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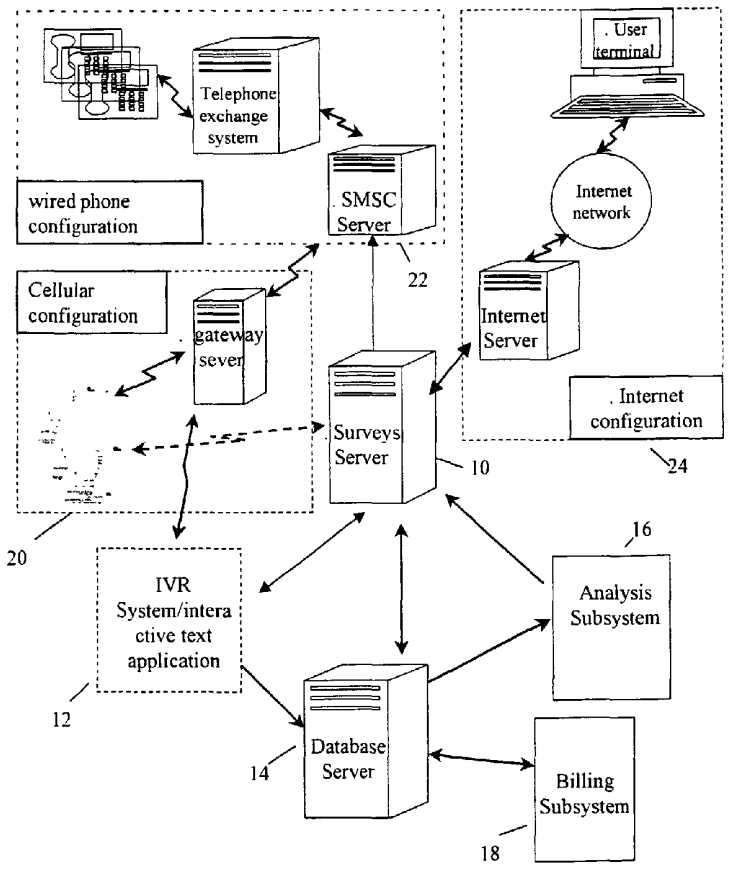
(54) Title: METHOD AND SYSTEM FOR CONDCUTING FULLY AUTOMATED SURVEY RESEARCH



(57) Abstract: The present invention preferably provides a completely automated method and system for conducting survey research including: self-service wizard for editing survey questions, automatic module for generating an IVR interviewing application utilizing text-to-speech (TTS) technologies to convert text data to voice data format, and self-operated distributing mechanism, preferably using cellular communication and SMS (Short Message Service) technologies for transmitting proposal message to potential participants. Participants agreeing to take part in survey will connect to the IVR interviewing system and answer the survey questions by pressing the relevant phone keys.

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Method and System for Conducting Fully Automated Survey Research

BACKGROUND OF THE INVENTION

The present invention relates in general to a fully automated solution for conducting a survey research or an opinion poll. More particularly, the present invention relates to automatic survey system for generating survey questionnaire and conducting survey through a communication network, such as the Internet or a cellular network, using IVR (Interactive Voice Response) technologies.

Surveys have been traditionally conducted by mailing a questionnaire to the concerned individuals or optionally by making personal telephone interviews. More up-to-date surveys are processed by Internet web-sites, addressing the large market of Internet users. Such survey systems are more efficient and demand much less human resources than the traditional survey systems. Although such systems are more convenient for the survey participants, the survey results do not necessarily insure statistical significance and might be diverted. Publication EP0976265 (WO9809451 "An Opinion Poll Utilizing a Wireless Data transmission Connection") describes a method for conducting opinion polls through cellular telephones. The system utilizes SMS technologies for transmitting poll questions to cellular phones' customers and receiving participants' replies.

Non of prior art survey service systems as described above, provide self service for editing survey question sets and automatic mechanism for generating IVR interviewing application.

The present invention will, preferably, provide a "human-free" survey generator, using Internet and cellular applications, and thus offering significant advantages and innovation over the existing state of the art. Notably, the present invention will be available at a substantially lower price than other existing state of the art systems. Furthermore, the present invention will operate at a much faster speed and will provide more precise results.

It is thus the prime object of the invention to provide a system and method for conducting fully automated survey research using wireless communication channels and IVR technologies.

It is additional object of the invention to provide automated survey system and method based on network communication ensuring the survey customer significant statistical survey results.

Summary of the Invention

The present invention preferably provides a completely automated method and system for conducting survey research including: self-service wizard for editing survey questions, automatic module for generating an IVR interviewing application utilizing text-to-speech (TTS) technologies to convert text data to voice data format, and self-operated distributing mechanism, preferably using cellular communication and SMS (Short Message Service) technologies for transmitting proposal message to potential participants. Consumers agreeing to participate will connect to the IVR interviewing system and answer the survey questions by pressing the relevant phone keys.

BRIEF DESCRIPTION OF THE DRAWINGS

These and further features and advantages of the invention will become more clearly understood in the light of the ensuing description of a preferred embodiment thereof, given by way of example only, with reference to the accompanying drawings, wherein-

Fig. 1 is a diagrammatic representation of the fully automated survey service system according to the present invention;

Fig. 2 is a general scheme of the optional information flow, as operated by the present invention;

Fig. 3 is a general scheme of editing automatic survey questionnaire according to the present invention;

Fig. 4 is a general flowchart of generating survey application according to the present invention.

Fig. 5 is a general flowchart of distributing survey proposals according to the present invention.

Fig. 6 is a general flowchart of conducting interactive survey according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Fig. 1 illustrates the environment of the fully automated survey system suggested by the present invention.

The present invention provides a new system and method for conducting self-made automatic surveys. Individuals or organizations wishing to conduct a survey according to prior art systems have to employ professional services for creating a survey questionnaire and conducting the survey interviews. Such services are expensive and time consuming.

The basic concept of the present invention is to provide a self-assisted subsystem for the creating a survey questionnaire, an automatic system for distributing survey proposal and a human-free interviewing application for conducting the survey operation itself.

The distributing process can be applied either by using cellular networks (see block 20 illustrating cellular configuration) , a telephone exchange system (block 22) or an Internet network (see block 24) as will be further described below.

The human free interviewing application is an IVR application according to proffered embodiment of the present invention. Optionally the interviewing application is an interactive text application.

As seen in Fig. 1 the survey system according to the present invention is comprised of: a designated server 10 (the "survey server") which is associated with the interviewing application 12, database server 14, analysis subsystem 16 and billing subsystem 18. The survey server consists of a questionnaires' generator and a survey organization application. The questionnaire generator can be implemented as a simple form application enabling to fill in the desired questions or optionally by a smart wizard application. Such wizard application comprises a selection of questionnaire templates, each template is designated for different survey subjects and applies different questionnaire structures (e.g. sequential order, hierarchical structure etc.).

The database server 14 stores survey questionnaire, survey results, questionnaire templates data and potential participants details.

The billing subsystem 16 associated with the survey server comprises two modules: the customers' billing and the participants billing. The billing subsystem will charge the customer for using the system survey services and optionally credit the

participants for taking part in the survey. When conducting the survey through the cellular network the participant will preferably receive minimum credit for the survey airtime, and optionally will be paid with extra free airtime.

An additional component of the survey system is the analysis subsystem 18, which provides a statistical analysis of the survey results and visual presentation (charts) illustrating the survey result and analysis. Such analysis includes conventional statistical running results such as actual significant of the survey, correlations between survey subjects, averages and deviations of results, distribution statistics etc. All the data will be available to the customers via any conventional communication channel such as e-mail, fax etc.

Fig. 2 illustrates the flow chart of the full survey automatic process. First the user is provided with questionnaire generator service, guiding the user through a process of setting up his own questionnaire form. Such service can be provided through the Internet network using PC terminal or cellular phones.

The process of the questionnaire creation is further detailed in Fig. 3: the customer is provided with two optional procedures:

According to the first option, the customer is provided with guiding questionnaire wizard. With the help of the wizard questionnaire, the customer can select templates, wherein each template relates to specific category and consists sets of questions. For example the wizard provides specific category templates for election poll and other templates for checking people's favorite food products. Once the customer has selected the template, he is provided with sets of questions relating the respective category, at this point the customer can choose the whole set or just part of it or alternatively add questions or change them to fit the specific details relating his business. The second option enables the user start the questionnaire from scratch and phrase the questions by himself. This manual option enables the users to fill in questions and to determine the sequence of questions.

According to more advanced survey techniques, the system further enables the user to determine conditional set of questions, which are presented to the survey participants in dependence with participants' previous answers. Thus, the customer can customize the questionnaire path. This feature enables more efficient interviewing process by skipping irrelevant or non-applicable questions.

Once the final survey question set is completed the survey system enables the user to set the survey properties. First, the customer selects the desired statistical significant which is depended on sample size. In order to have more meaningful results the user can be provided with the option to select population categories (e.g. participant's residence). Furthermore, the user can determine the survey processing schedule: performing the survey at the same time or alternatively in different time periods. In case of conducting the survey through cellular communication devices, the customer can choose a real time survey option, based on the current location of the participants. For example, checking the favorite food of the participants, which are having lunch at the same geographic zone. This real time option is applicable when using advanced cellular networking technologies enabling to locate cellular customer location at specific areas.

At the last step of survey process, the user may select the desired analysis out of the available options.

The next step of the full survey process (step32 in Fig.2) is the creation of the automatic interviewing application. This process is illustrated in Fig. 4: according to the preferred embodiment of present invention the interviewing application is an IVR application: using TTS (text-to-speech) technologies for converting the set of text questions into an automatic interactive voice response application.

Optionally, an Internet interactive text questionnaire application is generated utilizing wireless network platforms such as WAP (Wireless Applications Protocol).

According to the proffered embodiment, as seen in Fig. 4, the survey server contains modules for converting the final question sets from text data format (e.g. ASCII) into voice data format, (e.g. WAV or VOX format file). Furthermore, the survey server comprises an IVR generator for creating an IVR interviewing application based on the questionnaire structure and content as was determined and edited by the user. The IVR generator program is an essential feature of the system according to the present invention, sparing the time and effort of creating new IVR application for each new set of questions by a human programmer.

At the next stage of the full survey process (see Fig.5), a population sample of potential participants (as determined by the customer) is selected out of the consumers' database according to a specified categories criterion.

Once selecting the population sample out of pre-defined population categories, proposal messages are distributed by the survey server to the potential participants via

any communication networks (see step 36 Fig.2). The preferred distribution environments according, to the present invention, are cellular and Internet networks (see step Fig. 5). Using a cellular network constitute a significant advantage over the Internet, as the cellular consumers can be identified and optionally, a real time location based survey is feasible.

The interviewing session is illustrated in Fig.6. In case an IVR application is used, the system receives calls from returning participants and interviews them.

The returning participants can connect themselves (preferably by free phone call) to the IVR system and answer the voice questions by pressing the relevant phone keys or by voice reply (the voice output is analyzed and processed by using known recognition technologies).

According to alternative procedure, the survey system directly calls the potential participants and offers them to take part in the survey. The participants who are willing to take part in the survey may immediately reply the survey questions or optionally provide the system with estimated future time convenient for conducting the survey. The system records participants' requests and initiates a new call at the appropriate hour/day.

In case of using an interactive text application, the returning participants are connecting via the Internet network to a designated survey web site, using computer terminal or cellular devices. The designated survey web site activates an interactive text interviewing application enabling the participants to answer the text version questions of the survey.

According to further feature of the present invention, the survey system provides open question sets, enabling the users to record (when using IVR applications) or type (when using text based survey application) their opinion when answering the survey questions. The text/voice answers may be analyzed manually by human examiners or optionally automatically analyzed using artificial intelligence tools.

While the above description contains many specifities, these should not be construed as limitations on the scope of the invention, but rather as exemplifications of the preferred embodiments. Those skilled in the art will envision other possible variations that are within its scope. Accordingly, the scope of the invention should be determined not by the embodiment illustrated, but by the appended claims and their legal equivalents.

WHAT IS CLAIMED IS:

1) A method for a conducting an automatic survey through communication networks, using an IVR interviewing system, said method comprising the steps of:

i) Setting survey properties by the user, such as: population categories, population size, survey subject;

ii) Creating survey questionnaire based on survey properties enabling the user to edit the questionnaire structure or content, wherein the questionnaire includes questions and respective set optional answers;

iii) Creating an automatic IVR interviewing application enabling interactive response of user to survey questions;

iv) Distributing survey proposals through the communication network to potential participants, based on defined survey population;

v) Activating the IVR interviewing application for each returning participant;

vi) Receiving each participant responses to survey questions and recording thereof by using the automatic interviewing application;

vii) Calculating survey statistics based on participants' responses.

2) The method of claim 1 wherein the creation of a survey questionnaire is supported by a questionnaire wizard application including question templates, each template relating to a different survey category or subject;

3) The method of claim 1 wherein the creation of the IVR application is processed automatically utilizing TTS technologies;

4) The method of claim 1 wherein the created IVR application is associated with a telephone exchange system;

5) The method of claim 1 wherein the created IVR application is associated with a cellular network;

6) The method of claim 5 wherein the survey proposal distribution is processed through a wired telephone network using voice messages;

7) The method of claim 2 wherein the survey proposal distribution is processed through a cellular network using SMS messages or voice messages;

8) The method of claim 2 wherein the survey proposal distribution is processed through the Internet using electronic messages;

9) The method of claim 7 further comprising the step of conducting real-time location based interviews;

10) The method of claim 3 wherein the created IVR application is implemented within Internet server;

11) The method of claim 1 further comprising the step of initiating a telephone call to the potential participants by the IVR application at a predetermined time and date;

12) The method of claim 11 further comprising the step of enabling the user to define the predetermined time and date for receiving the IVR application phone call;

13) The method of claim 1 wherein the creation of the survey questionnaire further includes conditional settings relating specific questions;

14) The method of claim 1 wherein the participants responses are key signals indicating participants selections of answers out of available answers defined by the questionnaire;

15) The method of claim 1 wherein the participants responses are voice or text data representing participants' answers relating respective questions;

16) A system for conducting an automatic survey through communication networks, said system comprising the steps of:

i) Questionnaire designer application based on predefined survey properties supporting human editing of the questionnaire structure or content, wherein the questionnaire includes questions and respective set of optional answers;

ii) Automatic application for creating an IVR interviewing application based on created survey questionnaire for enabling interactive response of users to survey questions;

iii) First communication means for transmitting survey proposals through communication network to survey potential participants based on defined survey population;

iv) Second communication means for conducting the interviewing session;

v) Storage means for recording all participant responses to survey questions in relation to their respective questions;

vi) Analyzing module for calculating survey statistics based on participants reactions.

17) The system of claim 16 wherein the Questionnaire generator is implemented as smart wizard application including question templates where in each template relates to a different category;

18) The system of claim 16 wherein the first communicating means are associated with a wired telephone network;

19) The system of claim 16 wherein the first communicating means are associated with a cellular network;

20) The system of claim 16 wherein the first communicating means are associated with wired telephone network;

21) The system of claim 16 wherein the first communicating means are associated with the Internet;

22) The system of claim 16 wherein the second communicating means are associated with a cellular network;

23) The system of claim 16 wherein the second communicating means are associated with a wired telephone network;

24) The system of claim 16 wherein the second communicating means are associated with the Internet;

25) The system of claim 16 wherein the creation of the survey questionnaire further includes conditional settings relating specific questions;

27) The system of claim 16 wherein the participants responses are voice or text data representing participants' answers relating respective questions;

Fig. 1

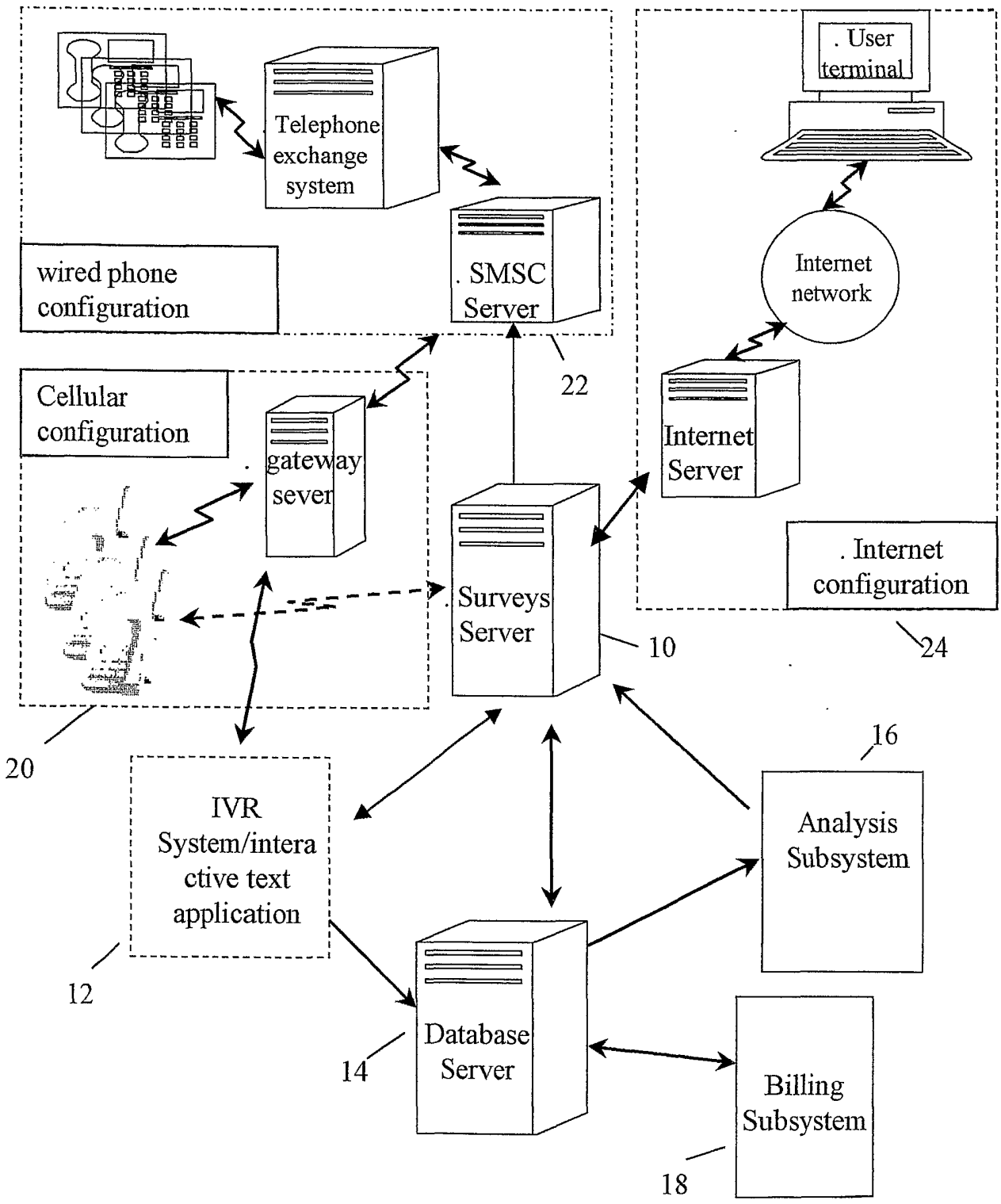

. User terminal
Telephone exchange system
. SMSC Server
wired phone configuration
Internet network
Cellular configuration
. gateway sever
Internet Server
22
. Surveys Server
. Internet configuration
10
24
20
16
IVR System/interactive text application
Analysis Subsystem
12
Database Server
14
Billing Subsystem
18

Fig. 2

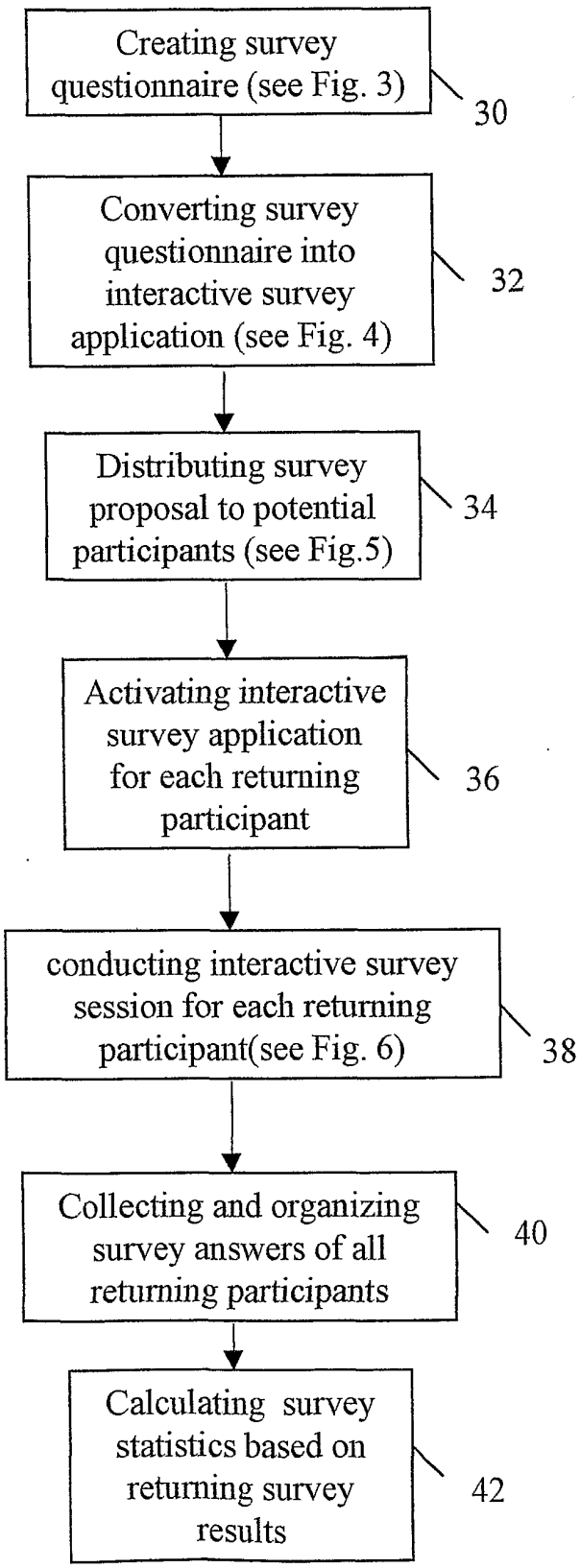

Creating survey questionnaire (see Fig. 3)
30
Converting survey questionnaire into interactive survey application (see Fig. 4)
32
Distributing survey proposal to potential participants (see Fig.5)
34
Activating interactive survey application for each returning participant
36
conducting interactive survey session for each returning participant(see Fig. 6)
38
Collecting and organizing survey answers of all returning participants
40
Calculating survey statistics based on returning survey results
42

Fig. 3

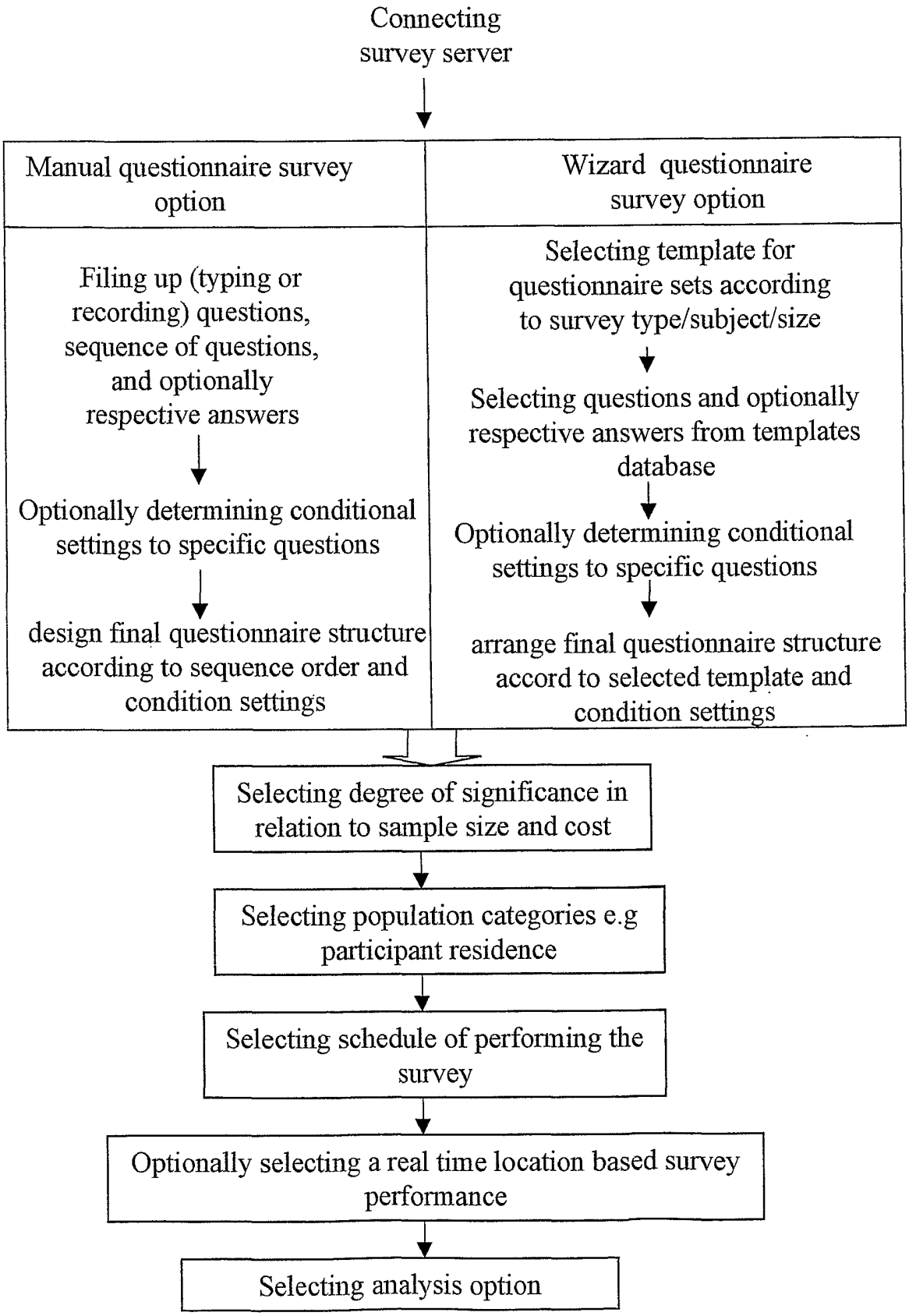

Connecting survey server
Manual questionnaire survey option
Wizard questionnaire survey option
Filing up (typing or recording) questions, sequence of questions, and optionally respective answers
Optionally determining conditional settings to specific questions
design final questionnaire structure according to sequence order and condition settings
Selecting template for questionnaire sets according to survey type/subject/size
Selecting questions and optionally respective answers from templates database
Optionally determining conditional settings to specific questions
arrange final questionnaire structure accord to selected template and condition settings
Selecting degree of significance in relation to sample size and cost
Selecting population categories e.g participant residence
Selecting schedule of performing the survey
Optionally selecting a real time location based survey performance
Selecting analysis option

Fig. 4

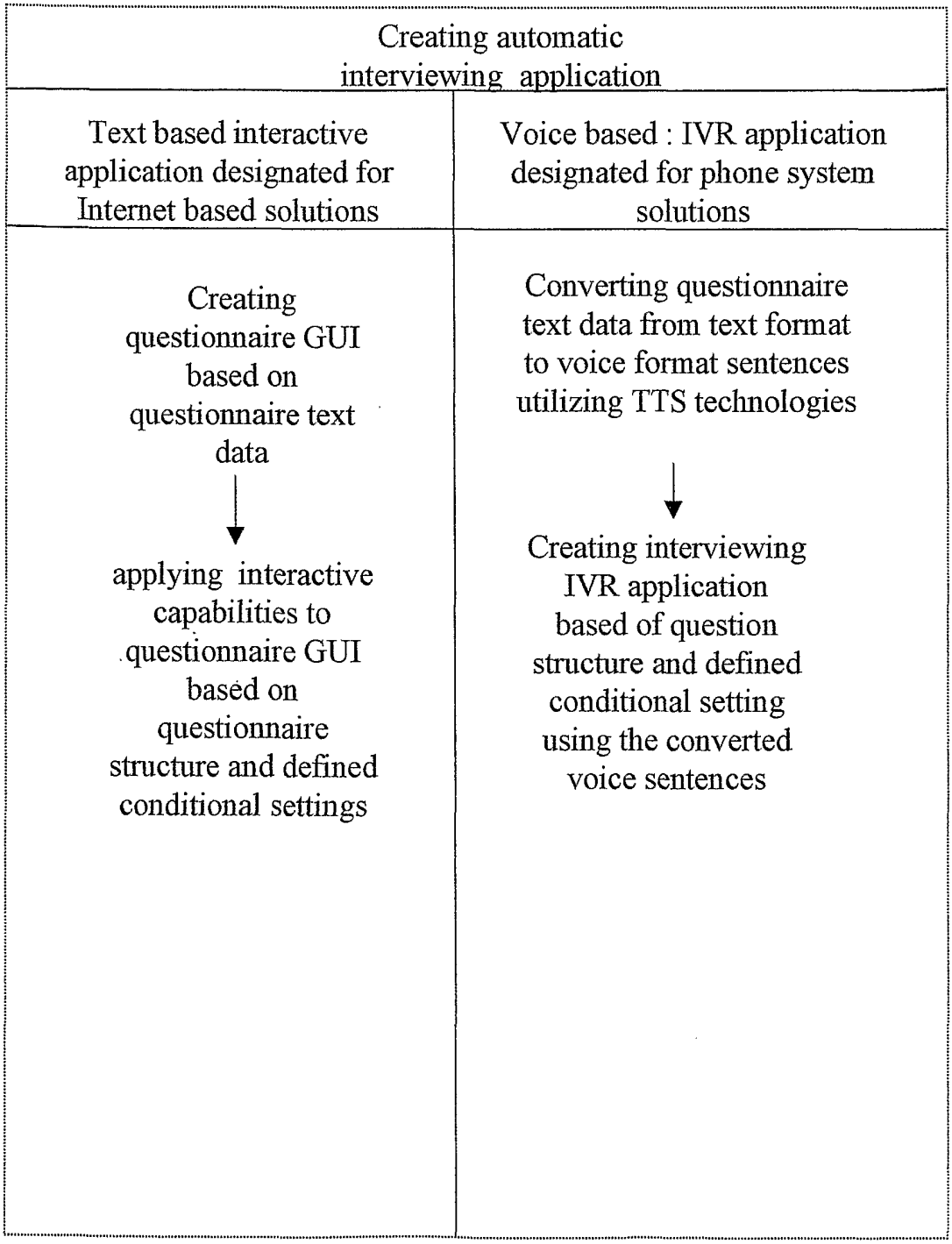

Creating automatic interviewing application
Text based interactive application designated for Internet based solutions
Voice based : IVR application designated for phone system solutions
Creating questionnaire GUI based on questionnaire text data
applying interactive capabilities to questionnaire GUI based on questionnaire structure and defined conditional settings
Converting questionnaire text data from text format to voice format sentences utilizing TTS technologies
Creating interviewing IVR application based of question structure and defined conditional setting using the converted voice sentences

Fig. 5

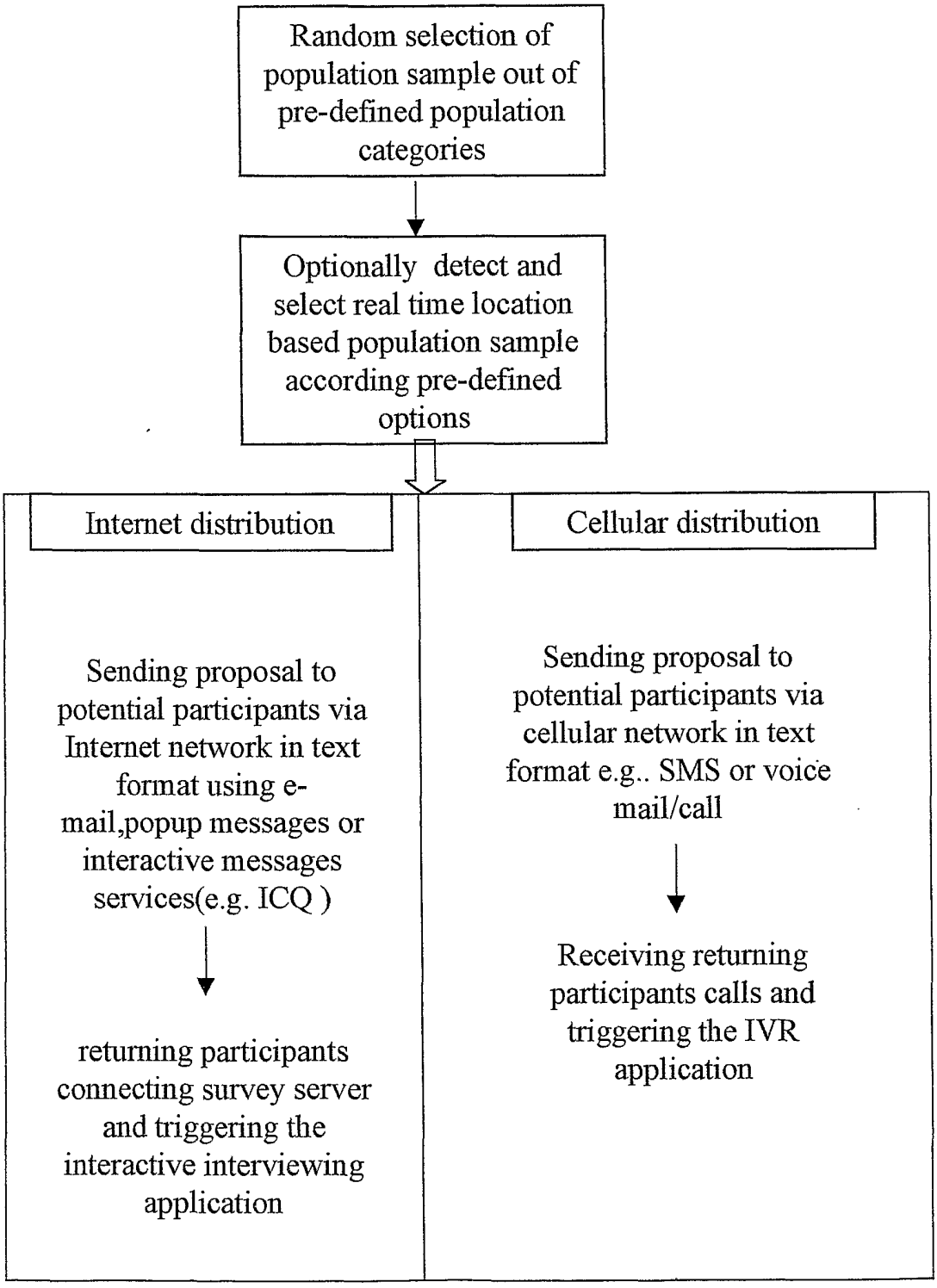
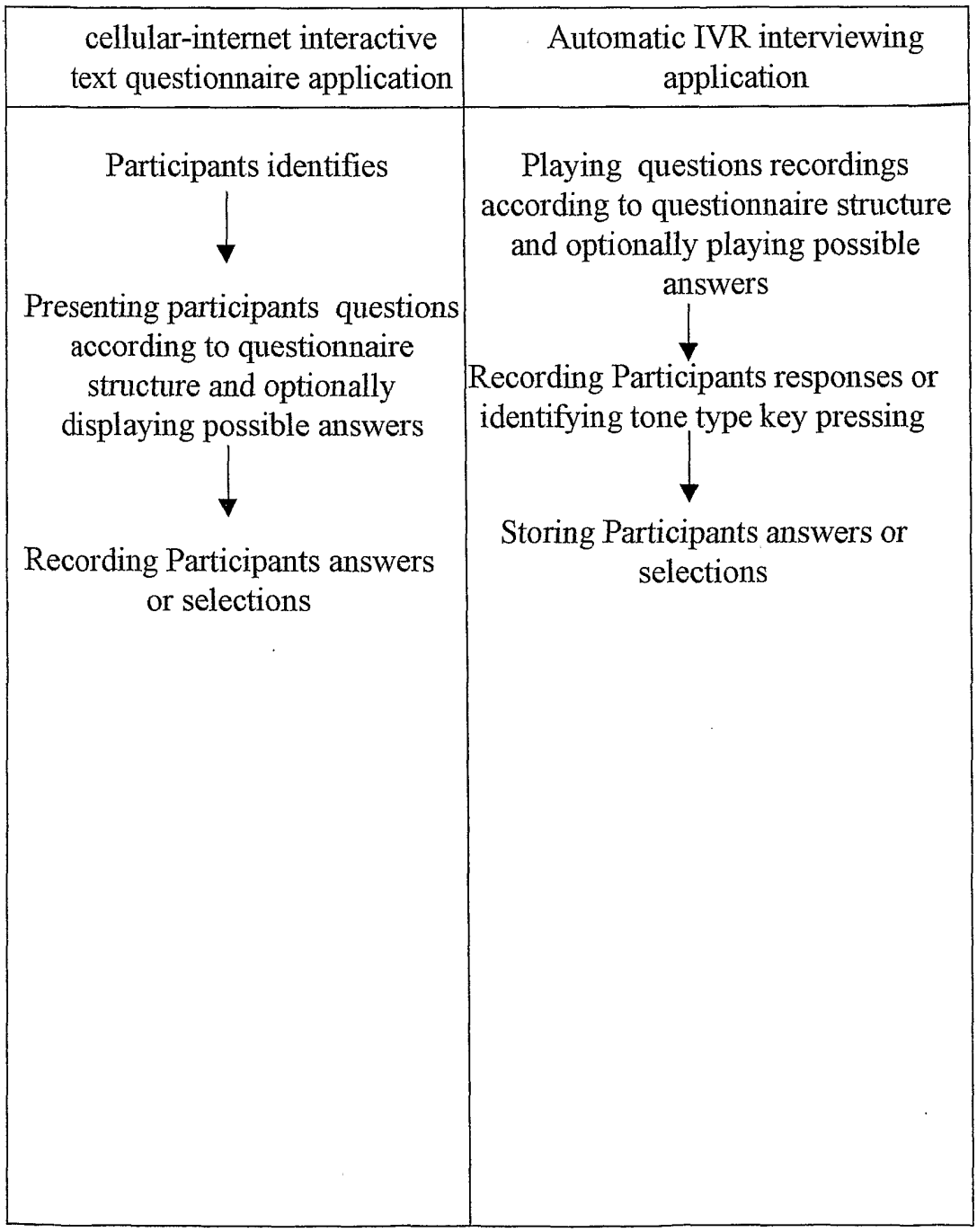

Random selection of population sample out of pre-defined population categories
Optionally detect and select real time location based population sample according pre-defined options
Internet distribution
Cellular distribution
Sending proposal to potential participants via Internet network in text format using e-mail,popup messages or interactive messages services(e.g. ICQ)
returning participants connecting survey server and triggering the interactive interviewing application
Sending proposal to potential participants via cellular network in text format e.g.. SMS or voice mail/call
Receiving returning participants calls and triggering the IVR application

Fig. 6


cellular-internet interactive text questionnaire application
Automatic IVR interviewing application
Participants identifies
Presenting participants questions according to questionnaire structure and optionally displaying possible answers
Recording Participants answers or selections
Playing questions recordings according to questionnaire structure and optionally playing possible answers
Recording Participants responses or identifying tone type key pressing
Storing Participants answers or selections