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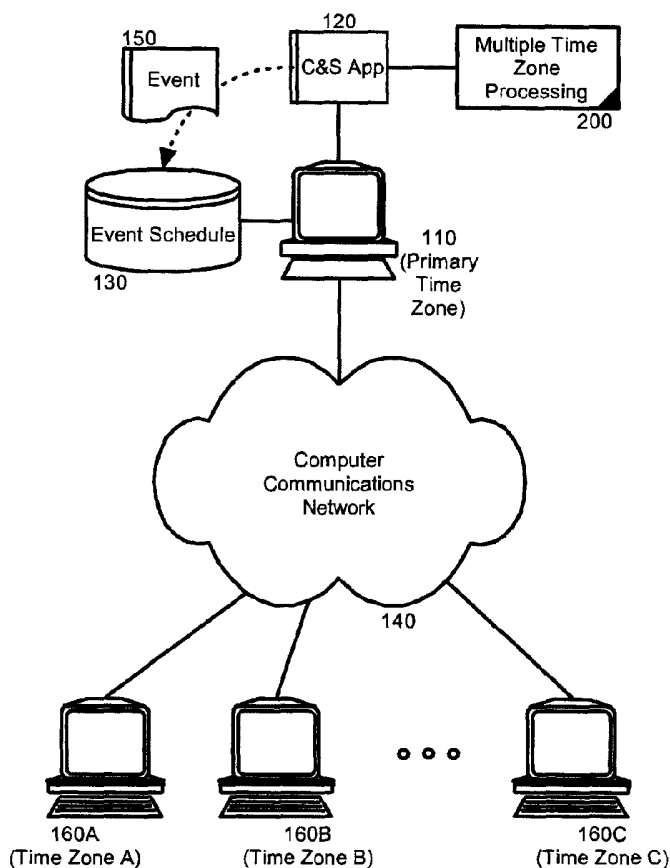(43) International Publication Date
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(54) Title: VISUALIZING MULTIPLE TIME ZONES IN A CALENDARING AND SCHEDULING APPLICATION

(57) Abstract: A method, system and apparatus for visualizing multiple time zones can include a C&S application, an event schedule managed by the C&S application, and multiple time zone processing logic coupled to the C&S application. The multiple time zone processing logic can determine a time zone for each participant to a defined event. The multiple time zone processing logic further can render a user interface showing a local time in the determined time zone corresponding to a preferred time for the defined event for each the participant. For instance, the user interface can include an arrangement of juxtaposed time ranges for each participant, where the time ranges have a staggered appearance so that a local time for each of the time ranges corresponds to the preferred time.

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VISUALIZING MULTIPLE TIME ZONES
IN A CALENDARING AND SCHEDULING APPLICATION

FIELD OF THE INVENTION

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The present invention relates to the field of calendaring and scheduling systems and more particularly to the field of time zone processing when scheduling meetings, activities or appointments in a calendaring or scheduling system.

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BACKGROUND OF THE INVENTION

Calendaring systems have formed the core component of personal information management software and firmware applications for decades.

15   Initially, a mere calendar display, modern calendaring systems provide scheduling and alarm functions in addition to full integration with contact management, time entry, billing and project management applications. The typical calendaring application minimally provides a mechanism for scheduling an event to occur on a certain date at a certain

20   time. Generally, the event can be associated with a textual description of the event. More advanced implementations also permit the association of the scheduled event with a particular contact, a particular project, or both. Furthermore, most calendar applications provide functionality for setting an alarm prior to the occurrence of the event, as well as archival

25   features.

Several software products include support for Calendaring & Scheduling (C&S). Known C&S products include Lotus(TM) Notes(TM), Microsoft(TM) Outlook(TM), and web-based products like Yahoo!(TM) Calendar(TM). These

30   products allow one to manage personal events including appointments and anniversaries. C&S products also typically allow one to manage shared events, referred to generally as meetings. Electronic Calendaring and Scheduling software allows a group of people to negotiate around the scheduling of a proposed event such as a meeting, with the goal of

35   selecting a time that allows most of the group to attend. Finding a common free time slot across multiple calendars can be challenging; but, the challenge can be compounded when different people in the group reside in different time zones.

40   Notwithstanding, conventional C&S products display date/time values only in respect to the time zone of the person performing the scheduling.

In consequence, it can be difficult for the person scheduling an event to acquire an awareness of the typical available hours for all of the invitees to a meeting, since the person scheduling the event must first know the locations and time zones of all of the invitees, and must second compute the overlapping time zones. While this computation can be somewhat convenient where only a small number of familiar time zones are involved, the computation can become intractable when dealing with large numbers of geographies, some of which may be unfamiliar. For example, scheduling a meeting with participants across three time zones within the United States and four time zones across Dublin, China, India, and Japan can be difficult with time/date values provided only in respect to the local time zone of the person scheduling the event.

SUMMARY OF THE INVENTION

The present invention addresses the deficiencies of the art in respect to time zone processing when setting an event in a C&S application and provides a novel and non-obvious method, system and apparatus for visualizing multiple time zones in a C&S application. In this regard, a method for visualizing multiple time zones in a calendaring and scheduling system can include defining an event for a preferred time and a specified set of participants, determining a time zone for each of the participants, and rendering a user interface showing a local time in the determined time zone corresponding to the preferred time for each of the participants.

The determining step can include querying a directory to determine the time zone for each of the participants. Also, the rendering step can include computing a stagger for the preferred time for the time zone for each of the participants, generating a time range for each of the participants, staggering each time range according to the computed stagger so that a local time for the time range corresponds to the preferred time, and juxtaposing each the time range in the user interface.

A system for visualizing multiple time zones can include a C&S application, an event schedule managed by the C&S application, and multiple time zone processing logic coupled to the C&S application. The multiple time zone processing logic can determine a time zone for each participant to a defined event. The multiple time zone processing logic further can render a user interface showing a local time in the determined time zone corresponding to a preferred time for the defined event for each the participant. For instance, the user interface can include an arrangement of juxtaposed time ranges for each participant, where the time

ranges have a staggered appearance so that a local time for each of the
time ranges corresponds to the preferred time.

Additional aspects of the invention will be set forth in part in the
description which follows, and in part will be obvious from the
description, or may be learned by practice of the invention. The aspects
of the invention will be realized and attained by means of the elements
and combinations particularly pointed out in the appended claims. It is
to be understood that both the foregoing general description and the
following detailed description are exemplary and explanatory only and are
not restrictive of the invention, as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

Preferred embodiments of the present invention will now be described,
by way of example only, with reference to the following drawings:
Figure 1 is a schematic illustrating of a C&S system configured to
visualize multiple time zones in accordance with a preferred embodiment of
the present invention;
Figure 2 is a flow chart illustrating a process for visualizing
multiple time zones; and,
Figure 3 is a pictorial illustration of a user interface having a
staggered presentation of multiple time zones in accordance with a
preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

An embodiment of the present invention include a method, system and
apparatus for visualizing multiple time zones in a C&S application. In
accordance with an embodiment of the present invention, associated time
zones can be determined for each proposed participant to an event.
Utilizing the determined associated time zones, a localized time for the
proposed event can be computed for each proposed participant.
Subsequently, a user interface can be generated and rendered which
presents the localized times for each participant. Optionally, the user
interface can include a set of staggered time ranges juxtaposed to one
another showing a common time for the proposed event across all time
ranges.

In illustration of a particular arrangement of an embodiment of the
present invention, Figure 1 is a schematic illustrating of a C&S system

configured to visualize multiple time zones. As shown in Figure 1, the
system can include a computing platform 110 configured for communicative
coupling to one or more other computing platforms 160A, 160B, 160C over a
computer communications network 140. The computing platform 110 can
include a C&S application 120 programmed to calendar, schedule or
otherwise establish within an event schedule 130 a time for an event 150
such as a meeting, appointment, phone call and the like.

Significantly, the C&S application 120 can utilize multiple time zone
processing 200 to provide a user interface to facilitate the establishment
of a time for a proposed event. The multiple time zone processing 200 of
the system of Figure 1 can determine the time zone for the participants to
the proposed event 150. In this regard, a time zone can be determined for
each participant associated with the other computing platforms 160A, 160B,
160C. Subsequently, a user interface can be rendered in the computing
platform 110 through the C&S application 120 which can provide a visual
cue as to the relationship between the time zones for each participant to
the proposed event 150.

In more specific illustration, Figure 2 is a flow chart illustrating a
process for visualizing multiple time zones. Beginning in block 210, an
event can be defined to occur at a particular time or within a particular
block of time to include one or more other participants. In this regard,
a participant can specify a particular time at which an event is to occur.
Alternatively, the participant can specify a block of time during which
the event is to occur. Examples can include a block of time representing
working hours for the participant, or the times when the participant is
expected to be present at a particular location. The data supporting the
block of time can be inferred from related data disposed within a user
directory or the block of time can be manually specified.

In block 220, a first participant can be selected for processing and in
block 230, a time zone can be determined for the selected participant.
For example, the location of the selected participant can be determined
from a directory entry for the selected participant. In any case, in
block 240 stagger value can be computed for the selected participant which
value indicates a number of hours difference from the particular time or
the particular block of time of the event for the time zone of the
selected participant. This process can repeat through decision block 250
and block 260 for each of the participants.

Once all of the participants to the event have been processed, in block 270 a staggered display of time ranges can be generated and in block 280 the display can be rendered to provide a visual cue to the organizer of the event to assist in determining whether the proposed time or block of time for the event will be problematic based upon the time zone differences for the participants. To the extent that multiple participants can produce an excess number of displayed staggered time ranges, individual time ranges can be rendered for all participants residing within the individual time zones rather than rendering a separate time range for each participant who might be in the same time zone.

As an example, Figure 3 is a pictorial illustration of a user interface having a staggered presentation of multiple time zones in accordance with the inventive arrangements. As shown in Figure 3, a separate time range 310A, 310B, 310C, 310D can be provided in a user interface 300 for each of the participants in a different time zone. The selected time 320 for the event can be rendered across all of the time ranges 310A, 310B, 310C, 310D so as to provide a visual cue as to the localized time for the proposed event for all participants. In this way, the unintentional scheduling of an event at an unreasonable time for a participant in a different time zone can be avoided without requiring a cumbersome mental computation of the time zone difference--especially where multiple time zones are involved.

Embdodiments of the present invention can be realized in hardware, software, or a combination of hardware and software. An implementation of the method and system of embodiments of the present invention can be realized in a centralized fashion in one computer system, or in a distributed fashion where different elements are spread across several interconnected computer systems. Any kind of computer system, or other apparatus adapted for carrying out the methods described herein, is suited to perform the functions described herein.

A typical combination of hardware and software could be a general purpose computer system with a computer program that, when being loaded and executed, controls the computer system such that it carries out the methods described herein. Embodiments of the present invention can also be embedded in a computer program product, which comprises all the features enabling the implementation of the methods described herein, and which, when loaded in a computer system is able to carry out these methods.

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Computer program or application in the present context means any
expression, in any language, code or notation, of a set of instructions
intended to cause a system having an information processing capability to
perform a particular function either directly or after either or both of
the following a) conversion to another language, code or notation; b)
reproduction in a different material form.

CLAIMS

1.   A method for visualizing multiple time zones in a calendaring and scheduling system, the method comprising the steps of:
        defining an event for a preferred time and a specified set of participants;
        determining a time zone for each of said participants; and,
        rendering a user interface showing a local time in said determined time zone corresponding to said preferred time for each of said participants.

2.   The method of claim 1, wherein said defining step comprises the step of defining an event for a preferred block of time and a specified set of participants.

3.   The method of claim 1, wherein said determining step comprises the step of querying a directory to determine said time zone for each of said participants.

4.   The method of claim 2, wherein said determining step further comprises the step of inferring a block of time for at least one of said participants by retrieving supplemental data from a user directory which indicates said block of time.

5.   The method of claim 1, wherein said rendering step comprises the steps of:
        computing a stagger for said preferred time for said time zone for each of said participants;
        generating a time range for each of said participants;
        staggering each said time range according to said computed stagger so that a local time for said time range corresponds to said preferred time; and,
        juxtaposing each said time range in said user interface.

6.   The method of claim 5, wherein said generating step further comprises the steps of:
        grouping a set of said participants having a same time range; and,
        generating a single time range for said set of said participants.

7.   A system for visualizing multiple time zones, the system comprising:
        a calendaring and scheduling (C&S) application;

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an event schedule managed by said C&S application; and,

multiple time zone processing logic coupled to said C&S application, said multiple time zone processing logic determining a time zone for each participant to a defined event and rendering a user interface showing a local time in said determined time zone corresponding to a preferred time for said defined event for each said participant.

8. The system of claim 7, further comprising a directory service having time zone information for each said participant.

9. The system of claim 7, wherein said event is a meeting.

10. The system of claim 7, wherein said user interface comprises an arrangement of juxtaposed time ranges for each said participant, said time ranges having a staggered appearance so that a local time for each of said time ranges corresponds to said preferred time.

11. A computer program element comprising computer program code to, when loaded into a computer system and executed thereon, cause the computer to perform the steps of a method as claimed in any of claims 1 to 6.
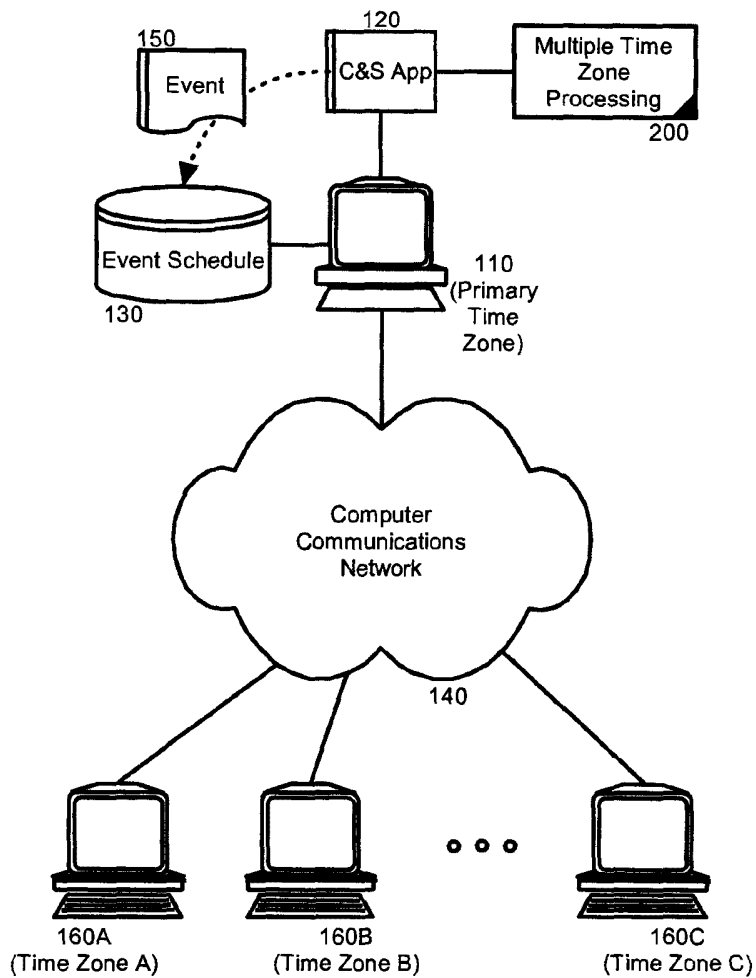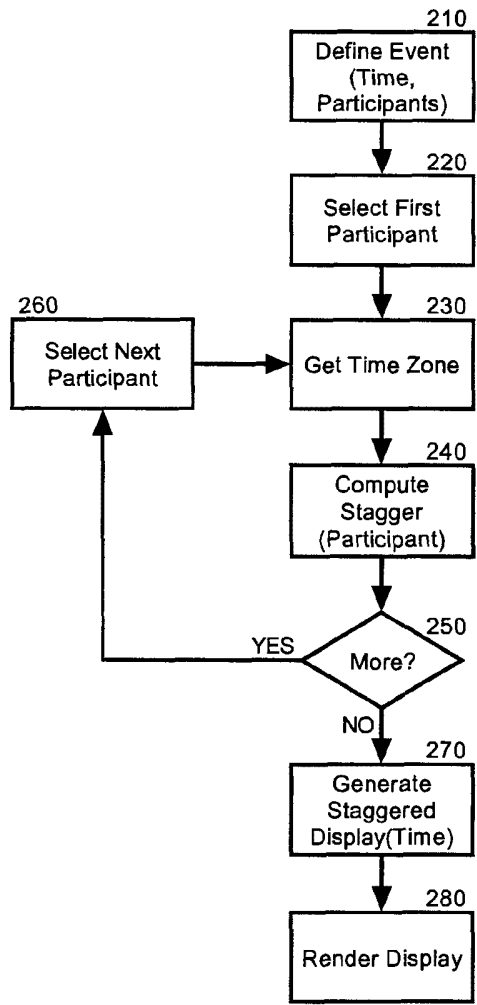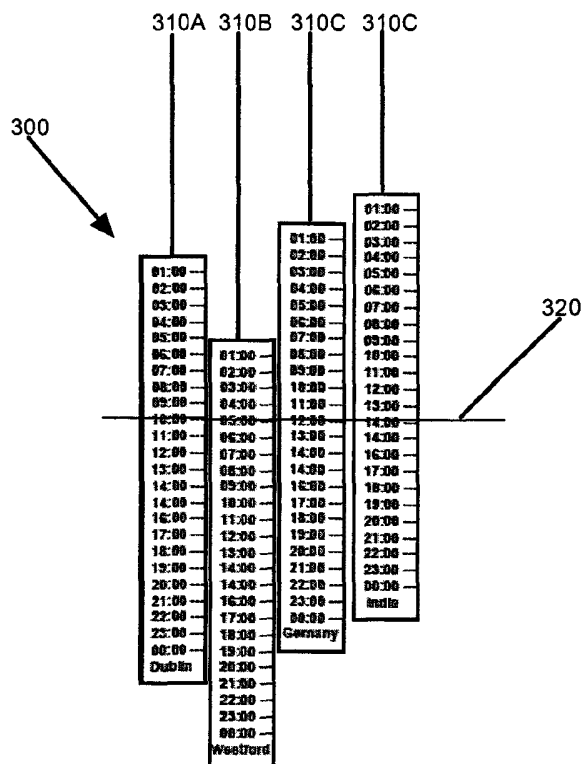
FIG. 1

FIG. 2

FIG. 3

INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
INV.   G06Q10/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G06Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 101 480 A (CONMY ET AL) 8 August 2000 (2000-08-08) column 3, lines 21-62 column 5, line 4 - column 6, line 19 column 8, lines 7-25	1-11
A	US 6 647 370 B1 (FU XIANG ET AL) 11 November 2003 (2003-11-11) abstract column 2, line 15 - column 5, line 67	1-11
A	US 2003/061087 A1 (SRIMUANG PAUL) 27 March 2003 (2003-03-27) paragraphs [0071], [0078]	1-11
A	US 5 960 406 A (RASANSKY ET AL) 28 September 1999 (1999-09-28) column 10, lines 49-57	1-11

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
8 August 2006	22/08/2006

Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Authorized officer Breidenich, M

Form PCT/ISA/210 (second sheet) (April 2005)

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