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# Information processing apparatus, method, and non-transitory computer-readable storage medium storing program


## Abstract

An information processing apparatus includes: a specifying unit configured to specify, of messages received by a message exchange service between users, a message to which a job ticket for executing a job is attached; an acquisition unit configured to acquire information of the job ticket attached to the message specified by the specifying unit; and a display control unit configured to display, in the message exchange service, a list of information of the job ticket acquired by the acquisition unit.



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## Background/Summary

BACKGROUND OF THE INVENTION

Field of the Invention

(1) The present invention relates to an information processing apparatus capable of executing a message exchange service, a method, and a non-transitory computer-readable storage medium storing a program.

Description of the Related Art
(2) There have been proliferated business chat tools (to be referred to as collaboration tools or message exchange services hereinafter) capable of communication by a chat. Japanese Patent Laid-Open No. 2020-47000 describes an information processing system capable of submitting a print job directly from a collaboration tool to an MFP.
SUMMARY OF THE INVENTION
(3) The present invention provides a mechanism capable of easily confirming a job ticket on a message exchange service.
(4) The present invention in one aspect provides a non-transitory computer-readable storage medium storing a program configured to cause a computer of an information processing apparatus to function as: a specifying unit configured to specify, of messages received by a message exchange service between users, a message to which a job ticket for executing a job is attached; an acquisition unit configured to acquire information of the job ticket attached to the message specified by the specifying unit; and a display control unit configured to display, in the message exchange service, a list of information of the job ticket acquired by the acquisition unit.
(5) According to the present invention, it is possible to easily confirm a job ticket on a message exchange service.
(6) Further features of the present invention will become apparent from the following description of exemplary embodiments with reference to the attached drawings.

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## Description

BRIEF DESCRIPTION OF THE DRAWINGS
(1) FIGS. **1**A and **1**B are views showing the configuration of a communication system;
(2) FIG. **2** is a view showing the configuration of an image forming apparatus;
(3) FIG. **3** is a view showing a system configuration built on an information processing apparatus;
(4) FIGS. **4**A and **4**B are views showing the configuration of a program of the information processing apparatus;
(5) FIG. **5** is a flowchart showing processing of creating a workflow ticket and transmitting it;
(6) FIG. **6** is a view showing a screen configured to create a workflow ticket;
(7) FIG. **7** is a view showing a message to which a workflow ticket is attached;
(8) FIG. **8** is a flowchart showing processing of displaying a list of workflow tickets;
(9) FIG. **9** is a view showing a screen that displays a list of workflow tickets;
(10) FIG. **10** is a flowchart showing processing of transmitting a job to an image forming apparatus;
(11) FIG. **11** is a flowchart showing processing of displaying a list of workflow tickets;
(12) FIG. **12** is a flowchart showing processing of displaying a list of workflow tickets; and
(13) FIG. **13** is a view showing a screen that displays a list of workflow tickets.
DESCRIPTION OF THE EMBODIMENTS
(14) Hereinafter, embodiments will be described in detail with reference to the attached drawings. Note, the following embodiments are not intended to limit the scope of the claimed invention. Multiple features are described in the embodiments, but limitation is not made to an invention that requires all such features, and multiple such features may be combined as appropriate. Furthermore, in the attached drawings, the same reference numerals are given to the same or similar configurations, and redundant description thereof is omitted.
(15) There is assumed a case where a user who desires execution of a job transmits a message with a job ticket attached to another user (receiver) on a message exchange service. In this case, on the receiver side, there is a demand for a mechanism capable of easily confirming the job ticket on the message exchange service.

(16) According to the present disclosure, it is possible to easily confirm the job ticket on the message exchange service.

First Embodiment

(17) FIG. **1**A is a view showing an example of the configuration of a communication system according to this embodiment, and FIG. **1**B is a view showing an example of the hardware configuration of an information processing apparatus. As shown in FIG. **1**A, the communication system includes information processing apparatuses **100** and **101** each having the configuration of a general-purpose information processing apparatus such as a PC, and a server **102**. The apparatuses are communicably connected to each other via a network such as the Internet.

(18) The server **102** is a server that provides a communication service (message exchange service) by a collaboration tool such as Microsoft Teams® or Slack®. Remote works are popular in recent years, and communication between employees in a remote work is generally done by the above-described collaboration tool. There is case where a user A working at home in a remote work requests a user B near an image forming apparatus **103** in the office to print or scan a document. In such a case, for example, the user A creates a workflow ticket including print settings in executing a job by the image forming apparatus **103**. The user A transmits the created workflow ticket to the user B via a collaboration tool. In this embodiment, the information processing apparatus **100** is a PC operated by the user A, and the information processing apparatus **101** is a PC operated by the user B. Also, the information processing apparatus **100** exists in the home of the user A, and the information processing apparatus **101** and the image forming apparatus **103** exist in the office.

(19) Note that the workflow ticket in this embodiment is one of job tickets that are set to execute jobs for the image forming apparatus **103**. Also, in this embodiment, the term “workflow” includes not only a workflow system with a workflow server that manages each step but also a workflow for circulating a document output as paper among users. The communication system shown in FIG. **1**A may include another device. For example, a workflow server configured to manage a workflow or a file server may be included as another server. FIG. **1**B shows an example of the hardware configuration of the information processing apparatus **100**, the information processing apparatus **101**, and the server **102**. The information processing apparatus **100** will be described below as a representative example of the apparatuses. A CPU **11** executes a program corresponding to each of applications (to described later) stored in a storage unit **13** or program execution environments, thereby comprehensively controlling the information processing apparatus **100**. The storage unit **13** is a nonvolatile memory such as a ROM, a Hard Disk Drive (HDD), or a Solid State Drive (SSD). The operation of the information processing apparatus **100** according to this embodiment is implemented by, for example, the CPU **11** reading out a program stored in the storage unit **13** into a RAM **12** that is a volatile memory and executing the program.

(20) Also, the RAM **12**, the storage unit **13**, a display unit **14**, an external connection interface (IF) **15**, and an input unit **16** are connected to the CPU **11** via a bus **10**. The input unit **16** includes a keyboard, a mouse, and the like and can accept a user operation. The display unit **14** is a display configured to display various kinds of user interface screens. Note that the display unit **14** and the input unit **16** may be integrally formed like a touch panel. The external connection IF **15** has a configuration according to the medium of an external network and enables communication with the network. Note that the external network may include a wired network, a wireless network, or both of these.

(21) The information processing apparatus **100**, the information processing apparatus **101**, and the server **102** may have configurations different from each other. Also, the information processing apparatus **100** is not limited to the configuration shown in FIG. **1**B and appropriately has a configuration in accordance with functions that the device applied to the information processing apparatus **100** can implement. For example, a control circuit such as an ASIC that operates in cooperation with the CPU **11** may be formed. There may be a plurality of CPUs **11**, and distributed processing may be executed by the plurality of CPUs **11**. The information processing apparatus **100**

may operate by cooperation of a plurality of apparatuses. At this time, a plurality of CPUs **11** may be distributed to the plurality of apparatuses.
(22) FIG. **2** is a view showing an example of the hardware configuration of the image forming apparatus **103**.
(23) The image forming apparatus **103** includes a print engine **201**, an external connection interface **202**, an input interface **203**, a ROM **204**, a RAM **205**, a CPU **206**, an output interface **207**, and a display unit **208**.
(24) The ROM **204** stores permanent data such as control programs to be executed by the CPU **206**, data tables, or the OS program. The external connection interface **202** has a configuration according to the medium of an external network and enables communication with the network. Note that the external network may include a wired network, a wireless network, or both of these.
(25) The RAM **205** is formed by a DRAM that needs a backup power supply. Note that the RAM **205** holds data by receiving power from a data backup power supply (not shown) and can therefore store important data such as a program control variable without volatilizing it. The RAM **205** is also used as the main memory and the work memory of the CPU **206**, and also functions as a reception buffer configured to temporarily save a job received from the information processing apparatus **101** or the like. The ROM **204** stores permanent data such as control programs to be executed by the CPU **206**, data tables, or the OS program. In this embodiment, each control program stored in the ROM **204** performs software execution control such as scheduling, task switch, or interrupt processing under the management of an embedded OS stored in the ROM **204**. The ROM **204** is also provided with a memory area for storing data that needs to be held even without power supply, such as the setting information of the image forming apparatus **103** or the management data of the image forming apparatus **103**.
(26) The CPU **206** is a system control unit and comprehensively controls the entire image forming apparatus **103**. Based on information stored in the RAM **205** or a job received from the information processing apparatus **101** or the like, the print engine **201** forms an image on a print medium such as paper using a printing material such as ink and outputs it as a printed product. Note that the print engine **201** can have a configuration according to various printing methods such as an inkjet printing method and an electrophotographic method.
(27) The input interface **203** is an interface configured to accept data input or operation instructions from the user and is formed by a physical keyboard, buttons, a touch panel, and the like. Note that the output interface **207** to be described later and the input interface **203** may have the same configuration, and output of a screen and acceptance of an operation from the user may be done by the same configuration. The output interface **207** is a control interface used by the display unit **208** to display data or notify the state of the image forming apparatus **103**.
(28) The display unit **208** is formed by a Light Emitting Diode (LED) or a Liquid Crystal Display (LCD), and displays data or notifies the state of the image forming apparatus **103**. Note that input from the user may be accepted via the display unit **208** by installing, on the display unit **208**, a software keyboard including numeric value input keys, mode setting keys, a determination key, a cancel key, a power key, and the like.
(29) The components of the image forming apparatus **103** are not limited to those shown in FIG. **2**, and components according to functions executable by the image forming apparatus **103** are included as needed. For example, the image forming apparatus **103** may be formed as a Multi Function Peripheral (MFP) having a scan function and a facsimile function. Also, in this embodiment, the workflow ticket will be explained as a job ticket for executing a print job. However, it may be a job ticket for executing a job according to a function executable by the image forming apparatus **103**.
(30) FIG. **3** is a view showing an example of a system configuration built on the information processing apparatuses **100** and **101**. An Operating System (OS) **301** is software that is the base of the entire system. A process **302** is a unit of execution for operating software on the OS **301**. Each

program to be described later with reference to FIG. **4**A operates as the process **302** on the OS **301**. The OS **301** controls each hardware portion shown in FIG. **1**B.

(31) FIG. **4**A is a view showing an example of the configuration of a program according to this embodiment. The program shown in FIG. **4**A is formed in each of the information processing apparatus **100** and the information processing apparatus **101**, and the following description will be made assuming that the program is formed in the information processing apparatus **100** as a representative example. Each program shown in FIG. **4**A operates on the process **302** shown in FIG. **3**. A collaboration tool **410** is, for example, Microsoft Teams® or Slack®, and includes a message management portion **411** that manages a file or a chat transmitted/received between users. A workflow plug-in **400** is a plug-in program incorporated in the collaboration tool **410**, and can be activated by clicking an icon on the collaboration tool **410**.

(32) In this embodiment, the workflow plug-in **400** includes a workflow ticket management portion **401**, a workflow ticket creation portion **402**, a workflow ticket display portion **403**, a workflow ticket execution portion **404**, and a plug-in cooperation portion **405**. The workflow ticket management portion **401** manages a workflow ticket **420** received from the outside by the collaboration tool **410**. The workflow ticket creation portion **402** generates the workflow ticket **420** based on print settings designated by the user. The workflow ticket display portion **403** performs display control to display a screen associated with the workflow ticket **420** on the collaboration tool **410**. The workflow ticket execution portion **404** creates a job based on the print settings of the workflow ticket **420**, and transmits it to the image forming apparatus **103**. The plug-in cooperation portion **405** causes the workflow ticket management portion **401** to the workflow ticket execution portion **404** to cooperate with the collaboration tool **410**. By this cooperation, the functions of the workflow ticket management portion **401** to the workflow ticket execution portion **404** are implemented in the collaboration tool **410**.

(33) The workflow plug-in **400** is not limited to the configuration shown in FIG. **4**A. For example, the workflow ticket creation portion **402** may be formed separately as a ticket creation application. In this case, the plug-in cooperation portion **405** causes the ticket creation application to cooperate with the collaboration tool **410**. Also, the workflow ticket execution portion **404** may be formed separately as a ticket execution application. In this case, the plug-in cooperation portion **405** causes the ticket execution application to cooperate with the collaboration tool **410**. By this cooperation as well, the functions of the applications are implemented in the collaboration tool **410**.

(34) In this embodiment, a description will be made assuming that the workflow ticket execution portion **404** transmits a generated job to the image forming apparatus **103**. However, another configuration is also possible. For example, the workflow ticket execution portion **404** may transmit a generated job to the image forming apparatus **103** using a job transmission function of a driver operating on the OS **301**.

(35) FIG. **4**B is a view showing an example of the workflow ticket **420** created by the workflow ticket creation portion **402**. The workflow ticket **420** created by the workflow ticket creation portion **402** can be shared with other users on a chat or a channel of the collaboration tool **410**.

(36) The workflow ticket **420** includes workflow information portion **421** and document information portion **422**. The workflow information portion **421** holds information concerning a workflow. Here, information concerning a workflow includes, for example, print settings, information of a folder to be saved after scan, and the task name of the workflow. The workflow information portion **421** also includes the status information of the job, and the name of the creator of the workflow ticket. For example, the workflow ticket **420** may include, as the status information, information representing whether the workflow ticket has already been executed by the workflow ticket execution portion **404** as will be described below.

(37) If the workflow ticket **420** is executed, concerning the executed workflow ticket **420**, the workflow ticket execution portion **404** notifies the workflow ticket management portion **401** that the workflow ticket has already been executed. Upon receiving the notification, the workflow ticket

management portion **401** adds information representing that the workflow ticket has already been executed to the workflow information portion **421** of the corresponding workflow ticket **420**. The workflow ticket management portion **401** stores the notified fact that the workflow ticket **420** has already been executed, and instructs the workflow ticket display portion **403** to display, in the list display of workflow tickets, that the workflow ticket **420** has already been executed. The list display of workflow tickets will be described later.

(38) The document information portion **422** holds the information of a document as the execution target of the workflow ticket **420**. The document information portion **422** may be, for example, the print target document itself or the file path of the document held on an external file server.

(39) This embodiment assumes communication between the information processing apparatus **100** of the user A and the information processing apparatus **101** of the user B by the collaboration tool **410**. Note that the user B sometimes communicates not only with the user A but also with a plurality of users by the collaboration tool **410**. In this embodiment, a case will be described, where the user A logs in to the collaboration tool **410**, creates the workflow ticket **420** for printing a daily report, attaches it to a chat message, and transmits it to the user B in the office where the image forming apparatus **103** is installed.

(40) If there are many home users away from the office, the user B receives many work requests via chat messages, and management of the requests is difficult. Also, the user A and the user B have many opportunities to transmit/receive chat messages for business consultation other than daily report printing. Hence, a chat message (to be referred to as a message hereinafter) of a work request may escape the notice of the user B, and the user B may miss the work request from the user A. In this embodiment, the workflow plug-in **400** in the information processing apparatus **101** of the user B displays a list of the information of the workflow tickets **420** attached to messages transmitted from a plurality of users. This can prevent the user B from missing the work request from the user A.

(41) In this embodiment, the workflow plug-in **400** on the information processing apparatus **100** accepts an input operation of the user A, designates the print settings of the image forming apparatus **103** or a print target document, and creates the workflow ticket **420**. The workflow plug-in **400** on the information processing apparatus **100** attaches the created workflow ticket **420** to a message of the collaboration tool **410** and transmits it to the information processing apparatus **101**.

(42) On the other hand, the workflow plug-in **400** on the information processing apparatus **101** detects the workflow ticket **420** received from the outside in the collaboration tool **410**. The workflow plug-in **400** displays, in the collaboration tool **410**, a list of the information of the workflow tickets **420** (to be referred to as a list of the workflow tickets **420** hereinafter). The user B selects an arbitrary workflow ticket **420** in the list of the workflow tickets **420** and instructs execution. Upon accepting the execution instruction, the workflow plug-in **400** generates a job by executing the selected workflow ticket **420** and transmits the generated job to the image forming apparatus **103**.

(43) Processing from creating the workflow ticket **420** in the information processing apparatus **100** of the user A until displaying the list of the workflow tickets **420** in the information processing apparatus **101** of the user B will be described.

(44) FIG. **5** is a flowchart showing processing of creating the workflow ticket **420** and transmitting it. Processing shown in FIG. **5** is implemented by, for example, the CPU **11** of the information processing apparatus **100** of the user A reading out a program stored in the storage unit **13** to the RAM **12** and executing it. Processing shown in FIG. **5** is started when the user A logs in to the collaboration tool **410**.

(45) In step S**101**, the workflow ticket management portion **401** determines whether a transmission function execution instruction is accepted. Here, the transmission function is a function of creating the workflow ticket **420** and transmitting it to another user by the message exchange service function of the collaboration tool **410**. As described above, the workflow plug-in **400** is

incorporated as a plug-in program in the collaboration tool **410**. Hence, the user A can instruct execution of the transmission function by, for example, clicking the icon of the transmission function corresponding to the plug-in program. The processing of step S**101** is repeated until it is determined that the transmission function execution instruction is accepted. If it is determined that the transmission function execution instruction is accepted, the process advances to step S**102**.

(46) In step S**102**, the workflow ticket management portion **401** instructs the workflow ticket display portion **403** to display a screen configured to create the workflow ticket **420**. The workflow ticket display portion **403** then displays the screen configured to create the workflow ticket in the collaboration tool **410**. The workflow ticket display portion **403** accepts, via the displayed screen, information used to create the workflow ticket.

(47) FIG. **6** is a view showing an example of the screen configured to create the workflow ticket **420**. On a screen **600**, setting items needed to create the workflow ticket **420** are displayed. An item **601** is an item used to set the contents of a work to be requested of the user B. In FIG. **6**, "print", "scan", and "FAX" are displayed as an example. In this example, "print" is selected. If "print" is selected, the workflow ticket **420** for executing printing by the image forming apparatus **103** is created. An item **602** is an item displayed when "print" is selected in the item **601**, and the user A can designate the file path of the print target document.

(48) Items **603** and **604** are items representing print settings to be executed by the image forming apparatus **103**. In FIG. **6**, "single-sided" and "double-sided" are displayed as an example. In this example, "double-sided" is selected. Also, in FIG. **6**, "A3", "A4", and "B5" are displayed as an example. In this example, "A4" is selected. An item **605** is an item used to designate the transmission destination of the workflow ticket **420**. In FIG. **6**, "Aoki (manager)", "Okawa", and "Hanada" are displayed as an example. In this example, "Okawa" is selected. Note that the selection candidates of the item **605** may be acquired from organization information incorporated in the collaboration tool **410**.

(49) A button **606** is a button used to download, to the information processing apparatus **100**, the workflow ticket **420** created based on the contents of the items **601** to **605**. The user A can transmit the workflow ticket **420** downloaded to the information processing apparatus **100** by pressing the button **606** to the user B by another application, for example, email. A button **607** is a button used to transmit the workflow ticket **420** created based on the contents of the items **601** to **605** to the transmission destination of the item **605** by the collaboration tool **410**. In this example, the user A is assumed to press the button **607**.

(50) In step S**103**, the workflow ticket display portion **403** determines whether a transmission instruction is accepted. Here, the transmission instruction is an instruction to transmit the created workflow ticket **420** to the transmission destination selected in the item **605** by the message of the collaboration tool **410** and is, for example, pressing of the button **607**. The processing of step S**103** is repeated until it is determined that the transmission instruction is accepted. If it is determined that the transmission instruction is accepted, the process advances to step S**104**.

(51) In step S**104**, the workflow ticket display portion **403** notifies the workflow ticket management portion **401** that the transmission instruction is accepted. The workflow ticket management portion **401** then instructs the workflow ticket creation portion **402** to create the workflow ticket **420** based on the information accepted in step S**102**. Upon receiving the instruction from the workflow ticket management portion **401**, the workflow ticket creation portion **402** creates the workflow ticket **420** based on the information accepted in step S**102**. More specifically, for example, the workflow ticket **420** for causing the image forming apparatus **103** to print the document designated in the item **602** by double-sided printing in A4 is created.

(52) In step S**105**, the workflow ticket creation portion **402** notifies the workflow ticket management portion **401** that the workflow ticket **420** is created. Upon receiving the notification from the workflow ticket creation portion **402**, the workflow ticket management portion **401** requests the collaboration tool **410** to attach the created workflow ticket **420** to a message and

transmit it to the transmission destination selected in the item **605**. The request includes the created workflow ticket **420** and the information of the transmission destination of the item **605**. Upon receiving the request from the workflow plug-in **400**, the collaboration tool **410** activates a new message screen and accepts creation of a message from the user A. Upon accepting the creation of the message, the collaboration tool **410** attaches the workflow ticket **420** created by the workflow plug-in **400** and transmits the message to the transmission destination. The message is transmitted to the information processing apparatus **101** via the server **102**.

(53) FIG. **7** is a view showing an example of the transmitted message to which the created workflow ticket **420** is attached. FIG. **7** shows a state in which a message **701** to which a workflow ticket **702** created in step S**104** is attached is transmitted to Okawa.

(54) FIG. **8** is a flowchart showing processing of displaying a list of the workflow tickets **420**. Processing shown in FIG. **8** is implemented by, for example, the CPU **11** of the information processing apparatus **101** of the user B reading out a program stored in the storage unit **13** to the RAM **12** and executing it. Processing shown in FIG. **8** is started when the user B logs in to the collaboration tool **410**.

(55) In step S**201**, the workflow ticket management portion **401** scans all chats and all channels with the user B participating therein at a predetermined time interval. The scan may be executed not at the predetermined time interval but every time a new message is received.

(56) In step S**202**, the workflow ticket management portion **401** determines whether the workflow ticket **420** exists in the scanned chats and channels. The determination of step S**202** may be done by acquiring the file extension of the document attached to the message and determining whether it is a file extension indicating the workflow ticket **420**. If it is determined that the workflow ticket **420** does not exist, the processing shown in FIG. **8** is ended. If it is determined that the workflow ticket **420** exists, the process advances to step S**203**.

(57) In step S**203**, the workflow ticket management portion **401** instructs the workflow ticket display portion **403** to acquire the information of the workflow ticket **420** and display it. Upon accepting the instruction from the workflow ticket management portion **401**, the workflow ticket display portion **403** acquires the information of the workflow ticket **420** and displays a list of the workflow tickets **420**. Here, the information of the workflow ticket **420** is, for example, information included in the workflow information portion **421** and the document information portion **422**.

(58) FIG. **9** is a view showing an example of a screen that displays a list of the workflow tickets **420**. In the screen shown in FIG. **9**, a task name **901**, a document name **902**, a requester **903**, and a person **904** in charge are information that can be acquired from the workflow ticket **420**. In FIG. **9**, for example, “Okawa” in the column of the person **904** in charge corresponds to the user B. Also, for example, “Yamada” in the column of the requester **903** shown in FIG. **9** corresponds to the user A. FIG. **9** shows an example in which not only the user A but also another user “Suzuki” transmits a work request to the user B by a message.

(59) In this embodiment, the workflow ticket display portion **403** displays the information of the workflow ticket **420** and also displays status information concerning the execution state thereof. For example, if the workflow ticket **420** is not executed yet, information representing that the execution instruction can be accepted, more specifically, a print button **905** is displayed. If the user presses the print button **905**, a job is created based on the information of the corresponding workflow ticket **420** and transmitted to the image forming apparatus **103**. For the workflow ticket **420** on the lowest stage in FIG. **9**, information **906** representing that execution of the job is completed is displayed.

(60) As shown in FIG. **9**, in this embodiment, since the list of the workflow tickets **420** is displayed, a message of a work request can be prevented from mixing in the display of messages without the workflow ticket **420** attached. Note that instead of displaying the results obtained based on all chats and all channels, the screen of the list of the workflow tickets **420** may be able to filter

only specific chats or specific channels and display the results obtained based on these. Filtering may be performed based on an element such as a work request date. For example, filtering may be performed based on the request date, like a button **907** in FIG. **9**.

(61) If it is determined in step S**202** that the workflow ticket **420** does not exist, the processing shown in FIG. **8** is ended. That is, in this case, the list of the workflow tickets **420** as shown in FIG. **9** is not displayed.

(62) That is, according to this embodiment, for example, pieces of information of the workflow tickets **420** attached to messages received from the outside in the collaboration tool **410** are displayed as a list at a predetermined time interval. This can improve the convenience in managing a workflow ticket for the receiver (user B) of a message.

(63) Processing of the workflow plug-in **400** of the information processing apparatus **101** of the user B executing the workflow ticket **420** and transmitting a job to the image forming apparatus **103** will be described next.

(64) FIG. **10** is a flowchart showing processing of transmitting a job to the image forming apparatus **103**. Processing shown in FIG. **10** is implemented by, for example, the CPU **11** of the information processing apparatus **101** of the user B reading out a program stored in the storage unit **13** to the RAM **12** and executing it. Processing shown in FIG. **10** is started in a state in which the list of the workflow tickets **420** is displayed.

(65) In step S**301**, upon detecting pressing of the print button **905**, the workflow ticket management portion **401** instructs the workflow ticket execution portion **404** to acquire the information of the workflow ticket **420** and execute it. Upon receiving the instruction from the workflow ticket management portion **401**, the workflow ticket execution portion **404** acquires information from the workflow information portion **421** and the document information portion **422** of the workflow ticket **420** whose print button **905** is pressed. In step S**302**, the workflow ticket execution portion **404** creates a job based on setting information included in the workflow ticket **420** and transmits the job to the image forming apparatus **103**. Here, the setting information is, for example, information of the items **603** and **604** in FIG. **6**.

(66) In step S**303**, the workflow ticket execution portion **404** determines whether the transmission of the job to the image forming apparatus **103** is completed. The determination of step S**303** may be executed based on, for example, a response from the image forming apparatus **103** or timeout after the job transmission. Upon determining that the transmission of the job is completed, in step S**304**, concerning the executed workflow ticket **420**, the workflow ticket execution portion **404** notifies the workflow ticket management portion **401** that the workflow ticket has already been executed. Upon receiving the notification, the workflow ticket management portion **401** adds information representing that the workflow ticket has already been executed to the workflow information portion **421** of the corresponding workflow ticket **420**. The workflow ticket management portion **401** stores the notified fact that the workflow ticket **420** has already been executed, and instructs the workflow ticket display portion **403** to display, in the list display of workflow tickets, that the workflow ticket **420** has already been executed. Upon receiving the instruction from the workflow ticket management portion **401**, the workflow ticket display portion **403** updates the status information corresponding to the workflow ticket **420** for which the job transmission is completed from “print” to “completed”, and then ends the processing shown in FIG. **10**. The image forming apparatus **103** that has received the job executes the job. More specifically, for example, the document designated in the item **602** is printed in accordance with the settings defined in the items **603** and **604** shown in FIG. **6**.

(67) On the other hand, if it is determined in step S**303** that the transmission of the job is not completed, the processing shown in FIG. **10** is ended. Note that at this time, the workflow ticket execution portion **404** may notify the workflow ticket management portion **401** that the transmission of the job is not completed. Upon receiving the notification, the workflow ticket management portion **401** adds information representing that no job is transmitted to the workflow

information portion **421** of the corresponding workflow ticket **420**. The workflow ticket management portion **401** stores the notified fact that no job is transmitted for the workflow ticket **420**, and instructs the workflow ticket display portion **403** to display, in the list display of workflow tickets, that no job is transmitted. The workflow ticket display portion **403** updates the status information of the corresponding workflow ticket **420** from "print" to "no job transmitted".

(68) As described above, according to this embodiment, the list of the workflow tickets **420** is displayed on the collaboration tool **410**. With this configuration, it is possible to improve the convenience in managing a workflow ticket for the user who is requested to do a work via a message. Also, in this embodiment, the workflow ticket **420** has been described as a job ticket for executing single processing, that is printing. However, it may be a job ticket for continuously executing a plurality of processes managed on a workflow server.

Second Embodiment

(69) The second embodiment will be described below concerning differences from the first embodiment. In the first embodiment, the pieces of information of a plurality of workflow tickets **420** are displayed as a list. In this embodiment, one button **905** is displayed in correspondence with the display of the pieces of information of a plurality of workflow tickets **420** that are judged to be similar. With this configuration, when executing the plurality of workflow tickets **420**, the print button **905** need not be pressed a plurality of times, and convenience can further be improved.

(70) FIG. **11** is a flowchart showing processing of displaying a list of the workflow tickets **420** according to this embodiment. Processing shown in FIG. **11** is implemented by, for example, a CPU **11** of an information processing apparatus **101** of a user B reading out a program stored in a storage unit **13** to a RAM **12** and executing it. Processing shown in FIG. **11** is started when the user B logs in to a collaboration tool **410**.

(71) In step S**401**, a workflow ticket management portion **401** scans all chats and all channels with the user B participating therein at a predetermined time interval. The scan may be executed not at the predetermined time interval but every time a new message is received.

(72) In step S**402**, the workflow ticket management portion **401** determines whether the workflow ticket **420** exists in the scanned chats and channels. The determination of step S**402** may be done by acquiring the file extension of a document attached to a message and determining whether it is a file extension indicating the workflow ticket **420**. If it is determined that the workflow ticket **420** does not exist, the processing shown in FIG. **11** is ended. If it is determined that the workflow ticket **420** exists, the process advances to step S**403**.

(73) In step S**403**, the workflow ticket management portion **401** determines whether similar workflow tickets **420** exist in the scanned chats and channels. In step S**403**, for example, based on the result of layout analysis such as rectangle extraction or region segmentation, the workflow tickets **420** in which pieces of document information judged to have similar layouts are held in the document information portions **422** may be determined to be similar. For example, there is a case where a plurality of types of templates exist for a daily report or the like. In this case, the workflow tickets **420** in which similar templates are held in the document information portions **422** are determined to be similar. Also, in step S**403**, for example, the workflow tickets **420** in which pieces of document information judged to have similar file names under a predetermined condition by a prefix search, a suffix search, or including of the same word are held in the document information portions **422** may be determined to be similar.

(74) If it is determined in step S**403** that similar workflow tickets **420** do not exist, the process advances to step S**405**. In this case, in step S**405**, a list of the workflow tickets **420** is displayed, like step S**203** of FIG. **8**, and the processing shown in FIG. **11** is then ended. On the other hand, if it is determined in step S**403** that similar workflow tickets **420** exist, the process advances to step S**404**.

(75) In step S**404**, the workflow ticket management portion **401** rearranges the display rows of the workflow tickets **420** determined to be similar such that a group in which the workflow tickets are

adjacent to each other is formed. At this time, only workflow tickets of the same date or week may be put into a group. In step S**405**, in the rearranged list, the workflow ticket management portion **401** displays one print button for the group of the workflow tickets **420** determined to be similar. After that, the processing shown in FIG. **11** is ended. When performing display in step S**405**, the workflow ticket management portion **401** may notify the user B that the print button is displayed, using another application such as email.

(76) FIG. **13** is a view showing an example of a screen that displays a list of the workflow tickets **420** according to this embodiment. As shown in FIG. **13**, one button **1301** is displayed for the workflow tickets **420** on the rows **1304** and **1305**. Note that FIG. **13** shows an example in which the two workflow tickets **420** whose document names include words “daily report” and “0526” are determined to be similar. If the user presses the button **1301**, a job is created by the processing shown in FIG. **10** for each of the two workflow tickets **420** and transmitted to an image forming apparatus **103**. Note that the workflow ticket **420** with a document name “Yamada_daily report_20220527” on a row **1306** is not determined to be similar to the workflow tickets **420** on the rows **1304** and **1305**, and a print button **1302** is independently displayed.

(77) As described above, according to this embodiment, one print button **1301** is created and displayed in correspondence with the plurality of workflow tickets **420** determined to be similar. With this configuration, the user can create and execute the jobs of the plurality of workflow tickets **420** by pressing the print button once, and the convenience can further be improved.

Third Embodiment

(78) The third embodiment will be described below concerning differences from the first and second embodiments. In the second embodiment, a configuration has been described in which one print button **1301** is displayed in correspondence with the plurality of workflow tickets **420** determined to be similar in the list of the workflow tickets **420**. In this embodiment, it is possible to urge a user to wait to press a print button until all a plurality of workflow tickets **420** determined to be similar are received.

(79) FIG. **12** is a flowchart showing processing of displaying a list of the workflow tickets **420** according to this embodiment. Processing shown in FIG. **12** is implemented by, for example, a CPU **11** of an information processing apparatus **101** of a user B reading out a program stored in a storage unit **13** to a RAM **12** and executing it. Processing shown in FIG. **12** is started when the user B logs in to a collaboration tool **410**.

(80) In step S**501**, a workflow ticket management portion **401** scans all chats and all channels with the user B participating therein at a predetermined time interval. The scan may be executed not at the predetermined time interval but every time a new message is received.

(81) In step S**502**, the workflow ticket management portion **401** determines whether the workflow ticket **420** exists in the scanned chats and channels. The determination of step S**502** may be done by acquiring the file extension of a document attached to a message and determining whether it is a file extension indicating the workflow ticket **420**. If it is determined that the workflow ticket **420** does not exist, the processing shown in FIG. **12** is ended. If it is determined that the workflow ticket **420** exists, the process advances to step S**503**.

(82) In step S**503**, the workflow ticket management portion **401** determines whether N similar workflow tickets **420** exist in the scanned chats and channels. The method for determining similar workflow tickets is the same as that described in step S**403** of FIG. **11**. Note that “N” may be a predetermined number or may be a number decided by the workflow ticket management portion **401**. An example of deciding “N” will be described later.

(83) Upon determining in step S**503** that N similar workflow tickets exist, in step S**504**, the workflow ticket management portion **401** rearranges the display rows of the plurality of workflow tickets **420** determined to be similar such that a group in which the workflow tickets are adjacent to each other is formed. At this time, only workflow tickets of the same date or week may be put into a group. In step S**505**, in the rearranged list, the workflow ticket management portion **401** displays

one print button for the group of the workflow tickets **420** determined to be similar. After that, the processing shown in FIG. **12** is ended.

(84) Processing performed in a case where it is determined in step S**503** that N similar workflow tickets do not exist will be described below. First, as a case where "N" is a predetermined number, for example, a case where the members of a team (three users exist) transmit daily reports by messages is assumed. In this case, the three users are known as a user X, a user Y, and a user Z. Such information is often held as organization information in the collaboration tool **410**. Hence, the workflow ticket management portion **401** may acquire the value "N" and corresponding user information from the collaboration tool **410**. Alternately, when the user of the information processing apparatus **101** activates a workflow plug-in **400** in the collaboration tool **410**, a screen configured to set the value "N" representing the number of workflow tickets that can be determined to be similar and corresponding user information may be displayed, and these pieces of information may be accepted.

(85) In the above-described example, assume that the workflow ticket management portion **401** determines, as the result of the processes of steps S**501** and S**502**, that there are daily reports of the user X and the user Y. Note that in this example, the value "N" is "3" for the user X, the user Y, and the user Z. The process advances from step S**502** to step S**503**, and it is determined that the formats of the daily reports of the user X and the user Y are similar to each other. However, since the number of the workflow tickets **420** determined to be similar is "2", the process advances from step S**503** to step S**506**.

(86) Here, the workflow ticket management portion **401** recognizes that the similar workflow tickets **420** are transmitted for the user X, the user Y, and the user Z. That is, since the workflow tickets **420** of the user X and the user Y are already transmitted, the workflow ticket management portion **401** further predicts that the workflow ticket **420** determined to be similar is transmitted from the user Z. In step S**506**, the workflow ticket management portion **401** instructs a workflow ticket display portion **403** to rearrange the display rows of the plurality of workflow tickets **420** currently determined to be similar and display user information for which transmission is predicted. The workflow ticket display portion **403** rearranges the display rows of the plurality of workflow tickets **420** determined to be similar such that a group in which the workflow tickets are adjacent to each other is formed. The workflow ticket management portion **401** adds a row for displaying the user information for which transmission is predicted as a row adjacent to the group and displays it in the list of the workflow tickets **420**.

(87) A row **1307** in FIG. **13** is user information added and displayed in step S**506**. As the user information, a user name "Suzuki" is displayed. Also, on the row **1307**, "Waiting" is displayed as a display **1303**. When this display is performed, it is possible to make the user wait to press the print button **1302**. Also, for the plurality of users who transmit the plurality of workflow tickets **420** determined to be similar, the user of the information processing apparatus **101** can perform processing at once, instead of performing processing at an interval.

(88) In step S**507**, the workflow ticket management portion **401** determines whether the workflow ticket **420** associated with the user information for which transmission is predicted exists (is received). Here, if it is determined that the workflow ticket **420** does not exist, the process of step S**507** is repeated. That is, the display of "Waiting" of the display **1303** in FIG. **13** is maintained. On the other hand, if it is determined that the workflow ticket **420** exists, in step S**505**, in the rearranged list, the workflow ticket management portion **401** displays one print button for the group of the plurality of workflow tickets **420** determined to be similar. That is, the display **1303** in FIG. **13** is stopped, and one print button is displayed for a row **1306** and the row **1307**. At this time, a print button for another group displayed adjacent to the group of the plurality of workflow tickets **420** determined to be similar is sometimes displayed. If the print button is not executed yet, one print button may be displayed for the plurality of groups. For example, the display **1303** in FIG. **13** may be stopped, and one print button may be displayed for the rows **1304** to **1307**. When stopping

the display of “Waiting” and displaying the print button, the workflow ticket management portion **401** may notify the user B that the print button is displayed.

(89) As described above, according to this embodiment, if there exist a plurality of users who transmit the plurality of workflow tickets **420** determined to be similar, the work efficiency of the user on the receiving side can be improved. In the above description, the display of “Waiting” is maintained until it is determined in step S**507** that the workflow ticket **420** exists. However, the display of “Waiting” may be stopped based on the elapse of a predetermined time.

(90) Another a case where it is determined in step S**503** that N similar workflow tickets do not exist will be described below. The workflow plug-in **400** may hold a database in which the value “N”, corresponding user information, and the information of the workflow ticket **420** are associated with each other. For example, information about the group of the plurality of workflow tickets **420** determined to be similar in step S**403** may be accumulated in the workflow plug-in **400**. Here, the information of the workflow ticket **420** is, for example, information included in a workflow information portion **421** and a document information portion **422**. Upon determining in step S**502** that the workflow ticket **420** exists, the workflow ticket management portion **401** determines whether the similar workflow tickets **420** exist, like step S**403** of FIG. **11**. Upon determining that the similar workflow tickets **420** exist, based on the information of the workflow tickets **420**, the workflow ticket management portion **401** searches the database for a group including the combination of the pieces of information of similar workflow tickets. If a combination exists, the workflow ticket management portion **401** acquires the value “N” and corresponding user information for the group including the combination and performs the determination of step S**503**. The rest is the same as described above. The case of this example is, for example, a case where reports of inventory of fixed assets were transmitted by messages from the three users, X, Y, and Z and accumulated on December 2021. In this case, the possibility that similar messages are transmitted from the same three users on December 2022 is high. That is, if reports are transmitted from the user X and the user Y on December 2022, and the reports are determined to be similar, the workflow ticket management portion **401** searches the database based on the condition that “reports are similar for the user X and the user Y”. As the result of the search, the workflow ticket management portion **401** acquires “user Z” as the user name for which transmission is predicted and displays it in the list together with the message “Waiting”.

(91) As described above, according to this embodiment, if there exist a plurality of users who transmit the plurality of workflow tickets **420** determined to be similar, the work efficiency of the user on the receiving side can be improved.

Other Embodiments

(92) 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.

(93) 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.

(94) This application claims the benefit of Japanese Patent Application No. 2022-143936, filed Sep. 9, 2022, which is hereby incorporated by reference herein in their entirety.

## Claims

1. A non-transitory computer-readable storage medium storing a program executable by a computer of an information processing apparatus to execute a method comprising: specifying, among messages received by a message exchange service between users, a message to which a workflow ticket for executing a job is attached, wherein the workflow ticket includes: workflow information portion including information concerning a workflow for the job, status information of the job, and a creator's name of the workflow ticket; and document information portion including information of a document, including a document name, associated with the job; acquiring workflow information of a first workflow ticket, among a plurality of existing workflow tickets, from the workflow information portion and the document information portion thereof; determining whether a second workflow ticket, among the plurality of existing workflow tickets, is similar to the first workflow ticket based on the document information portion thereof; and displaying, in the message exchange service, a list of the plurality of existing workflow tickets, and the respective workflow information, wherein in a state where the determining determines that the first and second workflow tickets are similar: displaying the list with the first and second workflow tickets into a group, with a single execution button for receiving a user instruction for executing the jobs associated with the first and second workflow tickets.

2. The medium according to claim 1, wherein the list includes the status information of each job associated with the listed workflow tickets and that has been instructed to be executed.

3. The medium according to claim 1, wherein the displaying lists the first and second workflow tickets determined to be similar adjacent to each other.

4. The medium according to claim 1, wherein: the determining further predicts whether the first and second workflow tickets are similar based on the workflow information portion thereof, and the displaying displays the common execution button in a state where the determining predicts that the first and second workflow tickets are also similar based on the workflow information portion.

5. The medium according to claim 4, wherein the displaying includes a message indicating to wait execution of the job associated with the first workflow ticket in the state where the determining predicts that the first and second workflow tickets are similar based on the workflow information portion thereof.

6. The medium according to claim 1, wherein the method further comprises creating a workflow ticket.

7. The medium according to claim 1, wherein the program is a plug-in program incorporated in a program that implements the message exchange service.

8. The medium according to claim 1, wherein the single execution button is disposed adjacent to the listing of the first and second workflow tickets.

9. An information processing apparatus comprising: at least one memory storing instructions; and at least one processor that executes the instructions to: specify, among messages received by a message exchange service between users, a message to which a workflow ticket for executing a job is attached, wherein the workflow ticket includes: workflow information portion including information concerning a workflow for the job, status information of the job, and a creator's name

of the workflow ticket; and document information portion including information of a document, including a document name, associated with the job; acquire workflow information of a first workflow ticket, among a plurality of existing workflow tickets, from the workflow information portion and the document information portion thereof; determine whether a second workflow ticket, among the plurality of existing workflow tickets, is similar to the first workflow ticket based on the document information portion thereof; and display, in the message exchange service, a list of the plurality of existing workflow tickets, and the respective workflow information, wherein in a state where the determining determines that the first and second workflow tickets are similar: displaying the list with the first and second workflow tickets into a group, with a single execution button for receiving a user instruction for executing the jobs associated with the first and second workflow tickets.

10. The information processing apparatus according to claim 9, wherein the single execution button is disposed adjacent to the listing of the first and second workflow tickets.

11. A method executed in an information processing apparatus, comprising: specifying, among messages received by a message exchange service between users, a message to which a workflow ticket for executing a job is attached, wherein the workflow ticket includes: workflow information portion including information concerning a workflow for the job, status information of the job, and a creator's name of the workflow ticket; and document information portion including information of a document, including a document name, associated with the job; acquiring workflow information of a first workflow ticket, among a plurality of existing workflow tickets, from the workflow information portion and the document information portion thereof; determining whether a second workflow ticket, among the plurality of existing workflow tickets, is similar to the first workflow ticket based on the document information portion thereof; and displaying, in the message exchange service, a list of the plurality of existing workflow tickets, and the respective workflow information, wherein in a state where the determining determines that the first and second workflow tickets are similar: displaying the list with the first and second workflow tickets into a group, with a single execution button for receiving a user instruction for executing the jobs associated with the first and second workflow tickets.

12. The method according to claim 11, wherein the single execution button is disposed adjacent to the listing of the first and second workflow tickets.