

SYSTEM AND METHOD FOR GENERATING NOTIFICATIONS RELATED TO USER QUERIES

BACKGROUND

5 Field of invention:

[001] The subject matter in general relates to information technology. More particularly, but not exclusively, the subject matter relates to a system and a method for notifying a user.

Discussion of related art:

10 [002] With the increase in usage of computing networks, for example the internet, people are provided with an ample amount of information from various sources. Due to the advancement in technology over the last few years, people rely on the internet as a search engine where they receive results based on their inputs. Machine learning systems are such systems that are executable on computing
15 networks and machine learning systems provide answers to user doubts.

[003] Conventional systems have been proposed that answer user doubts/inputs using techniques such as natural language processing, information retrieval, knowledge representation and reasoning, algorithms and the like. However, there may be cases where users have multiple questions and may not
20 receive proper answers to all their queries. There are no intelligent machine learning based system exists to attend such user queries. Further, the existing rule-based systems are limited in scope, utility and cost user's time. The conventional system could not able to appropriately learn and understand the questions asked by the user and also takes long processing time to provide a suitable answer for such user
25 queries. Further, the conventional systems relating to query processing may not be able to generate appropriate results and does not provide relevant alerts/announcements/notices to the users for each of their questions/queries. Therefore, users will not be notified irrespective of whether each of their question is answered or not answered.

[004] Thus, the conventional systems failed to solve the above problems resulting in improper understanding of user questions and inconsistent notifications pertaining to user inputs/questions to the system, which may not be desirable.

[005] In view of the foregoing discussion, there is a need to overcome the
5 above problems.

SUMMARY

[006] Accordingly, an improved technique to overcome the above problems is needed. To fulfill this need, a system and method for generating notifications relating to user queries is disclosed.

10 **[007]** In one embodiment, a system for generating notifications relating to user queries is disclosed. The system comprises a query input module configured to receive one or more queries associated with a user by verbal communication means and/or gesture means. The system further comprises a natural language processing (NLP) engine configured to determine a meaning of the one or more
15 queries (MOQ) received from verbal communication means. The system further comprises a gesture engine configured to determine the meaning of the one or more queries (MOQ) received from gesture means. The system further comprises a machine learning unit which receives the meaning of the one or more queries (MOQ) determined from at least one of the NLP and the gesture engine. The
20 machine learning unit may be configured to identify at least one data source, among the one or more data sources, required to resolve the one or more queries. In addition, the machine learning unit may be configured to identify one or more trigger points based on the meaning of the query (MOQ). The machine learning unit is configured to determine a logical relationship between one or more identified
25 trigger points. The system further comprises an execution unit in communication with the machine learning unit. The execution unit may be configured to collect contextual data from the identified data sources, process incoming data, generate one or more trigger points pertaining to the associated data sources and evaluate logical relationship between the one or more trigger points to generate one or more
30 events upon successful logical relationships. In addition, the execution unit may be

configured to communicate one or more events to an electronic device associated with the user. The electronic device is configured to convert the events to appropriate user notifications.

[008] In another embodiment, a method for generating notifications relating to user queries is disclosed. The method comprises identifying at least one data source pertaining to the meaning of the query (MOQ). The method further comprises identifying one or more trigger points (TPs) based on the at least one identified data source. The method further comprises determining a logical relationship (R) between the one or more trigger points identified. The method further comprises collecting contextual data from the identified data sources. The method further comprises processing of incoming data and generating one or more trigger points pertaining to the associated data sources and identified trigger points. The method further comprises evaluating the logical relationship between one or more trigger points to generate at least one event. In addition, the method comprises generating one or more events pertaining to the one or more successful logical relationships. The method further comprises delivering the events to an electronic device and converting the subject event into appropriate user notification.

[009] Other objects, features, and advantages of the present invention will become apparent from the following detailed description. It should however be understood that the detailed description and specific examples, while indicating preferred embodiments of the present invention, are given by way of illustration only and various modifications may naturally be performed without deviating from the present invention.

BRIEF DESCRIPTION OF DIAGRAMS

[010] This disclosure is illustrated by way of example and not limitation in the accompanying figures. Elements illustrated in the figures are not necessarily drawn to scale, in which like references indicate similar elements and in which:

[011] FIG. 1 is an exemplary architecture of a system 100 illustrates the processing of user queries, in accordance with an embodiment.

[012] FIG. 2 is an exemplary block diagram illustrating an execution unit 200 which receives basic configuration settings (one time) from the machine learning unit 116 and generates notifications, in accordance with an embodiment.

[013] FIG. 3 is an exemplary architecture of a system 300 illustrating co-ordination between modules of the machine learning unit 116 and execution unit 200, in an embodiment of the present invention.

[014] FIG. 4 illustrates an exemplary system architecture 400 of the system for generating events and notifications, in accordance with an embodiment.

[015] FIG. 5 illustrates an exemplary method 500 illustrating a flowchart for receiving a user query, processing the query, identifying one or more data sources relating to meaning of the query (MOQ), identifying one or more trigger points relating to the identified data sources, and determining a logical relationship with respect to identified trigger points, in accordance with an embodiment.

[016] FIG. 6 illustrates an exemplary method 600 illustrating a flowchart for supplying identified data to the execution unit from the machine learning unit, in accordance with an embodiment.

[017] FIG. 7 illustrates an exemplary method 700 illustrating a flowchart for evaluating one or more trigger points, in accordance with an embodiment.

DETAILED DESCRIPTION OF THE INVENTION

[018] The following detailed description includes references to the accompanying drawings, which form part of the detailed description. The drawings show illustrations in accordance with example embodiments. These example embodiments are described in enough details to enable those skilled in the art to practice the present subject matter. However, it will be apparent to one of ordinary skill in the art that the present invention may be practised without these specific details. In other instances, well-known methods, procedures and components have not been described in detail so as not to unnecessarily obscure aspects of the embodiments. The embodiments can be combined, other embodiments can be utilized, or structural and logical changes can be made without departing from the

scope of the invention. The following detailed description is, therefore, not to be taken as a limiting sense.

[019] In this document, the terms “a” or “an” are used, as is common in patent documents, to include one or more than one. In this document, the term “or” is used to refer to a non-exclusive “or,” such that “A or B” includes “A but not B,” “B but not A,” and “A and B,” unless otherwise indicated.

[020] It should be understood that the capabilities of the invention described in the present disclosure and elements shown in the figures may be implemented in various forms of hardware, firmware, software, non-transitory computer readable medium or combinations thereof.

[021] FIG. 1 is an exemplary architecture of a system 100 illustrates the processing of user queries, in accordance with an embodiment. As shown, the system 100 may include a query input module 102, an NLP engine 104, a voice to text converter 106, a command meaning unit 108, a gesture engine 110, a pattern recognition engine 112, a gesture meaning unit 114, a machine learning unit 116, a network 118, and an electronic device 120. The NLP engine 104 may comprise the voice to text converter 106 and the command meaning unit 108. The gesture engine 110 may comprise the pattern recognition engine 112 and the gesture meaning unit 114. Each component is described in further detail below.

[022] In one embodiment, the user inputs in the form of ‘Queries’ are given to the system 100 through the electronic device 120 (for example, a smart wearable). Further, the user inputs one or more queries using verbal communication means and gesture means. Verbal communication relates to inputs in the form of speech. Gesture communication relates to inputs in the form of user actions. The electronic device 120 may capture the subject query (inputted either verbally and/or through gesture means) and sending the query to the query input module 102 via a communication network 118.

[023] The query input module 102 may be configured to receive the one or

more queries received from the user through verbal means, through gesture means, or through a combination of both verbal means and gesture means. If the input may be a combination of both verbal means and gesture means, then the input is first split into both verbal means and gesture means, and the verbal means is fed to the
5 NLP engine 104 and the gesture means is fed to the gesture engine 110. The NLP engine 104 and the gesture engine 110 both integrate to determine the meaning of the command/queries (MOQ).

[024] Further, the NLP engine 104 may be configured to determine a meaning of the one or more queries (MOQ) of the user, pertaining to verbal communication
10 means. The user may input the sounds for verbal communication means using a microphone. Vibrations are created in the air typically when users speak. Analog waves of these vibrations created are then translated into digital data using an analog-to-digital converter (ADC). The translation occurs by sampling the wave by taking precise measurements at frequency intervals. The digitalized sound is then
15 filtered for removing unwanted noise and segregating the sound into separate frequency bands. Segregation mainly occurs because not all persons speak at the same speed, tone, ascent, so the sound must be adjusted matching to the sound samples stored in a memory of the NLP engine 104.

[025] The sound waves are then divided into multiple segments, which are
20 then matched with phonemes of the respected language through the voice to text converter 106. The command meaning unit 108 may be trained to compare related phonemes with other phonemes and vast database of words, sentences, phrases etc... The command meaning unit 108 determines closest phonemes and prioritizes them according to the closest meaning pertaining to the user input.

[026] Further, there may be cases where the user repeats a word more than
25 once, says some word(s) louder, says some word(s) softer, and the like, while providing their queries. This may be because, as an example, a specific word may carry more importance. The command meaning unit 108 then creates priorities based on importance. For example, if the user repeats a word more than one or says

some word(s) with a louder tone, then the command meaning unit 108 considers these factors with higher importance and priority. If a user repeats a sentence one or more times, then the command meaning unit 108 also considers this factor with high importance and priority. The command meaning unit 108 may be trained to distinguish importance of every word, with respect to the user's actions and data. In one example, the command meaning unit 108 may allocate priority for every word and maintains a priority table of words, for further processing.

[027] Further, the gesture engine 110 may be configured to determine the meaning of the one or more queries of the user, pertaining to gesture means. Gestures relate to the movement of body parts, while the user may be trying to express something, by way of one or more actions. Gestures may be captured (for example by a camera) and fed to the gesture engine 110 for recognition. The gesture engine 110 may be trained to identify gestures relating to facial expressions, hand and body movement and the like.

[028] The one or more gestures may be captured by the camera, and then received by the gesture engine 110. The pattern recognition engine 112 then compares the captured gesture images with stored images pertaining to the gesture context in a database of the gesture engine 110. The database has a certain number of images corresponding to each gesture. Apart from storing images, the database also stores commands, which interpret a meaning of gestures. Once the gesture image is matched with the image stored in the database, the gesture meaning unit 114 correlates the database image with commands and pattern recognition engine 112, to determine the command matching the database image for determining the meaning of the gesture inputted by the user. Support vector machine (SVM) classification, K-Nearest Neighbour (KNN) are known techniques in the art for matching the input image (gesture image here) with images stored in the database of the gesture engine 110.

[029] For example, the user may give a gesture action 'thumbs up'. The camera captures one or more images of this 'thumbs up' gesture. These captured

images are then fed to the gesture engine 110, which then determines the image(s) stored in its database that may depict a thumb in an upwards position, to match with the gesture image(s) captured by the camera. The pattern recognition engine 112 then matches the database image (thumb in upward direction here). Once the match is determined, the gesture meaning unit 114 may receive the matching image determined by the pattern recognition engine 112 and further determine command(s) relating to the meaning of the thumbs up gesture. Commands relating to the thumbs up gesture typically means good job, great and nice, and the like as examples. The gesture meaning unit 114 then determines that the meaning of the gesture command is good/nice/great. Command(s) may be referred to as meaning of the query (MOQ) or processed queries.

[030] The machine learning unit 116 may comprise a data source identification block 122, a trigger point definition unit 124 and a relationship definition unit 126. The data source identification block 122 may provide a set of data sources identified based on relevancy of MOQ.

[031] Further, a data source is source of the data. The data source can be a file, a database on a DBMS, or even a live data feed. The data may be stored in a database (internal data) or may be in other remote servers (external data), accessed over a network. Also, the system 100 may collect data from various data from internal data sources (of user), that may include but not limited to sensor modules, emails, calendars, social networks, messages, app configurations, activity information (GPS), etc... The external data source may be any piece of data/dataset which is available in internet (structured or unstructured) or 3rd party server, and accessible through one or more networking standards. One or more data sources are required to process the given query and further. The identification of one or more data sources is crucial because, the entire output of the system depends on the appropriate selection of data sources, relevant to the context.

[032] Further, the data source identification block 122 of the machine learning unit 116 may be configured to receive the one or more MOQ from the NLP engine

104 and the gesture engine 110. The data source identification block 122 may be trained to identify one or more data sources that relate to the MOQ determined based on the user's input. When the query is being processed, the data source identification block 122 can infer the closest matching data source based on MOQ,
5 and user's current context. In other words, the objective of the data source identification block 122 is to identify relevant data source from the all available set of data sources.

[033] For example, the user query is "Do I have to carry an umbrella tomorrow?", the MOQ may be, 'Is it going to rain here, tomorrow'. Further, in this
10 case the identified data sources may be 'weather', 'location' and 'time'. Rain and tomorrow may be the keywords present in the MOQ, which may also be identified by the machine learning unit 116. Data source 'weather' may be in relation with rain, data source 'location' may be in relation with GPS and data source 'time' may be in relation with tomorrow. For example, the word umbrella relates to rain and
15 user's present position relates to location and time. The meaning umbrella may be carried by the user, when there is a rain tomorrow. The machine learning unit 116 may prioritize these keywords and select the data sources that may be based on the closest inference of the MOQs.

[034] Further, the trigger point definition unit 124 of machine learning system
20 116 may be configured to identify one or more trigger points (TPs) relating to the identified data source and MOQ received. Each data source may have one or more trigger points that are continuously checked. The trigger points may be time based, user based, activity based, priority based and the like. The example of identified trigger points may include, Rain on 20/04/2018 (TP1), at user location (TP2), time
25 the user leaves office (TP3). The trigger points may be automatically framed by the system 100.

[035] Further, the relationship definition unit 126 of machine learning unit 116 may be configured to determine a logical relationship (R) between the one or more identified trigger points, to generate one or more events. Relating to the query

“Do I have to carry an umbrella tomorrow?”, events may be generated. The events may be possible logical combination of one or more trigger points. In continuation to the above example, the event may be represented by $R1 = TP1 \ \& \ TP2 \ \& \ TP3$.

[036] The network 118 may be a wired network, a wireless network or a combination thereof. Furthermore, the network 118 may include a wide area network (WAN) (e.g., the Internet), or other interconnected data paths across which multiple devices and/or entities may communicate. In some implementations, the network 118 may include a peer-to-peer network. The network 118 may also include a mobile data network that may include third-generation (3G), fourth-generation (4G), long-term evolution (LTE), long-term evolution advanced (LTE-A), Voice-over-LTE (“VoLTE”) or any other mobile data network or combination of mobile data networks. The electronic device 120 may include, but not limited to, a mobile device, a smart wearable, a wrist-watch, a personal computer (PC), a tablet, a smartphone, a personal digital assistant (PDA) and the like.

[037] FIG. 2 is an exemplary block diagram illustrating an execution unit 200 which receives basic configuration settings (one time) from the machine learning unit 116 and generates notifications, in accordance with an embodiment. As shown, the execution unit 200 may include data sources 204, a trigger point generation unit 206, and a logical sequence block 208. Each component is explained in further detail below.

[038] Each component of the execution unit 200 receives a configuration from other components of the machine learning unit 116 (a data source identification block 122, a trigger point definition unit 124 and a relationship definition unit 126, respectively). In one embodiment, the data source identification block 122 supplies information relating selection and identification of data sources 204. The trigger point definition unit 124 may also supply identified trigger points to the trigger point generation unit 206. Further, the relationship definition unit 126 may send possible identified logical relationship data to the logical sequence block 208. Each component of execution unit 200 is explained in further detail below.

[039] In one embodiment, the data sources 204 may be configured to collect data related to one or more queries associated with the user. The data sources 204 may be differentiated into internal data or external data. The internal data may only have user data. The user data may include but not limited to emails, messages,
5 calendar, schedules, social network messages, data received from user sensor modules (accessible by the user), in app configurations and the like. The external data may be any curated information from the internet.

[040] Further, the one or more external data sources 204 may include, but not limited to weather data, GPS data, food data, news feeds, activity data, sports data
10 and the like. The data sources 204 may be identified pertaining to the query, and the data sources 204 may be configured to fetch relevant data. The one or more data sources 204 may also generate live data streams.

[041] Further, the trigger point generation unit 206 may be configured for generating one or more trigger points pertaining to the associated data
15 sources/streams. For example, the data sources 204 may be weather data, GPS data, and activity data. The user may input a query stating, “Do I have to carry an umbrella tomorrow?”, for which weather data may be identified as one of the data source 204 and a trigger point TP1 is generated if the condition (“Rain on 20/04/2018”) is matched in the incoming weather data source. The trigger point
20 TP2 is generated if the condition (“at user location”) is matched in the incoming GPS location data source. Similarly, the trigger point TP3 is generated if the condition (“when the user leaves for office”) is matched in the incoming user activity data source.

[042] Further, the logical sequence block 208 may be configured to receive
25 all the generated trigger points. The logical sequence block 208 may be configured to generate events based on the relationships between the trigger points and once relationship evaluation is successful, then logical sequence block 208 may create an event (R). The event may be delivered to the electronic device 120 via the network 118. The event may be converted to appropriate form of user notification

by the electronic device 120. For example, the trigger points TP1, TP2, and TP3 may be received by the logical sequence block 208 from the trigger point generation unit 206. For example, the logical sequence block 208 may create an event when the logical relationship evaluation $R = (TP1 + TP2) \text{ XOR } TP3$ is successful. Further, the logical sequence block 208 may consider $(TP2 \ \& \ TP3)$, if TP1 had occurred in the past, to create a corresponding event. The notification of the corresponding event may be delivered to the user in one or more forms, not limited to, audible alarm, synthesized voice, digital display, depending on the capability of the electronic device 120.

10 **[043]** FIG. 3 is an exemplary architecture of a system 300 illustrating co-ordination between modules of the machine learning unit 116 and execution unit 200, in an embodiment of the present invention.

15 **[044]** The NLP engine 104, the gesture engine 110, and the blocks (data source identification block 122, the trigger point definition unit 124, the relationship definition unit 126) of the machine learning unit 116 may be one time setting units. In one embodiment, the modules of machine learning unit 116 are considered as ‘one time setting units’. The meaning of the user query is determined through NLP engine 104 and gesture engine 110. The machine learning unit 116 identifies one or more appropriate data sources relating to the meaning of the query (MOQ), identifies one or more trigger points relating to the one or more identified data sources, and determines logical relationships between the one or more identified trigger points. As shown there, the NLP engine 104 and gesture engine 110 supplies the meaning of the query (MOQ) to each of the modules of machine learning unit 116. The modules of machine learning unit 116 supplies identified data sources, trigger points and logical relationships (computed between the trigger points).

25 **[045]** On the other hand, the execution unit 200 receives identified data sources, trigger points and successful logical relationships (computed between the trigger points) from the modules of machine learning unit 116. The data sources 204, the trigger point generation unit 206, and the logical sequence block 208 may

be continuous execution units. In other words, the modules of execution unit 200 are described as 'continuous execution units'. As shown there, the execution unit 200 also collects contextual data from the identified data sources, continuously process the incoming contextual data/data streams and generates one or more trigger points pertaining to one or more data sources and identified trigger points. The execution unit 200 further configured to evaluate the logical relationship between one or more generated trigger points, considering the identified data sources and logic previously configured by the machine learning unit 116. When the evaluation is successful, the execution unit 200 creates one or more event(s).

10 **[046]** The execution unit 200 further delivers the one or more events to the user's electronic device 120 through the network 118. The electronic device 120 appropriately converts the subject events into user notifications.

15 **[047]** FIG. 4 illustrates an exemplary system architecture 400 of the system for generating notifications, in accordance with an embodiment. As shown, the system may include a processor 402, a memory 406, a communication unit 404, a I/O 408, and a bus 410. Each component is described in further detail below.

20 **[048]** In general, the processor 402 may include any suitable special-purpose or general-purpose computer, computing entity, or processing device including various computer hardware or software modules and may be configured to execute instructions stored on any applicable computer-readable storage media. For example, the processor 402 may include a microprocessor, a microcontroller, a digital signal processor (DSP), an application-specific integrated circuit (ASIC), a Field-Programmable Gate Array (FPGA), or any other digital or analog circuitry configured to interpret and/or to execute program instructions and/or to process data.

25 **[049]** The memory 406 may include computer-readable storage media for carrying or having computer-executable instructions or data structures stored thereon. Such computer-readable storage media may be any available media that may be accessed by a general-purpose or special-purpose computer, such as the

processor 402. By way of example, and not limitation, such computer-readable storage media may include tangible or non-transitory computer-readable storage media including Random Access Memory (RAM), Read-Only Memory (ROM), Electrically Erasable Programmable Read-Only Memory (EEPROM), Compact Disc Read-Only Memory (CD-ROM) or other optical disk storage, magnetic disk storage or other magnetic storage devices, flash memory devices (e.g., solid state memory devices), or any other storage medium which may be used to carry or store desired program code in the form of computer-executable instructions or data structures and which may be accessed by a general-purpose or special-purpose computer.

[050] The communication unit 404 may be a wired network or a wireless network. Furthermore, the communication unit 404 may include a local area network (LAN), a wide area network (WAN) (e.g., the Internet), or other interconnected data paths across which multiple devices and/or entities may communicate.

[051] The I/O (input/output unit) 408 may provide communication between the processor 402, the memory 406, and the communication unit 404. The processor 402, the memory 406, the communication unit 404, and the I/O 408 may all be interconnected via the bus 410. The bus 410 may be a communication system that transfers data/information between each component.

[052] FIG. 5 illustrates an exemplary method 500 illustrating a flowchart for receiving a user query, processing the query, identifying one or more data sources relating to meaning of the query (MOQ), identifying one or more trigger points relating to the identified data sources, and determining a logical relationship with respect to identified trigger points, in accordance with an embodiment. The steps 502 – 506 may be executed by the NLP engine 104 or the gesture engine 110. The steps 508 – 512 may be executed by the machine learning unit 116. Each step is explained in further detail below.

[053] At step 502, the user inputs one or more queries to the system 100 (of

FIG. 1) via the electronic device 120 (for example, a smart wearable). Further, the user may input the one or more queries using verbal communication means and gesture means. Verbal communication relates to inputs in the form of speech. Gesture communication relates to inputs in the form of user actions.

5 **[054]** At step 504, the NLP engine 104 and the gesture engine 110 may be configured to receive the one or more queries that the user provided as inputs. The NLP engine 104 receives the inputs pertaining to verbal communication means and the gesture engine 110 receives the inputs pertaining to gesture means.

10 **[055]** At step 506, the meaning of the query (MOQ) is determined. The NLP engine 104 may be configured to determine a meaning of the one or more queries of the user, pertaining to verbal communication means. The gesture engine 110 may also be configured to determine the meaning of the one or more queries (MOQ) of the user, pertaining to gesture means. The MOQ is fed to the machine learning unit 116.

15 **[056]** At step 508, the machine learning unit 116 may be configured to identify one or more identified data sources relating to the MOQ.

20 **[057]** At step 510, the machine learning unit 116 may be configured to identify one or more trigger points based on the data sources identified pertaining to the user queries. Each data source may have one or more trigger points that are continuously checked. The trigger points may be time based, user based, activity based, priority based and the like.

[058] At step 512, the machine learning unit 116 may be configured to determine a logical relationship between the one or more identified trigger points, to generate one or more events.

25 **[059]** FIG. 6 illustrates an exemplary method 600 illustrating a flowchart for supplying identified data to the execution unit from the machine learning unit, in accordance with an embodiment. Step 602 may be executed by the data source

identification block 122, step 604 may be executed by the trigger point definition unit 124, and step 606 may be executed by the relationship definition unit 126. Each step is explained in further detail below.

5 **[060]** At step 602, the data source identification block 122 may be configured to supply information relating to selection and identification of the one or more data sources to the data source block 204.

[061] At step 604, the trigger point definition unit 124 may be configured to supply a set of identified trigger points to the trigger point generation unit 206.

10 **[062]** At step 606, the relationship definition unit 126 may be configured to supply possible logical relationship(s) data to the logical sequence block 208.

[063] FIG. 7 illustrates an exemplary method 700 illustrating a flowchart for evaluating one or more trigger points, in accordance with an embodiment. The steps 702 – 714 may be executed by the data sources 204, the trigger point generation unit 206, and the logical sequence block 208 of the execution unit 200 (relating to
15 FIG. 2). Each step is explained in further detail below.

[064] At step 702, contextual data from the one or more data sources may be collected. Data may be collected from various data from internal data sources (of user), that may include but not limited to sensor modules, emails, calendars, social networks, messages, app configurations, activity information (GPS), etc. The
20 external data source may be any piece of data/dataset which is available in internet (structured or unstructured) or 3rd party server, and accessible through one or more networking standards.

[065] At step 704, the trigger point generation unit 206 may be configured to process the incoming data and generate one or more trigger points pertaining to the
25 associated data sources and identified trigger points. The trigger point generation unit 206 may be configured for generating one or more trigger points pertaining to associated data streams.

[066] At step 706, the logical sequence block 208 may be configured to evaluate one or more logical relationships between the trigger points generated. At step 708, the success of the logical evaluation is checked. If the logical evaluation is not successful, then step 706 repeats where the logical relationships may be re-evaluated. If the logical evaluation is successful, then at step 710, one or more events are created. The logical sequence block 208 may be configured to generate events based on the relationships between the trigger points and once relationship evaluation is successful, then it may create an event (R). For example, the logical sequence block 208 may create an event when the logical relationship evaluation $R = (TP1+TP2) \text{ XOR } TP3$ is successful. Further, the logical sequence block 208 may consider $(TP2 \ \& \ TP3)$, if TP1 had occurred in the past, to create a corresponding event.

[067] At step 712, the one or more events may be delivered to the electronic device 120 via the network 118. At step 714, the events are converted into appropriate user notifications by the electronic device 120. The notification of the corresponding event may be delivered to the user in one or more forms, not limited to, audible alarm, synthesized voice, digital display, depending on the capability of the electronic device 120.

[068] It shall be noted that the processes described above are described as sequence of steps; this was done solely for the sake of illustration. Accordingly, it is understood that some steps may be added, some steps may be omitted, the order of the steps may be re-arranged, or some steps may be performed simultaneously.

CONCLUSION

[069] The forgoing disclosure overcomes the drawbacks of the conventional inventory management system. Thus, the present invention as discussed in this document with respect to different embodiments will be advantageous at least for improving receiving constant notifications pertaining to user queries. Furthermore, the system and method are also advantageous as the system is intelligent enough to generate events pertaining to user query(s), generate notifications for the events,

and frequency of notifications automatically. Furthermore, the system and method are also advantageous as the system can receive, collect, organize, and segregate the events. Additional advantages not listed may be understood by a person ordinary skilled in the art in view of the embodiments disclosed above.

5 **[070]** In the foregoing detailed description, numerous specific details, examples, and scenarios are explained in order to facilitate a thorough understanding of the present disclosure. However, the embodiments of the disclosure may be practiced without such specific details. Further, such examples and scenarios are provided for illustration, and are not intended to limit the
10 disclosure in any way. Those of ordinary skill in the art, with the included descriptions, should be able to implement appropriate functionality without undue experimentation. Thus, the scope of the invention should be determined by the appended claims and their legal equivalents rather than by details, examples, and scenarios provided.

15 **[071]** Although embodiments have been described with reference to specific example embodiments, it will be evident that various combinations, modifications, additions, and omissions may be made to these embodiments without departing from the broader spirit and scope of the foregoing disclosure and appended claims. Accordingly, the specification and drawings are to be regarded in an illustrative
20 sense rather than a restrictive sense.

[072] It is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

Claims

WE CLAIM:

1. A system (100) for generating notifications based on one or more queries associated with a user, the system (100) comprising:

a query input module (102) configured to receive one or more queries associated with a user, wherein the user inputs the one or more queries using at least one of a verbal communication means and a gesture means, characterized in that:

a natural processing engine (NLP) (104) configured to determine a meaning of the one or more queries received through the verbal communication means, wherein, natural processing engine (NLP) (104) comprises:

a voice to text converter (106) configured to transcribe spoken words by the user while speaking out the one or more queries, into text; and

a command meaning unit (108) configured to determine the meaning of the one or more queries based on the text determined by the voice to text converter (106), wherein the command meaning unit (108) prioritize the one or more words based on current and ongoing activities of the user and closest meaning pertaining to the query.

a gesture engine (110) configured to determine a meaning of the one or more queries received through the gesture means, and configured to identify gestures in relation to facial expressions, hand, and body movement of the user, wherein the gesture engine (110) comprises:

a pattern recognition engine (112) configured to identify one or more gestures pertaining to an action performed by the user, with respect to the one or more queries, wherein the pattern recognition engine (112) compares the identified gesture with stored gesture context in a database of the gesture engine (110); and

a gesture meaning unit (114) configured to determine the meaning of the one or more queries, based on the gesture identified by the pattern recognition engine (112), wherein once the gestures are matched with the gesture stored in the database, then the gesture meaning unit (114) correlates the database image with commands and pattern recognition engine (112), to determine the command or word matching the database image for determining the meaning of the gesture inputted by the user;

a unit (116) in communication with one or more data sources, wherein the unit (116) receives the meaning of the one or more queries determined from the at least one of the NLP engine (104) and the gesture engine (110), and the unit (116) is capable of identifying

suitable keywords and prioritizing subject keywords for selecting relevant data sources closest to meaning of the query and, wherein the unit (116) comprises:

- a data source identification block (122) configured to receive meaning of one or more queries determined from at least one of the NLP engine (104) and the gesture engine (110), wherein, the data source identification module is capable of identifying one or more data sources which relate to the at least one of the meaning of the query determined based on the user's input, wherein, the data source is differentiated into internal and external data, whereas, internal data pertains to user data and external data pertains to curated information from internet;

- a trigger point definition unit (124) configured to identify one or more trigger points relating to the identified data source and meaning of query received;

- a relationship definition unit (126) configured to determine a logical relationship between the one or more identified trigger points by relating subject query;

wherein the unit (116) is configured to supply identified data sources, trigger points and logical relationships as computed between the trigger points;

an execution unit (200) in communication with the unit (116), receives identified data sources, trigger points and logical relationships, comprises:

- data sources (204) configured to collect data related to one or more queries associated with the user;

- trigger generation unit (206) configured to generate plurality trigger points pertaining to the associated data sources; and

- logical sequence block (208) configured to receive all generated trigger points, wherein the execution unit (200) is configured to:

- process contextual data from the identified data sources (204) in relation to one or more trigger points;

- evaluate the logical relationship between the one or more trigger points considering the identified data sources and logic previously configured by the unit (116);

- create one or more events when the logical relationship evaluation is successful;
 - communicate the one or more events to an electronic device associated with the user; and

- generate one or more notifications pertaining to the one or more events generated.

2. A method for generating notifications based on one or more queries associated with a user, the method comprising:

receiving, by a query input module (102), one or more queries associated with a user, wherein the user inputs the one or more queries using at least one of a verbal communication means and a gesture means, characterized in that,

determining, by a natural processing engine (NLP) (104), a meaning of the one or more queries received through the verbal communication means, wherein, natural processing engine (NLP) (104) comprise, a voice to text converter (106) and a command meaning unit (108), wherein,

transcribing spoken words by the user, by the voice to text converter (106), while speaking out the one or more queries, into text and

determining the meaning of the one or more queries, by the command meaning unit (108), based on the text determined by the voice to text converter (106), wherein the command meaning unit (108) identifies and prioritize the one or more words based on current and ongoing activities of the user, frequent use, repetition, and closest meaning pertaining to the query;

determining, by a gesture engine (110), a meaning of the one or more queries received through gesture means, and identifying, by a gesture engine (110), gestures in relation to facial expressions, hand, and body movement of the user and the gesture engine (110) comprises, a pattern recognition engine (112) and gesture meaning unit (114), wherein,

identifying, by a pattern recognition engine (112), one or more gestures pertaining to an action performed by a user corresponding to one or more queries, wherein the pattern recognition engine (112) compares the identified gesture with stored gesture context in a database of the gesture engine (110); and

determining, by a gesture meaning unit (114), the meaning of the one or more queries in the form of words, based on the gesture identified, wherein once the gestures are matched with the gesture stored in the database, then the gesture meaning unit (114) correlates the database image with commands and pattern recognition engine (112), to determine the command or word matching the database image for determining the meaning of the gesture inputted by the user, wherein one or more words are identified and prioritized based on current and ongoing activities of the user frequent use, repetition, and closest meaning pertaining to the query;

receiving, by a unit (116), the meaning of the one or more queries determined from at least one of the NLP engine (104) and the gesture engine (110), and the unit (116) in communication with one or more data sources, wherein, the unit (116) is capable of identifying suitable keywords and prioritizing subject keywords for selecting relevant data sources closest to meaning of the query and wherein the unit (116) comprises, a data source identification unit (122), trigger point definition unit (124) and relationship definition unit (126), wherein,

receiving, by the data source identification unit (122), the meaning of one more queries determined from at least one of the NLP engine (104) and the gesture engine (110), and identifying one or more data sources which relate to the at least one of the meaning of the query determined based on the user's input, wherein, the data source is differentiated into internal and external data, whereas, internal data pertains to user data and external data pertains to curated information from internet;

identifying, by the trigger point definition unit (124), one or more trigger points relating to the identified data source and meaning of query received;

determining, by the relationship definition unit (126), a logical relationship between the one or more trigger points by relating the subject query;

wherein, supplying identified data sources, trigger points and logical relationships as computed between the trigger points, by the unit (116), to the execution unit (200);

receiving, by the execution unit (200), the identified data sources, trigger points and logical relationships from unit (116), wherein, the execution unit comprise, data sources (204), trigger generation unit (206) and logical sequence block (208), wherein,

collecting data, by the data sources (204), in relation to one or more queries associated with the user;

generating, by the trigger generation unit (206), plurality of trigger points pertaining to the associated data sources; and

receiving, by the logical sequence block, all generated trigger points, wherein, the execution unit (200) is capable of,

processing contextual data from the identified data sources in relation to one or more trigger points;

evaluating the logical relationship between the one or more trigger points considering the identified data sources and logic previously configured by the unit (116) and

creating one or more events when the logical relationship evaluation is successful;

communicating the one or more events to an electronic device associated with the user and

generating one or more notifications pertaining to the one or more events generated.

3. The method as claimed in claim 2, wherein the one or more queries are received through verbal communication means, gesture means, or a combination of verbal communication means and gesture means.

ABSTRACT

A system and method for generating notifications relating to user queries is disclosed. The system comprises a query input module configured to receive one or more queries associated with a user. The system further comprises an NLP engine
5 configured to determine the query meaning pertaining to verbal communication means and a gesture engine configured to determine the query meaning pertaining to gesture means. The system further comprises a machine learning unit and execution unit configured to generate one or more notifications based one events generated pertaining to one or more queries associated with the user.

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[FIG. 1]