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Storage medium, information processing apparatus, and control method for information processing apparatus

Abstract

A non-transitory computer-readable storage medium storing a program for causing a computer to execute a control method for an information processing apparatus that transmits a print job, which causes to execute a print processing according to an instruction, to an image forming apparatus, the control method including a step of obtaining a total number of already-printed pages including the number of pages already printed to date, and a step of, in a case that a sum of the total number of already-printed pages and the number of pages included in the instruction exceeds a threshold value corresponding to a contracted plan, causing a display unit of the information processing apparatus to display a user interface including a first object for instructing to transmit a print job that causes to execute a print processing exceeding the threshold value, and a second object for instructing to cancel transmitting the print job.

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Background/Summary

BACKGROUND OF THE INVENTION
Field of the Invention
(1) The present invention relates to a storage medium, an information processing apparatus, and a control method for the information processing apparatus.
Description of the Related Art
(2) In recent years, due to the reduction of initial investment in offices and ease of budget management, an increasing number of people are using a fixed-rate plan (a subscription) for a printer (including office equipment having a printer function such as a multifunction peripheral (an MFP)). In the subscription for the printer, for example, by paying a fixed monthly fee, a user is able to print up to a predetermined maximum number of pages without paying an additional fee. In addition, there are several plans for the maximum number of pages, so the user is able to select a desired plan from the several plans by using, for example, the average number of printed pages per month as an index.

(3) However, in the case that the user needs to print more than the maximum number of pages for a plan under contract (hereinafter, referred to as "a current plan"), the plan under contract (the current plan) is often accompanied with a contract that automatically shifts the current plan to the next plan with a higher maximum number of pages than that of the current plan or a contract that an additional fee will apply depending on the number of excess pages.

(4) On the other hand, the number of printed pages is managed so that the number of printed pages does not exceed the maximum number of pages. Japanese Laid-Open Patent Publication (kokai) No. 2006-221262 has disclosed a configuration (a technique) that allows the user to select whether to cancel printing or to change to a print setting, which does not exceed the maximum number of pages, in the case of becoming printing exceeding the maximum number of pages when printing is instructed from a computer.

(5) However, the user may want to perform printing even in the case that automatically shifting of the plan under contract to the next plan is performed or the user has to bear expenses (pay the additional fee) depending on the number of excess pages. However, in the case of using the technique (the configuration) disclosed in Japanese Laid-Open Patent Publication (kokai) No. 2006-221262, the user is not able to perform the printing exceeding the maximum number of pages (the user is not able to print more than the maximum number of pages).

SUMMARY OF THE INVENTION

(6) The present invention provides a mechanism capable of answering a need to print more than the maximum number of pages in a current plan even by allowing changing from the current plan to the next plan or applying of an additional fee for exceeding the number of printed pages.

(7) Accordingly, the present invention provides a non-transitory computer-readable storage medium storing a program for causing a computer to execute a control method for an information processing apparatus that transmits a print job, which causes to execute a print processing according to an instruction issued by a user, to an image forming apparatus, which restricts the number of printed pages based on a contracted plan, the control method comprising a step of obtaining a total number of already-printed pages including the number of pages already printed to date by the image forming apparatus, and a step of, in a case that a sum of the total number of already-printed pages and the number of pages included in the instruction exceeds a threshold value corresponding to the contracted plan, causing a display unit of the information processing apparatus to display a user interface including a first object for instructing to transmit a print job that causes the image forming apparatus to execute a print processing exceeding the threshold value, and a second object for instructing to cancel transmitting the print job to the image forming apparatus.

(8) According to the present invention, it is possible to answer the need to print more than the maximum number of pages in the current plan even by allowing changing from the current plan to the next plan or applying of the additional fee for exceeding the number of printed pages.

(9) Further features of the present invention will become apparent from the following description of exemplary embodiments with reference to the attached drawings.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

(1) FIG. **1** is a diagram that shows a schematic configuration of a printing system including a computer functioning as an information processing apparatus according to a preferred embodiment of the present invention.

(2) FIGS. **2**A, **2**B, and **2**C are block diagrams that show hardware configurations of the computer, a subscription server, and a printer that constitute the printing system shown in FIG. **1**.

(3) FIG. **3** is a block diagram that shows a configuration of print-related software of the computer.

(4) FIG. **4** is a diagram that shows an example of a subscription plan for the printer in a first

embodiment.

(5) FIG. **5** is a diagram that shows an example of a user interface (a UI) displayed on a display unit of the computer in the first embodiment.

(6) FIG. **6** is a flowchart of a processing performed by a printer driver in the first embodiment.

(7) FIG. **7** is a flowchart of a response processing performed by the printer with respect to an information obtaining request.

(8) FIG. **8** is a flowchart of a print processing executed by the printer in the first embodiment.

(9) FIG. **9** is a flowchart of a processing executed by the subscription server based on information from the printer in the first embodiment.

(10) FIG. **10** is a diagram that shows another example of the UI displayed on the display unit of the computer.

(11) FIG. **11** is a diagram that shows an example of a subscription plan for the printer in a second embodiment.

(12) FIG. **12** is a diagram that shows an example of a UI displayed on the display unit of the computer in the second embodiment.

(13) FIG. **13** is a flowchart of a processing performed by the printer driver in the second embodiment.

(14) FIG. **14** is a flowchart of a print processing executed by the printer in the second embodiment.

(15) FIG. **15** is a flowchart of a processing executed by the subscription server based on information from the printer in the second embodiment.

DESCRIPTION OF THE EMBODIMENTS

(16) The present invention will now be described in detail below with reference to the accompanying drawings showing embodiments thereof.

(17) Hereinafter, preferred embodiments of the present invention will be described in detail with reference to the accompanying drawings.

(18) FIG. **1** is a diagram that shows a schematic configuration of a printing system including a computer **100** functioning as an information processing apparatus according to a preferred embodiment of the present invention. The configuration of the printing system is common to a first embodiment and a second embodiment, which will be described below. As shown in FIG. **1**, the printing system includes a subscription server **130**, the computer **100** functioning as the information processing apparatus, and a printer **120** functioning as an image forming apparatus. The computer **100** and printer **120** are installed in, for example, an office, and are communicably connected to each other via an in-house network **140**. The in-house network **140** is connected to the Internet **150** via a router (not shown). It should be noted that the in-house network **140** is, for example, a local area network (a LAN), but it does not matter whether it is a wired connection or a wireless connection.

(19) The subscription server **130** is a server that provides a printer subscription service, is managed by a printer subscription provider, and is connected to the Internet **150**. In this way, the subscription server **130** is communicably connected to the computer **100** and the printer **120** via the Internet **150** and the in-house network **140**. It should be noted that regarding the use of the printer **120**, it is assumed that a contract under any one of plans 1 to 4 and A to D described below has been concluded between a user of the printer **120** and the printer subscription provider.

(20) FIG. **2**A is a block diagram that shows a hardware configuration of the computer **100**. As shown in FIG. **2**A, the computer **100** includes a display unit **201**, an operation unit **202**, a storage unit **203**, a control unit **204**, and a network communication unit **205**, and the control unit **204** includes a central processing unit (a CPU) **211** and a memory **212**.

(21) The display unit **201** is a display device such as a liquid crystal display (an LCD). The operation unit **202** is an input device including, for example, a mouse and a keyboard that accept operations performed by the user. The storage unit **203** is a storage medium such as a hard disk drive (an HDD) or a solid state drive (an SSD), and stores various kinds of software necessary for

the operations of the computer **100**.

(22) The control unit **204** performs overall control of the computer **100** by causing the CPU **211** to execute predetermined programs stored in the memory **212** and the storage unit **203**. In addition, the control unit **204** causes the CPU **211** to load a predetermined software program stored in the storage unit **203** into the memory **212**, thereby executing various kinds of processing, which will be described below. The network communication unit **205** is connected to an external network such as the Internet **150** via the in-house network **140**, and performs input/output of data from/to external apparatuses.

(23) FIG. **2B** is a block diagram that shows a hardware configuration of the subscription server **130**. As shown in FIG. **2B**, the subscription server **130** includes a display unit **221**, an operation unit **222**, a storage unit **223**, a control unit **224**, and a network communication unit **225**, and the control unit **224** includes a CPU **231** and a memory **232**.

(24) Although the subscription server **130** and the computer **100** execute different programs (different processing), they have almost the same hardware configuration. Therefore, the description of the hardware configuration of the subscription server **130** is similar to the description of the hardware configuration of the computer **100**, and the description of the hardware configuration of the subscription server **130** will be omitted here.

(25) FIG. **2C** is a block diagram that shows a hardware configuration of the printer **120**. As shown in FIG. **2C**, the printer **120** includes a display unit **241**, an operation unit **242**, a storage unit **243**, a control unit **244**, a network communication unit **245**, and a printing unit **246**, and the control unit **244** includes a CPU **251** and a memory **252**.

(26) The display unit **241** is a display device such as an LCD. The operation unit **242** is an input means including, for example, a touch panel, buttons, switches, and the like that accept operations performed by the user. The touch panel is disposed to overlap a display panel of the display device, and the touch panel and the display device cooperate to function as an operation means for accepting user operations. The storage unit **243** is a storage medium such as an HDD or an SSD, and stores various kinds of software necessary for the operations of the printer **120**.

(27) The control unit **244** performs overall control of the printer **120** by causing the CPU **251** to execute predetermined programs stored in the memory **252** and the storage unit **243**. In addition, the control unit **244** causes the CPU **251** to load a predetermined software program stored in the storage unit **243** into the memory **252**, thereby executing various kinds of processing, which will be described below.

(28) The network communication unit **245** is connected to the external network such as the Internet **150** via the in-house network **140**, and performs input/output of data from/to the external apparatuses. The printing unit **246** converts digital data stored in the storage unit **243** or the memory **252** into an image according to an instruction from the control unit **244**, and prints the image on recording sheets (printing sheets). The printing method is not limited, and for example, an inkjet method or an electrophotographic method may be used.

(29) FIG. **3** is a block diagram that shows a configuration of print-related software of the computer **100**. As shown in FIG. **3**, the print-related software includes an application **301** and an operating system (an OS) **302**. In addition, the OS **302** includes a graphic device interface (a GDI) **311**, a printer driver **312**, and a spooler **313**. The application **301** refers to any software such as document creation software, spreadsheet software, or image editing software, and is assumed to include a printing function. By executing the printing function included in the application **301**, the user is able to print information and the like displayed on the display unit **201** of the computer **100** by using the printer **120**. The printing function included in the application **301** is realized by calling an interface provided by the GDI **311** out.

(30) The OS **302** is software that controls the basic operations of the computer **100**. The application **301** and the printer driver **312** are managed by the OS **302**, and become usable by being installed on the OS **302**. The GDI **311** is a component that provides an interface related to rendering such as

printing to the external apparatus. The printer driver **312** displays print settings for performing printing with the printer **120** on the display unit **201**, and also generates rendering data (page description language (PDL)) that can be interpreted by the printer **120** during printing. The spooler **313** transmits the PDL generated by the printer driver **312** to the printer **120**.

(31) The above description is a description of the configuration common to the first embodiment and the second embodiment, which will be described below.

(32) First, the first embodiment will be described. FIG. **4** is a plan table that shows an example of a subscription plan for the printer **120** in the first embodiment. As shown in FIG. **4**, the plans 1, 2, 3, and 4 are available as the subscription plan. The maximum number of pages for the plan 1 is 10 pages per month, and the monthly fee is 1,500 yen. For the plans 2 to 4 as well, the maximum number of pages per month (the monthly maximum number of pages) and the monthly fee are determined as shown in FIG. **4**. It should be noted that the maximum number of pages indicates a threshold value for the number of printed pages per month determined for each plan. In the case that the user has subscribed to the subscription plan shown in FIG. **4**, when printing exceeding the maximum number of pages is performed, it is assumed that automatically shifting to the plan with the next highest monthly maximum number of pages is performed.

(33) It is desirable for the user to perform printing within the maximum number of pages in his/her contracted plan (a current plan), but in the case of exceeding the maximum number of pages, since his/her contracted plan shifts to the plan with the next highest maximum number of pages (a new plan), the user will need to pay the monthly fee for the new plan.

(34) FIG. **5** is a diagram that shows a user interface (hereinafter, referred to as "a UI") **500** displayed on the display unit **201** by the printer driver **312** in the case that in the first embodiment, when printing of the number of all pages in a print job is performed, the number of all pages in the print job will exceed the maximum number of pages for the current plan.

(35) The UI **500** includes an explanation **501** that calls attention to the fact that if you perform printing with the current settings, your contracted plan will be shifted to the next subscription plan, plan information **502** for the current plan and the next plan, a print button **511**, a limited print button **512**, and a cancel button **513**. In addition, the print button **511**, the limited print button **512**, and the cancel button **513** accept a selection from the user. It should be noted that the current plan is a plan that is currently under contract. In addition, the next plan is a plan that will be applied by automatic shifting in the case that printing exceeding the maximum number of pages of the current plan is performed, and is a plan with less restriction on the number of printed pages than the current plan. In the case of the plan table shown in FIG. **4**, it is assumed that the plan 1 is shifted to the plan 2, the plan 2 is shifted to the plan 3, and the plan 3 is shifted to the plan 4.

(36) The plan information **502** represents a plan name, the maximum number of pages, and a fee that are shown in FIG. **4**, and the number of pages printed to date (more precisely, "a total number of already-printed pages", which will be described below). The print button **511** is a button for instructing to perform printing after allowing the shifting from the current plan to the next plan, that is, a button for instructing to transmit a print job that causes the printer **120** to execute printing exceeding the maximum number of pages (the threshold value). The limited print button **512** is a button for instructing to perform printing up to the maximum number of pages of the current plan without allowing the shifting from the current plan to the next plan. In other words, the limited print button **512** is a button for instructing to transmit a print job that causes the printer **120** to execute printing of a predetermined number of pages among all pages included in an instruction received from the user. It should be noted that a sum of the predetermined number of pages and the total number of already-printed pages described below matches the maximum number of pages. The cancel button **513** is a button for instructing to cancel transmitting the print job to the printer **120**. Selection from the print button **511**, the limited print button **512**, and the cancel button **513** can be made by using any one of the mouse and the keyboard that constitute the operation unit **202**.

(37) FIG. **6** is a flowchart of a processing executed by the printer driver **312** during printing in the

first embodiment. Respective processes (respective steps) indicated by S numbers in the flowchart of FIG. **6** are realized by loading the printer driver **312** stored in the storage unit **203** of the computer **100** into the memory **212** and executing it by the CPU **211**. In addition, the flowchart of FIG. **6** is executed when printing is instructed after opening a screen of the printer driver **312** from the application **301** such as Microsoft Word and accepting the print settings.

(38) As shown in FIG. **6**, in S**601**, the printer driver **312** receives a print job from the application **301** via the GDI **311**. In S**602**, the printer driver **312** obtains the number of pages in the print job received in S**601**. For example, in the case that the application **301** is a type of application that transmits the number of pages and the number of pages is received from the application **301**, the number of pages to be printed (the number of printing sheets) is obtained based on the number of pages received from the application **301** and the print settings (single-sided/double-sided and aggregated layout). On the other hand, in the case that the application **301** is a type of application that does not transmit the number of pages, the number of pages to be printed is obtained by analyzing image data received from the application **301** and based on the print settings.

(39) In S**603**, the printer driver **312** obtains plan information for the current subscription contract and the total number of already-printed pages from the printer **120** via the network **140**. The total number of already-printed pages includes the number of pages already printed by the printer **120** to date.

(40) It should be noted that the plan information is the plan names of the current plan and the next plan, the monthly maximum numbers of pages of the current plan and the next plan, and the fees of the current plan and the next plan, and is used as the plan information **502** when the process of S**606** is executed later and the UI **500** is displayed.

(41) In S**604**, the printer driver **312** adds the number of pages in the print job obtained in S**602** to the current total number of already-printed pages obtained in S**603**, and determines whether or not executing this print job will exceed the maximum number of pages of the current plan (determines whether or not the maximum number of pages of the current plan will be exceeded in the case of executing this print job). In the case that the printer driver **312** determines that the maximum number of pages of the current plan will not be exceeded (NO in S**604**), the printer driver **312** executes the process of S**605**, and on the other hand, in the case that the printer driver **312** determines that the maximum number of pages of the current plan will be exceeded (YES in S**604**), the printer driver **312** executes the process of S**606**.

(42) In **605**, the printer driver **312** converts the print job for all designated pages into PDL, transmits the print job to the printer **120** via the spooler **313**, and then ends the processing shown in the flowchart of FIG. **6**. In S**606**, the printer driver **312** displays the UI **500** shown in FIG. **5** on the display unit **201**, and waits for an input operation performed by the user. In S**607**, the printer driver **312** confirms which button has been selected (pressed) among the print button **511**, the limited print button **512**, and the cancel button **513**. In the case of determining that the print button **511** has been pressed, the printer driver **312** executes the process of S**608**. Furthermore, in the case of determining that the limited print button **512** has been pressed, the printer driver **312** executes the process of S**609**. Moreover, in the case of determining that the cancel button **513** has been pressed, the printer driver **312** executes the process of S**610**.

(43) In S**608**, the printer driver **312** issues a print job, in which print data of all designated pages is converted into PDL, and then ends the processing shown in the flowchart of FIG. **6**. It should be noted that issuing a print job refers to generating a print job and transmitting it to the printer **120**. In S**609**, the printer driver **312** issues a print job, to which an attribute indicating that "the maximum number of pages cannot be exceeded" has been attached (hereinafter, referred to as "a print job with an attribute indicating that the maximum number of pages cannot be exceeded"). It should be noted that "the maximum number of pages cannot be exceeded" means that PDL for all pages is generated for the printer **120** and pages exceeding the maximum number of pages cannot be printed. After that, the printer driver **312** ends the processing shown in the flowchart of FIG. **6**. It

should be noted that the handling of the print job with the attribute indicating that the maximum number of pages cannot be exceeded will be described below. In S**610**, the printer driver **312** cancels printing, that is, does not transmit the print job to the printer **120**. After that, the printer driver **312** ends the processing shown in the flowchart of FIG. **6**.

(44) FIG. **7** is a flowchart of a response processing performed by the printer **120** with respect to an information obtaining request (S**603**) from the printer driver **312**. Processes (steps) indicated by S numbers in the flowchart of FIG. **7** are realized by loading the software stored in the storage unit **243** into the memory **252** and executing it by the CPU **251**.

(45) As shown in FIG. **7**, in S**701**, the control unit **244** receives a request to obtain the plan information and the total number of already-printed pages from the printer driver **312**. This corresponds to the printer **120** receiving an inquiry from the printer driver **312** through the process of S**603**. In S**702**, the control unit **244** obtains the plan information of the current plan and the number of pages already printed to date. It should be noted that the plan information is information regarding the plan name, the maximum number of pages, and the fee of the current plan selected from the plan table shown in FIG. **4**, and this information is stored in the storage unit **243** of the printer **120**. Furthermore, the number of pages already printed to date is a cumulative number of pages printed by the printer **120** from the first day of the month to the present (from the first day of the month to date), and is stored in the storage unit **243**. It should be noted that the number of already-printed pages is updated every time printing is performed.

(46) In S**703**, the control unit **244** obtains a total number of pages of the current print jobs accumulated in a print queue. The print queue is an area in the storage unit **243** in which print jobs that are scheduled to be printed but have not yet been printed are listed. Normally, in the case that print jobs are accumulated in the print queue, a subsequently received print job is listed at the end of the print queue and is executed after all the accumulated print jobs are completed.

(47) In S**704**, the control unit **244** calculates the total number of already-printed pages, which is the number of already-printed pages including the number of pages that are scheduled to be printed based on the obtained number of already-printed pages and the total number of pages of the print jobs accumulated in the print queue. It should be noted that in the case that no print job is accumulated in the print queue, the total number of already-printed pages obtained in S**704** is the number of already-printed pages obtained in S**702**.

(48) In S**705**, the control unit **244** returns the plan information obtained in S**702** and the total number of already-printed pages calculated in S**704** to the printer driver **312** of the computer **100**, and then ends the response processing shown in the flowchart of FIG. **7**. In this way, by returning the total number of already-printed pages that also takes the number of pages that are scheduled to be printed into account to the computer **100**, the printer driver **312** becomes able to more accurately make the determination in S**604**.

(49) FIG. **8** is a flowchart of a print processing executed by the printer **120** in the first embodiment. Processes (steps) indicated by S numbers in the flowchart of FIG. **8** are realized by loading the software stored in the storage unit **243** into the memory **252** and executing it by the CPU **251**.

(50) As shown in FIG. **8**, in S**801**, the control unit **244** receives the print job from the printer driver **312**. Here, it is assumed that no print job is accumulated in the print queue. In S**802**, the control unit **244** confirms (determines) whether or not there are any unprinted pages in the received print job. In the case that the control unit **244** determines that there are unprinted pages in the received print job (YES in S**802**), the control unit **244** executes the process of S**803**, and on the other hand, in the case that the control unit **244** determines that there are no unprinted pages in the received print job (NO in S**802**), the control unit **244** executes the process of S**807**.

(51) In S**803**, the control unit **244** determines whether or not the number of pages already printed to date has reached the maximum number of pages in the current subscription plan. In the case that the control unit **244** determines that the number of pages already printed to date has reached the maximum number of pages in the current subscription plan (YES in S**803**), the control unit **244**

executes the process of S**804**, and on the other hand, in the case that the control unit **244** determines that the number of pages already printed to date has not reached the maximum number of pages in the current subscription plan (NO in S**803**), the control unit **244** executes the process of S**805**.

(52) In S**804**, the control unit **244** determines whether or not the print job received in S**801** is the print job with the attribute indicating that the maximum number of pages cannot be exceeded. In the case that the control unit **244** determines that the print job received in S**801** is the print job with the attribute indicating that the maximum number of pages cannot be exceeded (YES in S**804**), the control unit **244** executes the process of S**807** without performing printing of the unprinted pages. On the other hand, in the case that the control unit **244** determines that the print job received in S**801** is not the print job with the attribute indicating that the maximum number of pages cannot be exceeded (NO in S**804**), the control unit **244** executes the process of S**805**. In S**805**, the control unit **244** prints only one unprinted page of the print job. Then, in S**806**, the control unit **244** increments the number of already-printed pages stored in the storage unit **243** (adds 1 to the number of already-printed pages stored in the storage unit **243**), updates and stores the incremented number of already-printed pages, and then executes the process of S**802**.

(53) In S**807**, the control unit **244** finishes printing and transmits the number of already-printed pages stored in the storage unit **243** to the subscription server **130**. In S**808**, the control unit **244** requests the subscription server **130** to transmit the plan information of the current plan, obtains the plan information of the current plan (in the case that printing exceeding the maximum number of pages is performed, plan information after plan change) from the subscription server **130**, and stores it in the storage unit **243**.

(54) In this way, in the case that the printer **120** has received a print job based on pressing the print button **511** of the UI **500** from the computer **100**, the printer **120** prints all pages, and in the case that the printer **120** has received a print job based on the limited print button **512** of the UI **500** from the computer **100**, the printer **120** is able to perform printing without exceeding the maximum number of pages.

(55) FIG. **9** is a flowchart of a processing executed by the subscription server **130** when the subscription server **130** obtains information from the printer **120**. Processes (steps) indicated by S numbers in the flowchart of FIG. **9** are realized by loading the software stored in the storage unit **223** into the memory **232** and executing it by the CPU **231**.

(56) As shown in FIG. **9**, in S**901**, the control unit **224** receives predetermined information from the printer **120**. In S**902**, the control unit **224** determines whether or not the content of the received information is update information for the number of already-printed pages. In other words, the control unit **224** determines whether or not the information received in S**901** is the information obtained by the process of S**807** of the flowchart of FIG. **8**. In the case that the control unit **224** determines that the content of the received information is the update information for the number of already-printed pages (YES in S**902**), the control unit **224** executes the process of S**903**, and on the other hand, in the case that the control unit **224** determines that the content of the received information is not the update information for the number of already-printed pages (NO in S**902**), the control unit **224** executes the process of S**906**.

(57) In S**903**, the control unit **224** updates the number of already-printed pages stored in the storage unit **223**, which corresponds to the printer **120** that has transmitted the information in S**901**, with the value received in S**901**. Next, in S**904**, the control unit **224** determines whether or not the number of already-printed pages updated in S**903** exceeds the maximum number of pages in the current subscription plan contracted for the printer **120** that has transmitted the information in S**901**. It should be noted that it is assumed that the plan information of each subscription plan and the current plan contracted for the printer **120** are also stored in the storage unit **223**. In the case that the control unit **224** determines that the number of already-printed pages updated in S**903** exceeds the maximum number of pages in the current subscription plan contracted for the printer **120** that has transmitted the information in S**901** (YES in S**904**), the control unit **224** executes the

process of S**905**, and on the other hand, in the case that the control unit **224** determines that the number of already-printed pages updated in S**903** does not exceed the maximum number of pages in the current subscription plan contracted for the printer **120** that has transmitted the information in S**901** (NO in S**904**), the control unit **224** ends the processing shown in the flowchart of FIG. **9**.

(58) In S**905**, the control unit **224** changes the subscription plan for the printer **120** that has transmitted the information in S**901** from the current plan to the next plan, and then ends the processing shown in the flowchart of FIG. **9**. For example, in the case that the contracted subscription plan is the plan 3 in the plan table shown in FIG. **4**, when the number of already-printed pages exceeds **500**, the contracted subscription plan is changed to the plan 4, which is the next plan. As a result, in the case that printing exceeding the maximum number of pages of the current plan is performed, it becomes possible to automatically update to the next plan.

(59) In S**906**, the control unit **224** determines whether or not the information received in S**901** is a request to transmit the plan information. In other words, whether or not a request to transmit the plan information of the current plan from the printer **120** through the process of S**808** in the flowchart of FIG. **8** has been accepted is determined. In the case that the control unit **224** determines that the information received in S**901** is the request to transmit the plan information (YES in S**906**), the control unit **224** executes the process of S**907**, and on the other hand, in the case that the control unit **224** determines that the information received in S**901** is not the request to transmit the plan information (NO in S**906**), the control unit **224** executes the process of S**908**.

(60) In S**907**, the control unit **224** takes out the plan information of the printer **120** that has transmitted the information in S**901** from the storage unit **223**, transmits it to the printer **120**, and then ends the processing shown in the flowchart of FIG. **9**. In S**908**, the control unit **224** executes processing with respect to any other request received in S**901** that is neither the update of the number of already-printed pages nor the request to transmit the plan information, and then ends the processing shown in the flowchart of FIG. **9**. It should be noted that the other processing executed in S**908** have no direct relation to the present invention, and therefore their description will be omitted.

(61) As described above, according to the present embodiment, in the case that the sum of the total number of already-printed pages and the number of pages in the print job obtained in S**602** exceeds the maximum number of pages of the current plan, the UI **500** including the print button **511** and the cancel button **513** is displayed on the display unit **201**. The print button **511** is the button for instructing to execute printing after allowing the shifting from the current plan to the next plan, that is, the button for instructing to transmit the print job that causes the printer **120** to execute printing exceeding the maximum number of pages. With the above configuration, the user becomes able to choose whether or not to perform printing exceeding the maximum number of pages before printing is executed even by allowing the change of the subscription plan, and it is possible to enhance the convenience when using the printer subscription service.

(62) In addition, in the present embodiment, the UI **500** further displays the explanation **501** that calls attention to the fact that if you perform printing with the current settings, your contracted plan will be shifted to the next subscription plan, and the plan information **502** for the current plan and the next plan. As a result, it is possible to make it easier for the user to decide whether or not to perform printing exceeding the maximum number of pages even by allowing the change of the subscription plan.

(63) In addition, in the present embodiment, the UI **500** further includes the limited print button **512**. The limited print button **512** is the button for instructing to transmit the print job that causes the printer **120** to execute printing of the predetermined number of pages among all pages included in the instruction received from the user. It should be noted that the sum of the predetermined number of pages and the total number of already-printed pages matches the maximum number of pages. By displaying the UI **500** including such a limited print button **512**, it is possible to provide the user with the option of performing printing without exceeding the maximum number of pages.

(64) It should be noted that the UI **500** shown in FIG. **5** is an example of a UI that is displayed in the case that there is a high possibility of shifting from the current plan to the next plan, and the example of the UI in such a case is not limited to the UI **500**. FIG. **10** is a diagram that shows another UI **1000** that the printer driver **312** displays on the display unit **201** in the case that there is a high possibility of shifting from the current plan to the next plan.

(65) The UI **1000** includes an explanation **1001** that calls attention to the fact that if you perform printing with the current settings, your contracted plan will be shifted to the next subscription plan, a print job content **1002** displaying the number of pages scheduled to be printed, and plan information **1003** for the current plan and the next plan. In this example, an example is shown in which printing of multiple copies is performed, and one of four options can be selected from the explanation **1001**, the print job content **1002**, and the plan information **1003**. Therefore, the UI **1000** includes a print button **1011**, a first limited print button **1012**, a second limited print button **1013**, and a cancel button **1014** that accept a selection from the user.

(66) The user can recognize from the content of the explanation **1001** that if performing printing exceeding 15 pages, the subscription plan will be changed to the next plan. The print job content **1002** represents the number of pages per copy in the print job that is about to be performed, the number of copies to be printed, and the total number of pages to be printed. The plan information **1003** is similar to the plan information **502**, and represents the plan name, the maximum number of pages, and the number of pages printed to date that are shown in FIG. **4**. It should be noted that although the plan information **1003** does not display the fees for respective plans, they may be displayed.

(67) In the case that the user wants to perform printing of all copies with allowing the change from the current plan to the next plan, the user only has to press (select) the print button **1011**. Further, in the case that the user wants to perform printing of only one copy (10 pages) when the change from the current plan to the next plan is not allowed, the user only has to press (select) the first limited print button **1012**. On the other hand, in the case that the user wants to use up to the maximum number of pages within the current plan, the user only has to press (select) the second limited print button **1013**. The user can also cancel the print job by pressing the cancel button **1014**.

(68) In this way, the printer driver **312** may be configured to obtain the number of pages from the print job from the application **301** and provide a plurality of print patterns (print options) to the user. In the case that the first limited print button **1012** has been pressed, or in the case that the second limited print button **1013** has been pressed, the printer driver **312** internally changes the number of copies to be printed or the number of pages to be printed, and then executes the print processing. The processing of the printer driver **312** at this time can be performed by using existing (publicly known) technology, and therefore the description thereof will be omitted.

(69) Next, the second embodiment will be described. In the first embodiment, the case has been described in which when printing exceeding the maximum number of pages of the subscription plan under contract is performed, the subscription plan is automatically shifted to the next plan. On the other hand, in the second embodiment, the case will be described in which when printing exceeding the maximum number of pages of the subscription plan under contract is performed, plan change will not be made automatically and an additional fee will apply depending on the number of excess pages. Since the configuration of the printing system in the second embodiment is equivalent to the configuration of the printing system in the first embodiment and the hardware configurations of the respective apparatuses constituting the printing system in the second embodiment are also equivalent to the hardware configurations of the respective apparatuses constituting the printing system in the first embodiment, the descriptions thereof will be omitted.

(70) FIG. **11** shows an example of a subscription plan for the printer in the second embodiment. As shown in FIG. **11**, the plans A, B, C, and D are available as the subscription plan. The maximum numbers of pages for the plans A to D are the same as the maximum numbers of pages for the plans 1 to 4 of the subscription plan shown in FIG. **4**, but the plans A to D and the plans 1 to 4 behave

differently in the case that printing exceeding the maximum number of pages is performed. That is, in the plans A to D, in the case that printing exceeding the maximum number of pages is performed, the subscription plan under contract will not be automatically changed to the next plan, and an additional fee of 150 yen will be applied for every 10 pages printed. The user can perform printing exceeding the maximum number of pages of the current plan just by paying a slightly higher additional fee depending on the number of pages exceeding the maximum number of pages of the current plan.

(71) FIG. **12** is a diagram that shows a UI **1200** that the printer driver **312** displays on the display unit **201** in the second embodiment in the case that printing all the pages of the print job will exceed the maximum number of pages of the current plan.

(72) The UI **1200** includes an explanation **1201** that calls attention to the fact that an additional fee will be applied when printing all the pages of the print job, and first plan information **1202** indicating the plan information of the current plan and the additional fee when printing all the pages of the print job. In addition, in order to enable printing after changing from the current plan to the next plan, the UI **1200** includes second plan information **1203** indicating the plan information of the next plan.

(73) The UI **1200** further includes a print button **1211**, a plan change and print button **1212**, and a cancel button **1213** that accept a selection from the user. The print button **1211** is a button for instructing to perform printing of all the pages of the print job by paying an additional fee. The plan change and print button **1212** is a button for instructing to perform printing of all the pages of the print job by changing from the current plan to the next plan without paying an additional fee for excess pages. The cancel button **1213** is a button for instructing to cancel transmitting the print job to the printer **120**.

(74) FIG. **13** is a flowchart of a processing executed by the printer driver **312** during printing in the second embodiment. Respective processes (respective steps) indicated by S numbers in the flowchart of FIG. **13** are realized by loading the printer driver **312** stored in the storage unit **203** of the computer **100** into the memory **212** and executing it by the CPU **211**. It should be noted that the flowchart of FIG. **13** is similar to the flowchart of FIG. **6** described above, and hereinafter, in particular, contents that are different from the flowchart of FIG. **6** will be described. Similar to the flowchart of FIG. **6**, the flowchart of FIG. **13** is executed when printing is instructed after opening a screen of the printer driver **312** from the application **301** such as Microsoft Word and accepting the print settings.

(75) Since the respective processes of S**1301** to S**1307** and S**1310** are the same as the respective processes of S**601** to S**607** and S**610** shown in the flowchart of FIG. **6**, the description thereof will be omitted here. It should be noted that a message (a UI) displayed on the display unit **201** in S**1306** is the UI **1200** shown in FIG. **12**.

(76) In the case of determining in S**1307** that the print button **1211** has been pressed, the printer driver **312** executes the process of S**1308**. In S**1308**, the printer driver **312** issues a print job, in which print data of all the pages is converted into PDL, and then ends the processing shown in the flowchart of FIG. **13**. In this case, the additional fee for the excess pages will be charged.

(77) In the case of determining in S**1307** that the plan change and print button **1212** has been pressed, the printer driver **312** executes the process of S**1309**. In S**1309**, the printer driver **312** issues a print job in which print data of all the pages is converted into PDL and to which a plan change instruction has been attached, and then ends the processing shown in the flowchart of FIG. **13**. It should be noted that the handling of the print job to which the plan change instruction has been attached will be described below.

(78) FIG. **14** is a flowchart of a print processing executed by the printer **120** in the second embodiment. Processes (steps) indicated by S numbers in the flowchart of FIG. **14** are realized by loading the software stored in the storage unit **243** into the memory **252** and executing it by the CPU **251**. It should be noted that the flowchart of FIG. **14** is similar to the flowchart of FIG. **8**

described above, and hereinafter, in particular, contents that are different from the flowchart of FIG. **8** will be described.

(79) As shown in FIG. **14**, in S**1401**, the control unit **244** receives the print job from the printer driver **312**. Here, it is assumed that no print job is accumulated in the print queue of the printer **120**. In S**1402**, the control unit **244** determines whether or not the plan change instruction has been attached to the received print job. In other words, the control unit **244** confirms whether or not the print job issued by the printer driver **312** in S**1309** has reached the printer **120** in S**1401**. In the case that the control unit **244** determines that the plan change instruction has been attached to the received print job (YES in S**1402**), the control unit **244** executes the process of S**1403**, and on the other hand, in the case that the control unit **244** determines that the plan change instruction has not been attached to the received print job (NO in S**1402**), the control unit **244** executes the process of S**1405**.

(80) In S**1403**, the control unit **244** requests the subscription server **130** to change the subscription plan from the current plan to the next plan. Then, in S**1404**, the control unit **244** obtains plan information after plan change (the plan information of the next plan) from the subscription server **130**, stores it in the storage unit **243**, and then executes the process of S**1405**.

(81) Since the respective processes of S**1405**, S**1406**, S**1407**, S**1408**, and S**1409** are the same as the respective processes of S**802**, S**803**, S**805**, S**806**, and S**807** that have been described with reference to the flowchart of FIG. **8**, the description thereof will be omitted. It should be noted that although the process of S**804** is executed in the case that the determination in S**803** is YES, the process of S**1409** is executed in the case that the determination in S**1406** is YES. By executing the process of S**1409**, the print processing shown in the flowchart of FIG. **14** ends.

(82) FIG. **15** is a flowchart of a processing executed by the subscription server **130** when the subscription server **130** obtains information from the printer **120** in the second embodiment. Processes (steps) indicated by S numbers in the flowchart of FIG. **15** are realized by loading the software stored in the storage unit **223** into the memory **232** and executing it by the CPU **231**. It should be noted that the flowchart of FIG. **15** is similar to the flowchart of FIG. **9** described above, and hereinafter, in particular, contents that are different from the flowchart of FIG. **9** will be described.

(83) As shown in FIG. **15**, in S**1501**, the control unit **224** receives predetermined information from the printer **120**. In S**1502**, the control unit **224** determines whether or not the content of the received information is a request to change the subscription plan from the current plan to the next plan (hereinafter, referred to as "a plan change request"). In other words, the control unit **224** determines whether or not the information received in S**1501** is the information obtained by the process of S**1403** of the flowchart of FIG. **14**. In the case that the control unit **224** determines that the content of the received information is the plan change request (YES in S**1502**), the control unit **224** executes the process of S**1503**, and on the other hand, in the case that the control unit **224** determines that the content of the received information is not the plan change request (NO in S**1502**), the control unit **224** executes the process of S**1504**.

(84) In S**1503**, the control unit **224** updates the current plan, which is stored in the storage unit **223** as information corresponding to the printer **120** that has transmitted the information in S**1501**, to the next plan and stores it, and then ends the processing shown in the flowchart of FIG. **15**.

(85) The determination process of S**1504**, and the processes of S**1505** and S**1508** that are executed based on the determination result of the determination process of S**1504** are the same as the processes of S**902**, S**903**, and S**906** that are shown in the flowchart of FIG. **9**, respectively, and therefore the description thereof will be omitted here. In addition, the processes of S**1509** and S**1510** that are executed based on the result of the determination process of S**1508** are the same as the processes of S**908** and S**907** that are shown in the flowchart of FIG. **9**, respectively, and therefore the description thereof will be omitted here.

(86) In S**1506** executed following S**1505**, the control unit **224** determines whether or not the

number of already-printed pages updated in S**1505** exceeds the maximum number of pages in the current subscription plan contracted for the printer **120** that has transmitted the information in S**1501**. It should be noted that it is assumed that the plan information of each subscription plan (see FIG. **11**) and the current plan contracted for the printer **120** are stored in the storage unit **223**. In the case that the control unit **224** determines that the number of already-printed pages updated in S**1505** exceeds the maximum number of pages in the current subscription plan contracted for the printer **120** that has transmitted the information in S**1501** (YES in S**1506**), the control unit **224** executes the process of S**1507**, and on the other hand, in the case that the control unit **224** determines that the number of already-printed pages updated in S**1505** does not exceed the maximum number of pages in the current subscription plan contracted for the printer **120** that has transmitted the information in S**1501** (NO in S**1506**), the control unit **224** ends the processing shown in the flowchart of FIG. **15**.

(87) In S**1507**, the control unit **224** counts the number of excess pages as additional fee pages for the printer **120** (counts the number of excess pages as subject to an additional fee for the printer **120**), and then ends the processing shown in the flowchart of FIG. **15**. For example, in the case that the current plan is the plan C and the number of already-printed pages exceeds **500**, the number of excess pages (=the number of already-printed pages-**500**) will be counted as additional fee pages. As a result, in the case that printing exceeding the maximum number of pages of the current plan is performed, the user only has to pay an additional fee corresponding to the number of excess pages.

(88) As described above, in the second embodiment, in the case that changing from the current plan to the next plan is not allowed, the user is able to select and print the desired number of pages. In addition, in the case of performing printing exceeding the maximum number of pages of the current plan, the user is able to immediately select whether to perform printing by paying an additional fee for the number of excess pages exceeding the maximum number of pages of the current plan, or to perform printing by updating the current plan to the next plan, and then is able to execute the print job. In this way, it is possible to enhance the convenience when using the subscription service of the printer **120**.

(89) In addition, in the second embodiment, the UI **1200** includes the explanation **1201** that calls attention to the fact that an additional fee will be applied when printing of all the pages of the print job is performed, and the first plan information **1202** indicating the additional fee when printing of all the pages of the print job is performed. As a result, it is possible to make it easier for the user to decide whether or not to perform printing of all the pages of the print job even by paying an additional fee.

(90) Although the present invention has been described above in detail based on its preferred embodiments, the present invention is not limited to these specific embodiments, and the present invention also includes various forms without departing from the gist of the invention. Further, each of the embodiments described above is merely one embodiment of the present invention, and each embodiment can be combined as appropriate.

(91) For example, a part of the operations described in the above-described embodiments as operations of the printer driver **312** within the computer **100** may be executed by a dedicated application. In this case, the dedicated application resides in the computer **100** and monitors print jobs, and in the case that the issuance of the print job of the subscription plan is detected, performs the processing corresponding to the flowchart of FIG. **6** and the processing corresponding to the flowchart of FIG. **13**.

(92) The transmission and reception of data between the computer **100**, the printer **120**, and the subscription server **130** can be realized without using the above configuration. For example, in the above-described embodiments, although the printer driver **312** is configured to obtain the plan information of the current plan and the number of already-printed pages from the printer **120**, the present invention is not limited thereto, and these pieces of information may be obtained from the subscription server **130**.

(93) Furthermore, in the above-described embodiments, although the configuration, in which the UI **500**, the UI **1000**, and the UI **1200** are displayed on the display unit **201** of the computer **100** that transmits the print job to the printer **120**, has been described, the present invention is not limited to this configuration. For example, the UI **500**, the UI **1000**, and the UI **1200** may be displayed on the display unit **241** of the printer **120** that has received a copy instruction issued by the user's operation of the operation unit **242** of the printer **120**. In the case of causing the display unit **241** of the printer **120** to display these UIs, for example, these UIs are displayed on the display unit **241** after all set documents have been read. Alternatively, the number of pages of a document to be copied is measured, whether or not the measured number of pages is less than a predetermined value is determined, and the display control of these UIs is performed based on the result of this determination. For example, in the case that the measured number of pages is less than the predetermined value, whether or not the maximum number of pages is exceeded is determined each time one page of the document is read, and when the maximum number of pages is exceeded, these UIs are displayed on the display unit **241**. On the other hand, in the case that the measured number of pages is equal to or greater than the predetermined value, whether or not the maximum number of pages is exceeded is determined after all set documents have been read, and when the maximum number of pages is exceeded, these UIs are displayed on the display unit **241**. By controlling in this way, even with a configuration in which the user issues a copy instruction from the operation unit **242** of the printer **120**, the same effects as in the above-described embodiments can be achieved.

Other Embodiments

(94) Embodiment(s) of the present invention can also be realized by a computer of a system or apparatus that reads out and executes computer executable instructions (e.g., one or more programs) recorded on a storage medium (which may also be referred to more fully as a 'non-transitory computer-readable storage medium') to perform the functions of one or more of the above-described embodiment(s) and/or that includes one or more circuits (e.g., application specific integrated circuit (ASIC)) for performing the functions of one or more of the above-described embodiment(s), and by a method performed by the computer of the system or apparatus by, for example, reading out and executing the computer executable instructions from the storage medium to perform the functions of one or more of the above-described embodiment(s) and/or controlling the one or more circuits to perform the functions of one or more of the above-described embodiment(s). The computer may comprise one or more processors (e.g., central processing unit (CPU), micro processing unit (MPU)) and may include a network of separate computers or separate processors to read out and execute the computer executable instructions. The computer executable instructions may be provided to the computer, for example, from a network or the storage medium. The storage medium may include, for example, one or more of a hard disk, a random-access memory (RAM), a read only memory (ROM), a storage of distributed computing systems, an optical disk (such as a compact disc (CD), digital versatile disc (DVD), or Blu-ray Disc (BD)™), a flash memory device, a memory card, and the like.

(95) While the present invention has been described with reference to exemplary embodiments, it is to be understood that the invention is not limited to the disclosed exemplary embodiments. The scope of the following claims is to be accorded the broadest interpretation so as to encompass all such modifications and equivalent structures and functions.

(96) This application claims the benefit of Japanese Patent Application No. 2023-025960, filed on Feb. 22, 2023, which is hereby incorporated by reference herein in its entirety.

Claims

1. A non-transitory computer-readable storage medium storing a program for causing a computer to execute a control method for an information processing apparatus that transmits a print job, which

causes to execute a print processing according to an instruction issued by a user, to an image forming apparatus, which restricts the number of printed pages based on a contracted plan, the control method comprising: obtaining a total number of already-printed pages including the number of pages already printed to date by the image forming apparatus; obtaining, by the information processing apparatus that transmits the print job to the image forming apparatus, a number of pages included in the print job; and causing, in a case that a sum of the total number of already-printed pages and the number of pages included in the print job exceeds a threshold value corresponding to the contracted plan, a display unit of the information processing apparatus to display a user interface including a first object for instructing to transmit a print job that causes the image forming apparatus to execute a print processing exceeding the threshold value, and a second object for instructing to cancel transmitting the print job to the image forming apparatus.

2. The non-transitory computer-readable storage medium according to claim 1, wherein the user interface further includes a third object for instructing to transmit a print job that causes the image forming apparatus to execute a print processing of a predetermined number of pages among all pages included in the instruction, for which a sum of the predetermined number of pages and the total number of already-printed pages matches the threshold value.

3. The non-transitory computer-readable storage medium according to claim 1, wherein the user interface further includes a fourth object for instructing to transmit a print job that causes the image forming apparatus to execute a print processing of a predetermined number of pages among all pages included in the instruction, for which a sum of the predetermined number of pages and the total number of already-printed pages is less than the threshold value.

4. The non-transitory computer-readable storage medium according to claim 1, wherein the control method further comprises issuing the print job, and in a case that the first object is selected by the user, in the issuing, a print job designating all pages included in the instruction is issued.

5. The non-transitory computer-readable storage medium according to claim 1, wherein information of the contracted plan, information of another plan with less restriction on the number of printed pages than the contracted plan, and information indicating that the contracted plan will be changed to the another plan if the print processing is performed according to the instruction are further displayed on the user interface.

6. The non-transitory computer-readable storage medium according to claim 5, wherein in a case that the first object is selected, the contracted plan is changed to the another plan.

7. The non-transitory computer-readable storage medium according to claim 1, wherein information indicating that an additional fee will be applied if the print processing is performed according to the instruction and information indicating the additional fee are further displayed on the user interface.

8. The non-transitory computer-readable storage medium according to claim 7, wherein in a case that the first object is selected, the number of pages exceeding the threshold value is counted as subject to the additional fee.

9. The non-transitory computer-readable storage medium according to claim 1, wherein the total number of already-printed pages further includes a total number of pages of print jobs waiting to be printed.

10. The non-transitory computer-readable storage medium according to claim 1, wherein the control method further comprises obtaining, by the information processing apparatus that transmits the print job to the image forming apparatus, the sum of the total number of already-printed pages and the number of pages included in the print job.

11. An information processing apparatus that transmits a print job, which causes to execute a print processing according to an instruction received from a user, to an image forming apparatus, which restricts the number of printed pages based on a contracted plan, the information processing apparatus comprising: a display unit; at least one processor; and a memory coupled to the at least one processor and storing instructions that, when executed by the at least one processor, cause the

at least one processor to function as: an obtaining unit that obtains (i) a total number of already-printed pages including the number of pages already printed to date by the image forming apparatus and (ii) a number of pages included in the print job; and a display control unit that causes, in a case that a sum of the total number of already-printed pages and the number of pages included in the print job exceeds a threshold value corresponding to the contracted plan, the display unit to display a user interface including a first object for instructing to transmit a print job that causes the image forming apparatus to execute a print processing exceeding the threshold value, and a second object for instructing to cancel transmitting the print job to the image forming apparatus.

12. A control method for an information processing apparatus that transmits a print job, which causes to execute a print processing according to an instruction issued by a user, to an image forming apparatus, which restricts the number of printed pages based on a contracted plan, the control method comprising: obtaining a total number of already-printed pages including the number of pages already printed to date by the image forming apparatus; obtaining, by the information processing apparatus that transmits the print job to the image forming apparatus, a number of pages included in the print job; and causing, in a case that a sum of the total number of already-printed pages and the number of pages included in the print job exceeds a threshold value corresponding to the contracted plan, a display unit of the information processing apparatus to display a user interface including a first object for instructing to transmit a print job that causes the image forming apparatus to execute a print processing exceeding the threshold value, and a second object for instructing to cancel transmitting the print job to the image forming apparatus.