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(54) Abstract Title
Initiating a WAP session using voice recognition

(57) Method and system using speech recognition to initiate a wireless application protocol (WAP) session between a wireless device 1 and information network 5, where the speech recognition is carried out at a remote server 7, not at the wireless device 1. A wireless device 1 user may initiate a call to a voice recognition server, e.g. S-WAP server 7 incorporating a VoiceXML application, and request the desired content/information by speech. The server 7 in turn contacts one or more web sites 5 for the content/information and sends the found content/information to a WAP gateway 3 to initiate a WAP session with the wireless device 1. The server 7 can translate the voice request into one or more searchable strings and multiple requests may be made without having to initiate a call to the voice recognition server each time. The content/information may be displayed by a browser in the wireless device 1 and may pushed to the device by a web alert feature. Applications include Internet content, email, customer care, unified messaging, weather and traffic alerts, news, sport, electronic commerce, banking, address book and directory services.

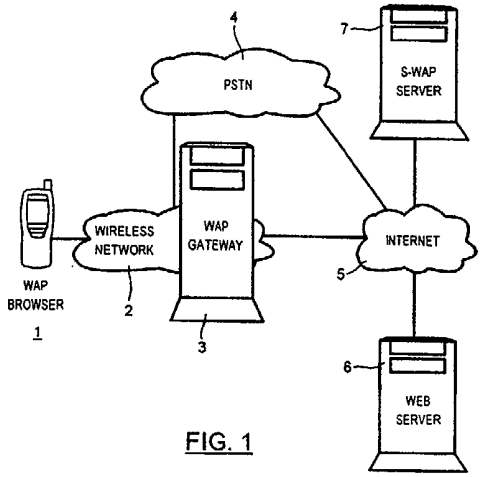


FIG. 1

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1995

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(58) Field of Search

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ONLINE: WPI, JAPIO, EPODOC, TXTUS, TXTEP, TXTGB, TXTWO

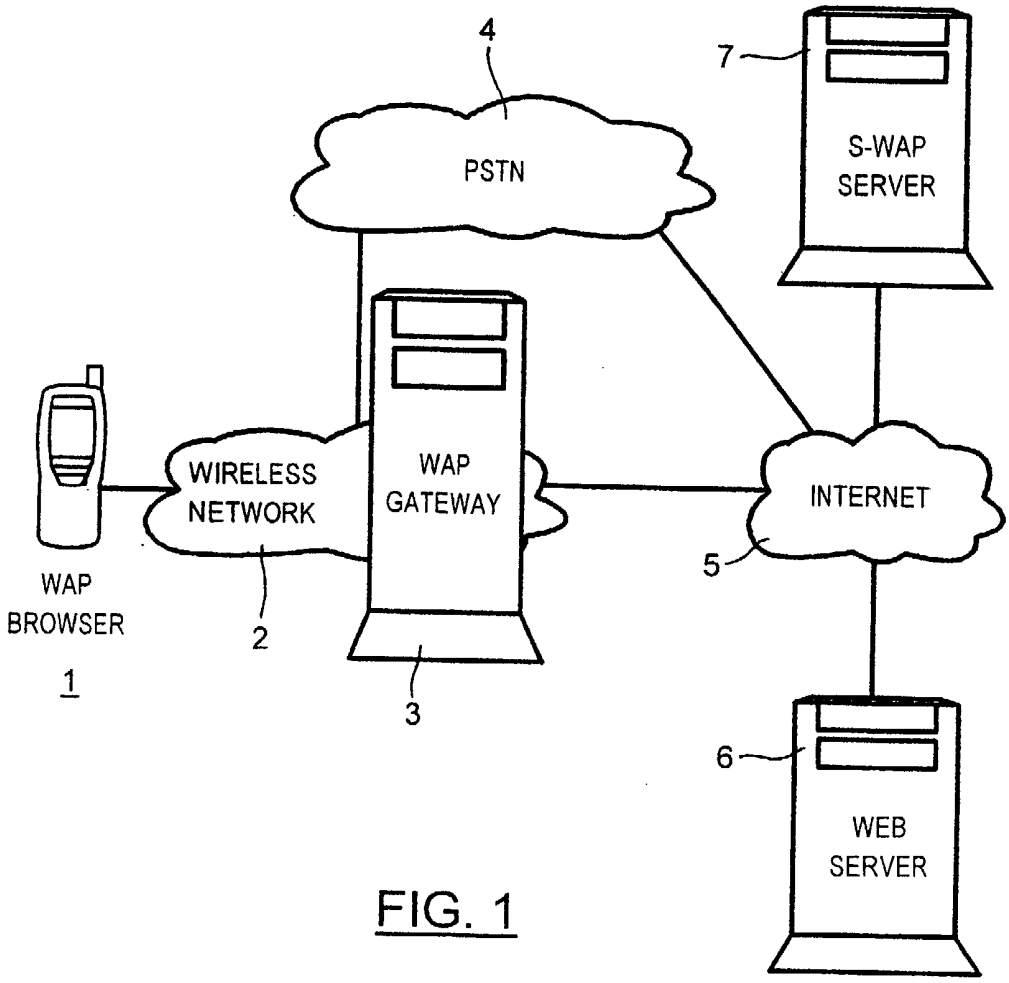

4
PSTN
7
S-WAP
SERVER
WIRELESS
NETWORK
WAP
GATEWAY
INTERNET
WAP
BROWSER
1
2
3
5
6
WEB
SERVER

FIG. 1

METHOD OF USING SPEECH RECOGNITION TO INITIATE A WIRELESS APPLICATION PROTOCOL (WAP) SESSION

FIELD OF INVENTION

This invention relates to Wireless Application Protocol (WAP) Sessions and in particular, to a method of using speech recognition to initiate a WAP Session between a mobile wireless device and an information network over a wireless communications link.

BACKGROUND OF THE INVENTION

The Wireless Application Protocol (WAP) Forum has developed the de-facto world standard for wireless information and telephony services on personal digital assistants (PDAs), digital mobile wireless telephones, and other mobile wireless devices, collectively referred to herein as "wireless devices". The WAP standard has been published as an open, global wireless protocol specification based on existing Internet standards, such as Extensible Markup Language (XML) and Internet Protocol (IP), for all wireless networks. WAP empowers users of mobile wireless devices to access easily content such as live interactive information services and applications and display the accessed content on the display screens of the mobile wireless devices. Services and applications include e-mail, customer care, call management, unified messaging, weather and traffic alerts, news, sports and information services, electronic commerce transactions and banking services, online address book and directory services, as well as corporate intranet applications.

WAP-enabled wireless devices typically include a Wireless Markup Language (WML) browser instead of a Hypertext Markup Language (HTML) browser to enable the wireless devices to access the Internet and view content, without hyperlinks. To start a WAP session, a user must enter the Uniform Resource Locator (URL) address of the web site where the desired content is located into the WML browser. Unfortunately, WAP-enabled wireless devices provide limited facilities for entering

text data or commands. Currently text data or commands are entered into WAP-enabled wireless devices using telephone dial pads, alphabets displayed on the display screens of the wireless devices, or styluses (usually on a PDA). Entering text data or commands into WML browsers in these manners has proven to be unsatisfactory.

It is known to use voice recognition for text data or command entry. However, employing voice recognition in wireless devices is not economically feasible due to the limited memory and power that are available in wireless devices. In addition, wireless networks are not generally capable of handling both voice and data over the course of a call. Furthermore, protocol standards for handling both voice and data over the course of a call have been unavailable.

It is therefore an object of the present invention to provide a method and system of using speech recognition to initiate a WAP session between a wireless device and an information network over a wireless communications link.

SUMMARY OF THE INVENTION

According to an aspect of the invention, there is provided a method of using speech recognition to 'front-end' a WAP session. To initiate a session, the user calls a voice recognition server using a wireless device and requests the desired content/information by speech. The server in turn contacts one or more web sites for the content/information and sends the found content/information to a WAP gateway to initiate a WAP session with the wireless device.

According to another aspect of the invention, there is provided a method of using speech recognition to initiate WAP sessions on a wireless network capable of handling both voice and data without having to initiate a call to a voice recognition server for each request. The user calls a voice recognition server and repeatedly

requests the desired content/information by speech. The server in turn contacts one or more web sites for the content/information and sends the found content/information to a WAP gateway to initiate a WAP session with the wireless device.

According to another aspect of the invention, there is provided a method for a user using a wireless device over a wireless network to interact with web sites on the Internet, comprising the steps of contacting a network application with voice recognition capability, where the application's server is remote from the user; interacting with the network application by speech to request a service from at least one server on the Internet; and receiving a response.

According to another aspect of the invention, there is provided a method of performing a service for a user who is using a wireless device on a wireless network, comprising the steps of receiving a call from the user; interacting with the user by speech to obtain a request for a service; performing the service; and pushing a response to the user.

According to an another aspect of the invention, there is provided an apparatus for providing services to a user who is using a wireless device on a wireless network, comprising a communications system for receiving a call from the user and for connecting to the Internet; and a network application with voice recognition capability for interacting with the user by speech to obtain a request for a service, for carrying out the service, and for pushing a response to the user.

BRIEF DESCRIPTION OF THE DRAWING

Embodiments of the present invention will now be described more fully with reference to the accompanying drawing in which:

Figure 1 illustrates a network topology over which a WAP session is carried and initiated using speech recognition.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention relates generally to a method and system of using speech recognition to initiate a data communication session between a mobile wireless device and an information network, such as the Internet, over a wireless communications link. In general, to initiate a data communication session, a voice call is made by the wireless device to a remote server executing a speech recognition application. Speech collected over the voice call is translated by the speech recognition application and is used to locate and retrieve desired information from the information network. The retrieved information is then pushed to the wireless device via the wireless communications link and displayed on the display screen of the wireless device.

In a preferred embodiment, the information retrieved by the speech recognition application is pushed to the wireless device over a WAP 1.2 gateway. The pushed information received by the wireless device is displayed via a WML browser loaded on the wireless device.

Turning to Figure 1, a communications system is shown including a wireless network **2** coupled to a public switched telephone network (PSTN) **4** and to an information network such as the Internet **5** through a WAP gateway **3**. PSTN **4** also communicates with the Internet **5**. A web server **6** and S-WAP server **7** are shown and communicate with the Internet **5**. A WAP-enabled wireless device **1** is shown and can be used to initiate WAP sessions using speech recognition as will be described. WAP-enabled wireless device **1** includes a WML browser to allow WAP content to be displayed on its display screen.

The S-WAP server **7** includes an S-WAP browser incorporating a VoiceXML application. S-WAP browser is a software application capable of locating and retrieving information from the Internet **5** in response to recognized speech commands and pushing the retrieved information to the WAP-enabled wireless device **1** over the wireless network **2**.

When a user wishes to initiate a WAP session, a voice call is placed over the wireless network **2** and the PSTN **4** that terminates at the S-WAP server **7**. Upon receipt of the call, the S-WAP browser loads the VoiceXML application, which in turn plays a prompt to the user asking for the information for which the user is searching. Upon receiving the user's spoken response to the request, the S-WAP browser translates the speech using voice recognition into a series of searchable strings and evokes a CGI script. The CGI script in turn passes the directory number (DN) of the wireless device **1** and the searchable strings to the Internet **5** to carry out a search. When the results of the search are returned to the S-WAP browser, the VoiceXML application plays a confirmation prompt to the user to notify the user that the search has been completed. Following the prompt, the VoiceXML application terminates the call with the WAP-enabled wireless device so that the wireless device may receive the results of the search. Upon termination of the voice call, the CGI pushes the search results to the WAP-enabled wireless device over the wireless network **2** through the WAP gateway **3** using the DN of the wireless device and the Push Proxy Gateway (PPG) functionality as part of WAP 1.2.

With respect to the confirmation, a number of options are available. For example, when the results of the search are available, the VoiceXML application can simply play an announcement indicating that the search results are being sent. Alternatively, the VoiceXML application can play an announcement that provides audible feedback concerning the results of the search. Depending on the search

results, the VoiceXML application may play announcements that include user selectable options allowing the user to decide whether the search results are to be pushed to the wireless device **1**.

Although the system is described as pushing the search results directly to the wireless device over a WAP session, other options are available. For example, alternatively, the S-WAP browser can send a web alert URL to the WAP-enabled wireless device. When the web alert URL is selected by the user, a call is made to the S-WAP server causing the S-WAP browser to push the WAP content associated with the web alert URL.

From the user's point of view, information can be searched and retrieved for display on a WAP-enabled wireless telephone easily by carrying out the following steps, namely calling the S-WAP server; speaking the information to be searched; terminating the call and then waiting for the WAP content. If web alert is used, the additional step of clicking on the web alert URL is required before the WAP content is delivered.

As will be appreciated, the present invention uses speech recognition to "glue" voice and data sessions allowing spoken commands to be used to initiate searches of information networks. Since the speech recognition application is executed by a remote server, the limited memory and power of wireless devices is not of concern.

A further aspect of an embodiment of the invention is using voice recognition to initiate a WAP session on third generation networks (3G networks), which handle both voice and data traffic over the course of a call. The 3G networks enable a dialog of speech while displaying content, rather than a one-time request per call followed by the content. From the user's point of view, the steps of obtaining the requested information or web content for a WAP enabled device can be characterized as call S-

WAP or click on Web icon if continuously linked to the Internet, speak, wait for WAP content, speak again, wait for more content, and etc.

As will be appreciated to those of skill in the art, present invention is adaptable to provide services to users beyond obtaining content from the Internet. Such services could include e-mail, customer care, call management, unified messaging, weather and traffic alerts, news, sports and information services, electronic commerce transactions and banking services, online address book and directory services, as well as corporate intranet applications.

Although preferred embodiments of the present invention have been described herein, it will be understood by those skilled in the art that variations and modifications may be made without departing from the spirit and scope thereof as defined by the appended claims.

We claim:

1. A method for a user using a wireless device over a wireless network to interact with web sites on the Internet, comprising the steps of

(a) contacting a network application with voice recognition capability, where the application's server is remote from the user;

(b) interacting with the network application by speech to request a service from at least one server on the Internet; and

(c) receiving a response.

2. The method of claim 1, wherein the service is for retrieval of content from at least one web site and the response is content from at least one web site.

3. The method of claim 2, wherein the wireless network is capable of handling both voice and data over the course of a call.

4. The method of claim 3, wherein steps (b) and (c) are performed repeatedly over the course of the call.

5. The method of claim 2, wherein the wireless network is capable of handling either voice or data traffic over the course of a call.

6. The method of claim 5, wherein after step (b), there comprises further step of terminating the call with the network application.

7. The method of claim 6, wherein the wireless device is WAP enabled.

8. The method of claim 7, wherein the response is pushed by a WAP gateway to the wireless device in a WAP session as WAP content.

9. The method of claim 1, wherein the wireless device is one of wireless telephone and wireless personal digital assistant.

10. The method of claim 7, wherein the response is pushed by a Web Alert feature of HTML via a WAP gateway when the Web Alert URL is clicked by the user to receive the content.

11. A method of performing a service for a user who is using a wireless device on a wireless network, comprising the steps of

(a) receiving a call from the user;

(b) interacting with the user by speech to obtain a request for a service;

(c) performing the service; and

(d) pushing a response to the user.

12. The method of claim 11, wherein the service is for retrieval of content from at least one web site and the response is content from at least one web site.

13. The method of claim 12, wherein the wireless network is capable of handling both voice and data over the course of a call.

14. The method of claim 13, wherein steps (b) to (d) are performed repeatedly over the course of the call.

15. The method of claim 12, wherein the wireless network is capable of handling either voice or data traffic over the course of a call.

16. The method of claim 15, wherein after step (b) of claim 11, there comprises further one step of terminating the contact with the user.

17. The method of claim 16, wherein the wireless device is WAP enabled.

18. The method of claim 16, wherein the response is pushed by a WAP gateway to the wireless device in a WAP session as WAP content.

19. The method of claim 11, wherein the wireless device is one of wireless telephone and personal digital assistant.

20. The method of claim 17, wherein the response is pushed by a Web Alert feature of HTML via a WAP gateway when the Web Alert URL is clicked by the user to receive the content.

21. An apparatus for providing services to a user who is using a wireless device on a wireless network, comprising

a communications system for receiving a call from the user and for connecting to the Internet; and

a network application with voice recognition capability for interacting with the user by speech to obtain a request for a service, for carrying out the service,

and for pushing a response to the user.

22. The apparatus of claim 21, wherein the service is for retrieval of content from at least one web site and the response is content from at least one web site.

23. A method of initiating a data communication session between a wireless device and an information network over a wireless communication link comprising the steps of:

establishing a voice call using said wireless device to a remote voice recognition application; and

conveying a speech request to said remote voice recognition application for information from said information network to cause said remote voice recognition application to search said information network for said requested information and prepare the search results for transmission to said wireless device.

24. The method of claim 23 further comprising the steps of terminating the voice call after completing the search and pushing the search results to said wireless device over said wireless communications link in a WAP session.

25. The method of claim 24 further comprising the step of confirming the search results prior to terminating the voice call.

Application No: GB 0016144.8 12 **Examiner:** Anita Keogh
Claims searched: 1-25 **Date of search:** 18 January 2001

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): H4L (LDGX, LDPPX, LED, LEP, LESF, LEUF, LRAA, LRAI LRAD, LRAX)

Int Cl (Ed.7): H04L (12/28, 12/56, 29/06, 29/12), H04M (1/253, 7/00, 11/00, 11/06) H04Q (7/22, 7/24, 11/04)

Other: Online: WPI, EPODOC, JAPIO, TXTUS, TXTEP, TXTGB, TXTWO

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	EP 0859500 A2	(LUCENT) see whole document	1, 2, 5, 9, 11, 12, 15, 19, 21, 22, 23 at least
X, E	WO 00/52914 A1	(KHAN) see whole document	1, 2, 5, 9, 11, 12, 15, 19, 21, 22, 23 at least
X	WO 00/30329 A1	(TELSTRA) see whole document, especially page 8 lines 14-16	1, 2, 5, 9, 11, 12, 15, 19, 21, 22, 23 at least
X	WO 00/17854 A1	(NOKIA NETWORKS) see whole document, especially page 7 lines 1-14 and page 16 lines 36-38	1, 2, 5, 7, 8, 9, 10, 11, 12, 15, 17, 18, 19, 20, 21, 22, 23, 24, 25

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

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Application No: GB 0016144.8 13 **Examiner:** Anita Keogh
Claims searched: 1-25 **Date of search:** 18 January 2001

Category	Identity of document and relevant passage	Relevant to claims
X	WO 97/23973 A1 (RUTGERS UNI.) see whole document, especially page 5 lines 20-21	1, 2, 5, 9, 11, 12, 15, 19, 21, 22, 23 at least
X	Lucent Technologies press release, "VoiceXML Forum issues specification for voice internet access", 07.03.00, retrieved from Internet 16.01.00 via <URL:http://www.lucent.com/press/0300/000307.coa.html>	1, 2, 9, 11, 12, 19, 21, 22, 23 at least
X	ROHDE, David, "Standard completed for voice-activated web browsing", 09.03.00, retrieved from Internet 16.01.00 via <URL:http://www.infoworld.com/articles/en/xml/00/03/09/000309envoicespec.xml>	1, 2, 11, 12, 21, 22, 23 at least
X	MOORE, Cathleen, "Lucent deploys VoiceXML", 31.03.00, retrieved from Internet 16.01.00 via <URL:http://www.infoworld.com/articles/hn/xml/00/04/03/000403hniworld.xml>	1, 2, 5, 9, 11, 12, 15, 19, 21, 22, 23 at least
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A	REHOR, Kenneth, "What is VoiceXML?", retrieved from Internet 16.01.01 via <URL:http://www.voicexmlreview.org/features/Jan2001_what_is_voicexml.html>	1,11,21,23

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.