



(51) International Patent Classification:

G06Q 10/06 (2012.01) G10L 15/26 (2006.01)

(21) International Application Number:

PCT/IB2019/057721

(22) International Filing Date:

13 September 2019 (13.09.2019)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

2018903434 13 September 2018 (13.09.2018) AU

(71) Applicant: TALK 5 PTY LTD [AU/AU]; Level 4, 29 Kiora Road, Miranda, New South Wales 2228 (AU).

(72) Inventor: BANCS, George; Level 4, Kiora Road, Miranda, New South Wales 2228 (AU).

(74) Agent: MILLS OAKLEY; Level 6, 530 Collins Street, Melbourne, Victoria 3000 (AU).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME,

MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))
- in black and white; the international application as filed contained color or greyscale and is available for download from PATENTSCOPE

(54) Title: METHOD AND SYSTEM FOR COMPLETING AND MANAGING WORKFLOWS

(57) Abstract: A method of completing and managing workflows, the method comprising: displaying text questions and/or generating voice questions asking a user for voice answers to identify and complete a workflow, and converting voice answers from the user into text answers to complete the workflow.

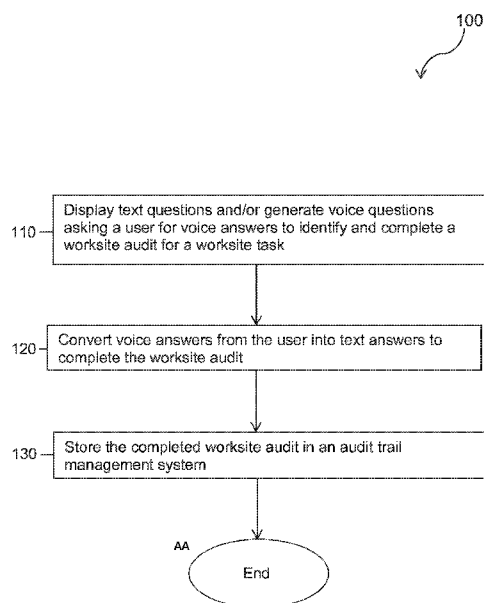


Figure 1



METHOD AND SYSTEM FOR COMPLETING AND MANAGING WORKFLOWS

Field

[0001] The present invention relates to a computer-implemented method and system for completing and managing workflows..

Background

[0002] Workflows, such as audits, inspections, surveys and checklists are traditionally completed by manually filling in paper forms or paper checklists. Once completed, the paper checklists must be stored and managed, often with a view to create an audit trail to show compliance with relevant regulations.

[0003] For example, audits of worksites are conducted regularly to ensure compliance with a wide range of policies and regulations, including safety, quality and environmental regulations. A specific example is worksite safety audits, such as "Take 5" pre-start safety checklists, that help workers and contractors who are working on new or external worksites reduce their exposure to occupational health and safety (OHS) risks and hazards.

[0004] OHS regulations in many industries, such as the building and construction industry, require pre-start safety audits to be completed each day before work starts on a task at a worksite. In addition, post-task audits, such as quality audits, may also need to be completed after work on the task has ended.

[0005] The use of manually filled, paper checklists for workflows suffer from several drawbacks. Sometimes, a completed checklist is lost, or an incorrect checklist is used for the workflow task. Other times, a checklist is not completed before work starts on the workflow task, but someone fills out the checklist, or a portion of the checklist, after work on the workflow task has started. This makes the answers to the checklists unreliable, at least to a degree, and certainly not useful to establish an audit trail to show that correct workflow procedures were followed.

[0006] In this context, there is a need for an improved method and system for completing and managing workflows.

Summary

[0007] According to the present invention, there is provided a method of completing and managing workflows, the method comprising:

- displaying text questions and/or generating voice questions asking a user for voice answers to identify and complete a workflow;

- converting voice answers from the user into text answers to complete the workflow.

[0008] The method may further comprise storing the completed workflow in an audit trail management system.

[0009] The workflow may comprise an audit, an inspection, a survey, or a checklist.

[0010] The audit may comprise a pre-start audit or a post-task audit.

[0011] The audit may comprise a safety audit, a quality audit or an environmental audit.

[0012] The audit may, for example, comprise a Take 5 pre-start safety checklist.

[0013] The voice answers from the user may be converted into text answers using a speech-to-text service.

[0014] A system for completing and managing workflows, the system comprising:

- a memory to store instructions;

- one or more processors to execute instructions stored in the memory to:

- display text questions and/or generate voice questions asking a user for voice answers to identify and complete a workflow; and

- convert voice answers from the user into text answers to complete the workflow.

[0015] The workflow may comprise an audit, an inspection, a survey or a checklist.

Brief Description of Drawings

[0016] Embodiments of the invention will now be described by way of example only with reference to the accompanying drawings, in which:

Figure 1 is an example flow chart of a method for completing and managing worksite audits according to an example embodiment of the present invention;

Figure 2 is an example high level architecture and dataflow diagram illustrating an example system for completing and managing worksite audits according to an example embodiment of the present invention; and

Figures 3 to 8 are example graphical user interfaces (GUIs) generated by an example speech-to-text app for completing and managing worksite audits according to an example embodiment of the present invention.

Description of Embodiments

[0017] Referring to Figure 1, an example method 100 for completing and managing a workflow in the form of a worksite audit according to an example embodiment of the present invention starts at step 110 by displaying text questions and/or generating voice questions asking a user for voice answers to identify and complete a worksite audit for a worksite task. The worksite audit may comprise a safety audit, a quality audit, an environmental audit, or any other type of audit conducted on worksites. The worksite audit may, for example, comprise a pre-start audit or a post-task audit. For example, the worksite audit may comprise a Take 5 pre-start safety checklist.

[0018] Next, at step 120, the voice answers from the user may be converted into text answers to complete the worksite audit. The voice answers may be converted into text answers using, for example, a speech-to-text service.

[0019] The method 100 may end at step 130 where the completed worksite audit may be stored in an audit trail management system.

[0020] Figure 2 illustrates an example high level architecture and dataflow diagram illustrating an example client-server database system 200 for implementing the method

100 as a mobile software application (or "app") 210 running on a mobile computing device such as a smartphone, tablet or laptop.

[0021] The speech-to-text worksite audit app 210 may interface via application programming interfaces (APIs) to a worksite task (or "job") management system 220. The completed worksite audits may be stored in the job management system 220 as part of an audit trail management system. The speech-to-text worksite audit app 210 may further interface via an API to a speech-to-text service (not shown). The speech-to-text worksite audit app 210 may, for example, be provided to users as software as a service (SaaS).

[0022] Referring to Figures 3 to 8, the method 100 may be performed using GUIs generated by the speech-to-text worksite audit app 210. Figure 3 illustrates an example GUI 300 that may display a text question 310 "Please speak your Job Number" asking the user for a voice answer to identify a worksite task for which a worksite audit must be completed. In addition to the text question 310, a corresponding voice question may be generated by the speech-to-text worksite audit app 210 asking the user for the voice answer. The voice answer from the user may be converted by the speech-to-text service into a text answer that is used to retrieve the correct pre-start audit from the job management system 220.

[0023] Figures 4 to 6 illustrates examples GUI 400, 500, 600 that may display text questions 410, 510, 610 to the user asking for voice answers 420, 520, 620 "Say YES or NO or NA (NOT APPLICABLE)" to individual audit items of the worksite audit. Again, in addition to the text questions 410, 510, 610, corresponding voice questions may be generated by the speech-to-text worksite audit app 210 asking the user for the voice answers. Again, the voice answers 420, 520, 620 from the user may be converted by the speech-to-text service into a text answers to complete the individual audit items of the worksite audit.

[0024] The worksite audit app 210 may be configured to respond with custom questions, actions, and/or alerts based on the voice answers given by the user. For example, the worksite audit app 210 may generate an alert or a warning if the answer to a question may indicate possible dangerous working conditions, or falls outside safe parameters.

As a specific example, if the user answers “NO” to the question “Have you checked the power lines?”, then a warning message with danger about powerlines can be displayed before the app proceeds to the next question. Further examples may include, changing or skipping the sequence of questions based on a user’s answer, generating an alert or warning, which may, for example, inform a user of possible unsafe working conditions. The worksite audit app 210 may also request the user to upload a photograph or video material in evidence of a given answer.

[0025] In a further example, the worksite audit app 210 may be configured to generate an action, such as a maintenance work task, based on the voice answer provided by the user. The generated action may also include a further workflow which may be assigned to another user. The worksite audit app may therefore be used to automate multiple dependant work tasks, based on the status of a primary work task. The worksite audit app 210 may also, for example, be configured to save and exit the audit in response to a voice command or voice answer provided by the user, which may, for example, allow a user to complete a task before continuing the audit. The worksite audit app may be configured to generate and send notification emails to a specific person or group of people, in response to specific voice answers.

[0026] The worksite audit app 210 may be configured to provide multi language support such that the app supports multiple input and output languages, allowing the voice answers 420, 520, 620 to be given in any of a number of supported languages. The worksite audit app 210 may be configured to translate the audit answers and audit questions such that these questions and answers can be asked and answered in any of a number of supported languages. For example, the worksite audit app 210 may make use of an application such as Google translate to convert audit answers to be read, or for audit reports to be generated, in multiple languages including English. Advantageously this allows users to complete audits in their own preferred language (if supported). The worksite audit app 210 may be configured to determine the language of the user automatically, based on the voice answers, and provide further questions in the preferred language accordingly.

[0027] When text answers to the individual audit items of the worksite audit have been converted into a text file, the method 100 and system 200 may generate an example GUI 700 illustrated in Figure 7 that may display a text question 710 "Say finish to complete audit" which asks the user for a voice answer to confirm that the worksite audit for the worksite task has been completed. As described above, a corresponding voice question may also be generated asking the user for the voice answer "finish." The voice answer "finish" from the user may then be converted by the speech-to-text service into a text answer that identifies that the worksite audit for the worksite task has been completed. The completed text file for the worksite audit for the worksite task may then be stored in the job management system 220 to provide an audit trail for compliance. The audit or parts of the audit, including both voice questions and voice answers, may be recorded. The recorded audit may be stored as an audio file, or as a transcribed text file. Audit recordings may be used for review to, for instance, improve the system and identify and/or clarify any conflicting information within the audit.

[0028] After the worksite audit for the worksite task has been completed, the method 100 and system 200 may generate an example GUI 800 illustrated in Figure 8 that may display a text question 810 "What would you like to do next?" asking the user for a voice answer 820 "Say FIND JOB to complete next Audit or Say Quit or Exit." Again, corresponding voice questions may also be generated for the user to provide voice answers. The user then may either complete another worksite audit for another worksite task, or quit the app.

[0029] The worksite audit app 210 may be configured to operate in both online or offline mode depending on network availability. In online mode, the worksite audit app 210 may receive audits, questions and instructions from a remote server and answers provided by the user may be continuously transmitted to and stored on the remote server. In offline mode, audits, questions and instructions may be stored locally on the mobile computing device. In offline mode, the worksite audit app 210 may include a synchronisation function, allowing the worksite app 210 to synchronize with a central server to download new audits, questions and instructions, and to upload answers provided by the user and completed audits to the remote server. For example, the synchronization feature may download audits in text and audio file format. When users

provide an answer, the worksite app uses the mobile device's built in speech-to-text function to convert information and synchronize when in online mode.

[0030] The worksite audit app 210 may include text and/or voice chat functionality allowing users to exchange text or voice messages in relation to the audits in one-to-one or group messaging. Text and voice chat functionality may advantageously cut down on use of telephone calls and intermediary administration staff. Messaging, especially group messaging, may be helpful in broadcasting information, such as safety information.

[0031] The worksite audit app 210 may be configured to generate and distribute an emergency signal in response to a request by a user. For example, if the worksite app is running, a user may generate an emergency signal by using the words "Help" or "S-O-S" and the speech-to-text service may be configured to recognize these words and generate an emergency signal based thereon. This feature may be configured to require further verbal "YES" or "NO" confirmation from a user before an emergency signal is generated.

[0032] Embodiments of the present invention provide a speech-to-text worksite audit app that is both generally and specifically useful for completing and managing worksite audits, such as safety audits, quality audits, environmental audits, etc.

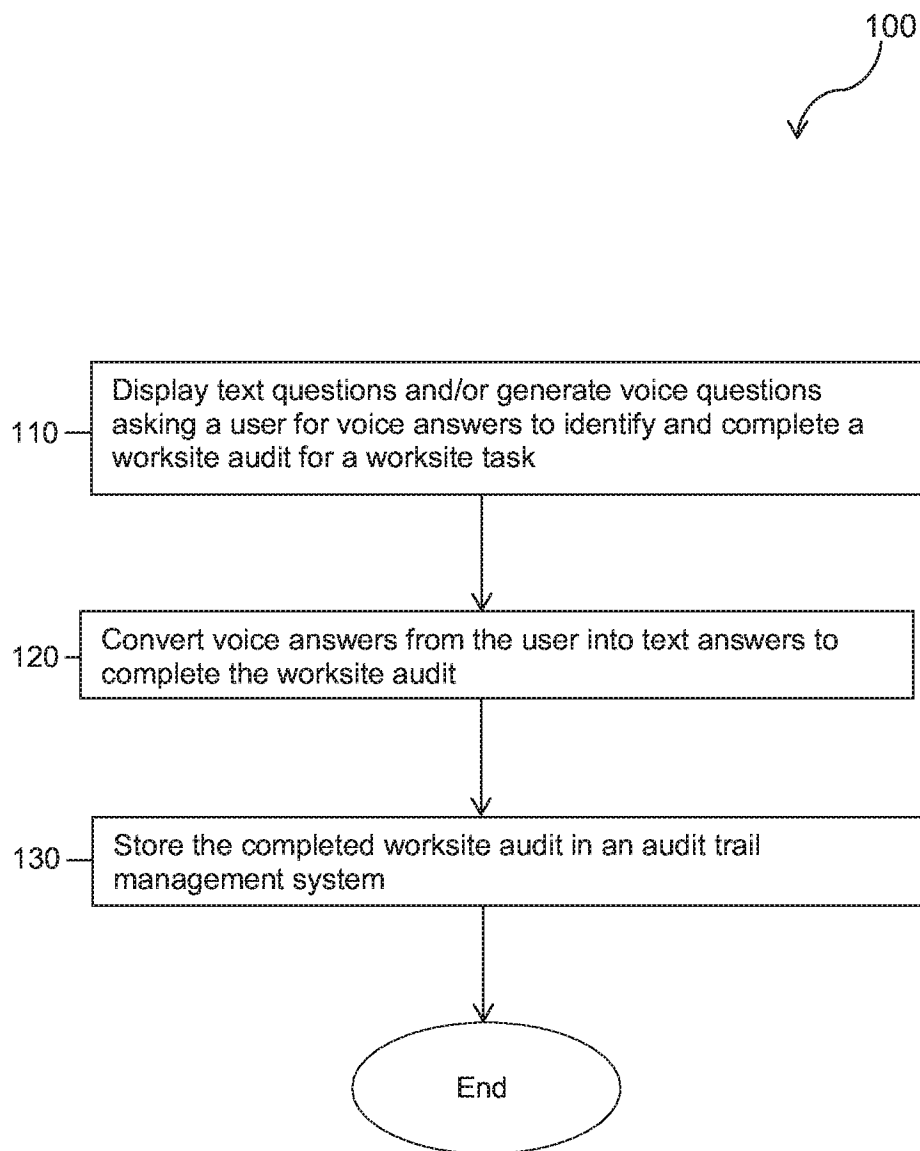
[0033] For the purpose of this specification, the word "comprising" means "including but not limited to," and the word "comprises" has a corresponding meaning.

[0034] The above embodiments have been described by way of example only and modifications are possible within the scope of the claims that follow.

Claims

1. A method of completing and managing workflows, the method comprising:
displaying text questions and/or generating voice questions asking a user for voice answers to identify and complete a workflow; and
converting voice answers from the user into text answers to complete the workflow.
2. The method of claim 1, further comprising storing the completed workflow in an audit trail management system.
3. The method of claim 1, wherein the workflow comprises an audit, an inspection, a survey, or a checklist.
4. The method of claim 3, wherein the audit comprises a safety audit, a quality audit or an environmental audit.
5. The method of either claim 3 or claim 4, wherein the audit comprises a pre-start audit or a post-task audit.
6. The method of claim 5, wherein the audit comprises a Take 5 pre-start safety checklist.
7. The method of claim 1, wherein the voice answers from the user are converted into text answers using a speech-to-text service.
8. A system for completing and managing workflows, the system comprising:
a memory to store instructions;
one or more processors to execute instructions stored in the memory to:
display text questions and/or generating voice questions asking a user for voice answers to identify and complete a workflow; and
convert voice answers from the user into text answers to complete the workflow.

9. The system of claim 8, wherein the workflow comprises an audit, an inspection, a survey or a checklist.

**Figure 1**

200

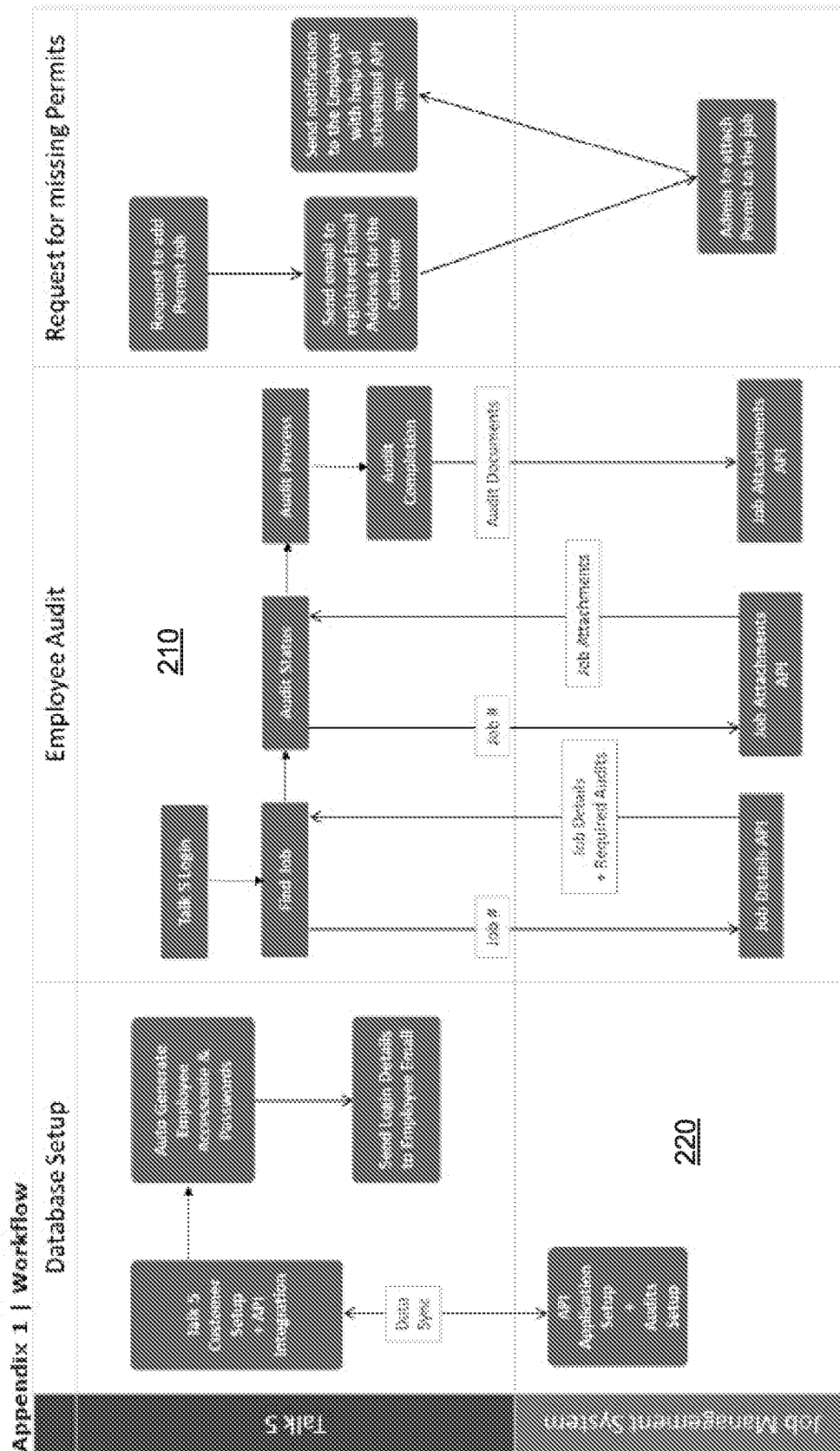


Figure 2

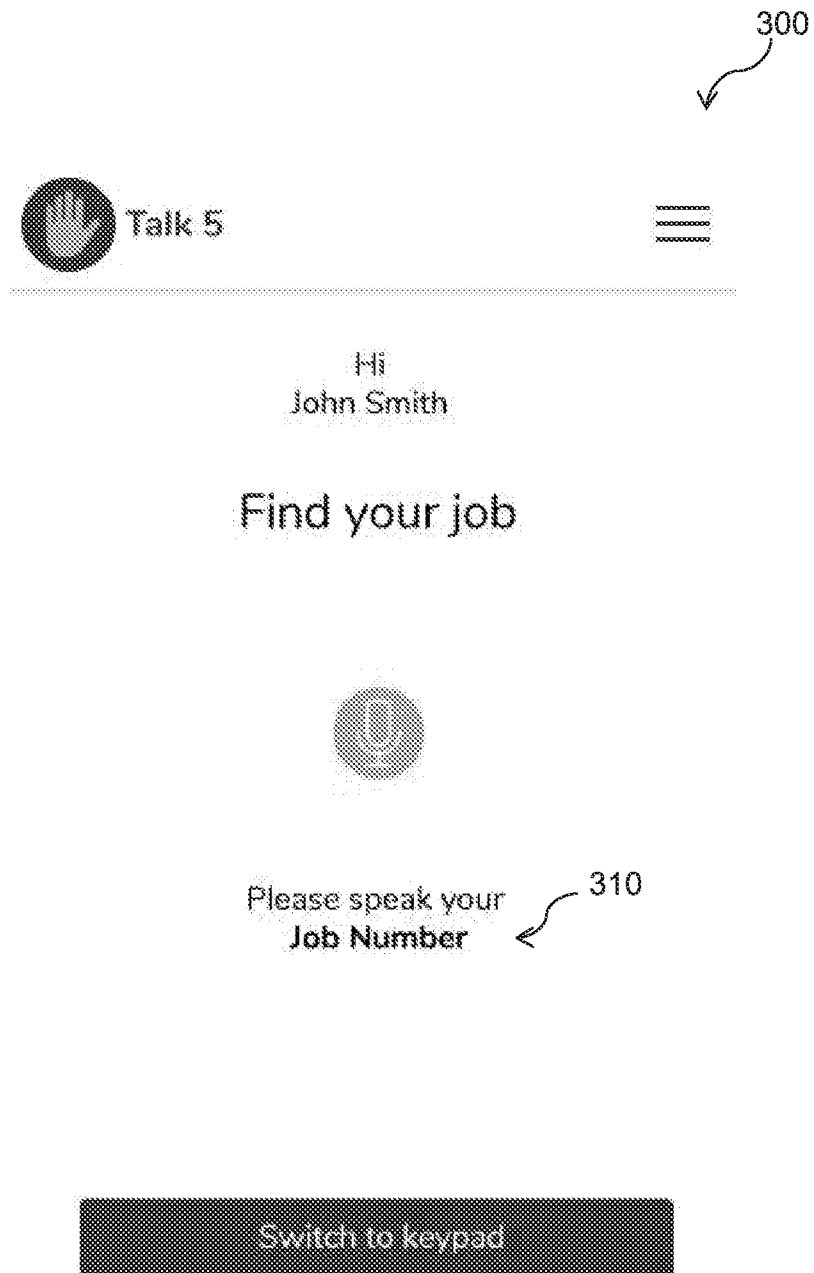
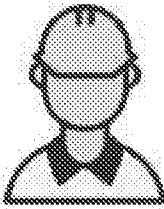


Figure 3

400

 Talk 5 



Are all persons in the Work Pack,
SHEWMS relevant to the activity? 410

Yes ✓

No

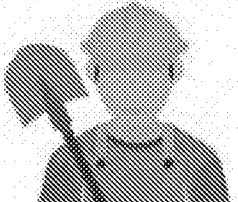
N/A

 Say YES or NO or NA (NOT APPLICABLE) 420

Figure 4

500

 Talk 5 



Is someone else working in
my work area or in this task?

510

Yes ☒

No

N/A

 Say YES or NO or NA (NOT APPLICABLE) 520

Figure 5

Talk 5

Personal Safety Equipment (PPE)

Do you have Wrap around safety glasses/goggles?

Yes

No

N/A

Say YES or NO or NA (NOT APPLICABLE)

Figure 6

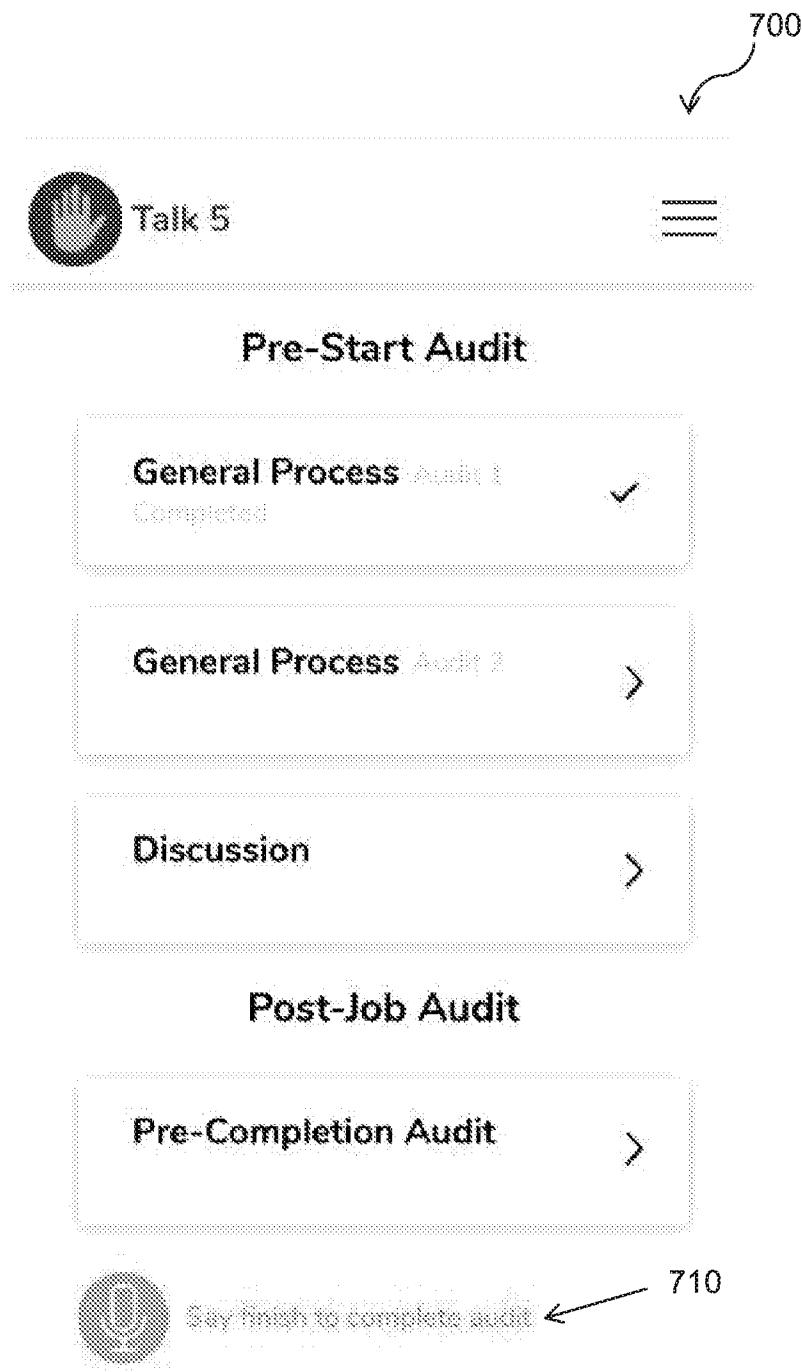
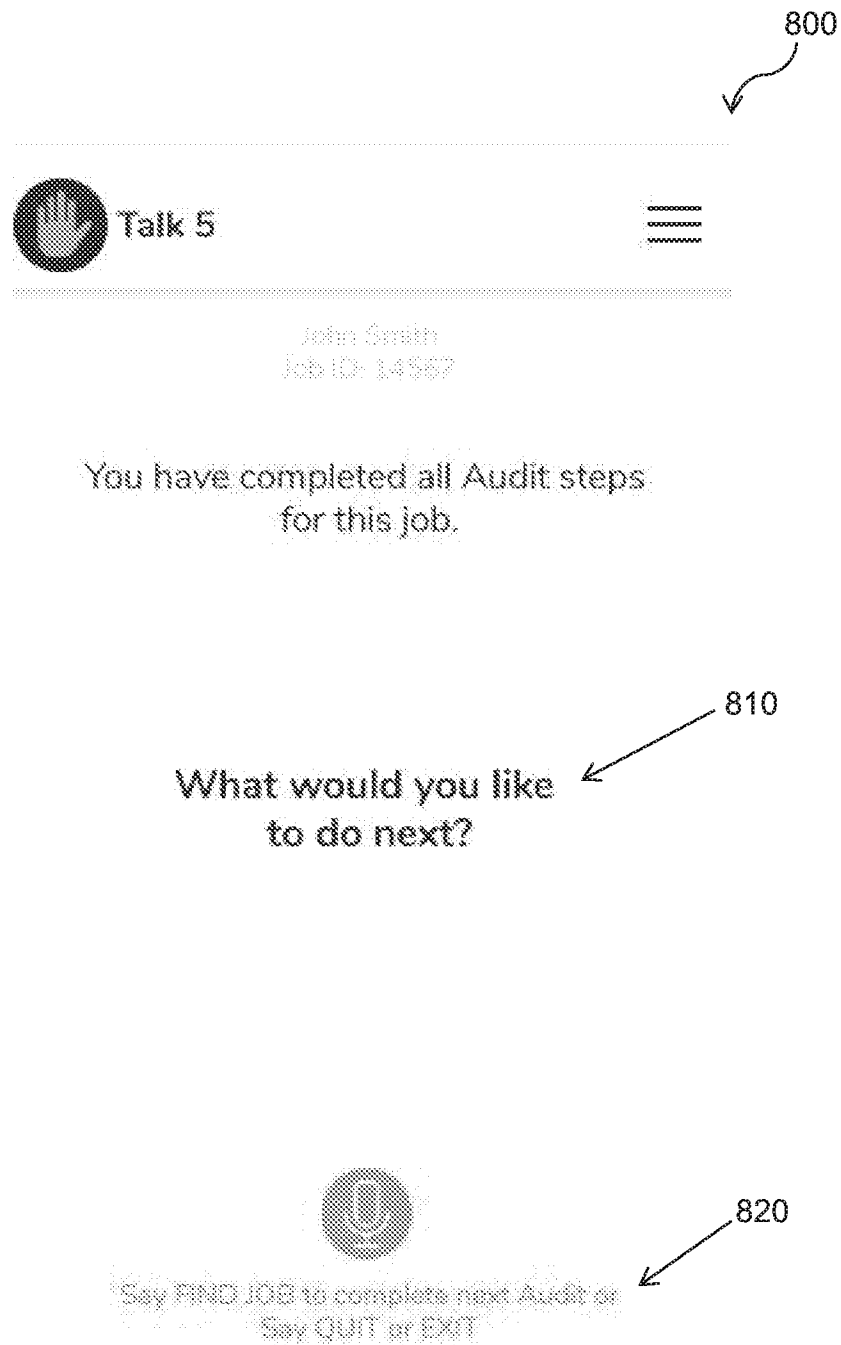


Figure 7

**Figure 8**

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2019/057721**A. CLASSIFICATION OF SUBJECT MATTER****G06Q 10/06(2012.01)i, G10L 15/26(2006.01)i**

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 10/06; G06F 17/30; G06F 3/0482; G06F 3/0488; G06F 9/48; G06Q 10/00; H04L 29/08; G10L 15/26

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & Keywords: workflow, text, voice, management, conversion

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2011-0035245 A1 (STEVEN NIELSEN et al.) 10 February 2011 See paragraphs [0035], [0063], [0142]–[0143], [0264] and figures 11, 13, 18–19.	1–9
A	US 2014-0223438 A1 (LG ELECTRONICS INC.) 07 August 2014 See paragraphs [0068]–[0069] and figure 2.	1–9
A	US 2006-0015475 A1 (CHARLES CHRISTIAN BIRKNER et al.) 19 January 2006 See paragraphs [0011], [0225] and claims 1–4.	1–9
A	US 2018-0183884 A1 (TENCENT TECHNOLOGY (SHENZHEN) COMPANY LIMITED) 28 June 2018 See paragraphs [0071]–[0074] and claims 21–23.	1–9
A	US 2017-0083179 A1 (APPLE INC.) 23 March 2017 See paragraphs [0130]–[0141] and figures 8, 17.	1–9



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

"D" document cited by the applicant in the international application

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

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"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

10 January 2020 (10.01.2020)

Date of mailing of the international search report

10 January 2020 (10.01.2020)

Name and mailing address of the ISA/KR

International Application Division

Korean Intellectual Property Office

189 Cheongsa-ro, Seo-gu, Daejeon, 35208, Republic of Korea



Facsimile No. +82-42-481-8578

Authorized officer

KANG, Min Jeong



Telephone No. +82-42-481-8131

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/IB2019/057721

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2011-0035245 A1	10/02/2011	AU 2010-214100 A1 CA 2692110 A1 CA 2692110 C US 2010-0205032 A1 US 2011-0035251 A1 US 2011-0035252 A1 US 2011-0035260 A1 US 2011-0035324 A1 US 2011-0035328 A1 US 2017-0278026 A1 US 9563863 B2 WO 2010-093424 A2 WO 2010-093424 A3	11/08/2011 29/04/2010 27/10/2015 12/08/2010 10/02/2011 10/02/2011 10/02/2011 10/02/2011 10/02/2011 28/09/2017 07/02/2017 19/08/2010 22/12/2011
US 2014-0223438 A1	07/08/2014	EP 2763031 A1 KR 10-2014-0099007 A US 9448838 B2	06/08/2014 11/08/2014 20/09/2016
US 2006-0015475 A1	19/01/2006	None	
US 2018-0183884 A1	28/06/2018	CN 104426972 A CN 104426972 B KR 10-1677881 B1 KR 10-2016-0021913 A US 10305998 B2 US 2015-0156267 A1 US 9917906 B2 WO 2015-027780 A1	18/03/2015 05/07/2019 18/11/2016 26/02/2016 28/05/2019 04/06/2015 13/03/2018 05/03/2015
US 2017-0083179 A1	23/03/2017	AU 2013-262803 A1 CN 104335205 A CN 104335205 B CN 109324732 A EP 2847693 A2 EP 2847693 A4 HK 1205312 A1 HK 1206835 A1 JP 2015-519838 A JP 6193361 B2 KR 10-1697416 B1 KR 10-2015-0003877 A US 10241644 B2 US 2014-0033071 A1 WO 2013-173511 A2 WO 2013-173511 A3	27/11/2014 04/02/2015 19/10/2018 12/02/2019 18/03/2015 13/01/2016 11/12/2015 15/01/2016 09/07/2015 06/09/2017 17/01/2017 09/01/2015 26/03/2019 30/01/2014 21/11/2013 16/01/2014