METHOD AND SYSTEM FOR IDENTIFICATION OF RESEARCH GAPS THROUGH LITERATURE REVIEW

FIELD OF INVENTION

[0001] Embodiments of the present disclosure relate to research related information technology and more particularly to a method and a system for identification of research gaps through literature review.

BACKGROUND

[0002] Applied research is a research method which is done by reviewing the literature and state of arts and developing practical solutions for the problems or research gaps which are identified while doing the review of the literature. More particularly, the applied research is the research which takes place the context of everyday problems which someone is facing, and the goal of this research is to solve a specific problem. The problem is solved by using the evidence of previous works and thinking about the solution after identifying a research gap in the literatures.

[0003] Research is usually a long process taking several years. The research gap is a problem, which should be addressed. This may be due to lack of sufficient information to support their claim and also literature gap which are the missing or incomplete piece of data in the research literature that is not been explored or ventured so far. It may arise due to failure in understanding the working of particular instruments, new technological advances or studying a new organism that has been recently discovered. In the fast-changing world, such delay in research activities is due to a lack of a systematic method and architecture. Often such delays end up in slow advancements and reduce the competitiveness of industry and universities.

[0004] Hence, there is a need for an improved method and system for identification of research gaps through literature review to address the aforementioned issue(s).

BRIEF DISCRIPTION

[0005] In accordance with an embodiment of the present disclosure, a method for identification of research gaps through literature review is provided. The method includes

selecting one or more dependent variable from a research area, wherein the one or more dependent variable is corresponding to research topic. The method also includes identifying a research scope for one or more selected dependent variable by recording research activity. The method further includes detecting one or more keywords in recorded research activity associated to the research scope, wherein the one or more keywords is corresponding to research gap. The method further includes conducting frequency distribution to identify one or more independent variables by grouping the research gaps having similar nature. The method further includes identifying a group having maximum number of frequencies obtained based on the frequency distribution. The method further includes generating one or more sub-variables by identifying the research scope in each of the one or more independent variable. The method further includes conducting frequency distribution on the one or more sub-variables to identify the research scope in each of the one or more sub-variables. The method further includes selecting at least three recorded activities corresponding to each of the one or more sub-variables. The method further includes evaluating the research scope in the at least three recorded activities to select a top statement based domain knowledge and feedback from subject matter, thereby identifying the research gap in the at least three recorded activities to develop a research question linking to the one or more dependent variable.

[0006] In accordance with another embodiment of the present disclosure, a system for identification of research gaps through literature review is provided. The system includes a memory subsystem configured to collect articles and prior arts, corresponding to a research area, from different sources for the literature review. The system also includes a processing subsystem hosted on a server and configured to execute on a network to control bidirectional communications among a plurality of modules. The plurality of modules includes an input module which is configured to select one or more dependent variable from a research area, wherein the one or more dependent variable is corresponding to research topic. The input module is also configured to identifying a research scope for one or more selected dependent variable by recording research activity. The processing subsystem also includes a control module operatively coupled to the input module. The control module is configured to detect one or more keywords in recorded research activity associated to the research scope, wherein the one or more keywords is corresponding to research gap. The control module is also configured to conduct frequency distribution to identify one or more independent variables by grouping the research gaps having similar nature. The control module is further configured

to identify a group having maximum number of frequencies obtained based on the frequency distribution. The control module is further configured to generate one or more sub-variables by identifying the research scope in each of the one or more independent variable. The control module is further configured to conduct frequency distribution on the one or more sub-variables to identify the research scope in each of the one or more sub-variables. The evaluation module operatively coupled to the control module. The evaluation module is configured to select at least three recorded activities corresponding to each of the one or more sub-variables. The evaluation module is also configured to evaluate the research scope in the at least three recorded activities to select a top statement based domain knowledge and feedback from subject matter, thereby identifying the research gap in the at least three recorded activities to develop a research question linking to the one or more dependent variable.

[0007] To further clarify the advantages and features of the present disclosure, a more particular description of the disclosure will follow by reference to specific embodiments thereof, which are illustrated in the appended figures. It is to be appreciated that these figures depict only typical embodiments of the disclosure and are therefore not to be considered limiting in scope. The disclosure will be described and explained with additional specificity and detail with the appended figures.

BRIEF DESCRIPTION OF THE DRAWINGS

The disclosure will be described and explained with additional specificity and detail with the accompanying figures in which:

[0008] FIG. 1(a) and 1(b) illustrates a flow chart representing steps involved in a method for identification of research gap through literature review in accordance with an embodiment of the present disclosure;

[0009] FIG. 2 is a schematic representation of an exemplary embodiment of the method of FIG. 1(a) and 1(b) in accordance with an embodiment of the present disclosure; and

[00010] FIG. 3 is a block diagram representation of system for identification of research gaps through literature review in accordance with an embodiment of the present disclosure.

[00011] Further, those skilled in the art will appreciate that elements in the figures are illustrated for simplicity and may not have necessarily been drawn to scale. Furthermore, in terms of the construction of the device, one or more components of the device may have been represented in the figures by conventional symbols, and the figures may show only those specific details that are pertinent to understanding the embodiments of the present disclosure so as not to obscure the figures with details that will be readily apparent to those skilled in the art having the benefit of the description herein.

DETAILED DESCRIPTION

[00012] For the purpose of promoting an understanding of the principles of the disclosure, reference will now be made to the embodiment illustrated in the figures and specific language will be used to describe them. It will nevertheless be understood that no limitation of the scope of the disclosure is thereby intended. Such alterations and further modifications in the illustrated system, and such further applications of the principles of the disclosure as would normally occur to those skilled in the art are to be construed as being within the scope of the present disclosure.

[00013] The terms "comprises", "comprising", or any other variations thereof, are intended to cover a non-exclusive inclusion, such that a process or method that comprises a list of steps does not include only those steps but may include other steps not expressly listed or inherent to such a process or method. Similarly, one or more devices or sub-systems or elements or structures or components preceded by "comprises... a" does not, without more constraints, preclude the existence of other devices, sub-systems, elements, structures, components, additional devices, additional sub-systems, additional elements, additional structures or additional components. Appearances of the phrase "in an embodiment", "in another embodiment" and similar language throughout this specification may, but not necessarily do, all refer to the same embodiment.

[00014] Unless otherwise defined, all technical and scientific terms used herein have the same meaning as commonly understood by those skilled in the art to which this disclosure belongs. The system, methods, and examples provided herein are only illustrative and not intended to be limiting.

[00015] In the following specification and the claims, reference will be made to a number of terms, which shall be defined to have the following meanings. The singular forms “a”, “an”, and “the” include plural references unless the context clearly dictates otherwise.

[00016] Embodiments of the present disclosure relate to a system and method for identification of research gaps through literature review. As used herein, a literature review is an overview of the previously published works on a topic. The term may refer to a full scholarly paper or a section of a scholarly work such as a book, or an article. Either way, a literature review is supposed to provide the researcher/author and the audiences with a general image of the existing knowledge on the topic under question. It also provides future research directions. A good literature review may ensure that a proper research question has been asked and a proper theoretical framework and/or research methodology have been chosen. To be precise, a literature review serves to situate the current study within the body of the relevant literature and to provide context for the reader. Similarly, as used herein, the research gap is a topic or area for which missing or insufficient information limits the ability to reach a conclusion for a question. Identifying a research gap is a question or a problem on which enough existing research is not done or it is outdated and needs to be updated. For example: antecedents of the Adoption of Big Data by the Global Chemical Industry The detailed process of identification of research gaps is further described in FIG. 1 onwards.

[00017] FIG. 1(a) and 1(b) illustrates a flow chart representing steps involved in a method (100) for wearable device to calculate human body vitals in accordance with an embodiment of the present disclosure. The method (100) includes selecting one or more dependent variable from a research area, wherein the one or more dependent variable is corresponding to research topic in step 101. As used herein, the research topic is a subject or issue that a researcher is interested in when conducting research. A well-defined research topic is the starting point of every successful research project. Choosing a topic is an ongoing process by which researchers explore, define, and refine their ideas. The method (100) also includes identifying a future research scope for one or more selected dependent variable by recording research activity in step 102. As used herein, the research scope explains the extent to which the research area will be explored in the work and specifies the parameters within the study will be operating. In one embodiment, identifying the research scope for the one or more selected dependent variable may include identifying the research scope through a systematic

literature review process or by conducting interviews with subject matter experts and top executives.

[00018] Furthermore, the method (100) includes detecting one or more keywords in recorded research activity associated to the research scope in step 103. The research scope referred here is a statement that literature or experts consider as an area to explore in the identified dependent variable. The one or more keywords is corresponding to research gap. In one embodiment, the research gap used herein may be limited to 1 or 2 words from the entire research scope. There may be one or several such research gaps in each statement which should be noted separately. It is necessary to formulate questions that will require more research and investigation. This may be done by collecting data or resources from books, journals or databases that will help in identifying the research gaps.

[00019] The method (100) further includes conducting frequency distribution to identify one or more independent variables by grouping the research gaps having similar nature in step 104. In detail, the frequency distribution is a process where the researcher notes down all the identified research gaps. All similar research gaps are combined to form a group. Each group is given a name that represents all the research gaps in that group. The number of research gaps under a group is called frequency corresponding to the group. The frequency distribution includes calculation of frequency function which calculates how often values occur within a range of values, and then returns a vertical array of numbers. In one embodiment, identifying the research gap may include identifying the research gap based on the limitations and future scope of the research identified during the literature review.

[00020] Moreover, the method (100) further includes identifying a group having maximum number of frequencies obtained based on the frequency distribution in step 105. Specifically, all such groups identified along with frequency are listed. In one embodiment, identifying the group having maximum number of frequencies may include assigning a name to each group representing the research gaps in the group. In such an embodiment, identifying the group having maximum number of frequencies comprises arranging the research gaps in a descending or ascending order of frequencies. A group with a maximum number of frequencies is listed first followed by the next. The researcher then uses his domain knowledge or expert opinions to identify the group that is of the highest importance for the research. Depending on the scope of research the researcher may choose one or several

groups to be part of his research. The representative name of the selected group or groups is called the independent variable.

[00021] The method (100) further includes generating one or more sub-variables by identifying the research scope in each of the one or more independent variable in step 106. In some embodiments, identifying the research scope may include collecting the data by framing a well-organized questionnaire in an order of the one or more independent variables and the one or more dependent variables. The researchers follow the procedure of conducting interviews with subject matter expert and top executives to identify the research scope in each independent variable. The research gap generated in this step is called a sub-variable.

[00022] In addition, the method (100) further includes conducting frequency distribution on the one or more sub-variables to identify the research scope in each of the one or more sub-variables in step 107. The method (100) further includes selecting at least three recorded activities corresponding to each of the one or more sub-variables in step 108. The method (100) further includes evaluating the research scope in the at least three recorded activities to select a top statement based domain knowledge and feedback from subject matter, thereby identifying the research gap in the at least three recorded activities to develop a research question linking to the one or more dependent variable in step 109. In one embodiment, evaluating the research scope in the at least three recorded activities may include a first recorded activity corresponding to identification of research gaps in the research scope, the second recorded activity corresponding to identification of research gaps in each of the one or more independent variables and the third recorded activity corresponding to identification of research gaps in each of the one or more sub-variable. More specifically, the research scope in all the recorded activities is evaluated to select the top activity based on domain knowledge and feedback from subject matter experts. The research gap in that activity is used to develop a research question linking to the dependent variable.

[00023] FIG. 2 is a schematic representation of one embodiment (200) of the method of FIG. 1 in accordance with an embodiment of the present disclosure. Considering an example of Antecedents of the Adoption of Big Data by the Global Chemical Industry where the data of chosen topic should be collected with a good sample size. The research should be able to solve a real problem with its empirical results. For making the project efficient, for example, an article for dependent variable are collected which defines the main topic, at least 5 sub-articles should be collected for independent variable which defines the factors affecting the

main topic, and article on sub variables should also be collected which defines the factors influencing the independent variables. A literature should be chosen on the basis of its quality, relevance, and timeliness, wherein the review of literature should be done efficiently for acquiring the root of the subject, to understand the present situation and future possibilities by identifying the research gaps based on the limitation of the literature, and to formulate a new hypothesis for future improvements in the chosen topic. The scope of the study should not be broad so that a depth analysis can be done.

[00024] The research is done on the basis of either secondary data or primary or the combination of both. In the secondary data based research, a framework is presented for identifying the dependent and independent variables, wherein the framework helps in drawing a well-structured questionnaire. In the primary based research, the data is collected by framing a well-organized questionnaire in order of dependent and independent variables. The method includes collecting articles and prior arts from different sources for reviewing the literature, wherein articles are selected for last four year for having an up to date secondary data collection, and wherein only those articles are selected that have a research gap. If the research question is not viable then modifying the research problem which is the best way to move ahead. This may be due to the confusing literature review methodology.

[00025] Furthermore, the method includes conducting frequency distribution to identify top independent variables. A group with a maximum number of frequencies is listed first followed by the next. For example, 50 articles are taken, and research problems are derived from research gaps highlighted in relevant articles as scope of future research. Further, 5 significant gaps identified part of the literature survey is considered as research problems. Subsequently, the frequency distribution is applied on the gaps identified from the articles and those gaps which are occurring more frequently and collected to obtain 5 independent variables.

[00026] Once the various independent variables are identified, research gap is further calculated from the identified independent variables. Again, the frequency distribution is applied on the various independent variables to obtain the sub-variables. e. For example,1 article as a dependent variable is used to calculate 5 independent variable and the 5 independent variables along with the research gap is used to identify 25 sub-variables. .

[00027] As a next step of the process, the researcher selects three recorded statements related to each sub-variable. The first statement is corresponding to 1 identified dependent variable, the second statement from 5 independent variables and the third statement from the each of the set of 25 sub variables related to that specific sub-variable. The research scope in all the statements is evaluated to select the top statement based on domain knowledge and feedback from subject matter experts. The research gap in that statement is used to develop a research question linking to the dependent variable or may be further used to prepare a research thesis as one of the applications. Hereafter, the system is called as “Seetha model of research executed by Ashiff Khan”.

[00028] FIG. 3 is a block diagram representation of a system (300) for identification of research gaps through literature review in accordance with an embodiment of the present disclosure. In one embodiment, the system (300) may be an excel sheet. The system (300) includes a memory subsystem (301) which is configured to collect articles and prior arts, corresponding to a research area, from different sources for the literature review. In one embodiment, the sources may include peer reviewed journal articles, edited academic books, articles in professional journals, statistical data from government websites, website material from professional associations or the like. Furthermore, the system (300) includes a processing subsystem (302) which is hosted on a server (303). In one embodiment, the server (303) may be a local server. In another embodiment, the server (303) may be a cloud server. The processing subsystem (302) is configured to execute on a network to control bidirectional communications among a plurality of modules. The processing subsystem (302) includes an input module (304) which is configured to select one or more dependent variable from a research area, wherein the one or more dependent variable is corresponding to research topic. The input module (304) is also configured to identify a research scope for one or more selected dependent variable by recording research activity.

[00029] The processing subsystem (302) further includes a control module (306) operatively coupled to the input module. The control module (306) is configured to detect one or more keywords in recorded research activity associated to the research scope. The one or more keywords is corresponding to research gap. The control module (306) is also configured to conduct frequency distribution to identify one or more independent variables by grouping the research gaps having similar nature.

[00030] The control module (306) is further configured to identify a group having maximum number of frequencies obtained based on the frequency distribution. The control unit (306) is further configured to generate one or more sub-variables by identifying the research scope in each of the one or more independent variable. The control unit (306) is further configured to conduct frequency distribution on the one or more sub-variables to identify the research scope in each of the one or more sub-variables.

[00031] The processing subsystem (302) further includes an evaluation module (308) operatively coupled to the control module (306). The evaluation module (308) is configured to select at least three recorded activities corresponding to each of the one or more sub-variables. The evaluation module (308) is also configured to evaluate the research scope in the at least three recorded activities to select a top statement based domain knowledge and feedback from subject matter, thereby identifying the research gap in the at least three recorded activities to develop a research question linking to the one or more dependent variable.

[00032] Various embodiments of the present disclosure as described above accelerates the literature review process in research activities which might substantially reduce the time required by greater than 50% and improve the delivery time. The system and method resolve the aforementioned problems by using the evidence of previous works and thinking about the solution after identifying a research gap in the present works.

[00033] The present invention is implementable by a device that may be implemented in programmable hardware devices such as processors, digital signal processors, central processing units, field programmable gate arrays, programmable array logic, programmable logic devices, cloud processing systems, or the like. The devices may also be implemented in software for execution by various types of processors. An identified device may include executable code and may, for instance, comprise one or more physical or logical blocks of computer instructions, which may, for instance, be organized as an object, procedure, function, or other construct. Nevertheless, the executable of an identified device need not be physically located together but may comprise disparate instructions stored in different locations which, when joined logically together, comprise the device and achieve the stated purpose of the device.

[00034] It will be understood by those skilled in the art that the foregoing general description and the following detailed description are exemplary and explanatory of the disclosure and are not intended to be restrictive thereof.

[00035] While specific language has been used to describe the disclosure, any limitations arising on account of the same are not intended. As would be apparent to a person skilled in the art, various working modifications may be made to the method in order to implement the inventive concept as taught herein.

[00036] The figures and the foregoing description give examples of embodiments. Those skilled in the art will appreciate that one or more of the described elements may well be combined into a single functional element. Alternatively, certain elements may be split into multiple functional elements. Elements from one embodiment may be added to another embodiment. For example, the order of processes described herein may be changed and are not limited to the manner described herein. Moreover, the actions of any flow diagram need not be implemented in the order shown; nor do all of the acts need to be necessarily performed. Also, those acts that are not dependent on other acts may be performed in parallel with the other acts. The scope of embodiments is by no means limited by these specific examples.

CLAIMS:

1. A method (100) for identification of research gaps through literature review comprising:

selecting one or more dependent variable from a research area, wherein the one or more dependent variable is corresponding to research topic; (101)

identifying a future research scope for one or more selected dependent variable by recording research activity; (102)

detecting one or more keywords in recorded research activity associated to the research scope, wherein the one or more keywords is corresponding to research gap; (103)

conducting frequency distribution to identify one or more independent variables by grouping the research gaps having similar nature; (104)

identifying a group having maximum number of frequencies obtained based on the frequency distribution; (105)

generating one or more sub-variables by identifying the research scope in each of the one or more independent variable; (106)

conducting frequency distribution on the one or more sub-variables to identify the research scope in each of the one or more sub-variables; (107)

selecting at least three recorded activities corresponding to each of the one or more sub-variables; (108) and

evaluating the research scope in the at least three recorded activities to select a top statement based domain knowledge and feedback from subject matter, thereby identifying the research gap in the at least three recorded activities to develop a research question linking to the one or more dependent variable. (109)

2. The method (100) as claimed in claim 1, wherein identifying the research scope for the one or more selected dependent variable comprises identifying the research scope through a systematic literature review process or by conducting interviews with subject matter experts and top executives.

3. The method (100) as claimed in claim 1, wherein identifying the group having maximum number of frequencies comprises assigning a name to each group representing the research gaps in the group.

4. The method (100) as claimed in claim 1, wherein identifying the group having maximum number of frequencies comprises arranging the research gaps in a descending or ascending order of frequencies.

5. The method (100) as claimed in claim 1, wherein evaluating the research scope in the at least three recorded activities comprises a first recorded activity corresponding to identification of research gaps in the research scope, the second recorded activity corresponding to identification of research gaps in each of the one or more independent variables and the third recorded activity corresponding to identification of research gaps in each of the one or more sub-variable.

6. The method (100) as claimed in claim 1, wherein identifying the research gap comprises identifying the research gap based on the limitations and future scope of the research identified during the literature review.

7. The method (100) as claimed in claim 1, wherein identifying the research scope comprises collecting the data by framing a well organized questionnaire in an order of the one or more independent variables and the one or more dependent variables.

8. A system (300) for identification of research gaps through literature review comprising:

a memory subsystem (301) configured to collect articles and prior arts, corresponding to a research area, from different sources for the literature review;

a processing subsystem (302) hosted on a server (303) and configured to execute on a network to control bidirectional communications among a plurality of modules comprising:

an input module (304) configured to:

select one or more dependent variable from a research area, wherein the one or more dependent variable is corresponding to research topic;

identify a future research scope for one or more selected dependent variable by recording research activity;

a control module (306) operatively coupled to the input module (304), wherein the control module (306) is configured to:

detect one or more keywords in recorded research activity associated to the research scope, wherein the one or more keywords is corresponding to research gap;

conduct frequency distribution to identify one or more independent variables by grouping the research gaps having similar nature

identify a group having maximum number of frequencies obtained based on the frequency distribution;

generate one or more sub-variables by identifying the research scope in each of the one or more independent variable;

conduct frequency distribution on the one or more sub-variables to identify the research scope in each of the one or more sub-variables;

an evaluation module (308) operatively coupled to the control module (306), wherein the evaluation module is configured to:

select at least three recorded activities corresponding to each of the one or more sub-variables; and

evaluate the research scope in the at least three recorded activities to select a top statement based domain knowledge and feedback from subject matter, thereby identifying the research gap in the at least three recorded activities to develop a research question linking to the one or more dependent variable.