

**METHOD, SYSTEM, AND NON-TRANSITORY COMPUTER-READABLE RECORDING
MEDIUM FOR SUPPORTING WRITING ASSESSMENT**

FIELD OF THE INVENTION

The present invention relates to a method, system, and non-transitory computer-readable recording medium for supporting writing assessment.

BACKGROUND

In general, writing (or composing) is done to fulfill a variety of goals. For example, writing a cover letter is done to fulfill a goal such as employment or college admission, and writing a thesis is done to fulfill a goal such as earning a degree or academic achievement.

It is common to assess the writing in the process of fulfilling such goals, and since the writing has traditionally been assessed by a specific individual (e.g., a professor or teacher), the possibility of the assessor's subjectivity being involved in the assessment results cannot be excluded.

That is, there has been no technique for quantitative assessment of writing, and thus writing has inevitably been assessed in manners that are neither objective nor accurate.

SUMMARY OF THE INVENTION

One object of the present invention is to solve all the above-described problems in the prior art.

Another object of the invention is to quantitatively assess writing on the basis of predetermined criteria and provide the results of the assessment in quantified metrics, so that the assessment of writing may be objective and accurate.

The representative configurations of the invention to achieve the above objects are described below.

According to one aspect of the invention, there is provided a method for supporting writing assessment, the method comprising the steps of: extracting assessment target elements for writing assessment from a document associated with a user; and determining writing assessment information for the document with reference to a score determined according to an assessment criterion specified for each of the assessment target elements, wherein the assessment criterion specified for at least one of the assessment target elements is determined with reference to a type of the document.

According to another aspect of the invention, there is provided a system for supporting writing assessment, the system comprising: an assessment target element extraction unit configured to extract assessment target elements for writing assessment from a document associated with a user; and a writing assessment information determination unit configured to determine writing assessment information for the document with reference to a score determined according to an assessment criterion specified for each of the assessment target elements, wherein the assessment criterion specified for at least one of the assessment target elements is determined with reference to a type of the document.

In addition, there are further provided other methods and

systems to implement the invention, as well as non-transitory computer-readable recording media having stored thereon computer programs for executing the methods.

According to the invention, it is possible to quantitatively assess writing on the basis of predetermined criteria and provide the results of the assessment in quantified metrics, so that the assessment of writing may be objective and accurate.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 schematically shows the configuration of an entire system for supporting writing assessment according to one embodiment of the invention.

FIG. 2 specifically shows the internal configuration of a writing assessment support system according to one embodiment of the invention.

FIG. 3 illustratively shows a user interface screen provided by the writing assessment support system according to one embodiment of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In the following detailed description of the present invention, references are made to the accompanying drawings that show, by way of illustration, specific embodiments in which the invention may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the invention. It is to be understood that the various

embodiments of the invention, although different from each other, are not necessarily mutually exclusive. For example, specific shapes, structures and characteristics described herein may be implemented as modified from one embodiment to another without departing from the spirit and scope of the invention. Furthermore, it shall be understood that the positions or arrangements of individual elements within each embodiment may also be modified without departing from the spirit and scope of the invention. Therefore, the following detailed description is not to be taken in a limiting sense, and the scope of the invention is to be taken as encompassing the scope of the appended claims and all equivalents thereof. In the drawings, like reference numerals refer to the same or similar elements throughout the several views.

Hereinafter, various preferred embodiments of the invention will be described in detail with reference to the accompanying drawings to enable those skilled in the art to easily implement the invention.

Configuration of the entire system

FIG. 1 schematically shows the configuration of the entire system for supporting writing assessment according to one embodiment of the invention.

As shown in FIG. 1, the entire system according to one embodiment of the invention may comprise a communication network 100, a writing assessment support system 200, and a device 300.

First, the communication network 100 according to one embodiment of the invention may be implemented regardless of communication modality such as wired and wireless communications, and may be constructed from a variety of communication networks

such as local area networks (LANs), metropolitan area networks (MANs), and wide area networks (WANs). Preferably, the communication network 100 described herein may be the Internet or the World Wide Web (WWW). However, the communication network 100 is not necessarily limited thereto, and may at least partially include known wired/wireless data communication networks, known telephone networks, or known wired/wireless television communication networks.

Next, the writing assessment support system 200 according to one embodiment of the invention may communicate with the device 300 to be described below via the communication network 100, and may function to extract assessment target elements for writing assessment from a document associated with a user, and determine writing assessment information for the document with reference to a score determined according to an assessment criterion specified for each of the assessment target elements. Meanwhile, the writing assessment support system 200 may be digital equipment having a memory means and a microprocessor for computing capabilities, and may be, for example, a server system operating on the communication network 100.

The configuration and functions of the writing assessment support system 200 according to one embodiment of the invention will be discussed in detail below.

Next, the device 300 according to one embodiment of the invention is digital equipment capable of connecting to and then communicating with the writing assessment support system 200, and any type of digital equipment having a memory means and a microprocessor for computing capabilities, such as a smart phone, a tablet, a smart watch, a smart band, smart glasses, a desktop

computer, a notebook computer, a workstation, a personal digital assistant (PDAs), a web pad, and a mobile phone, may be adopted as the device 300 according to the invention.

Further, according to one embodiment of the invention, the device 300 may further include an application program for performing the functions according to the invention. The application may reside in the device 300 in the form of a program module. The characteristics of the program module may be generally similar to those of an assessment target element extraction unit 210, a writing assessment information determination unit 220, a communication unit 230, and a control unit 240 of the writing assessment support system 200 to be described below. Here, at least a part of the application may be replaced with a hardware device or a firmware device that may perform a substantially equal or equivalent function, as necessary.

Configuration of the writing assessment support system

Hereinafter, the internal configuration of the writing assessment support system 200 crucial for implementing the invention and the functions of the respective components thereof will be discussed.

FIG. 2 specifically shows the internal configuration of the writing assessment support system 200 according to one embodiment of the invention.

As shown in FIG. 2, the writing assessment support system 200 according to one embodiment of the invention may comprise an assessment target element extraction unit 210, a writing assessment information determination unit 220, a communication unit 230, and a control unit 240. According to one embodiment of

the invention, at least some of the assessment target element extraction unit 210, the writing assessment information determination unit 220, the communication unit 230, and the control unit 240 of the writing assessment support system 200 may be program modules to communicate with an external system (not shown). The program modules may be included in the writing assessment support system 200 in the form of operating systems, application program modules, or other program modules, while they may be physically stored in a variety of commonly known storage devices. Further, the program modules may also be stored in a remote storage device that may communicate with the writing assessment support system 200. Meanwhile, such program modules may include, but are not limited to, routines, subroutines, programs, objects, components, data structures, and the like for performing specific tasks or executing specific abstract data types as will be described below in accordance with the invention.

Meanwhile, the above description is illustrative although the writing assessment support system 200 has been described as above, and it will be apparent to those skilled in the art that at least a part of the components or functions of the writing assessment support system 200 may be implemented in the device 300 or a server (not shown) or included in an external system (not shown), as necessary.

First, the assessment target element extraction unit 210 according to one embodiment of the invention may function to extract assessment target elements for writing assessment from a document associated with a user.

According to one embodiment of the invention, the

assessment target element extraction unit 210 may acquire a document associated with a user from the user. For example, the user may input (or upload) a document (e.g., a cover letter, a thesis, or a report) that the user has written to the assessment target element extraction unit 210 (or to a server or platform that supports the functionality of the assessment target element extraction unit 210), and the assessment target element extraction unit 210 may acquire the inputted document as the document associated with the user.

Next, according to one embodiment of the invention, the assessment target element extraction unit 210 may perform preprocessing on the document associated with the user and acquired as above. For example, the assessment target element extraction unit 210 according to one embodiment of the invention may remove portions of the document associated with the user that are excluded from writing assessment (e.g., spaces and special symbols). As another example, the assessment target element extraction unit 210 according to one embodiment of the invention may use a morphological analyzer (e.g., Komoran or Kkma) to segment the text in the document associated with the user by morphemes.

Next, according to one embodiment of the invention, the assessment target element extraction unit 210 may extract assessment target elements for writing assessment from the document associated with the user and acquired as above (or from the preprocessed document). Here, the assessment target elements according to one embodiment of the invention may include at least one of a word (hereinafter, "first assessment target element"), a sentence (hereinafter, "second assessment target

element"), and a paragraph (hereinafter, "third assessment target element").

Next, the writing assessment information determination unit 220 according to one embodiment of the invention may function to determine writing assessment information for the document associated with the user with reference to a score (or an assessment score) determined according to an assessment criterion specified for each of the assessment target elements.

According to one embodiment of the invention, the writing assessment information determination unit 220 may assign (or determine) a score for each of the assessment target elements on the basis of the assessment criterion specified for each of the assessment target elements, and may calculate (e.g., sum or arithmetically average) the determined scores (wherein each score may be weighted on the basis of a predetermined ratio that may be determined according to a type of the document) to produce (or determine) an assessment score for the document associated with the user. Here, according to one embodiment of the invention, the writing assessment information determination unit 220 may determine writing assessment information for the document associated with the user with reference to the assessment score produced as above. According to one embodiment of the invention, the writing assessment information may include the assessment score itself, and may also include the score for each of the assessment target elements used to determine the assessment score. Further, according to one embodiment of the invention, the writing assessment information may include feedback information determined on the basis of the assessment score. For example, the feedback information according to one

embodiment of the invention may include recommendation information of a content (e.g., an essay writing class or online mentoring) determined on the basis of the assessment score. However, it is noted that the writing assessment information according to one embodiment of the invention is not necessarily limited to those listed above, and may be diversely changed as long as the objects of the invention may be achieved.

It will be discussed in detail below how to determinate the score for each of the assessment target elements on the basis of the assessment criterion specified for each of the assessment target elements. Further, according to one embodiment of the invention, the assessment criterion specified for at least one of the assessment target elements may be determined with reference to a type of the document associated with the user, which will also be discussed below.

According to one embodiment of the invention, the writing assessment information determination unit 220 may determine a score for the first assessment target element with reference to attributes of words contained in the document to be assessed (i.e., the document associated with the user). According to one embodiment of the invention, the attributes of the words may include vocabulary (or originality) and diversity of the words.

For example, the writing assessment information determination unit 220 according to one embodiment of the invention may determine the score for the first assessment target element by summing a score for the vocabulary of the words contained in the assessed document and a score for the diversity of the words contained in the assessed document. More specifically, the writing assessment information determination

unit 220 according to one embodiment of the invention may determine the score for the vocabulary of the words with reference to the number of words extracted from the assessed document, excluding words for language learning (e.g., words corresponding to the 5,965 words on the vocabulary list for Korean language learning published in May 2003 by the National Institute of Korean Language). Further, the writing assessment information determination unit 220 according to one embodiment of the invention may determine the score for the diversity of the words with reference to the number of words that are not repeatedly used (i.e., words that are not used more than once) in the assessed document. Here, the writing assessment information determination unit 220 according to one embodiment of the invention may determine the score for the diversity of the words by using a ratio of the number of words extracted from the assessed document, excluding words repeatedly used in the assessed document, to the total number of words extracted from the assessed document (wherein the ratio is produced by the relationship: (the total number of words extracted from the assessed document - the number of words repeatedly used in the assessed document) / the total number of words extracted from the assessed document.)

According to one embodiment of the invention, the writing assessment information determination unit 220 may also determine the score for the first assessment target element (more specifically, the score for the vocabulary of the words) with reference to a result of comparing the words contained in the assessed document and words contained in a word cluster corresponding to the type of the assessed document. Specifically,

the writing assessment information determination unit 220 according to one embodiment of the invention may generate at least one word cluster by clustering (or classifying) words contained in a pre-built word database on the basis of a level of each word (wherein the words contained in the word database may exclude the aforementioned words for language learning). Here, according to one embodiment of the invention, the level of any word may be determined with reference to a frequency with which the word is used in a document used by a particular group (e.g., a high school sophomore textbook if the particular group is a group of high school sophomores). Then, the writing assessment information determination unit 220 according to one embodiment of the invention may determine which of the at least one word cluster corresponds to the type of the assessed document (or a word level required according to the type of the assessed document). For example, assuming that the type of the assessed document is a thesis, a cluster containing graduate level words may be determined as the word cluster corresponding to the type of the assessed document. As another example, assuming that the type of the assessed document is a newspaper article, a cluster containing middle school second grade level words may be determined as the word cluster corresponding to the type of the assessed document. Then, the writing assessment information determination unit 220 according to one embodiment of the invention may determine the score for the vocabulary of the words with reference to the number of words contained in the determined word cluster among the words contained in the assessed document.

Meanwhile, according to one embodiment of the invention,

each of the scores (e.g., the score for vocabulary of the words and the score for the diversity of the words) used to determine the score for the first assessment target element may be weighted on the basis of a predetermined ratio (which may be preset or may be dynamically changed according to the purposes of writing assessment), and the weighted scores may be summed to determine the score for the first assessment target element. For example, when the score for the vocabulary of the words is determined as 80 points and the score for the diversity of the words is determined as 60 points, each of the scores may be weighted by $1/2$ on the basis of a preset ratio of 50:50, and the weighted scores (i.e., the score of 40 points for the vocabulary of the words and the score of 30 points for the diversity of the words) may be summed to determine the score for the first assessment target element as 70 points.

According to one embodiment of the invention, the writing assessment information determination unit 220 may determine a score for the second assessment target element with reference to attributes of sentences contained in the document to be assessed (i.e., the document associated with the user). According to one embodiment of the invention, the attributes of the sentences may include readability of the sentences.

For example, the writing assessment information determination unit 220 according to one embodiment of the invention may determine the score for the second assessment target element on the basis of a score for the readability of the sentences contained in the assessed document. Here, according to one embodiment of the invention, the score for the readability of the sentences may be determined by summing a

score for an average length of the sentences contained in the assessed document and a score for structure of the sentences contained in the assessed document. More specifically, the writing assessment information determination unit 220 according to one embodiment of the invention may determine the score for the average length of the sentences with reference to an average value of the number of word segments of each of the sentences extracted from the assessed document. Further, the writing assessment information determination unit 220 according to one embodiment of the invention may determine the score for the structure of the sentences with reference to a percentage of complex sentences among the sentences extracted from the assessed document. Here, according to one embodiment of the invention, whether a sentence extracted from the assessed document is a complex sentence may be determined using at least one ending contained in the sentence (e.g., a connective ending, a pre-final ending, or a final ending).

Meanwhile, according to one embodiment of the invention, the writing assessment information determination unit 220 may determine the score for the second assessment target element (more specifically, the score for the structure of the sentences) with reference to the type of the assessed document. Specifically, the writing assessment information determination unit 220 according to one embodiment of the invention may determine the score for the structure of the sentences with reference to an extent to which a percentage of complex sentences among the sentences extracted from the assessed document exceeds an allowable percentage of complex sentences preset on the basis of the type of the assessed document. For

example, the allowable percentage of complex sentences may be set to 30% if the type of the assessed document is a thesis, and may be set to 15% if the type of the assessed document is a cover letter.

Meanwhile, according to one embodiment of the invention, each of the scores (e.g., the score for the average length of the sentences and the score for the structure of the sentences) used to determine the score for the second assessment target element may be weighted on the basis of a predetermined ratio (which may be preset or may be dynamically changed according to the purposes of writing assessment), and the weighted scores may be summed to determine the score for the second assessment target element. For example, when the score for the average length of the sentences is determined as 90 points and the score for the structure of the sentences is determined as 70 points, the scores may be weighted by $2/5$ and $3/5$, respectively, on the basis of a preset ratio of 40:60, and the weighted scores (i.e., the score of 36 points for the average length of the sentences and the score of 42 points for the structure of the sentences) may be summed to determine the score for the second assessment target element as 78 points.

According to one embodiment of the invention, the writing assessment information determination unit 220 may determine a score for the third assessment target element with reference to attributes of paragraphs contained in the document to be assessed (i.e., the document associated with the user). According to one embodiment of the invention, the attributes of the paragraphs may include information on association (e.g., an extent of association) between a plurality of paragraphs

contained in the assessed document.

For example, the writing assessment information determination unit 220 according to one embodiment of the invention may determine the score for the third assessment target element on the basis of a score for the association between the plurality of paragraphs contained in the assessed document. More specifically, the writing assessment information determination unit 220 according to one embodiment of the invention may extract at least one keyword from each of a first paragraph and a second paragraph of the assessed document, and determine the score for the association between the plurality of paragraphs with reference to a level of similarity between the at least one keyword extracted from the first paragraph of the assessed document and the at least one keyword extracted from the second paragraph of the assessed document. Here, the first paragraph of the assessed document may be a paragraph that is determined with reference to the type of the assessed document (i.e., a paragraph that describes the core content of the assessed document according to the type of the assessed document), and the second paragraph of the assessed document may be a single paragraph or a plurality of paragraphs different from the first paragraph of the assessed document. For example, assuming that the type of assessed document is a thesis, the first paragraph of the assessed document may be a paragraph contained in an abstract (or a conclusion) that describes the core content of the assessed document, and the second paragraph of the assessed document may be a paragraph contained in a body of the assessed document.

Here, according to one embodiment of the invention, the at

least one keyword extracted from the first paragraph and the at least one keyword extracted from the second paragraph may be extracted using a natural language processing technique (e.g., TF-IDF). Further, according to one embodiment of the invention, the at least one keyword extracted from the first paragraph and the at least one keyword extracted from the second paragraph may be embedded and converted into vector values (e.g., the keywords may be embedded from a Sentence-BERT model). That is, according to one embodiment of the invention, the score for the association between the plurality of paragraphs may be determined with reference to a level of similarity (e.g., cosine similarity) between the vector value converted from the at least one keyword extracted from the first paragraph and the vector value converted from the at least one keyword extracted from the second paragraph.

Meanwhile, according to one embodiment of the invention, the writing assessment information determination unit 220 may determine the score for the association between the plurality of paragraphs with further reference to in-paragraph locations of the at least one keyword extracted from the first paragraph and the at least one keyword extracted from the second paragraph. Specifically, according to one embodiment of the invention, when the paragraph from which the keyword is to be extracted (i.e., the first paragraph or the second paragraph) consists of a plurality of sentences, the writing assessment information determination unit 220 may determine, from among the plurality of sentences, a point sentence from which the keyword is to be extracted. According to one embodiment of the invention, the point sentence may be determined with reference to the type of

the assessed document. For example, when the assessed document is of a type that is written such that its topic comes first (e.g., a document written in English) and the paragraph from which the keyword is to be extracted consists of a plurality of sentences, the writing assessment information determination unit 220 may determine a point sentence from among the sentences located at the early part of the paragraph from which the keyword is to be extracted (i.e., a sentence located at the beginning of the paragraph from which the keyword is to be extracted and a predetermined number of sentences sequentially located after the sentence), and extract at least one keyword from the determined point sentence. As another example, when the assessed document is of a type that is written such that its topic comes last (e.g., a document written in Korean) and the paragraph from which the keyword is to be extracted consists of a plurality of sentences, the writing assessment information determination unit 220 may determine a point sentence from among the sentences located at the latter part of the paragraph from which the keyword is to be extracted (i.e., a sentence located at the end of the paragraph from which the keyword is to be extracted and a predetermined number of sentences sequentially located before the sentence), and extract at least one keyword from the determined point sentence. That is, according to one embodiment of the invention, the score for the association between the plurality of paragraphs may be determined with reference to a level of similarity between the at least one keyword extracted from the point sentence of the first paragraph (or a vector value converted from the at least one keyword) and the at least one keyword extracted from the point sentence of

the second paragraph (or a vector value converted from the at least one keyword).

Next, the communication unit 230 according to one embodiment of the invention may function to enable data transmission/reception from/to the assessment target element extraction unit 210 and the writing assessment information determination unit 220.

Lastly, the control unit 240 according to one embodiment of the invention may function to control data flow among of the assessment target element extraction unit 210, the writing assessment information determination unit 220, and the communication unit 230. That is, the control unit 240 according to the invention may control data flow into/out of the writing assessment support system 200 or data flow among the respective components of the writing assessment support system 200, such that the assessment target element extraction unit 210, the writing assessment information determination unit 220, and the communication unit 230 may carry out their particular functions, respectively.

FIG. 3 illustratively shows a user interface screen provided by the writing assessment support system 200 according to one embodiment of the invention.

Referring to FIG. 3, the writing assessment support system 200 according to one embodiment of the invention may provide a user with the writing assessment information determined as above via the user interface screen.

According to one embodiment of the invention, a first screen 310 of the user interface screen may display an assessment score for a document associated with the user.

According to one embodiment of the invention, the assessment score may be set to a score out of 100, but is not necessarily limited thereto.

Further, according to one embodiment of the invention, a second screen 320 of the user interface screen may display a trend of the assessment score over time. For example, the trend of the assessment score may be displayed on a monthly basis.

Further, according to one embodiment of the invention, a third screen 330 of the user interface screen may display scores used to determine the assessment score. For example, the third screen 330 may display a score for each assessment target element.

Further, according to one embodiment of the invention, a fourth screen 340 of the user interface screen may display other information on the document associated with the user. For example, the fourth screen 340 may display an average time taken to write the document (i.e., the document associated with the user).

Further, according to one embodiment of the invention, a fifth screen 350 of the user interface screen may display recommendation information of a content determined on the basis of the assessment score. For example, the fifth screen 350 may display recommendation information of an essay writing class or online mentoring determined on the basis of the assessment score.

The embodiments according to the invention as described above may be implemented in the form of program instructions that can be executed by various computer components, and may be stored on a computer-readable recording medium. The computer-readable recording medium may include program instructions, data

files, and data structures, separately or in combination. The program instructions stored on the computer-readable recording medium may be specially designed and configured for the present invention, or may also be known and available to those skilled in the computer software field. Examples of the computer-readable recording medium include the following: magnetic media such as hard disks, floppy disks and magnetic tapes; optical media such as compact disk-read only memory (CD-ROM) and digital versatile disks (DVDs); magneto-optical media such as floptical disks; and hardware devices such as read-only memory (ROM), random access memory (RAM) and flash memory, which are specially configured to store and execute program instructions. Examples of the program instructions include not only machine language codes created by a compiler, but also high-level language codes that can be executed by a computer using an interpreter. The above hardware devices may be changed to one or more software modules to perform the processes of the present invention, and vice versa.

Although the present invention has been described above in terms of specific items such as detailed elements as well as the limited embodiments and the drawings, they are only provided to help more general understanding of the invention, and the present invention is not limited to the above embodiments. It will be appreciated by those skilled in the art to which the present invention pertains that various modifications and changes may be made from the above description.

Therefore, the spirit of the present invention shall not be limited to the above-described embodiments, and the entire scope of the appended claims and their equivalents will fall within

the scope and spirit of the invention.

WHAT IS CLAIMED IS:

1. A method for supporting writing assessment, the method comprising the steps of:

extracting assessment target elements for writing assessment from a document associated with a user; and

determining writing assessment information for the document with reference to a score determined according to an assessment criterion specified for each of the assessment target elements,

wherein the assessment criterion specified for at least one of the assessment target elements is determined with reference to a type of the document.

2. The method of Claim 1, wherein the assessment target elements include a first assessment target element, and a score for the first assessment target element is determined with reference to a result of comparing words contained in the document and words contained in a word cluster corresponding to the type of the document.

3. The method of Claim 1, wherein the assessment target elements include a second assessment target element, and a score for the second assessment target element is determined with reference to attributes of sentences contained in the document.

4. The method of Claim 1, wherein the assessment target elements include a third assessment target element, and a score for the third assessment target element is determined with reference to information on association between a plurality of

paragraphs contained in the document.

5. The method of Claim 4, wherein the information on the association is determined with reference to a level of similarity between at least one keyword extracted from a first paragraph of the document and at least one keyword extracted from a second paragraph of the document.

6. The method of Claim 5, wherein the information on the association is determined with further reference to in-paragraph locations of the at least one keyword extracted from the first paragraph and the at least one keyword extracted from the second paragraph.

7. A non-transitory computer-readable recording medium having stored thereon a computer program for executing the method of Claim 1.

8. A system for supporting writing assessment, the system comprising:

an assessment target element extraction unit configured to extract assessment target elements for writing assessment from a document associated with a user; and

a writing assessment information determination unit configured to determine writing assessment information for the document with reference to a score determined according to an assessment criterion specified for each of the assessment target elements,

wherein the assessment criterion specified for at least one

of the assessment target elements is determined with reference to a type of the document.

9. The system of Claim 8, wherein the assessment target elements include a first assessment target element, and a score for the first assessment target element is determined with reference to a result of comparing words contained in the document and words contained in a word cluster corresponding to the type of the document.

10. The system of Claim 8, wherein the assessment target elements include a second assessment target element, and a score for the second assessment target element is determined with reference to attributes of sentences contained in the document.

11. The system of Claim 8, wherein the assessment target elements include a third assessment target element, and a score for the third assessment target element is determined with reference to information on association between a plurality of paragraphs contained in the document.

12. The system of Claim 11, wherein the information on the association is determined with reference to a level of similarity between at least one keyword extracted from a first paragraph of the document and at least one keyword extracted from a second paragraph of the document.

13. The system of Claim 12, wherein the information on the association is determined with further reference to in-paragraph

locations of the at least one keyword extracted from the first paragraph and the at least one keyword extracted from the second paragraph.