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(54) SYSTEMS AND METHODS FOR EDITING ELECTRONIC DOCUMENTS

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CPC G06F 40/106; G06F 40/109; G06F 40/166; G06F 40/123; G06F 3/048; G06F 3/0482; G06F 3/04842
See application file for complete search history.

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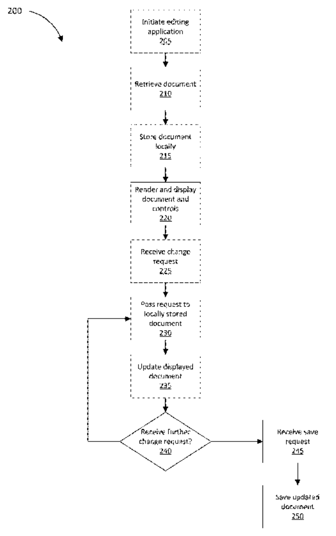
Primary Examiner — Tam T Tran

(57) ABSTRACT

Embodiments generally relate to a method comprising storing document data corresponding to a document to a memory of a computing device; rendering the document data to cause the document to be displayed within a web portion of a user interface of the computing device; rendering at least one control element within a native portion of the user interface by executing a native editing application; in response to receiving an input via the at least one control element, passing at least one parameter to at least one function stored within the document data to cause a modification of the displayed document; and re-rendering the displayed document within the web portion.

20 Claims, 3 Drawing Sheets


200
Initiate editing application 205
Retrieve document 210
Store document locally 215
Render and display document and controls 220
Receive change request 225
Pass request to locally stored document 230
Update displayed document 235
Receive further change request? 240
Receive save request 245
Save updated document 250

(51) **Int. Cl.**

G06F 40/123	(2020.01)
G06F 40/166	(2020.01)

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2020/0117850	A1	4/2020	Amoli et al.	
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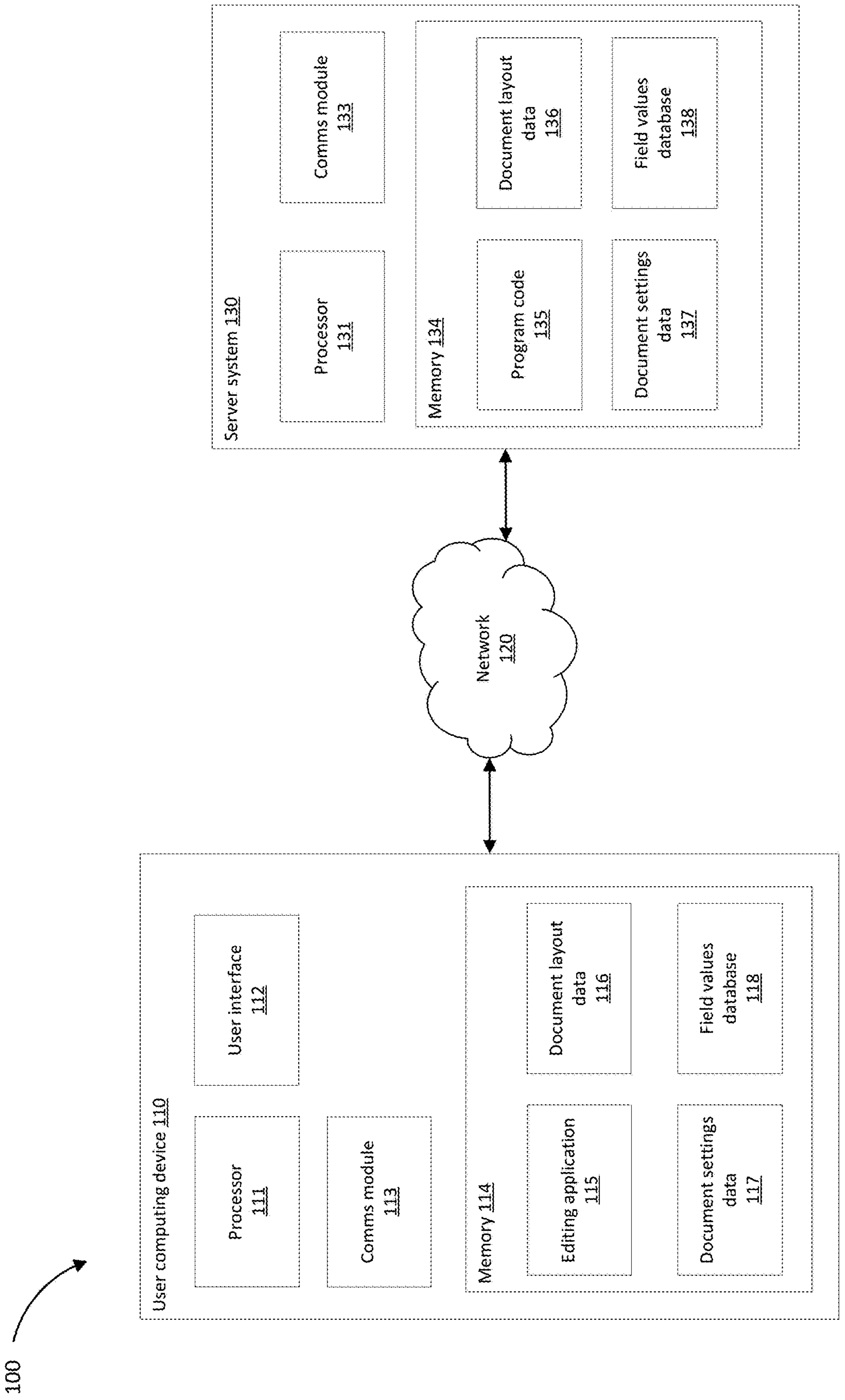

Server system 130
Processor 131
Comms module 133
Memory 134
Program code 135
Document layout data 136
Document settings data 137
Field values database 138
Network 120
User computing device 110
Processor 111
User interface 112
Comms module 113
Memory 114
Editing application 115
Document layout data 116
Document settings data 117
Field values database 118
100

Figure 1

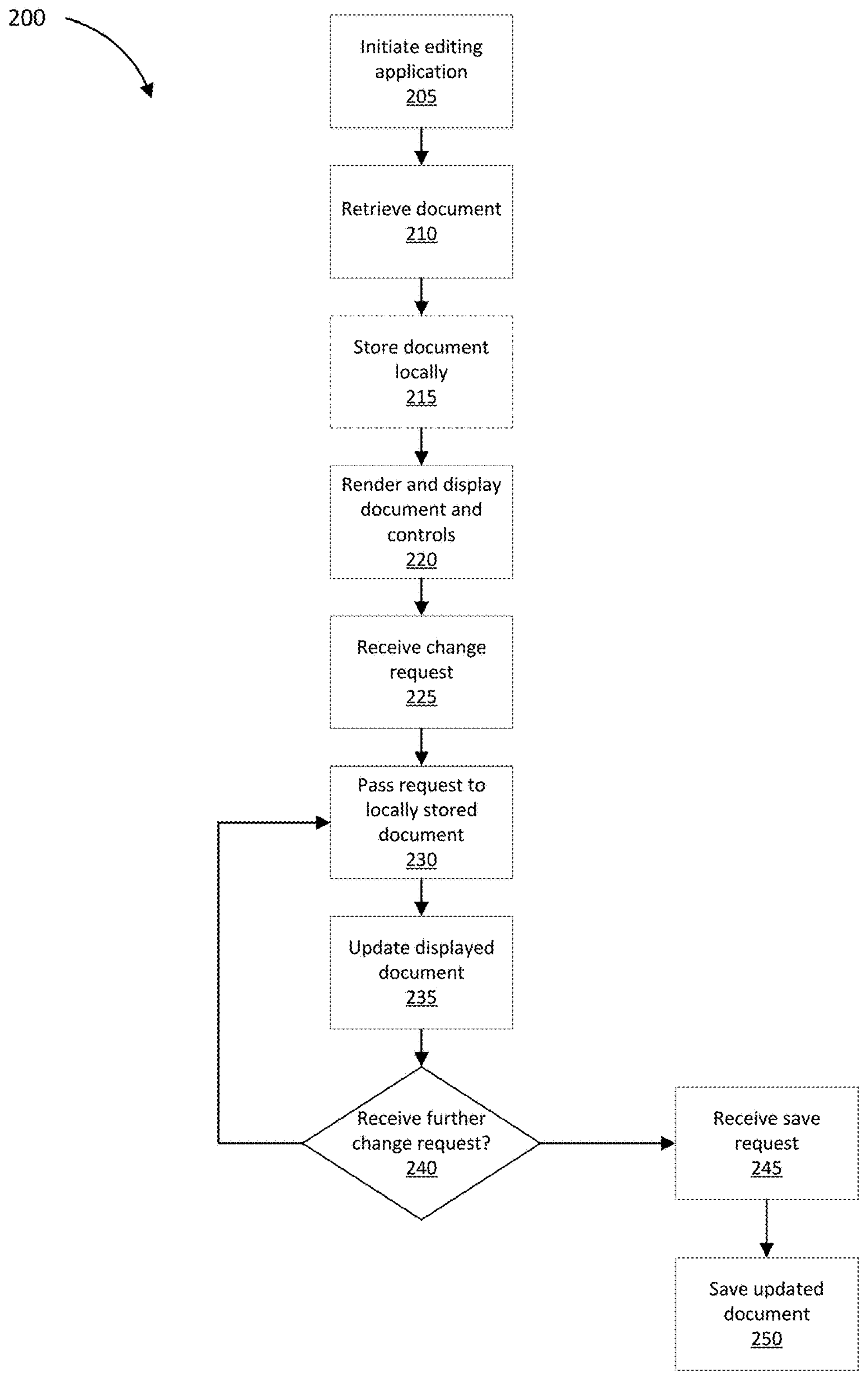
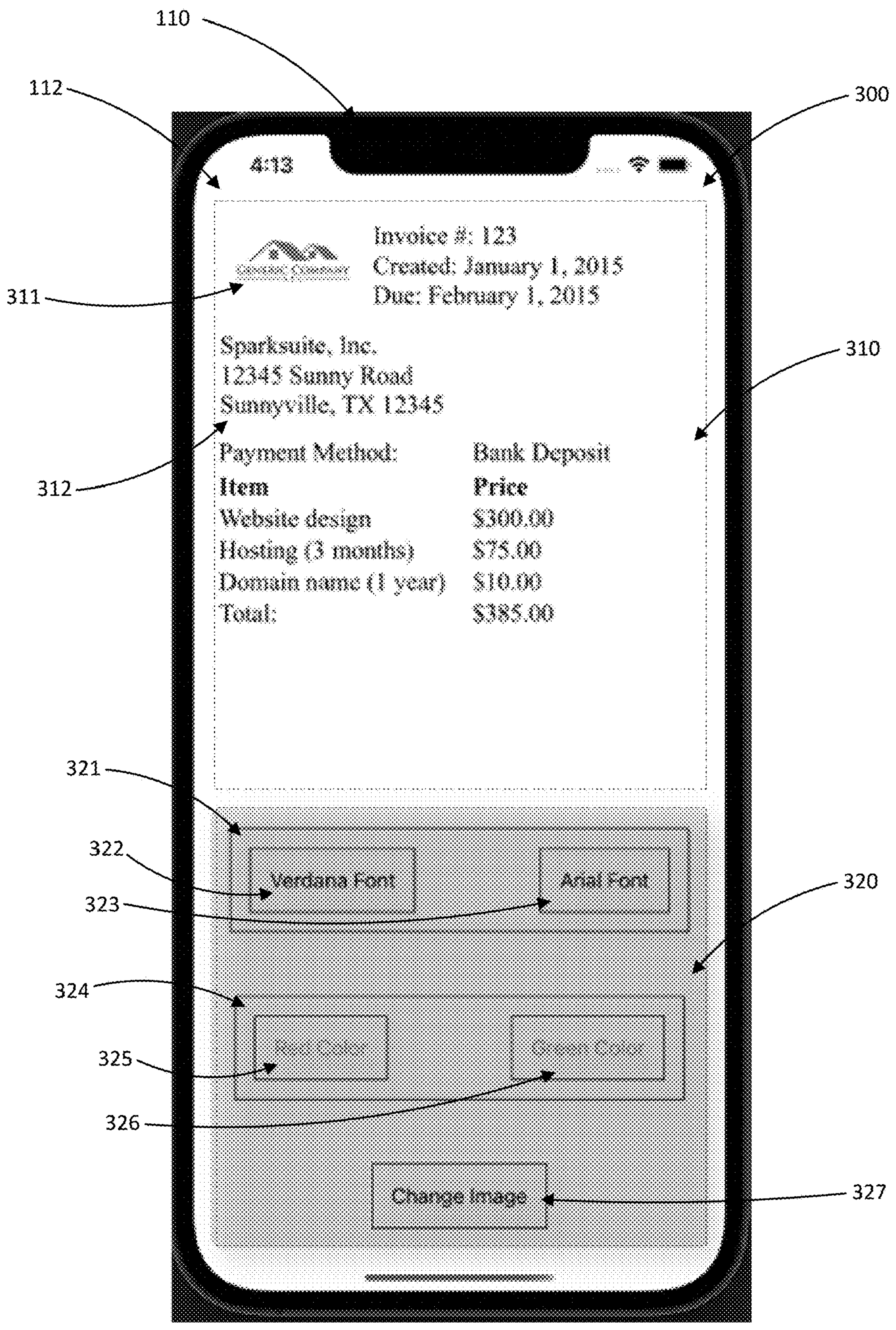

200
Initiate editing application 205
Retrieve document 210
Store document locally 215
Render and display document and controls 220
Receive change request 225
Pass request to locally stored document 230
Update displayed document 235
Receive further change request? 240
Receive save request 245
Save updated document 250

Figure 2



Invoice #: 123
Created: January 1, 2015
Due: February 1, 2015

Sparksuite, Inc.
12345 Sunny Road
Sunnyville, TX 12345

Payment Method:	Bank Deposit
Item	**Price**
Website design	$300.00
Hosting (3 months)	$75.00
Domain name (1 year)	$10.00
Total:	$385.00

Figure 3

SYSTEMS AND METHODS FOR EDITING ELECTRONIC DOCUMENTS

TECHNICAL FIELD

Embodiments generally relate to systems, methods and computer-readable media for editing electronic documents. In particular, some embodiments relate to systems, methods and computer-readable media for editing web-based electronic documents via a native application.

BACKGROUND

Businesses often send various electronic documents to their clients, such as purchase confirmations, invoices, receipts, and reports, for example. These documents may be generated in a web-based environment using a markup language such as HTML, allowing them to be previewed using a web browser. A single document template can then be automatically filled with details relating to each particular customer and their purchase details, and exported to a format for delivery to the customer, such as PDF.

When creating documents to send to their customers, a business owner may wish to change the appearance of a document by adding branding images or changing the fonts used. However, existing methods of allowing for users to edit their electronic documents tend to be difficult to use and inefficient, especially when the user is unfamiliar with the markup language used to generate the document.

It is desired to address or ameliorate one or more shortcomings or disadvantages associated with prior systems for editing electronic documents, or to at least provide a useful alternative thereto.

Any discussion of documents, acts, materials, devices, articles or the like which has been included in the present specification is not to be taken as an admission that any or all of these matters form part of the prior art base or were common general knowledge in the field relevant to the present disclosure as it existed before the priority date of each of the appended claims.

SUMMARY

Some embodiments relate to a method comprising:
- storing document data corresponding to the document to a memory of the computing device;
- rendering the document data to cause the document to be displayed within a web portion of a user interface of the computing device;
- rendering at least one control element within a native portion of the user interface by executing a native editing application;
- in response to receiving an input via the at least one control element, passing at least one parameter to at least one function stored within the document data to cause a modification of the displayed document; and
- re-rendering the displayed document within the web portion.

Some embodiments further comprise retrieving the document data from a server system prior to storing the document to the memory.

Some embodiments further comprise storing the at least one parameter as a document setting corresponding to the document data.

According to some embodiments, storing the at least one parameter as a document setting comprises sending the at

least one parameter to a server system for storing in a memory location within the server system.

In some embodiments, the document data comprises at least one markup language. In some embodiments, the document data comprises HTML.

According to some embodiments, the at least one function stored within the document data comprises a client-side language function. In some embodiments, the at least one function stored within the document data comprises a JavaScript function.

In some embodiments, the at least one parameter received from the control element is passed to the at least one function by exploiting a hook mechanism exposed in the document data that allows parameters to be passed from the native portion of the user interface to the web portion of the user interface.

In some embodiments, the web portion comprises an embedded web browser rendering engine. According to some embodiments, the web portion comprises a Web View rendering engine.

According to some embodiments, the at least one control element comprises one or more of a virtual button, drop-down box, slider, check box or radio button.

In some embodiments, the at least one parameter relates to at least one of a font colour, font size, font type, or image to be displayed within the document.

Some embodiments relate to a device comprising:
- a user interface
- a memory storing executable code;
- a processor configured to access the memory to execute the executable code;

wherein when executing the executable code, the processor is caused to:
- store document data corresponding to the document to the memory;
- render the document data to cause the document to be displayed within a web portion of the user interface;
- render at least one control element within a native portion of the user interface by executing a native editing application;
  - in response to receiving an input via the at least one control element, passing at least one parameter to at least one function stored within the document data to cause a modification of the displayed document; and
  - re-rendering the displayed document within the web portion.

Some embodiments further comprise a communications module configured to retrieve the document data from a server system over a network prior to storing the document to the memory.

In some embodiments, the processor is further caused to store the at least one parameter as a document setting corresponding to the document data. In some embodiments, storing the at least one parameter as a document setting comprises sending the at least one parameter to the server system over a network via the communications module for storing.

According to some embodiments, the document data comprises at least one markup language. In some embodiments, the document data comprises HTML.

In some embodiments, the at least one function stored within the document data comprises a client-side language function. In some embodiments, the at least one function stored within the document data comprises a JavaScript function.

According to some embodiments, the processor is caused to pass the at least one parameter received from the control element to the at least one function by exploiting a hook mechanism exposed in the document data that allows parameters to be passed from the native portion of the user interface to the web portion of the user interface.

According to some embodiments, the web portion comprises an embedded web browser rendering engine. In some embodiments, the web portion comprises a Web View rendering engine.

In some embodiments, the at least one control element comprises one or more of a virtual button, drop-down box, slider, check box or radio button.

In some embodiments, the at least one parameter relates to at least one of a font colour, font size, font type, or image to be displayed within the document.

Some embodiments relate to a computer-readable storage medium storing instructions that, when executed by a processor, cause the processor to perform the method of some other embodiments.

Throughout this specification the word "comprise", or variations such as "comprises" or "comprising", will be understood to imply the inclusion of a stated element, integer or step, or group of elements, integers or steps, but not the exclusion of any other element, integer or step, or group of elements, integers or steps.

BRIEF DESCRIPTION OF DRAWINGS

Various ones of the appended drawings merely illustrate example embodiments of the present disclosure and cannot be considered as limiting its scope.

FIG. **1** is a schematic diagram of a system for editing electronic documents, according to some embodiments;

FIG. **2** is a process flow diagram of a method of editing electronic documents, according to some embodiments; and

FIG. **3** is an example screenshot as displayed by the user computing device of FIG. **1** when executing an application for editing electronic documents, according to some embodiments.

DESCRIPTION OF EMBODIMENTS

Embodiments generally relate to systems, methods and computer-readable media for editing electronic documents. In particular, some embodiments relate to systems, methods and computer-readable media for editing web-based electronic documents via a native application.

Markup languages are often used to generate documents in cases where a particular document type is to be generated multiple times with variable fields. For example, a business may wish to send invoices to their clients on a monthly basis. While the addressee of the invoice will change between customers, and the invoice amount will change from month to month, it may be desirable to keep other parts of the invoice the same across all generated invoices. For example, the business owner may wish to replicate their branding across all invoice documents, and to provide the same payment details. Using a markup language allows for the static portions of the invoice to be encoded within an electronic document as document layout data, and for the variable fields to be filled in based on data retrieved from a database when the document is rendered for provision to the recipient as a rendered document page.

As markup languages may not be intuitive, web based environments may be used to provide a more user-friendly way of updating the appearance of the documents. Document layout data may be retrieved from a server, rendered and presented as a preview document page in a web based environment, such as within a browser application. Using control elements provided within the web based environment, a user may be able to update the appearance of the preview document page by adding branding to the document or changing fonts, sizes and colours of any text. As the user interacts with the control elements, instructions generated based on their actions are sent to the server hosting the document layout data, which processes the instructions to make the requested change to the document layout data. The browser application then retrieves the updated document layout data and re-renders it to cause an updated preview document page to be displayed.

This method of editing documents causes lag between the time the user requests the change and the time at which the change is displayed, due to the duration of time required to send the instructions to the server and to re-download and re-render the updated document layout data. Furthermore, this method requires a consistent network connection between the user device and the server hosting the document being edited.

The described embodiments relate to an alternative method of editing an electronic document. Described embodiments may reduce the lag between a time at which a change is requested and a time at which the change is displayed. Described embodiments also relate to a method that does not require a network connection to be maintained between a user computing device and a server system while a document is being edited.

This is achieved by providing an application that displays a rendered preview document page within a web portion of a user interface, while control elements for modifying the appearance of the document are displayed in a native portion of the user interface. A hook mechanism is used to allow for communication between the web portion and the native portion. By storing a local copy of the document settings data relating to the document to be edited, changes to the document requested using the native control elements can be applied locally on the user device and displayed to the user instantaneously via the preview document page. When a user is satisfied with the changes and modifications, the updated document settings data can be uploaded to a server system or cloud server.

FIG. **1** is a block diagram of a system **100** for facilitating editing of electronic documents. System **100** may facilitate editing of electronic documents capable of being modified using JavaScript, according to some embodiments. System **100** comprises a user computing device **110** in communication with a server system **130** over a communications network **120**.

User computing device **110** comprises a processor **111** in communication with a memory **114**. Processor **111** comprises one or more data processors for executing instructions, and may comprise one or more microprocessor based platforms, central processing units (CPUs), application specific instruction set processors (ASIPs), application specific integrated circuits (ASICs), suitable integrated circuits, or other processors capable of fetching and executing instruction code as stored in memory **114**. Processor **111** may include an arithmetic logic unit (ALU) for mathematical and/or logical execution of instructions, such as operations performed on data stored in internal registers of processor **111**.

Memory **114** may comprise one or more memory storage locations, which may be volatile or non-volatile memory types. For example, memory **114** may comprise one or more of random access memory (RAM), read-only memory (ROM), electrically erasable programmable read-only memory (EEPROM) or flash memory. Memory **114** is configured to store program code accessible by the processor **111**. The program code may comprise a plurality of executable program code modules executable by processor **111** to cause processor **111** to perform functions as described in further detail below. For example, memory **114** comprises program code in the form of an editing application **115** executable by processor **111**.

Memory **114** may also comprise one or more data files comprising data that is accessible to processor **111** for performing read and write functions. For example, memory **114** may store document layout data **116**, document settings data **117**, and a field values database **118**.

Document layout data **116** may be used to store data associated with an electronic document that is accessible to processor **111** for reading and rendering for display as a rendered document page. According to some embodiments, document layout data **116** may comprise markup language that describes the structure of the document page. For example, document layout data **116** may comprise markup language such as HTML in some embodiments. According to some embodiments, document layout data **116** may comprise executable scripts. For example, document layout data **116** may comprise scripts defining Javascript functions in some embodiments. According to some embodiments, document layout data **116** may comprise scripts defining CSS functions.

Document settings data **117** may be used to store document settings associated with the document data stored in document layout data **116**. Specifically, document settings data **117** may store parameter values relating to editable aspects of an electronic document. For example, document settings data **117** may store values corresponding to the specific font colour, font size, font type, or image data to be displayed as a rendered document page by processor **111** when rendering document layout data **116**. These values may relate to the whole document, or to sections of the document. In some embodiments, document settings data **117** may additionally or alternatively store visibility and/or position data for elements of the document. According to some embodiments, the executable scripts forming part of document layout data **116** may define characteristics of the electronic document that are able to be edited, and document settings data **117** may store the values that get passed to the scripts in order to cause the rendered document page to be displayed with the selected characteristic.

Field values database **118** may store the specific values that are to be input into the text fields of the electronic document when rendering the document to produce the final rendered document pages. For example, field values database **118** may store an array of customer names and contact details, payment information, invoice data, purchase orders, or other data to be inserted into the electronic documents to be sent out to the end clients or customers.

Processor **111** may be configured to execute editing application **115** to cause processor **111** to facilitate the editing of an electronic document. The data relating to the document to be edited may be stored in document layout data **116**, document settings data **117** and field values database **118** by processor **111** when executing editing application **115**, as described in further detail below with reference to method **200**.

User computing device **110** may also comprise a user interface **112** capable of receiving inputs, such as requests, from one or more users of user computing device **110**, and capable of conveying outputs, such as information, to the user. User interface **112** may comprise one or more user interface components, such as one or more of a display device, a touch screen display, a keyboard, a mouse, a camera, a microphone, and buttons, for example.

User computing device **110** may further comprise a communications module **113** configured to facilitate communication between user computing device **110** and one or more external computing devices via one or more networks. Communications module **113** may comprise a combination of network interface hardware and network interface software suitable for establishing, maintaining and facilitating communication over a relevant communication channel. According to some embodiments, communications module **113** may facilitate communication between user computing device **110** and other devices within system **100** via network **120**. For example, communications module **113** may facilitate communication between user computing device **110** and server system **130** via network **120**.

Network **120** may comprise one or more local area networks or wide area networks that facilitate communication between elements of system **100**. For example, according to some embodiments, network **120** may be the internet. However, network **120** may comprise at least a portion of any one or more networks having one or more nodes that transmit, receive, forward, generate, buffer, store, route, switch, process, or a combination thereof, etc. one or more messages, packets, signals, some combination thereof, or so forth. Network **120** may include, for example, one or more of: a wireless network, a wired network, an internet, an intranet, a public network, a packet-switched network, a circuit-switched network, an ad hoc network, an infrastructure network, a public-switched telephone network (PSTN), a cable network, a cellular network, a satellite network, a fibre-optic network, or some combination thereof.

Server system **130** may comprise one or more computing devices and/or server devices, such as one or more servers, databases, and/or processing devices in communication over a network. Server system **130** may be configured to host one or more web based documents available for access and editing by user computing device **110**.

According to some embodiments, server system **130** may comprise a cloud based server system. Server system **130** comprises a processor **131** in communication with a memory **134**. Processor **131** comprises one or more data processors for executing instructions, and may comprise one or more microprocessor based platforms, central processing units (CPUs), application specific instruction set processors (ASIPs), application specific integrated circuits (ASICs), suitable integrated circuits, or other processors capable of fetching and executing instruction code as stored in memory **134**. Processor **131** may include an arithmetic logic unit (ALU) for mathematical and/or logical execution of instructions, such as operations performed on the data stored in internal registers of processor **131**.

Memory **134** may comprise one or more memory storage locations, which may be volatile or non-volatile memory types. For example, memory **134** may comprise one or more of random access memory (RAM), read-only memory (ROM), electrically erasable programmable read-only memory (EEPROM) or flash memory. Memory **134** is configured to store program code **135** accessible by the processor **131**. Program code **135** may comprise a plurality of executable program code modules executable by processor **131** to cause processor **131** to perform functions as described in further detail below.

Memory **134** may also comprise one or more data files comprising data that is accessible to processor **131** for performing read and write functions. For example, memory

134 may store document layout data **136**, document settings data **137**, and a field values database **138**.

Document layout data **136** may be used to store data associated with a web based electronic document that is accessible to processor **131** for reading and rendering for display as a rendered document page. As described above with reference to document layout data **116**, document layout data **136** may comprise markup language that describes the structure of the document page. For example, document layout data **136** may comprise markup language such as HTML in some embodiments. According to some embodiments, document layout data **136** may comprise executable scripts. For example, document layout data **136** may comprise scripts defining Javascript functions in some embodiments. According to some embodiments, document layout data **136** may comprise scripts defining CSS functions.

Document settings data **137** may be used to store document settings associated with the document data stored in document layout data **136**. As described above with reference to document settings data **117**, document settings data **137** may store parameter values relating to editable aspects of an electronic document. For example, document settings data **137** may store values corresponding to the specific font colour, font size, font type, or image data to be displayed as a rendered document when rendering document layout data **136**. According to some embodiments, the executable scripts forming part of document layout data **136** may define characteristics of the electronic document that are able to be edited, and document settings data **137** may store the values that get passed to the scripts in order to cause the rendered document page to be displayed with the selected characteristic.

Field values database **138** may store the specific values that are to be input into the text fields of the electronic document when rendering the document to produce the final rendered document pages. As described above with reference to field values database **118**, field values database **138** may store an array of customer names and contact details, payment information, invoice data, purchase orders, or other data to be inserted into the electronic documents to be sent out to the end clients or customers.

Processor **131** may be configured to execute program **135** to perform functions such as retrieving one or more of document layout data **136**, document settings data **137** and field values database **138** from memory **134**, causing communications module **133** to communicate the retrieved document layout data **136**, document settings data **137** and/or field values database **138** to user computing device **110** via network **120**, receiving updated document settings data from user computing device **110** via network **120**, and writing the updated document settings data to memory **134** as document settings data **137**.

Server system **130** may further comprise a communications module **133** configured to facilitate communication between user server system **130** and one or more external computing devices via one or more networks. Communications module **133** may comprise a combination of network interface hardware and network interface software suitable for establishing, maintaining and facilitating communication over a relevant communication channel. According to some embodiments, communications module **133** may facilitate communication between server system **130** and other devices within system **100** via network **120**. For example, communications module **133** may facilitate communication between server system **130** and user computing device **110** via network **120**.

FIG. **2** is a process flow diagram of a method **200** performed by processor **111** of user computing device **110** when caused to execute editing application **115**. Processor **111** may be caused to execute editing application **115** in response to a command received from a user of user computing device **110** via user interface **112**, such as by a user interacting with a virtual icon representing the editing application **115**.

At step **205**, processor **111** executing editing application **115** is caused to initiate editing application **115**. This may comprise causing user interface **112** to display a graphical user interface representing editing application **115**. According to some embodiments, user interface **112** may be caused to display a graphical user interface having a first portion, being a web portion **310** configured to display web based content, and a second portion, being a native portion **320** configured to display native content, as described in further detail below with reference to FIG. **3**. Web portion **310** may comprise a web view object that allows for the display of web content within the graphical user interface of editing application **115**, such as an embedded web browser rendering engine. Web portion **310** may comprise a WebView rendering engine in some embodiments.

At step **210**, processor **111** executing editing application **115** is caused to retrieve an electronic document for editing. According to some embodiments, step **210** may be performed in response to a user interaction with the graphical user interface displayed by user interface **112**, such as interacting with a virtual button displayed on user interface **112** to instruct user computing device **110** to open a selected document for editing. In some alternative embodiments, processor **111** may automatically retrieve a default document for editing upon initiating editing application **115**.

According to some embodiments, at least some of the document data may be retrieved from server system **130**. This may be done by processor **111** sending a message to server system **130** via network **120** and using communications module **113**, requesting particular document data that is hosted on server system **130**. Communications module **133** of server system **130** may receive the message, which may be interpreted by processor **131**. Processor **131** may then be caused to execute program code **135**, which may contain instructions that further cause processor **131** to retrieve one or more of document layout data **136**, document settings data **137** and field values database **138** from memory **134**. Processor **131** may subsequently be caused to communicate the retrieved document layout data **136**, document settings data **137** and/or field values database **138** back to user computing device **110** via network **120** and using communications module **133**.

According to some alternative embodiments, the required document data may be hosted locally by user computing device **110**. In such embodiments, processor **110** may be caused to retrieve document layout data **116**, document settings data **117** and field values database **118** from local memory **114**, and proceed directly to step **220** of method **200**.

Where one or more of document layout data **136**, document settings data **137** and field values database **138** has been retrieved from server system **130**, processor **111** executing editing application **115** is subsequently caused to perform step **215** to store the document data locally. Processor **111** receives document layout data **136**, document settings data **137** and/or field values database **138** via communications module **113**, and stores it as local document layout data **116**, document settings data **117** and/or field values database **118**, respectively.

At step **220**, processor **111** executing editing application **115** is then caused to render and display the retrieved and/or stored document layout data **116**. According to some embodiments, document layout data **116** may comprise data relating to an electronic document. As described above, document layout data **116** may comprise markup language, such as HTML, defining the structure of the electronic document to be displayed. Document layout data **116** may further comprise executable scripts. In some embodiments, these scripts may be Javascript functions which can be passed particular values to set certain characteristics of the displayed document. For example, document layout data **116** may comprise a "Font Colour" Javascript function, which may receive a "Colour" input value, and cause the font of one or more sections of the document as defined by the markup language to be rendered in a colour associated with the value passed to the function.

Processor **111** uses a web view object defined by editing application **115** to render document layout data **116**, and to cause the rendered document page to be displayed in web portion **310**. Document layout data **116** may be rendered by processor **111** interpreting the markup language code stored in document layout data **116**. For example, where document layout data **116** comprises a HTML document, processor **111** may render the document by using the HTML to construct the data Document Object Model (DOM). Processor **111** uses the DOM to construct a render tree, which is then rendered by the web view object acting as a browser engine.

According to some embodiments, processor **111** may also be configured to execute any scripts and functions stored in document layout data **116**, such as CSS and/or JavaScript functions. Where document layout data **116** comprises executable functions that assign values to particular parameters of the document page being rendered, processor **111** may execute those functions with initial default values, which may be stored in document settings data **117**. For example, if document layout data **116** comprises a Javascript "Font Colour" function that is passed a value corresponding to a desired colour for a portion of the text to be displayed, processor **111** may execute that function by passing the function a default colour value stored in document settings data **117**.

Document layout data **116** includes one or more hooks that allow for communication between web portion **310** and native portion **320** in the form of the executable functions. The hooks may serve as a form of communication contract between the web portion **310** and native portion **320**. Where document layout data **116** comprises executable scripts as described above, the particular scripts within document layout data **116** can be accessed by native editing application **115** based on a contract between the editing application **115** and document layout data **116**. Editing application **115** can identify which parameters can be passed to the scripts to modify the stored document layout data **116**.

According to some embodiments, document layout data **116** may also include text fields that may take on various values when the document layout data **116** is processed to produce customer-specific rendered document pages, such as customer name or address fields. In such embodiments, when rendering document layout data **116**, processor **111** may select a default value for these fields from values stored in field values database **118**, in order to provide an example of the rendered appearance of such document pages. An example of a rendered document page displayed in web portion **310** of a user interface **112** is shown in FIG. **3**, and described in further detail below.

Also at step **220**, processor **111** executing editing application **115** is further caused to render and display editing control elements in the native portion **320** of the graphical user interface displayed on user interface **112**. These may include virtual buttons, drop-down boxes, sliders, check boxes, radio buttons and other graphical control elements that are native to editing application **115**. The control elements may allow a user of user computing device **110** to make changes to the document as displayed in web portion **310**. Examples of control elements, such as elements **322**, **323**, **325** and **326**, are shown in FIG. **3** and described in further detail below.

At step **225**, processor **111** executing editing application **115** receives a change request via user interface **112**. The change request may be initiated by a user interacting with a control element displayed in native portion **320** in order to change the appearance of one or more visual elements of the document displayed in web portion **310**. Changes to visual appearance may include hiding or revealing sections or elements of the document, and/or altering the position of sections or elements of the document in some embodiments. Changes to visual appearance may additionally or alternatively include changes to one or more of font colour, font size, font type, or image data to be displayed. For example, in some embodiments the change request may arise from a user interacting with a virtual button that is configured to cause a change in the colour of a font of the document displayed in web portion **310**. For example, a user may interact with virtual button **325** or **326** as described in further detail below with reference to FIG. **3**. Based on the user input received, processor **111** may be configured to determine parameters relating to the requested change, such as the portion of the document the change is to be applied to, the property to be changed, and the new value of the property. For example, the change request may relate to the header portion of the document, to the font type property, and specify that the new value for that property corresponds to the Times New Roman font.

Having received the change request, processor **111** executing editing application **115** may perform step **230** by executing a function within editing application **115** called in response to the received user input. At step **230**, processor **111** may execute the function to derive the parameters defining the requested change, and to translate these to the parameter types identified at step **220** as being able to be passed to document layout data **116**. Processor **111** then passes the translated parameters to the appropriate function within document layout data **116**, to cause the particular function or functions to be evoked by the scripts within document layout data **116**. Processor **111** may execute the scripts within document layout data **116** using the parameters passed to the function. Processor **111** may also store the parameters passed to document layout data **116** as updated document settings data **117**.

At step **235**, having updated the locally stored document settings data **117** based on a change request, processor **111** executing editing application **115** displays the updated document in web portion **310**. As described above with reference to step **220**, this involves processor **111** using a web view object defined by editing application **115** to render the document layout data **116** using the updated document settings data **117**, and to cause the rendered document to be displayed in web portion **310**.

At step **240**, processor **111** executing editing application **115** may receive a further change request in response to a user interacting with a different or the same control element of native portion **320**. If processor **111** receives such a request, processor **111** may continue executing method **200** from step **230**.

Alternatively, processor **111** executing editing application **115** may receive a save request at step **245**. A save request may be generated periodically by user computing device **110**, or may be generated in response to an input received from a user via user interface **112**. For example, a save request may be generated in response to a user interacting with a virtual 'save' button displayed on user interface **112**.

In response to receiving the save request, at step **250** processor **111** executing editing application **115** is caused to save the updated document settings data **117**. According to some embodiments, document settings data **117** may be saved by being copied to a second memory location within memory **114**. According to some alternative embodiments, document settings data **117** may be saved by being sent to server system **130** via network **120** and using communications module **113**. Upon receiving the updated document data, processor **131** of server system **130** executing program code **135** may be caused to store the updated document data as document settings data **137**.

The previously stored document settings data may be overwritten by the updated data, or the updated data may be stored alongside the previously stored document settings data.

FIG. **3** is an example screenshot showing a graphical user interface **300** displayed on user interface **112** of user computing device **110** executing editing application **115**.

Graphical user interface **300** comprises a first portion, being a web portion **310** configured to display web based content, and a second portion, being a native portion **320** configured to display native content. Web portion **310** may comprise a web view object that allows for the display of web based content within the graphical user interface as rendered by processor **111** executing editing application **115** and passed to web portion **310** for display. For example, web portion **310** may comprise a Web View embedded web browser rendering engine in some embodiments. Web portion **310** may be configured to display an electronic document written in one or more client-side languages, such as HTML, JavaScript and/or CSS, for example. Electronic documents are displayed in web portion **310** by processor **111** rendering the markup language and executing the scripts stored in the documents, which causes the visual elements as described in the markup language and scripts to be displayed. In the illustrated embodiment, web portion **310** is displaying an invoice document page comprising a logo **311** as well as text **312**. The appearance and configuration of the displayed content is governed by the scripts contained within the electronic document as retrieved by processor **111**.

Native portion **320** displays native control elements. The native control elements are rendered and displayed by processor **111** executing editing application **115**, which contains code describing the control elements to be displayed. When a user interacts with a control element, processor **111** executing editing application **115** may be caused to pass parameters relating to the change request to document layout data **116** and to update the document displayed in web portion **310** and the data stored in document settings data **117**, as described above with reference to steps **230** and **235** of method **200**.

In the illustrated embodiment, the displayed control elements include font type controls **321**, and font colour controls **324**. The illustrated font type controls **321** include a Verdana font virtual button **322**, and an Arial font virtual button **323**. A user interacting with Verdana font virtual button **322** may cause processor **111** executing editing application **115** to pass at least one parameter to a "Font Style" function within document layout data **116**, where the parameter corresponds to Verdana font. Processor **111** may be caused to execute a script stored in document layout data **116**, wherein executing the script causes a font type of at least a portion of the text to be displayed by execution of document layout data **116** to be changed to Verdana font. A user interacting with Arial font virtual button **323** may cause processor **111** executing editing application **115** to pass at least one parameter to a "Font Style" function within document layout data **116**, where the parameter corresponds to Arial font. Processor **111** may be caused to execute a script stored in document layout data **116**, wherein executing the script causes a font type of at least a portion of the text to be displayed by execution of document layout data **116** to be changed to Arial font.

The illustrated font colour controls **324** include a red colour virtual button **325**, and a green colour virtual button **326**. A user interacting with red colour virtual button **325** may cause processor **111** executing editing application **115** to pass at least one parameter to a "Font Colour" function within document layout data **116**, where the parameter corresponds to the colour red. Processor **111** may be caused to execute a script stored in document layout data **116**, wherein executing the script causes a font colour of at least a portion of the text to be displayed by execution of document layout data **116** to be changed to red. A user interacting with green colour virtual button **326** may cause processor **111** executing editing application **115** to pass at least one parameter to a "Font Colour" function within document layout data **116**, where the parameter corresponds to the colour green. Processor **111** may be caused to execute a script stored in document layout data **116**, wherein executing the script causes a font colour of at least a portion of the text to be displayed by execution of document layout data **116** to be changed to green.

Of course, the displayed control elements **322**, **323**, **325** and **326** are only a limited example of possible control elements that may be displayed in native portion **320**. The control elements may include any graphical control elements that allow a user to modify the appearance of a document displayed in web portion **310**, including modifying the appearance of text; adding, moving or removing text; modifying the appearance of images; adding, moving or removing images; or any other visual modifications.

Native portion **320** also includes a change image virtual button **327**. When a user interacts with change image virtual button **327**, processor **111** executing editing application **115** may be caused to ask the user to select an image to be added to the displayed document as logo **311**. Once the user has selected an image to be displayed, processor **111** may be caused to pass at least one parameter to a "Change Image" function within document layout data **116**, where the parameter corresponds to a URI pointing to the image selected by the user. Processor **111** may be caused to execute a script stored in document layout data **116**, wherein executing the script causes the selected image to be displayed as logo **311**.

It will be appreciated by persons skilled in the art that numerous variations and/or modifications may be made to the above-described embodiments, without departing from the broad general scope of the present disclosure. The present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive.

The invention claimed is:

1. A method comprising:

storing document data corresponding to a document to a memory of a computing device;

rendering the document data to cause the document to be displayed within a web portion of a user interface of the computing device, wherein the web portion comprises an embedded web browser rendering engine;

rendering at least one control element within a native portion of the user interface by executing a native editing application;

in response to receiving an input via the at least one control element, passing at least one parameter to at least one function stored within the document data to cause a modification of the displayed document; and

using the embedded web browser rendering engine to re-render the displayed document within the web portion.

2. The method of claim **1**, further comprising retrieving the document data from a server system prior to storing the document to the memory.

3. The method of claim **1**, further comprising storing the at least one parameter as a document setting corresponding to the document data.

4. The method of claim **3**, wherein storing the at least one parameter as a document setting comprises sending the at least one parameter to a server system for storing in a memory location within the server system.

5. The method of claim **1**, wherein the document data comprises at least one markup language.

6. The method of claim **1**, wherein the at least one function stored within the document data comprises a client-side language function.

7. The method of claim **1**, wherein the at least one parameter received from the control element is passed to the at least one function by exploiting a hook mechanism exposed in the document data that allows parameters to be passed from the native portion of the user interface to the web portion of the user interface.

8. The method of claim **1**, wherein the web portion comprises an embedded web browser rendering engine.

9. The method of claim **1**, wherein the at least one control element comprises one or more of a virtual button, drop-down box, slider, check box or radio button.

10. The method of claim **1**, wherein the at least one parameter relates to at least one of a font colour, font size, font type, or image to be displayed within the document.

11. A device comprising:

a user interface;

a memory storing executable code; and

a processor configured to access the memory to execute the executable code;

wherein when executing the executable code, the processor is caused to:

store document data corresponding to the document to the memory;

render the document data to cause the document to be displayed within a web portion of the user interface, wherein the web portion comprises an embedded web browser rendering engine;

render at least one control element within a native portion of the user interface by executing a native editing application;

in response to receiving an input via the at least one control element, pass at least one parameter to at least one function stored within the document data to cause a modification of the displayed document; and

using the embedded web browser rendering engine to re-render the displayed document within the web portion.

12. The device of claim **11**, further comprising a communications module configured to retrieve the document data from a server system over a network prior to storing the document to the memory.

13. The device of claim **11**, wherein the processor is further caused to store the at least one parameter as a document setting corresponding to the document data.

14. The device of claim **11**, wherein the processor is further caused to store the at least one parameter as a document setting corresponding to the document data and wherein storing the at least one parameter as a document setting comprises sending the at least one parameter to the server system over a network via the communications module for storing.

15. The device of claim **11**, wherein the document data comprises at least one markup language.

16. The device of claim **11**, wherein the at least one function stored within the document data comprises a client-side language function.

17. The device of claim **11**, wherein the processor is caused to pass the at least one parameter received from the control element to the at least one function by exploiting a hook mechanism exposed in the document data that allows parameters to be passed from the native portion of the user interface to the web portion of the user interface.

18. The device of claim **11**, wherein the web portion comprises an embedded web browser rendering engine.

19. The device of claim **11**, wherein the at least one parameter relates to at least one of a font colour, font size, font type, or image to be displayed within the document.

20. A non-transient computer-readable storage medium storing instructions that, when executed by a processor, cause the processor to perform a method comprising the steps of:

storing document data corresponding to a document to a memory of a computing device;

rendering the document data to cause the document to be displayed within a web portion of a user interface of the computing device, wherein the web portion comprises an embedded web browser rendering engine;

rendering at least one control element within a native portion of the user interface by executing a native editing application;

in response to receiving an input via the at least one control element, passing at least one parameter to at least one function stored within the document data to cause a modification of the displayed document; and

using the embedded web browser rendering engine to re-render the displayed document within the web portion.

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