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Bonney-Ache et al.

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(54) **ASSIGNMENTS FOR CLASSROOMS**

USPC 434/362
See application file for complete search history.

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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Primary Examiner — Thomas J Hong

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H04L 29/08 (2006.01)
H04L 12/58 (2006.01)
H04L 29/06 (2006.01)
H04L 12/18 (2006.01)

(52) **U.S. Cl.**

CPC **G09B 7/02** (2013.01); **H04L 12/1822** (2013.01); **H04L 51/14** (2013.01); **H04L 51/22** (2013.01); **H04L 67/06** (2013.01); **H04L 67/12** (2013.01); **H04L 67/306** (2013.01); **H04L 67/42** (2013.01)

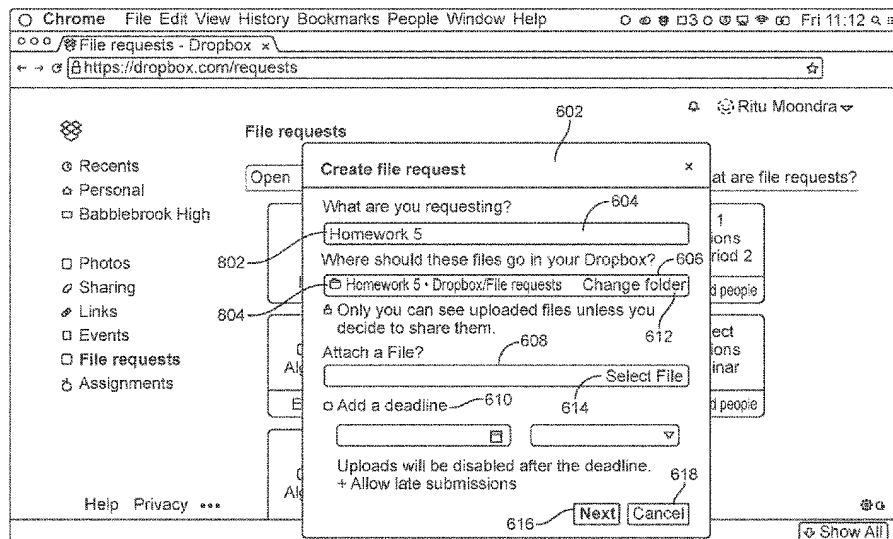
(57) **ABSTRACT**

A computer implemented method for distributing, collecting and monitoring assignments by a content management system. The method includes receiving a request for a file request from a teacher to distribute an assignment to one or more students. In response to receiving the request, the teacher is prompted for information associated with the assignment. The information can include a name for the assignment, an assignment file and a collection identifier. In response to receiving the information, one or more metadata tags are generated based on the received information. The file request is distributed along with the one or more metadata tags to the one or more student.

(58) **Field of Classification Search**

CPC G09B 19/00; G09B 7/02; H04L 51/22

20 Claims, 44 Drawing Sheets



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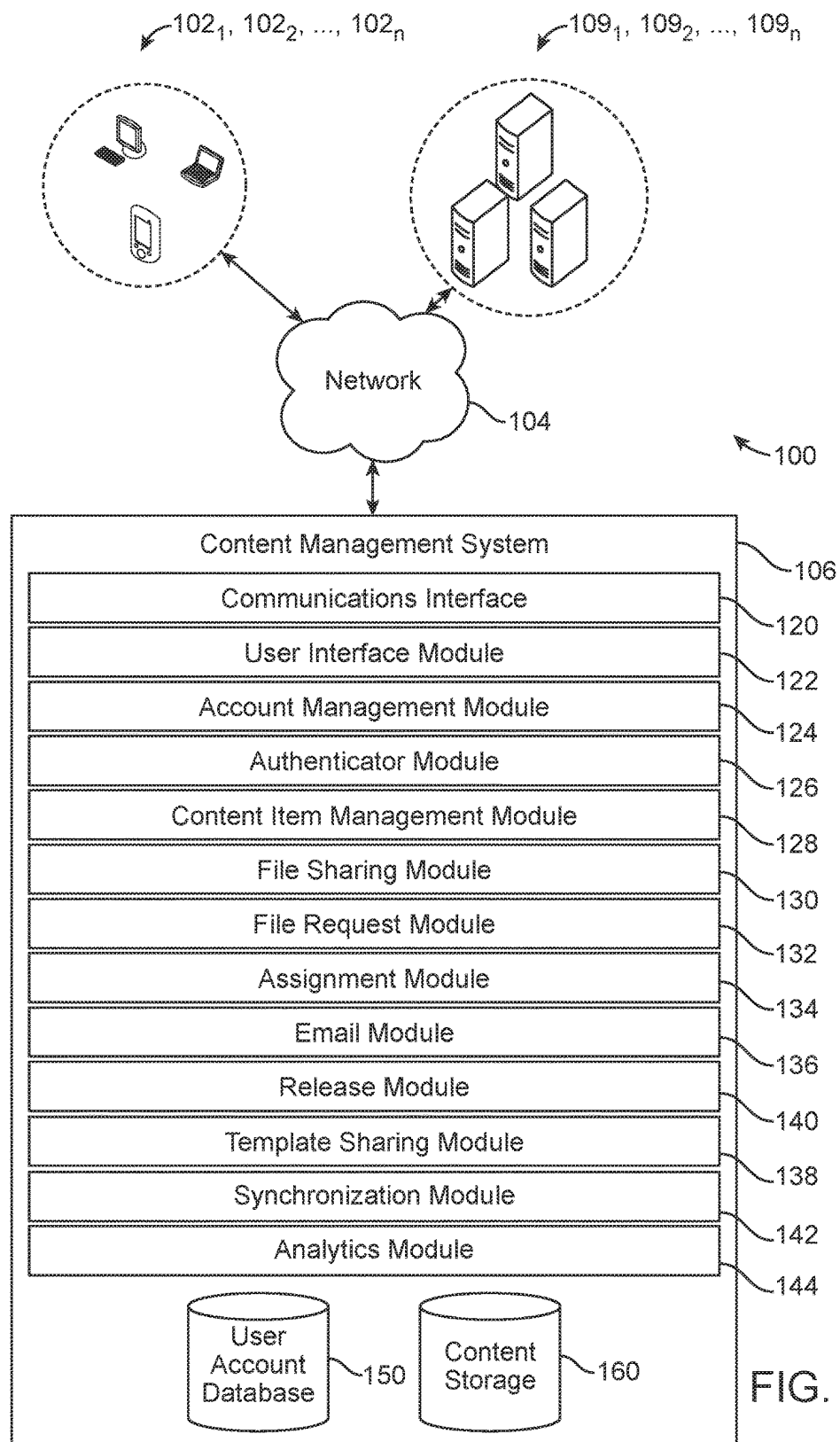


FIG. 1

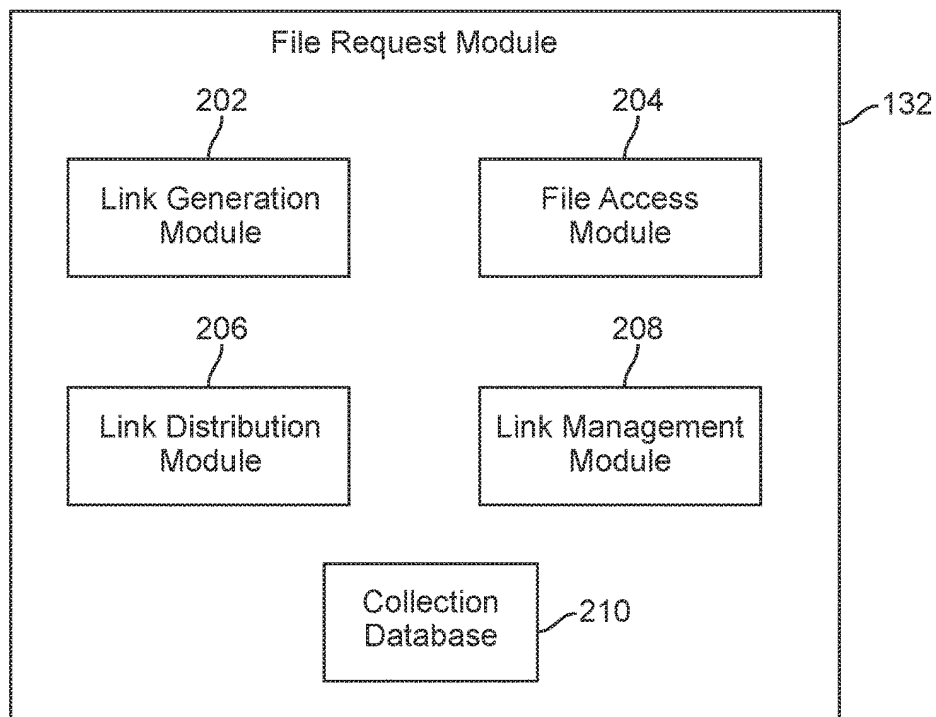


FIG. 2A

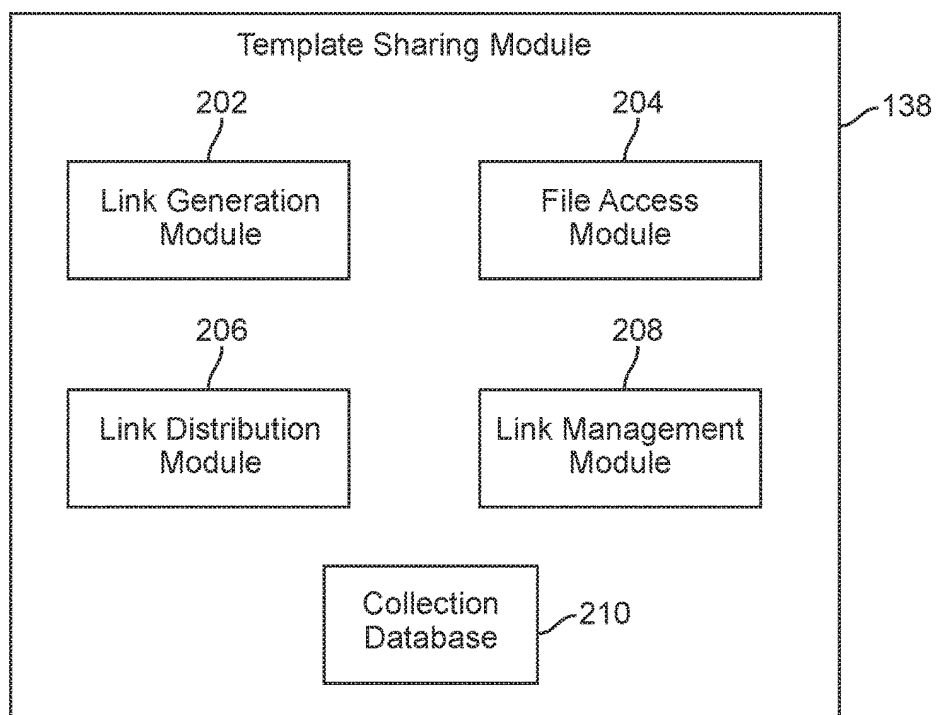


FIG. 2B

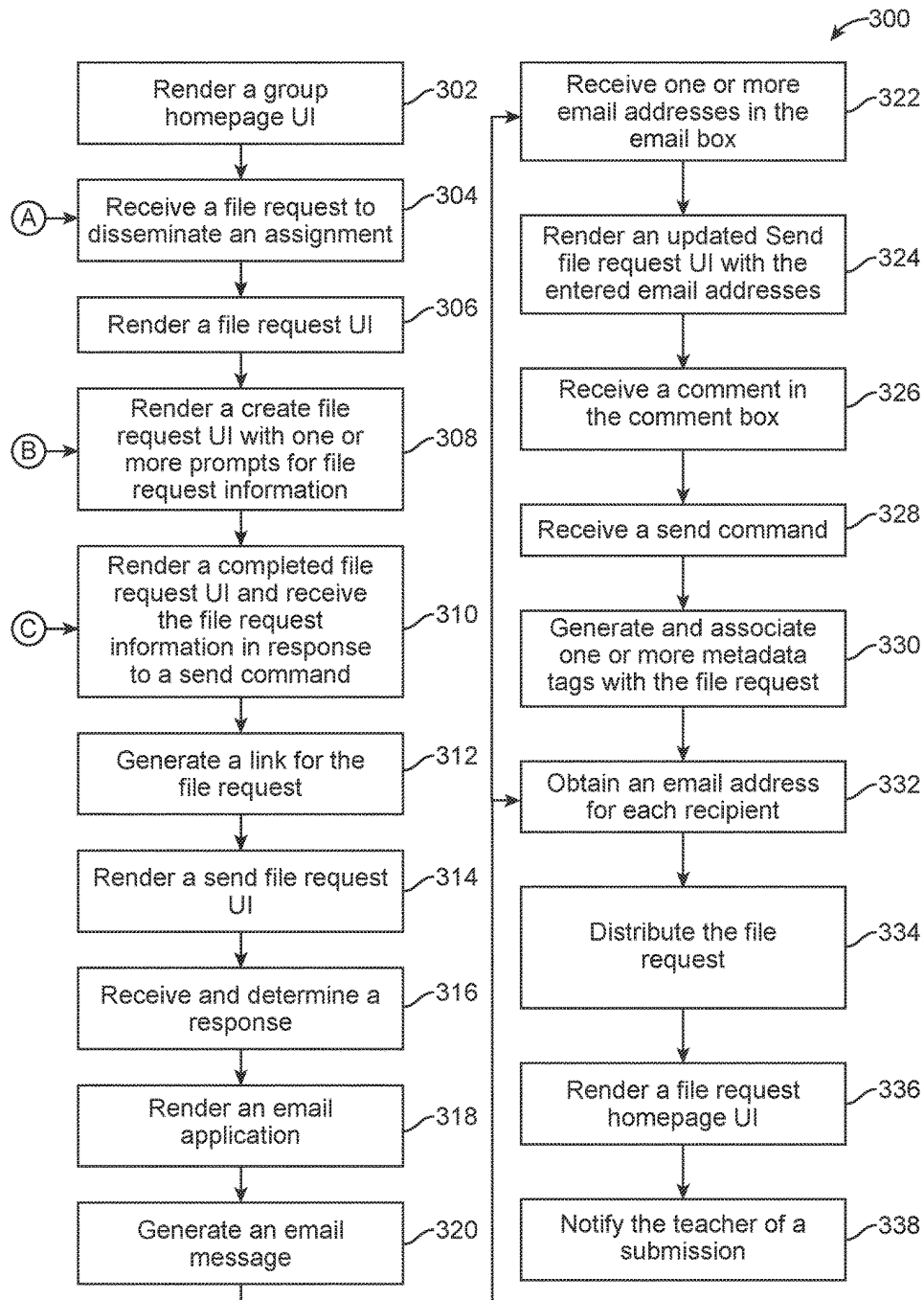


FIG. 3

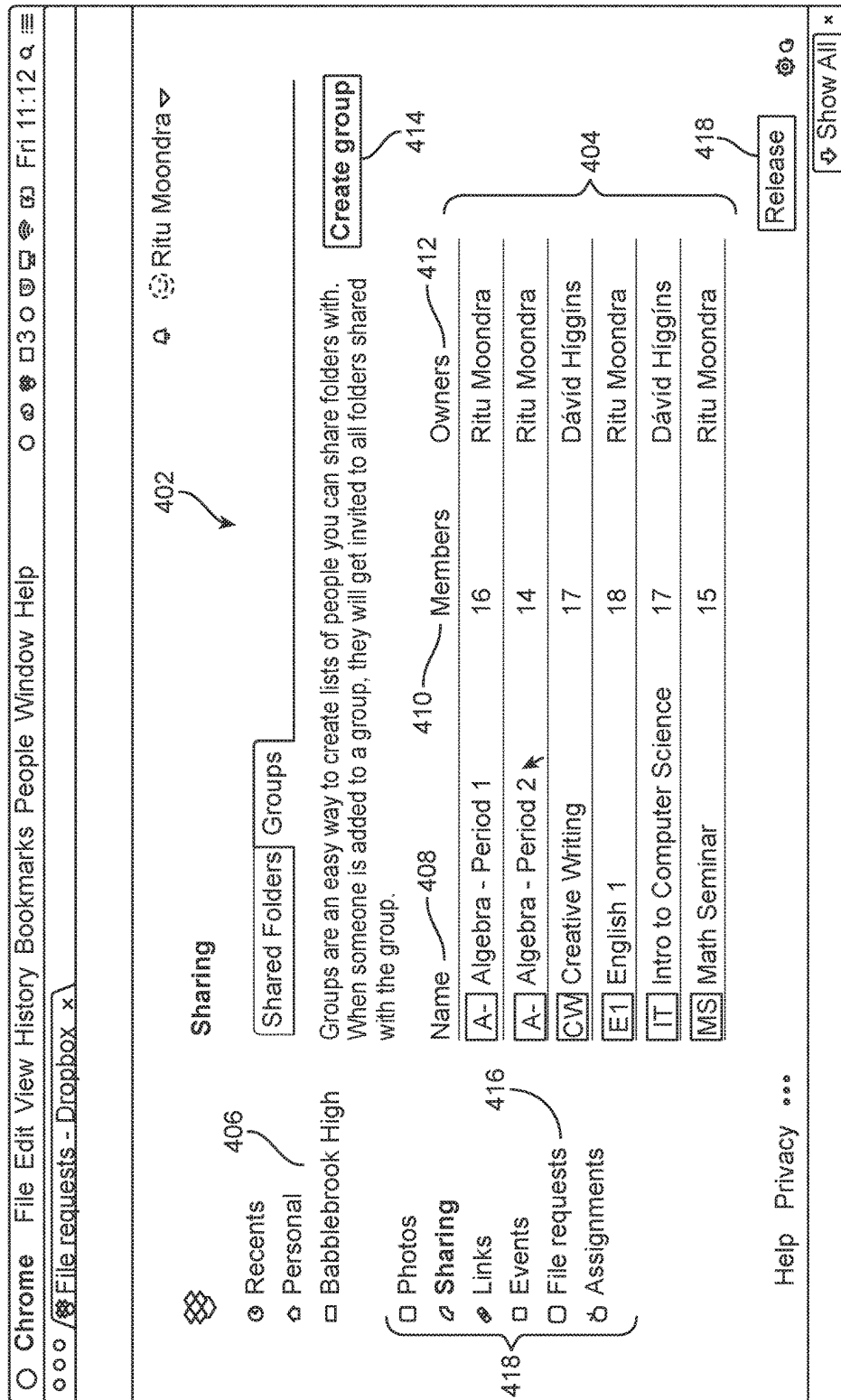


FIG. 4

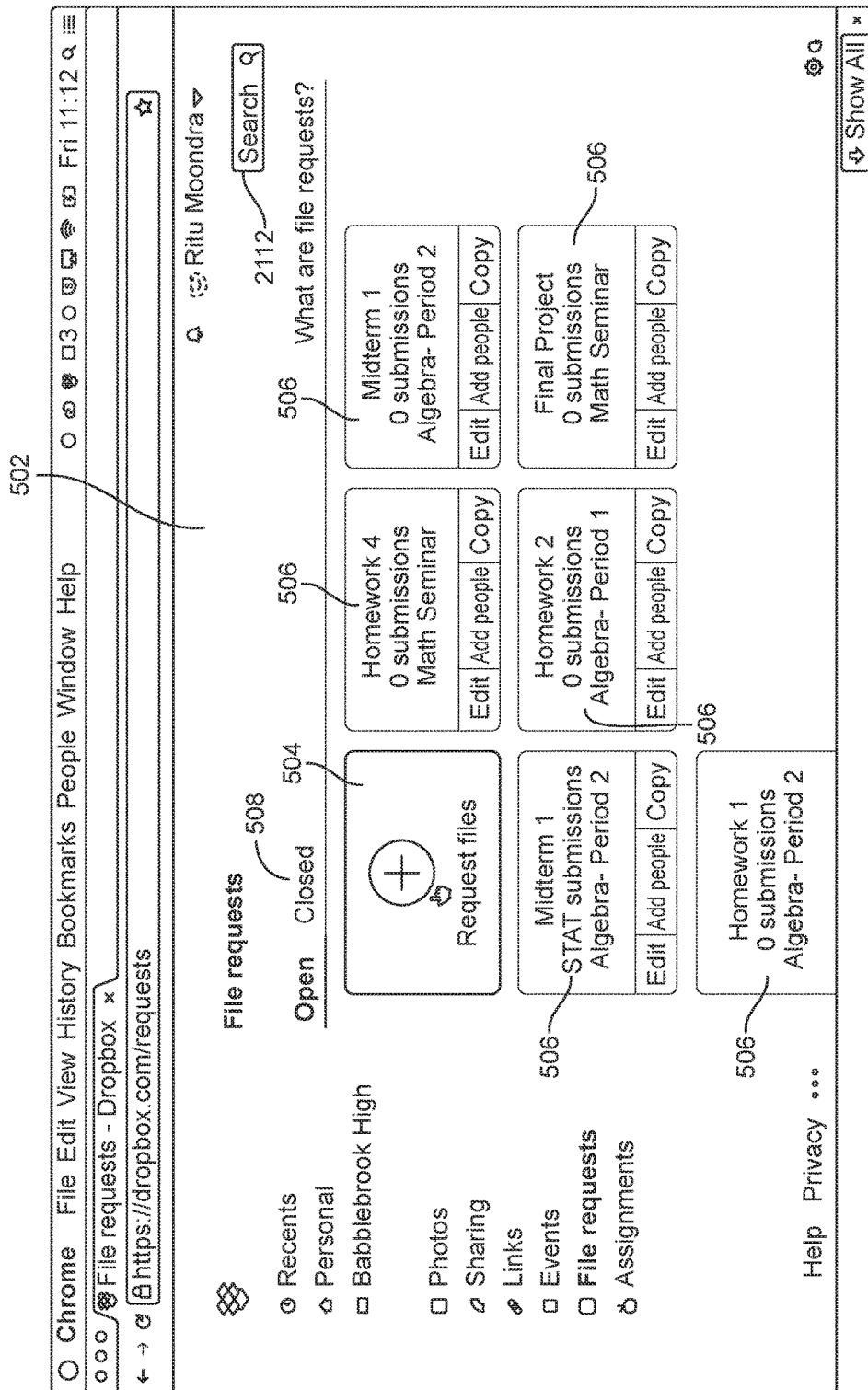


FIG. 5

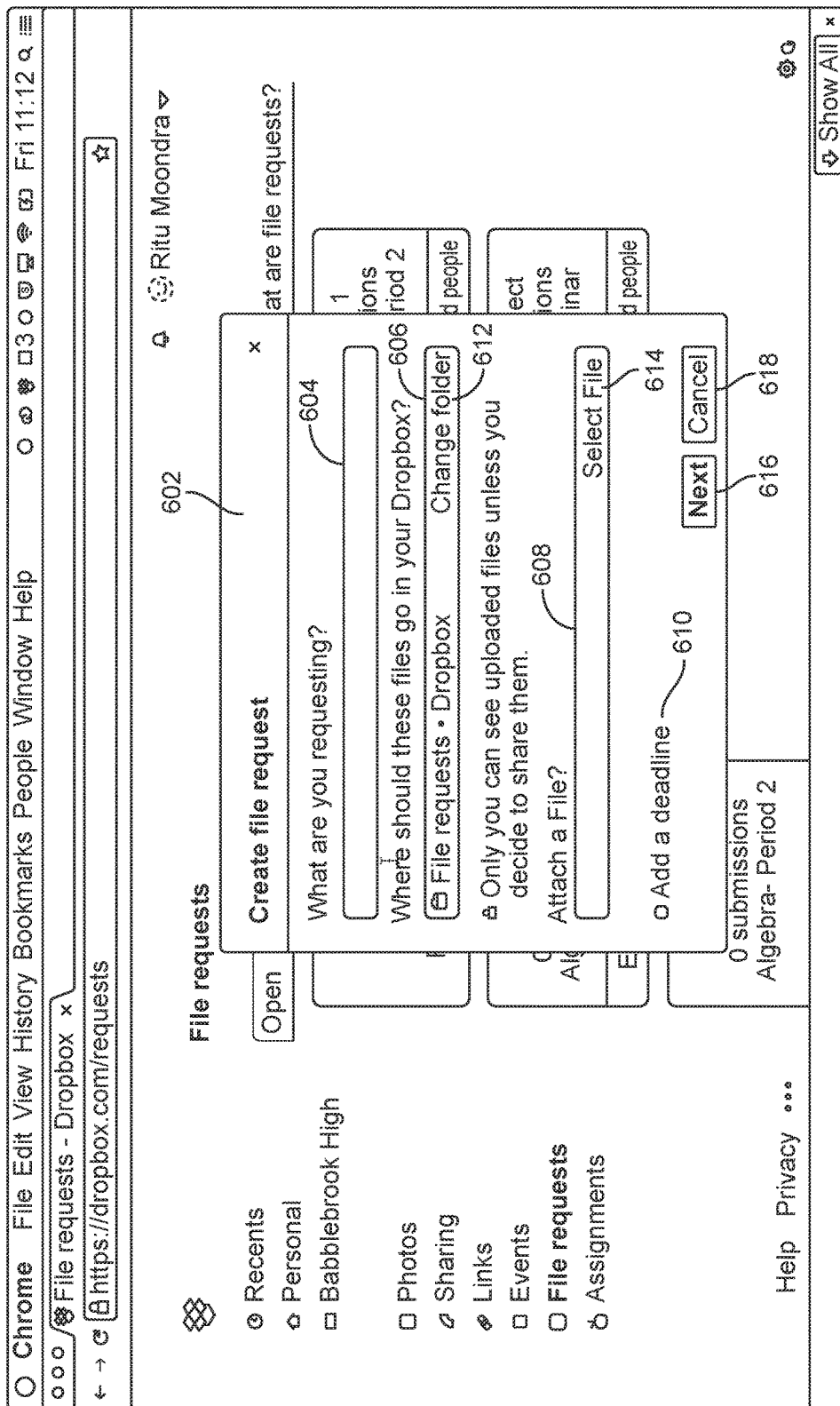


FIG. 6

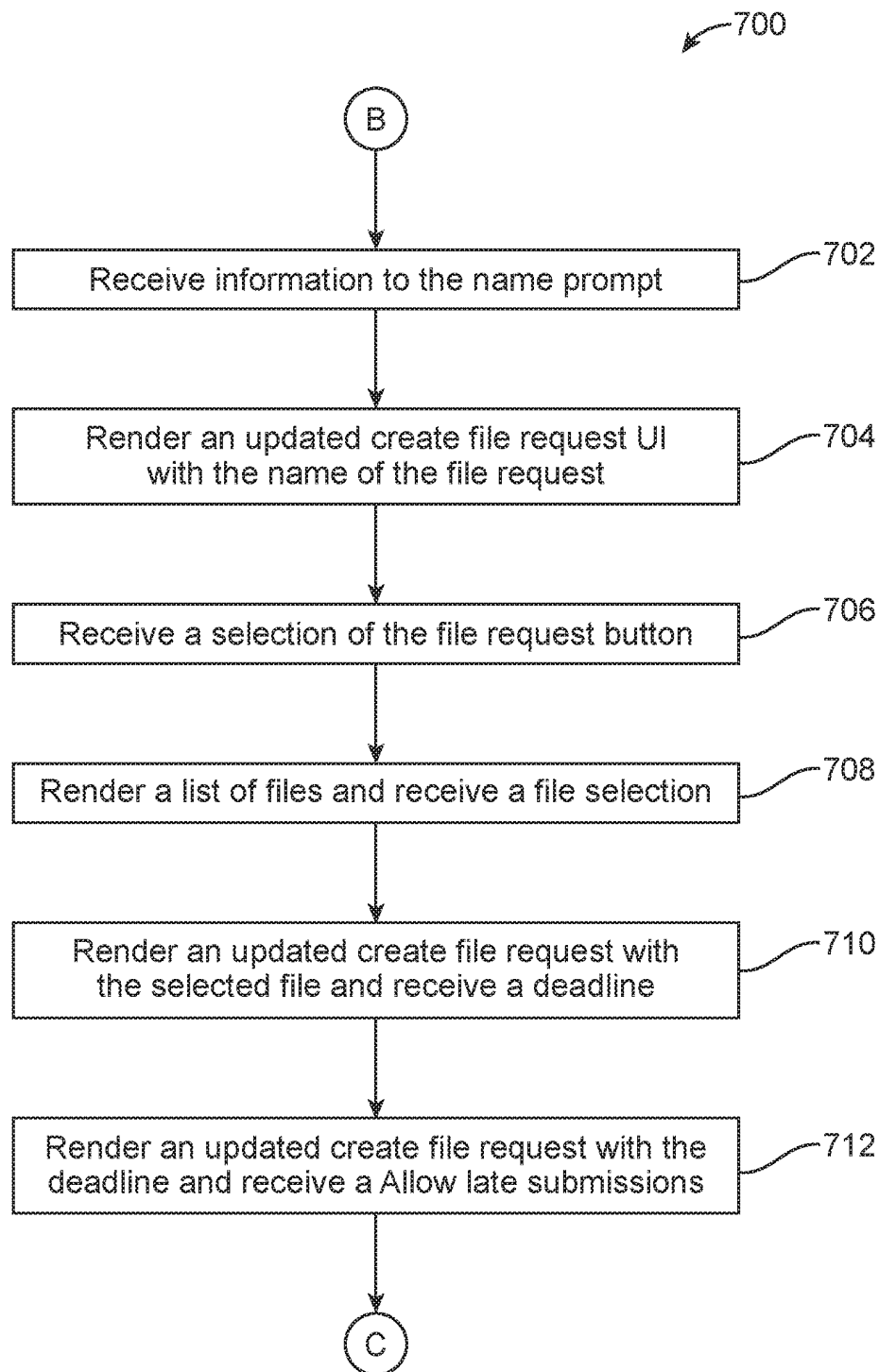


FIG. 7

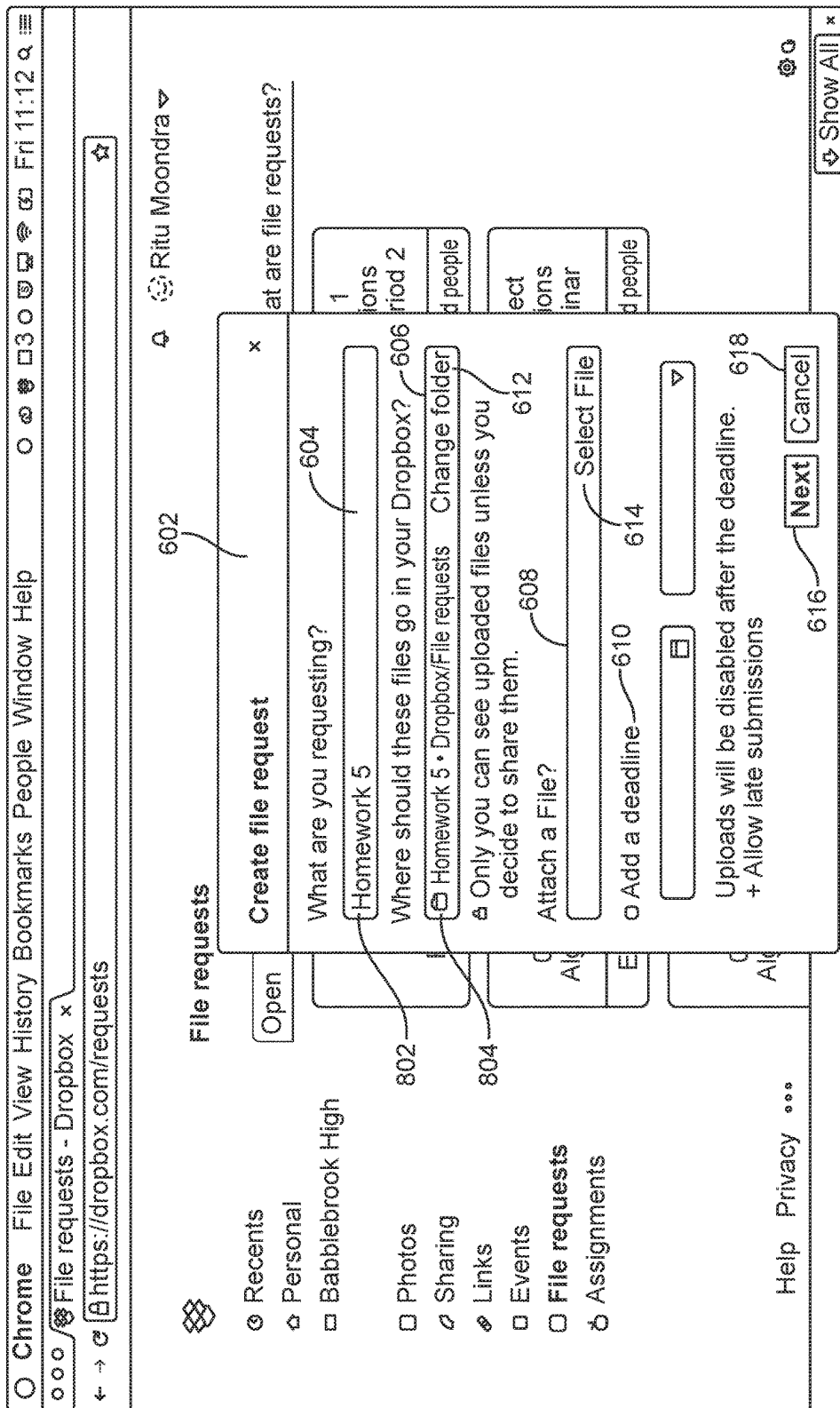


FIG. 8

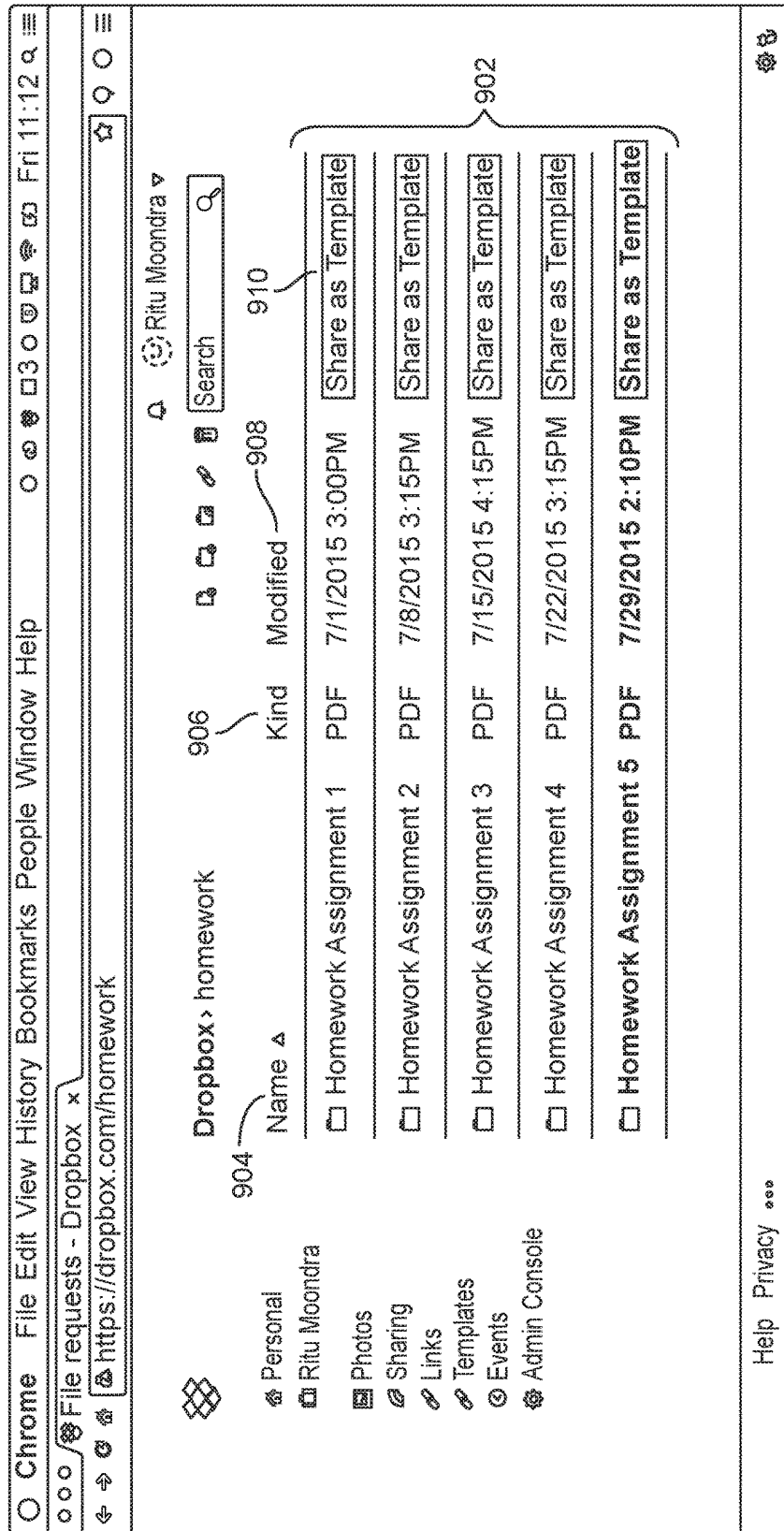


FIG. 9

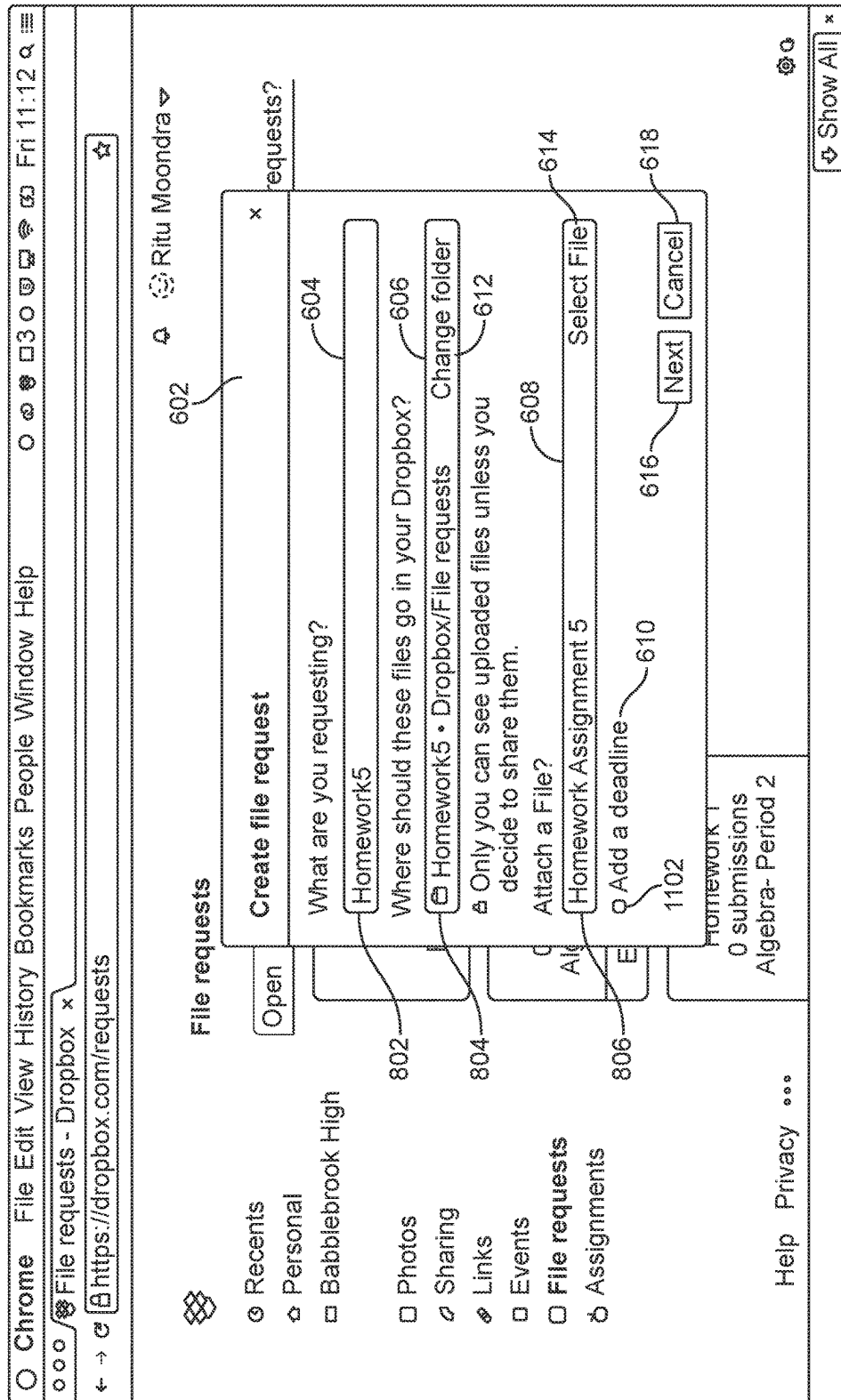


FIG. 10

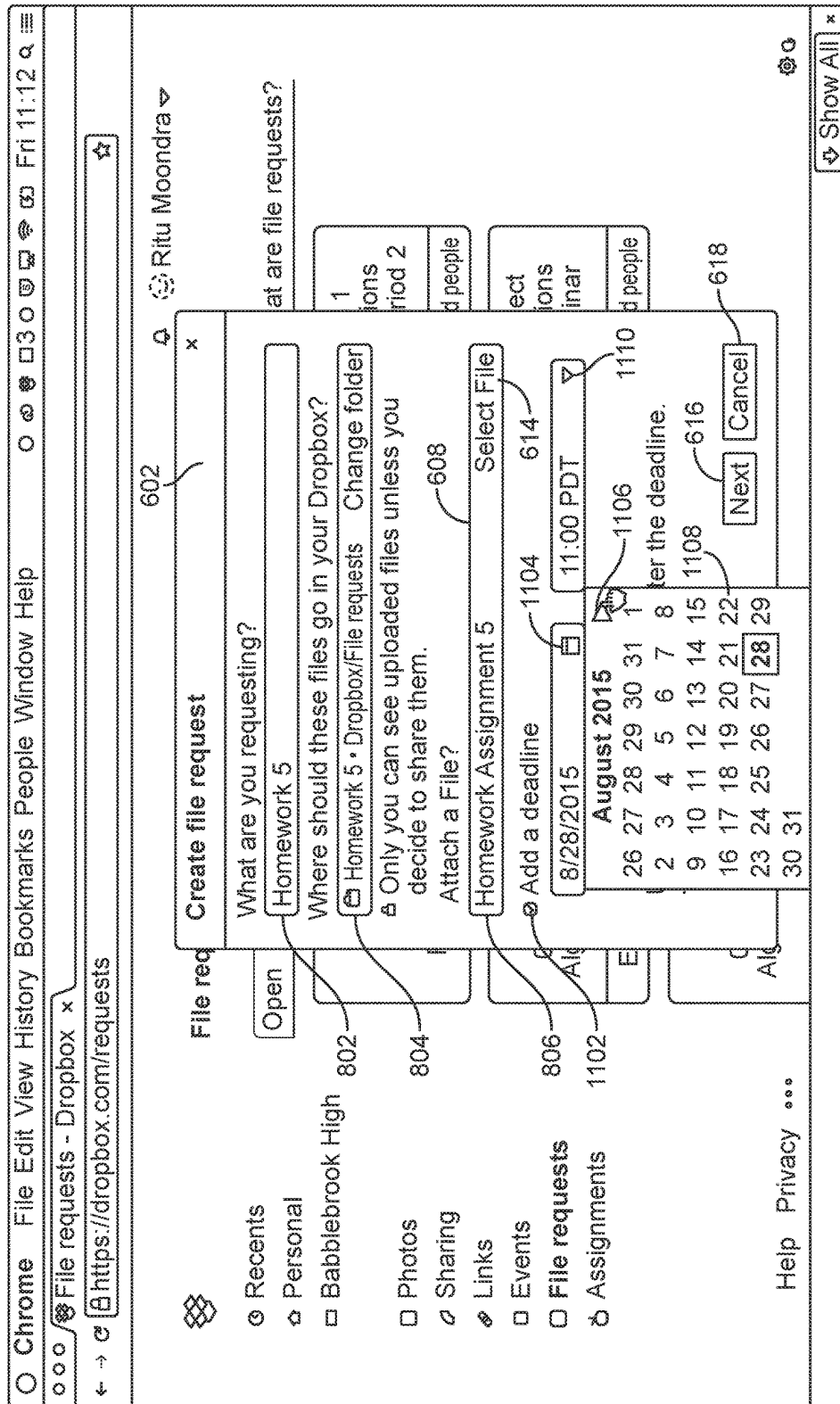


FIG. 11

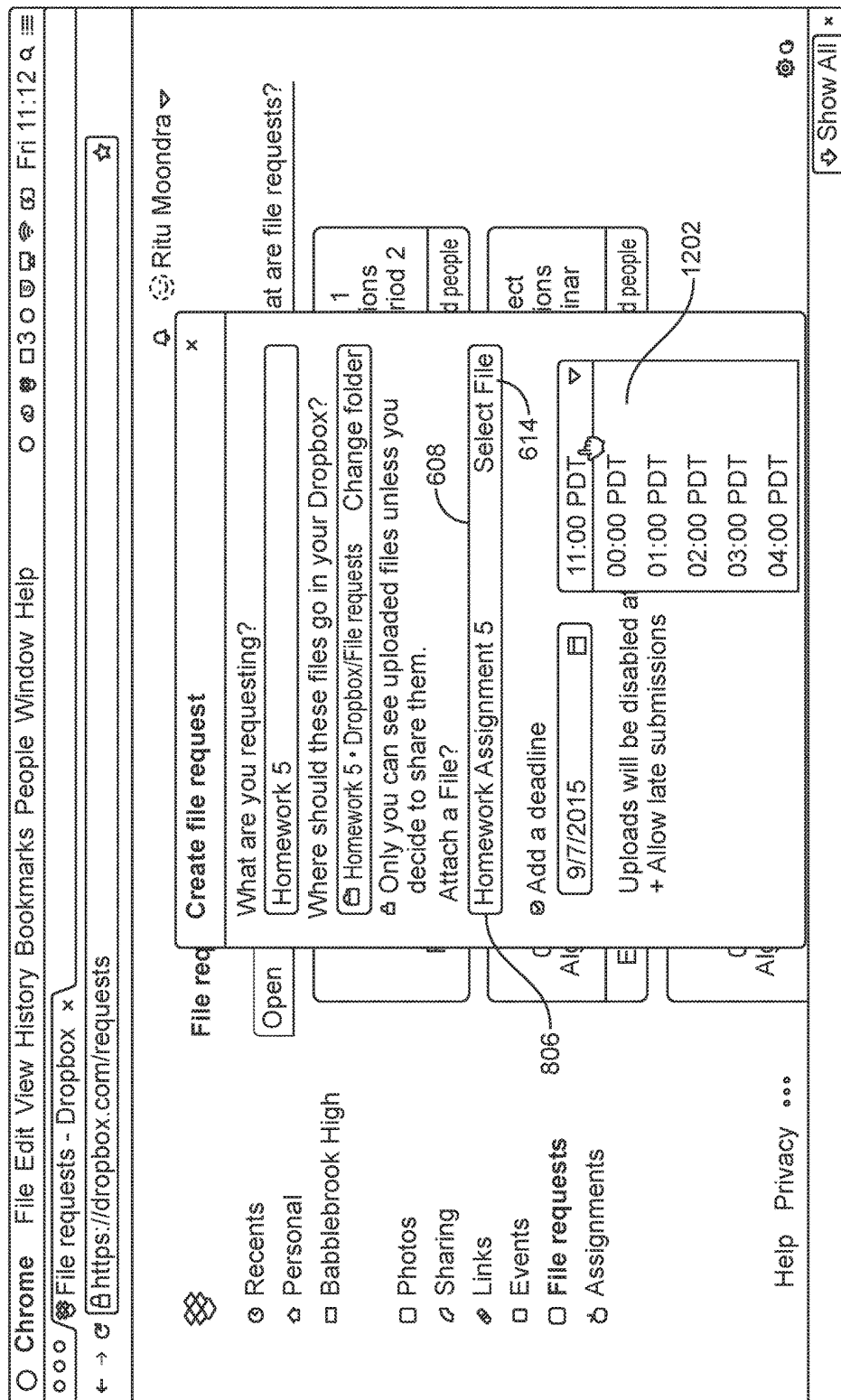


FIG. 12

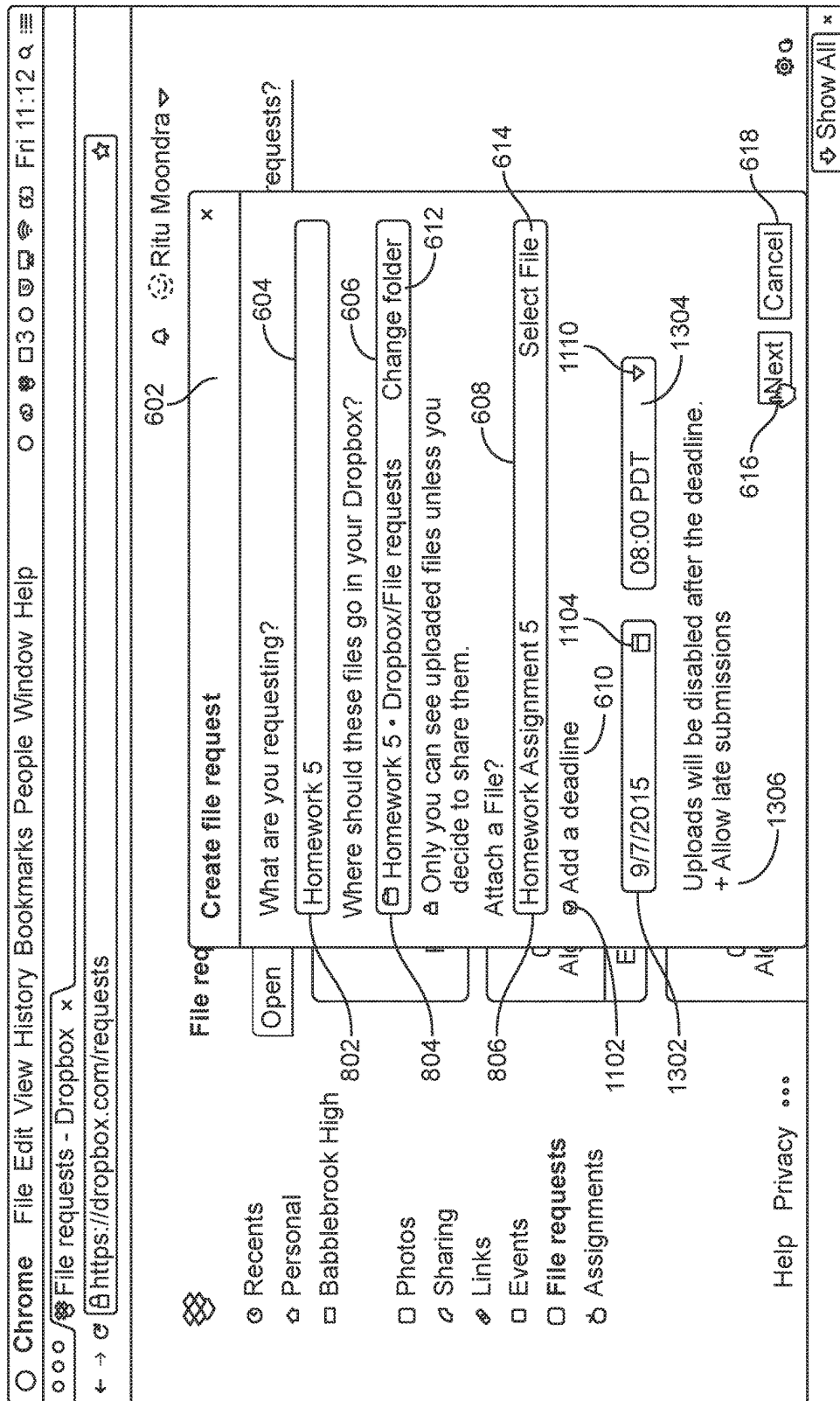


FIG. 13

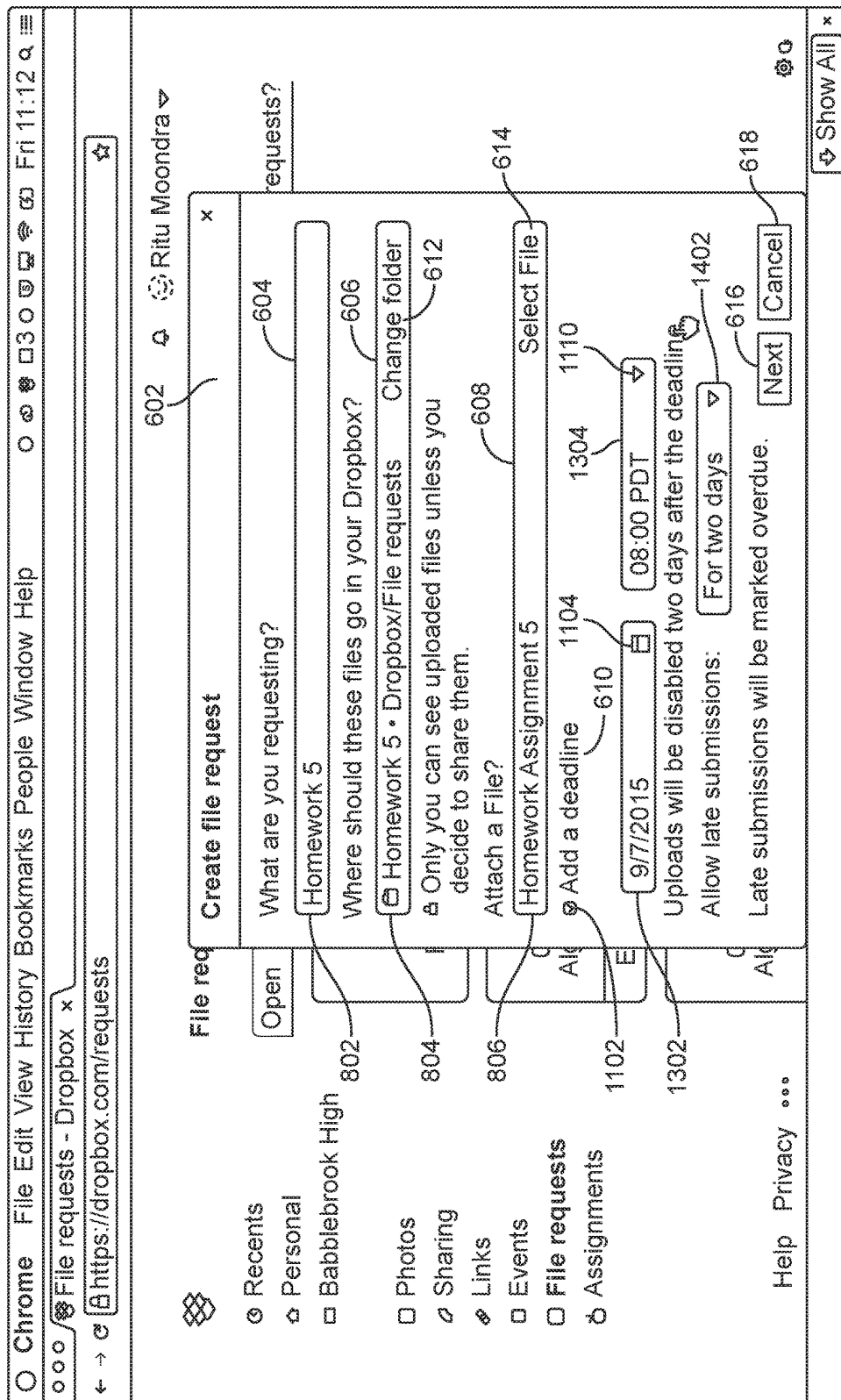


FIG. 14

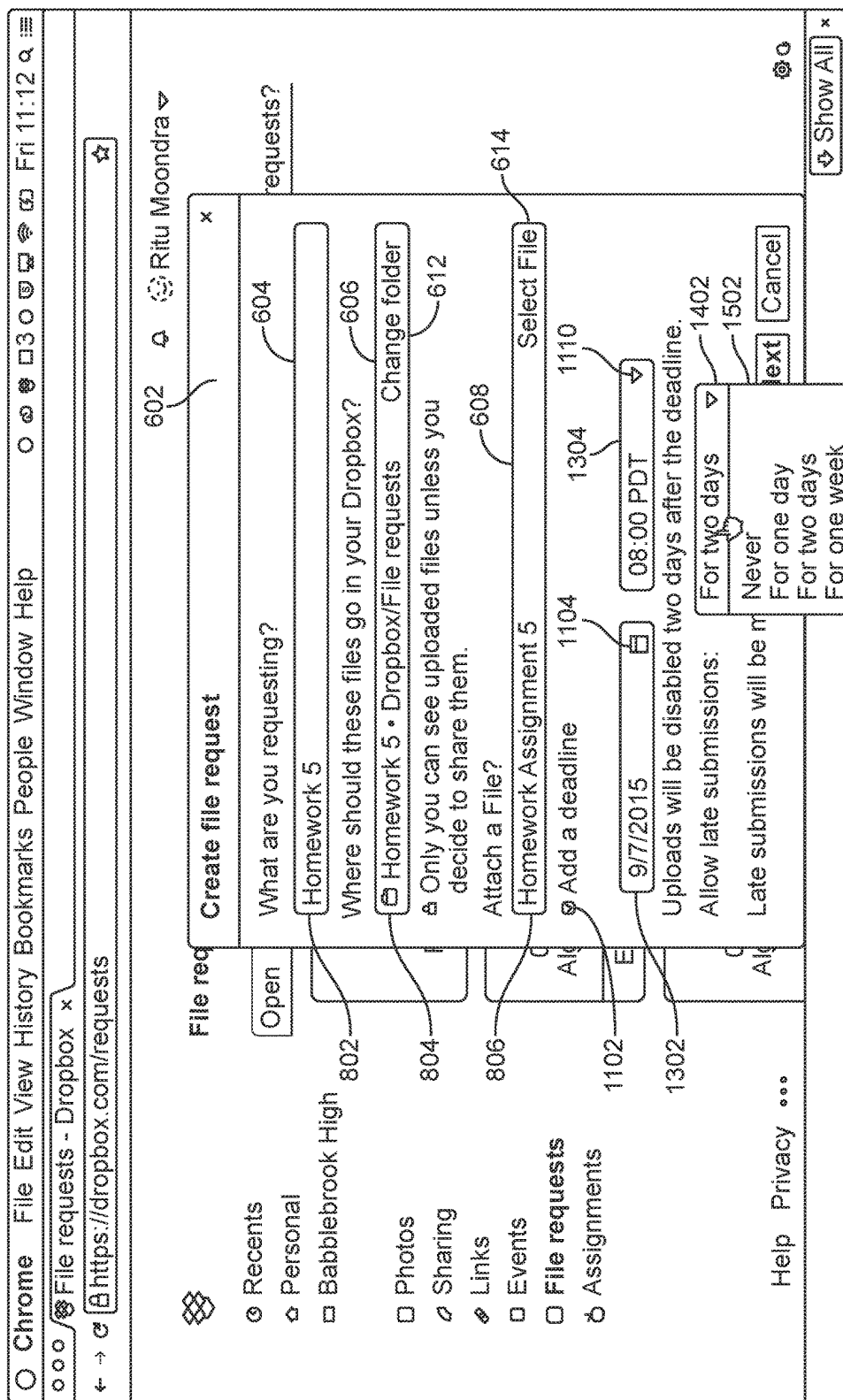


FIG. 15

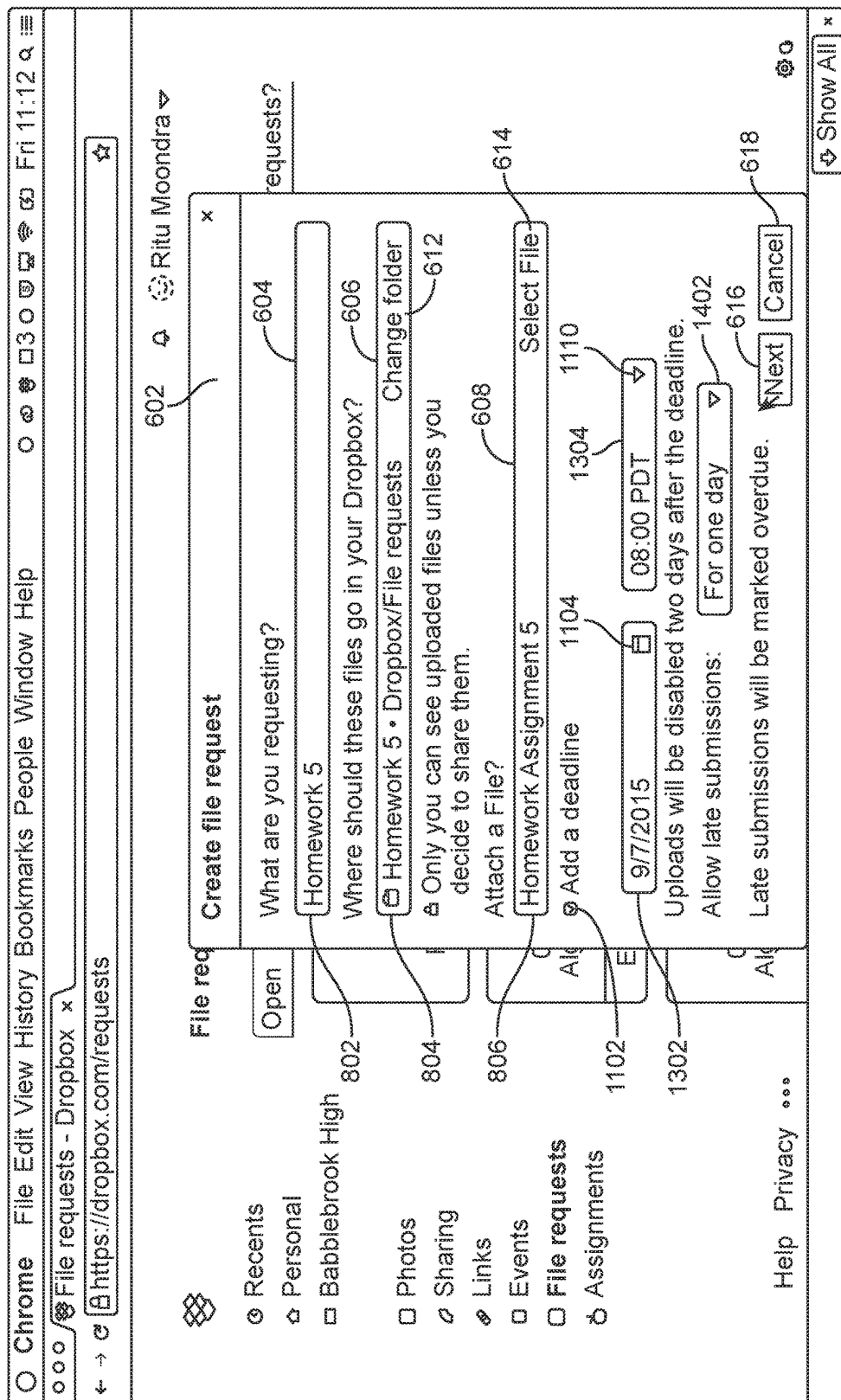


FIG. 16

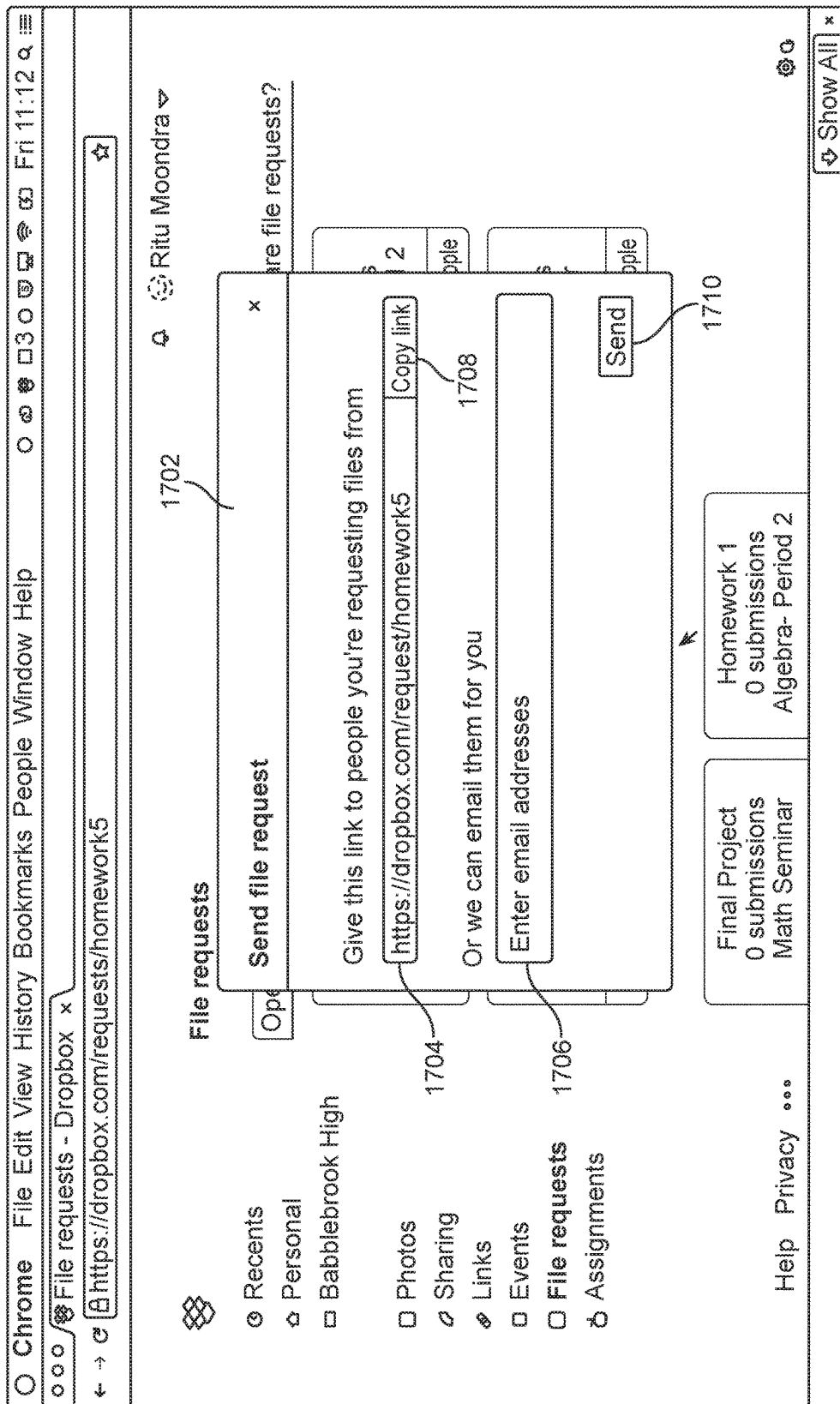


FIG. 17

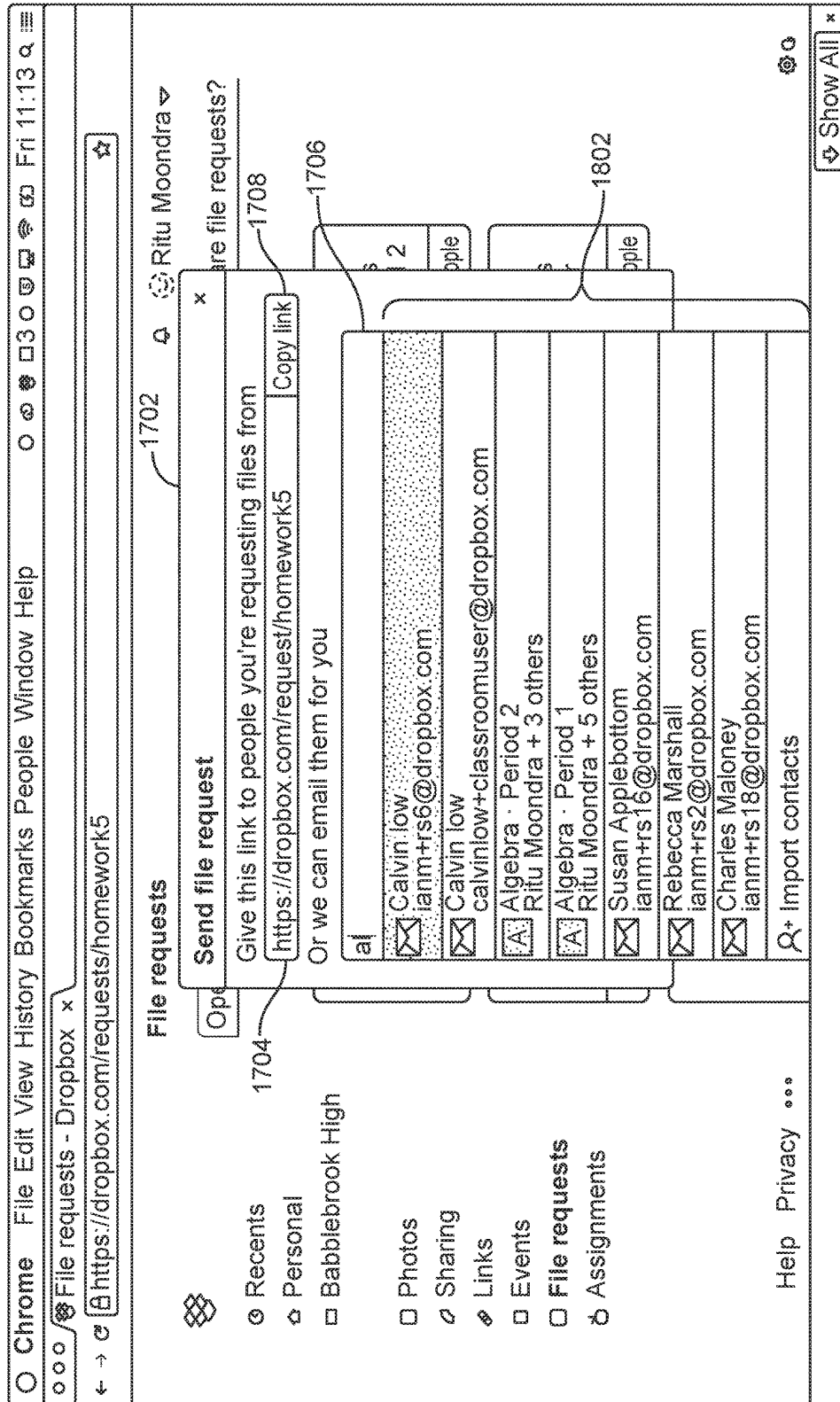


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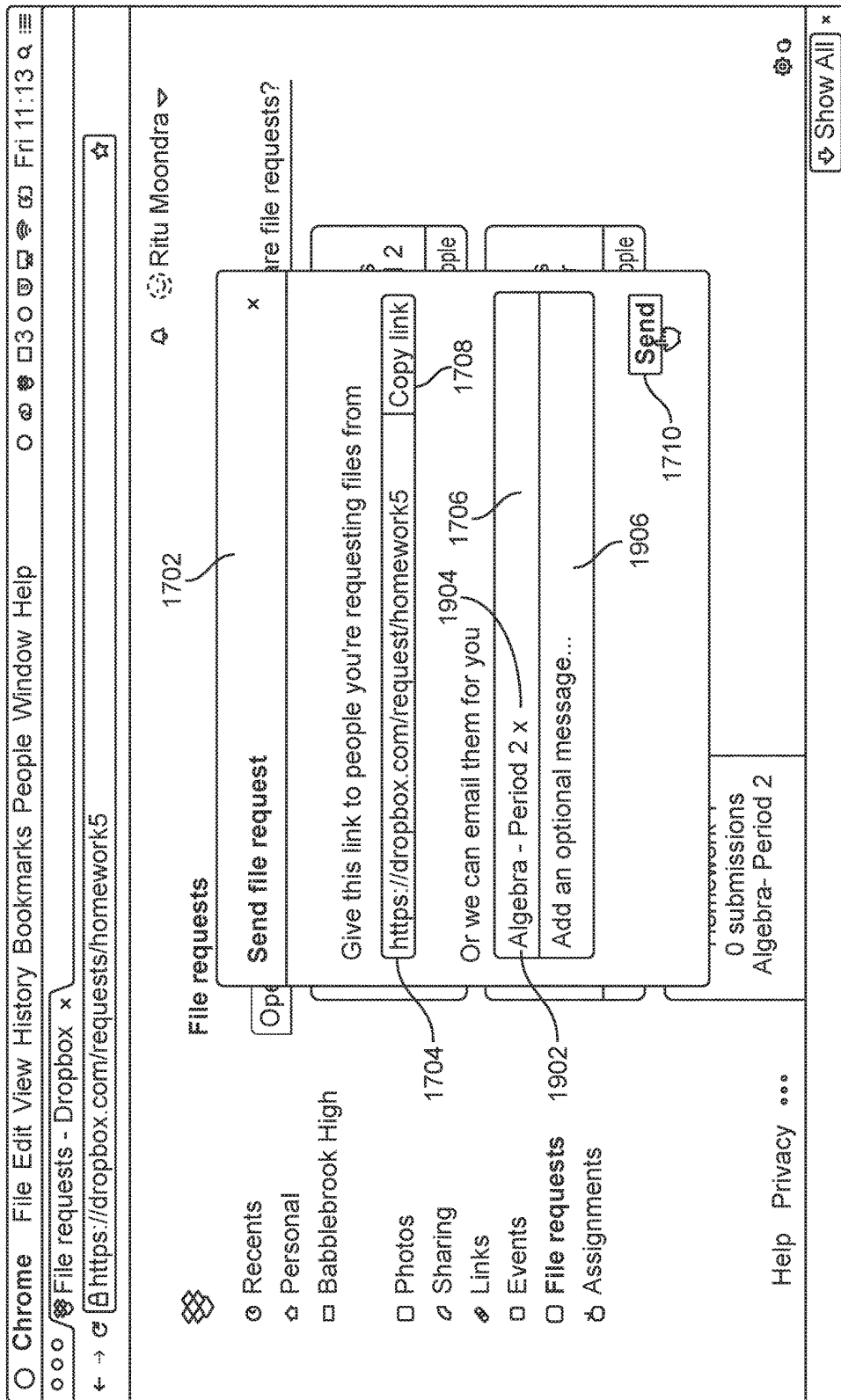


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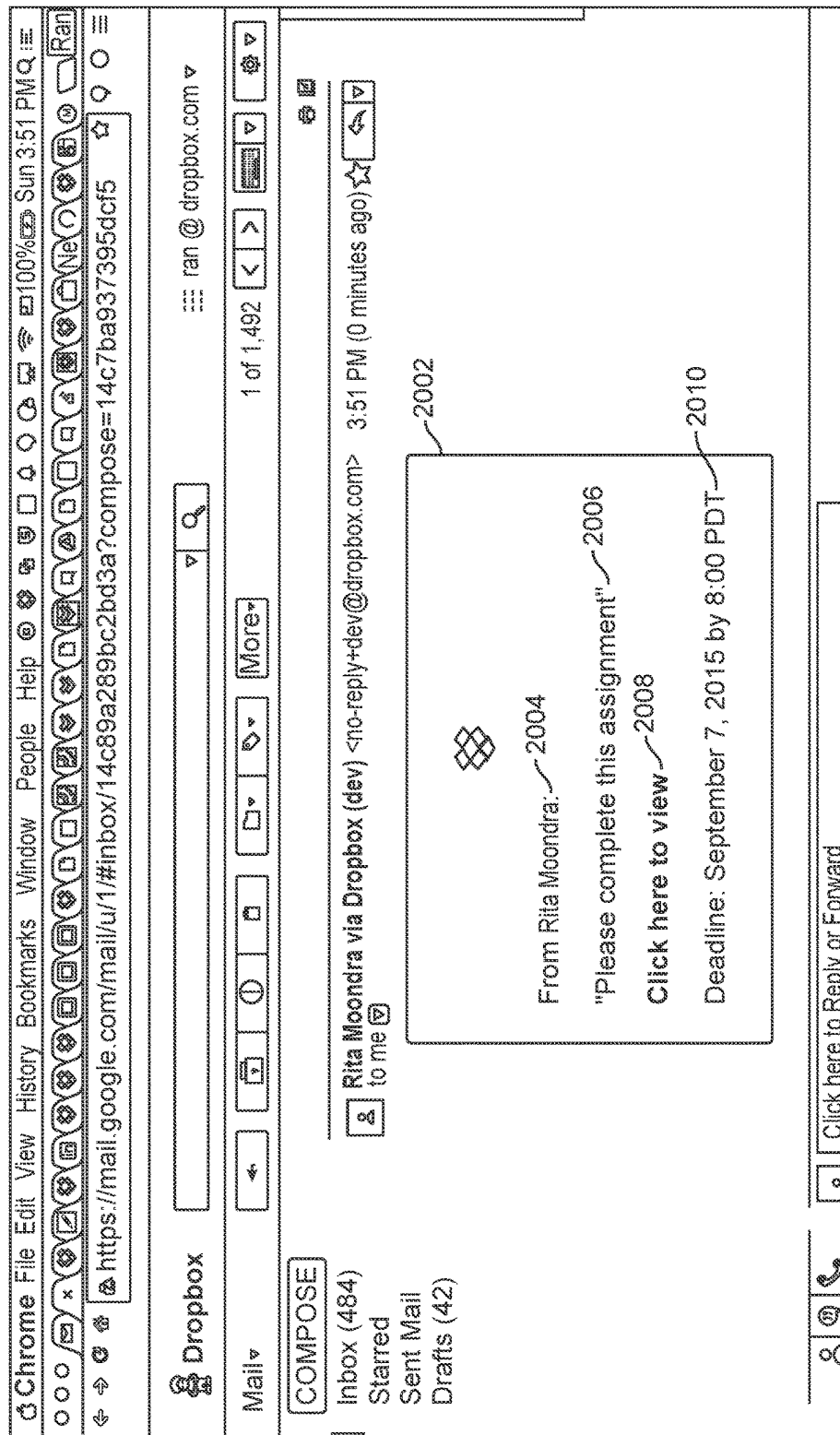


FIG. 20

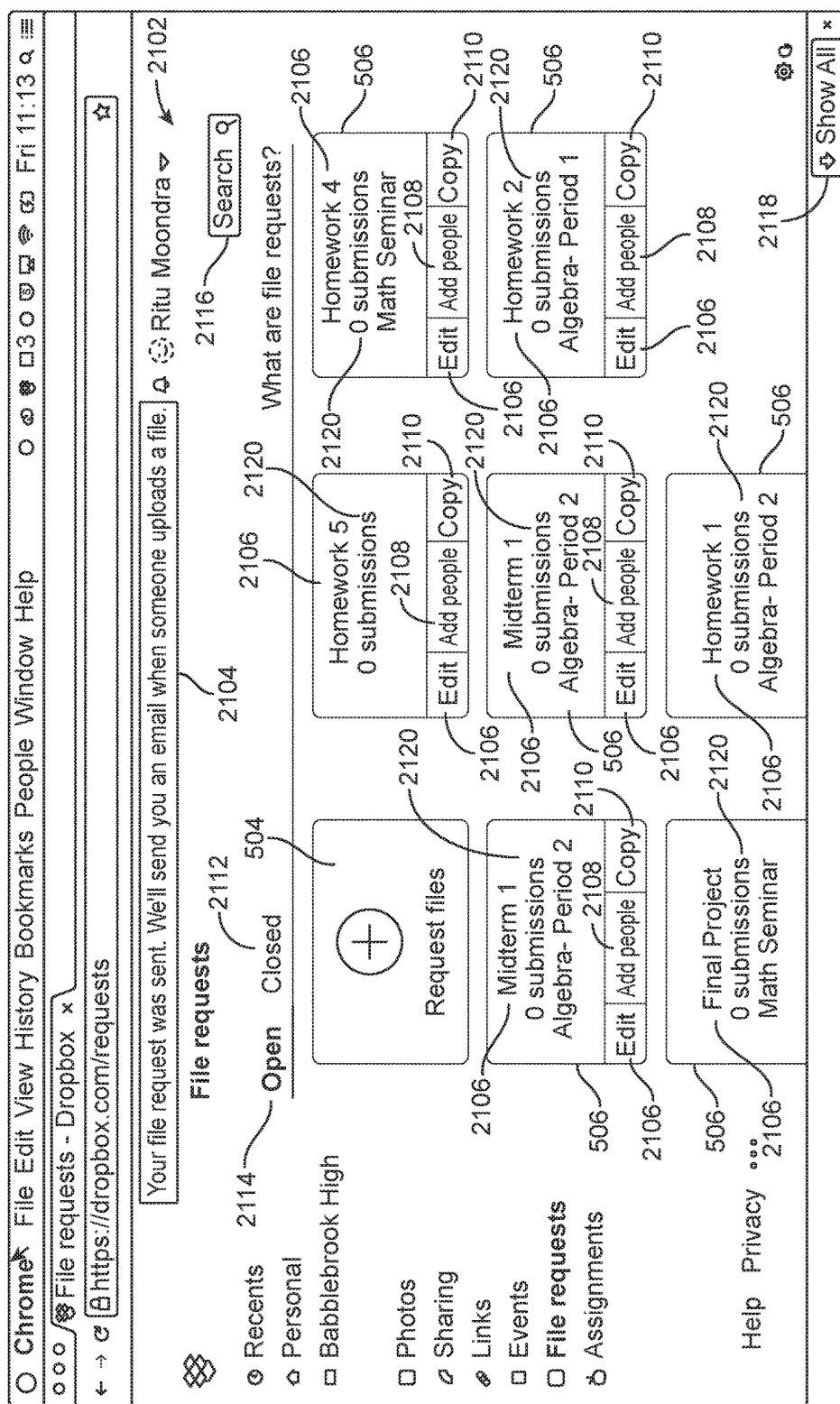


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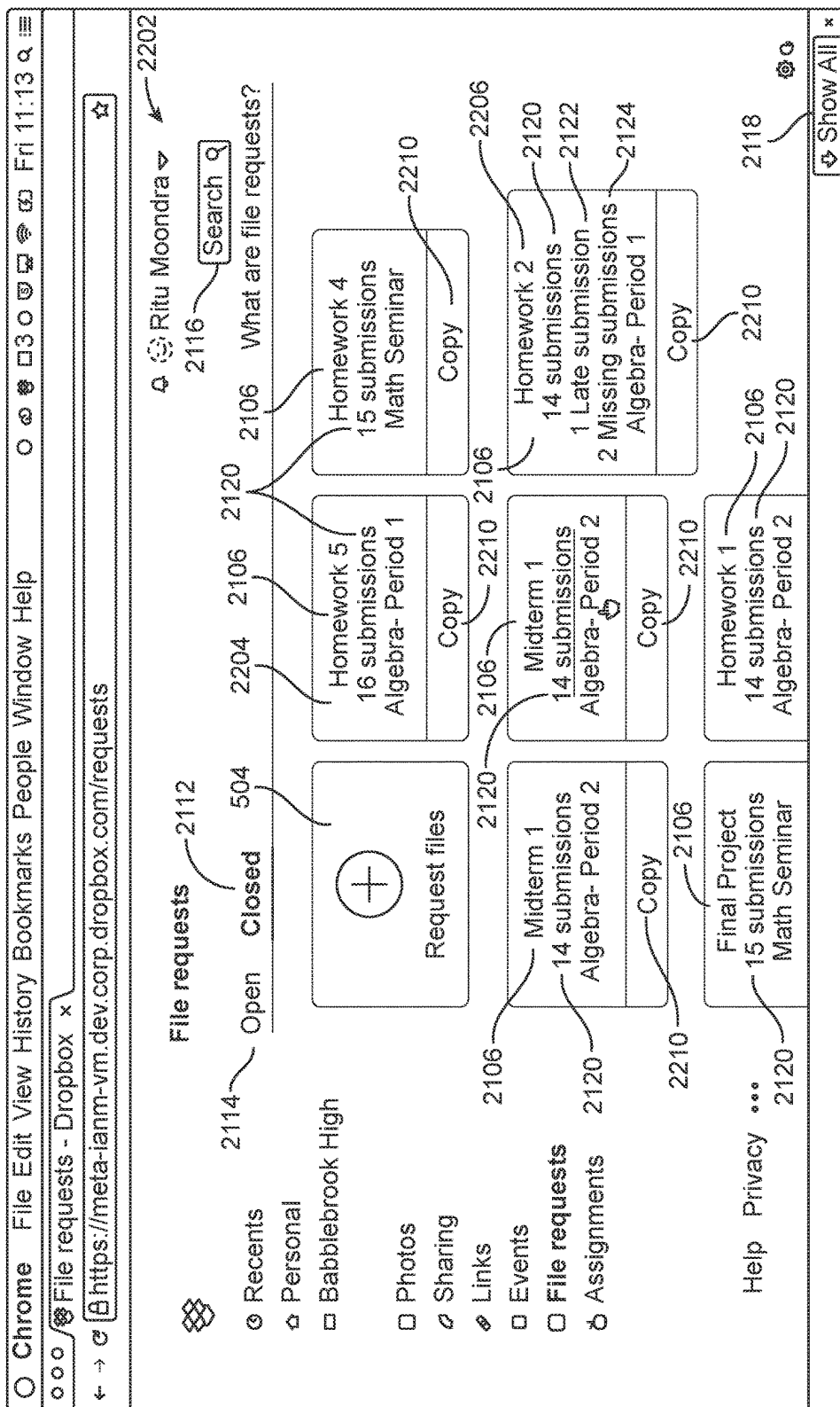


FIG. 22

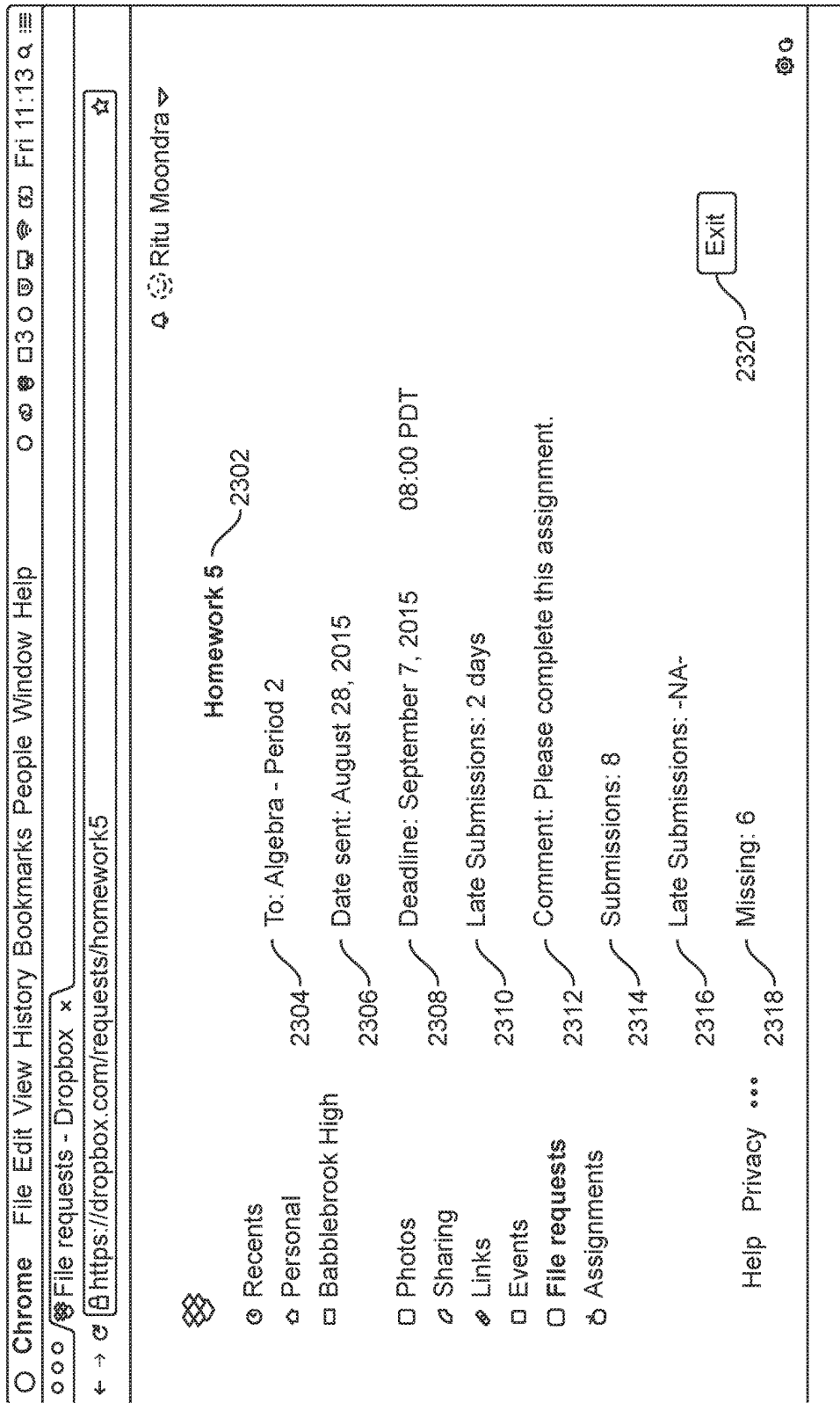


FIG. 23

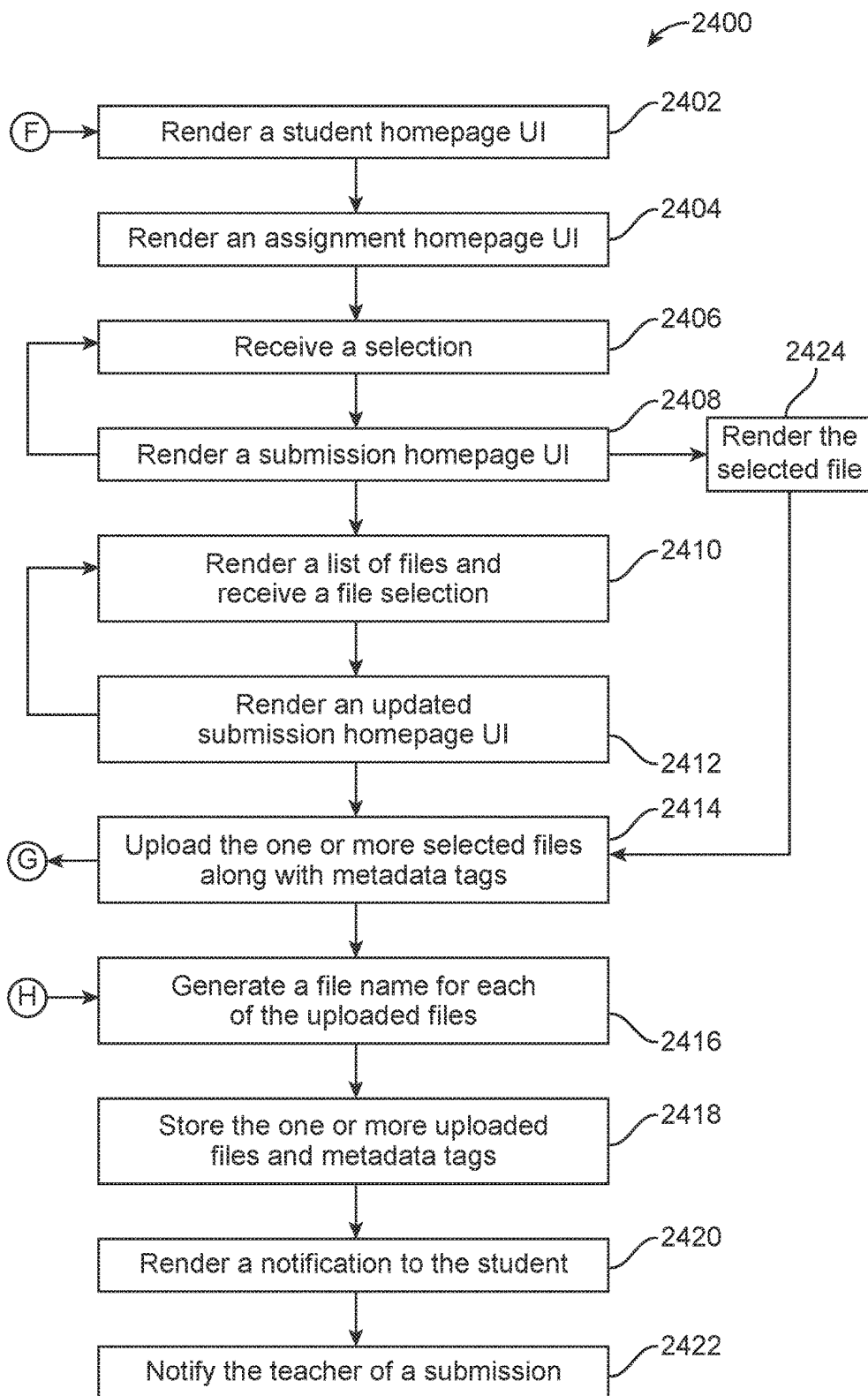


FIG. 24

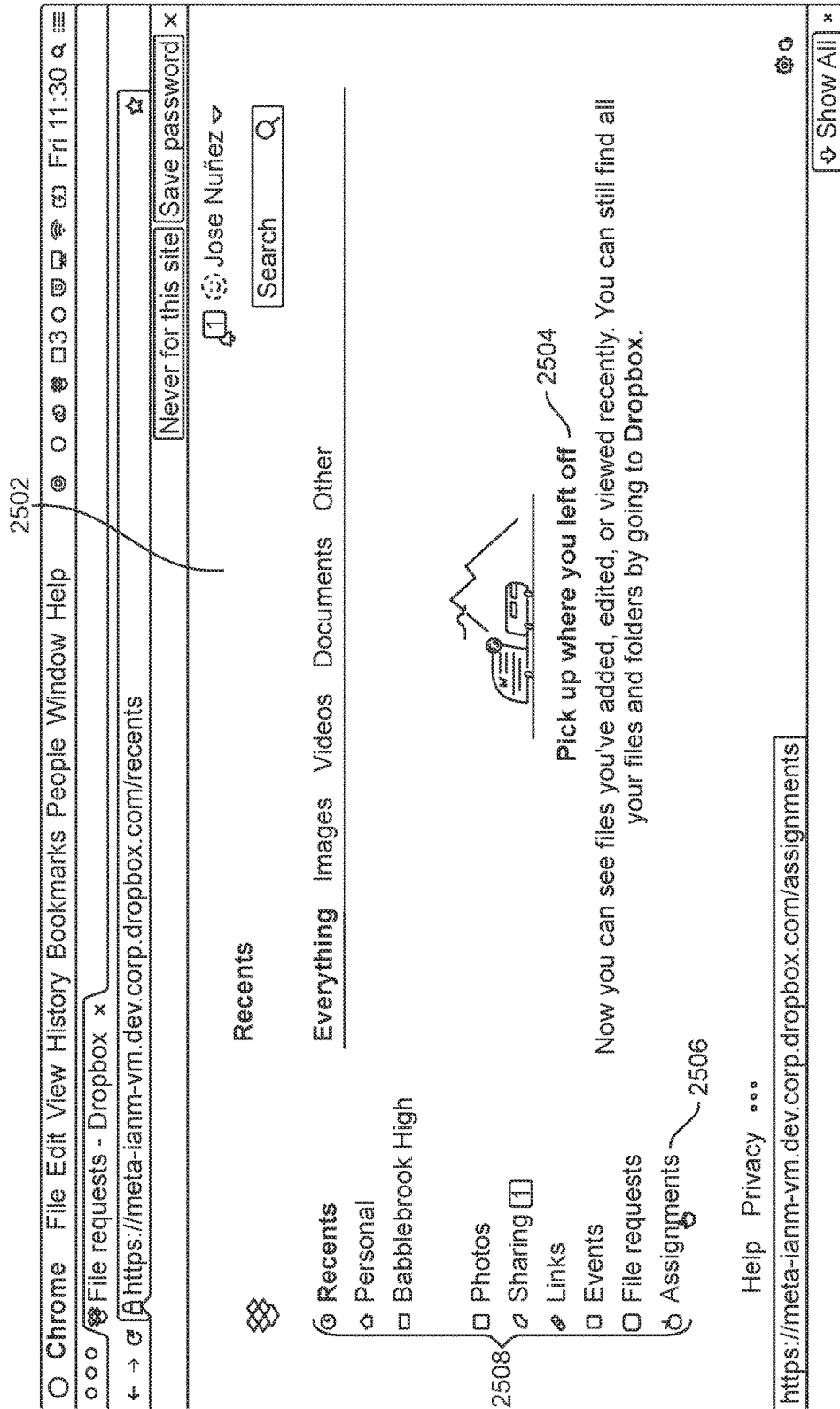


FIG. 25

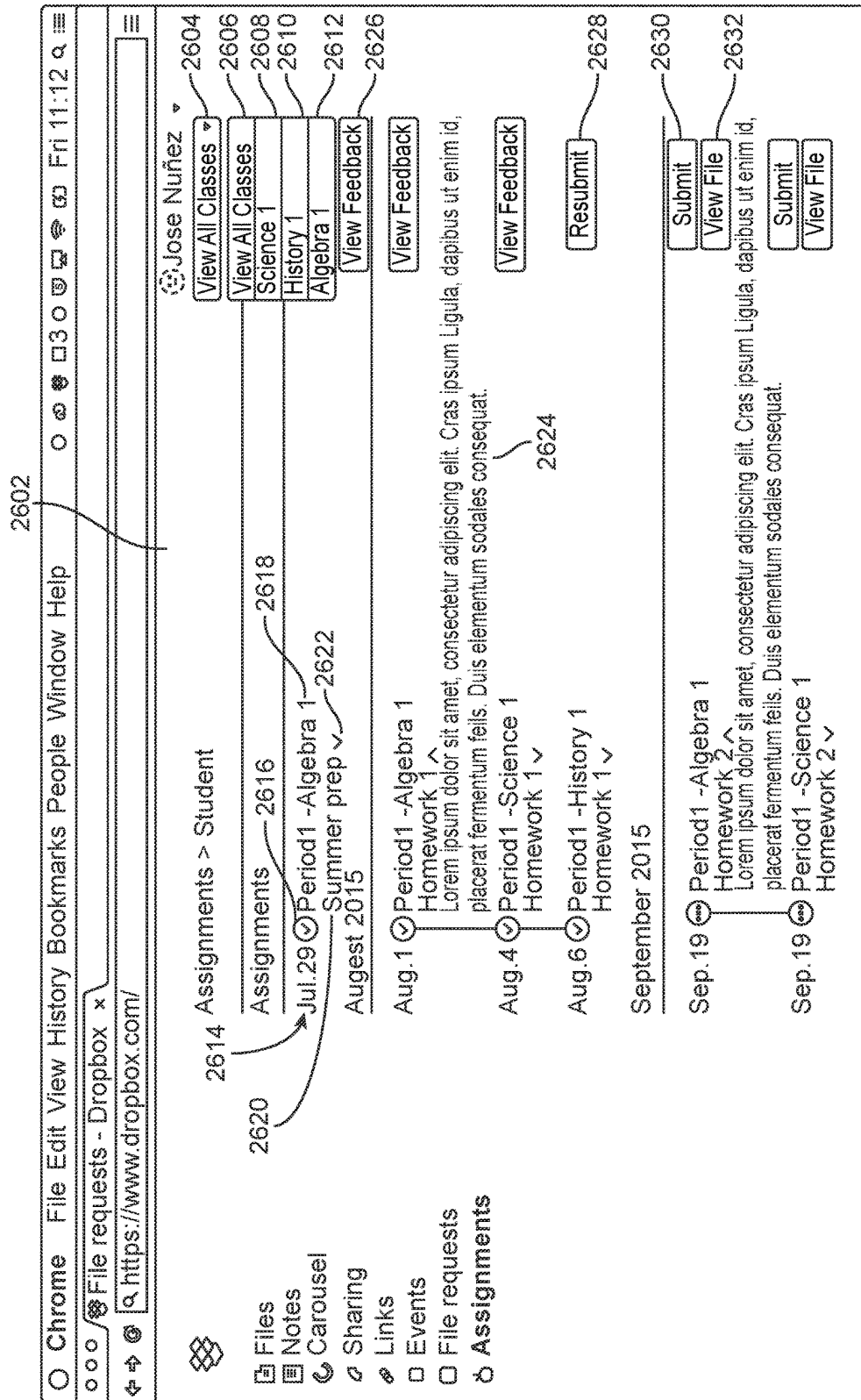


FIG. 26

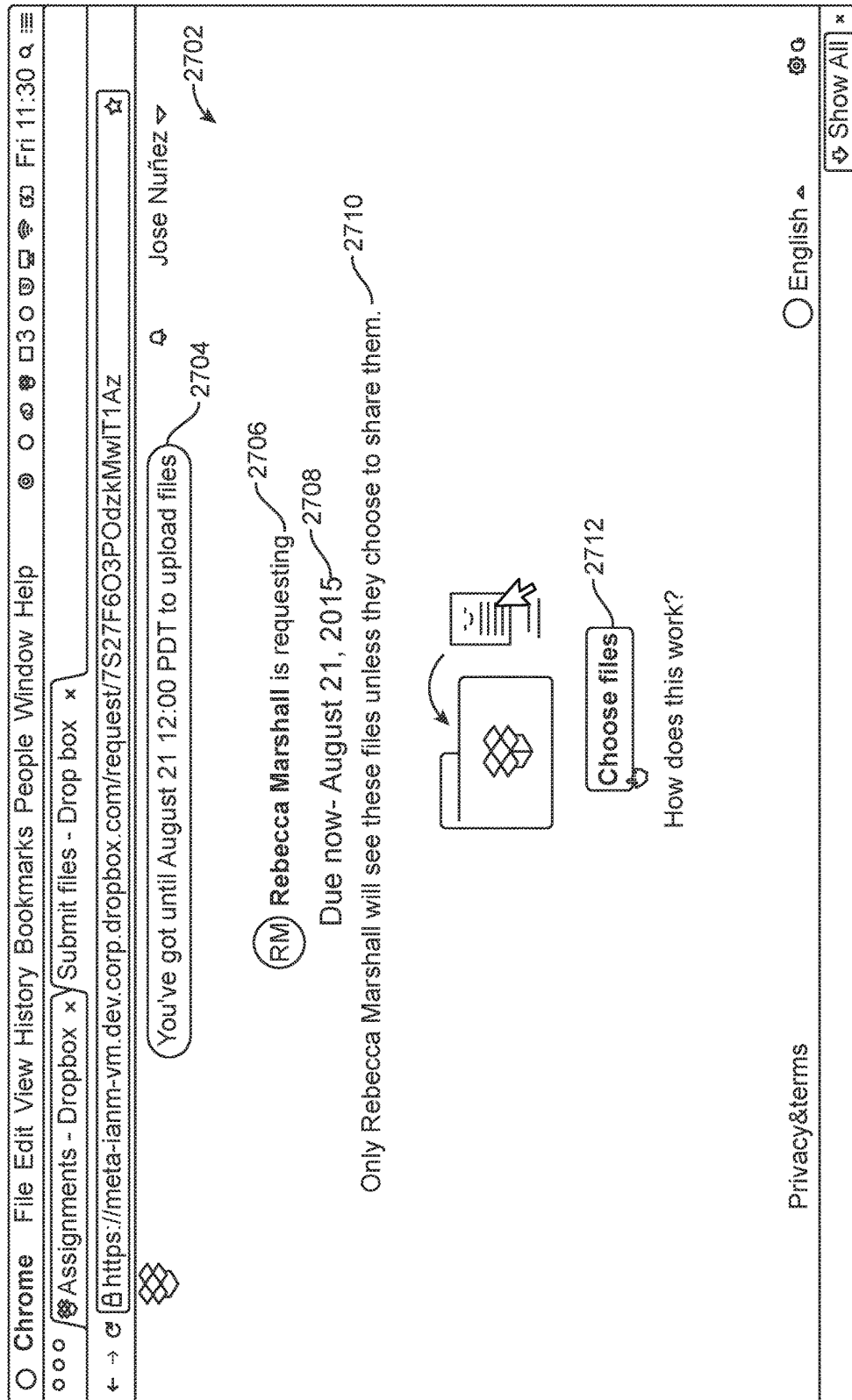


FIG. 27

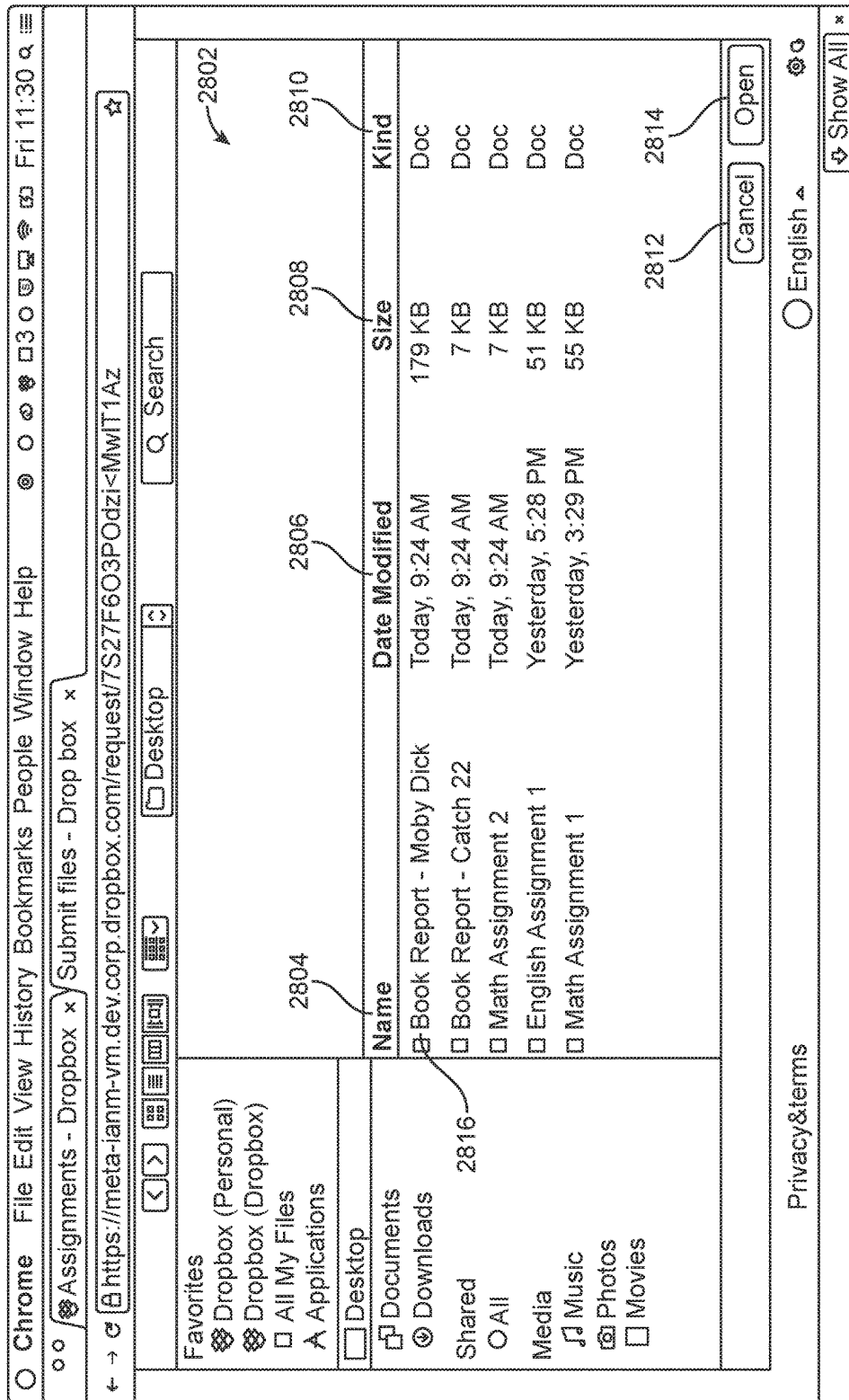


FIG. 28

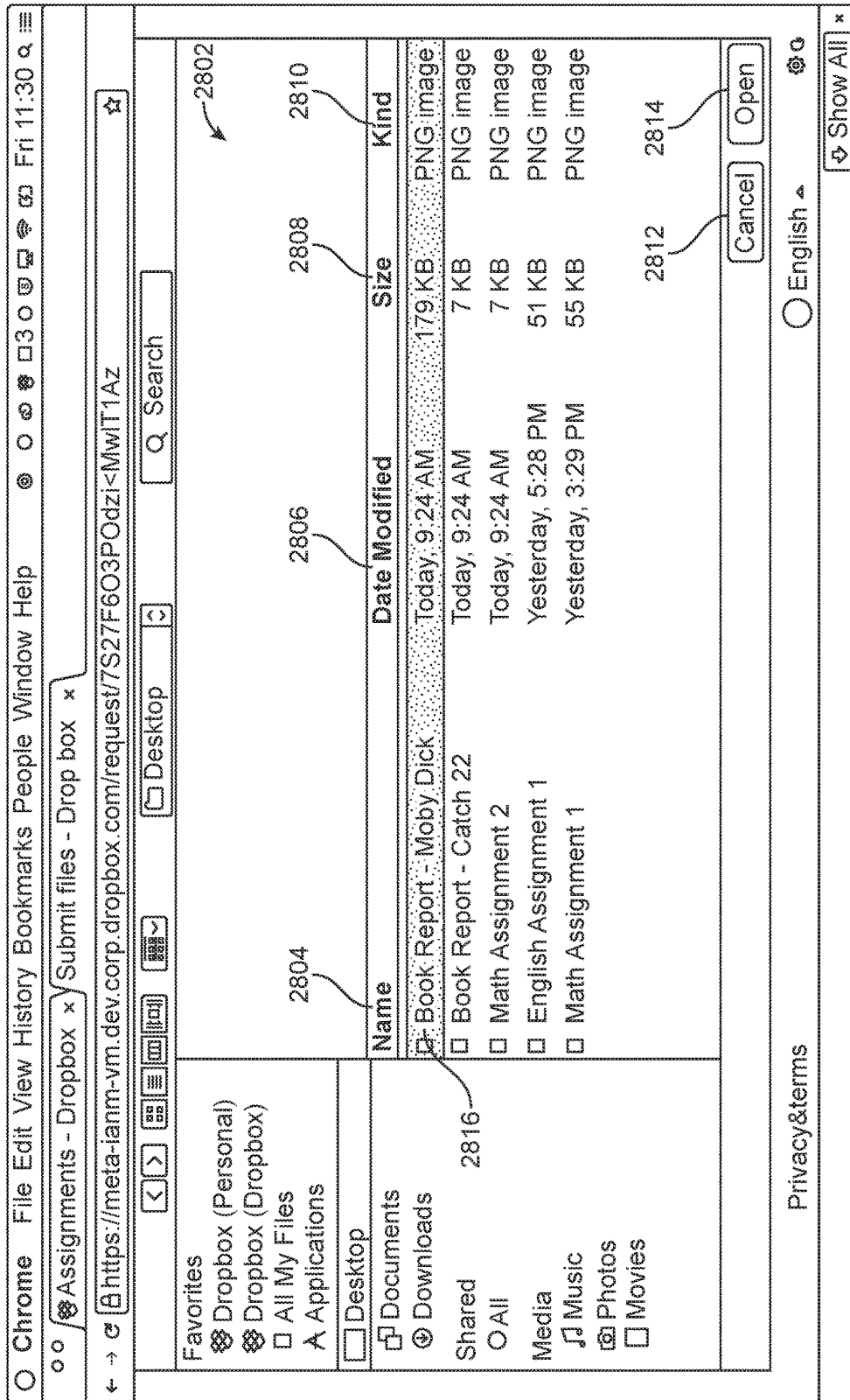


FIG. 29

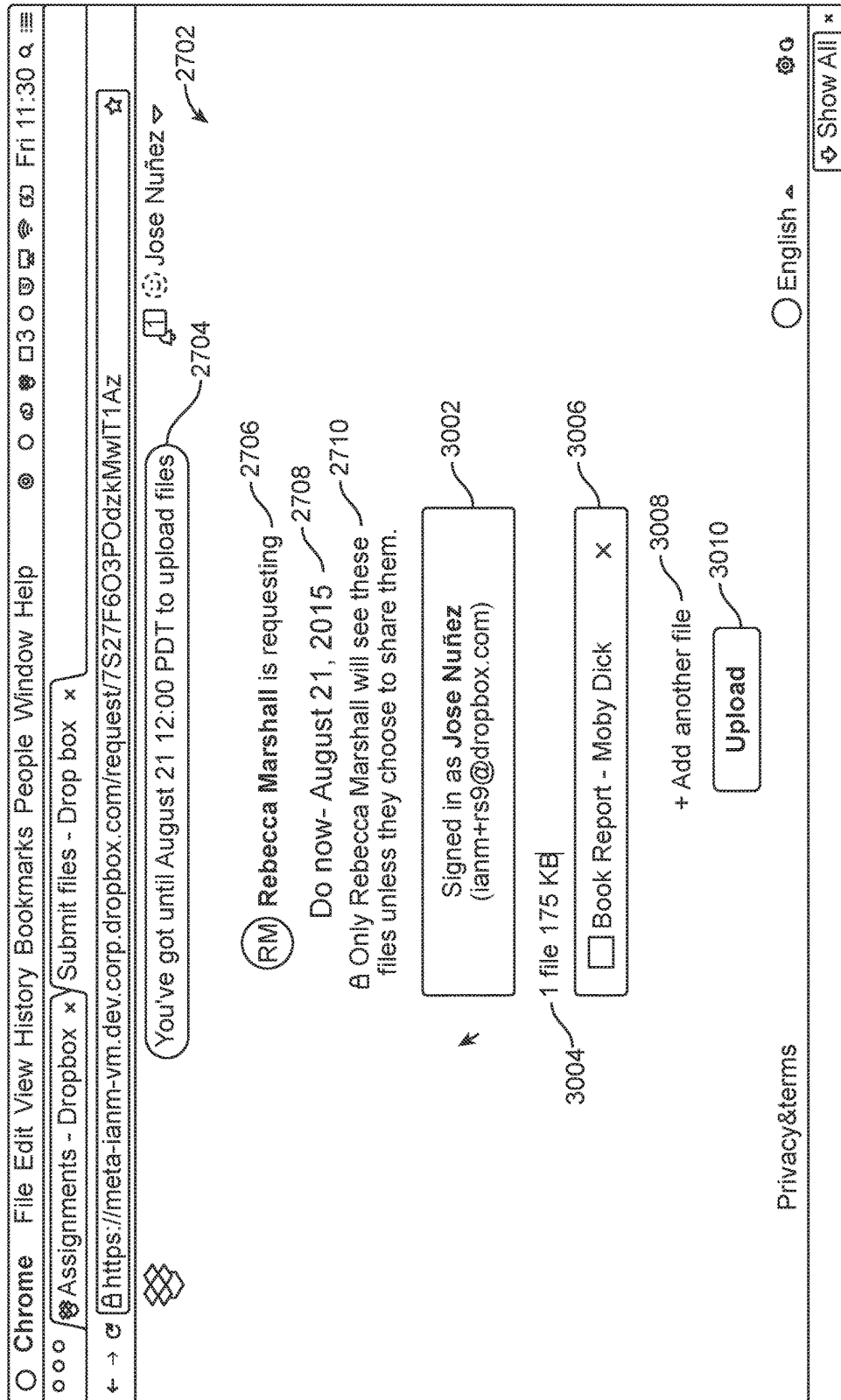


FIG. 30

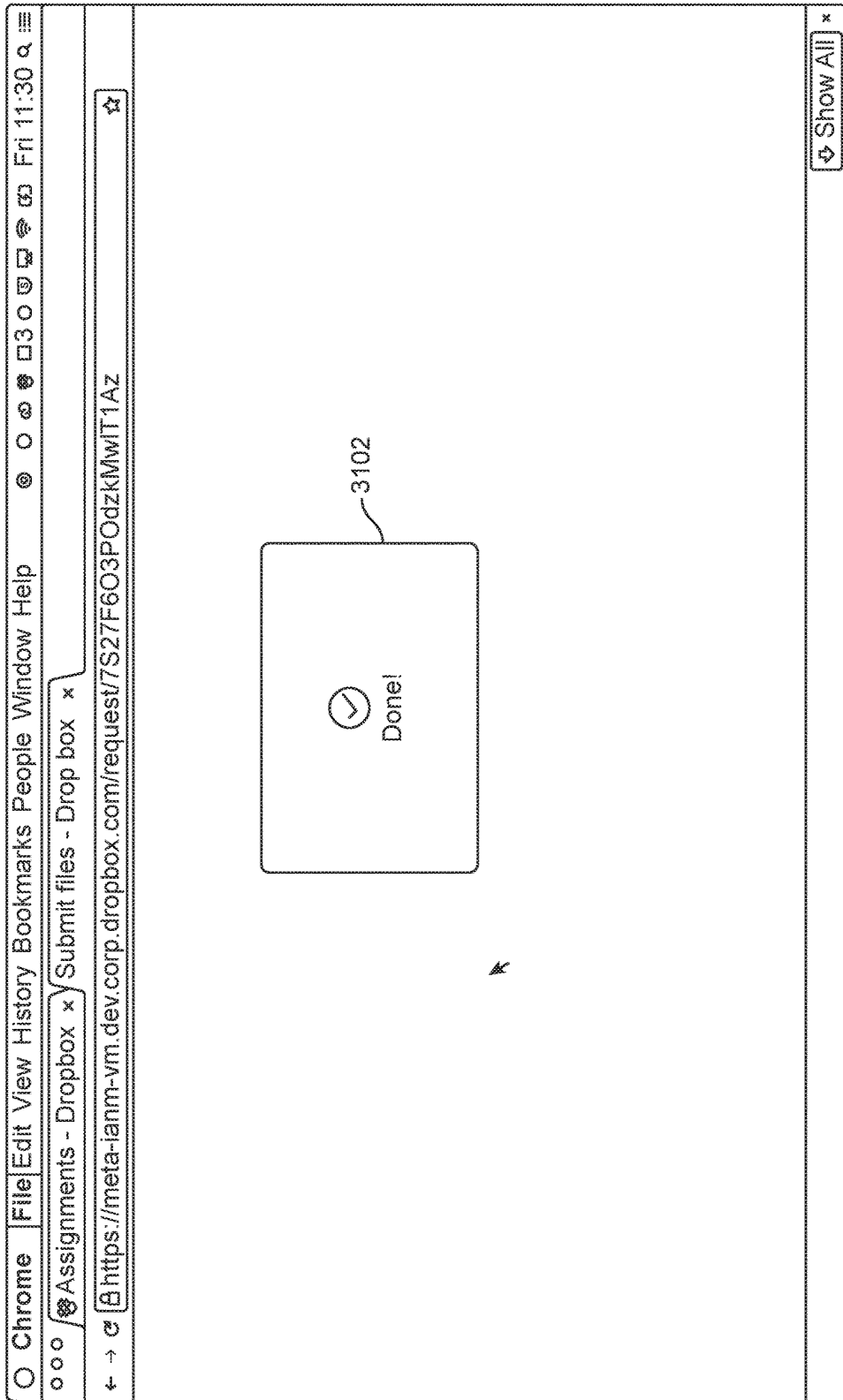


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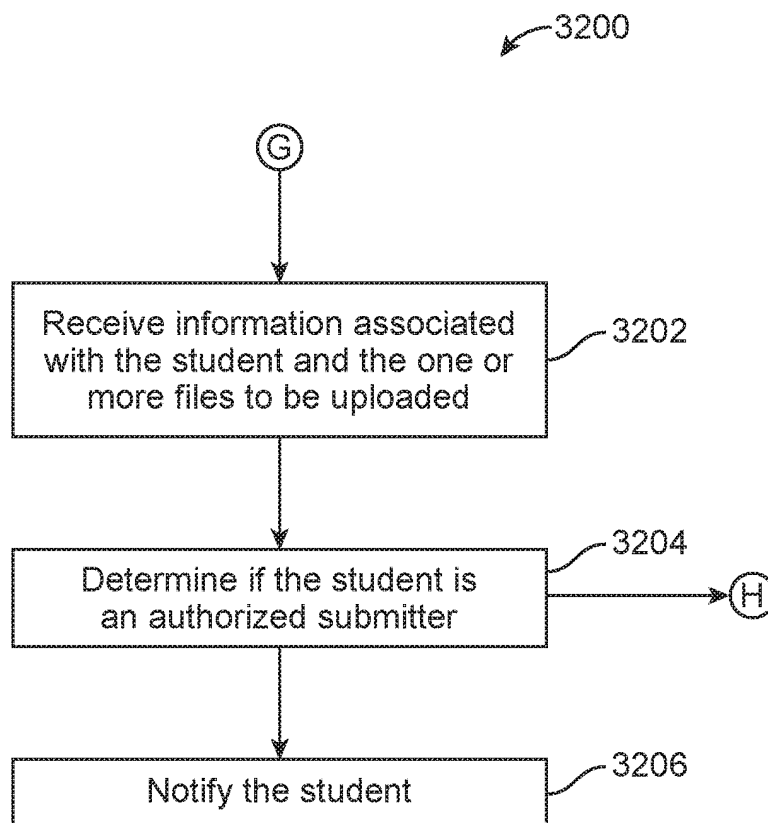


FIG. 32

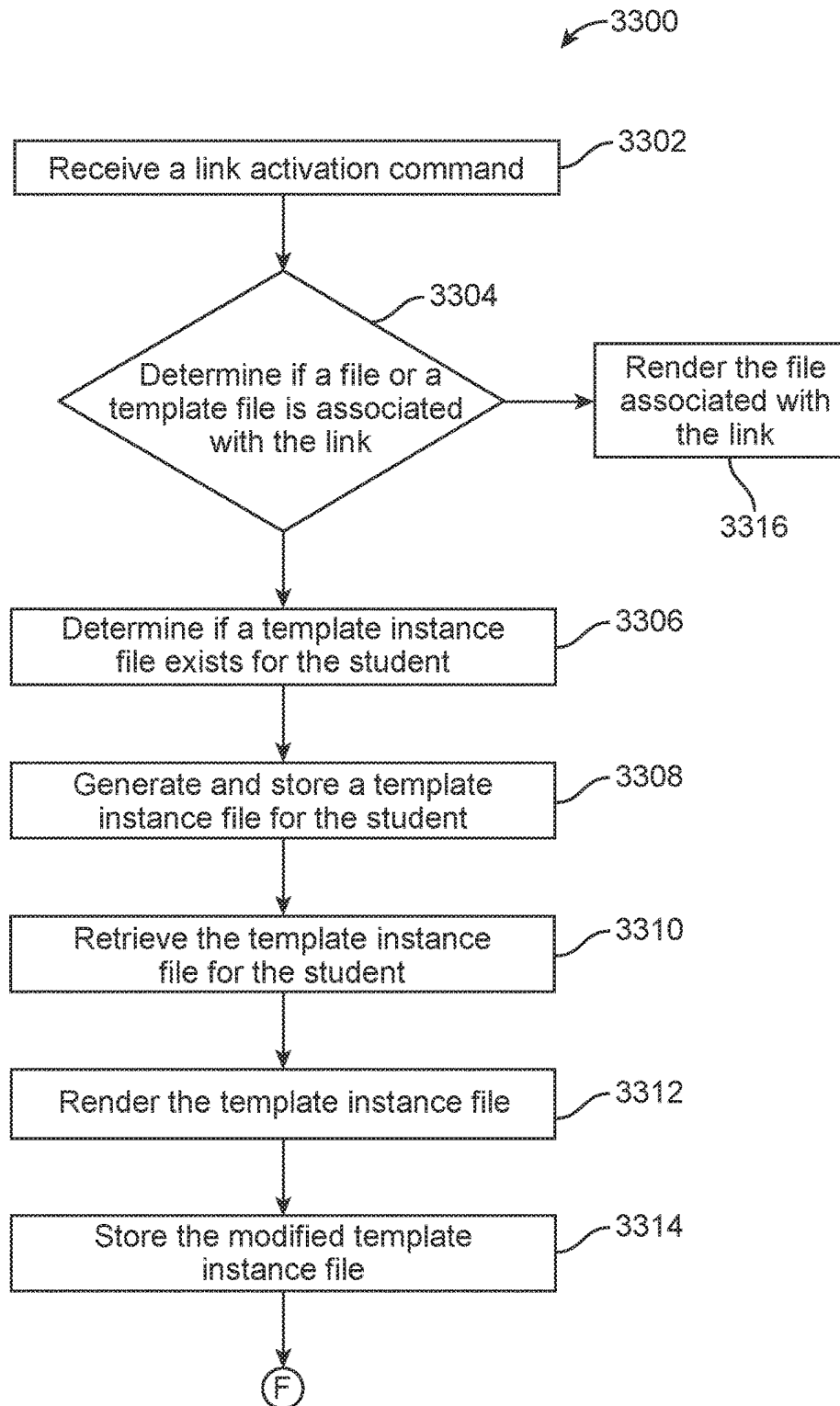


FIG. 33

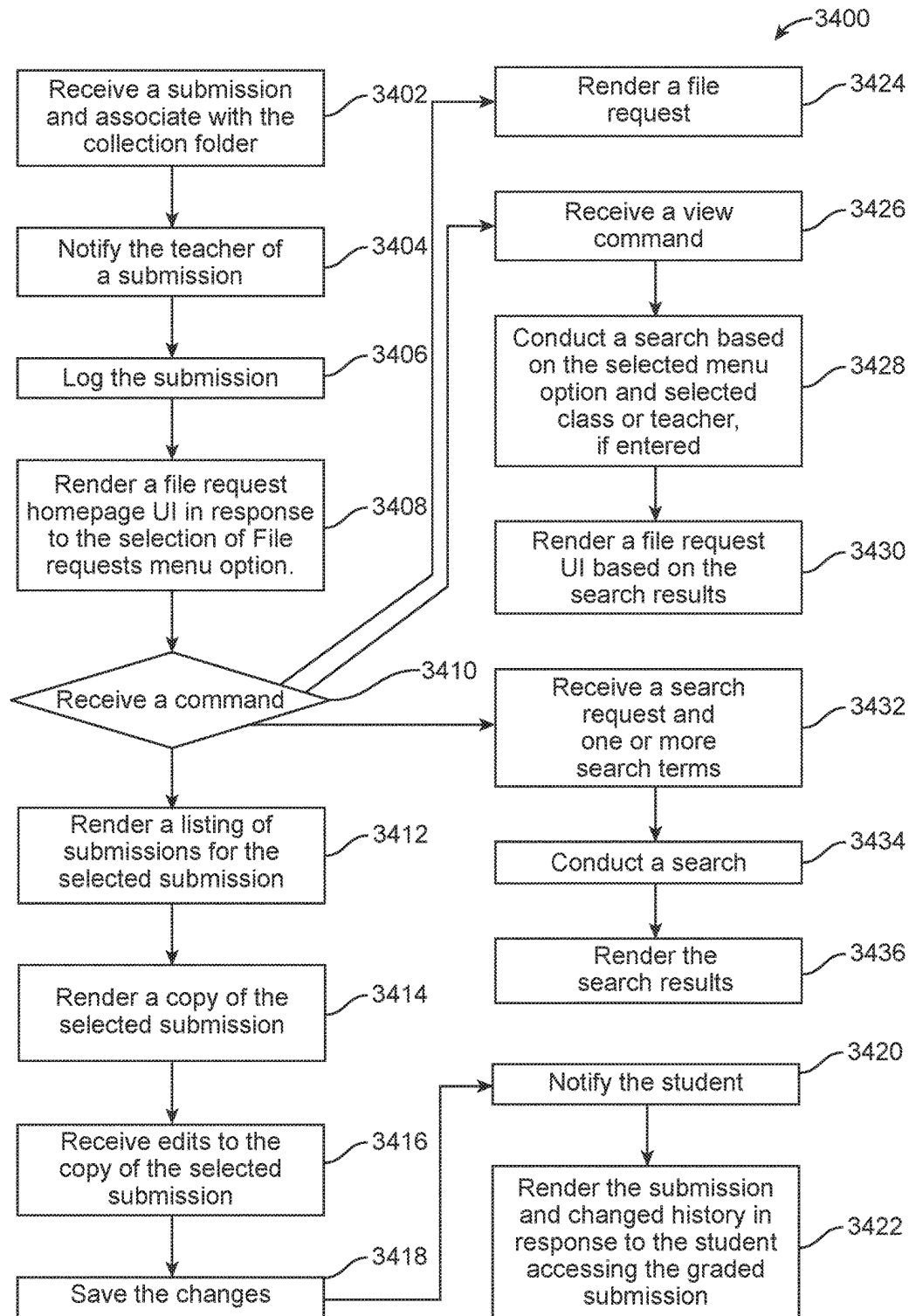


FIG. 34

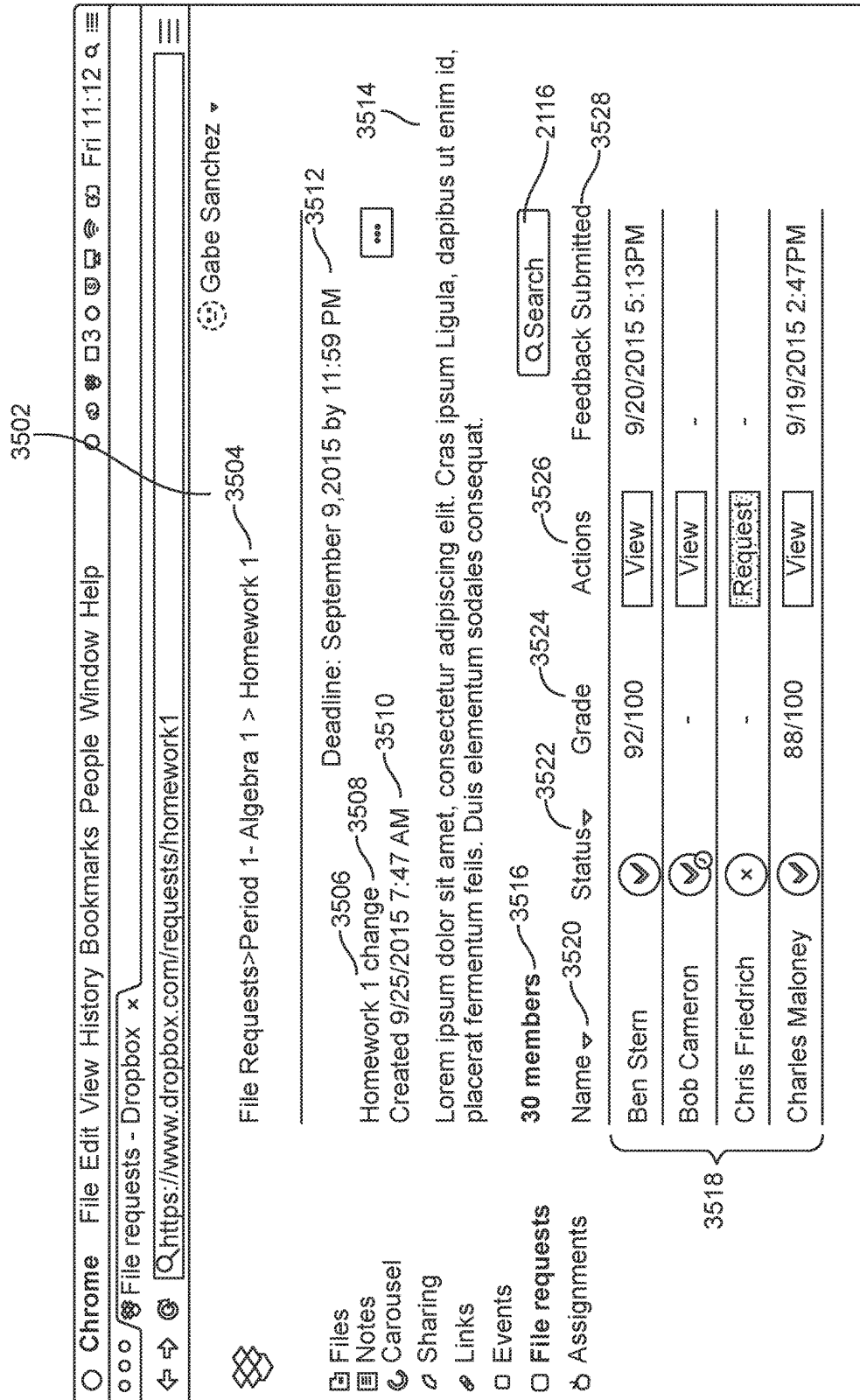


FIG. 35

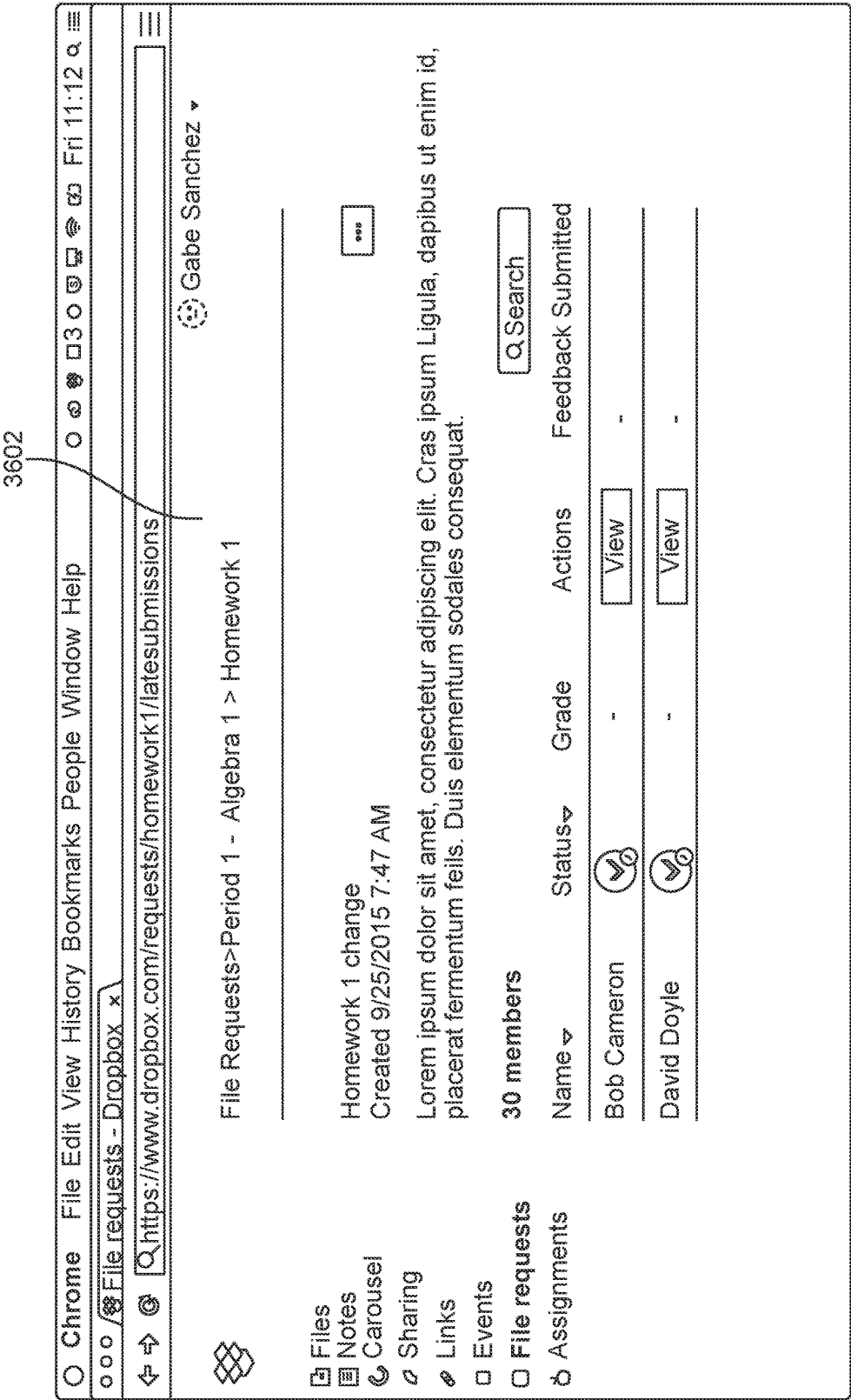


FIG. 36

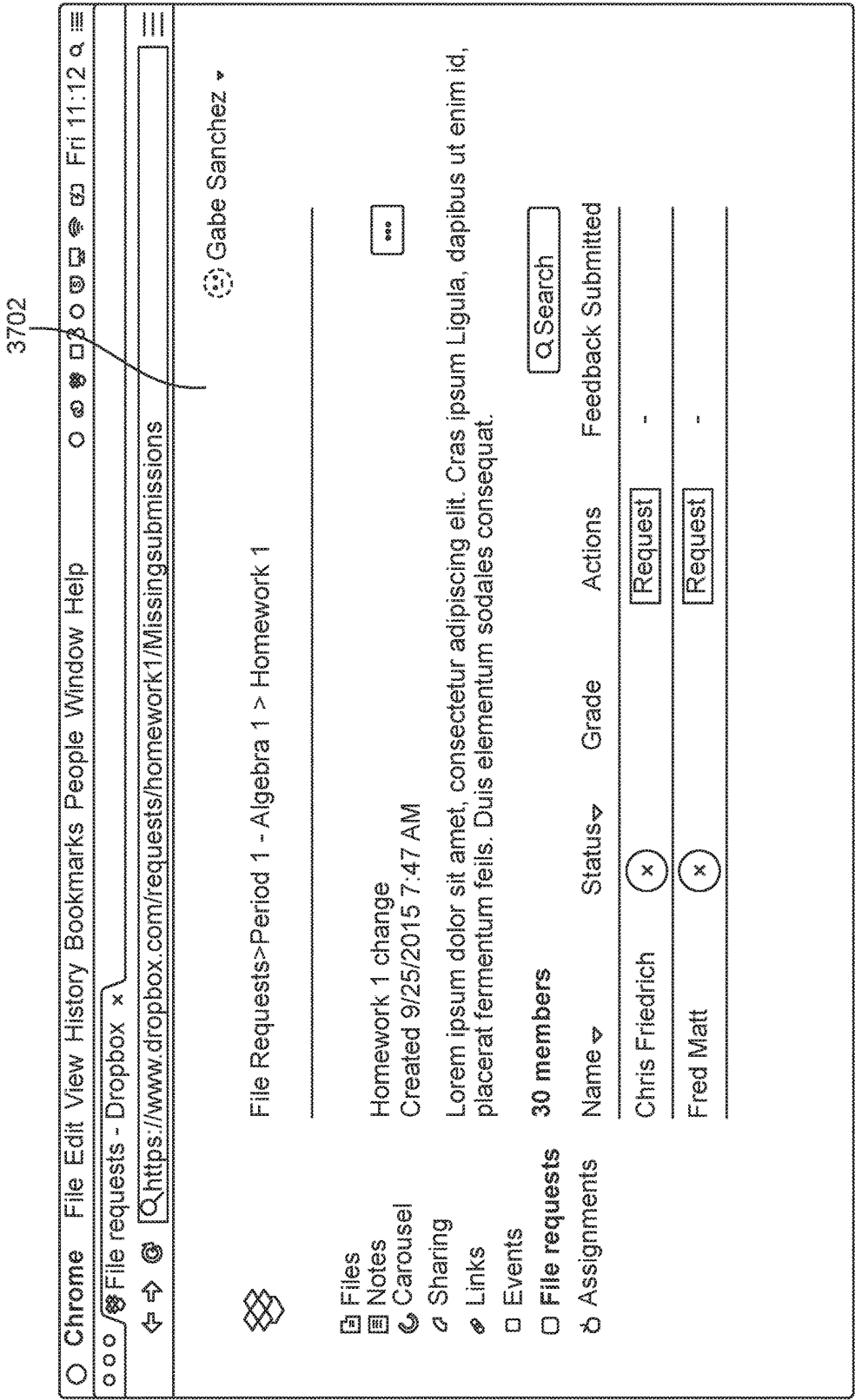


FIG. 37

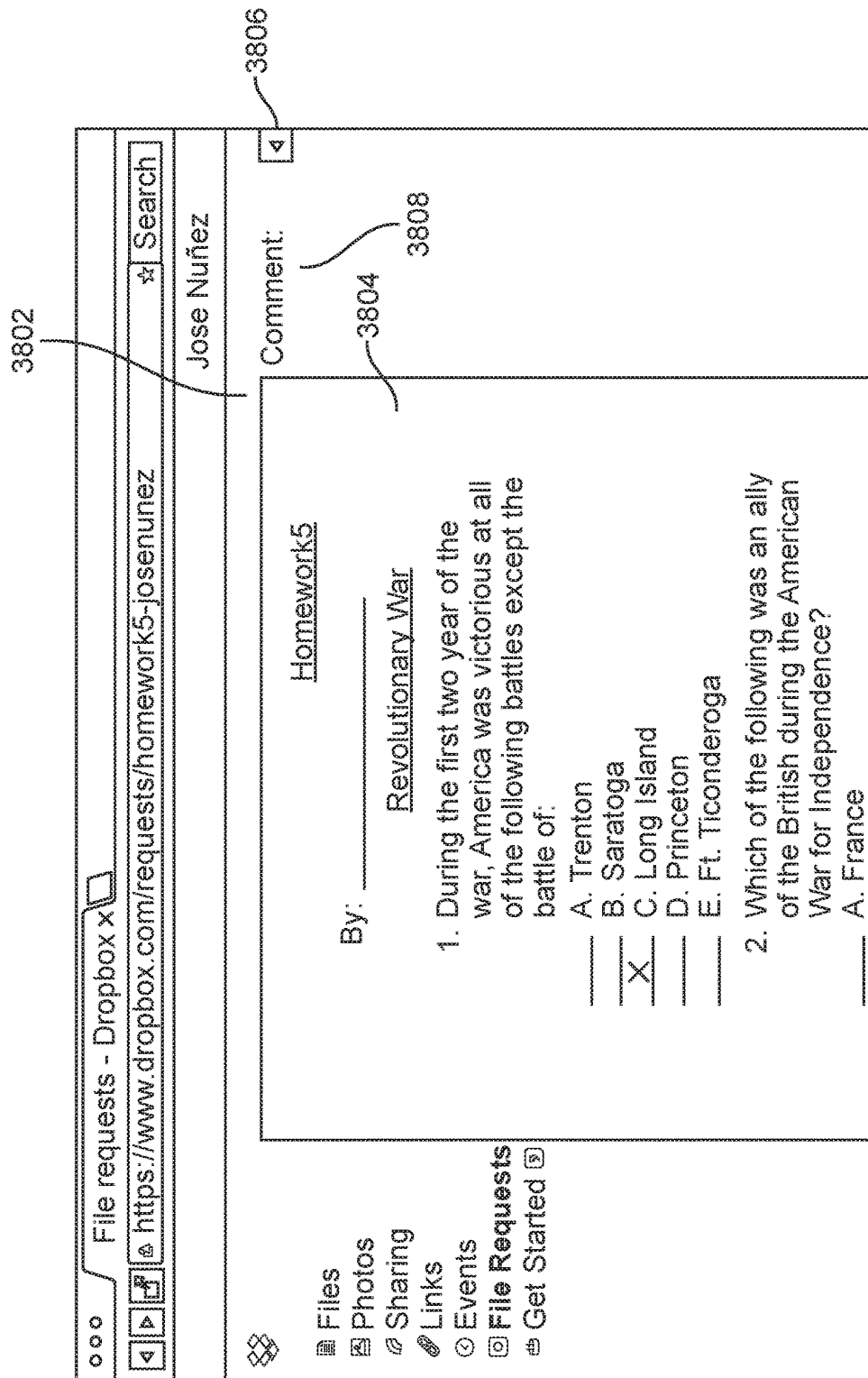


FIG. 38

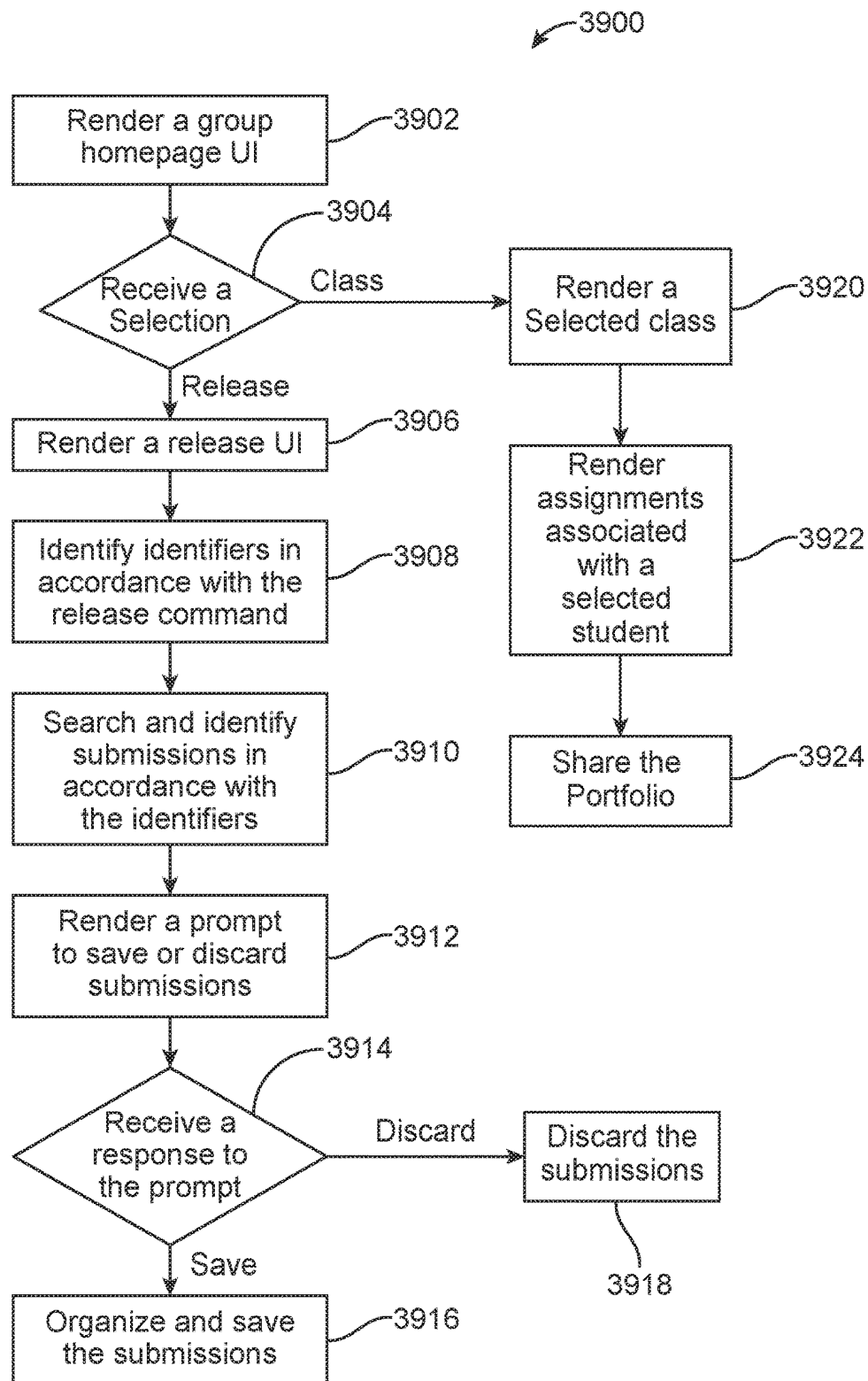


FIG. 39

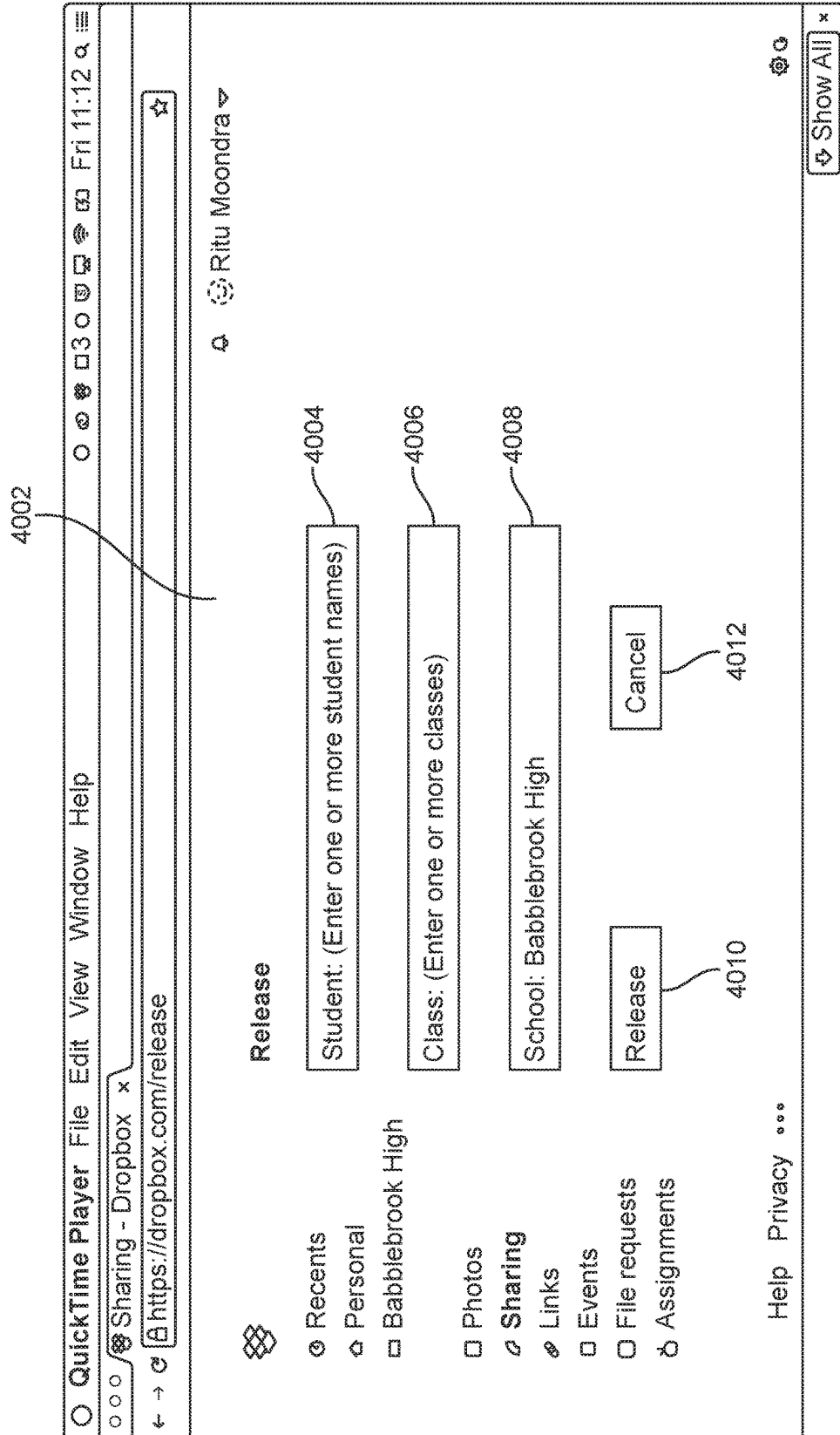


FIG. 40

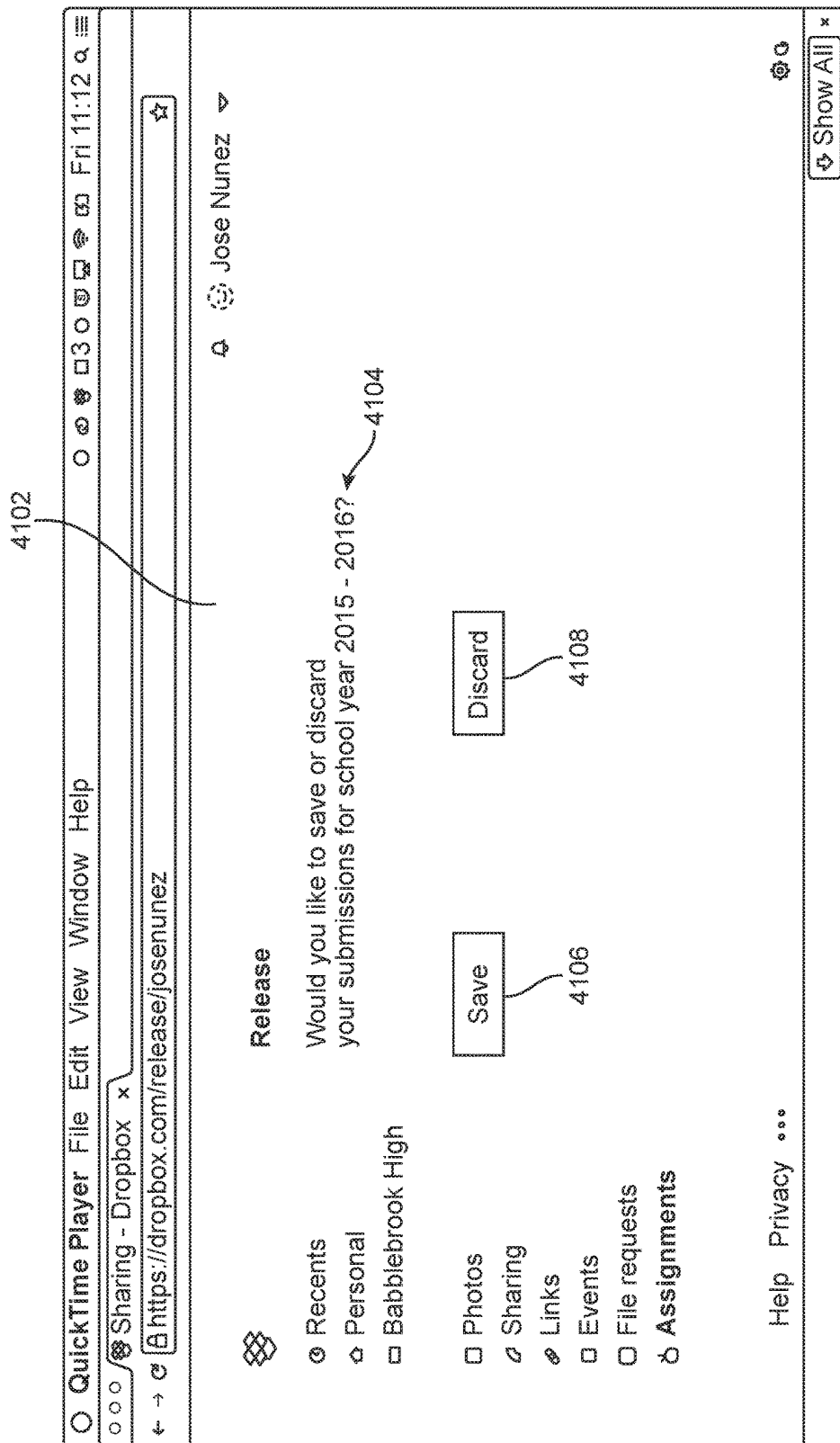
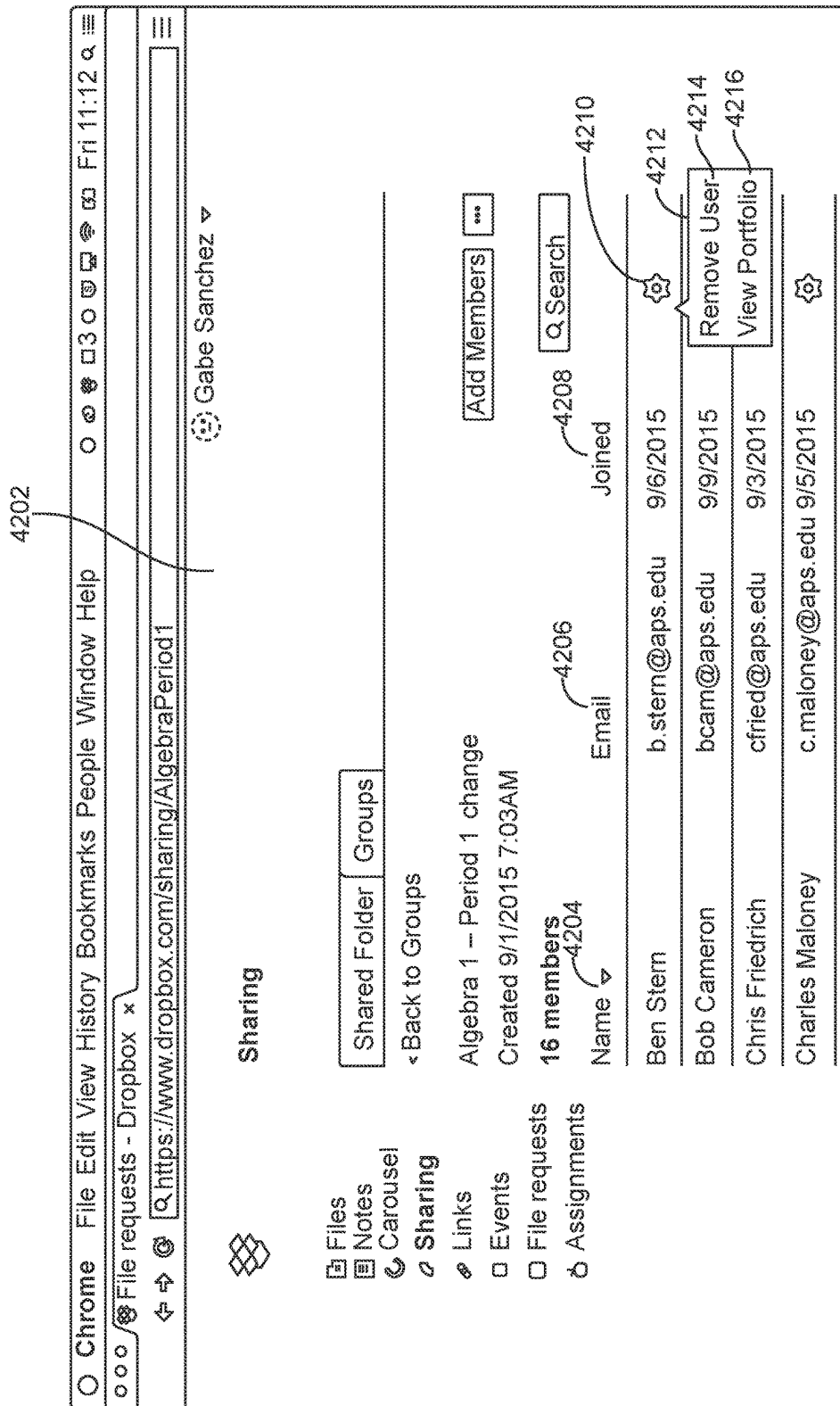


FIG. 41

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FIG.^x

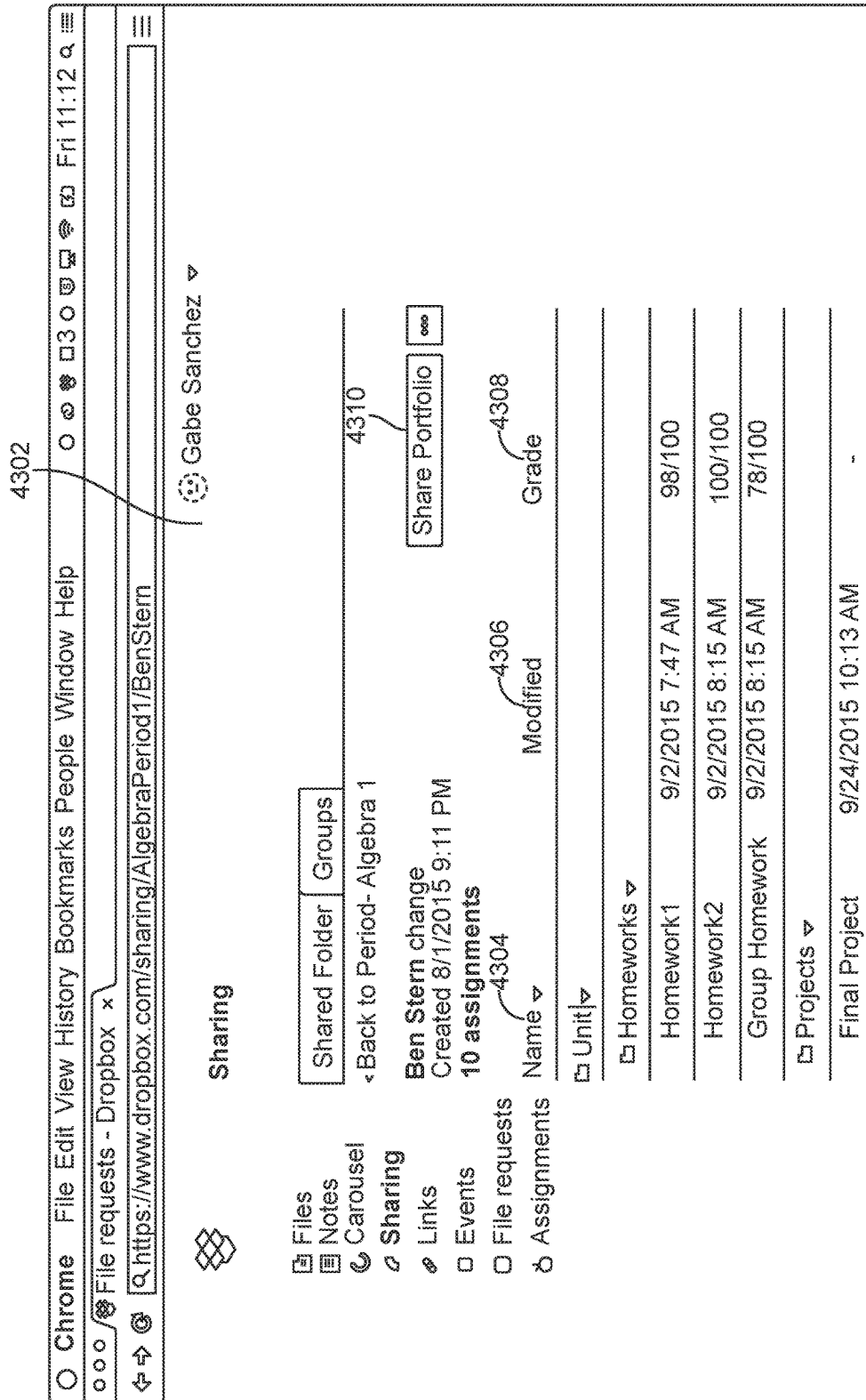


FIG. 43

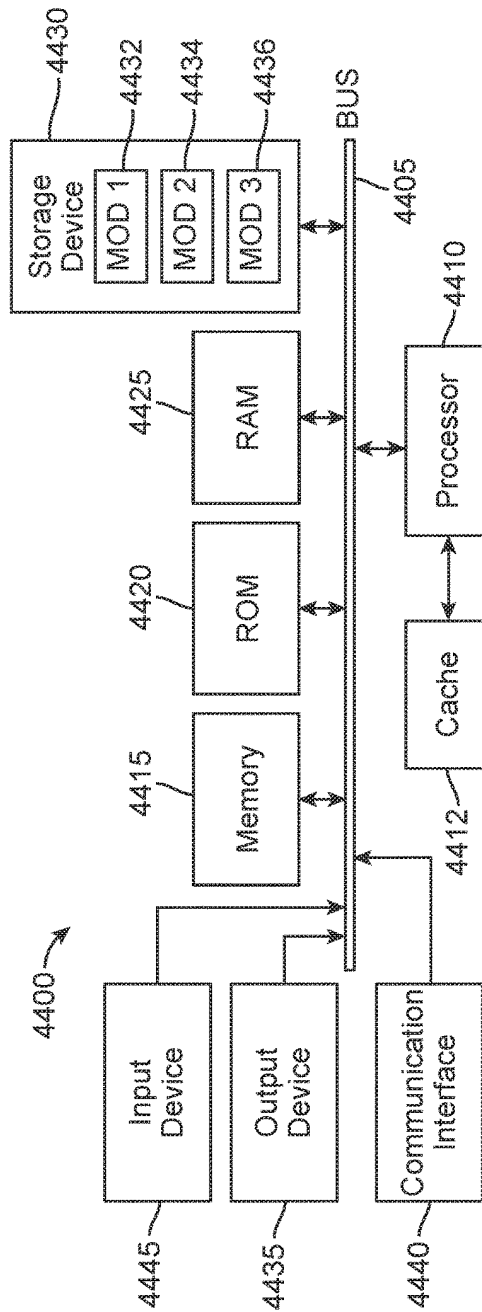


FIG. 44A

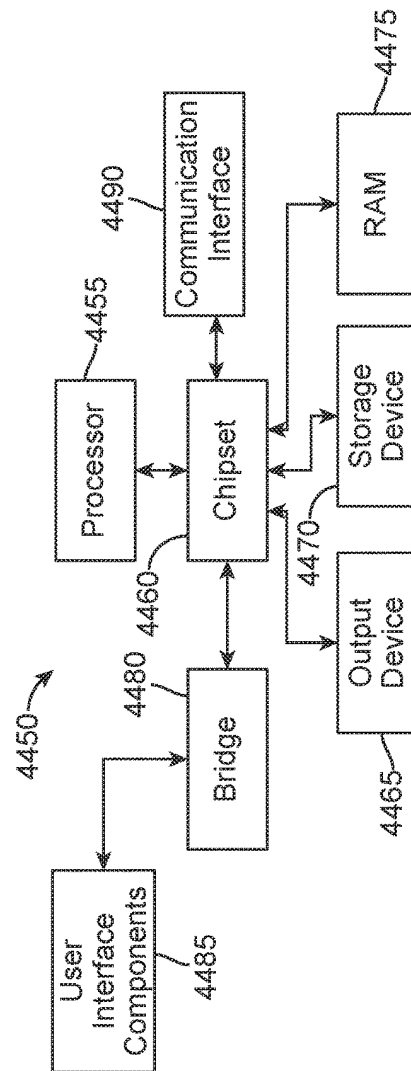


FIG. 44B

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ASSIGNMENTS FOR CLASSROOMS

TECHNICAL FIELD

The present technology pertains to using file requests for school assignments, and more specifically pertains to a user interface that creates a file request for school assignments, submitting a file, monitoring the status of the submissions and viewing the submissions using one or more metadata tags.

BACKGROUND

Conventional teacher-student software does not provide user friendly user interfaces. For teachers, conventional systems are typically class based and do not provide teachers with easy search features. For students, conventional systems are also typically class driven and do not provide students with the ability to see upcoming due dates in one user interface. Conventional student-teacher systems do not allow a student to maintain their own records.

SUMMARY

Additional features and advantages of the disclosure will be set forth in the description which follows, and in part will be obvious from the description, or can be learned by practice of the herein disclosed principles. The features and advantages of the disclosure can be realized and obtained by means of the instruments and combinations particularly pointed out in the appended claims. These and other features of the disclosure will become more fully apparent from the following description and appended claims, or can be learned by the practice of the principles set forth herein.

Disclosed are systems, methods, and non-transitory computer-readable storage media for allowing teachers a means to distribute assignments and determine the assignment statuses in a variety of ways. Teachers are able to review assignment status on a per class basis, on a per assignment basis and a per student basis. For students, they are able to see all outstanding assignments via a user interface and are able to submit completed assignments using the same interface. To allow both the student and teacher features, assignments can include one or more metadata tags that can identify a school, teacher, class, term, assignment and student. By using metadata tags and identifiers, user interfaces or dashboards can display assignments and other information based on the metadata tags.

Disclosed are systems, methods, and non-transitory computer-readable storage media for allowing teachers a means to distribute assignments and determine the assignment statuses in a variety of ways. Students can submit assignments with the assignments being stored. In response to a release command, the stored assignments can be searched and identified. Students can be prompted to save or discard the released assignments.

BRIEF DESCRIPTION OF THE DRAWINGS

The above-recited and other advantages and features of the disclosure will become apparent by reference to specific embodiments thereof which are illustrated in the appended drawings. Understanding that these drawings depict only exemplary embodiments of the disclosure and are not therefore to be considered to be limiting of its scope, the

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principles herein are described and explained with additional specificity and detail through the use of the accompanying drawings in which:

FIG. 1 is block diagram of a configuration of devices and a network in accordance with an exemplary embodiment;

FIG. 2A is a block diagram of a file request module in accordance with an exemplary embodiment;

FIG. 2B is a block diagram of a template sharing module in accordance with an exemplary embodiment;

FIG. 3 is a flow diagram of a method for sharing an assignment in accordance with an exemplary embodiment;

FIG. 4 is a group homepage user interface (UI) for viewing groups and shared folders in accordance with an exemplary embodiment;

FIG. 5 is a file request UI rendering existing file requests and a file requests file icon to create a file request in accordance with an exemplary embodiment;

FIG. 6 is a create file request UI rendering prompts to create a file request in accordance with an exemplary embodiment;

FIG. 7 is a flowchart of a method for generating a file request in accordance with an exemplary embodiment;

FIG. 8 is an updated create file request UI rendering a file request name in accordance with an exemplary embodiment;

FIG. 9 is a UI rendering a list of files to add to a file request in accordance with an exemplary embodiment;

FIG. 10 is an updated create file request UI rendering a file name in accordance with an exemplary embodiment;

FIG. 11 is an updated create file request UI rendering a calendar for a deadline date in accordance with an exemplary embodiment;

FIG. 12 is an updated create file request UI rendering a scrollable time deadline for a deadline time in accordance with an exemplary embodiment;

FIG. 13 is an updated create file request UI rendering a deadline in accordance with an exemplary embodiment;

FIG. 14 is an updated create file request UI rendering a default late submission deadline in accordance with an exemplary embodiment;

FIG. 15 is an updated create file request UI rendering a late submission scrollable menu in accordance with an exemplary embodiment;

FIG. 16 is a updated create file request UI rendering a filled-in file request in accordance with an exemplary embodiment;

FIG. 17 is a send file request UI rendering prompts to send a file request in accordance with an exemplary embodiment;

FIG. 18 is a send file request UI rendering a list of email addresses in accordance with an exemplary embodiment;

FIG. 19 is a send file request UI rendering an email address in accordance with an exemplary embodiment;

FIG. 20 is an email message rendering a notification of an assignment in accordance with an exemplary embodiment;

FIG. 21 is an updated file request UI rendering existing file requests and a file requests file icon to create a file request in accordance with an exemplary embodiment;

FIG. 22 is a closed file request UI rendering closed file requests and a file requests file icon to create a file request in accordance with an exemplary embodiment;

FIG. 23 is a file request UI rendering a selected file request in accordance with an exemplary embodiment;

FIG. 24 is a flowchart of a method for responding to a file request in accordance with an exemplary embodiment;

FIG. 25 is a student homepage UI in accordance with an exemplary embodiment;

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FIG. 26 is a student homepage UI or dashboard rendering a list of assignments for a student in accordance with an exemplary embodiment;

FIG. 27 is a submission homepage UI rendering information for an assignment in accordance with an exemplary embodiment;

FIG. 28 is a UI rendering a list of files for responding to a file request in accordance with an exemplary embodiment;

FIG. 29 is a UI rendering a list of files with a selected file for responding to a file request in accordance with an exemplary embodiment;

FIG. 30 is an updated submission homepage UI rendering information and a file for submitting an assignment in accordance with an exemplary embodiment;

FIG. 31 is a notification that a submission to an assignment was submitted in accordance with an exemplary embodiment;

FIG. 32 is a flowchart for a method for authenticating a student in accordance with an exemplary embodiment;

FIG. 33 is a flowchart for a method to use a template file to complete an assignment in accordance with an exemplary embodiment;

FIG. 34 is a flow diagram for a method to review one or more submissions in accordance with an exemplary embodiment;

FIG. 35 is a submission UI rendering a listing of submissions for an assignment in accordance with an exemplary embodiment;

FIG. 36 is a late submission UI rendering a listing of late submissions in accordance with an exemplary embodiment;

FIG. 37 is a missing submission UI rendering a listing of missing submissions in accordance with an exemplary embodiment;

FIG. 38 is a document UI rendering a copy of a submission in accordance with an exemplary embodiment;

FIG. 39 is a flowchart of a method for releasing and/or sharing submissions in accordance with an exemplary embodiment;

FIG. 40 is a release UI rendering prompts to release submissions in accordance with an exemplary embodiment;

FIG. 41 is a student UI rendering prompts to save or discard released submissions in accordance with an exemplary embodiment;

FIG. 42 is a class UI rendering a scrollable list of students for a corresponding class in accordance with an exemplary embodiment;

FIG. 43 is an assignment UI rendering a list of assignments associated with a student in accordance with an exemplary embodiment;

FIG. 44A is a block diagram of a system for implementing various embodiments of the present technology in accordance with an exemplary embodiment; and

FIG. 44B shows an exemplary possible system embodiment for implementing various embodiments of the present technology in accordance with an exemplary embodiment.

DESCRIPTION

Various embodiments of the disclosure are discussed in detail below. While specific implementations are discussed, it should be understood that this is done for illustration purposes only. A person skilled in the relevant art will recognize that other components and configurations may be used without parting from the spirit and scope of the disclosure.

The disclosed technology addresses the need in the art for teacher and student user interfaces that allow teachers to

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distribute, monitor and search student submissions. The submissions are in response to a file request. The file request allows a teacher to distribute an assignment to one or more students and is used to collect and monitor assignment statuses once disseminated to the students. A file request is generated in response to receiving responses to prompts and includes one or more metadata tags identifying at least one of a school, teacher, class, term and assignment. For example, the one or more metadata tags can identify the assignment. Students can respond to the file request and submit assignments. The assignments include one or more metadata tags identifying at least one of a school, teacher, class, term, assignment and student. For example, the one or more metadata tags identify the assignment and student. Teachers are able to view assignments based on class, student and assignment using the one or more metadata tags. Once assignments are submitted and stored, a teacher or administrator can release the stored assignments to the students. The release can be for a given student, class or school. Once the assignments are released, the student can elect to save the released assignments or discard them. If saved, the released assignments can be organized by school year and class.

With respect to implementing various embodiments of the disclosed technology, an exemplary system configuration 100 is shown in FIG. 1, wherein electronic devices communicate via a network for purposes of exchanging content and other data. The system can be configured for use on a wide area network such as that illustrated in FIG. 1. However, the present principles are applicable to a wide variety of network configurations that facilitate the intercommunication of electronic devices. For example, each of the components of system 100 in FIG. 1 can be implemented in a localized or distributed fashion in a network.

In system 100, a user can interact with content management system 106 through client devices 102₁, 102₂, . . . , 102_n (collectively "102") connected to network 104 by direct and/or indirect communication. Content management system 106 can support connections from a variety of different client devices, such as desktop computers; mobile computers; mobile communications devices, e.g. mobile phones, smart phones, tablets; smart televisions; set-top boxes; and/or any other network enabled computing devices. Client devices 102 can be of varying type, capabilities, operating systems, etc. Furthermore, content management system 106 can concurrently accept connections from and interact with multiple client devices 102.

A user can interact with content management system 106 via a client-side application installed on client device 102_i. In some embodiments, the client-side application can include a content management system specific component. For example, the component can be a stand-alone application, one or more application plug-ins, and/or a browser extension. However, the user can also interact with content management system 106 via a third-party application, such as a web browser, that resides on client device 102_i and is configured to communicate with content management system 106. In either case, the client-side application can present a user interface (UI) for the user to interact with content management system 106. For example, the user can interact with the content management system 106 via a client-side application integrated with the file system or via a webpage displayed using a web browser application.

Content management system 106 can make it possible for a user to store content, as well as perform a variety of content management tasks, such as retrieve, modify, browse, and/or share the content. Furthermore, content management

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system **106** can make it possible for a user to access the content from multiple client devices **102**. For example, client device **102**_i can upload content to content management system **106** via network **104**. The content can later be retrieved from content management system **106** using the same client device **102**_i, or some other client device **102**_j.

To facilitate the various content management services, a user can create an account with content management system **106**. The account information can be maintained in user account database **150**. User account database **150** can store profile information for registered users. In some cases, the only personal information in the user profile can be a username and/or email address. However, content management system **106** can also be configured to accept additional user information.

User account database **150** can also include account management information, such as account type, e.g. free or paid; usage information, e.g. file edit history; maximum storage space authorized; storage space used; content storage locations; security settings; personal configuration settings; content sharing data; etc. Account management module **124** can be configured to update and/or obtain user account details in user account database **150**. The account management module **124** can be configured to interact with any number of other modules in content management system **106**.

An account can be used to store content items, such as digital data, documents, text files, audio files, video files, etc., from one or more client devices **102** authorized on the account. The content items can also include folders or other mechanisms of grouping content items together with different behaviors, such as collections, playlists, albums, etc. For example, an account can include a public folder that is accessible to any user. The public folder can be assigned a web-accessible address. A link to the web-accessible address can be used to access the contents of the public folder. In another example, an account can include a photos folder that is intended for photos and that provides specific attributes and actions tailored for photos; an audio folder that provides the ability to play back audio files and perform other audio related actions; or other special purpose folders. An account can also include shared folders or group folders that are linked with and available to multiple user accounts. Each of the shared folders or group folders can include one or more recipients associated with the folder. Each of the shared folders or group folders can include an email address for each of the associated recipients. The permissions for multiple users may be different for a shared folder.

The content items can be stored in content storage **160**. Content storage **160** can be a storage device, multiple storage devices, or a server. Alternatively, content storage **160** can be a cloud storage provider or network storage accessible via one or more communications networks. Content management system **106** can hide the complexity and details from client devices **102** so that client devices **102** do not need to know exactly where the content items are being stored by content management system **106**. In one variation, content management system **106** can store the content items in the same folder hierarchy as they appear on client device **102**_i. However, content management system **106** can store the content items in its own order, arrangement, or hierarchy. Content management system **106** can store the content items in a network accessible storage (SAN) device, in a redundant array of inexpensive disks (RAID), etc. Content storage **160** can store content items using one or more partition types, such as FAT, FAT32, NTFS, EXT2, EXT3, EXT4, ReiserFS, BTRFS, and so forth.

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Content storage **160** can also store metadata describing content items, content item types, and the relationship of content items to various accounts, folders, or groups. The metadata for a content item can be stored as part of the content item or can be stored separately. In one variation, each content item stored in content storage **160** can be assigned a system-wide unique identifier.

Content storage **160** can decrease the amount of storage space required by identifying duplicate files or duplicate segments of files. Instead of storing multiple copies, content storage **160** can store a single copy and then use a pointer or other mechanism to link the duplicates to the single copy. Similarly, content storage **160** can store files more efficiently, as well as provide the ability to undo operations, by using a file version control that tracks changes to files, different versions of files (including diverging version trees), and a change history. The change history can include a set of changes that, when applied to the original file version, produce the changed file version.

Content management system **106** can be configured to support automatic synchronization of content items from one or more client devices **102**. The synchronization can be platform agnostic. That is, the content items can be synchronized across multiple client devices **102** of varying type, capabilities, operating systems, etc. For example, client device **102**_i can include client software, which synchronizes, via synchronization module **142** at content management system **106**, content in client device **102**_i's file system with the content in an associated user account. In some cases, the client software can synchronize any changes to content in a designated folder and its sub-folders, such as new, deleted, modified, copied, or moved files or folders. The client software can be a separate software application, can integrate with an existing content management application in the operating system, or some combination thereof. In one example of client software that integrates with an existing content management application, a user can manipulate content directly in a local folder, while a background process monitors the local folder for changes and synchronizes those changes to content management system **106**. Conversely, the background process can identify content items that have been updated at content management system **106** and synchronize those changes to the local folder. The client software can provide notifications of synchronization operations, and can provide indications of content statuses directly within the content management application. Sometimes client device **102**_i may not have a network connection available. In this scenario, the client software can monitor the linked folder for file changes and queue those changes for later synchronization to content management system **106** when a network connection is available. Similarly, a user can manually stop or pause synchronization with content management system **106**.

A user can also view or manipulate content via a web interface generated and served by user interface module **122**. For example, the user can navigate in a web browser to a web address provided by content management system **106**. Changes or updates to content in the content storage **160** made through the web interface, such as uploading a new version of a file, can be propagated back to other client devices **102** associated with the user's account. For example, multiple client devices **102**_i, each with their own client software, can be associated with a single account and files in the account can be synchronized between each of the multiple client devices **102**.

Content management system **106** can include communications interface **120** for interfacing with various client

devices **102**, and can interact with other content and/or service providers **109**₁, **109**₂, . . . , **109**_n (collectively “**109**”) via an Application Programming Interface (API). Certain software applications can access content storage **160** via an API on behalf of a user. For example, a software package, such as an app on a smartphone or tablet computing device, can programmatically make calls directly to content management system **106**, when a user provides credentials, to read, write, create, delete, share, or otherwise manipulate content. Similarly, the API can allow users to access all or part of content storage **160** through a web site.

Content management system **106** can also include authenticator module **126**, content management module **128**, file request module **132**, assignment module **134**, email module **136**, release module **140**, and analytics module **144**. Authenticator module **125** can verify user credentials, security tokens, API calls, specific client devices, and so forth, to ensure only authorized clients and users can access files. Content item management module **128** can store the content items in the content storage **160**. The content item management module **128** can include a content directory for identifying the location of each content item stored in content storage **160**. File request module **132** can manage the file requests and interactions related to the file requests. Assignment module **134** can manage student submissions and interactions related to the submissions. Email module **136** can manage emailing file requests and notifications related to the file requests. Template sharing module **138** can enable a template sharer to share a file, such as a template file, with one or more recipients. For example, each recipient can receive an email message containing a link encoding a template file identifier and a template instance file can be created in response to the link being acted upon. Alternatively, each recipient can receive a link to a template instance file. When either of the links is acted upon, each recipient is able to access and modify their own template instance file. Release module **140** can manage releases of students’ submissions and interactions related to the release of the students’ submissions. Analytics module **144** that can track and report on aggregate file operations, user actions, network usage, total storage space used, as well as other technology, usage, or business metrics. A privacy and/or security policy can prevent unauthorized access to user data stored with content management system **106**.

Content management system **106** can include sharing module **130** for managing sharing content publicly or privately. Sharing content publicly can include making the content item accessible from any computing device in network communication with content management system **106**. Sharing content privately can include linking a content item in content storage **160** with two or more user accounts so that each user account has access to the content item. The sharing can be performed in a platform agnostic manner. That is, the content can be shared across multiple client devices **102**, of varying type, capabilities, operating systems, etc. The content can also be shared across varying types of user accounts.

In some embodiments, content management system **106** can be configured to maintain a content directory identifying the location of each content item in content storage **160**. The content directory can include a unique content entry for each content item stored in the content storage. A content entry can include a content path that can be used to identify the location of the content item in a content management system. For example, the content path can include the name of the content item and a folder hierarchy associated with the content item. For example, the content path can include a

folder or path of folders in which the content item is placed as well as the name of the content item. Content management system **106** can use the content path to present the content items in the appropriate folder hierarchy.

A content entry can also include a content pointer that identifies the location of the content item in content storage **160**. For example, the content pointer can include the exact storage address of the content item in memory. In some embodiments, the content pointer can point to multiple locations, each of which contains a portion of the content item.

In addition to a content path and content pointer, a content entry can also include a user account identifier that identifies the user account that has access to the content item. In some embodiments, multiple user account identifiers can be associated with a single content entry indicating that the content item has shared access by the multiple user accounts.

Referring to FIGS. 2A and 2B, block diagrams illustrating the components of file request module **132** and template sharing module **138** in accordance with an exemplary embodiment is illustrated. File request module **132** and template sharing module **138** contain similar modules that perform similar functions with file request module **132** handling file requests for files (e.g., non-template files) and template sharing module **138** handling file requests for template files. File request module **132** and template sharing module **138** enable a teacher to share a file or a template file, with one or more students in which each recipient receives a link. The link can encode a file identifier identifying a read only file or a template file identifier identifying a template file or a template instance file stored in the shared folder. The shared folder can store submissions, e.g., files and/or template instance files for the students and allows each student to modify their files or own template instance file. As a result, a teacher is able to share a read only file (e.g., instructions for an assignment) and/or a single template file (e.g., a test) with one or more students. For template files, the teacher has access to each student’s template instance file. As shown, file request module **132** and template sharing module **138** can include a link generation module **202**, a file access module **204**, a link distribution module **206**, a link management module **208** and a collection database **210**. The link generation module **202** can generate a link encoding a file identifier (e.g., file link), a template file identifier (e.g., a template file link) or to a template instance file (e.g., a template file instance link) stored in the shared folder. The link distribution module **204** can distribute generated links to the students. The link management module **206** allows a teacher to access the file, template file and each of the template instance files. The link management module **206** allows a student to have access only to the file (e.g., read only file) and/or to a student’s template instance file. The collection database **208** can maintain information about a file, template file and each template instance file and related information such as whether a shared folder is activated or deactivated.

Link generation module **202** is configured to generate a file link, template file link and/or template instance file links. In one or more embodiments, upon receiving a share as a template command, the link generation module **202** generates a template instance file, for each designated recipient associated with the shared folder. A unique file set descriptor for the file, template file or the template instance file set, and a unique file location path or URL that serves as the link. File request module **132** and template sharing module **138** saves an association of the file set descriptor and the file location path or URL to collection database **210**. In some embodi-

ments, the generated link can be independent of the file set descriptor so that the file set descriptor cannot be inferred from the link, and vice versa. An independent file set descriptor and file location path or URL prevents malfeasance by making it essentially impossible to guess or reverse engineer a sharable link if it is not already known. As an example, when sharing a folder "Homework 1" with a file id of 3D8B99, link generation module 202 might generate a unique (e.g., one-way pad, or a pseudo-random value) URL such as <https://www.service.com/s/28rtiz608u2mnco/BBQ.pdf>, where the URL component 28rtiz608u2mnco cannot be reverse-engineered, and accordingly create an entry `<3D8B99, https://www.service.com/s/28rtiz608u2mnco/BBQ.pdf>` in collection database 210. In one embodiment, the generated link can further be shortened. In some embodiments, the generated URL <https://www.service.com/s/28rtiz608u2mnco/BBQ.pdf> can further be shortened using a link-shortening service to a shorter URL (e.g., <http://db.tt/xOFounw>), and an additional association between the original link and the shortened link can be added to collection database 210. In another embodiment, the file set can be directly associated with the shortened link rather than with an intermediate, longer generated link.

In other embodiments, a teacher can generate multiple different links to the same shared folder or shared folders. For example, the same shared folder can be used for different files and/or template files. In other embodiments, a teacher can deactivate a shared folder or shared folders. By deactivating a shared folder or shared folders, students can no longer upload a file to the shared folder or shared folders. In addition, students are prohibited access to the shared folder or shared folders that are designated as deactivated. Moreover, since a shared folder link is versatile, in some embodiments, the system may include reference to a particular relevant application, or applications, in a link by embedding an application identifier in the generated link. As an example, the generated link for a given shared folder could be the URL <https://www.service.com?app=1ps3q/s/28rtiz608u2mnco/BBQ.pdf>, which specifies (via the portion "app=1ps3q") that some application uniquely associated with the identifier "1ps3q" (e.g., Microsoft Word or Microsoft Visio) should be used to view a file in the shared folder. Alternatively, the association between the link and the application or application plug-in can be made as an entry in collection database 210, rather than by including an application identifier in the link. For example, in various embodiments, a teacher may generate a first link to a shared folder that specifies use of a first application for viewing a file in the shared folder, and a second link that specifies use of a second application for viewing a file in the shared folder. In this example, the collection database 210 would in turn contain two corresponding entries: i.e., `<collection file identifier, first link identifier, first application identifier>` and `<collection file identifier, second link identifier, second application identifier>`. In another embodiment, the link management module 208 may be configured to select the proper applications or application plug-ins to use in the file browser, e.g., based on the types of files in the shared folder. The link management module 208 may also allow teachers to specify which application should open a particular file or set of files when the files are accessed via a particular link.

To share a content item privately, file request module 132 and template sharing module 138 can be configured to add a user account identifier to the content entry associated with the content item, thus granting the added user account access to the content item. File request module 132 and template sharing module 138 can also be configured to remove user

account identifiers from a content entry to restrict a user account's access to the content item. In one or more embodiments, the teacher can limit the sharing of a content item in one or more ways. For example, the teacher can limit sharing with students that are: members of an enterprise, students who have an account with the content management system 106, students who have an access password and/or based on an expiration date. An enterprise member is a member who has a user account that is associated with an enterprise account, such as a Dropbox for Business account. An enterprise member can be a student and the enterprise can be a school. Sharing can be limited to only students who have an account with the content management system 106 and prohibit users who do not have an account with the content management system 106. Sharing can be limited to students who enter a password associated with a file, e.g., a read-only file or template file. For example, a teacher can provide each student with a password in person and/or can send an email message containing the password to one or more students. Sharing can be limited based on a deadline. The deadline can be set by the teacher or can be a default deadline set by the content management system 106.

To share content publicly, file request module 132 and template sharing module 138 can be configured to generate a custom network address, such as a uniform resource locator (URL), which allows any web browser to access the content in content management system 106 without any authentication. To accomplish this, file request module 132 and template sharing module 138 can be configured to include content identification data in the generated URL, which can later be used to properly identify and return the requested content item. For example, file request module 132 and/or template sharing module 138 can be configured to include the user account identifier and the content path in the generated URL. Upon selection of the URL, the content identification data included in the URL can be transmitted to content management system 106 which can use the received content identification data to identify the appropriate content entry and return the content item associated with the content entry.

In addition to generating the URL, file request module 132 and template sharing module 138 can also be configured to record that a URL to the content item has been created. In some embodiments, the content entry associated with a content item can include a URL flag indicating whether a URL to the content item has been created. For example, the URL flag can be a Boolean value initially set to 0 or false to indicate that a URL to the content item has not been created. File request module 132 and template sharing module 138 can be configured to change the value of the flag to 1 or true after generating a URL to the content item.

In some embodiments, file request module 132 and template sharing module 138 can also be configured to deactivate a generated URL. For example, each content entry can also include a URL active flag indicating whether the content should be returned in response to a request from the generated URL. For example, file request module 132 and template sharing module 138 can be configured to only return a content item requested by a generated link if the URL active flag is set to 1 or true. Thus, access to a content item for which a URL has been generated can be easily restricted by changing the value of the URL active flag. This allows a teacher to restrict access to the shared content item without having to move the content item or delete the generated URL. Likewise, file request module 132 and template sharing module 138 can reactivate the URL by again changing the value of the URL active flag to 1 or true.

A teacher can thus easily restore access to the content item without the need to generate a new URL.

To share a content item as a template file, template sharing module **138** can be configured to save the template file and each template instance file. The template file and the template instance file can be stored in the content storage **160**. In one or more embodiments, the template file is stored in a first database of the collection database **210** and each template instance file is stored in a second database of the collection database **210**. Alternatively, the template file and each template instance file is stored in the same database, e.g., collection database **210**. In one or more embodiments, each template instance file can be stored in a shared folder. A shared folder can be a folder that allows the teacher to access the template instance files. The shared folder can also provide an indication to identify whether the template instance files were modified.

Files can include metadata or one or more metadata tags, such as a file identifier and an owner identifier. Template files can also include template metadata or one or more template metadata tags, such as, a template name a template file identifier. The file identifier, e.g., a file id, can be a unique identifier assigned to the file or template file. The template name, e.g., a template file name, can be a format for naming each of the template instance files. The owner identifier, e.g., ownerid, can be an identifier that identifies the owner or creator of the template file. The template file identifier, e.g., fileid, can be a unique template file identifier that identifies the template file.

For each template instance file, the template instance file can include template instance metadata. The template metadata can include a template identifier, a student identifier and a template file identifier. The template identifier, e.g., a template id, can be a unique identifier assigned to the template instance file. The student identifier, e.g., userid, can be a unique identifier identifying the student associated with the template instance file. The template file identifier, e.g., template fileId, can be a unique identifier assigned to the template instance file after the template instance file has been modified.

To share a file, file request module **132** and template sharing module **138** can be configured to generate a custom network address for a shared folder, file or for each template instance file, such as a uniform resource locator (URL), which allows any web browser to access the content in content management system **106** without any authentication. To accomplish this, sharing module **130** can be configured to include content identification data in the generated URL, which can later be used to properly identify and return the requested content item. For example, file request module **132** and template sharing module **138** can be configured to include a user account identifier and the content path in the generated URL. Upon selection of the URL, the content identification data included in the URL can be transmitted to content management system **106** which can use the received content identification data to identify the appropriate content entry and return the content item associated with the content entry.

In addition to generating the URL, file request module **132** and template sharing module **138** can also be configured to record that a URL to the shared folder, file and/or to the content item has been created for each template instance file. In some embodiments, the content entry associated with a content item can include a URL flag indicating whether a URL to the shared folder and/or to the content item has been created. For example, the URL flag can be a Boolean value initially set to 0 or false to indicate that a URL to the shared

folder and/or content item has not been created. File request module **132** and template sharing module **138** can be configured to change the value of the flag to 1 or true after generating a URL to the shared folder, file and/or content item.

In some embodiments, file request module **132** and template sharing module **138** can also be configured to deactivate a generated URL. For example, each shared folder, file and/or template instance file can also include a URL active flag indicating whether the content instance file should be returned in response to a request from the generated URL. For example, template sharing module **138** can be configured to only return a template instance file requested by a generated link if the URL active flag is set to 1 or true. Thus, access to a file or template instance file for which a URL has been generated can be easily restricted by changing the value of the URL active flag. This allows a teacher to restrict access to the shared folder, file and/or template instance files without having to move the shared folder, file and/or template instance file, or delete the generated URL. Likewise, file request module **132** and template sharing module **138** can reactivate the URL by again changing the value of the URL active flag to 1 or true. A teacher can thus easily restore access to the shared folder, file and/or content instance file without the need to generate a new URL.

Example User Experience

Referring to FIG. 3, a flow diagram for sharing an assignment in accordance with an exemplary embodiment is illustrated. The exemplary method **300** is provided by way of example, as there are a variety of ways to carry out the method. The method **300** described below can be carried out using the configurations illustrated in FIG. 1 by way of example, and various elements of this figure are referenced in explaining exemplary method **300**. Each block shown in FIG. 3 represents one or more processes, methods or sub-routines, carried out in the exemplary method **300**. The exemplary method **300** is described with respect to an application operating on a client device **102**. However, one of ordinary skill in the art would recognize that the method **300** can be performed via a browser on a client device **102**, as known in the art. The exemplary method **300** can begin at block **302**.

At block **302**, render a group homepage user interface (UI) or dashboard. For example, content management system renders a group homepage UI which lists one or more groups associated with an entity, such as a school. FIG. 4 shows a group homepage UI **402** which list six different groups **404** associated with a school, e.g., Babblebrook High School **406**. As shown, six groups **404** are Algebra Period 1, Algebra Period 2, Creative Writing, English 1, Intro to Computer Science and Math Seminar. Each listing identifies the group **408**, number of members **410** and owner of the group **412**. The identified group is the name associated with the group and can be set when the group is formed. The members are the members/users who can access a shared folder. Members can be students, parents, and/or guardians. An owner can be an administrator, teacher and/or student. An owner can share content items with the members of a group. Groups provide a means to share folders and/or assignments with the entire group. The owner can specify whether a group should have edit access or view-only access. An owner can add a member to the group and the new member is automatically added to all shared folders for that group. In an exemplary embodiment, Algebra Period 1 has sixteen members and Ritu Moondra is the owner of the group. A teacher or administrator can create a group by selecting Create group button **414**. If a teacher selects file

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requests menu option **416** rendered in side menu **418**, method **300** can proceed to block **304**.

At block **304**, receive a file request to disseminate or distribute an assignment. For example, content management system **106** and/or file request module **132** receives a file request to disseminate or distribute an assignment to one or more students. Once created, content management system **106** and/or file request module **132** can collect and monitor assignment statuses once the assignment is disseminated or distributed to the one or more students. FIG. **4** shows a file group homepage user interface (UI) **402**, rendered on a client device **102**, which allows a teacher to select a file request menu option **416** that is displayed in side menu **418**. In response to the selection of the file request menu option **416** from the side menu **418**, file request UI **502** in FIG. **5** is rendered on client device **102**. After receiving a file request selection, method **300** can proceed to block **306**.

At block **306**, render a file request UI. For example, content management system **106** and/or file request module **132** causes the rendering of a file request UI on client device **102**. FIG. **5** shows a file request UI **502**, rendered on client device **102**, which allows a teacher to send a file request. To create a file request, the user can select the Request files icon **504** as shown in the file request UI **502**. As shown, the file request UI **502** displays the Request files icons **504** along with file request icons **506** for previous file requests. If there are no previous file requests, then only the Request files icon **504** is rendered. As shown, only open file request are shown. To view closed file requests, a teacher can select closed icon **508**. After receiving a file request selection, method **300** can proceed to block **308**.

At block **308**, render a create file request UI with one or more prompts for file request information. The prompts can request information, which includes a name for the file request, a collection identifier, a file and a deadline. FIG. **6** shows a create file request UI **602**, rendered on client device **102**, which allows a teacher to respond to the prompts for file request information. The prompts can include name of the file request prompt **604**, a collection identifier prompt **606**, a file prompt **608** and add a deadline **610**. The name of the file request prompt **604** can be, "What are you requesting?" The response to this prompt can be the title of the file request. The collection identifier prompt **606** can be, "Where should these files go in your Dropbox?" The response to this prompt can identify where the submissions will be stored in the teacher's account. As shown, a default location of File requests is displayed. The teacher can change the location where the submissions will be stored. For example, the teacher can select the "Change folder" button **612** to change the location of where the responses will be stored. By using one or more metadata tags, as discussed below, the submissions can be stored in a collection folder associated with the file request or elsewhere. The file prompt **608** can be, "Attach a file?" The response to this prompt can identify a file to be shared with the students. The teacher can select a file as known in the art. For example, the teacher can select the "Select File" button **614** to select a file to be shared with the students. As explained below in more detail, the shared file can be a template file which allows students to receive their own template instance file that the student can modify and save. As a result, each student can modify their own template instance file. An "Add a deadline" button **610** allows a teacher to set a deadline for students to submit their responses to the assignment. After rendering the one or more prompts, method **300** can proceed to block **310**.

Referring to FIG. **7**, a flow diagram for creating a file request in accordance with an exemplary embodiment is

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illustrated. The exemplary method **700** is provided by way of example, as there are a variety of ways to carry out the method. The method **700** described below can be carried out using the configurations illustrated in FIG. **1** by way of example, and various elements of this figure are referenced in explaining exemplary method **700**. Each block shown in FIG. **7** represents one or more processes, methods or sub-routines, carried out in the exemplary method **700**. The exemplary method **700** is described with respect to an application operating on a client device **102**. However, one of ordinary skill in the art would recognize that the method **700** can be performed via a browser on a client device **102**, as known in the art. The exemplary method **700** can begin at block **702**.

At block **702**, receive information to the name prompt. For example, content management system **106** and/or file request module **132** receives a response to the name prompt **604**. For example, the teacher can enter, "Homework 5" in response to the name prompt **604**. After receiving information to the name prompt, method **700** can proceed to block **704**.

At block **704**, render an updated create file request UI with the name of the file request. For example, content management system **106** and/or file request module **132** causes an updated create file request UI to be rendered on client device **102**, in response to the information received to the name prompt. FIG. **8** shows an updated create file request UI **602** with the name of the file request, "Homework 5" **802**. The updated create file request UI **602** can include a location for receiving submission in response to the file request. The location can be a collection folder, "Homework 5" **804**. The collection folder can be named at least partially in response to the received information to the name prompt **604**. The teacher can change the collection folder **606** by selecting Change folder icon **612**. After rendering the updated create file request UI, method **700** can proceed to block **706**.

At block **706**, receive a selection of the file request button. For example, content management system **106** and/or file request module **132** receives a select of the Select File button **614**. In response to receiving the selection of the file request button **614**, method **700** can proceed to block **708**.

At block **708**, render a list of files and receive a file selection. For example, content management system **106** and/or file request module **132** causes the rendering of a file listing UI displaying a list of files on client device **102**. FIG. **9** shows a list of files **902** that can be included in the file request. As known in the art, the teacher can navigate to one or more lists of files **902** and select one or more files to be included in the file request. As shown, there are five files listed with each including a file name **904**, kind or type of file **906**, modification date **908** and a Share as Template button **910**. The teacher can select a file or can select Share as Template button **910**. To select a file, a teacher can select the name of the file, e.g., Homework Assignment 5. To select a file as a template, the teacher can select Share as Template button **910**. As explained below, if the teacher selects the Share as Template button **910**, each student can receive their own template instance file of the selected file as described in U.S. patent application Ser. No. 14/961,094, which is incorporated herein in its entirety. After rendering the list of files and receiving a selection, method **700** can proceed to block **710**.

At block **710**, render an updated create file request with the selected file and receive a deadline. The deadline can be optional. For example, content management system **106** and/or file request module **132** causes the rendering of an

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updated create file request with the selected file on client device **102**. FIG. **10** shows an updated file request UI **602** with a selected file, Homework Assignment 5 **806** being rendered on client device **102**. In response to the teacher selecting Add a deadline button **1102**, a default deadline can be rendered. FIG. **11** shows a create file request UI **602** with a default deadline being rendered on client device **102**. As shown, the deadline is Aug. 28, 2015 at 11:00 PDT. If the teacher selects calendar icon **1104**, a calendar **1108** is rendered which allows the teacher to select a deadline date. As known in the art, the teacher can select next month icon **1106** to see the next calendar, e.g., September 2015. After selecting a deadline date, e.g., Sep. 7, 2015, the teacher can change the deadline time by selecting time icon **1110**. If the teacher selects time icon **1110**, a scrollable listing of times **1202** is rendered on client device **102**, as shown in FIG. **12**. For example, the teacher can select 08:00 PDT. After receiving a deadline, method **700** can proceed to block **712**.

At block **714**, render an updated create file request with the deadline and receive an Allow late submissions selection. Allowing late submissions can be optional. For example, content management system **106** and/or file request module **132** causes the rendering of an updated create file request with the deadline on client device **102**. FIG. **13** shows a create file request UI **602** with a deadline being rendered on client device **102**. As shown, the deadline is Sep. 7, 2015 **1302** at 08:00 PDT **1304**. In response to the teacher selecting Allow late submissions icon **1306**, a default late submission deadline is rendered on client device **102**. FIG. **14** shows a create file request UI **602** with a default late submission deadline of For two days **1402** being rendered. In response to the teacher selecting a late submission icon **1402**, a scrollable list of late submission times **1502** can be rendered on client device **102**, as shown in FIG. **15**. As shown, in an exemplary embodiment, the late submission times can be Never, For one day, For two days and For one week. The teacher can select a late submission time from the rendered list. For example, the teacher can select For one day. In one or more embodiments, the late submission time can be a date that the teacher sets. For example, the teacher can set a late submission time in a similar manner as setting the deadline. After receiving a late submission time, method **700** can proceed to block **310** of FIG. **3**.

Referring to FIG. **3** again, at block **310**, render a completed file request UI and receive the file request information in response to a send command. For example, content management system **106** and/or file request module **132** receives the file request information associated with the prompts in response to a user selecting a send command. FIG. **16** shows a filled-in file request UI **602**. As shown in this example, the file request is for Homework 5 **802**, the collection folder is Homework 5 **804**, the deadline date is Sep. 7, 2015 **1302** with 08:00 PDT **1304** as the deadline time and late submissions can be received up to one day **1402** late. The teacher can edit the file request information. In response to the teacher selecting the Next button **616**, the information can be provided to content management system **106** and/or file request module **132** and method **300** can proceed to block **312**. The teacher can cancel the file request by selecting Cancel button **618**.

At block **312**, generate a link for the file request. For example, content management system **106**, file request module **132** and/or template module **138** generates a link for the file request. For example, the link generation module **202** generates a collection link to a designated collection folder using at least some of the information received from the prompts, e.g., where the teacher would like the uploaded

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files to be stored. If the designated collection folder does not exist, the link generation module **202** can create the collection folder. The link can be the path to collection folder as described earlier. If the selected file is a template file, e.g., a file that was shared when the Share as Template button **910** was selected, the generated link encodes a template file identifier. For example, link generation module **202** encodes a template file identifier identifying the template file as a link. The link generation module **202** can store the generated collection link and the information associated with the link, e.g., the name, the collection folder, deadline, late submission, teacher identifier, school identifier, term identifier, file identifier, template identifier, etc. The generated collection link can be stored in one or more locations. For example, the generated collection link can be associated with the collection and stored in the content storage **160** and/or in an activity log. After generating a link for the file request, method **300** can proceed to block **314**.

At block **314**, render a send file request UI. For example, content management system **106** and/or file request module **132** causes the rendering of the send file request UI on client device **102**. FIG. **17** shows a send file request UI **1702** displaying the generated link: <https://dropbox.com/request/Homework5> **1704**, a prompt to email the generated link **1706** and Send button **1710**. The teacher can copy the generated link by selecting Copy link button **1708**. By selecting Copy link button **1708**, the teacher can email the link via an email application. By selecting email box **1706**, the teacher can enter one or more email addresses to have the file request sent via email. The teacher can enter a group name, e.g., Algebra—Period 2 to have the file request associated with the group. After rendering the send file request UI, method **300** can proceed to block **316**.

At block **316**, receive and determine a response. For example, content management system **106** and/or file request module **132** receives a response from the teacher and determines what the response is. The response can be a selection of Copy link button **1708** or selecting email box **1706**. If the teacher selects Copy link button **1708**, method **300** can proceed to block **318**. If the teacher selects email box **1706**, method **300** can proceed to block **322**.

At block **318**, render an email application. For example, content management system **106**, file request module **132** and/or email module **136** causes the rendering of an email application on client device **102**. The email application can be an email application associated with the content management system **106** or a third party email application associated with the client device **102**, such as Outlook® by Microsoft Corporation of Redmond, Wash. After rendering the email application, method **300** can proceed to block **320**.

At block **320**, generate an email message. For example, the teacher can generate an email message using the email application associated with content management system **106** or the third party email application. The teacher can enter one or more email addresses, paste the copied link and enter an optional message in the email. After generating the email message, method **300** can proceed to block **328**.

At block **322**, receive one or more email addresses in the email box. For example, content management system **106**, file request module **132** and/or email module **136** receives one or more email addresses in email box **1706** as known in the art. The teacher can enter one or more email addresses manually by typing one or more complete email addresses in email box **1706**. For multiple email addresses, the teacher can separate the email addresses using a semicolon. Alternatively, the teacher can start to type in an email address and have a list of email addresses **1802** displayed as shown in

FIG. 18 based on the partially entered email address. The teacher can complete the email address or select a displayed email address. The teacher can enter one or more email addresses. The email address can be a group email address. For example, a teacher and/or administrator can generate one or more group email addresses. Each group email address can be associated with an email address for each member in a group. A group email address can include others, such an email address for a parent, guardian, teacher, teacher aide, etc. A group can be for a class, a team (e.g. sports team), a study group or any other combination of one or more people that a teacher or administrator may send an assignment to. After receiving one or more email addresses in the email box, method 300 can proceed to block 324.

At block 324, render an updated send file request UI with the entered email addresses. For example, content management system 106 and/or file request module 132 can cause the rendering of an update Send file request UI 1702 on client device 102. FIG. 19 shows an updated Send file request UI with a group email address for "Algebra—Period 2" 1902. The teacher can add one or more email addresses or by selecting the delete icon 1904, the teacher can replace the rendered email address. The teacher can add a comment to the file request by selecting the comment box 1906. If the teacher does not want to add a comment, method 300 can proceed to block 328. If the teacher wants to add a comment, method 300 can proceed to block 326.

At block 326, receive a comment in the comment box. For example, content management system 106 and/or file request module 132 receives a comment that the teacher enters in comment box 1906. After receiving a comment, method 300 can proceed to block 328.

At block 328, receive a send command. For example, content management system 106, file request module 132, email module 136 and/or third party email application receives a send command. For example, the teacher can enter/hit a send command in the email application of the content management system 106, in the third party email application associated with the client device 102, or in response to the teacher selecting Send button 1710 displayed in the updated Send file request UI 1702 shown in FIG. 19. After receiving a send command, method 300 can proceed to block 330.

At block 330 generate and associate one or more metadata tags with the file request. For example, content management system 106, file request module 132 and/or email module 136 generates and associates one or more metadata tags with the file request. Regarding the third party email application, software such as a plugin associated with content management system 106, can generate the metadata tags and provide them to content management system 106. The file request can include one or more selected files, one or more template instance files, the comment (if entered in the comment box 1906) and one or more metadata tags. The one or more metadata tags can include a file request identifier, a teacher identifier, a school identifier, a class identifier, a term identifier, a file identifier, and one or more email identifiers. The file request identifier can be a unique identifier that identifies the file request. The teacher identifier can be a unique identifier that identifies the teacher who created the file request. The school identifier can be a unique identifier that identifies the school for which the file request was created. The term identifier can be an identifier that identifies the school year and term, e.g., 2015 semester 1, 2015 semester 2, 2015 quarter 1, 2015 quarter 2, etc. The class identifier can identify a class that the file request is associated with. The file identifier can be a unique identifier that

identifies a file that is associated with the file request. The file identifier can identify a template file if a template file is associated with the assignment. An email identifier can identify who the file request was sent to. Each email identifier can identify each individual that the file request is sent to and/or a group email identifier. The metadata tag can be one metadata tag that combines all of the metadata tags. For example, the one metadata tag can be all of the metadata tags concatenated together. The concatenated metadata tags can have a specific order with one or more nulls for an empty metadata tag. For example, if an assignment only has a group email address and no additional email addresses, the concatenated metadata tag can have a null for where additional email addresses may be stored. After generating and associating one or more metadata tags with the assignment, method 300 can proceed to block 332.

At block 332, obtain an email address for each recipient. For example, content management system 106, file request module 132 and/or email module 136 and/or third party email application obtains an email address for each of the one or more designated recipients, e.g., students. The email addresses can be based on the recipients associated with one or more selected email addresses and/or the email addresses that are entered in the recipient box 1706. For the third party email application a patch, plugin or application program interface (API) can be used to obtain the email address or addresses as known in the art. After obtaining an email address for each of the designated recipients, the method 300 can proceed to block 334.

At block 334, distribute the file request. For example, content management system 106, file request module 132 and/or email module 136 and/or third party email application distributes the file request and the one or more associated metadata tags. Distribution can include sending an email message and/or associating the file request and the one or more associated metadata tags with each member of the group associated with a group name and/or group email address. For example, one email message can be sent to all of the recipients or individual email messages can be sent to each recipient. The email message(s) can include a comment from the teacher if the teacher entered a message in the comment box 1906. The email message can notify the recipients associated with the file request of the file request. In another example, the email message can contain a link for the encoded file identifier or encoded template file identifier. FIG. 20 shows an email message 2002 rendered on client device 102. As shown, the mail message 2002 identifies the teacher, Rita Moondra 2004; the comment, "Please complete this assignment" 2006; a hypertext, "Click here to view" which encodes the link to the file request 2008; and the deadline, Sep. 7, 2015 by 08:00 PCT 2010. The file request can be associated with each designated recipient. For example, a pointer to the file request and associated one or more metadata tags can be associated with a user account for each designated recipient. After distributing the file request, method 300 can proceed to block 336.

At block 336, render a file request homepage UI. For example, content management system 106 and/or file request 132 causes the rendering of a file request homepage UI on client device 102. FIG. 21 shows a file request homepage UI 2102 which includes notification 2104 that the file request was sent. As shown, the notification 2104 is "Your file request was sent. We'll send you an email when someone uploads a file." File request homepage UI 2102 can display the open file requests with "Homework 5" 2106 being the latest file request and is displayed next to the

request files icon **504**. After rendering a file request homepage UI, method **300** can proceed to block **338**.

At block **338**, notify the teacher of a submission. For example, content management system **106** and/or file request module **132** monitors submissions. Submissions are discussed in further detail below. In response to a submission to a file request, a notification can be provided to the teacher. Notifications can include, but are not limited to, email, text message, posting to the account, application notifications (E.g., in-band notifications) or any other for notifications. For example, content management system **106**, file request module **132** and/or email module **136** sends an email message to the teacher informing the teacher that a student submitted an assignment in response to the file request. An exemplary email message can be, "Jose Nunez submitted an assignment to Homework 5 on Sep. 14, 2015 at 2:00 PDT."

Student

Referring to FIG. **24**, a flow diagram for responding to a file request in accordance with an exemplary embodiment is illustrated. The exemplary method **2400** is provided by way of example, as there are a variety of ways to carry out the method. The method **2400** described below can be carried out using the configurations illustrated in FIG. **1** by way of example, and various elements of this figure are referenced in explaining exemplary method **2400**. Each block shown in FIG. **24** represents one or more processes, methods or subroutines, carried out in the exemplary method **2400**. The exemplary method **2400** is described with respect to an application operating on a client device **102_i**. However, one of ordinary skill in the art would recognize that the method **2400** can be performed via a browser on a client device **102_i**, as known in the art. The exemplary method **2400** can begin at block **2402**.

At block **2402**, render a student homepage UI. For example, content management system **106** and/or the assignment module **132** causes a student homepage UI to be rendered on a client device **102_i** in response to a student accessing the content management system **106**. FIG. **25** shows a student homepage UI **2502**. By selecting the "Pick up where you left off" hyper link **2504** or by selecting Assignments menu option **2506** from side menu **2508**, a student can go to an assignment homepage UI. In response to hyperlink **2504** or Assignment menu option **2506**, method **2400** can proceed to block **2404**.

At block **2404**, render an assignment homepage UI. For example, content management system **106** and/or assignment module **134** causes the rendering of an assignment homepage UI or dashboard on a client device **102_i** based on the one or more associated metadata tags. FIG. **26** shows a student homepage UI or dashboard **2602** displaying a list of assignments **2604** for a student, e.g., Jose Nunez. The list can be an ordered list, such as ascending or descending order. As shown, the list includes the assignments for all of the student's classes. The list of assignments can be based on the one or more metadata tags, such as a metadata tag associated with the student or student identifier. To change the view, the student can select a view button **2604**. By selecting the view button **2604**, a menu is rendered on the client device **102_i** which allows the student to select different view options. For example, the student can select View All Classes **2606**, Science 1 **2608**, History 1 **2610** or Algebra 1 **2612**. By selecting a specific class menu option, e.g., Science 1 **2608**, the assignments for the selected class can be displayed based on the one or more metadata tags, such as a class identifier and student identifier. For each assignment, a due date **2614**, status indicator **2616**, class identifier **2618**,

assignment name **2620**, comment button **2622**, comment **2624** and one or more selection buttons **2626**, **2628**, **2630**, **2632** are displayed. The due date **2614** can identify the due date for the assignment. The status indicator **2616** can identify the status of the assignment. For example, a circle with a check can indicate that the submission was on time, a circle with a clock can indicate that the submission was submitted in a late submission period, a circle with three dots can indicate that the assignment is pending, and a circle with an X can indicate that no submission was made and the submission period has ended. Each status indicator can include a color. For example, green can indicate a timely submission, yellow can indicate a late submission (e.g., within the late submission period), red can indicate no submission and blue can indicate a pending assignment. The class identifier can indicate the class associated with the assignment. For example, as shown, the classes are Science 1, History 1 and Algebra 1. The class identifier can indicate the period or semester. The assignment name **2620** can identify the name of the assignment, e.g., Homework 1 or Homework 2. The comment button **2622** can cause a comment associated with an assignment to be rendered or hidden. By selecting comment button **2622** a comment can be rendered or hidden. For example, comments for two of the Algebra homework assignments are shown. The selection buttons can include View Feedback button **2626**, Resubmit button **2628**, Submit button **2630** or View File button **2632**. View Feedback button **2626** allows a student to view a graded assignment and any comments associated with the assignment. Resubmit button **2628** allows a student to resubmit an assignment that was previously graded. Submit button **2630** allows a student to submit a submission. View File button **2632** allows a student to view a file associated with a File request. For example, the file can be instructions and/or a template file. After rendering an assignment homepage, method **2400** can proceed to block **2406**.

At block **2406**, receive a selection. For example, content management system **106** and/or assignment module **134** receives a selection which can be a view selection **2606**, **2608**, **2610**, **2612**, an assignment **2618** or **2620**, View Feedback button **2626**, Resubmit button **2628**, Submit button **2630** or View File button **2632**. If the selection is a view selection **2606**, **2608**, **2610**, **2612**, method **2400** can proceed to block **2404** with the assignment homepage UI or dashboard being rendered in accordance with the selection. If the selection is an assignment, method **2400** can proceed to block **3302** of FIG. **33**. If the selection is View Feedback button **2626**, method **2400** can proceed to block **2424**. If the selection is Resubmit button **2628**, method **2400** can proceed to block **2410** if the assignment includes an associated template file or can proceed to block **2408** if the assignment does not include an associated template file. If the selection is Submit button **2630**, method **2400** can proceed to block **2408**. If the selection is View File button **2632**, method **2400** can proceed to block **2424**.

At block **2408**, render a submission homepage UI. For example, content management system **106** and/or assignment module **134** causes the rendering of a submission homepage UI based on the one or more associated metadata tags. FIG. **27** shows a submission homepage UI **2702** having a due date message rendered on client device **102_i**. The submission homepage UI **2702** displays due date message **2704**, teacher requesting the assignment **2706**, comment **2708**, due date **2710** and Choose files button **2712**. The due date message **2704** recites, "You've got until August 21 12:00 PDT to upload files." The teacher requesting the assignment **2706** is Rebecca Marshall. The due date **2710** is

Due now—Aug. 21, 2015. The comment **2710** is a default comment, e.g., “Only Rebecca Marshall will see these files unless they choose to share them.” If the teacher submitted a comment in the file request, the teacher’s comment would also be displayed in comment **2710**. Choose files button **2712** allows the student to submit one or more files for the assignment. In response to Choose files button **2712** being selected, method **2700** can proceed to block **2410**.

At block **2410**, render a list of files and receive a file selection. For example, content management system **106** and/or assignment module **134** causes the rendering of a list of files on client device **102**, FIG. **28** shows a list of files **2802** that a student can select to be uploaded. As known in the art, the student can navigate to one or more lists of files **2802** and select one or more files to be included in the file upload. As shown, there are five files listed with each including a Name **2804**, Date Modified **2806**, Size **2808** and Kind **2810**. Name **2804** is the file name. Date Modified **2806** is the date of when the file was modified last. Size **2808** is the size of the file. Kind **2810** is the type of file, e.g., Doc, PDF, etc. To select a file, a student can select the name of the file, e.g., Book Report—Moby Dick **2816**. FIG. **29** shows that the top file, Book Report—Moby Dick **2902** was selected. To cancel the selection of a file to be uploaded, the student can select Cancel button **2812**. To open a file, e.g., for editing, the student can select Open button **2814**. After rendering the list of files and receiving a selection, method **2400** can proceed to block **2412**.

At block **2412**, render an updated submission homepage UI. For example, content management system **106** and/or assignment module **134** causes the rendering of an upload UI. FIG. **30** shows an updated submission homepage UI **3002** with the student’s name being displayed as being logged in **3002**, size of the file **3004**, e.g., 175 KB, selected file being displayed **3006**, e.g., Book Report—Moby Dick, Add another file button **3008** and Upload button **3010**. If the student selects Add another file button **3008**, method **2400** can proceed to block **2410** to select another file. If the student selects Upload button **3010**, method **2400** can proceed to block **2412**.

At block **2414**, upload the one or more selected files along with metadata tags. For example, content management system **106** and/or assignment module **134** generates metadata tags to be uploaded with the one or more files and provides the metadata tags and one or more files to content management system **106** and/or assignment module **134**. The metadata tags can include at least one of a student identifier, a file identifier for each uploaded file, a file request identifier, a school identifier, a class identifier, a term identifier and a timestamp for the upload. After uploading the one or more selected files and one or more associated metadata tags, method **2400** can proceed to block **2416**.

At block **2416**, generate a file name for each of the uploaded files. For example, the file access module **204** determines how many files the submitter has submitted in the collection folder under the file request name and generates a file name for each of the uploaded files. The file name is generated by combining the file request name and either the submitter’s name or the submitter’s user name of the submitter’s email address. The submitter’s first name, last name or any combination thereof can be used. For example, if the file request was named Homework Assignment #3 and Jane Doe uploaded a file, the file name can be “Homework Assignment #3—Jane Doe”. Depending on whether the submitter’s name or user name is unique a number may be added. For example, if two submitter’s have the same first and last name, then a number can be added to the one of the

submitter’s name to differentiate the two submitters. If the submitter has submitted more than one file, the files submitted after the first file can include a number. For example, if a file request for a Homework Assignment #3 and Jose Nunez submits three files, the first file can be named Jose Nunez Homework Assignment #3-1, the second photo can be named Jose Nunez Homework Assignment #3-2 and the third photo can be Jose Nunez Homework Assignment #3-3. One of ordinary skill in the art would recognize other methods for generating unique names for the submitters and for generating unique file names can be used. After generating a file name for each uploaded files, the method **2400** can proceed to block **2418**.

At block **2418**, store the one or more uploaded files and metadata tags. For example, content management system **106** and/or assignment module **134** stores the one or more uploaded files and metadata tags in content storage **160**. The one or more uploaded files and metadata tags can be associated with the collection folder. The one or more uploaded files and metadata tags can be stored in the collection folder and/or be associated with the collection folder. A content directory can identify the location of each content item in content storage **160**. The content directory can include a unique content entry for each content item stored in the content storage **160**. The content entry can include a content pointer that identifies the location of the content item in content storage **160**. Pointers can be added to the teacher’s account and/or student’s account. After storing the one or more uploaded files and metadata tags, method **2400** can proceed to block **2420**.

At block **2420**, render a notification to the student. For example, content management system **106** and/or assignment module **134** causes the rendering of a notification that the file upload is complete. FIG. **31** shows a notification **3102** that is rendered on the client device **102**. As shown, the notification is “Done!” **3102**. After notifying the student, method **2400** can proceed to block **2422**.

At block **2422**, notify the teacher of a submission. For example, content management system **106** and/or assignment module **134** notifies the teacher of the submission. Notifications can include, but is not limited to, email, text message, posting to the account, application notifications (e.g., in-band notifications) or any other for notifications. For example, content management system **106**, file request module **132** and/or email module **136** sends an email message to the teacher informing the teacher that a student submitted an assignment in response to the file request. An exemplary email message can be, “Jose Nunez submitted an assignment to Homework 5 on Aug. 21, 2015 at 11:00 PDT.”

At block **2424**, render the selected file. For example, content management system **106** and/or assignment module **134** causes the rendering of the selected file. The selected file can be a template file associated with the file request, a file associated with the file request, e.g., directions or instructions for the assignment, or a graded assignment.

Referring to FIG. **32**, a flowchart for a method for storing an uploaded file in a collection folder in accordance with an exemplary embodiment is illustrated. Exemplary method **3200** is provided by way of example, as there are a variety of ways to carry out the method. Method **3200** described below can be carried out using the configurations illustrated in FIGS. **1** and **2A** by way of example, and various elements of these figures are referenced in explaining exemplary method **3200**. Each block shown in FIG. **32** represents one or more processes, methods or subroutines, carried out in exemplary method **3200**. Exemplary method **3200** can begin at block **3200**.

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At block **3202**, receive information associated with the student and the one or more files to be uploaded. For example, communications interface module **120** receives information associated with the student and the one or more uploaded files. After receiving the information and the one or more files, method **3200** can proceed to block **3204**.

At block **3204**, determine if the student is an authorized submitter. For example, authenticator module **126** can determine if the submitter is authorized to upload content based on the information received from the submitter. For example, authenticator module **126** can compare the received information against information associated with the collection folder to determine if the student is authorized to upload content. If the student is not authorized, method **3200** can proceed to block **3206**. If the submitter is authorized, method **3200** can proceed to block **2416** of FIG. **24**.

At block **3206**, notify the student. Notification can include, but is not limited to, email, text message, posting to the account, application notifications (e.g., in-band notifications) or any other means of notification. For example, authenticator module **126**, UI module **122** and/or email module **144** notifies the student that the student is not authorized to upload content to the collection folder. UI module **122** can cause a message to be rendered on the student's client device **102**, and/or email module **144** can send an email message to the student. The message and/or email message can inform the student that they are not authorized to submit a file. The notification can be done via an email message or a web page.

Referring to FIG. **33**, a flow diagram for using a template file to complete an assignment in accordance with an exemplary embodiment is illustrated. The exemplary method **3300** is provided by way of example, as there are a variety of ways to carry out the method. The method **3300** described below can be carried out using the configurations illustrated in FIG. **1** by way of example, and various elements of this figure are referenced in explaining exemplary method **3300**. Each block shown in FIG. **33** represents one or more processes, methods or subroutines, carried out in the exemplary method **3300**. The exemplary method **3300** is described with respect to an application operating on a client device **102**. However, one of ordinary skill in the art would recognize that the method **3300** can be performed via a browser on a client device **102**, as known in the art. The exemplary method **3300** can begin at block **3302**.

At block **3302**, receive a link activation command. For example, content management system **106**, assignment module **134**, email module **136** and/or template sharing module **138** receives a template activation command in response to a student selecting a link in an email message, such as link **2008** in FIG. **20**, or by selecting View File button **2632** as shown in FIG. **26**. The link activation command can include a session id and can trigger an Application Program Interface (API), such as a template sharing API or file sharing API. After receiving the link activation command, the method **3300** can proceed to block **3304**.

At block **3304**, determine if a file or a template file is associated with the link. For example, content management system **106**, assignment module **134**, email module **136** and/or template sharing module **138** determines if a file or a template file is associated with the link. If a file is associated with the link, method **3300** can proceed to block **3316**. If a template file is associated with the link, method **3300** can proceed to block **3306**.

At block **3306**, determine if a template instance file exists for the student. For example, content management system

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106 and/or template sharing module **138** determines if a template instance file exists for the student who caused the link activation command to be sent. In one or more embodiments, this can be done by extracting a user id from a session id associated with the recipient's accessing the link to and determining if a template instance file was created for the user. For example, if a template instance file was created, the template instance file would include a user id associated with the user. If a template instance file does not exist for the recipient, the method **3300** proceeds to block **3308**. If a template instance file exists for the recipient, the method **3300** proceeds to block **3310**.

At block **3308**, generate and store a template instance file for the student. For example, content management system **106** and/or template sharing module **138** generates a template instance file for the student who accessed the link. The template instance file is stored in the shared folder. The file name for each stored template instance file includes the template filename and the student's name. For example, if the template file is Homework 5 and the student is Jose Nunez, the template filename can be Homework 5—Jose Nunez. Naming a template instance file can be similar to the naming of a submission done in block **2416** of FIG. **24**. After generating and storing the template instance file, the method **3300** can proceed to block **3310**.

At block **3310**, retrieve the template instance file for the student. For example, the content management system **106** and/or the template sharing module retrieves the previously generated template instance file for the student. This can be done using the extracted user id. After retrieving the template instance file, the method **3300** can proceed to block **3312**.

At block **3312**, render the template instance file. For example, content management system **106**, assignment module **134** and/or template sharing module **138** causes the template instance file to be rendered on the client device **102**. The rendered template instance file can be the template instance file that was generated at block **3306** or the template instance file that was retrieved at block **3308**. After rendering the template instance file, the method **3300** can proceed to block **3314**.

At block **3314**, store the modified template instance file. For example, the recipient modifies the template instance file and content management system **106** and/or assignment module **134** and/or template sharing module **138** saves the modified file and associated one or more metadata tags in the collection folder. The modified template instance file can be stored in response to the recipient entering a save command and/or if the recipient exits out of the template instance file. Thus, the designated recipient is able to fill out or modify the template instance file and have the changes saved in the shared folder.

At block **3316**, render the file. For example, content management system **106** and/or assignment module **134** causes the file to be rendered on the client device **102**. The file can be a document providing instructions for the assignment.

Teacher

Referring to FIG. **34**, a flow diagram for reviewing one or more submissions in accordance with an exemplary embodiment is illustrated. The exemplary method **3400** is provided by way of example, as there are a variety of ways to carry out the method. The method **3400** described below can be carried out using the configurations illustrated in FIG. **1** by way of example, and various elements of this figure are referenced in explaining exemplary method **3400**. Each block shown in FIG. **34** represents one or more processes,

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methods or subroutines, carried out in the exemplary method **3400**. The exemplary method **3400** is described with respect to an application operating on a client device **102**. However, one of ordinary skill in the art would recognize that the method **3400** can be performed via a browser on a client device **102i** as known in the art. The exemplary method **3400** can begin at block **3402**.

At block **3402**, receive a submission and associate with the collection folder. For example, content management system **106** and/or file request module **132** receives a submission from a student and associates the submission with the collection folder. The submission can include one or more files and one or more associated metadata tags. For example, the one or more metadata tags can identify the school, teacher, class, term, assignment and student. After receiving a submission and associating the submission with the collection folder, method **3400** can proceed to block **3404**.

At block **3404**, notify the teacher of a submission. For example, content management system **106** and/or file request module **132** monitors submissions. Submissions are discussed in further detail below. In response to a submission to a file requests, a notification can be provided to the teacher. Notifications can include, but is not limited to, email, text message, posting to the account, application notifications (E.g., in-band notifications) or any other for notifications. For example, content management system **106**, file request module **132** and/or email module **136** sends an email message to the teacher informing the teacher that a student submitted an assignment in response to the file request. An exemplary email message can be, "Jose Nunez submitted an assignment to Homework 5 on Sep. 14, 2015 at 2:00 PDT." After notifying the teacher of a submission, method **3400** can proceed to block **3406**.

At block **3406**, log the submission. For example, content management system **106** and/or file request module **132** logs the submission in an activity log. The logging of a submission can include updating the number of submissions that are received for a given file request, identifying the student who submitted the submission using the user id and/or metadata tag and if the submission is received during the late submission period, the submission can be logged as a late submission. After logging the submission, method **3400** can proceed to block **3408**.

At block **3408**, render a file request homepage UI in response to the selection of File requests menu option. For example, content management system **106** and/or file request module **132** causes the rendering of a file request homepage UI on the teacher's client device **102**. FIG. **21** shows a file request homepage UI **2102** for open file requests. An open file request is a file request that has not reached the deadline and/or late submission deadline. FIG. **22** shows a file request homepage UI **2202** for closed file requests. A closed file request is a file request that is past the deadline and/or late submission deadline. The teacher can access either one by selecting Open button **2214** or Closed button **2212**. The rendered file request homepage UI is based on the metadata tags associated with the teacher, such as a teacher identifier. After rendering the file request homepage UI, method **3400** can proceed to block **3410**.

At block **3410**, receive a command. For example, content management system **106** and/or file request module **132** receives a command. The command can include a Request files, Edit, Add people, Copy, view submissions, view late submissions, view missing submissions, view file request, view, or search. A Request file command is received in response to the teacher selecting the Request files icon **504**

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in FIGS. **21** and **22**. In response to receiving a Request files icon, method **3400** can proceed to block **304** of FIG. **3**. An Edit command is received in response to the teacher selecting the Edit button **2106** shown in FIG. **21**. In response to receiving an edit command, method **3400** can proceed to block **3404** to allow the teacher to edit the file request. An Add people command is received in response to the teacher selecting the Add people button **2108** shown in FIG. **21**. In response to receiving an Add people command, method **3400** can proceed to block **310** of FIG. **3** to allow the teacher to add one or more students to the file request. A copy command is received in response to the teacher selecting Copy button **2110** shown in FIGS. **21** and **22**. In response to receiving a Copy command, method **3400** can proceed to block **310** of FIG. **3**. A view submissions command is received in response to the teacher selecting the submissions button **2120** shown in FIGS. **21** and **22**. In response to receiving a view submission command, method **3400** can proceed to block **3412**. A view late submissions command is received in response to the teacher selecting the late submissions button **2122** shown in FIG. **22**. In response to receiving a view late submission command, method **3400** can proceed to block **3412**. A view missing submissions command is received in response to the teacher selecting the missing submissions button **2124** shown in FIG. **22**. In response to receiving a view missing submission command, method **3400** can proceed to block **3412**. A view file request command is received in response to the teacher selecting a file request **2106** shown in FIGS. **21** and **22**. In response to receiving a view file request command, method **3400** can proceed to block **3426**. A view command is received in response to the teacher selecting the view button **2118** shown in FIGS. **21** and **22**. In response to receiving a view command, method **3400** can proceed to block **3428** shown in FIGS. **21** and **22**. A search command is received in response to the teacher selecting the Search button **2116** shown in FIGS. **21** and **22**. In response to receiving a Search command, method **3400** can proceed to block **3434**.

At block **3412**, render a listing of submissions for the selected submission. For example, content management system **106** and/or file request module **132** causes the rendering of a submission UI or dashboard displaying a listing of submissions that are associated with the file request and the submission button that was selected. If the submission button **2120** was selected, the listing of submissions can include the status of submissions for all of the students. Alternatively, the listing of submissions can include the a listing of submissions that were submitted on time. FIG. **35** shows a submission UI or dashboard **3502** displaying a listing of submissions. As shown, the submission UI or dashboard **3502** can include the name of the file request **3504**, name of assignment **3506**, change button **3508**, creation date **3510**, deadline **3512**, comment **3514**, search button **2116**, number of students associated with the file request **3516** and a submission listing **3518**. As shown, the name of the file request is Period 1—Algebra 1> Homework 1 **3504** and the name of the assignment is Homework 1 **3506**. Change button **3508** allows the teacher to select a different assignment. The creation date is Sep. 2, 2015 at 7:47 AM **3510** and the deadline is Sep. 9, 2015 by 11:59 PM **3512**. The comment **3514** is the comment the teacher submitted when creating the file request. There are thirty students associated with the file request **3516**. The submission listing **3518** can be scrollable with four submissions shown in this figure. The listing can include student name **3520**, status indicator **3522**, grade **3524**, action buttons **3526** and feedback indicator **3528**. Student name **3520** can

be the names of the students associated with the file request. Status indicator **3522** can identify the status of the assignment. For example, a circle with a check can indicate that the submission was on time, a circle with a clock can indicate that the submission was submitted in a late submission period, a circle with three dots can indicate that the assignment is pending, and a circle with an X can indicate that no submission was made and the submission period has ended. Each status indicator can include a color. For example, green can indicate a timely submission, yellow can indicate a late submission, red can indicate no submission and blue can indicate a pending assignment. Grade **3524** can be the grade for the assignment. Action **3526** can be View and/or Request. By selecting View, the teacher can review a submission. By selecting Request, the teacher can allow a student to submit an assignment that is beyond the deadline. Feedback indicator **3528** identifies the time the teacher submitted the feedback, e.g., graded the submission. FIG. **36** shows a late submission UI or dashboard **3602** displaying a listing of late submissions. As shown, there are two late submissions for Period 1—Algebra 1> Homework 1. FIG. **37** shows a missing submission UI or dashboard **3702** displaying a listing of missing submissions. As shown there are two missing submissions for Period 1—Algebra 1> Homework 1. If the View action is selected, method **3400** can proceed to block **3414**.

At block **3414**, render a copy of the selected submission. For example, content management system **106** and/or file request module **132** causes the rendering of a document UI displaying a copy of the selection submission. FIG. **38** shows a document UI **3802** displaying a copy of Homework 5, e.g., Jose Nunez's Homework 5. After rendering a copy of the selected submission, method **3400** can proceed to block **3416**.

At block **3416**, receive edits to the copy of the selected submission. For example, content management system **106** and/or file request module **132** receives edits that the teacher makes to the document. The teacher can edit the copy of the document **3804**, e.g., mark the document up by indicating right answers and/or wrong answers. When finished the teacher can select grade icon **3806** to render a prompt to enter a grade for the assignment. The teacher can also enter a comment in comment section **3808**. For example, the teacher can enter "Great job!" in comment section **3808**. After editing the copy of the selected submission, method **3400** can proceed to block **3418**.

At block **3418**, save the changes. For example, content management system **106** and/or file request module **132** saves the edits in as a change history in a changed history file. The changed history file can be saved when the teacher exits the document. The change history file can include a set of changes that, when applied to the original file version, produce the changed file version. The entered grade can be saved in the changed history file. The entered grade can also be saved in a grade book that is associated with the class, e.g., U.S. History—Period 5. If the teacher entered one or more comments, the one or more entered comments can be saved in the changed history file. The changed history file can be stored in the collection folder along with one or more metadata tags. For example, a metadata tag can store a time stamp when the file was saved. The saved document can include permissions associated with the copy. For example, the teacher can edit the document if the teacher accesses the document again. The student can have read only access to the document. A pointer to the graded submission can be associated with the student's user account. After saving the changes, method **3400** can proceed to block **3420**.

At block **3420**, notify the student. For example, content management system **106** and/or file request module **132** notifies the student of the graded submission. Notifications can include, but is not limited to, email, text message, posting to the account, application notifications (e.g., in-band notifications) or any other for notifications. For example, content management system **106**, file request module **132** and/or email module **136** sends an email message to the teacher informing the student that a teacher graded the submission. An exemplary email message can be, "Teacher Shields graded Homework 5—U.S. History on Sep. 14, 2015 at 2:00 PDT." The email message can include a hyperlink to the graded submission and changed history file. After notifying the student, method **3400** can proceed to block **3422**.

At block **3422**, render the submission and changed history in response to the student accessing the graded submission. For example, content management system **106** and/or file request module **132** causes the rendering of the graded submission on client device **102**. The rendered graded submission includes the edits that the teacher entered, including the grade and any comments that were entered. The student can access the graded submission by clicking on a link in the email message and/or by accessing their user account.

At block **3424**, render a file request. For example, content management system **106** and/or file request module **132** causes the rendering of a file request on client device **102**. The file request can display information associated with the file request along with submission information. FIG. **23** shows an exemplary file request for Homework 5. As shown, the title of the file request is Homework 5 **2302**, the file request was sent to Algebra—Period 2 **2304**, was sent on Aug. 28, 2015 **2306**, has a deadline of Sep. 7, 2015 at 08:00 PDT **2308**, with a late submission of two days **2310**, the comment, "Please complete this assignment." **2312**, has received eight submission **2314**, no late submissions since the due date has not been reached and is missing six submissions **2316**. In response to the teacher selecting the Exit button **2320**, method **3400** can proceed to block **3410**.

At block **3426**, receive a view command. For example, content management system **106** and/or file request module **132** receives a view command. FIGS. **21** and **22** show a view button **2218** with Show All being the current view. By selecting the view button **2118**, a menu can be displayed listing different views. For example, the views can be by class or by teacher using the associated one or more metadata tags, such as a class identifier or teacher identifier. By selecting class or teacher, a second menu can be displayed that lists the different classes or teachers, respectively, and the teacher can select a class or teacher, respectively. After receiving a view command, method **3400** can proceed to block **3428**.

At block **3428**, conduct a search based on the selected menu option and selected class or teacher, if entered. For example, content management system **106** and/or file request module **132** searches the file request and associated one or more metadata tags. The search can be limited to open file requests or closed file request depending on which File Request UI is displayed, e.g., open file requests in FIG. **21** and closed file requests in FIG. **22**. After conducting a search, method **3400** can proceed to block **3430**.

At block **3430**, render a file request UI based on the search results. For example, content management system **106** and/or file request module **132** causes the rendering of the file requests based on the search results.

At block 3432, receive a search request and one or more search terms. For example, content management system 106 and/or file request module 132 receives a search request in response to a teacher selecting search icon 2214 and entering one or more search terms. The search terms can include, but is not limited to, teacher name, group name, email address, class name, student name, file request name, submissions, late submissions, missing submissions, keyword, open file requests and closed file requests. The teacher name refers to a teacher associated with the file requests. The group name refers to the group associated with one or more file requests. The email address refers to the email address of who a file request was sent to or who a file request was received from. The class name refers to a class name. Student name refers to a student. Submissions refer to submissions received by a student. Late submissions refer to submissions that were received in the late submission period. Missing submissions refer to students who did not respond to a file request in a timely manner. Keyword refers to a keyword in a file request and/or in a submission. Open file requests refer to open file requests. Closed file request refer to closed file requests. In an alternate embodiment, a search UI can be displayed with different prompts for these items and a teacher can enter one or more keywords to search with respect to a prompt. For example, the teacher can enter a student names under late submissions to receive a list of submissions from a student that were submitted during the late submission period. In another example, the teacher can enter a keyword for a keyword prompt and enter a student's name for the student prompt to identify one or more submissions from the designated student that contains the keyword. After receiving a search request and search terms, method 3400 can proceed to block 3434.

At block 3434, conduct a search. For example, content management system 106 and/or file request module 132 searches file requests, metadata tags associated with the file requests and submissions based on the one or more search terms. The one or more search terms can be searched in content storage 160 for file requests and submissions that are associated with a school associated with the teacher requesting the search. After conducting the search, method 3400 can proceed to block 3436.

At block 3436, render the search results. For example, content management system 106 and/or file request module 132 renders the search results on a search result UI on client device 102. Depending on the search request, the search results can render a list of submissions and/or a list of file requests. If a search results in a single submission, the submission can be rendered.

Releasing and/or Sharing Submissions

Referring to FIG. 39, a flow diagram for releasing and/or sharing submissions in accordance with an exemplary embodiment is illustrated. The exemplary method 3900 is provided by way of example, as there are a variety of ways to carry out the method. The method 3900 described below can be carried out using the configurations illustrated in FIG. 1 by way of example, and various elements of this figure are referenced in explaining exemplary method 3900. Each block shown in FIG. 39 represents one or more processes, methods or subroutines, carried out in the exemplary method 3900. The exemplary method 3900 is described with respect to an application operating on a client device 102. However, one of ordinary skill in the art would recognize that the method 3900 can be performed via a browser on a client device 102 as known in the art. The exemplary method 3900 can begin at block 3902.

At block 3902, render a group homepage UI. For example, content management system 106 renders a group homepage UI which lists one or more groups associated with an entity, such as a school. FIG. 4 shows a group homepage UI 402 which list six different groups 404 associated with a school, e.g., Babblebrook High School 406. A teacher or administrator can release submissions by selecting Release button 418. A teacher or administrator can share submissions by selecting a class. After rendering the group homepage UI, method 3900 can proceed to block 3904.

At block 3904, receive a selection. For example, content management system 106, file sharing module 130 and/or release module 140 receives a selection. If the selection is of the Release button 418, method 3900 can proceed to block 3904. If the selection is of a class, method 3900 can proceed to block 3920.

At block 3906, render a release UI. For example, content management system 106 and/or release module 140 renders a release UI. FIG. 40 shows a release UI 4002 rendered on client device 102, and displaying prompts. The prompts can be student prompt 4004 and class prompt 4006. The user, e.g., teacher or administrator can enter one or more students' name to release submissions associated with each student or can enter one or more classes to release submissions associated with each class. The school prompt can be automatically filled with the school. By entering one or more student's names and selecting Release button 4010, a student release command is generated by release module 140 and submissions associated with each entered student can be released. By entering one or more classes and selecting Release button 4010, a class release command is generated by release module 140 and submissions associated with students in each entered class can be released. By not entering any student names or class names and selecting Release button 4010, a school release command is generated by release module 140 and submissions for each student in the school can be released. In response to selecting Release button 4010, method 3900 can proceed to block 3908. In response to selecting Cancel button 4012, the release can be canceled and method 3900 can proceed to block 3902.

At block 3908, identify identifiers in accordance with the release command. For example, content management system 106 and/or release module 140 searches and identifies identifiers associated with the released command. For example, for a student release command, student identifiers for each entered student's name are identified. For a class release command, student identifiers and class identifiers for each student associated with each entered class are identified. For a school release command, student identifiers and school identifiers are identified. After identifying the identifiers in accordance with the release command, method 3900 can proceed to block 3910.

At block 3910, search and identify submissions in accordance with the identifiers. For example, content management system 106 and/or release module 140 searches and identifies submissions associated with the identifiers. For example, for a student release command, all of the submissions associated with the student identifiers are searched and identified. For a class release command, all of the submissions associated with the student identifiers and class identifiers are searched and identified. For a school release command, all of the submission associated with the student identifiers and school identifiers are search and identified. Identifying submissions can include generated a list of submissions and their locations within the content storage

160. After searching and identifying submissions in accordance with the release command, method 3900 can proceed to block 3912.

At block 3912, render a prompt to save or discard submissions. For example, content management system 106 and/or release module 140 renders a student UI on client device 102, prompting the student to save or discard their submissions. The student UI can be rendered in response to a student receiving an email message and selecting a link to the student UI or the student accessing the content management system 106 after the release. FIG. 41 shows a student UI 4102 displaying a release message 4104 prompting the student to save or discard their submissions. For example, the release message recites, "Would you like to save or discard your submissions for School Year 2015-2016?" 4104. The message can be for a student release or school release. A different message can be displayed for a class release. For example, the message can be, "Would you like to save or discard your submissions for U.S. History?" To save the submissions, the student can select Save button 4106. To discard the submissions, the student can select Discard button 4108. After rendering the prompt to save or discard the submissions, method 3900 can proceed to block 3914.

At block 3914, receive a response to the prompt. For example, content management system 106 and/or release module 140 receives a response to the prompt. The response can be to save the submissions or to discard the submissions. If the received response is to save the submissions, method 3900 can proceed to block 3916. If the received response is to discard the submissions, method 3900 can proceed to block 3918.

At block 3916, organize and save the submissions. For example, content management system 106 and/or release module 140 organizes and saves the submissions. Based on the metadata tags associated with the submissions, the submissions can be organized by school year and class. Save submissions can be saved in the user account associated with the student. For example, a pointer can be stored in the user's account with the pointer identifying where the saved submissions are stored in content storage 160 or can be archived in a different storage location.

At block 3918, discard the submissions. For example, content management system 106 and/or release module 140 deletes the submissions from content storage 160.

At block 3920, render a selected class. For example, content management system 106 and/or sharing module 130 renders a class UI on client device 102. FIG. 42 shows a class UI 4202 rendering a scrollable list of students in a corresponding class based on the metadata tags associated with the selected class. As shown, the selected class is Algebra—Period 1. The selected class has 16 members in the class. The scrollable list shows four students. The scrollable list includes student names 4204, email addresses 4206, joined date 4208 and menu button 4210. By selecting menu button 4210, a menu 4212 is displayed with Remove User 4214 menu option and View Portfolio 4216 menu option. By selecting Remover User 4214 menu option, a student can be removed from the group. By selecting View Portfolio 4216 menu option, assignments associated with a student can be viewed. In response to View Portfolio 4216 menu option being selected, method 3900 can proceed to block 3922.

At block 3922, render assignments associated with a student. For example, content management system 106 and/or sharing module 130 renders an assignment UI on client device 102. FIG. 43 shows an assignment UI 4302

rendering a list of assignments corresponding to a student based on metadata tags associated with selected student and class. As shown, ten assignments associated with Ben Stern, the selected student, are displayed. The scrollable list of assignments includes assignment names 4304, modification dates 4306 and grades 4308. Assignment UI 4302 also displays Share Portfolio button 4310. By selecting Share Portfolio button 4310, the assignments associated with the selected student can be shared. In response to Share Portfolio button 4310 being selected, method 3900 can proceed to block 3924.

At block 3924, share the portfolio. For example, content management system 106 and/or sharing module 130 allow the portfolio to be shared. To share the portfolio associated with the selected student, the teacher or administrator can copy and paste a link in an email and/or allows the teacher to enter a user identifier, e.g., a name or email address associated with a user account to share the portfolio associated with the student. The student portfolio can be shared with the student, parent, guardian, guidance counselor, administrator or any other person the teacher or administrator designates.

While content management system 106 is presented with specific components, it should be understood by one skilled in the art, that the architectural configuration of system 106 is simply one possible configuration and that other configurations with more or less components are also possible. The term module can be software that resides in memory of the client device 102, and/or on one or more servers of the content management system 106 and performs one or more functions when a processor executes the software associated with the module. The memory can be a non-transitory computer-readable medium.

FIGS. 44A and 44B show exemplary possible system embodiments. The more appropriate embodiment will be apparent to those of ordinary skill in the art when practicing the present technology. Persons of ordinary skill in the art will also readily appreciate that other system embodiments are possible.

FIG. 44A illustrates a conventional system bus computing system architecture 4400 wherein the components of the system are in electrical communication with each other using a bus 4405. Exemplary system 4400 includes a processing unit (CPU or processor) 4410 and a system bus 4405 that couples various system components including the system memory 4415, such as read only memory (ROM) 4420 and random access memory (RAM) 4425, to the processor 4410. The system 4400 can include a cache of high-speed memory connected directly with, in close proximity to, or integrated as part of the processor 4410. The system 4400 can copy data from the memory 4415 and/or the storage device 4430 to the cache 4412 for quick access by the processor 4410. In this way, the cache can provide a performance boost that avoids processor 4410 delays while waiting for data. These and other modules can control or be configured to control the processor 4410 to perform various actions. Other system memory 4415 may be available for use as well. The memory 4415 can include multiple different types of memory with different performance characteristics. The processor 4410 can include any general purpose processor and a hardware module or software module, such as module 1 4432, module 2 4434, and module 3 4436 stored in storage device 4430, configured to control the processor 4410 as well as a special-purpose processor where software instructions are incorporated into the actual processor design. The processor 4410 may essentially be a completely self-contained computing system, containing multiple cores

or processors, a bus, memory controller, cache, etc. A multi-core processor may be symmetric or asymmetric.

To enable user interaction with the computing device **4400**, an input device **4445** can represent any number of input mechanisms, such as a microphone for speech, a touch-sensitive screen for gesture or graphical input, keyboard, mouse, motion input, speech and so forth. An output device **4435** can also be one or more of a number of output mechanisms known to those of skill in the art. In some instances, multimodal systems can enable a user to provide multiple types of input to communicate with the computing device **4400**. The communications interface **4440** can generally govern and manage the user input and system output. There is no restriction on operating on any particular hardware arrangement and therefore the basic features here may easily be substituted for improved hardware or firmware arrangements as they are developed.

Storage device **4430** is a non-volatile memory and can be a hard disk or other types of computer readable media which can store data that are accessible by a computer, such as magnetic cassettes, flash memory cards, solid state memory devices, digital versatile disks, cartridges, random access memories (RAMs) **4425**, read only memory (ROM) **4420**, and hybrids thereof.

The storage device **4430** can include software modules **4432**, **4434**, **4436** for controlling the processor **4410**. Other hardware or software modules are contemplated. The storage device **4430** can be connected to the system bus **4405**. In one aspect, a hardware module that performs a particular function can include the software component stored in a computer-readable medium in connection with the necessary hardware components, such as the processor **4410**, bus **4405**, display **4435**, and so forth, to carry out the function.

FIG. **44B** illustrates a computer system **4450** having a chipset architecture that can be used in executing the described method and generating and displaying a graphical user interface (GUI). Computer system **4450** is an example of computer hardware, software, and firmware that can be used to implement the disclosed technology. System **4450** can include a processor **4455**, representative of any number of physically and/or logically distinct resources capable of executing software, firmware, and hardware configured to perform identified computations. Processor **4455** can communicate with a chipset **4460** that can control input to and output from processor **4455**. In this example, chipset **4460** outputs information to output **4465**, such as a display, and can read and write information to storage device **4470**, which can include magnetic media, and solid state media, for example. Chipset **4460** can also read data from and write data to RAM **4475**. A bridge **4480** for interfacing with a variety of user interface components **4485** can be provided for interfacing with chipset **4460**. Such user interface components **4485** can include a keyboard, a microphone, touch detection and processing circuitry, a pointing device, such as a mouse, and so on. In general, inputs to system **4450** can come from any of a variety of sources, machine generated and/or human generated.

Chipset **4460** can also interface with one or more communication interfaces **44440** that can have different physical interfaces. Such communication interfaces can include interfaces for wired and wireless local area networks, for broadband wireless networks, as well as personal area networks. Some applications of the methods for generating, displaying, and using the GUI disclosed herein can include receiving ordered datasets over the physical interface or be generated by the machine itself by processor **4455** analyzing data stored in storage **4470** or **4475**. Further, the machine can

receive inputs from a user via user interface components **4485** and execute appropriate functions, such as browsing functions by interpreting these inputs using processor **4455**.

It can be appreciated that exemplary systems **4400** and **4450** can have more than one processor **4410** or be part of a group or cluster of computing devices networked together to provide greater processing capability.

Any of the steps, operations, functions, or processes described herein may be performed or implemented by a combination of hardware and software modules, alone or in combination with other devices. In an embodiment, a software module can be software that resides in memory of a client device and/or one or more servers of a content management system and perform one or more functions when a processor executes the software associated with the module. The memory can be a non-transitory computer-readable medium.

For clarity of explanation, in some instances the present technology may be presented as including individual functional blocks including functional blocks comprising devices, device components, steps or routines in a method embodied in software, or combinations of hardware and software.

In some embodiments the computer-readable storage devices, mediums, and memories can include a cable or wireless signal containing a bit stream and the like. However, when mentioned, non-transitory computer-readable storage media expressly exclude media such as energy, carrier signals, electromagnetic waves, and signals per se.

Methods according to the above-described examples can be implemented using computer-executable instructions that are stored or otherwise available from computer readable media. Such instructions can comprise, for example, instructions and data which cause or otherwise configure a general purpose computer, special purpose computer, or special purpose processing device to perform a certain function or group of functions. Portions of computer resources used can be accessible over a network. The computer executable instructions may be, for example, binaries, intermediate format instructions such as assembly language, firmware, or source code. Examples of computer-readable media that may be used to store instructions, information used, and/or information created during methods according to described examples include magnetic or optical disks, flash memory, USB devices provided with non-volatile memory, networked storage devices, and so on.

Devices implementing methods according to these disclosures can comprise hardware, firmware and/or software, and can take any of a variety of form factors. Typical examples of such form factors include laptops, smart phones, small form factor personal computers, personal digital assistants, and so on. Functionality described herein also can be embodied in peripherals or add-in cards. Such functionality can also be implemented on a circuit board among different chips or different processes executing in a single device, by way of further example.

The instructions, media for conveying such instructions, computing resources for executing them, and other structures for supporting such computing resources are means for providing the functions described in these disclosures.

Although a variety of examples and other information was used to explain aspects within the scope of the appended claims, no limitation of the claims should be implied based on particular features or arrangements in such examples, as one of ordinary skill would be able to use these examples to derive a wide variety of implementations. Further and although some subject matter may have been described in

language specific to examples of structural features and/or method steps, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to these described features or acts. For example, such functionality can be distributed differently or performed in components other than those identified herein. Rather, the described features and steps are disclosed as examples of components of systems and methods within the scope of the appended claims.

What is claimed is:

1. A computer implemented method comprising:
receiving, by a server device and from a client device associated with a teacher, a file request to distribute an assignment to a plurality of client devices associated with a corresponding plurality of students, the file request comprising request information that comprises an assignment name;
generating, based on the assignment name from the file request and prior to receiving electronic file assignment submissions, a target assignment folder on the server device within a content management system account associated with the teacher, wherein the target assignment folder is located within a folder hierarchy;
storing, on the server device, the electronic file assignment submissions received in response to the file request within the folder hierarchy, wherein the electronic file assignment submissions are stored in the target assignment folder within the folder hierarchy upon being received from the plurality of client devices associated with the corresponding plurality of students; and
providing, from the server device and to the client device associated with the teacher, a graphical user interface that comprises an assignment submission summary that lists the electronic file assignment submissions within a single user interface view without visually referencing the folder hierarchy.
2. The computer implemented method of claim 1, wherein the request information comprises an assignment deadline.
3. The computer implemented method of claim 2, wherein the request information further comprises a late assignment submission deadline.
4. The computer implemented method of claim 1, wherein the folder hierarchy within the content management system account associated with the teacher comprises a class folder and a plurality of assignment folders within the class folder, the target assignment folder being one of the plurality of assignment folders.
5. The computer implemented method of claim 4, wherein:
the plurality of assignment folders within the class folder comprises the target assignment folder in the class folder and a second assignment folder within the class folder; and
storing the electronic file assignment submissions further comprises:
storing, in the target assignment folder, a first electronic file assignment submission corresponding to the assignment; and
storing, in the second assignment folder, a second electronic file assignment submission corresponding to a second assignment.
6. The computer implemented method of claim 1, further comprising:
generating metadata tags associated with the file request based on the request information;

associating at least two of the metadata tags to assignments based on the request information; and
providing, to the plurality of client devices associated with the corresponding plurality of students, the assignments including the at least two of the metadata tags.

7. The computer implemented method of claim 6, wherein the metadata tags comprise an assignment metadata tag, a student metadata tag, a class metadata tag, and a teacher metadata tag.

8. The computer implemented method of claim 7, further comprising identifying, for a received electronic file assignment submission of the electronic file assignment submissions, the target assignment folder within the folder hierarchy based on a metadata tag associated with the received electronic file assignment submission.

9. The computer implemented method of claim 7, further comprising generating the assignment submission summary by identifying one or more electronic file assignment submissions that comprise two or more of the teacher metadata tag, the class metadata tag, or the assignment metadata tag associated with each of the electronic file assignment submissions.

10. The computer implemented method of claim 7, further comprising generating the assignment submission summary to display a list of outstanding assignments associated with the students based on the assignment metadata tag, the student metadata tag, and the class metadata tag.

11. The computer implemented method of claim 7, further comprising:

receiving the electronic file assignment submissions in response to the file request from the plurality of client devices associated with the corresponding plurality of students; and

associating, for each of the received electronic file assignment submissions, a student metadata tag with the received electronic file submission based on a first student that submitted the electronic file assignment submission.

12. The computer implemented method of claim 11, further comprising:

receiving, from the client device associated with the teacher, a request to filter the assignment submission by the first student; and

filtering the assignment submission summary within the graphical user interface based on the student metadata tag associated with the first student and without visually referencing the folder hierarchy within the graphical user interface.

13. The computer implemented method of claim 6, further comprising concatenating the at least two of the metadata tags into a single concatenated metadata tag, wherein the single concatenated metadata tags comprise a hierarchy order of the metadata tags, and wherein an empty metadata tag is populated with a null entry.

14. The computer implemented method of claim 1, wherein the assignment submission summary comprises a number of submissions to the file request, a number of late submissions to the file request, and a number of missing submissions to the file request.

15. A system comprising:

at least one processor; and

at least one non-transitory computer readable storage medium storing instructions that, when executed by the at least one processor, cause the system to:

receive, by a server device and from a client device associated with a teacher, a file request to distribute an assignment to a plurality of client devices asso-

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ciated with a corresponding plurality of students, the file request comprising request information that comprises an assignment name;

generate, based on the assignment name from the file request and prior to receiving electronic file submissions, a target assignment folder on the server device within a content management system account associated with the teacher, wherein the target assignment folder is located within a folder hierarchy;

store, on the server device, the electronic file assignment submissions received in response to the file request within the folder hierarchy, wherein the electronic file assignment submissions are stored in the target assignment folder within the folder hierarchy upon being received from the plurality of client devices associated with the corresponding plurality of students; and

provide, from the server device and to the client device associated with the teacher, a graphical user interface that comprises an assignment submission summary that lists the electronic file assignment submissions within a single user interface view without visually referencing the folder hierarchy.

16. The system of claim 15, further comprising instructions that, when executed by the at least one processor, cause the system to:

generate metadata tags associated with the file request based on the request information;

associate at least two of the metadata tags to assignments based on the request information; and

provide, to the plurality of client devices associated with the corresponding plurality of students, the assignments including the at least two of the metadata tags.

17. The system of claim 16, further comprising instructions that, wherein the metadata tags comprise an assignment metadata tag, a student metadata tag, a class metadata tag, and a teacher metadata tag.

18. A non-transitory computer-readable medium storing instructions that, when executed by at least one processor, cause a computer system to:

receive, by a server device and from a client device associated with a teacher, a file request to distribute an

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assignment to a plurality of client devices associated with a corresponding plurality of students, the file request comprising request information that comprises an assignment name;

generate, based on the assignment name from the file request and prior to receiving electronic file submissions, a target assignment folder on the server device within a content management system account associated with the teacher, wherein the target assignment folder is located within a folder hierarchy;

store, on the server device, the electronic file assignment submissions received in response to the file request within the folder hierarchy, wherein the electronic file assignment submissions are stored in the target assignment folder within the folder hierarchy upon being received from the plurality of client devices associated with the corresponding plurality of students; and

provide, from the server device and to the client device associated with the teacher, a graphical user interface that comprises an assignment submission summary that lists the electronic file assignment submissions within a single user interface view without visually referencing the folder hierarchy.

19. The non-transitory computer-readable medium of claim 18, further comprising instructions that, when executed by the at least one processor, cause the computer system to:

generate metadata tags associated with the file request based on the request information;

associate at least two of the metadata tags to assignments based on the request information; and

provide, to the plurality of client devices associated with the corresponding plurality of students, the assignments including the at least two of the metadata tags.

20. The non-transitory computer-readable medium of claim 19, further comprising instructions that, when executed by the at least one processor, cause the computer system to concatenate the at least two of the metadata tags into a single concatenated metadata tag, wherein the single concatenated metadata tags comprise a hierarchy order of the metadata tags.

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