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(54) **ELECTRONIC SURVEY TOOL AND DYNAMIC WORKFLOW TOOL**

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(57) **ABSTRACT**

Disclosed is a method and system for knowledge and information sharing. Disclosed embodiments include a central electronic information network and a plurality of portable client devices for use by mobile personnel in the field. The electronic information network has a central database that contains data objects in the form of logic trees representing the cumulative knowledge and information regarding a plurality of situations that are expected to be encountered by the mobile personnel while in the field. These logic trees represent diagnosing algorithms, survey questions, and/or troubleshooting instructions that can be given to help field personnel recognize appropriate question sets to use in a particular situation and how to ask those questions in a logical manner. To provide access to the logic trees whenever necessary, logic tree data objects are also stored electronically on each of the portable client devices. Intermittently and preferably wirelessly, such as whenever a given client device connects to the central network for any reason, each client device synchronizes its logic tree data objects with those in the central database. In this manner, recent updates to the cumulative knowledge or information owned by a particular organization and stored in the central database can be reflected in all field personnel's client devices during offline sessions without the need for a wire-line communication connection or a manual synchronization.
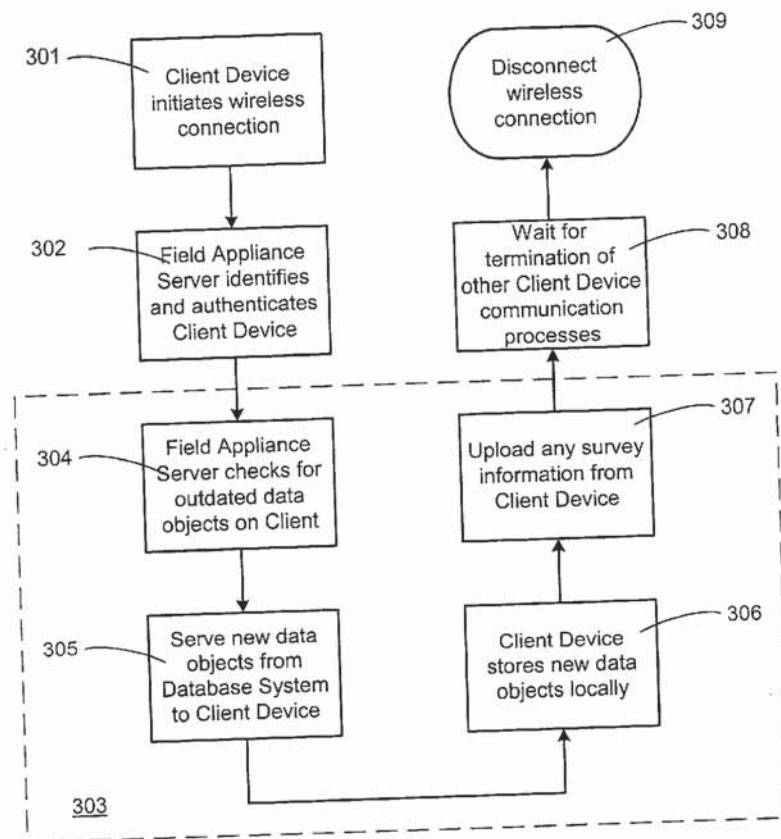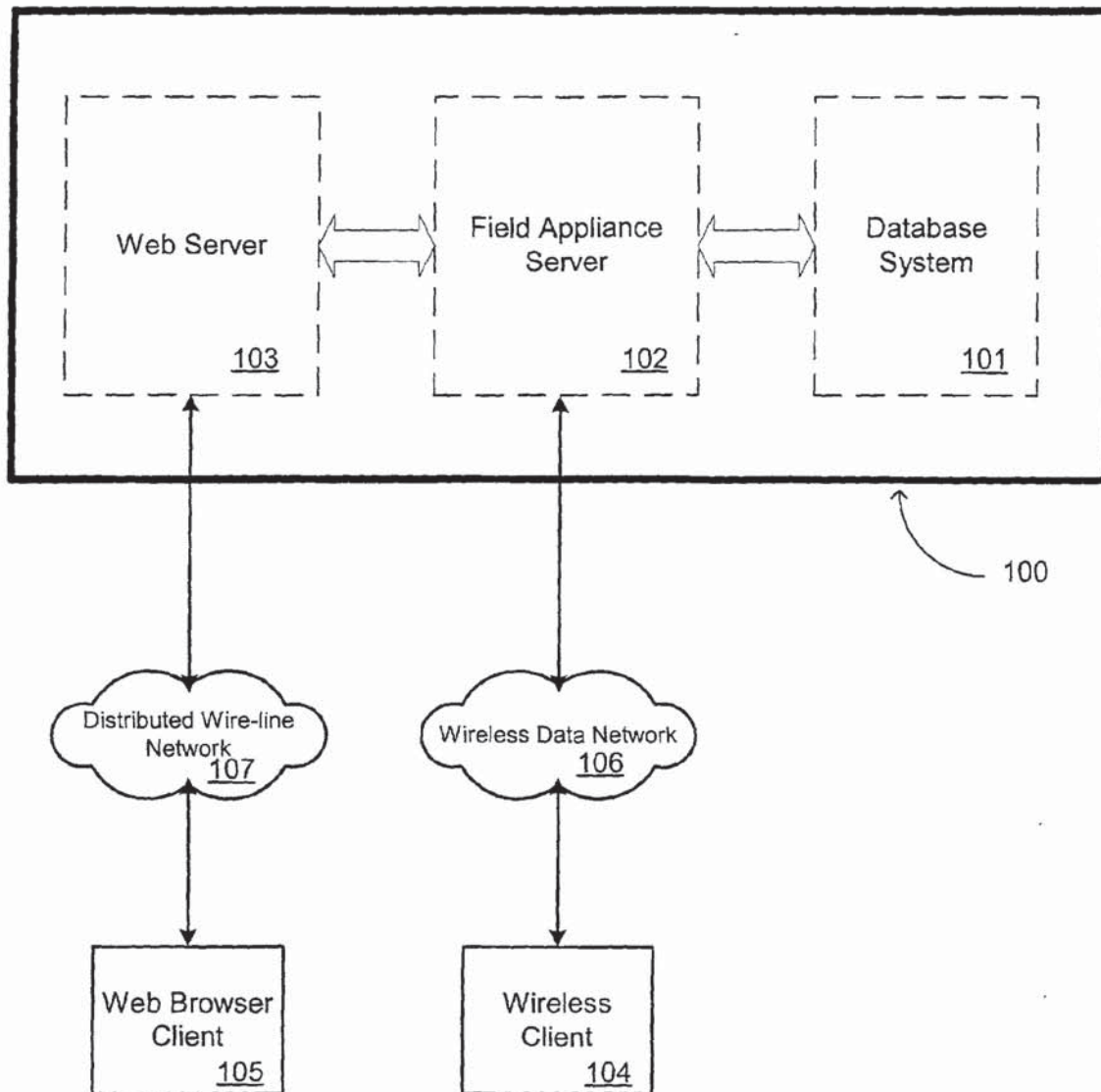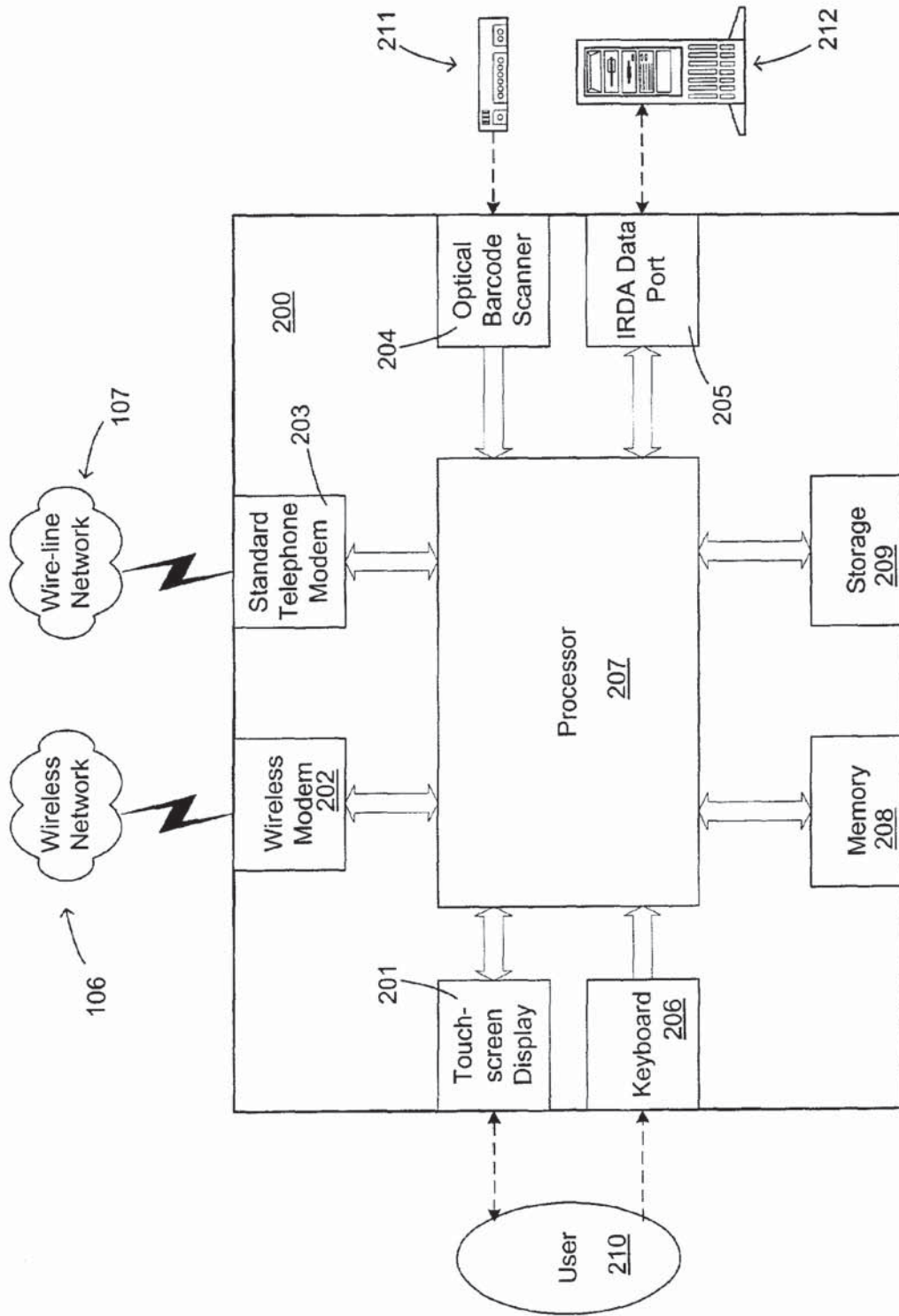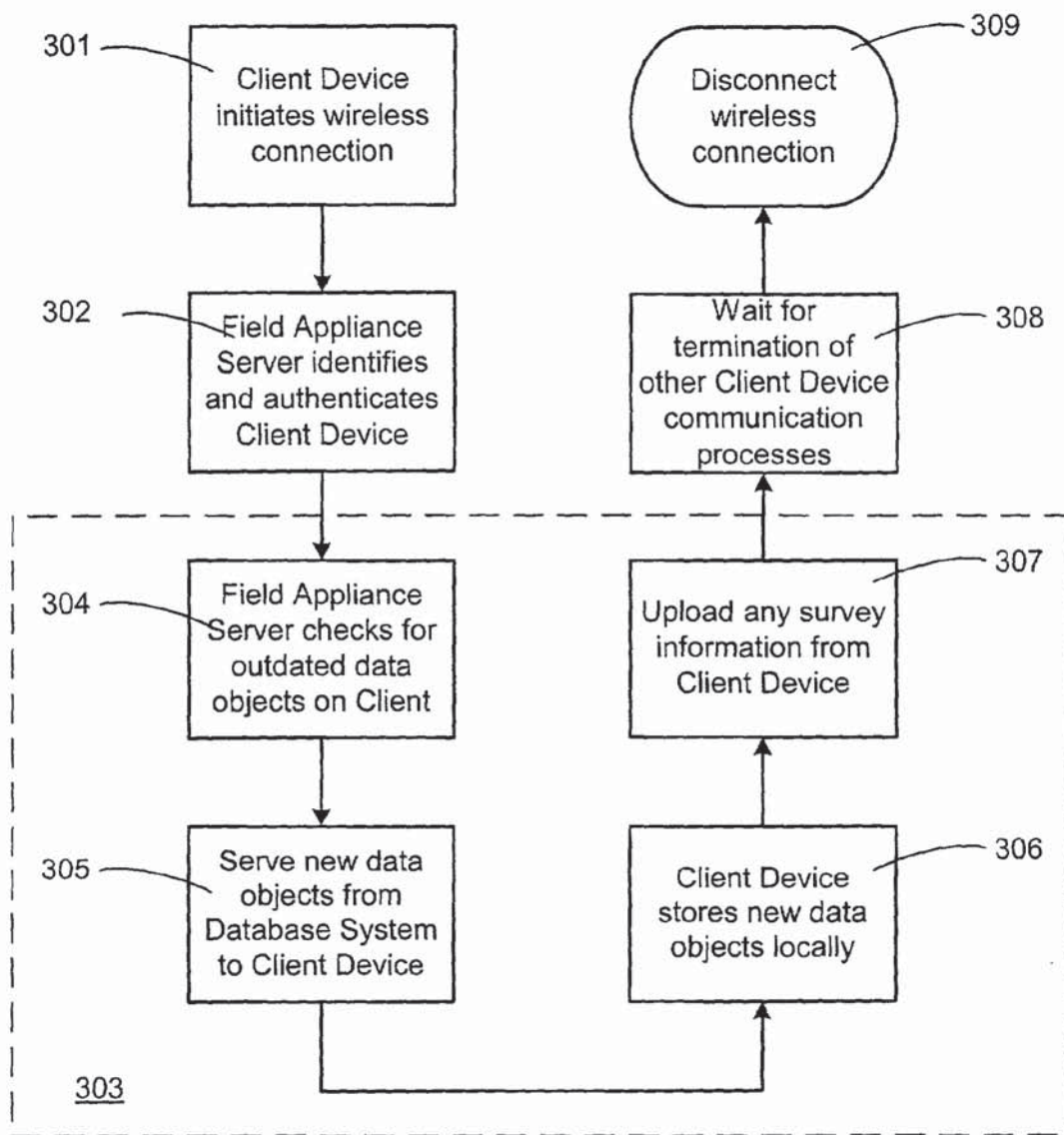
Figure 1

Figure 2

Figure 3

ELECTRONIC SURVEY TOOL AND DYNAMIC WORKFLOW TOOL

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to electronic tools for providing information resources to and obtaining feedback from a mobile remote workforce. More particularly, the present invention relates to a method and system for providing up to date information resources to each member of a remote workforce, and also for obtaining response information from the workforce wherein relevant data is transferred wirelessly in a manner that can approximate real time data access.

[0003] 2. Discussion of the Related Art

[0004] Various organizations and occupations rely heavily upon the ability of a particular person or persons to gather relevant facts or data pertaining to a particular situation and then to apply a series of rules, algorithms or troubleshooting processes to those facts and data on the spot in order to identify a solution for achieving a particular goal. As tasks become more and more complex, as is increasingly the case in high technology industries, it however becomes more difficult for such persons to remember completely what facts and data are relevant to a particular situation, and what to do once the relevant data is identified. For example, a computer field engineer who travels to a client site to fix a problem on the client's computer system must be able to ask the appropriate diagnostic questions, identify what the problem is from the answers to the diagnostic questions (and any necessary follow-up questions), and then apply appropriate remedial actions to correct the problem. While this may appear to be a simple task, as will be readily appreciated by those skilled in the art, it is very difficult for such persons, such as field engineers, to remember how to diagnose and respond to every potential situation.

[0005] Traditionally, field engineers, technicians, and other persons performing similar troubleshooting functions relied heavily upon their prior experiences and training to be able to properly identify and remedy problems in such situations. However, one cannot expect field personnel to retain the information for all potential scenarios simultaneously. Frequently, to assist field personnel in having the most up to date knowledge, each such person therefore would be issued a field manual containing technical information and descriptions of potential solutions frequently encountered situations. Such field manuals were often updated on a periodic basis or as significant new information or situations were identified. In order to keep field manuals small and portable (and thus able to be brought to client sites), often they by necessity do not contain information for all potential situations. Furthermore, since each person's field manual must be updated individually, often a slow and laborious process typically entailing circulating paper notices (or alternatively circulating soft copies of the update such as copy encoded on a CD-ROM) to all field personnel, the manual may contain inaccurate or outdated information and thus does not provide field personnel with the benefit of their organization's current knowledge and newest information.

[0006] Thus, traditional mechanisms are lacking in their ability to keep field personnel apprised of all, and especially newer, potential situations because they still rely heavily upon each person's individual ability to retain any necessary information and recall and apply the information on the spot at the appropriate time. In some applications, the use of distributed computer networks (including the Internet and World Wide Web) and centralized information databases has helped to alleviate this problem. First, a central computerized database of information is relatively easy to update and, using contemporary computer networking technologies known in the art, many individuals can simultaneously be given electronic access via networked computers. Thus, the knowledge and information accessible by each individual person is always complete and up to date whenever they are consulted by personnel (unlike field manuals). In essence, each member of the organization has their own constructive copy of the information contained in the central database so long as they have access to a computer networked to their organization's network system.

[0007] Unfortunately, this contemporary centralized database and distributed computer network approach to knowledge and information sharing among members of an organization has heretofore not been adequately adapted for use by mobile field personnel. Predominantly, distributed computer networks require each user to have a client computing device with an electronic wire-line communication connection (such as a local LAN, Ethernet, ISDN, or telephone modem) to a central network server. Current mobile computing devices, such as notebook computers, are highly powerful, portable, and thus generally suitable for use as client computing devices on central networks in most situations. However, the requirement for each client computing device to be tethered to a wire-line communication connection has proven problematic for organizations that rely heavily upon mobile field personnel. In many situations, it is simply not plausible or convenient for field personnel to have access to a wire-line communication connection while they are performing their duties.

[0008] In order to free network users from the need for wire-line connections when using portable client computing devices like laptop computers and personal digital assistants ("PDAs"), technologies such as cellular modems and micro-cellular data networks are often employed. Using these technologies, network connections can be made using cellular telephony and other radio frequency ("RF") network technology such that users are thus provided with mobile wireless access to certain types of information on their central networks. While these technologies are improving daily and are providing a potential alternative to wire-line connections in certain situations, they still have several drawbacks. The low bandwidth constraints imposed by current cellular voice network technology inherently limits the type of wireless data transfers that can use that technology. Additionally, with respect to digital wireless data networks such as cellular digital packet data ("CDPD") networks, while these networks now offer data transfer rates up to 19.2 Kbps, their effective service areas are limited, indoor reception is poor, and often there is not reliable quality of service within those limited service areas. Thus, these technologies still do not allow organizations that have mobile field personnel to benefit from centralized data because current mobile wireless client computing devices cannot provide consistent data access since it is difficult or impos-

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