HANDHELD ELECTRONIC DEVICE AND ASSOCIATED METHOD PROVIDING AVAILABILITY DATA IN A MESSAGING ENVIRONMENT

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of U.S. Provisional Application No. 60/503,367 entitled "A Method for Creating a Peer-to-Peer Quick Messaging Solution Without Using an Instant Messaging Server," which was filed on September 16, 2003, and U.S. Provisional Application No. 60/503,366 entitled "Activity Proxying Presence in Mobile Instant Messaging," which was filed on September 16, 2003. The disclosure of U.S. Provisional Application No. 60/503,367 and the disclosure of U.S. Provisional Application No. 60/503,366 are hereby incorporated into the present application by reference.

BACKGROUND OF THE INVENTION

Field of the Invention

The invention relates generally to handheld electronic devices and, more particularly, to a handheld electronic device and a method and protocol for providing information representative of an availability of a user in a messaging environment.

Background of the Invention

Numerous types of handheld electronic devices are known. Examples of such handheld electronic devices include, for instance, personal data assistants (PDAs), handheld computers, two-way pagers, cellular telephones, and the like. Such handheld electronic devices are generally intended to be portable, and thus are relatively small. Many handheld electronic devices also features wireless communication capability, although many such handheld electronic devices are stand-alone devices that are functional without communication with other devices. With advances in technology, handheld electronic devices are being configured to include greater numbers of features while having relatively smaller form factors.

Electronic devices, including handheld electronic devices, are capable of numerous types of communication. One type of communication is "messaging", and one type of messaging is "instant messaging" which enables a first device to send a message to a second device. Many instant messaging services, both public and private, are available today. With most all instant messaging services, a given electronic device is provided

with an interface that identifies various other electronic devices with which the given electronic device can communicate. If one of the other electronic devices has been logged out of the instant messaging service or has been switched off, the interface typically will identify the "presence" of such electronic device as being "unavailable". Otherwise, the other electronic devices are listed as having a "presence" of "available" unless a user of one of the other electronic devices has manually changed his or her presence to a different setting, such as "out to lunch". While instant messaging protocols and devices using the protocols have been generally effective for their intended purposes, such instant messaging protocols and devices have not been without limitation.

Generally all instant messaging services employ protocols that were written for desktop devices, i.e., devices that generally are not portable. In an environment that includes handheld electronic devices, i.e., devices that are portable and generally remain switched on, the old protocol presence designations of "available" and "unavailable" are imprecise since such a handheld electronic device is nearly always listed as "available", even late at night when a user clearly is not available, say, for instant messaging. Such an imprecise indication of a user's availability is generally undesirable in a messaging environment since it is generally desired that a recipient of a message be available to read and respond to the message. The communication of messages to an unavailable user wastes the time of the sender of the messages and also wastes communication bandwidth. It thus would be desirable to provide an improved method and apparatus for providing more accurate information regarding the availability of a user of a handheld electronic device in a messaging environment. Such an improved method and apparatus desirably might be capable of use with existing instant messaging services.

SUMMARY OF THE INVENTION

An improved handheld electronic device and an associated method are provided in which enhanced information regarding an "availability" of a user of a handheld electronic device is provided to another electronic device in a messaging environment. Such availability data provides step-wise indications of the relative availabilities of one or more users of electronic devices in a messaging environment. The step-wise indications can, for instance, range from an availability level of "currently active" to several levels of

nonavailability. The device and method can be incorporated into an existing messaging environment.

Accordingly, an aspect of the invention is to provide an improved handheld electronic device, a messaging method, and a protocol in which a relatively descriptive indication of a user's availability in a messaging environment is provided to other users in the environment.

Another aspect of the invention is to provide an improved method of helping users of a messaging service to communicate with other users by having an awareness of the relative availabilities of the other users of handheld electronic devices for messaging.

Another aspect of the invention is to provide an improved method of helping users of a messaging service to reduce the amount of time that otherwise is wasted in attempting to communicate with other users of the messaging service by providing an indication as to whether or not the other users are likely to respond to messages.

Another aspect of the invention is to provide an improved method of reducing wasted bandwidth in a messaging environment by reducing the number of sent messages that are unlikely to receive a response from another user.

Another aspect of the invention is to provide an improved handheld electronic device, a messaging method, and a protocol in which a relatively descriptive indication of a user's availability in a messaging environment is provided to other users in the environment and that can be incorporated, at least in part, into an existing messaging service.

Accordingly, an aspect of the invention is to provide an improved method of enabling communication between a first device and a second device, with the first device being a handheld electronic device having a wireless communication capability, and with the second device being an electronic device. The general nature of the method can be stated as including determining an extent of activity on the first device, determining from the extent of activity an availability value that is representative at least in part of a degree of relative availability of a user of the first device, providing a signal to the second device, at least a portion of the signal being representative of the availability value, and outputting on the second device an output representative of at least a portion of said availability value.

Another aspect of the invention is to provide an improved method of enabling communication between a first device and a second device, with the first device being a handheld electronic device having a wireless communication capability, and with the second device being an electronic device. The first device is adapted to enable a determination of an extent of activity on the first device, with the extent of activity being employable to enable a determination of an availability value that is representative at least in part of a degree of relative availability of a user of the first device. The general nature of the method can be stated as including providing to the second device a signal representative at least in part of the availability value.

Another aspect of the invention is to provide an improved method of enabling a determination of a value for use in enabling communication between a first device and a second device, with the first device being a handheld electronic device having a wireless communication capability, and with the second device being an electronic device. The general nature of the method can be stated as including enabling a determination of an extent of activity on the first device, and enabling from the extent of activity a determination of an availability value that is representative at least in part of a degree of relative availability of a user of the first device.

Another aspect of the invention is to provide an improved machine readable medium that provides instructions which, when executed on a handheld electronic device with a wireless communication capability, cause the handheld electronic device to perform operations, the general nature of which can be stated as including determining an extent of activity on the handheld electronic device, and determining from the extent of activity an availability value that is representative at least in part of a degree of relative availability of a user of the handheld electronic device.

Another aspect of the invention is to provide an improved handheld electronic device with a wireless communication capability, the general nature of which can be stated as including a processor apparatus, an input apparatus, and an output apparatus. The processor apparatus includes a processor and a memory. The memory includes a routine stored therein, with the routine being adapted to determine an extent of activity on the handheld electronic device, and with the routine being further adapted to determine from the extent of activity an availability value that is representative at least in part of a degree of relative availability of a user of the handheld electronic device.

BRIEF DESCRIPTION OF THE DRAWINGS

A full understanding of the invention can be gained from the following Description of the Preferred Embodiment when read in conjunction with the accompanying drawings in which:

Fig. 1 is an exemplary top plan view of a handheld electronic device in accordance with the invention which can be can be used in conjunction with an improved method in accordance with the invention;

Fig. 2 is a schematic view of the handheld electronic device of Fig. 1;

Fig. 3 is a schematic view of the handheld electronic device of Fig. 1 and another device in a messaging environment;

Fig. 4 is an exemplary view of an output provided in accordance with the method of the invention in the messaging environment;

Fig. 5 is an exemplary view of an alternate icon that can be provided as part of the output;

Fig. 6 is an exemplary flowchart of a portion of an improved method related to the devices of Fig. 3; and

Fig. 7 is another exemplary flowchart of a portion of another improved method related to the device of Fig. 3.

Similar numerals refer to similar parts to the specification.

DESCRIPTION OF THE PREFERRED EMBODIMENT

An improved handheld electronic device 4 in accordance with the invention is indicated generally in Fig. 1 and is depicted schematically in Fig. 2. The exemplary handheld electronic device 4 includes a housing 8 upon which are disposed an input apparatus 12, an output apparatus 16 and a processor apparatus 20. The input apparatus 12 includes a keypad 24 that can be said to include a plurality of keys 28.

The output apparatus 16 includes a display 50. The output apparatus 60 can additionally include, for instance, additional indicators such as lights, and the like, and can additionally include an audible output such as a speaker as well as other output devices.

The processor apparatus 20 includes a processor 52 that can be, for instance, and without limitation, a microprocessor (μP), and it is responsive to inputs from the input

apparatus 12 and provides output signals to the output apparatus 16. The processor apparatus 20 further includes a memory 56 that includes a client 60 stored therein. The exemplary client 60 is a messaging routine that can provide a messaging capability on the device 4. It is understood that the memory 56 likely includes a number of other routines that are not expressly mentioned herein. As employed herein, the expression "a number of" and variations thereof shall refer broadly to any nonzero quantity including a quantity of one. The processor 52 interfaces with the memory 56, and the client 60 is executable on the processor 52. A more detailed discussion of the generation and provision of availability information is provided in commonly owned United States Patent Application Nos. _____ and _____ filed concurrently herewith, entitled "Handheld Electronic Device and Associated Method Providing Availability Data in a Messaging Environment" and identified by Docket No. 291010-00112; and entitled "A Method For Creating A Peer-To-Peer Immediate Messaging Solution Without Using An Instant Messaging Server" and identified by Docket No. 291010-00080, the disclosures of which are hereby incorporated into the present application by reference.

The device 4 further includes a wireless communication system. As can be seen in Fig. 3, the device 4 and, more specifically, the client 60 can interface with a messaging service 62 to wirelessly provide the messaging capability on the device 4. In the depicted exemplary embodiment, the messaging service 62 provides an instant messaging capability on the device 4 and on the other electronic devices having clients that are subscribers to the messaging service 62. The messaging service 62 is schematically depicted as including a server 68 and as providing communication within a first communication band 64. The first communication band 64 can generally be said to include the preexisting protocol of the messaging service 62 as transmitted through the predetermined communication bandwidth through which the messaging service 62 is provided to its subscribers.

Fig. 3 further depicts another device 104 as being a device having a client that is another subscriber to the messaging service 62. Specifically, the device 104 is an electronic device having a client 160 thereon which can communicate with the messaging service 62 to provide a messaging capability on the device 104. While the exemplary device 104 is depicted as having a wireless connection with the messaging service 62, it is understood that the device 104 may employ a non-wireless communication capability and

still not depart from the concept of the invention. It is further understood that while only the two devices 4 and 104 are depicted in Fig. 3 as being subscribers to the messaging service 62, many more subscribers to the messaging service 62 exist but are not expressly depicted in Fig. 3.

In accordance with an aspect of the improved method of the invention, the protocol of the messaging service 62, as provided on the devices 4 and 104 by the clients 60 and 160, respectively, provides to users of the devices 4 and 104 enhanced data regarding the likely availability of the other users of the other devices that are subscribers to the messaging service 62. That is, a user of a device having a client that is a subscriber to the messaging service 62 can receive enhanced data regarding the likely availability of the other subscribers to the messaging service 62 with which the user has already developed some type of electronic relationship. The data regarding availability can, for example, be in a stepped form that provides discrete levels of availability. Other formats for the availability data can be provided without departing from the concept of the invention.

For example, the stepped availability of a user of a device 4 can be represented by, for instance, a level from among a plurality of levels of availability and a plurality, for instance, of levels of nonavailability, depending upon the configuration of the device 4 and the client thereon. The device 4 may, for instance, include a telephone capability, an e-mail capability, an organizer/calendar capability, a wireless point-to-point communication capability such as provided by the Bluetooth protocol or other protocol, an instant messaging capability, a push-to-talk communication capability, and/or many other capabilities. The detected degree of usage of the device 4 and/or of the various capabilities of the device 4 can be employed to generate the availability data which is reflective of an availability at any given time of a user of the device 4.

In the present exemplary embodiment, the availability data can be at any of six levels of availability, i.e., A(1), A(2), A(3), A(4), A(5), and A(6), with A(6) being the highest level of availability, or at any of three levels of nonavailability, i.e., and for example, "suspend", "unavailable", and "offline". Each such level can have a general description of the corresponding activity status on a device such as is provided in Table 1.

Availability Level	General Description of Activity Status
A(6)	Currently active on messaging application, i.e., client
A(5)	Currently actively using device
A(4)	Sporadically using device
A(3)	Less frequent device use
A(2)	Infrequent device use
A(1)	No recent device use
Suspend	On phone or on data call
Unavailable	Device unreachable (for instance, powered off or out of coverage)
Offline	Not logged into messaging service or client, or user is blocked.

TABLE 1

As a general matter, the "availability" of a user of a device 4 can be determined in a general fashion, or at least estimated, from the particular activity status of the device 4. For instance, if a user is actively using the messaging client 60 on the device 4, such as would be correspond with the availability level A(6), the user likely is highly available to receive and respond to additional messages received through the messaging service 62 from other subscribers to the messaging service 62. Similarly, if the user has not used the device 4 for a predetermined period of time, such as might correspond with the availability level A(1), the user may be unlikely to respond to messages sent through the messaging service 62. If another subscriber is considering sending a message to the aforementioned user, the subscriber may consult the availability data provided to him regarding the user in order to gauge the likelihood that the user will be available for and be able to respond to a message through the messaging service 62. If the subscriber sees that the other user's availability is low, the subscriber may refrain from sending a message to the user on the assumption that the user would not respond to such a message. This would save the subscriber from wasted time and effort and would also save wasted usage of transmission bandwidth on the messaging service 62. The protocol described herein thus provides a

plurality of levels of availability that are based at least in part upon the activity status of a device 4 and that provide to other subscribers an understanding of the potential for a user of the device 4 to respond to messages sent through the messaging service 62.

As suggested above, a plurality of nonavailability levels can be provided. The nonavailability level "suspend" might be used to refer to a situation in which a telephone event such as a telephone call is occurring on the device 4. In such a circumstance, the subscribers to the messaging service 62 would understand that the user of the device 4 on which the telephone event is occurring is temporarily not available but likely will be available as soon as the telephone call is ended. The nonavailability level "offline" might indicate to subscribers that the user of the device 4 has affirmatively terminated his or her availability, and that substantially no present possibility exists of the user receiving or responding to a message from a subscriber. The nonavailability level "unavailable" might indicate that the user of the device 4 is presently not available, but that the reason for such nonavailability is not specifically known, and that the user potentially could become available again at any time. The protocol described herein thus also provides a plurality of descriptive levels of nonavailability that provide to other subscribers an understanding of the potential for an availability of a user of a device to go from nonavailable to available.

Numerous different activity statuses of the device 4 can be employed in determining an availability status for the device 4. Certain specific activities on the device 4 can trigger the generation of a specific availability level for transmission to the other subscribers to the messaging service 62. Certain other activities can cause the current availability level to be altered by a specific degree, i.e., by increasing or decreasing the current availability level to a predetermined extent. An exemplary set of activities on the device 4 and their corresponding exemplary results on the availability level of the device 4 are provided in Table 2. It is noted that a listed result such as "A(-1)" means that the current activity level is to be dropped by one level. A listed result such as "A(1)" means that the activity level is to be changed from whatever is its current value to a value of A(1). It is noted that Table 2 is not intended to be exhaustive, and that numerous other activities and other results can be provided.

Activity	Result on Availability Level
Device stays in holder for 10 minutes	A(-1)
Device stays in holder for 3 minutes with new messages not being read.	A(-1)
Profile changes from alert mode to quiet mode	A(-2)
Handheld receives a phone call	Suspend
Handheld places a phone call	Suspend
Compose an email to me	A(6) provided to me A(5) provided to everybody else
Compose an email to somebody else	A(5)
Compose an Instant message to me	A(6)
Compose an Instant Message to somebody else	A(6)
Turn off radio	Unavailable
Turn on radio	A(1)
Auto shut-off	Unavailable
Auto power on	A(1)
Manual power on	A(4)
Appointment in Calendar	A(-2)
Meeting in calendar (with other attendees)	A(-4)
Turn off cell phone	A(-4)
Send/receive a Data Call	Suspend for 5 minutes
Radio turned off due to low battery	Unavailable
Read a received email, or SMS	A(+1), max A(5)
Read a received IM	A(6)

TABLE 2

From the activity in Table 2 "compose an email to me", it can be seen that the intended recipient of the email, i.e., "me", will receive an availability level of A(6) for the user composing the email, and the other subscribers will receive an availability level of A(5) for the user composing the email. This indicates that the availability level can be tailored to specific subscribers to the messaging service 62 in specific circumstances. It is

understood that the designation "IM" employed in the instant application refers generally to the expression "instant message" and variations thereof, and is generally intended to refer to the messaging service 62 or to a data transmission provided on the messaging service 62, although the designation "IM" is not intended to limit the teachings herein strictly to an instant messaging environment, and the teachings rather can be applied in a variety of messaging environment.

As can be seen in Fig. 4, a subscriber to the messaging service 62 may see, for example, the output 78 provided by the user interface 76 on his device. For instance, the subscriber who is the user of the device 104 may see the output 78, and the output 78 would include an indication of the various availability levels of the various other users with whom the user of the device 104 has already established an electronic relationship, such as the user of the device 4. The exemplary output 78 includes a listing of contacts 80, i.e., the other subscribers with whom an electronic relationship has already been established, as well as an indication of the level of availability of each contact 80. In the present example, the indication of the level of availability is provided both by an availability icon 84 and by a string value 96. Each of the exemplary availability icons 84 in Fig. 4 is a descriptive icon 88, meaning that it provides a general depiction of the availability of the user as determined by the specific activity status on the corresponding device. The corresponding exemplary string value 96 is depicted herein as being a linguistic expression that corresponds generally with the descriptive icon 88 and with the activity status of the other user.

The availability of the other subscribers can, however, be expressed in other fashions without departing from the concept of the invention. For instance, Fig. 5 depicts a plurality of availability icons 84 that are variable icons 92A, 92B, 92C, 92D, 92E, 92F, and 92G. The variable icons 92A, 92B, 92C, 92D, 92E, 92F, and 92G are depicted as each including a set of bars that either are filled in or are empty in a variable or graduated fashion depending upon the availability level. For instance, the variable icon 92A may correspond with activity level of nonavailable, the variable icon 92B may correspond with the activity level A(1), and so forth through the variable icon 92G which may correspond with the activity level A(6). Numerous other types of variable icons can be employed, such as icons that are lit at varying levels of brightness, that depict a water glass as gradually becoming more full with or less full of a liquid, and the like. Such variable

icons 92A, 92B, 92C, 92D, 92E, 92F, and 92G can be employed, for instance, in the place of either or both of the descriptive icons 88 and the string values 96. It is noted that all of the availability icons 84 and string values 96 are stepped indications representative of predetermined stepped availability levels. Other ways of presenting availability information can be employed without departing from the concept of the invention.

As can be understood, the availability data may, for instance, be sent from one device to another at particular times, rather than being continuously updated. For instance, the availability data may be sent only after an expiration of a predetermined duration of time, such as ten minutes, for example. Such periodic transfer of availability data will save transmission bandwidth while providing availability data that is generally up to date. Alternative, or in addition thereto, the availability data concerning a device may be transmitted more or less immediately upon the occurrence of a predetermined event on the device, such as the occurrence of a telephone event on the device, or such as the occurrence of an event that would affect the wireless capability of the device such as from a powering off of the device or a logging out by the user from the client 60 or the messaging service 62.

The availability data provided by the protocol and method presented herein typically is generated and transmitted automatically, i.e., without a need for an affirmative action by the user to select an availability level or an activity status. This is particularly useful in the environment of a handheld electronic device because, for instance, a person receiving a telephone call on the handheld electronic device typically will be unable at that moment to manually change an availability level.

It is also noted that the determination of an availability of a device can be incorporated with other data stored on the device or available to the device. For instance, a device may include a calendar function that stores meetings and the like. Upon determining, for instance, that a meeting is scheduled to begin at a specific time, and upon detecting that the specific time has occurred, the device may generate a resultant availability level that is relatively low or is a level of unavailability based upon the user being in the scheduled meeting. The resultant availability level potentially could be tailored by the user depending upon, for instance, the importance of the meeting and/or the need to not be interrupted during the meeting. Other uses will be apparent.

The protocol described herein can be employed in various messaging environments, such as instant messaging environments and other messaging environments, as well as, for instance, messaging environments that employ or could usefully employ presence information and are generally available in a mixed environment of fixed and portable electronic devices. It is understood, however, that known messaging protocols and messaging services are not currently configured to provide for the transfer of enhancement data which would be representative of the availability of the various subscribers to the messaging services. In accordance with an aspect of the invention, the protocol described herein can be implemented, at least in part, on such preexisting messaging services.

As a general matter, enhancement data that is reflective of an availability of a user of a device can be provided between a pair of devices that are subscribers to a known messaging service if the devices are in some fashion capable of sending and/or receiving availability data. Preexisting devices having preexisting clients that are subscribers to preexisting messaging services generally do not have the capability to communicate such availability data. However, it is possible for a preexisting device to have or receive an upgraded client, i.e., one that is capable of communication of availability data. Such an upgraded client can be provided in any of a variety of ways, such as by providing it in a download to the device, providing it on a machine readable medium, and in many other fashions. As a general matter, after an upgraded client is loaded onto a preexisting device on a preexisting messaging service, the upgraded client will begin to try to determine which of the other clients with which an electronic relationship has already been established are also upgraded clients capable of communication of availability data.

Figs 6 and 7 depict flowcharts that set forth the exemplary ways in which the methods of providing availability data set forth herein can be implemented, i.e., bootstrapped, into a preexisting messaging service which, by way of example herein, is an instant messaging service. A first method of providing the new protocol and methods described herein on a preexisting messaging service is depicted in Fig. 6.

Once the upgraded client has been loaded onto a preexisting first device 4, such as was mentioned above, the upgraded client then sends a coded transmission, as at 204, via the preexisting messaging service to a second preexisting device 104 having a client on the preexisting messaging service. In this regard, the message could be coded to include, for

example, special characters or specially formatted white space, i.e., spaces and tabs, that can be transmitted over the communications band of the preexisting messaging service. The coding may be such that an upgraded client, such as one capable of sending and/or receiving availability data, on the second device 104 would recognize the coding as an invitation from the client on the first device 4 to enter into an electronic negotiation for the transmission of activity data between the first device 4 and the second device 104. The coding may also be such that a non-upgraded client, such as one that is not capable of sending and/or receiving availability data, would simply ignore the coding.

In the present example, however, it is assumed that upon receiving the message on the second device 104, as at 208, the client thereon is an upgraded client that is capable of interpreting the coded portion of the message as an invitation from the first device 4 to enter into a negotiation with the first device 4. The client on the second device 104 then sends, as at 212, a response to the first device 4 using the preexisting messaging service to indicate that the second device 104 includes a client capable of handling availability data, and the upgraded clients on the first and second devices 4 and 104 enter into a negotiation as to how availability data will be transmitted therebetween. For instance, the negotiation may determine that the availability data is to be sent over the preexisting messaging service between the first and second devices 4 and 104 in a specific coded fashion or in any of a variety of other fashions.

The first device 4 then sends, as at 216, a signal representative of availability data over the preexisting messaging service to the second device 104. The first and second devices 4 and 104 also exchange, as at 220, conventional data over the preexisting messaging service, if such a communication is desired. It thus can be seen that by enabling an upgraded client to use a preexisting messaging service to locate other upgraded clients, the upgraded clients can exchange availability data over the preexisting messaging service in addition to exchanging conventional data such as messages over the same preexisting messaging service.

Another method of providing the new protocol described herein on a preexisting messaging service is depicted in Fig. 7. The method of Fig. 7 is similar to the method of Fig. 6, except that the availability data is shown in Fig. 7 as being communicated between the first and second devices 4 and 104 via an alternate communications band 72 (Fig. 3),

which can be any communications band other than the communications band of the preexisting messaging service 62.

Specifically, a coded transmission is sent, as at 304, via the preexisting message service from the upgraded client on the first device 4 to the upgraded client on the second device 104. The coded transmission is received on the second device 104, as at 308, and is interpreted by the upgraded client thereon. The second device 104 then sends, as at 312, a response via the preexisting message service to the first device 4 requesting a negotiation.

At 320, however, the first device 4 and the second device 104 exchange alternate identifications for the purpose of identifying an alternate communications band 72 and for identifying the first device 4 and the second device 104 on the alternate communications band 72. Specifically, the first device 4 transmits one or more first identifications to the second device 104, and the second device 104 transmits one or more second identifications to the first device 4. The first and second identifications can be, for example, telephone numbers, IP addresses, PINs, e-mail address, instant messaging user-IDs, and the like that would identify the first device 4 and the second device 104, respectively, on another network such as a telephone network, a global communications network, private or public messaging network, or other network on an alternate communications band on which the first device 4 and the second device 104 are capable of communication with one another.

Upon performing the negotiation, in which an alternate communications band is selected between the first and second devices 4 and 104, the availability data is sent, as at 324, between the first and second devices 4 and 104 over the alternate communications band. Conventional data can then be exchanged, as at 328, over the preexisting messaging service if such communication of data, such as a message, is desired.

The protocol and methods of exchanging availability data set forth herein thus advantageously can be implemented onto a preexisting messaging services. As set forth above, the availability data can be sent periodically, such as upon the occurrence of a predetermined event or an expiration of a predetermined duration of time, or otherwise. Of course, a new messaging service could be established that provides the protocol herein for the communication of availability data between devices.

While specific embodiments of the invention have been described in detail, it will be appreciated by those skilled in the art that various modifications and alternatives to those details could be developed in light of the overall teachings of the disclosure. Accordingly, the particular arrangements disclosed are meant to be illustrative only and not limiting as to the scope of the invention which is to be given the full breadth of the claims appended and any and all equivalents thereof.

CLAIMS:

1. A method of enabling communication between a first device and a second device, the first device being a handheld electronic device having a wireless communication capability, the second device being an electronic device, the method comprising:

determining an extent of activity on the first device;

determining from the extent of activity an availability value that is representative at least in part of a degree of relative availability of a user of the first device;

providing a signal to the second device, at least a portion of the signal being representative of the availability value; and

outputting on the second device an output representative of at least a portion of said availability value.

2. The method of Claim 1, further comprising detecting an occurrence of a predetermined event and, responsive to said predetermined event, initiating said providing a signal to the second device.

3. The method of Claim 2, further comprising detecting as the predetermined event an expiration of a predetermined period of time.

4. The method of Claim 2, further comprising detecting as the predetermined event a telephone event on the first device.

5. The method of Claim 2, further comprising detecting as the predetermined event an event affecting the wireless communication capability of the first device.

6. The method of Claim 1, further comprising outputting as the output a visual output of at least one of a descriptive icon, a variable icon, and a string value.

7. The method of Claim 1, further comprising determining the availability value by altering a previously-determined availability value according to the extent of activity.

8. The method of Claim 1, further comprising detecting as the extent of activity on the first device a relative absence of activity on the first device .

9. The method of Claim 1, further comprising detecting as the extent of activity on the first device a transmission of data between the first device and another device.

10. The method of Claim 1, further comprising detecting as the extent of activity on the first device an existence of a stored predetermined event that is scheduled to occur at a predetermined time and detecting an occurrence of the predetermined time.

11. The method of Claim 1, further comprising outputting as the output a stepped indication representative of an activity level from among a plurality of predetermined stepped activity levels ranging between a level of at least substantially present activity on the first device and a level of no activity within a preceding predetermined period of time on the first device.

12. The method of Claim 1, further comprising determining the availability value as being representative of a level of nonavailability of the first device from among a plurality of levels of nonavailability of the first device.

13. The method of Claim 12, further comprising determining the availability value as being representative of a level on nonavailability of the first device corresponding with an occurrence of a telephone event on the first device.

14. The method of Claim 12, further comprising determining the availability value as being representative of a level on nonavailability of the first device corresponding with the first device being logged out of a service.

15. A method of enabling communication between a first device and a second device, the first device being a handheld electronic device having a wireless communication capability, the second device being an electronic device, the first device being adapted to enable a determination of an extent of activity on the first device, the extent of activity

being employable to enable a determination of an availability value that is representative at least in part of a degree of relative availability of a user of the first device, the method comprising providing to the second device a signal representative at least in part of the availability value.

16. The method of Claim 15, further comprising, responsive to an occurrence of a predetermined event, initiating said providing a signal to the second device.

17. The method of Claim 16, further comprising employing as the predetermined event an expiration of a predetermined period of time.

18. The method of Claim 16, further comprising employing as the predetermined event a telephone event on the first device.

19. The method of Claim 16, further comprising employing as the predetermined event an event affecting the wireless communication capability of the first device.

20. The method of Claim 15, further comprising employing as the availability value a previously-determined availability value altered according to the extent of activity.

21. The method of Claim 15, further comprising employing as the extent of activity on the first device a relative absence of activity on the first device .

22. The method of Claim 15, further comprising employing as the extent of activity on the first device a transmission of data between the first device and another device.

23. The method of Claim 15, further comprising employing as the extent of activity on the first device a stored predetermined event that is scheduled to occur at a predetermined time and an occurrence of the predetermined time.

24. The method of Claim 15, further comprising employing as the availability value a value representative of a level of nonavailability of the first device from among a plurality of levels of nonavailability of the first device.

25. The method of Claim 24, further comprising employing as the availability value a value representative of a level on nonavailability of the first device corresponding with an occurrence of a telephone event on the first device.

26. The method of Claim 24, further comprising employing as the availability value a value representative of a level on nonavailability of the first device corresponding with the first device being logged out of a service.

27. A method of enabling a determination of a value for use in enabling communication between a first device and a second device, the first device being a handheld electronic device having a wireless communication capability, the second device being an electronic device, the method comprising:

enabling a determination of an extent of activity on the first device; and

enabling from the extent of activity a determination of an availability value that is representative at least in part of a degree of relative availability of a user of the first device.

28. The method of Claim 27, further comprising enabling a detection of an occurrence of a predetermined event and, responsive to said predetermined event, enabling an initiation of said providing a signal to the second device.

29. The method of Claim 28, further comprising employing as the predetermined event an expiration of a predetermined period of time.

30. The method of Claim 28, further comprising employing as the predetermined event a telephone event on the first device.

31. The method of Claim 28, further comprising employing as the predetermined event an event affecting the wireless communication capability of the first device.

32. The method of Claim 27, further comprising enabling a determination of the availability value by altering a previously-determined availability value according to the extent of activity.

33. The method of Claim 27, further comprising employing as the extent of activity on the first device a relative absence of activity on the first device.

34. The method of Claim 27, further comprising employing as the extent of activity on the first device a transmission of data between the first device and another device.

35. The method of Claim 27, further comprising employing as the extent of activity on the first device a stored predetermined event that is scheduled to occur at a predetermined time and an occurrence of the predetermined time.

36. The method of Claim 27, further comprising enabling outputting as the output a stepped indication representative of an activity level from among a plurality of predetermined stepped activity levels ranging between a level of at least substantially present activity on the first device and a level of no activity within a preceding predetermined period of time on the first device.

37. The method of Claim 27, further comprising employing as the availability value a value representative of a level of nonavailability of the first device from among a plurality of levels of nonavailability of the first device.

38. The method of Claim 37, further comprising employing as the availability value a value representative of a level on nonavailability of the first device corresponding with an occurrence of a telephone event on the first device.

39. The method of Claim 37, further comprising employing as the availability value a value representative of a level on nonavailability of the first device corresponding with the first device being logged out of a service.

40. A machine readable medium that provides instructions which, when executed on a handheld electronic device with a wireless communication capability, cause the handheld electronic device to perform operations comprising:

determining an extent of activity on the handheld electronic device; and

determining from the extent of activity an availability value that is representative at least in part of a degree of relative availability of a user of the handheld electronic device.

41. The machine readable medium of Claim 40, wherein said operations further comprise providing a signal to another electronic device, at least a portion of the signal being representative of the availability value.

42. The machine readable medium of Claim 41, wherein said operations further comprise detecting an occurrence of a predetermined event and, responsive to said predetermined event, initiating said providing a signal to said another electronic device.

43. The machine readable medium of Claim 42, wherein said operations further comprise detecting as the predetermined event an expiration of a predetermined period of time.

44. The machine readable medium of Claim 42, wherein said operations further comprise detecting as the predetermined event a telephone event on the handheld electronic device.

45. The machine readable medium of Claim 42, wherein said operations further comprise detecting as the predetermined event an event affecting the wireless communication capability of the handheld electronic device.

46. The machine readable medium of Claim 40, wherein said operations further comprise outputting as the output a visual output of at least one of a descriptive icon, a variable icon, and a string value.

47. The machine readable medium of Claim 40, wherein said operations further comprise determining the availability value by altering a previously-determined availability value according to the extent of activity.

48. The machine readable medium of Claim 40, wherein said operations further comprise detecting as the extent of activity on the handheld electronic device a relative absence of activity on the handheld electronic device.

49. The machine readable medium of Claim 40, wherein said operations further comprise detecting as the extent of activity on the handheld electronic device a transmission of data between the handheld electronic device and said another electronic device.

50. The machine readable medium of Claim 40, wherein said operations further comprise detecting as the extent of activity on the handheld electronic device an existence of a stored predetermined event that is scheduled to occur at a predetermined time and detecting an occurrence of the predetermined time.

51. The machine readable medium of Claim 40, wherein said operations further comprise outputting as the output a stepped indication representative of an activity level from among a plurality of predetermined stepped activity levels ranging between a level of at least substantially present activity on the handheld electronic device and a level of no activity within a preceding predetermined period of time on the handheld electronic device.

52. The machine readable medium of Claim 40, wherein said operations further comprise determining the availability value as being representative of a level of

nonavailability of the handheld electronic device from among a plurality of levels of nonavailability of the handheld electronic device.

53. The machine readable medium of Claim 52, wherein said operations further comprise determining the availability value as being representative of a level on nonavailability of the handheld electronic device corresponding with an occurrence of a telephone event on the handheld electronic device.

54. The machine readable medium of Claim 52, wherein said operations further comprise determining the availability value as being representative of a level on nonavailability of the handheld electronic device corresponding with the handheld electronic device being logged out of a service.

55. A handheld electronic device with a wireless communication capability comprising:

a processor apparatus including a processor and a memory;

an input apparatus;

an output apparatus; and

the memory including a routine stored therein, the routine being adapted to determine an extent of activity on the handheld electronic device, and the routine being further adapted to determine from the extent of activity an availability value that is representative at least in part of a degree of relative availability of a user of the handheld electronic device.

56. The handheld electronic device of Claim 55, wherein the routine is further adapted to provide a signal to another electronic device, at least a portion of the signal being representative of the availability value.

57. The handheld electronic device of Claim 56, wherein the routine is further adapted to detect an occurrence of a predetermined event and, responsive to said predetermined event, initiate said signal to said another electronic device.

58. The handheld electronic device of Claim 57, wherein the routine is further adapted to detect as the predetermined event an expiration of a predetermined period of time.

59. The handheld electronic device of Claim 57, wherein the routine is further adapted to detect as the predetermined event a telephone event on the handheld electronic device.

60. The handheld electronic device of Claim 57, wherein the routine is further adapted to detect as the predetermined event an event affecting the wireless communication capability of the handheld electronic device.

61. The handheld electronic device of Claim 55, wherein the routine is further adapted to output as the output a visual output of at least one of a descriptive icon, a variable icon, and a string value.

62. The handheld electronic device of Claim 55, wherein the routine is further adapted to determine the availability value by altering a previously-determined availability value according to the extent of activity.

63. The handheld electronic device of Claim 55, wherein the routine is further adapted to detect as the extent of activity on the handheld electronic device a relative absence of activity on the handheld electronic device.

64. The handheld electronic device of Claim 55, wherein the routine is further adapted to detect as the extent of activity on the handheld electronic device a transmission of data between the handheld electronic device and said another electronic device.

65. The handheld electronic device of Claim 55, wherein the routine is further adapted to detect as the extent of activity on the handheld electronic device an existence of a stored predetermined event that is scheduled to occur at a predetermined time and detecting an occurrence of the predetermined time.

66. The handheld electronic device of Claim 55, wherein the routine is further adapted to output as the output a stepped indication representative of an activity level from among a plurality of predetermined stepped activity levels ranging between a level of at least substantially present activity on the handheld electronic device and a level of no activity within a preceding predetermined period of time on the handheld electronic device.

67. The handheld electronic device of Claim 55, wherein the routine is further adapted to determine the availability value as being representative of a level of nonavailability of the handheld electronic device from among a plurality of levels of nonavailability of the handheld electronic device.

68. The handheld electronic device of Claim 67, wherein the routine is further adapted to determine the availability value as being representative of a level on nonavailability of the handheld electronic device corresponding with an occurrence of a telephone event on the handheld electronic device.

69. The handheld electronic device of Claim 67, wherein the routine is further adapted to determining the availability value as being representative of a level on nonavailability of the handheld electronic device corresponding with the handheld electronic device being logged out of a service.