature

Power Pup

Clippit

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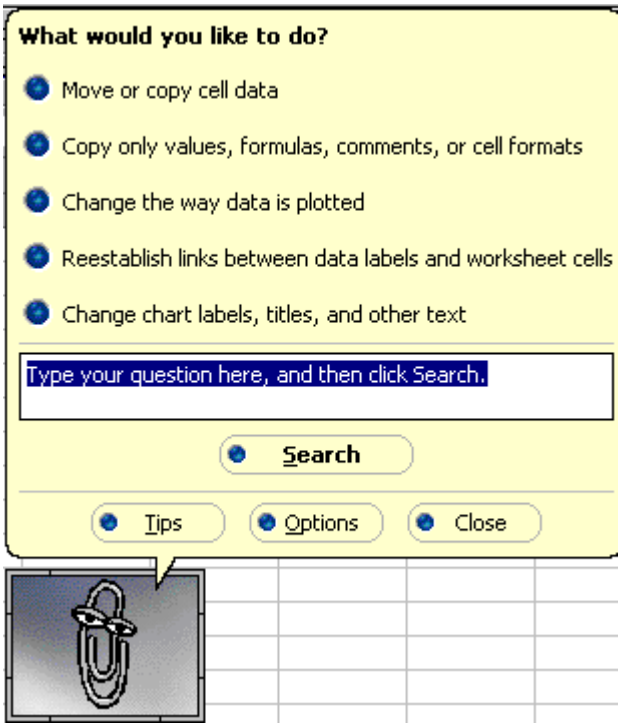
If users find yourself feeling skeptical about the usefulness of the Office Assistant, that's understandable — it's a new concept. It is common to greet new technologies at first with skepticism, but, when based in concrete research, they often turn out to be a breakthrough for users. Consider the Macintosh. Many people called it a "toy" computer. These same people said they didn't need Windows® or a mouse — a command line was all they would ever need.

How the Office Assistant Helps

The Office Assistant is the single place for intelligent user assistance in Office 97.

Intelligent Help

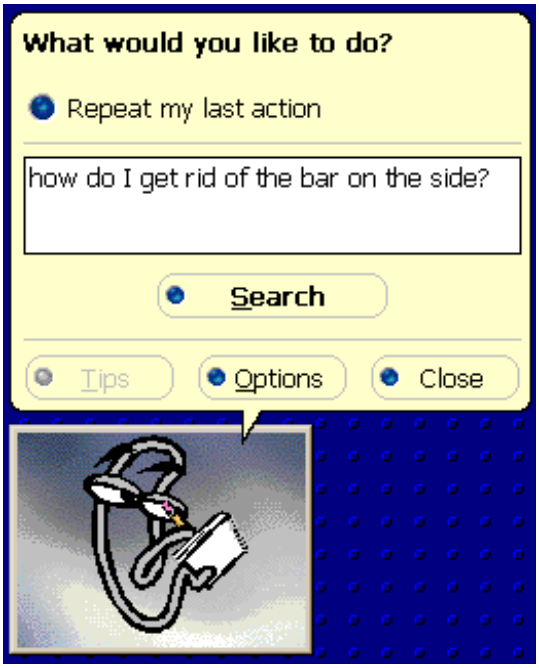
Wouldn't it be nice if software could see when users need some help and step in and point in the right direction? Well, that's what the Office Assistant's intelligent help capabilities can do unobtrusively. Based on the work being done, the Assistant uses its Bayesian inference engine to infer the help users need and propose a topic relevant to their information needs. The Assistant considers information such as their recent commands, attributes of their current selection, and application environment settings to make its intelligent guess. The guesses appear as choices in the Assistant's main balloon when users click on the Assistant. If users see the help they need, they simply click that choice. If not, they can enter the question again. For example, if users drag-and-drop some cells in Microsoft Excel and then click on the Assistant, they'll get the following list of topics:



Natural Language Assistance

Natural language assistance allows users to ask questions about software use in plain everyday language, not "technobabble." If they ask Microsoft Excel "how do I make it look nice", they will get advice on formatting, borders, and printing. Or if they ask Microsoft Word how to print sideways, the Office Assistant will show users how to change page layout from portrait to landscape. Although Microsoft introduced Natural Language Assistance in Microsoft Office for Windows 95, users will be much more likely to discover and use this feature in Office 97. By putting a face on this feature, through the Office Assistant, users will interact naturally with the Office Assistant by asking questions in the same way they would ask their departmental guru.

Two of Microsoft Research's teams, Decision Theory and Natural Language, developed the technology behind the Assistant's intelligent help capability and Natural Language Assistance. They designed an architecture and set of algorithms to analyze help queries using everyday language and match them to available online help information. The Office Assistant decomposes the customer's query, based on Bayesian inference techniques, and infers the desired help using the "expert system" built by a team of knowledgeable domain-specialists. The team of specialists who author the expert system draws from two main areas: User Assistance professionals and Product Support engineers. On the one hand, the User Assistance team members have experience designing computer and software help materials. On the other hand, the Product Support engineers are product experts who are well-versed in the types of problems encountered by real-world customers and the vocabulary with which customers express their needs.

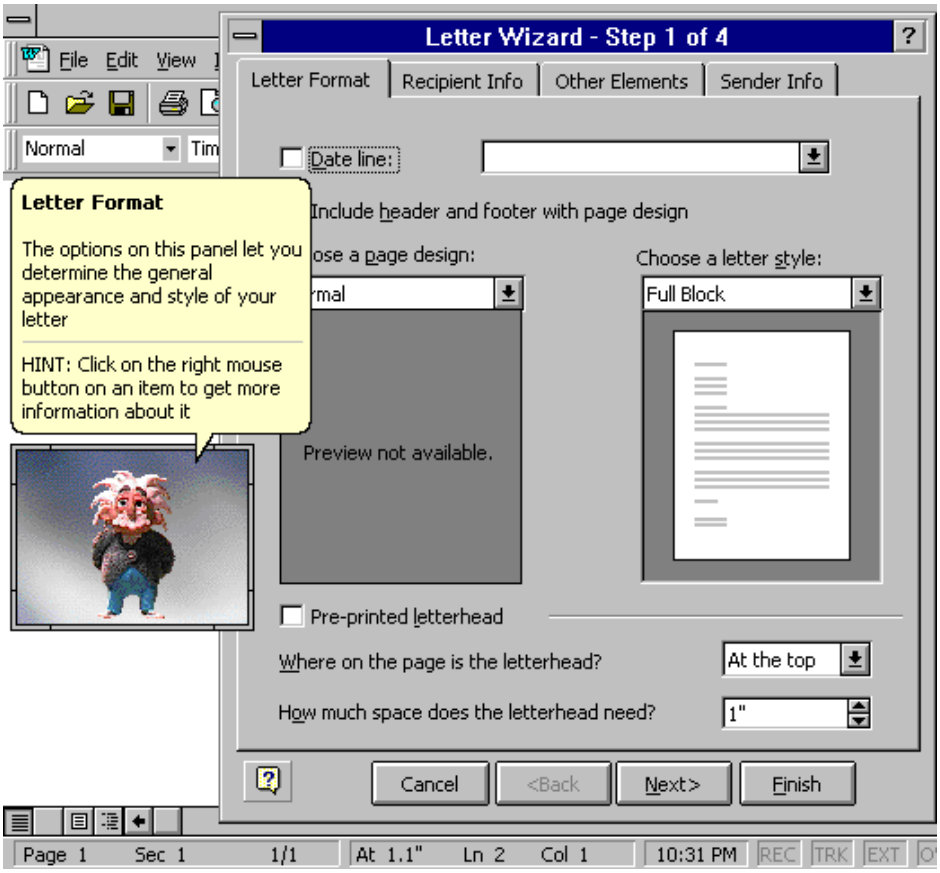


Once users ask a question, they could receive one of several types of assistance, depending on what is most appropriate:

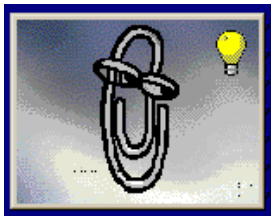
- **Procedural Topics** These are topics that the Office Assistant can give users step-by-step instructions for, such as how to do a mail merge or how to create criteria for a query in Microsoft Access.
- **Conceptual Topics** This is where the Office Assistant will explain a general topic, such as all of the paragraph formatting options in Microsoft Word.
- **Troubleshooting Topics** If users are having trouble printing, the Assistant can step them through the things to check, tracking down the problem and fixing it.

Wizard Assistance

Office 4.*x* included the first use of wizards to make it easier to accomplish more complex tasks. Examples include creating a Chart or PivotTable® view in Microsoft Excel, Mail Merges in Microsoft Word, using Presentation Conferencing in PowerPoint, or Unmatched Queries in Microsoft Access. What Microsoft found is that not only do these tasks take a few more steps, but users don't access these features as frequently, so they forget how to use them. So Microsoft built some extra help into the Office Assistant. The Assistant can give users tips about how to get full use of the wizard in question, or explain a more complex subject. Once users are familiar with that particular wizard, users can choose to turn off the additional assistance.



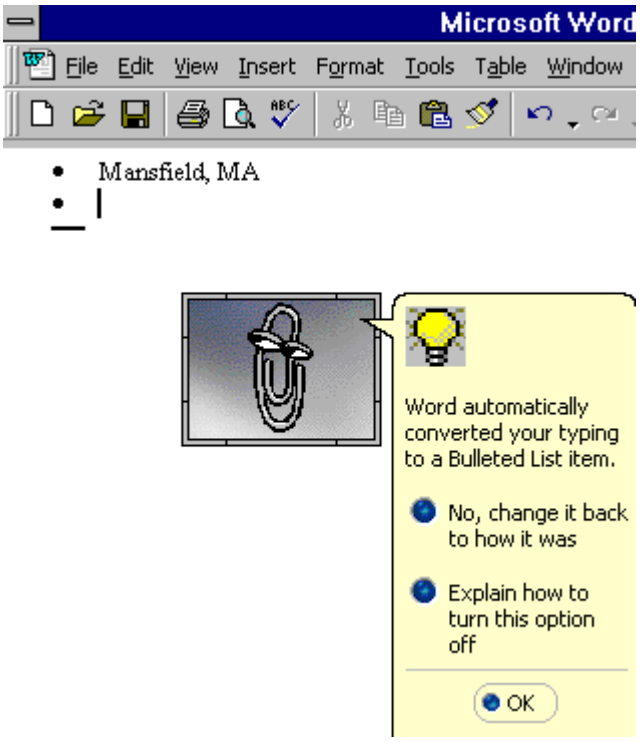
The Office Assistant and the Letter Wizard



Tips

Tips have been in Microsoft Office since Microsoft Excel introduced them in version 4.0, and are now also accessed through the Office Assistant. The Assistant will give users many tips, ranging from a faster way of completing a repetitive task, to explaining one of the many automatic features in Microsoft Office. For example, if users choose New from the File menu in Microsoft Excel, the Office Assistant will let users know users can accomplish the same task with the File New button on the standard toolbar. When Microsoft Word converts your asterisks into nicely formatted bullets, complete with the correct spacing, the Office Assistant will explain what happened and give users the option to turn off the bullets.

For those tips that are really important, the Assistant's bubble will come up, explaining the tip; otherwise, the light bulb will turn on, and users can click on it to see the tip.



An Active Tip

By proactively assisting the user, the Office Assistant gives tangible evidence to the user that the software is working for him.

Alerts and Reminders

All messages from the software come through the Office Assistant while users have it turned on, simplifying the user interface for the end user. The most common messages have actually been completely rewritten to be more friendly — ensuring that they all include a complete problem description and possible solutions.

On-Screen Etiquette

Many people will choose to leave the Office Assistant on-screen all the time. Whether users leave it on all of the time or just some of the time, the Office Assistant is as helpful as possible and is a well-behaved on-screen citizen.

- The Office Assistant will move to avoid blocking your view of dialog boxes or the screen areas where users are working.
- The Office Assistant temporarily leaves the screen for space-intensive operations, such as dragging a large range of cells in Microsoft Excel, or resizing a large object such as a chart. Once you've completed the operation, the Office Assistant returns.
- The Office Assistant tells users when you've finished an operation.

- Although present in all of the Office applications, the Assistant will not appear when users are working in a non-Office application.
- After five minutes of non-use, the Office Assistant shrinks to its smallest size to minimize its screen real-estate.

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The Office Assistant isn't just polite — it's part of your team. Similar to your departmental guru, it occasionally cheers users on as users accomplish new tasks, depending on the personality of the Office Assistant users are using. An example would be an Assistant that congratulates users for successfully completing one of the wizards.

Customizability

The combination of the on-screen etiquette with the high level of customizability of the Office Assistant ensures that your experience with it will be a good one. Users can interact with the Assistant as much or little as users choose. Users can move, size or even close the Assistant's window, which floats over the application.

The Options dialog — accessible from the Office Assistant's shortcut menu or from Options in the home balloon — lets users tailor the Office Assistant to fit your own preferences.

Customize the Office Assistant through the following options:

- Pick your favorite assistant from the Gallery.
- Choose whether to get advice when using wizards.
- Have the Office Assistant guess which topics users need assistance with.
- Turn Office Assistant sound on or off.
- Choose the priority and types of Tips.

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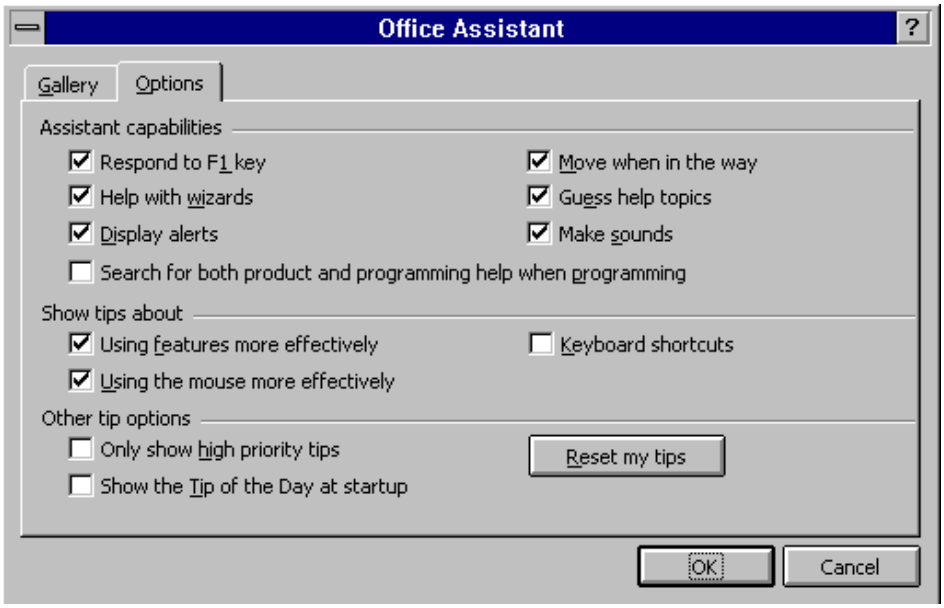

Of course, there is also the option to turn off the Office Assistant. Administrators can even control whether to install the Office Assistant and which characters are available.

Microsoft has exposed these options for administrators to pre-set across groups using Windows 95 and Windows NT® 4.0 System Policies through the Office Policy Template available in the *Microsoft Office 97 Resource Kit.*

Programmability

The Office Assistant has a full object model, which users can program from a controller language, such as Visual Basic® for Applications, included in all of the Microsoft Office applications, the Visual C++® development system, and the Visual Basic programming system. Developers can use this capability to customize their applications, using it to display messages through the balloons, and to include animation and sound.

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