

A Method And An Apparatus For Editing An Image

Field

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The present invention relates to a method and an apparatus for editing an image, for example, in the field of electronic learning (elearning), in particular, to enable an educator to edit an image of a document worked on by a learner.

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Background

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In the field of electronic learning (elearning), there are existing essay marking software enabling an educator or teacher to mark on an essay worked on by a learner or a student. In such software, the learner uploads the text document to data storage and the educator is able to access the text document remotely to mark the essay by editing the text document.

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However, the editing of the text document that could be performed by the educator is limited by features of a text editing software used for editing the text document. Sometimes, the educators are limited to certain actions such as highlighting selection of text and addition of annotations into the text document. As such, the marking experience to the educators is affected.

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Summary

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In accordance with an aspect of an example in the present disclosure, there is provided an apparatus for editing an image, the apparatus comprising: a storage for storing a captured image; a processing unit for executing instructions for retrieving the captured image stored in the storage, editing the retrieved image, storing the edited image, and accessing the edited image stored.

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In accordance with an aspect of an example in the present disclosure, there is provided a method for editing an image, the method comprising: retrieving a captured image stored in a storage; editing the retrieved image; storing the edited image; and accessing the edited image stored.

Brief Description of the Drawings

Examples of the present disclosure will be better understood and readily apparent to one skilled
 5 in the art from the following written description, by way of example only and in conjunction with
 the drawings, in which:

Figure 1 is a diagram illustrating elements in an example of an apparatus of the present
 disclosure.

10 Figure 2 is a flowchart illustrating a method according to an example of the present
 disclosure.

Figure 3 is a screen shot of a webpage of a website according to an example of the present
 disclosure.

Figure 4 is a screen shot based on an iphone operating system according to an example of
 15 the present disclosure.

Figure 5 is a screen shot based on a Windows operating system according to an example of
 the present disclosure.

Figure 6 is a screen shot illustrating marking of an answer according to an example of the
 present disclosure.

20 Figure 7 is a screen shot illustrating a Scroll mode according to an example of the present
 disclosure.

Figure 8 is a screen shot illustrating a Draw mode according to an example of the present
 disclosure.

Figure 9 is a screen shot illustrating an indicator according to an example of the present
 25 disclosure.

Figure 10 is a screen shot showing an image edited according to an example of the present
 disclosure.

Figure 11 is a diagram illustrating a server, a mobile device and a workstation according to
 an example of the present disclosure.

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Detailed Description

Current electronic learning (elearning) platforms do not allow an educator, which can be a
 35 teacher, a guardian (e.g. parent) of a learner or a student, and the like to view manual
 workings which a learner or student write in an academic assignment to arrive at, for
 instance, their answers to questions in the assignment. The educator can only view the

physical form i.e. the writings or markings of the manual workings made by the learner on typically a paper copy of the assignment.

Figure 1 illustrates elements in an example of an apparatus 100 of the present disclosure.

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The apparatus 100 allows a user to capture and attach images of their written assignment answers (i.e. answers together with workings, or text based answers e.g. essay answers) or workings leading to the answers using a camera function, or attach a captured image, for example, a screen snapshot, of the answers or workings via their desktop computer (Workstation 108), or mobile device 102, including a laptop, tablet personal computer, smart phone and the like. The captured and attached images are stored in a storage, cloud storage or database 106 configured to access a network 110 or be accessed via the network 110. The storage 106 may be a single database or a plurality of databases and may physically be a hard disk drive, flash memory, or a plurality of hard disk drives and/or flash memories, and the like. An educator is able to view the attached images of the answers or workings and is able to edit, make markings and/or doodle on the attached images, for instance, circling out mistakes in the answers or workings.

The network 110 can be the Internet, Intranet, a Local Area Network (LAN), a wireless network (e.g. WIFI network), and the like. The apparatus 100 also includes a workstation 108, which may be a desktop computer. The apparatus 100 further includes a mobile device 102, which may be a laptop, tablet Personal computer, smart phone and the like.

Advantageously, through the apparatus 100, educators can remotely understand in detail how learners work out or derive the answers in their workings. The Educators can then provide feedback through doodles on the attached images to help the learners who attached them to review on their mistakes in the workings.

The apparatus 100 includes a server 104 (also known as a back end server), which may be a computer (or a computing unit), or a plurality of the same, configured to access the network 110 or be accessed via the network 110. In more detail, the storage 106 can store data, including captured images, user account information of a particular website run by the server 104, user settings for the website, and any other data required for a website and by a website. The location of the storage 106 can be anywhere remote, connected or connectable to the server 104 for data communication. The server 104 runs any applications involving use of technology such as HTML5, Javascript and PHP scripts, and the like to operate the website.

The user account information may include account information of one or more learners and one or more educators, which are users of the website. Each account contains user specific information, for instance, access to images or data stored by the user in a storage space of the storage 106 that is allocated for the user. User settings may include any type of setting available for adjustment by a user on the website and preferred by the user. Examples of user setting may include amongst other things, appearance of the website, privacy and network security settings, manner of data presentation for purposes of editing an image, uploading an image, storing an image in the storage 106, and the like.

The particular website enables a learner to attach or upload selected a captured image for storing in the storage 106. The learner can capture, attach and select the image using hardware and software applications of the mobile device 102 and/or the workstation 108 used to access the website. The particular website also enables an educator to access and view the captured image of the learner, which is stored in the storage 106, enables the educator to edit the captured image and then store the captured image separately or replace the original captured image stored in the storage 106. The educator can access the captured image, edit the captured image and store the edited image using hardware and software applications of the mobile device 102 and/or a workstation 108 used to access the website.

The server 104 enables remote network access to the website run by the server 104 via the workstation 108 and the mobile device 102. The server also communicates with the workstation 108 and the mobile device 102 so as to allow a learner to attach or upload a selected captured image for storing in the storage 106, to allow an educator to access the captured image of the learner stored in the storage 106, to allow the educator to edit the captured image and then store the captured image separately or replace the original captured image stored in the storage 106.

The website run by the server 104 is accessible via the network 110 by the work station 108 and/or the mobile device 102 concurrently or separately using one or more browser applications. The browser may be, for example, Chrome, Internet Explorer, Firefox, Safari, and the like. However, a captured image of a learner can only be accessible after it is uploaded into the storage 106.

In the present example, code links, which are essentially network address locations for accessing a particular image, of images uploaded by a learner to the backend server 104 are also stored in the storage 106. This allows the uploaded images to be accessible by an

educator through the website. Images edited (e.g. via doodling) by an educator are also stored in the storage 106.

Hence, an apparatus 100 for editing an image is provided, the apparatus 100 comprising: a storage 106 for storing a captured image; and a processing unit i.e. the server 104 for executing instructions for retrieving the captured image stored in the storage 106, editing the retrieved image, storing the edited image, and accessing the edited image stored.

An example of the backend logic flow or method of the earlier described example of the present disclosure is as follows. Reference is made to the elements in Figure 1.

A learner uploads his or her answer or working leading to an answer of a question that is written in a paper or electronic assignment set by an educator in the following manner.

1) The learner takes a photograph of the answer or working for the question using a camera function of a camera-enabled smart phone 102. Alternatively, the learner takes a screen shot (to capture an image) of the answer or working written electronically and which is displayable on a screen of the smart phone 102 using a screen shot function of the smart phone 102.

2) The learner accesses a website and logs in to his or her user account via a browser accessed using the smart phone 102. However, it is appreciated that the step of user login is optional. The learner may be provided direct access to the website if, for instance, the network 110 is a secured Intranet in a school or institution.

3) The learner selects and uploads the image of the photograph or screen shot via the browser using the smart phone 102 using HTML input file format. The learner may select an earlier captured image of another answer or working if he or she wishes to have that other answer or working marked or edited by an educator.

4) The selected and uploaded image is saved in the server 104 running the website. More specifically, saving the uploaded image in the server 104 essentially means saving it in the storage 106 connected to the server 104.

5) The storage 106 is managed by a database application run by the server and is updated to store data of the user uploading the image i.e. the learner in this case, store a question code i.e. indication of which question the answer or working in the uploaded image pertains to, and address location of the uploaded image of the answer or working in the storage 106. The question code can be a parameter updated by the learner through the website or automatically identified by an application run on the server 104 when the learner uploads the image of the answer or working in a specific location in the website.

An educator, which may be a setter of the question, may mark or edit the image of the learner's answer or working in the following manner:

- 1) The educator accesses the website and logs in to his or her user account via a browser accessed using the workstation 108. However, it is appreciated that the step of user login is optional. The educator may be provided direct access to the website if, for instance, the network 110 is a secured Intranet in a school or institution.
 - 2) The educator selects on the website the question which the image of the answer or working of the learner has been uploaded into the storage 106.
 - 3) The website then shows up the relevant image of the answer or working uploaded by the learner.
 - 4) In the present example, code based on Javascript creates a HTML5 canvas for the relevant image.
 - 5) The HTML5 canvas allows the educator to edit i.e. doodle comments and make markings on the relevant image (in the form of a HTML5 canvas).
 - 6) After the educator completes editing, he or she clicks a "save" button on the website.
 - 7) In the present example, code based on Javascript converts the edited HTML5 canvas to an image.
 - 8) The image converted from HTML5 canvas is saved in the server 104 (i.e. saved in the storage 106 connected to the server 104). Furthermore, in this example, the edited and converted image replaces the earlier image uploaded by the learner in the storage 106.
 - 9) After saving of the edited image is completed, a database application run by the server 104 that is used to associate the image saved in the storage 106 with the question updates the question as "marked".
- After the question is "marked" by the educator, the student reviews markings of the educator for his answer or working as follows.
- 1) The student receives a notification on his marked answer or working. The notification may be in the form of an email automatically generated by the server 104, an SMS message received on the mobile device 102, etc.
 - 2) The student accesses the website and logs in to his or her user account via a browser accessed using the smart phone 102. However, it is appreciated that the step of user login is optional. The learner may be provided direct access to the website if, for instance, the network 110 is a secured Intranet in a school or institution.
 - 3) The student retrieves the edited image stored in the storage 106 by the educator from the website, views the image and learns from the comments and/or markings made on the edited image.

Figure 2 summarizes the method for editing an image by the educator according to the present example of the present disclosure, the method comprising: retrieving a captured image stored in a storage 106; editing the retrieved image; storing the edited image; and accessing the edited image stored.

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A specific example of the present disclosure in use is as follows. Reference is made to Figures 1 to 10.

10 In the specific example, there is a student attempting a Math question on an electronic learning (elearning) website that is run by the server 104 described with reference to Figure 1. The website is accessed via the mobile device 102 or a workstation 108. Figure 3 shows a screen shot 300 containing text of the Math question 306 on a webpage of the website. An answer section 304 resides below the text of the Math question 306. The answer section 304 includes a selectable "Attach working" button 302 allowing the student to attach an image of
15 his working to the question. In this example, the image is captured using the student's mobile device (e.g. 102) with a camera function. In other examples, the image may be taken by a camera or scanned as an image file using a scanner and saved into his workstation (e.g. 108) or his mobile device (e.g. 102).

20 Note that in this specific example, only the working is attached. The answer to the question is separately entered through an answer section 304. The answer section 304 includes a plurality of selectable number buttons 308, one of which when pressed will be a correct answer to the question, and an answer field 310 displaying the answer tied to a selected number button 308. It is appreciated that in other examples, a more elaborated answer that
25 includes the working and the answer can be uploaded and in such cases the answer section 304 may not be necessary.

The student then writes the working steps leading to his answer on a piece of paper (Not shown).

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When he completes writing his working steps, he clicks on "Attach working" button 302, which calls out a device photo dialogue as illustrated in Figures 4 or 5.

Depending on the type of mobile device 102 or workstation 108 and the respective operating
35 system, the dialogue window could be like the screen 400 as shown in Figure 4, which is based on the iphoneTM operating system, or Figure 5, which is based on the Microsoft Windows operating system.

It is appreciated that mobile devices usually offer an option to take a photo for uploading and such interface would operate according to the operating system of the mobile device used by the student. For instance, in the screen 400 in Figure 4, there is a selectable “Take Photo” button 402 to enable the student to take a photograph i.e. capture an image of his working for uploading.

Figure 5 shows a screen capture 500 comprising a dialogue window 502 that has showed up after the student clicks the “Attach working” button 302. The dialogue window 502 overlaps an Internet Explorer Browser window 504 after it shows up. The dialogue window 502 enables the student to select an image file for uploading.

After uploading the image of his working as an attachment with the assistance of the dialogue window 400 or 502, the student has entered his answer into the answer section 304 at the website.

With reference to Figure 6, a server application run by the server 104 marks the answer upon user submission i.e. after selection of submission is performed by the student on the webpage illustrated by the screen shot 300 in Figure 3. Figure 6 shows a screen shot 600 indicating that the answer entered by the student is wrong.

With the help of the apparatus 100 described with reference to Figure 1, the setter of the question i.e. the educator, which can be either a parent or a school teacher, can see the working attached by the student when they log into their respective user accounts from the same website using the educator’s mobile device (e.g. 102) or workstation (e.g. 108), which the student used to upload his working.

The educator will be able to edit the image of the working uploaded by the student through a Working Marker interface screen shot 700 illustrated in Figures 7 and 8, which is accessible after the educator logs in to the website. After accessing the Working Marker Interface on the website through the educator’s mobile device (e.g. 102) or workstation (e.g. 108), the educator can toggle between two modes i.e. Scroll and Draw via selection of respective “Scroll” button 702 and “Draw” button 704.

The Scroll mode illustrated by a screen shot 700 in Figure 7 allows the educator to move around (i.e. scroll) to display only specific regions of the image of the working. The Scroll mode is useful if the educator is editing the image using a mobile device 102. This is

because the image displayed on the mobile device 102 is usually larger than the display of the mobile device 102 as can be seen in Figure 7 to provide better visibility of the workings in the image. It may not be practical to show the entire image on the display of the mobile device 102 as the display can be quite small.

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The Draw mode illustrated by a screen shot 800 in Figure 8 allows the educator to doodle over the image of the working. Figure 8 shows circling 802 over a number 5, which is drawn by the educator on the display of a mobile device 102 used by the educator. The circling 802 can be accomplished via touch screen function and/or a cursor operated by a computer mouse or other user input device(s).

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In addition, as illustrated in both Figures 7 and 8, there are respective audio comment entry sections 708 and 804 having buttons allowing the educator to select to record and save an audio file of his or her spoken comments. The sound of the audio file can be recorded via a microphone, which is found in the mobile device 102 or installed to a workstation (e.g. 108), if a workstation is used instead. The audio file containing the educator's comments can be later accessed by the student when the student reviews the question after marking.

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Furthermore, there textboxes 706 and 806 present in the screen shots 700 and 800 of Figures 7 and 8 respectively for the educator to enter text comments. The text can be entered by any text input interface available on the mobile device 102 or the workstation 108.

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With reference to the screen shot 900 in Figure 9, when the student later reviews the question after the educator has edited the image of his working, there can be present an indicator 902 to show the student that his uploaded image of his working has already been marked by the educator. In the present example, the indicator 902 is a colour indicator that would display a certain colour for a graphical representation of "My working", which can be viewed by the student when he accesses the website. The colour of the graphical representation of "My working" before marking is done will be a different colour from the colour of the graphical representation of "My working" after marking is done to indicate that marking of the working has already taken place.

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In the present example, the indicator 902 is also a button for selection by the student to show the image edited by the educator. Figure 10 shows a screen shot 1000 showing the edited image 1002, and a button 1004 to show text comments entered by the educator for the student. In the present example, the same button 1004 enables the student to listen to

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the audio comments (saved as the audio file) made by the educator. In other examples, there can be separate buttons for showing text comments and hearing audio comments.

Figure 11 shows in more detail an example of the server 104, the mobile device 102, and the work station 108 as described with reference to Figure 1. The server 104, the mobile device 102, or the work station 108 may comprise a processing unit 1102 for processing software including one or more computer programs for running one or more server applications to enable the backend logic flow or method as described earlier.

Furthermore, the processing unit 1102 may include user input modules such as a computer mouse 1136, keyboard/keypad 1104, and/or a plurality of output devices such as a display device 1108. The display of the display device 1108 may be a touch screen capable of receiving user input as well.

The processing unit 1102 may be connected to a computer network 1112 via a suitable transceiver device 1114 (i.e. a network interface), to enable access to e.g. the Internet or other network systems such as a wired Local Area Network (LAN) or Wide Area Network (WAN). The processing unit 1102 may also be connected to one or more external wireless communication enabled devices 1134 via a suitable wireless transceiver device 1132 e.g. a WiFi transceiver, Bluetooth module, Mobile telecommunication transceiver suitable for Global System for Mobile Communication (GSM), 3G, 3.5G, 4G telecommunication systems, or the like.

The processing unit 1102 may include a processor 1118, a Random Access Memory (RAM) 1120 and a Read Only Memory (ROM) 1122. The processing unit 1102 may also include a number of Input/Output (I/O) interfaces, for example I/O interface 1138 to the computer mouse 1136, I/O interface 1124 to the display device 1108, and I/O interface 1126 to the keyboard/keypad 1104.

The components of the processing unit 1102 typically communicate via an interconnected bus 1128 and in a manner known to the person skilled in the relevant art.

The computer programs may further include one or more software applications for e.g. instant messaging platform, audio/video playback, internet accessibility, operating the server 104, the mobile device 102, or the work station 108 (i.e. operating system), network security, file accessibility, database management, which are applications

typically equipped on a desktop, electronic apparatus, mobile device or portable computer.

5 The computer programs may be supplied to the user of the server 104, the mobile device 102, or the work station 108 encoded on a data storage medium such as a CD-ROM, on a flash memory carrier or a Hard Disk Drive, and are to be read using a corresponding data storage medium drive of a data storage device 1130. Such computer or application programs may also be downloaded from the computer network 1112. The application programs are read and controlled in its execution by the
10 processor 1118. Intermediate storage of program data may be accomplished using RAM 1120.

In more detail, one or more of the computer or application programs may be stored on any non-transitory machine- or computer- readable medium. The machine- or computer-
15 readable medium may include storage devices such as magnetic or optical disks, memory chips, or other storage devices suitable for interfacing with a general purpose computer. The machine- or computer- readable medium may also include a hard-wired medium such as that exemplified in the Internet system, or wireless medium such as that exemplified in the Wireless LAN (WLAN) system and the like. The computer program when loaded and
20 executed on such a general-purpose computer effectively results in an apparatus that implements the steps of the computing methods in examples herein described.

Many modifications and other examples can be made to the method and apparatus for editing an image by those skilled in the art having the understanding of the above described
25 disclosure together with the drawings. Therefore, it is to be understood that the method and apparatus for editing an image is not to be limited to the above description contained herein only, and that possible modifications are to be included in the claims of the disclosure.

Claims

1. An apparatus for editing an image, the apparatus comprising:
a storage for storing a captured image; and
5 a processing unit for executing instructions for
retrieving the captured image stored in the storage,
editing the retrieved image,
storing the edited image, and
accessing the edited image stored.
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2. A method for editing an image, the method comprising:
retrieving a captured image stored in a storage;
editing the retrieved image;
storing the edited image; and
15 accessing the edited image stored.