

IBM Pervasive Computing
January 2003



Multimodal Applications for Small Devices

Contents	
3	<i>What is Multimodal?</i>
7	<i>Benefits of Multimodal on Small Devices</i>
7	<i>Examples of Successful Multimodal Applications</i>
8	<i>The Future of Multimodal on Small Devices</i>

Executive Summary

With more and more access to information in today's networked world, the interaction between users and their devices has become a major focus. As devices become smaller, means of input other than keyboards or tap screens become necessary. Small handheld devices such as cell phones and PDAs serve many functions and have sufficient processing power to handle multiple tasks. These devices can benefit the most from the use of applications that employ multimodal input methods.

This paper is written for a general audience with interest in multimodal technology.

Small handheld devices such as cell phones and PDAs will benefit the most from the use of multimodal input methods.

**Multimodal
Pizza Order Form**

Quantity:
1

Size:
 Small 12" Medium 16" Large 22"

Toppings:
 Extra Cheese

Vegetable Toppings:
 Olives Mushrooms
 Onions Peppers

Meat Toppings:
 Bacon Chicken Ham
 Meatball Sausage Pepperoni

Submit Pizza Order

Figure 1 -- A Pizza Order Form

What is Multimodal?

Multimodal device applications give a user multiple ways to communicate. These could include a keypad, touch or tap screen, handwriting recognition, and voice recognition.

Depending on the solution and device, a combination of input methods can simplify its use. For example, from a Web browser running on a PDA, a form could be completed by selecting items in a check box, tapping on the screen, or simply speaking. Once the form is completed, a summary of the information could be displayed and read back audibly.

It is possible, using voice recognition, to fill in or select multiple entries on a form with a single command, or utterance. For example, a customer completing an online pizza order form might say, "*large pizza with pepperoni and mushrooms*". The three selections of *Large pizza*, *Pepperoni*, and *Mushrooms* would be checked on the form, which is shown in *Figure 1 -- A Pizza Order Form*.

Or, this example could be designed so that each section of the form prompts the customer separately. For example, the quantity field could be completed by first tapping it with a stylus. The application would then ask for the number of pizzas. Once the customer replies, the system would automatically continue to the next section and ask for the pizza size. This process would continue until the form is completed.

Benefits of Multimodal to Small Devices

As devices become smaller, input from a keypad or tap screen alone may be impractical. With advanced embedded speech technology, speech-enabled input methods are becoming more robust, enabling more capabilities and functions on small devices. Imagine being able to request a stock quotation or the next available flight from your smart phone without having to type in the stock name or the desired travel location -- the applications are endless!

Examples of Successful Multimodal Applications

Currently, many implementations of this emerging technology are in development. Software applications that solve user interface problems are being developed and delivered to the marketplace. A few examples of current multimodal applications are the *IBM Embedded ViaVoice® Mobility Suite* and the *IBM WebSphere® Everyplace Multimodal Browser*.

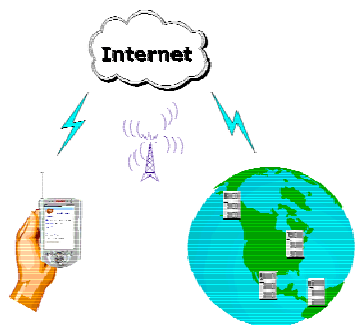
The IBM Embedded ViaVoice Mobility Suite is a software application that runs on a PDA. It permits a user to access the data stored on a PDA using voice commands or more traditional methods. For example, you could request information about a particular calendar entry or e-mail message. The PDA could then display the results to the screen, or read it back in a spoken voice. Since a selection is made by voice, the use of a stylus is

eliminated. This data retrieval enhancement makes the user interface more natural and simpler.

Another innovative software application is the *IBM WebSphere Everyplace Multimodal Browser*. It permits users to interact and request information from Web pages using multimodal input and output methods. The browser utilizes the XHTML + Voice standard to enhance the user interface functionality with a new, more robust set of user interface commands.

The Future of Multimodal on Small Devices

As improvements to operating systems and browsers on small devices are implemented, more multimodal applications will become available. These applications will enable users to more effectively interact with their devices.



Companies have just begun to tap into the vast opportunities this technology provides. The small devices of the future will no longer be stylus-only or stylus-with-keyboard, but will be able to accept a user's inputs from a variety of methods, including speech.

Future small devices will have greater access to information stored on servers. Information may be stored on servers around the world but will be accessible through the Internet.

In conclusion, multimodal technology can allow small devices to be able to interact more easily with the world around them.

For more information

For more information visit IBM Pervasive computing software at ibm.com/pvc. Requests for technical information about IBM products should be made to your IBM reseller or IBM marketing representative.



© Copyright IBM Corporation 2003

IBM Corporation
Route 100
Somers, NY 10589
U.S.A.

Produced in the United States of America
01-03
All Rights Reserved

IBM, WebSphere, ViaVoice and the IBM logo are registered trademarks of International Business Machines Corporation in the United States, other countries or both.

Linux is a registered trademark of Linus Torvalds.

Windows 2000 and Microsoft are registered trademarks of Microsoft Corporation in the United States, other countries, or both.

Other company, product and service names may be trademarks or service marks of others.

All statements regarding IBM future direction or intent are subject to change or withdrawal without notice and represent goals and objectives only.

The following paragraph does not apply to the United Kingdom or any country where such provisions are inconsistent with local law: INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions; therefore, this statement may not apply to you.

This publication could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time.

References in this publication to IBM products or services do not imply that IBM intends to make them available in any other countries.

Performance results obtained in other operating systems may vary significantly from your results. There is no guarantee that these measurements will be the same on your systems.