US 20260044831A1

(19) **United States**

(12) **Patent Application Publication**

TAE et al.

(10) **Pub. No.: US 2026/0044831 A1**

(43) **Pub. Date: Feb. 12, 2026**

(54) **METHOD FOR INPUTTING CATEGORIZED SCHEDULE BY USING CALENDAR APPLICATION**

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(21) Appl. No.: **19/101,338**

(22) PCT Filed: **Aug. 3, 2023**

(86) PCT No.: **PCT/KR2023/011446**

§ 371 (c)(1),
(2) Date: **Feb. 5, 2025**

(30) **Foreign Application Priority Data**

Aug. 5, 2022 (KR) 10-2022-0097782

Publication Classification

(51) **Int. Cl.**

G06Q 10/109 (2023.01)
G06F 3/04817 (2022.01)
G06F 3/0482 (2013.01)

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

CPC ***G06Q 10/109*** (2013.01); ***G06F 3/04817*** (2013.01); ***G06F 3/0482*** (2013.01)

(57) **ABSTRACT**

A method of inputting schedules including multiple categories, comprises: providing, on a category selection window of a user interface of a calendar application, selectable item buttons corresponding to each of at least two categories of a schedule simultaneously, wherein the at least two categories are associated with each other, and the provided item buttons are set differently for each user, receiving a selection of at least one item button among item buttons belonging to one of the at least two categories on the category selection window, and in response to the selection of the at least one item button, modifying and presenting item buttons belonging to the other one of the at least two categories on the category selection window, wherein the number of the modified item buttons is smaller than the number of the item buttons before modification.

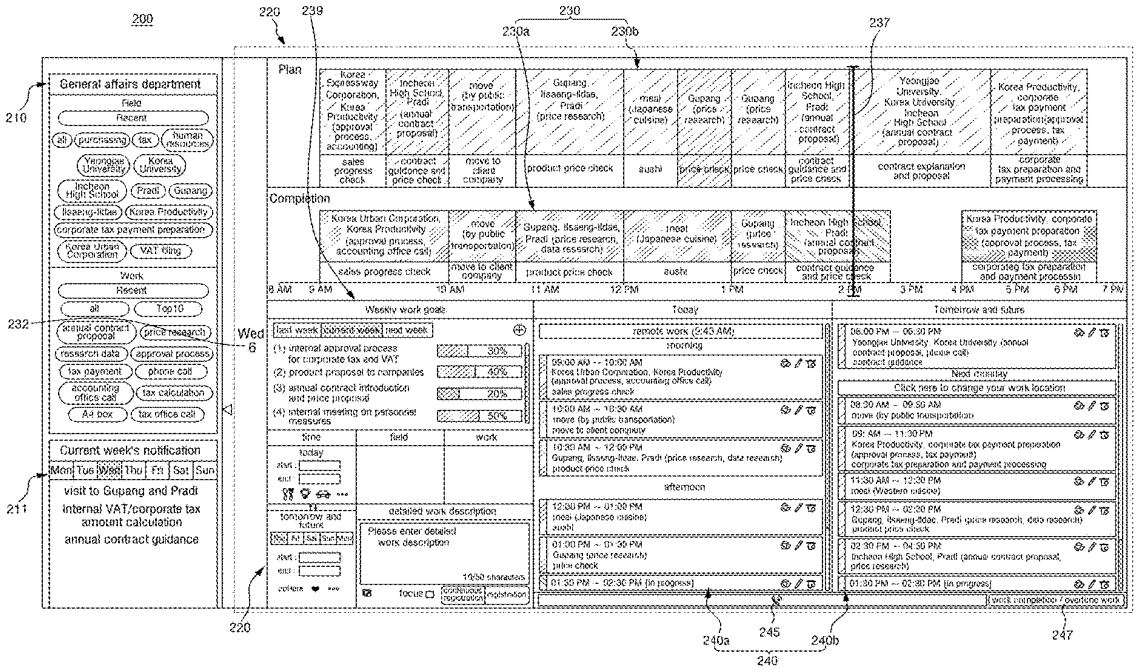


FIG. 1a

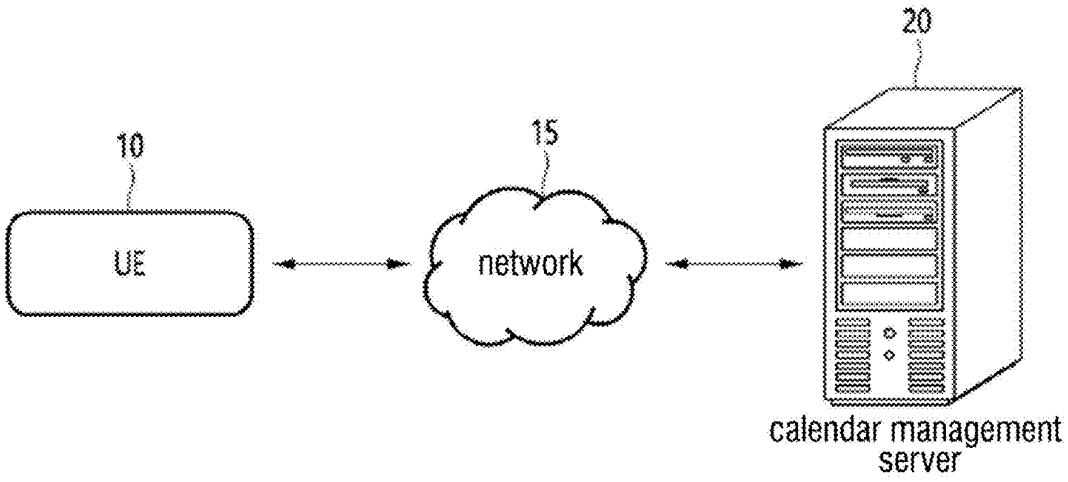


FIG. 1b

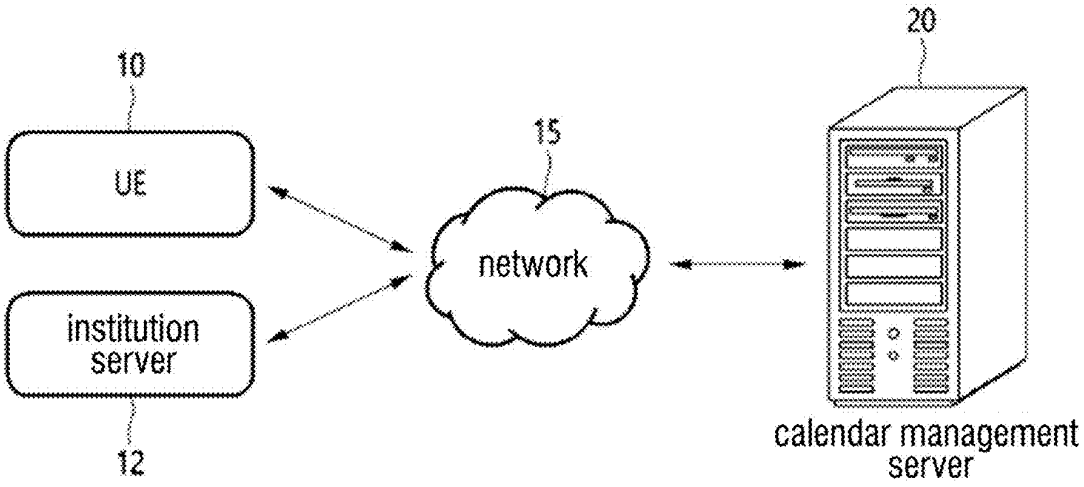

10
UE
institution server
12
15
network
20
calendar management server

FIG. 2

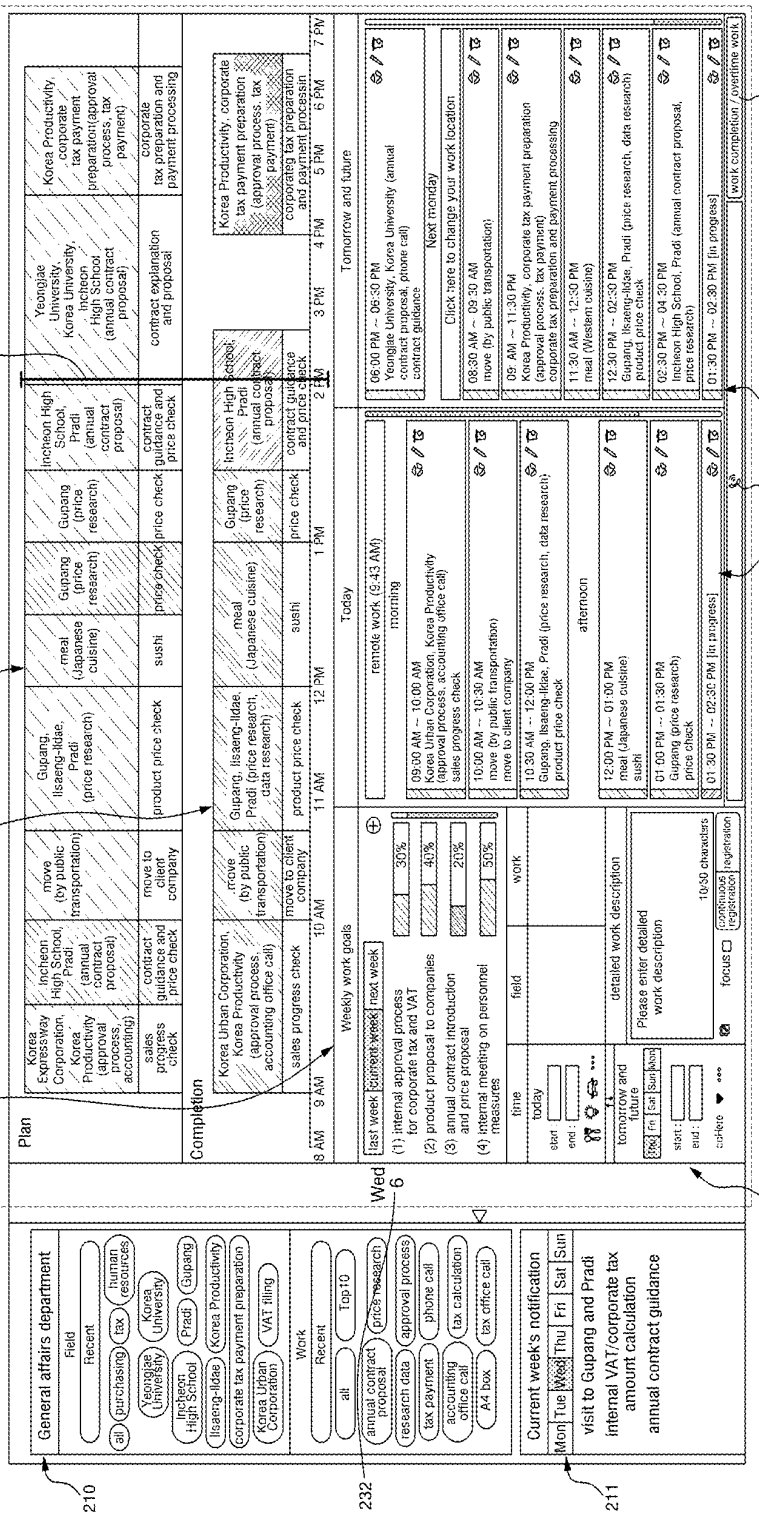

200
210
211
220
230
230a
230b
232
237
239
240
240a
240b
245
247
Plan
Completion
Today
Tomorrow and future
Weekly work goals
remote work (9:43 AM)
morning
afternoon
Current week's notification
visit to Gupang and Pradi
internal VAT/corporate tax amount calculation
annual contract guidance
Please enter detailed work description
1000 characters
registration

FIG. 3

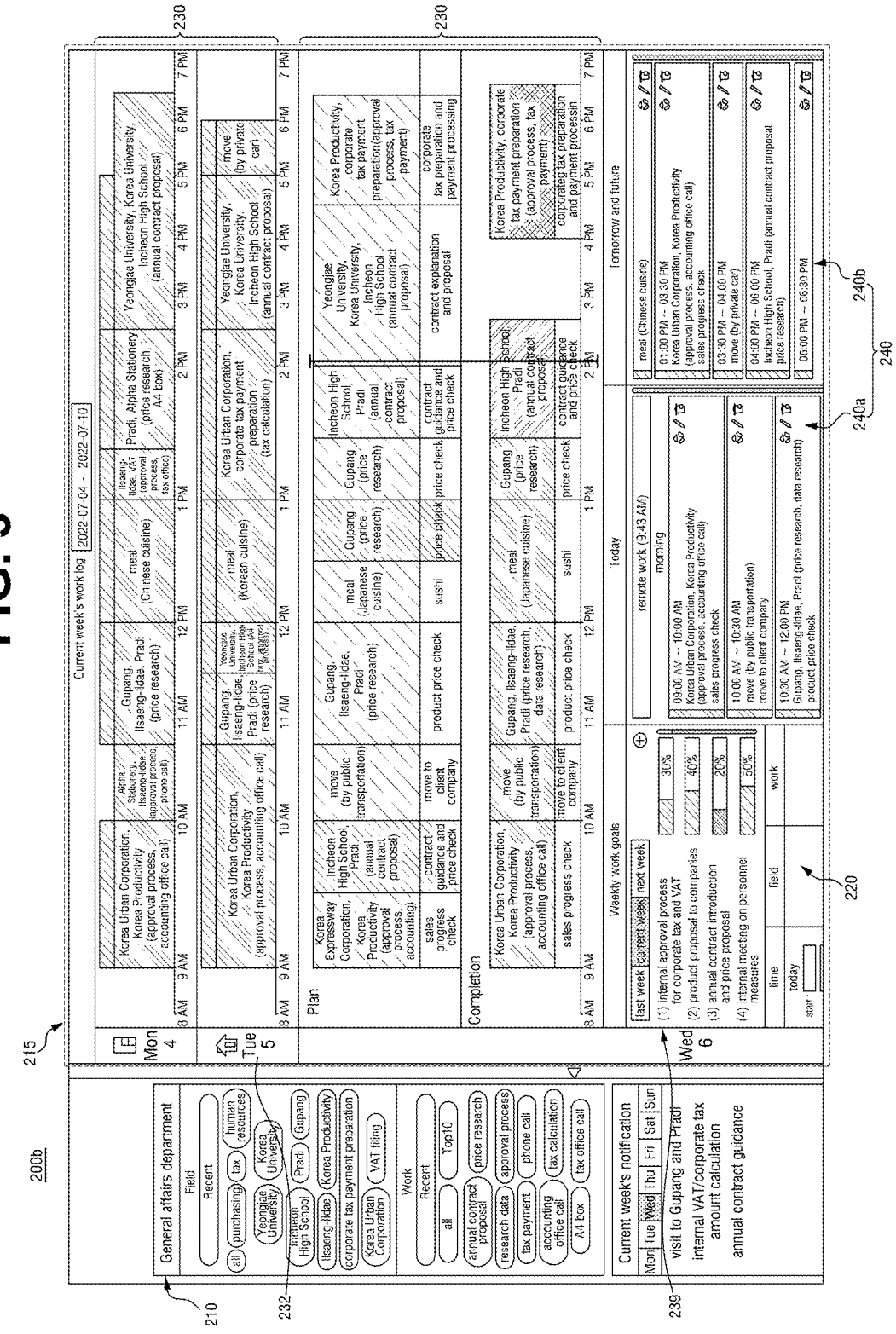

200b
215
210
232
239
220
230
240
240a
240b
General affairs department
Field
Recent
Work
Current week's notification
Current week's work log 2022-07-04 ~ 2022-07-10
Mon 4
Tue 5
Wed 6
Plan
Completion
Today
Tomorrow and future
Weekly work goals
last week
current week
next week
(1) internal approval process for corporate tax and VAT
(2) product proposal to companies
(3) annual contract introduction and price proposal
(4) internal meeting on personnel measures
visit to Gupang and Pradi
internal VAT/corporate tax amount calculation
annual contract guidance
remote work (9:43 AM)
morning
09:00 AM ~ 10:00 AM
Korea Urban Corporation, Korea Productivity (approval process, accounting office call)
sales progress check
10:00 AM ~ 10:30 AM
move (by public transportation)
move to client company
10:30 AM ~ 12:00 PM
Gupang, Ilsaeng-ildae, Pradi (price research, data research)
product price check
meal (Chinese cuisine)
01:00 PM ~ 03:30 PM
Korea Urban Corporation, Korea Productivity (approval process, accounting office call)
sales progress check
03:30 PM ~ 04:00 PM
move (by private car)
04:00 PM ~ 06:00 PM
Incheon High School, Pradi (annual contract proposal, price research)
06:00 PM ~ 08:30 PM

FIG. 4

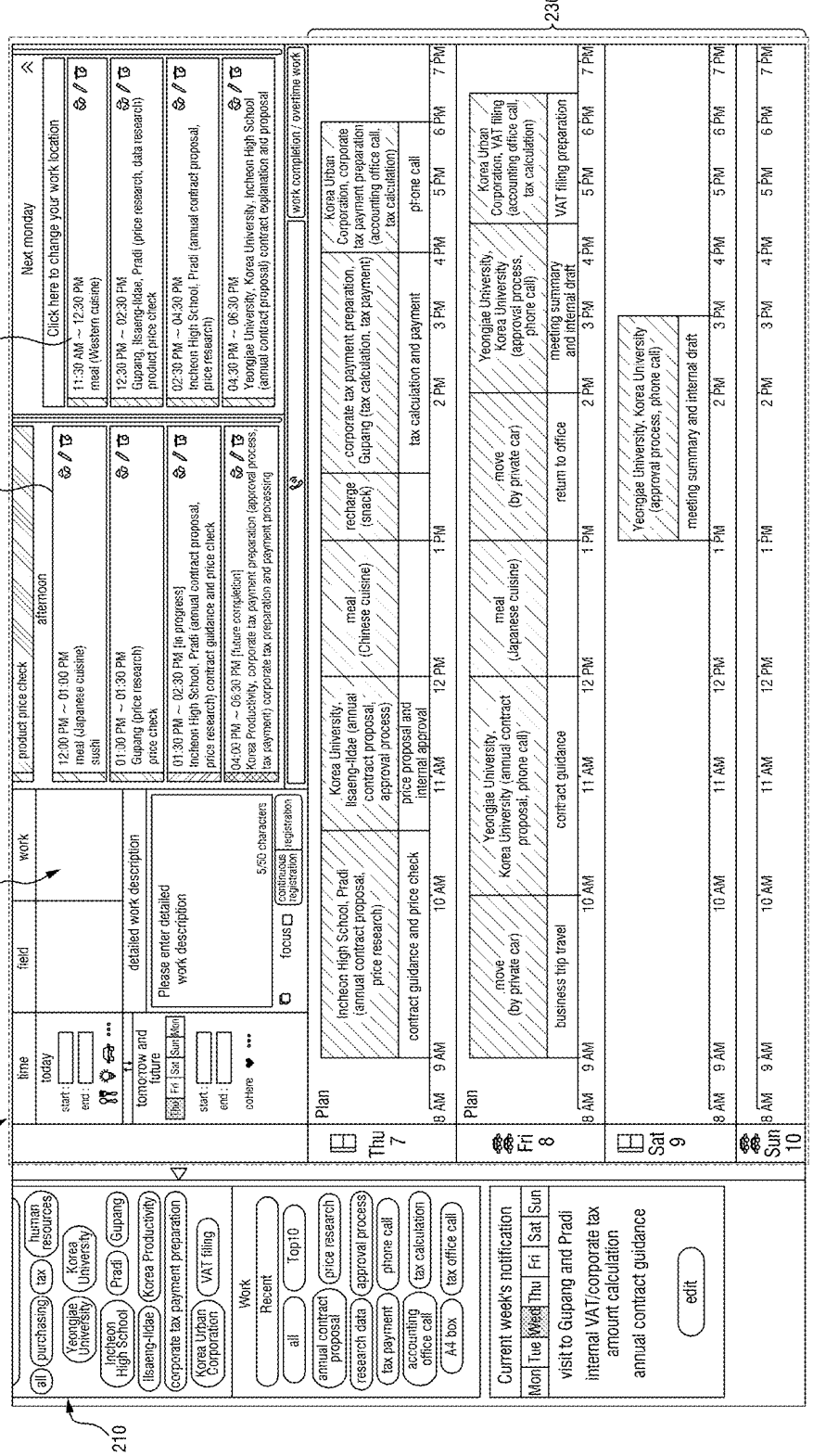

200c
210
215
220
240
240a
240b
230d
time
field
work
today
tomorrow and future
detailed work description
Please enter detailed work description
5/50 characters
focus
continuous registration
registration
product price check
afternoon
Next monday
Click here to change your work location
work completion / overtime work
Plan
Thu 7
Fri 8
Sat 9
Sun 10
8 AM
9 AM
10 AM
11 AM
12 PM
1 PM
2 PM
3 PM
4 PM
5 PM
6 PM
7 PM
all
purchasing
tax
human resources
Yeongjae University
Korea University
Incheon High School
Pradi
Gupang
Ilsaeng-Ildae
Korea Productivity
corporate tax payment preparation
Korea Urban Corporation
VAT filing
Work
Recent
all
Top10
annual contract proposal
price research
research data
approval process
tax payment
phone call
accounting office call
tax calculation
A4 box
tax office call
Current week's notification
Mon
Tue
Wed
Thu
Fri
Sat
Sun
visit to Gupang and Pradi
internal VAT/corporate tax amount calculation
annual contract guidance
edit

FIG. 5a

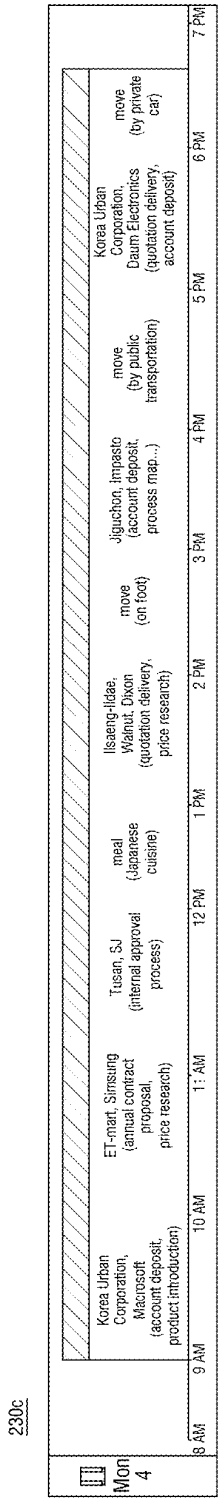

230c
Mon
4
8 AM
9 AM
10 AM
1 AM
12 PM
1 PM
2 PM
3 PM
4 PM
5 PM
6 PM
7 PM
Korea Urban Corporation, Macrosoft (account deposit, product introduction)
ET-mart, Simsung (annual contract proposal, price research)
Tusan, SJ (internal approval process)
meal (Japanese cuisine)
Isaeng-Idae, Walnut, Dixon (quotation delivery, price research)
move (on foot)
Jiguchon, Impasto (account deposit, process map...)
move (by public transportation)
Korea Urban Corporation, Daum Electronics (quotation delivery, account deposit)
move (by private car)

FIG. 5b

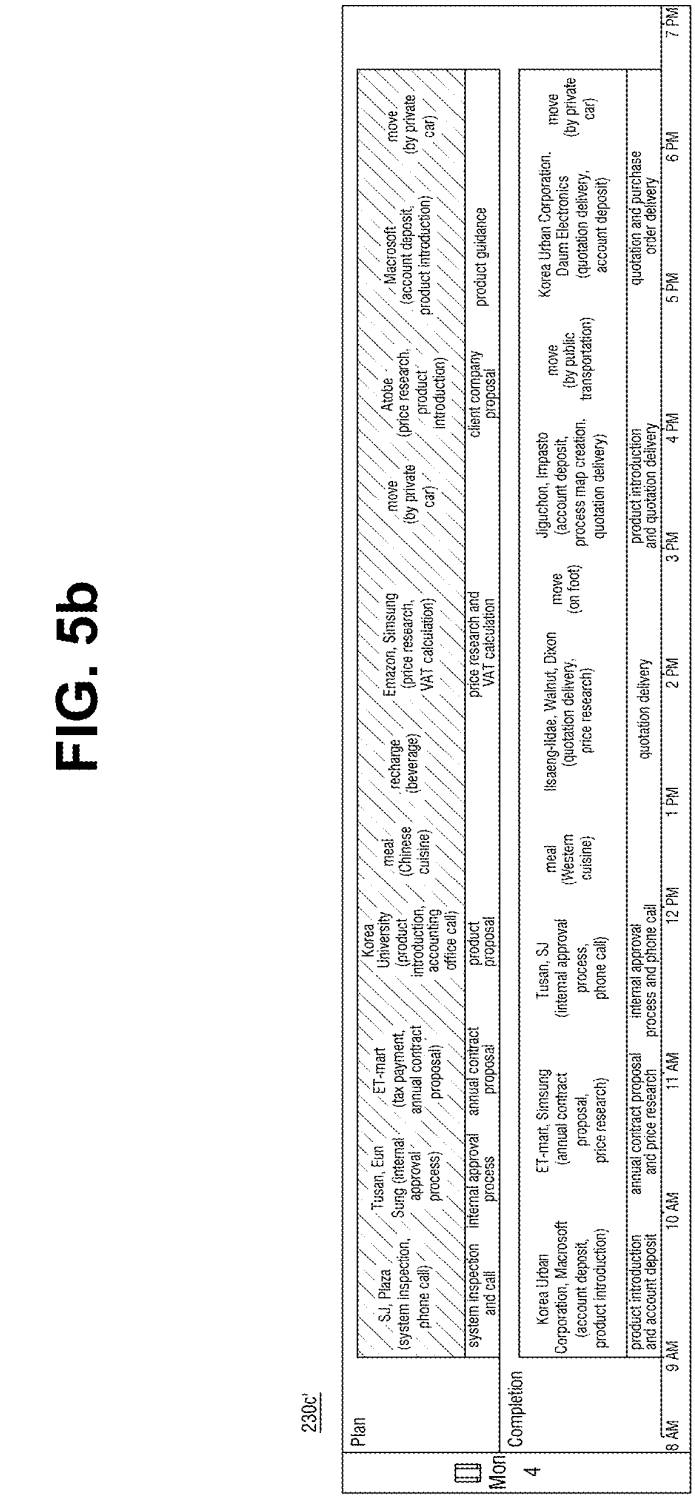

230c'
Plan
Mon
4
Completion
S.I, Plaza (system inspection, phone call)
Tusan, Eun Sung (internal approval process)
ET-mart (tax payment, annual contract proposal)
Korea University (product introduction, accounting office call)
meal (Chinese cuisine)
recharge (beverage)
Emazon, Simsung (price research, VAT calculation)
move (by private car)
Atobe (price research, product introduction)
Macrosoft (account deposit, product introduction)
move (by private car)
system inspection and call
internal approval process
annual contract proposal
product proposal
price research and VAT calculation
client company proposal
product guidance
Korea Urban Corporation, Macrosoft (account deposit, product introduction)
ET-mart, Simsung (annual contract proposal, price research)
Tusan, SJ (internal approval process, phone call)
meal (Western cuisine)
Ilsaeng-Ildae, Walnut, Dixon (quotation delivery, price research)
move (on foot)
Jiguchon, Impasto (account deposit, process map creation, quotation delivery)
move (by public transportation)
Korea Urban Corporation, Daum Electronics (quotation delivery, account deposit)
move (by private car)
product introduction and account deposit
annual contract proposal and price research
internal approval process and phone call
quotation delivery
product introduction and quotation delivery
quotation and purchase order delivery
8 AM
9 AM
10 AM
11 AM
12 PM
1 PM
2 PM
3 PM
4 PM
5 PM
6 PM
7 PM

FIG. 6a

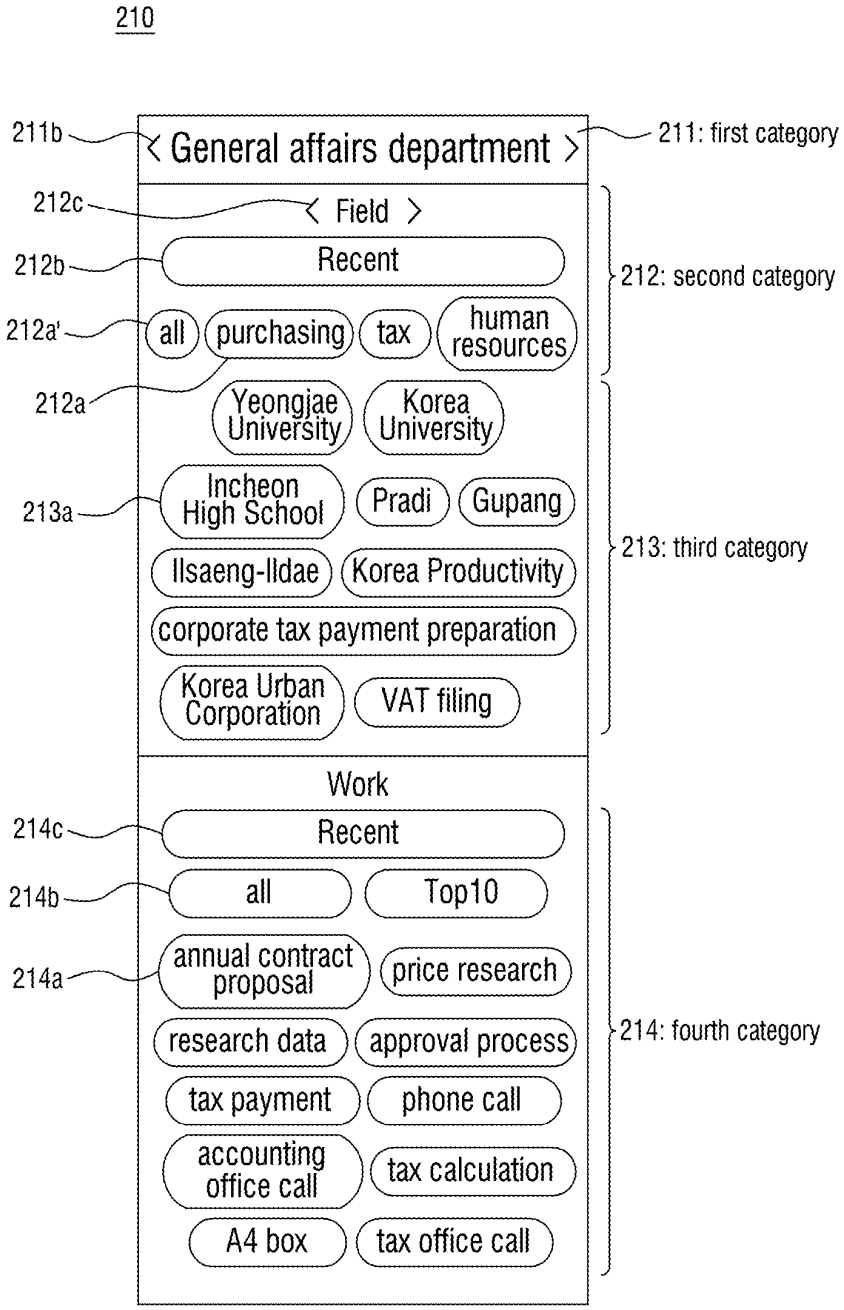

210
211b
< General affairs department >
211: first category
212c
< Field >
212b
Recent
212: second category
212a'
all
purchasing
tax
human resources
212a
Yeongjae University
Korea University
213a
Incheon High School
Pradi
Gupang
Ilsaeng-Ildae
Korea Productivity
corporate tax payment preparation
Korea Urban Corporation
VAT filing
213: third category
Work
214c
Recent
214b
all
Top10
214a
annual contract proposal
price research
research data
approval process
tax payment
phone call
accounting office call
tax calculation
A4 box
tax office call
214: fourth category

FIG. 6b

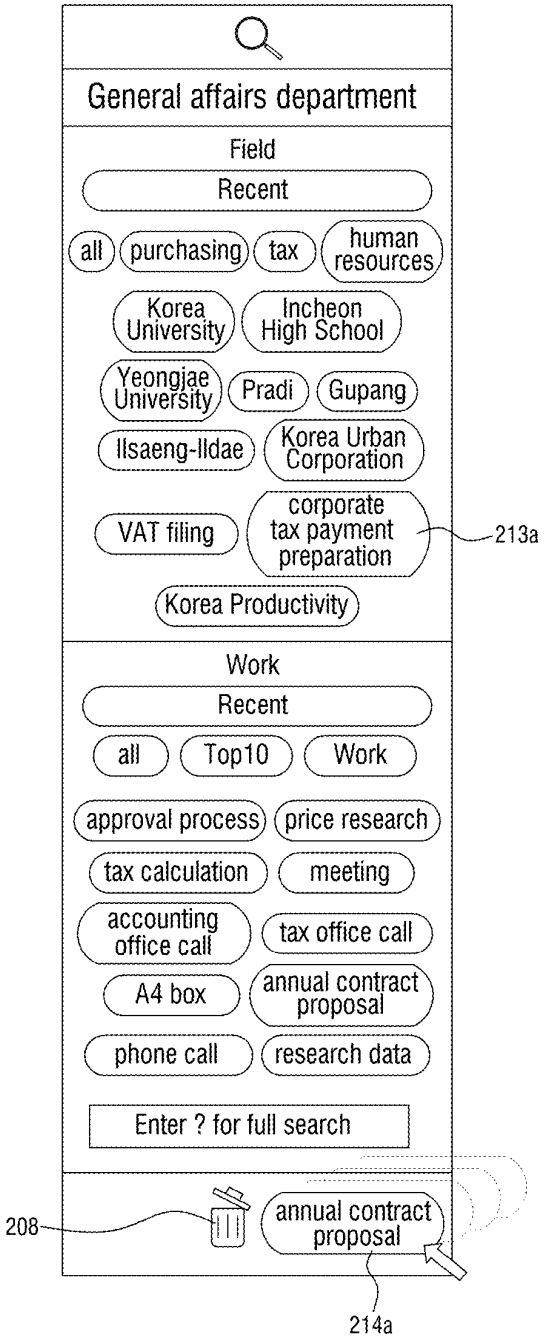

General affairs department
Field
Recent
all
purchasing
tax
human resources
Korea University
Incheon High School
Yeongjae University
Pradi
Gupang
Ilsaeng-Ildae
Korea Urban Corporation
VAT filing
corporate tax payment preparation
213a
Korea Productivity
Work
Recent
all
Top10
Work
approval process
price research
tax calculation
meeting
accounting office call
tax office call
A4 box
annual contract proposal
phone call
research data
Enter ? for full search
208
annual contract proposal
214a

FIG. 6c

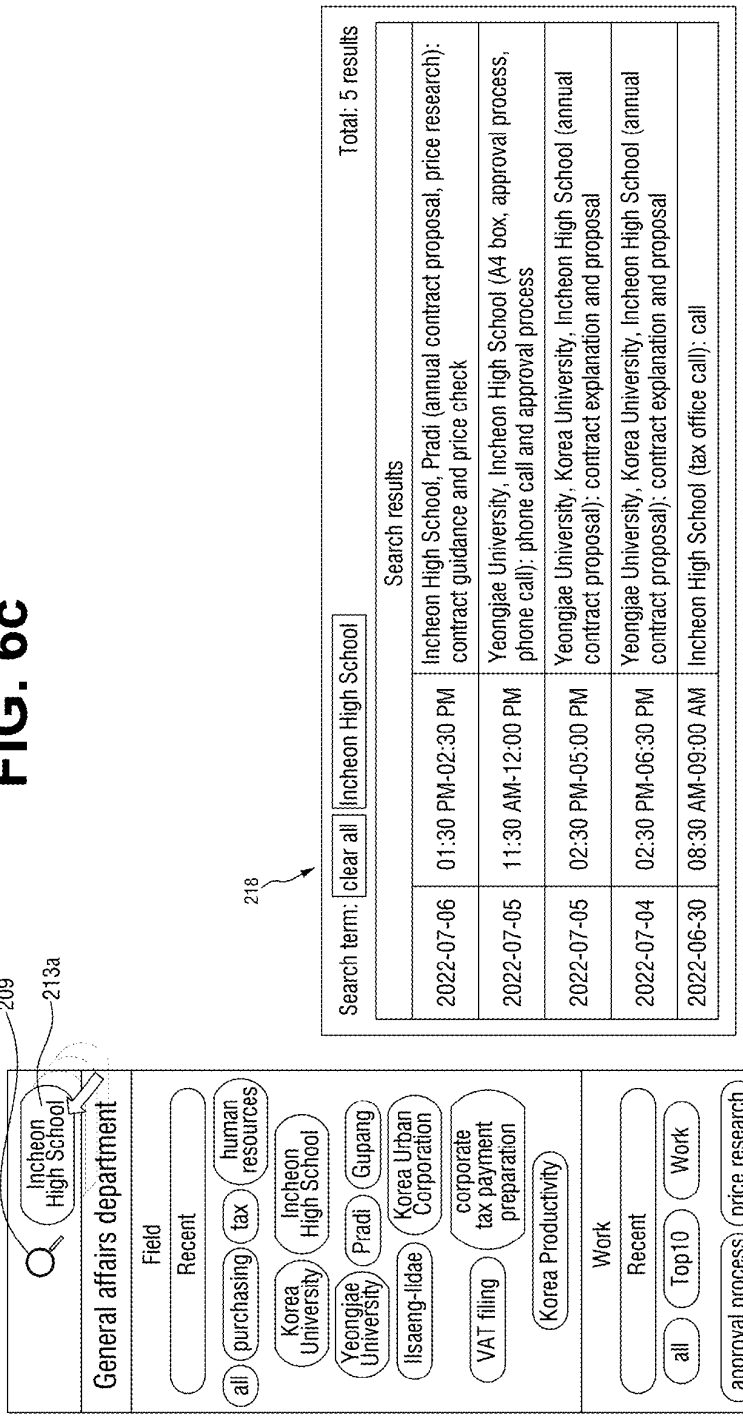

209
213a
Incheon High School
General affairs department
Field
Recent
all
purchasing
tax
human resources
Korea University
Incheon High School
Yeongjae University
Pradi
Gupang
Ilsaeng-Ildae
Korea Urban Corporation
VAT filing
corporate tax payment preparation
Korea Productivity
Work
Recent
all
Top10
Work
approval process
price research
tax calculation
meeting
accounting office call
tax office call
A4 box
annual contract proposal
phone call
research data
218
Search term: clear all Incheon High School
Total: 5 results
Search results
2022-07-06 01:30 PM-02:30 PM Incheon High School, Pradi (annual contract proposal, price research): contract guidance and price check
2022-07-05 11:30 AM-12:00 PM Yeongjae University, Incheon High School (A4 box, approval process, phone call): phone call and approval process
2022-07-05 02:30 PM-05:00 PM Yeongjae University, Korea University, Incheon High School (annual contract proposal): contract explanation and proposal
2022-07-04 02:30 PM-06:30 PM Yeongjae University, Korea University, Incheon High School (annual contract proposal): contract explanation and proposal
2022-06-30 08:30 AM-09:00 AM Incheon High School (tax office call): call

FIG. 7a

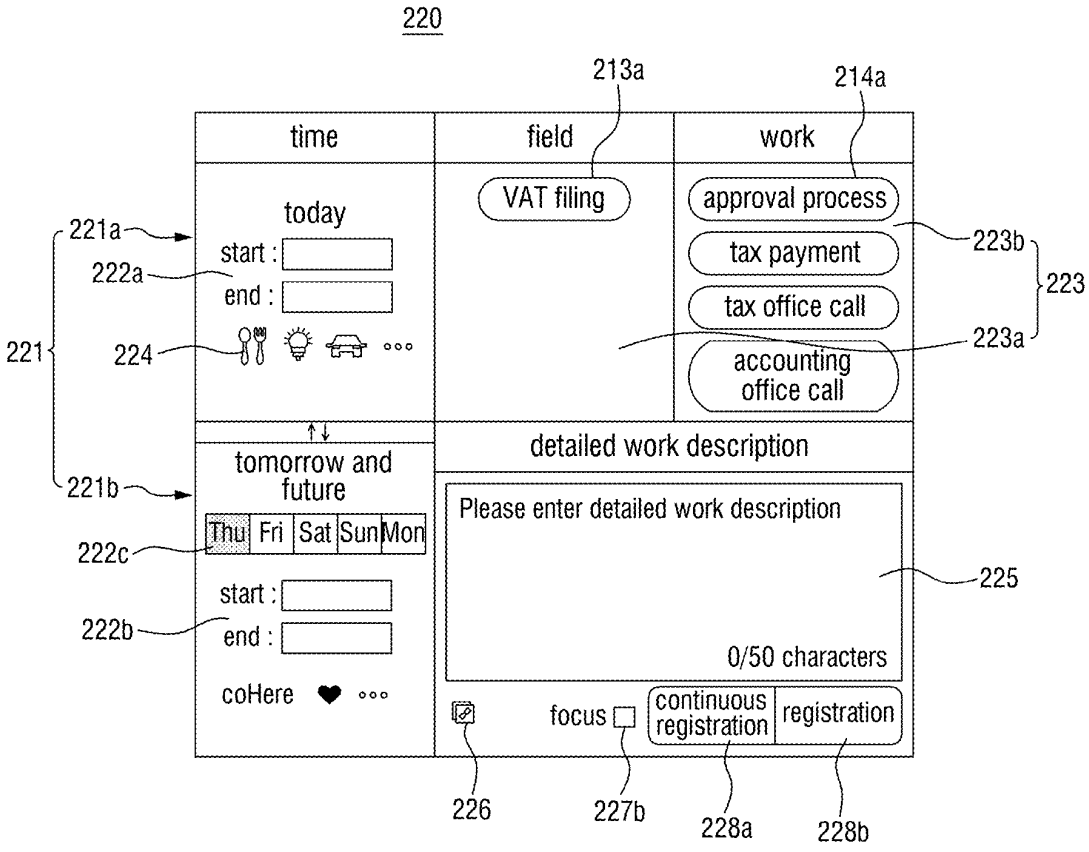

220
213a
214a
time
field
work
today
VAT filing
approval process
tax payment
tax office call
accounting office call
221a
222a
start :
end :
221
224
223b
223
223a
tomorrow and future
detailed work description
Please enter detailed work description
0/50 characters
221b
Thu
Fri
Sat
Sun
Mon
222c
start :
222b
end :
coHere
225
focus
continuous registration
registration
226
227b
228a
228b

FIG. 7b

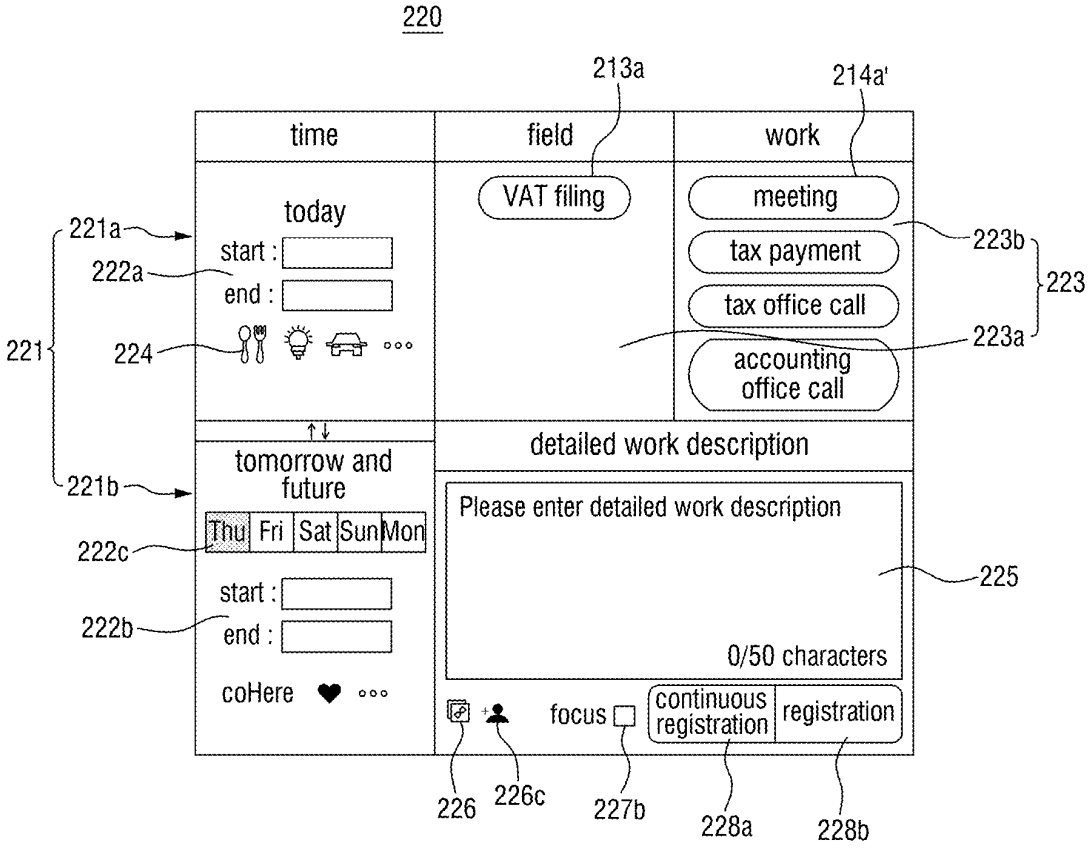

220
213a
214a'
time
field
work
today
VAT filing
meeting
tax payment
tax office call
accounting office call
start :
end :
221a
222a
221
224
223b
223
223a
tomorrow and future
detailed work description
Please enter detailed work description
0/50 characters
Thu
Fri
Sat
Sun
Mon
221b
222c
222b
coHere
focus
continuous registration
registration
225
226
226c
227b
228a
228b

FIG. 7c

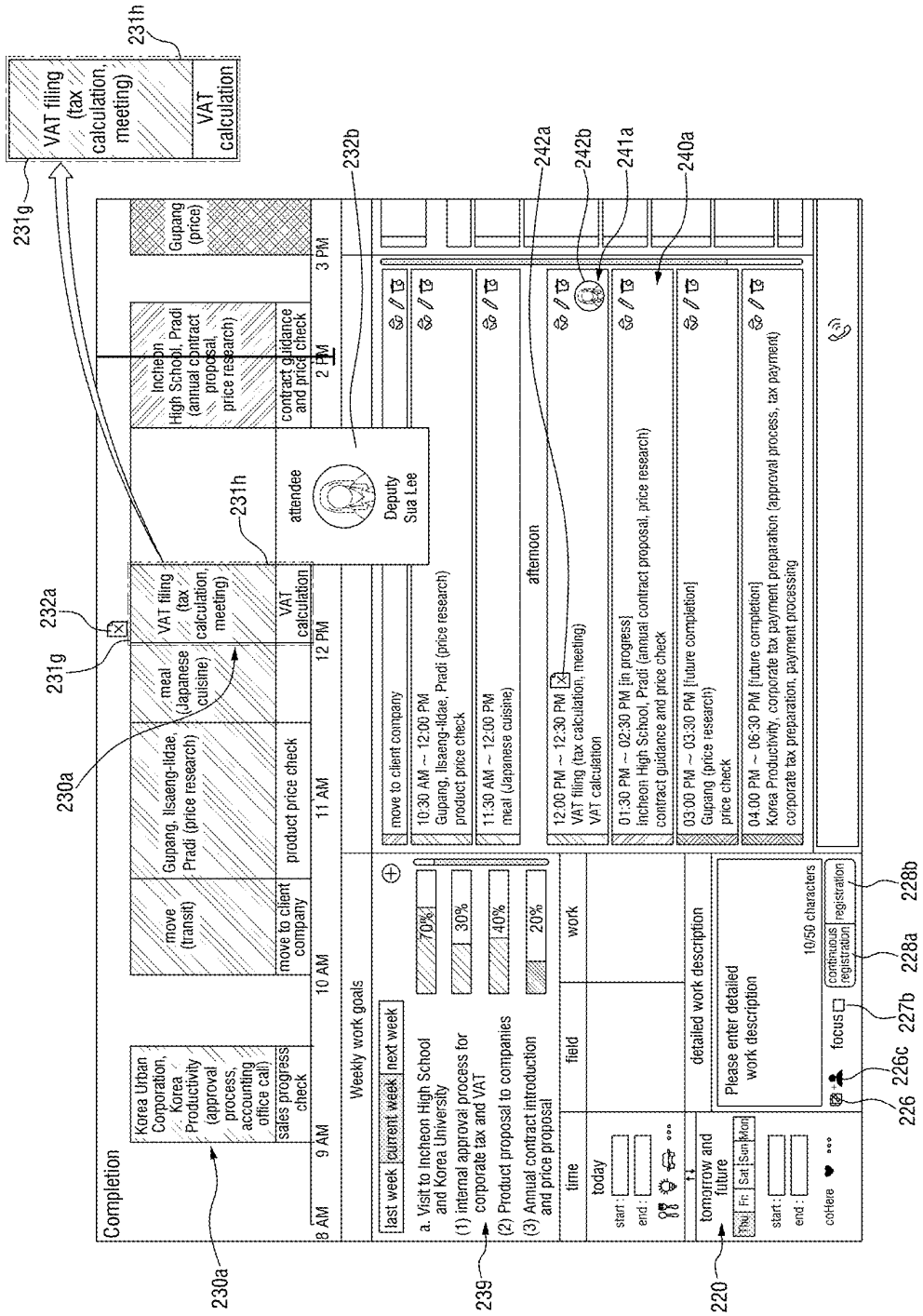

231h
VAT filing (tax calculation, meeting)
VAT calculation
231g
232a
230a
232b
242a
242b
241a
240a
Completion
Korea Urban Corporation, Korea Productivity (approval process, accounting office call)
sales progress check
move (transit)
Gupang, Ilsaeng-Ildae, Pradi (price research)
meal (Japanese cuisine)
move to client company
product price check
VAT filing (tax calculation, meeting)
VAT calculation
attendee
Deputy Sua Lee
Incheon High School, Pradi (annual contract proposal, price research)
contract guidance and price check
Gupang (price)
8 AM
9 AM
10 AM
11 AM
12 PM
2 PM
3 PM
Weekly work goals
last week
current week
next week
a. Visit to Incheon High School and Korea University
(1) internal approval process for corporate tax and VAT
(2) Product proposal to companies
(3) Annual contract introduction and price proposal
70%
30%
40%
20%
time
field
work
today
start :
end :
tomorrow and future
Thu
Fri
Sat
Sun
Mon
detailed work description
Please enter detailed work description
10/50 characters
continuous registration
registration
focus
coHere
move to client company
10:30 AM ~ 12:00 PM
Gupang, Ilsaeng-Ildae, Pradi (price research)
product price check
11:30 AM ~ 12:00 PM
meal (Japanese cuisine)
afternoon
12:00 PM ~ 12:30 PM
VAT filing (tax calculation, meeting)
VAT calculation
01:30 PM ~ 02:30 PM [in progress]
Incheon High School, Pradi (annual contract proposal, price research)
contract guidance and price check
03:00 PM ~ 03:30 PM [future completion]
Gupang (price research)
price check
04:00 PM ~ 06:30 PM [future completion]
Korea Productivity, corporate tax payment preparation (approval process, tax payment)
corporate tax preparation, payment processing
230a
239
220
226
226c
227b
228a
228b

FIG. 8

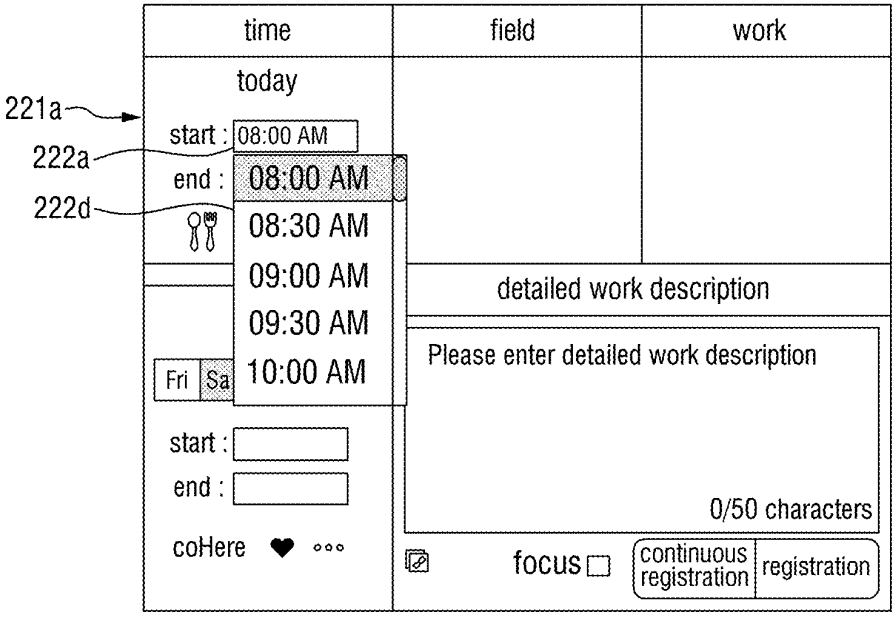

time
field
work
today
221a
start : 08:00 AM
222a
end : 08:00 AM
222d
08:30 AM
09:00 AM
09:30 AM
10:00 AM
Fri
Sa
start :
end :
coHere
detailed work description
Please enter detailed work description
0/50 characters
focus
continuous registration
registration

FIG. 9a

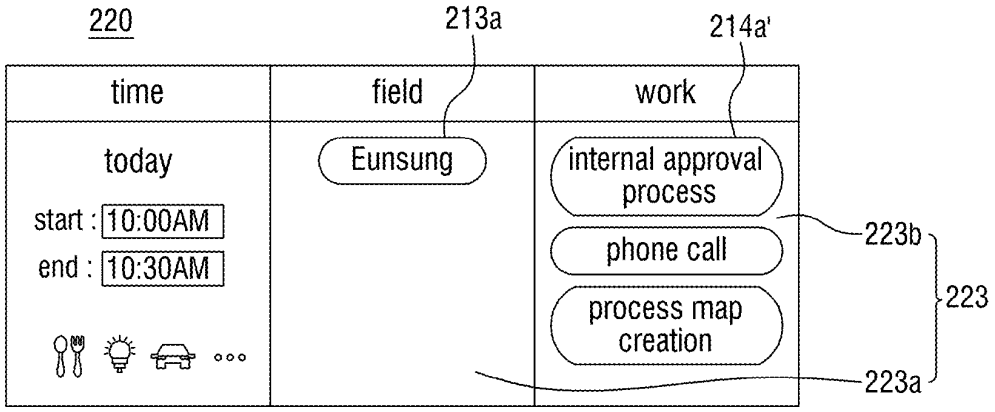

220
213a
214a'
time
field
work
today
start : 10:00AM
end : 10:30AM
Eunsung
internal approval process
phone call
process map creation
223b
223
223a

FIG. 9b

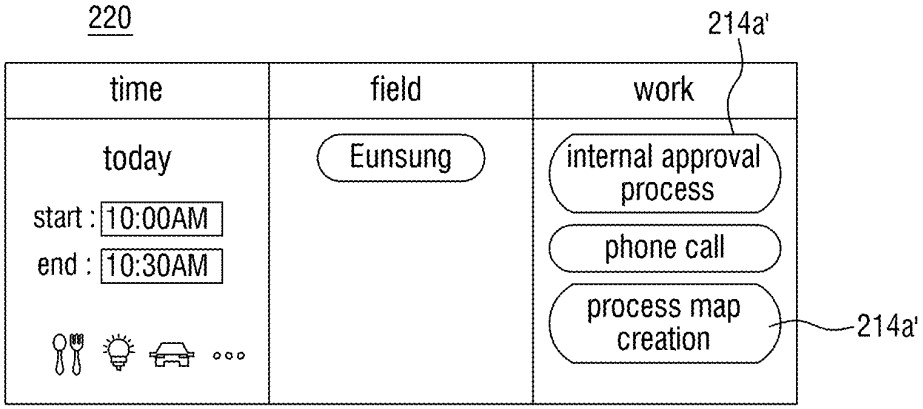

220
214a'
time
field
work
today
start : 10:00AM
end : 10:30AM
Eunsung
internal approval process
phone call
process map creation
214a'

FIG. 9c


10:30 AM ~ 10:30 PM
Eunsung (process map creation)
product introduction and quotation delivery
241

FIG. 9d

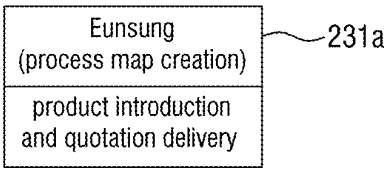

Eunsung
(process map creation)
product introduction
and quotation delivery
231a

FIG. 10a

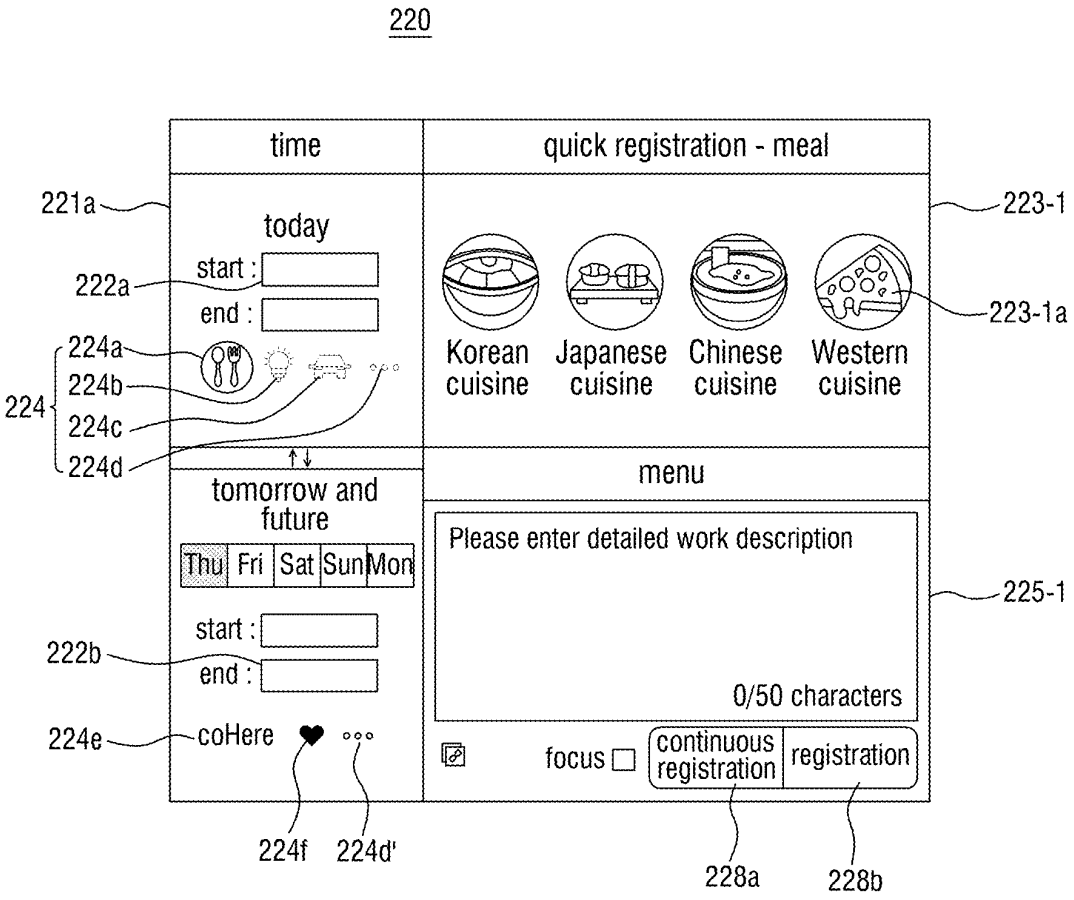

220
time
quick registration - meal
221a
today
start :
222a
end :
224a
224b
224
224c
224d
Korean cuisine
Japanese cuisine
Chinese cuisine
Western cuisine
223-1
223-1a
menu
tomorrow and future
Thu
Fri
Sat
Sun
Mon
Please enter detailed work description
225-1
0/50 characters
start :
222b
end :
224e
coHere
focus
continuous registration
registration
224f
224d'
228a
228b

FIG. 10b

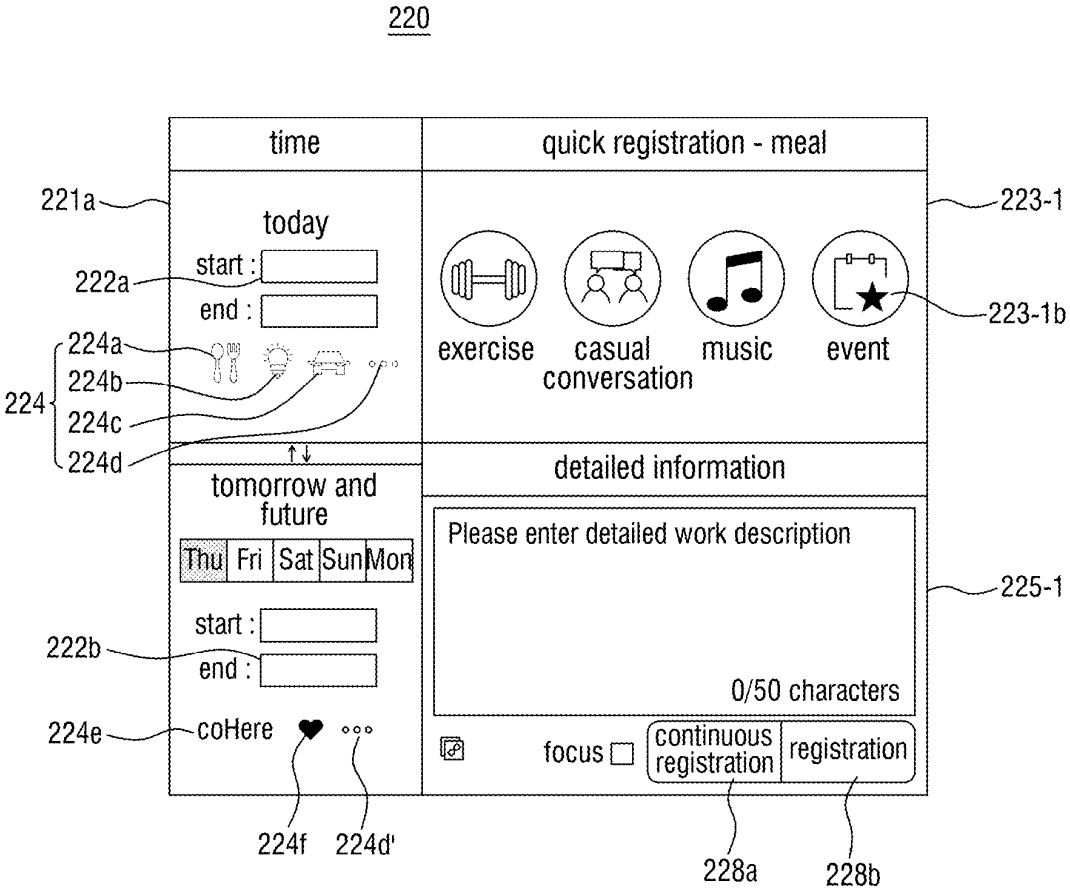

220
time
quick registration - meal
221a
today
start :
222a
end :
224a
224b
224c
224d
224
exercise
casual conversation
music
event
223-1
223-1b
detailed information
tomorrow and future
Thu
Fri
Sat
Sun
Mon
Please enter detailed work description
225-1
0/50 characters
start :
222b
end :
224e
coHere
focus
continuous registration
registration
224f
224d'
228a
228b

FIG. 11

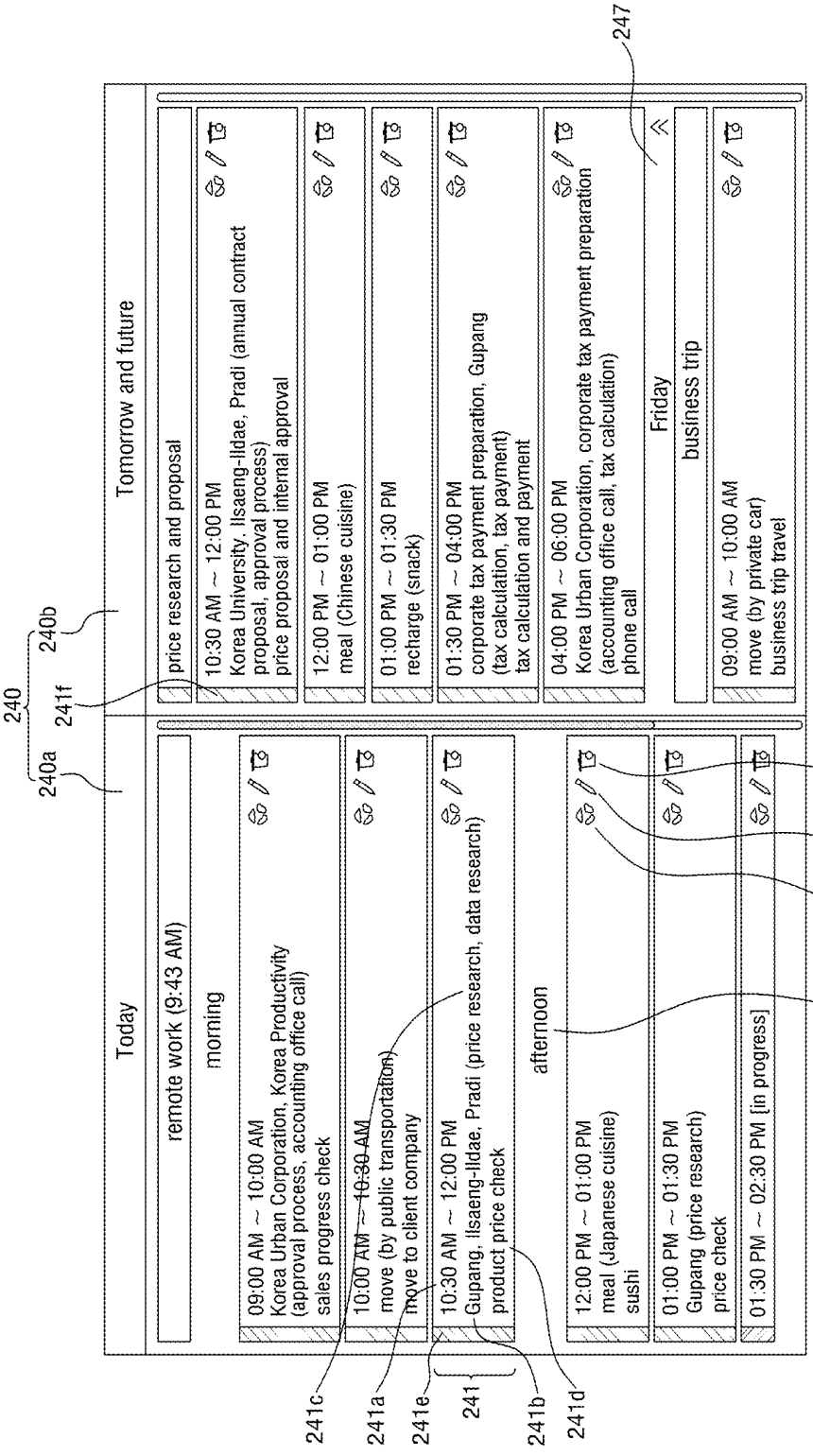

240
240a
240b
241f
Today
Tomorrow and future
remote work (9:43 AM)
morning
09:00 AM ~ 10:00 AM
Korea Urban Corporation, Korea Productivity
(approval process, accounting office call)
sales progress check
10:00 AM ~ 10:30 AM
move (by public transportation)
move to client company
10:30 AM ~ 12:00 PM
Gupang, Ilsaeng-Ildae, Pradi (price research, data research)
product price check
afternoon
12:00 PM ~ 01:00 PM
meal (Japanese cuisine)
sushi
01:00 PM ~ 01:30 PM
Gupang (price research)
price check
01:30 PM ~ 02:30 PM [in progress]
price research and proposal
10:30 AM ~ 12:00 PM
Korea University, Ilsaeng-Ildae, Pradi (annual contract
proposal, approval process)
price proposal and internal approval
12:00 PM ~ 01:00 PM
meal (Chinese cuisine)
01:00 PM ~ 01:30 PM
recharge (snack)
01:30 PM ~ 04:00 PM
corporate tax payment preparation, Gupang
(tax calculation, tax payment)
tax calculation and payment
04:00 PM ~ 06:00 PM
Korea Urban Corporation, corporate tax payment preparation
(accounting office call, tax calculation)
phone call
Friday
business trip
09:00 AM ~ 10:00 AM
move (by private car)
business trip travel
247
241c
241a
241e
241
241b
241d
243
244
245
246

FIG. 12

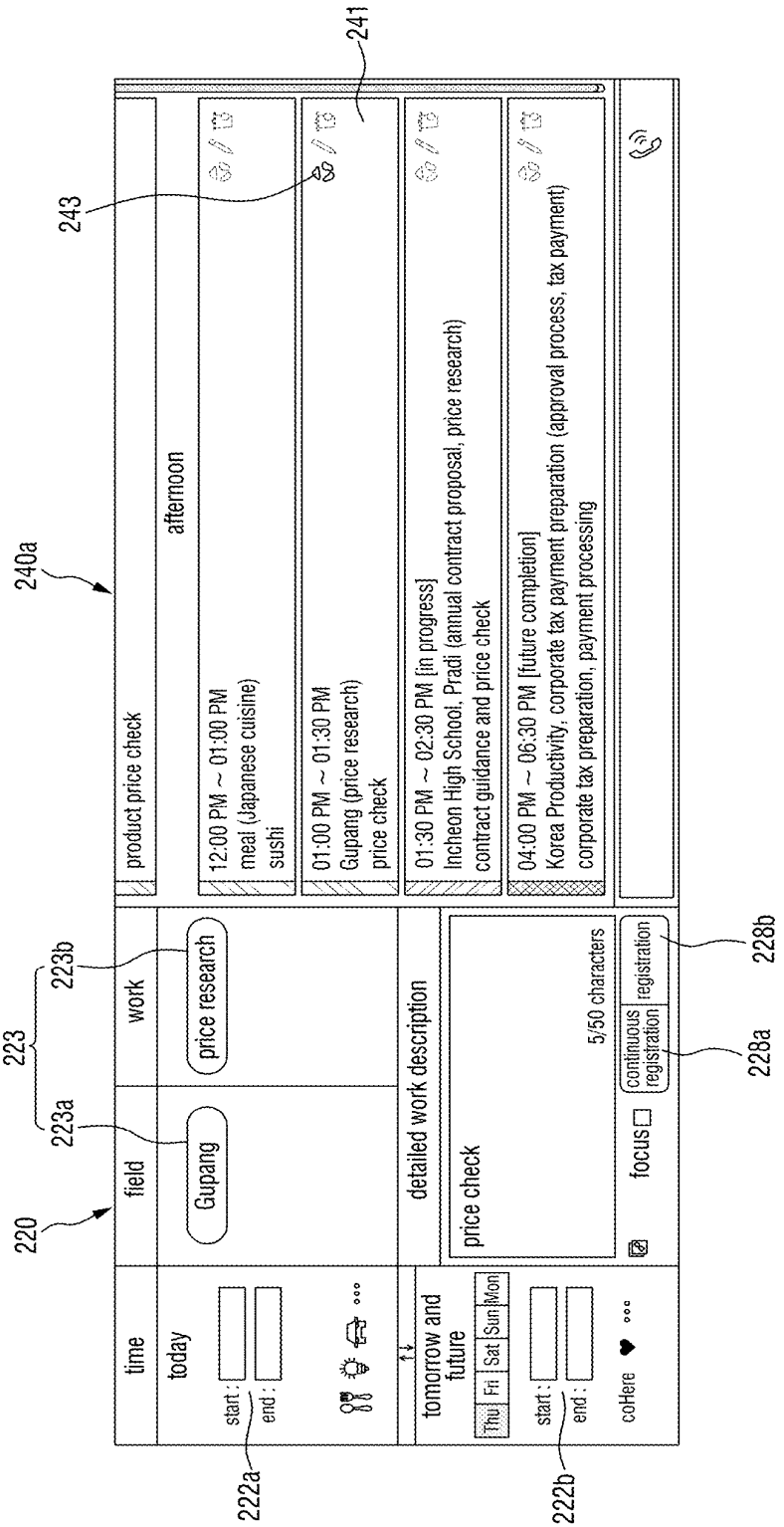

240a
241
243
220
223
223a
223b
222a
222b
228a
228b
time
field
work
today
start :
end :
Gupang
price research
detailed work description
tomorrow and future
Thu
Fri
Sat
Sun
Mon
price check
5/50 characters
continuous registration
registration
coHere
focus
product price check
afternoon
12:00 PM ~ 01:00 PM
meal (Japanese cuisine)
sushi
01:00 PM ~ 01:30 PM
Gupang (price research)
price check
01:30 PM ~ 02:30 PM [in progress]
Incheon High School, Pradi (annual contract proposal, price research)
contract guidance and price check
04:00 PM ~ 06:30 PM [future completion]
Korea Productivity, corporate tax payment preparation (approval process, tax payment)
corporate tax preparation, payment processing

FIG. 13

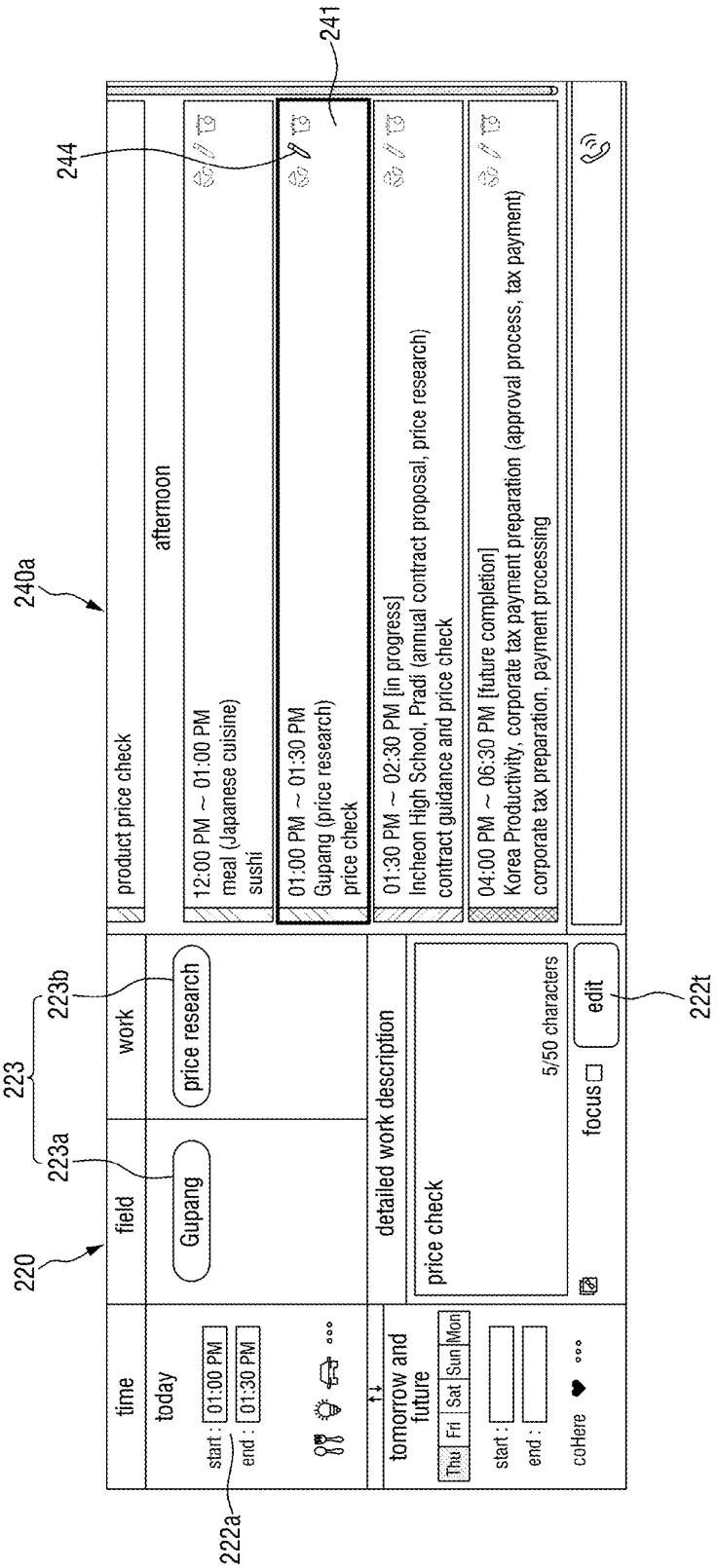

240a
241
244
220
223
223a
223b
222a
222t
time
field
work
today
start : 01:00 PM
end : 01:30 PM
Gupang
price research
tomorrow and future
Thu | Fri | Sat | Sun | Mon
start :
end :
coHere
detailed work description
price check
5/50 characters
focus
edit
product price check
afternoon
12:00 PM ~ 01:00 PM
meal (Japanese cuisine)
sushi
01:00 PM ~ 01:30 PM
Gupang (price research)
price check
01:30 PM ~ 02:30 PM [in progress]
Incheon High School, Pradi (annual contract proposal, price research)
contract guidance and price check
04:00 PM ~ 06:30 PM [future completion]
Korea Productivity, corporate tax payment preparation (approval process, tax payment)
corporate tax preparation, payment processing

FIG. 14

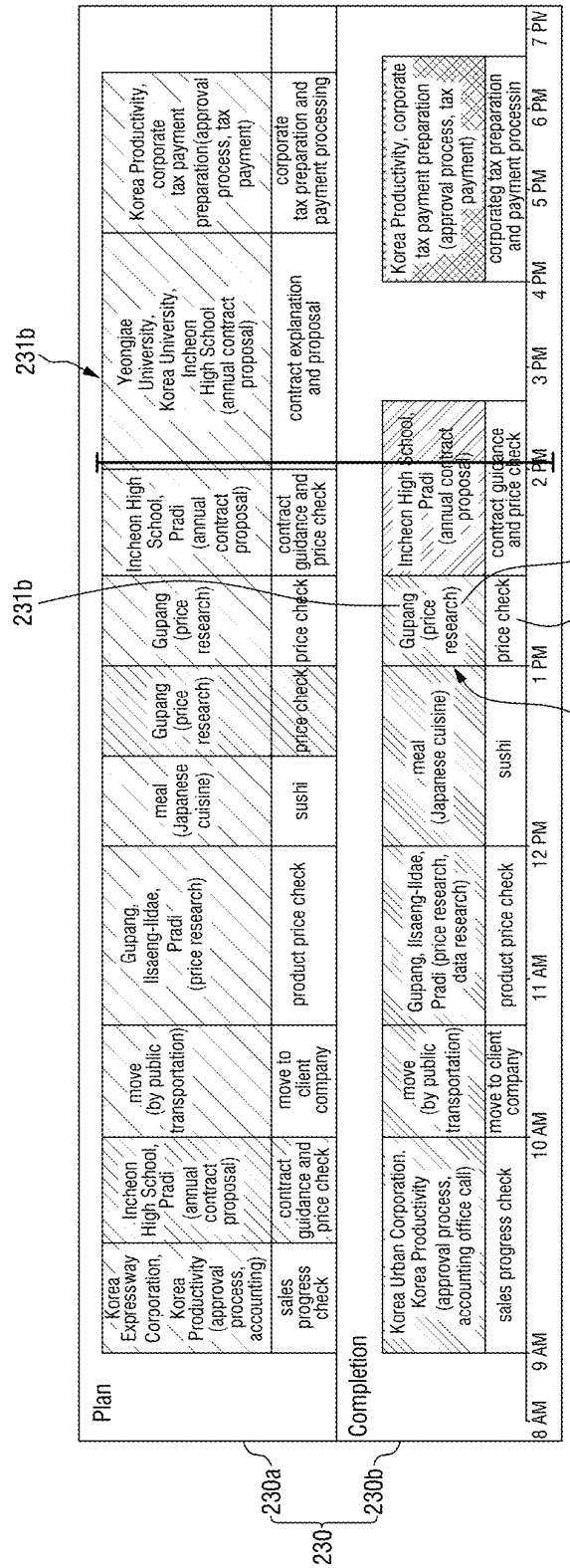

230
230a
230b
Plan
Completion
8 AM
9 AM
10 AM
11 AM
12 PM
1 PM
2 PM
3 PM
4 PM
5 PM
6 PM
7 PM
Korea Expressway Corporation, Korea Productivity (approval process, accounting)
Incheon High School, Pradi (annual contract proposal)
move (by public transportation)
Gupang, Iisaeng-Iidae, Pradi (price research)
meal (Japanese cuisine)
Gupang (price research)
Gupang (price research)
Incheon High School, Pradi (annual contract proposal)
Yeongjae University, Korea University, Incheon High School (annual contract proposal)
Korea Productivity, corporate tax payment preparation(approval process, tax payment)
sales progress check
contract guidance and price check
move to client company
product price check
sushi
price check
price check
contract guidance and price check
contract explanation and proposal
corporate tax preparation and payment processing
Korea Urban Corporation, Korea Productivity (approval process, accounting office call)
move (by public transportation)
Gupang, Iisaeng-Iidae, Pradi (price research, data research)
meal (Japanese cuisine)
Gupang (price research)
Incheon High School, Pradi (annual contract proposal)
Korea Productivity, corporate tax payment preparation (approval process, tax payment)
sales progress check
move to client company
product price check
sushi
price check
contract guidance and price check
corporateg tax preparation and payment processin
231a
231b
231b
231c
231d

FIG. 15

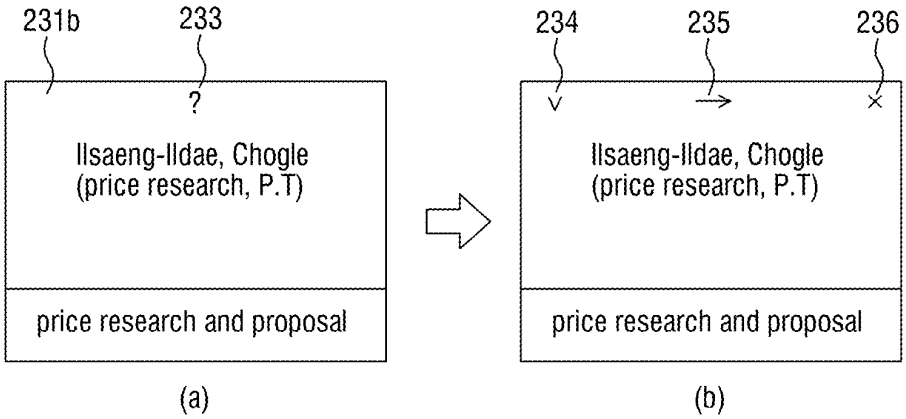

231b
233
?
Ilsaeng-Ildae, Chogle
(price research, P.T)
price research and proposal
(a)
234
235
236
Ilsaeng-Ildae, Chogle
(price research, P.T)
price research and proposal
(b)

FIG. 16a

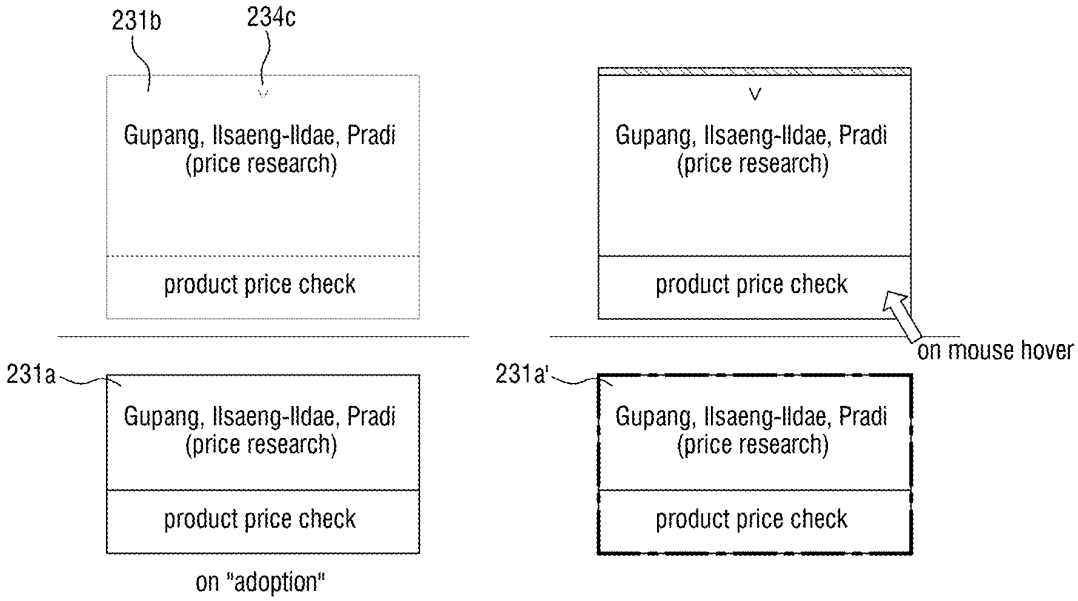

231b
234c
Gupang, Ilsaeng-Ildae, Pradi
(price research)
product price check
231a
Gupang, Ilsaeng-Ildae, Pradi
(price research)
product price check
on "adoption"
Gupang, Ilsaeng-Ildae, Pradi
(price research)
product price check
on mouse hover
231a'
Gupang, Ilsaeng-Ildae, Pradi
(price research)
product price check

FIG. 16b

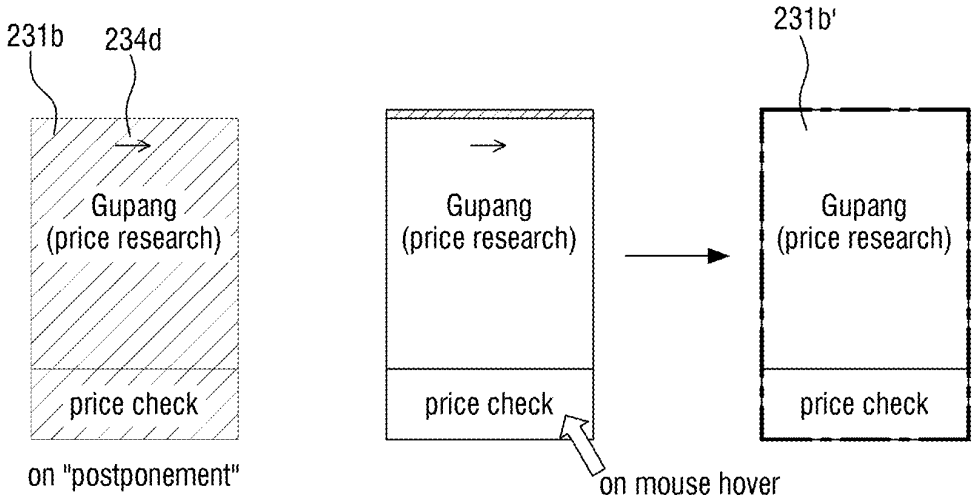

231b
234d
Gupang
(price research)
price check
on "postponement"
231b'
Gupang
(price research)
price check
Gupang
(price research)
price check
on mouse hover

FIG. 16c

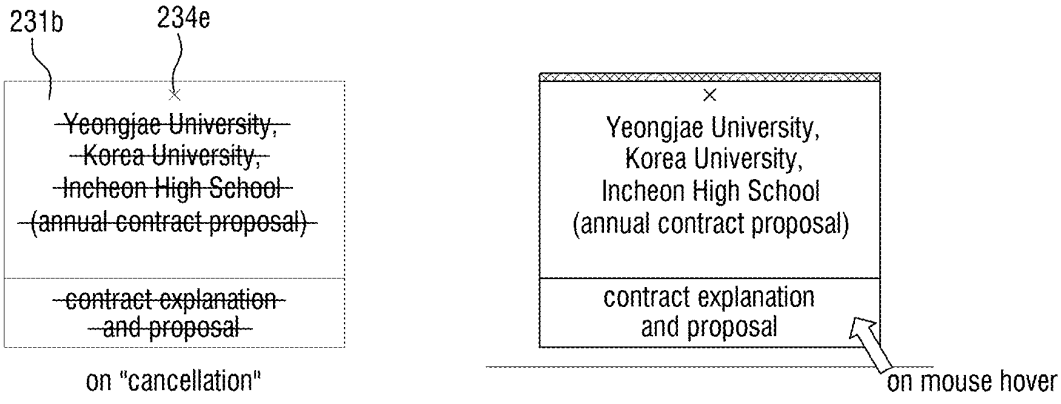

231b
234e
~~Yeongjae University,~~
~~Korea University,~~
~~Incheon High School~~
~~(annual contract proposal)~~
~~contract explanation~~
~~and proposal~~
on "cancellation"
Yeongjae University,
Korea University,
Incheon High School
(annual contract proposal)
contract explanation
and proposal
on mouse hover

FIG. 17a

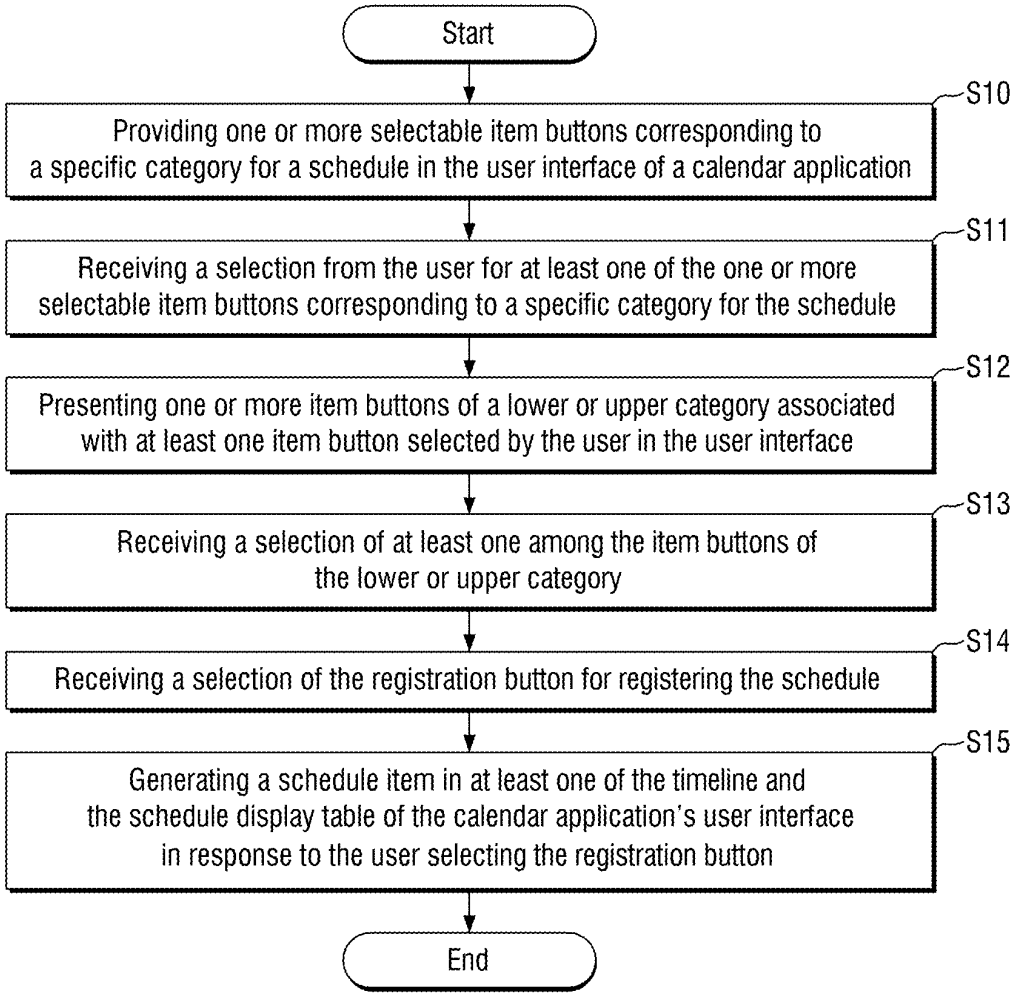

Start
Providing one or more selectable item buttons corresponding to a specific category for a schedule in the user interface of a calendar application
S10
Receiving a selection from the user for at least one of the one or more selectable item buttons corresponding to a specific category for the schedule
S11
Presenting one or more item buttons of a lower or upper category associated with at least one item button selected by the user in the user interface
S12
Receiving a selection of at least one among the item buttons of the lower or upper category
S13
Receiving a selection of the registration button for registering the schedule
S14
Generating a schedule item in at least one of the timeline and the schedule display table of the calendar application's user interface in response to the user selecting the registration button
S15
End

FIG. 17b

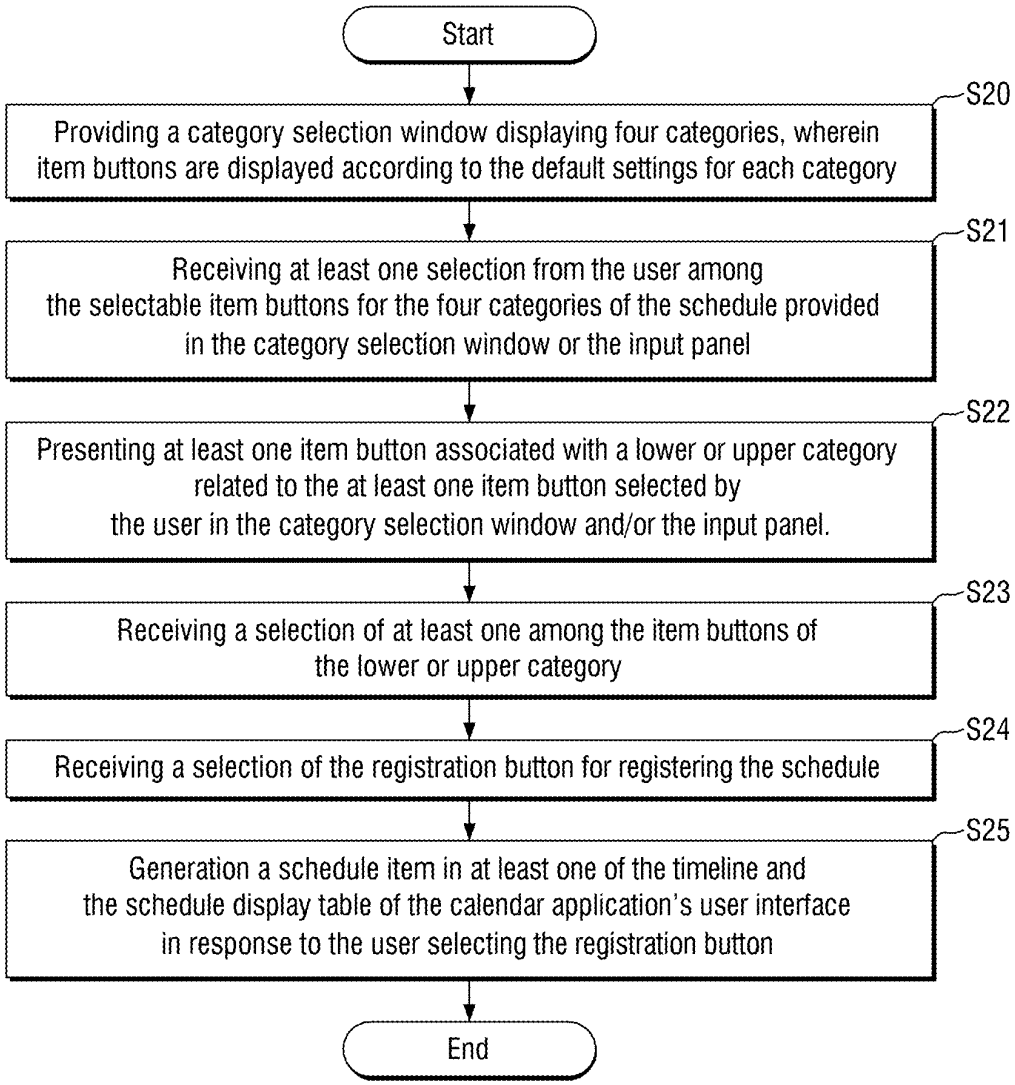

Start
S20
Providing a category selection window displaying four categories, wherein item buttons are displayed according to the default settings for each category
S21
Receiving at least one selection from the user among the selectable item buttons for the four categories of the schedule provided in the category selection window or the input panel
S22
Presenting at least one item button associated with a lower or upper category related to the at least one item button selected by the user in the category selection window and/or the input panel.
S23
Receiving a selection of at least one among the item buttons of the lower or upper category
S24
Receiving a selection of the registration button for registering the schedule
S25
Generation a schedule item in at least one of the timeline and the schedule display table of the calendar application's user interface in response to the user selecting the registration button
End

FIG. 18

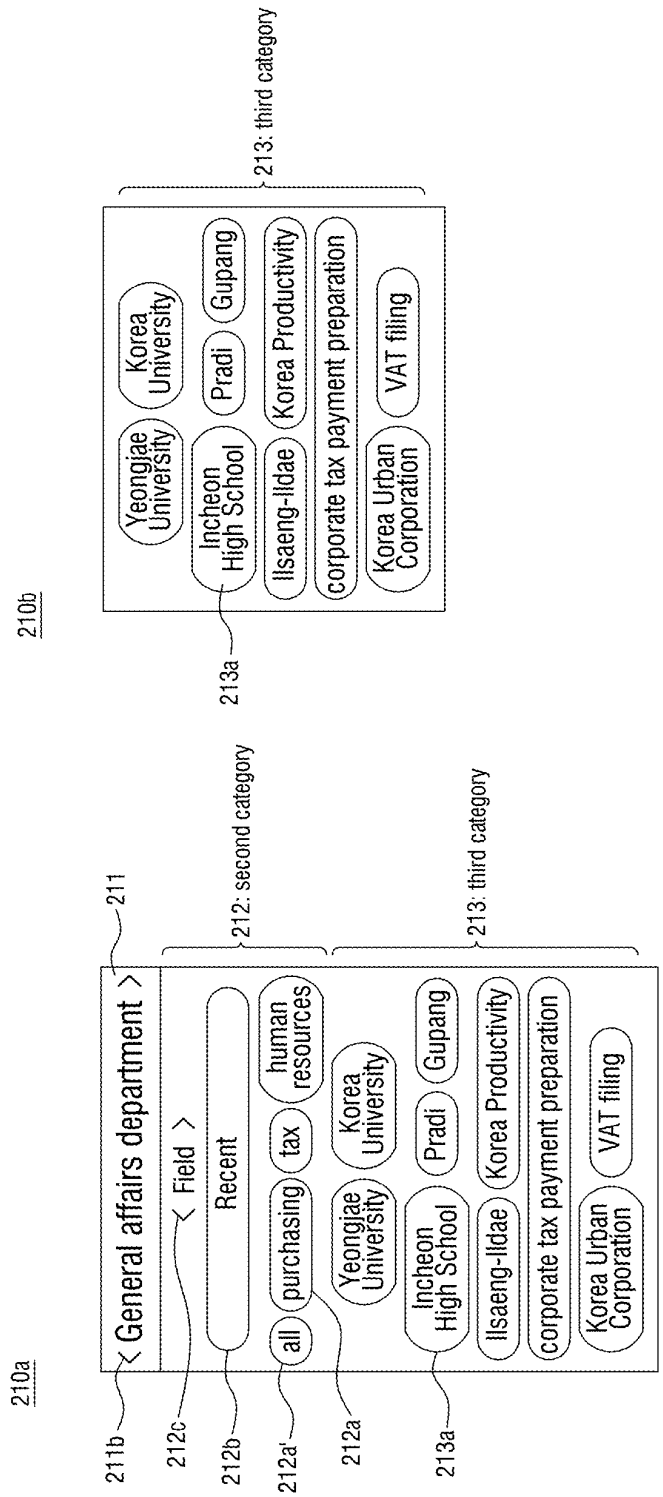

210a
211
211b
< General affairs department >
212c
< Field >
212b
Recent
212a'
all
purchasing
tax
human resources
212a
Yeongjae University
Korea University
213a
Incheon High School
Pradi
Gupang
Ilsaeng-Ildae
Korea Productivity
corporate tax payment preparation
Korea Urban Corporation
VAT filing
212: second category
213: third category
210b
213a
Yeongjae University
Korea University
Incheon High School
Pradi
Gupang
Ilsaeng-Ildae
Korea Productivity
corporate tax payment preparation
Korea Urban Corporation
VAT filing
213: third category

FIG. 19

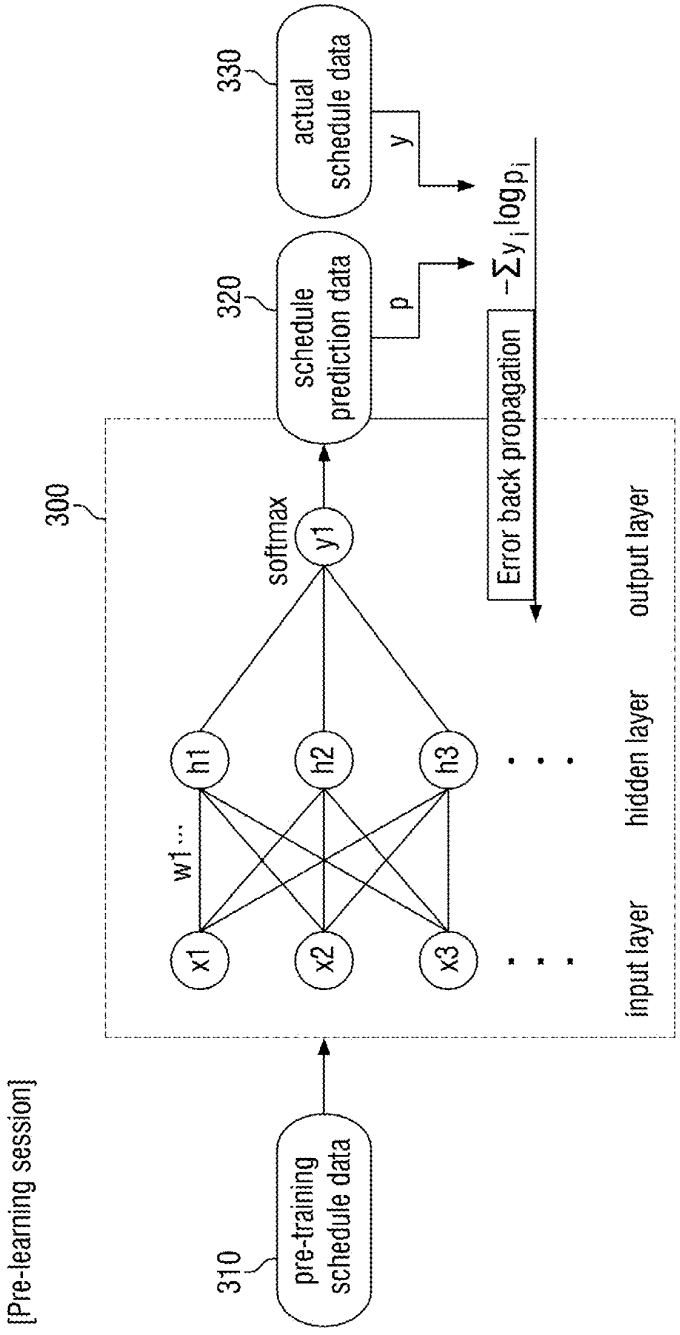
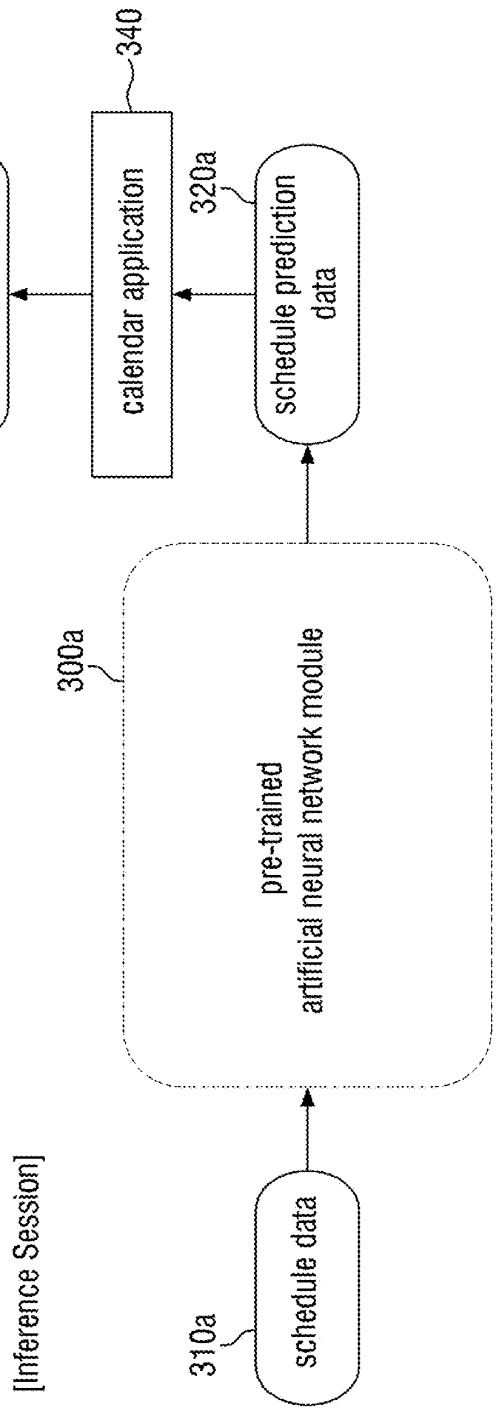

[Pre-learning session]
310
pre-training schedule data
300
input layer
hidden layer
output layer
x1
x2
x3
w1...
h1
h2
h3
softmax
y1
320
schedule prediction data
p
330
actual schedule data
y
Error back propagation
$-\sum y_i \log p_i$

FIG. 20


[Inference Session]
310a
schedule data
300a
pre-trained
artificial neural network module
320a
schedule prediction
data
340
calendar application
recommended item
button selection

METHOD FOR INPUTTING CATEGORIZED SCHEDULE BY USING CALENDAR APPLICATION

TECHNICAL FIELD

[0001] The present disclosure relates to a method of inputting categorized schedules using a calendar application, and more specifically, to a method that enables a user to input schedules by categorizing them, thereby allowing the user to systematically manage their schedules and enabling the generation of meaningful statistical data regarding the schedules.

BACKGROUND ART

[0002] The use of calendar applications on various user devices, such as personal computers (PCs), laptops, tablets, mobile phones, and wearable devices, has become widespread. These calendar applications initially only had functions, such as simply displaying a calendar and allowing users to input simple schedules. However, they have gradually evolved to include various features that enhance the user experience. However, the majority of users of conventional calendar applications often do not fully utilize or are unable to utilize most of the various features offered. In most cases, they use calendar applications merely for sporadically recording a few schedules and setting reminders.

SUMMARY OF INVENTION

Technical Problem

[0003] Accordingly, an object of the present disclosure is to provide a user interface that can enhance the user's utilization of the calendar application. More specifically, the present disclosure aims to provide a user interface that allows users to input schedules into the calendar application quickly and easily, enabling them to intuitively grasp their schedules and plans at a glance through the calendar application, thereby improving their work efficiency.

[0004] Additionally, another object of the present disclosure is to provide a user interface that enables users to input schedules by categorizing them, thereby allowing users to systematically manage their schedules and facilitating the generation of meaningful statistical data regarding the schedules.

[0005] However, the problems to be solved by the present disclosure are not limited to those mentioned above. The objects not explicitly mentioned but clearly understood by those skilled in the art to which the present disclosure pertains, based on the following description, are also included within the scope of the present disclosure.

Solution to Problem

[0006] According to some aspects of the disclosure, a method of inputting schedules including multiple categories, comprises: providing, on a category selection window of a user interface of a calendar application, selectable item buttons corresponding to each of at least two categories of a schedule simultaneously, wherein the at least two categories are associated with each other, and the provided item buttons are set differently for each user, receiving a selection of at least one item button among item buttons belonging to one of the at least two categories on the category selection window, and in response to the selection of the at least one item button, modifying and presenting item buttons belonging to the other one of the at least two categories on the category selection window, wherein the number of the modified item buttons is smaller than the number of the item buttons before modification.

[0007] According to some aspects, the method of inputting schedules including multiple categories according to claim **1**, wherein the at least two categories have a relationship as an upper category and a lower category.

[0008] According to some aspects, the method of inputting schedules including multiple categories according to claim **1**, wherein the user interface includes an input panel configured to input a time and a category for a schedule, and the method further comprises: displaying the selected at least one item button on the input panel in response to receiving a selection of at least one item button among item buttons belonging to one of the at least two categories on the category selection window.

[0009] According to some aspects, the method of inputting schedules including multiple categories according to claim **3**, wherein the modifying and presenting item buttons belonging to the other one of the at least two categories on the category selection window in response to the selection of the at least one item button comprises: presenting at least some of the modified and presented item buttons belonging to the other one of the at least two categories on the input panel.

[0010] According to some aspects, the method of inputting schedules including multiple categories according to claim **4**, wherein the input panel includes a first item display section and a second item display section, wherein the selected at least one item button is presented in the first item display section of the input panel, and wherein at least some of the modified and presented item buttons belonging to the other one of the at least two categories are presented in the second item display section of the input panel.

[0011] According to some aspects, the method of inputting schedules including multiple categories according to claim **1**, wherein the modifying and presenting item buttons belonging to the other one of the at least two categories on the category selection window in response to the selection of the at least one item button comprises: presenting the modified and presented item buttons by ranking them based on usage frequency.

[0012] According to some aspects, the method of inputting schedules including multiple categories according to claim **1**, wherein: the categories of the schedule include a first category, a second category, a third category, and a fourth category in order from upper to lower; the one of the at least two categories on the category selection window is the third category, and the other of the at least two categories is the fourth category; and by selecting the selected at least one item button, the first category and the second category are automatically determined.

[0013] According to some aspects, the method of inputting schedules including multiple categories according to claim **1**, wherein, before receiving the selection of an item button, the selectable item buttons corresponding to each of the at least two categories of the schedule presented on the category selection window include either item buttons recently used by the user or all item buttons of a specific category.

[0014] According to some aspects, the method of inputting schedules including multiple categories according to claim **1**, further comprising: receiving a selection of at least one of

the modified and presented item buttons; receiving a selection of a registration button for registering the schedule; and in response to the selection of the registration button, generating a schedule item in at least one of a timeline or a schedule display table of the user interface.

[0015] According to some aspects of the disclosure, a method of inputting schedules including multiple categories, comprises: providing, on a category selection window of a user interface of a calendar application, at least one selectable item button for a specific category of a schedule, receiving a selection of at least one item button among the at least one item button on the category selection window, and presenting, on an input panel of the user interface, at least one item button for a category associated with the category to which the selected at least one item button belongs, wherein the input panel is configured to receive user input for time and category of the schedule.

[0016] According to some aspects, the method of inputting schedules including multiple categories according to claim **10**, wherein the category associated with the category to which the selected at least one item button belongs is an upper category or a lower category of the category to which the selected at least one item button belongs.

[0017] According to some aspects, the method of inputting schedules including multiple categories according to claim **10**, wherein the categories of the schedule include a first category, a second category, a third category, and a fourth category in order from upper to lower; wherein the category to which the selected at least one item button belongs is the third category; wherein the category associated with the category to which the selected at least one item button belongs is the fourth category; and wherein by selecting the selected at least one item button, the first category and the second category are automatically determined.

[0018] According to some aspects of the disclosure, an apparatus implementing an application for inputting schedules including multiple categories, the apparatus comprises: a processor, and a memory including computer-executable instructions, wherein the computer-executable instructions, when executed by the processor, cause the processor to: provide, on a category selection window of a user interface of a calendar application, selectable item buttons corresponding to each of at least two categories of a schedule simultaneously, wherein the at least two categories are associated with each other, and the provided item buttons are set differently for each user, receive a selection of at least one item button among item buttons belonging to one of the at least two categories on the category selection window, and in response to the selection of the at least one item button, modify and present item buttons belonging to the other one of the at least two categories on the category selection window, wherein the number of the modified item buttons is smaller than the number of the item buttons before modification.

[0019] According to some aspects of the disclosure, a computer-readable recording medium storing computer-executable instructions, wherein the computer-executable instructions, when executed by a processor, cause the processor to: provide, on a category selection window of a user interface of a calendar application, selectable item buttons corresponding to each of at least two categories of a schedule simultaneously, wherein the at least two categories are associated with each other, and the provided item buttons are set differently for each user, receive a selection of at least one item button among item buttons belonging to one of the at least two categories on the category selection window, and in response to the selection of the at least one item button, modify and present item buttons belonging to the other one of the at least two categories on the category selection window, wherein the number of the modified item buttons is smaller than the number of the item buttons before modification.

Advantageous Effects

[0020] According to embodiments of the present disclosure, a user interface that enhances the utilization of the calendar application can be provided. More specifically, the present disclosure aims to provide a user interface that allows users to input schedules into the calendar application quickly and easily, enabling them to intuitively grasp their schedules and plans at a glance through the calendar application, thereby improving their work efficiency.

[0021] Additionally, according to embodiments of the present disclosure, a user interface can be provided that enables users to input schedules by categorizing them, thereby allowing users to systematically manage their schedules and facilitating the generation of meaningful statistical data regarding the schedules.

[0022] However, the effects achievable by the present disclosure are not limited to those mentioned above. Other effects not explicitly mentioned may also be clearly understood by those skilled in the art to which the present disclosure pertains based on the following description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] The following drawings attached to the present specification illustrate preferred embodiments of the present disclosure and serve to further aid in understanding the technical spirit of the present disclosure in conjunction with the detailed description. Therefore, the present disclosure should not be construed as being limited only to the matters described in such drawings.

[0024] FIGS. **1***a* and **1***b* are diagrams illustrating examples of a system for using a calendar application according to an embodiment of the present disclosure.

[0025] FIG. **2** is an exemplary diagram illustrating the main screen of the user interface for the calendar application according to an embodiment of the present disclosure.

[0026] FIGS. **3** and **4** are exemplary screens illustrating the main window of the user interface for the calendar application according to an embodiment of the present disclosure when scrolled upward and downward, respectively.

[0027] FIGS. **5***a* and **5***b* are exemplary diagrams illustrating the basic form and the expanded form of the timeline for dates other than today in the user interface of the calendar application according to an embodiment of the present disclosure.

[0028] FIG. **6***a* is an exemplary diagram illustrating the category selection window **210** of the user interface for the calendar application according to an embodiment of the present disclosure.

[0029] FIGS. **6***b* and **6***c* are diagrams illustrating additional usage examples of the category selection window in the calendar application according to an embodiment of the present disclosure.

[0030] FIGS. **7***a*, **7***b*, and **7***c* are diagrams illustrating the input panel according to an embodiment of the present disclosure.

[0031] FIG. **8** is an exemplary diagram illustrating a method for entering time through the time input section **221** according to an embodiment of the present disclosure.

[0032] FIGS. **9***a*, **9***b*, **9***c*, and **9***d* are diagrams illustrating, by way of example, the operation method of the item display section in the input panel of the calendar application according to an embodiment of the present disclosure.

[0033] FIGS. **10***a* and **10***b* are diagrams illustrating exemplary usage methods of the quick buttons in the input panel of the user interface of the calendar application according to an embodiment of the present disclosure.

[0034] FIG. **11** is a diagram illustrating the schedule display table **240** in the user interface of the calendar application according to an embodiment of the present disclosure.

[0035] FIG. **12** is an exemplary diagram illustrating a method for adding a schedule using a recycle button of the schedule items according to an embodiment of the present disclosure.

[0036] FIG. **13** is an exemplary diagram illustrating a method for adding a schedule using the edit button of the schedule items according to an embodiment of the present disclosure.

[0037] FIG. **14** is a diagram illustrating the timeline **230** of the user interface of the calendar application according to an embodiment of the present disclosure.

[0038] FIG. **15** is an exemplary diagram illustrating a process for determining the status of a schedule box for a planned schedule in the second timeline according to an embodiment of the present disclosure.

[0039] FIGS. **16***a*, **16***b*, and **16***c* are exemplary diagrams illustrating the cases where the user selects the adopt icon, defer icon, and cancel icon for the schedule box of a planned schedule prior to the current time, respectively.

[0040] FIG. **17***a* is a flowchart illustrating a method of inputting categorized schedules through the calendar application according to an embodiment of the present disclosure.

[0041] FIG. **17***b* is a flowchart illustrating a method of inputting a categorized schedule through a calendar application according to another embodiment of the present disclosure.

[0042] FIG. **18**, which illustrates examples of category selection windows **210***a* and **210***b* in the calendar application according to other embodiments of the present disclosure.

[0043] FIGS. **19** and **20** are diagrams illustrating a method for recommending categories for a schedule through an artificial neural network module according to another embodiment of the present disclosure.

DETAILED DESCRIPTION

[0044] The terms or words used in the disclosure and the claims should not be construed as limited to their ordinary or lexical meanings. They should be construed as the meaning and concept in line with the technical idea of the disclosure based on the principle that the inventor can define the concept of terms or words in order to describe his/her own inventive concept in the best possible way. Further, since the embodiment described herein and the configurations illustrated in the drawings are merely one embodiment in which the disclosure is realized and do not represent all the technical ideas of the disclosure, it should be understood that there may be various equivalents, variations, and applicable examples that can replace them at the time of filing this application.

[0045] In addition, the same reference numerals are used throughout the drawings to refer to elements having similar functions and operations. Throughout the specification, when a particular element is described as being connected to, above, or below another element, such descriptions include both direct and indirect connections or positional relationships, with or without intervening elements.

[0046] The terms used in the description and the claims are merely used to describe particular embodiments and are not intended to limit the disclosure. Singular forms are intended to include plural forms unless the context clearly indicates otherwise. In the application, terms such as "comprise," "comprise," "have," etc. should be understood as not precluding the possibility of existence or addition of features, numbers, steps, operations, components, parts, or combinations thereof described herein.

[0047] Although terms such as first, second used in the description and the claims may be used to describe various components, the components should not be limited by these terms. These terms are only used to differentiate one component from another. For example, a first component may be referred to as a second component, and similarly, a second component may be referred to as a first component, without departing from the scope of the disclosure. The term 'and/or' includes a combination of a plurality of related listed items or any item of the plurality of related listed items.

[0048] Unless being defined otherwise, all terms used herein, including technical or scientific terms, have the same meaning as commonly understood by those skilled in the art to which the disclosure pertains.

[0049] Terms such as those defined in commonly used dictionaries should be construed as having a meaning consistent with the meaning in the context of the relevant art, and are not to be construed in an ideal or excessively formal sense unless explicitly defined in the application. In addition, each configuration, procedure, process, method, or the like included in each embodiment of the disclosure may be shared to the extent that they are not technically contradictory to each other.

System for Using a Calendar Application

[0050] FIGS. **1***a* and **1***b* are diagrams illustrating examples of a system for using a calendar application according to an embodiment of the present disclosure.

[0051] Referring to the system shown in FIG. **1***a*, a user device **10** may be connected to a calendar management server **20** via a network **15**. According to embodiments of the present disclosure, the calendar application may be installed on the user device **10** or may be used by utilizing calendar application-related resources of the calendar management server **20** in the form of a cloud through the user device **10**. Additionally, the calendar application may be distributed across the user device **10** and the calendar management server **20**.

[0052] The user device **10** may be any device equipped with a display capable of displaying the calendar application, such as a personal computer (PC), laptop, tablet, mobile phone, or wearable device, and may connect to the calendar management server via a network. The same user may use two or more user devices. In this case, the calendar

application may operate in synchronization across the user's devices, or it may operate on only one user device at a time. The present disclosure does not limit the implementation method in this regard.

[0053] The network **15** may be a wired or wireless network. The user device **10** may connect to the network **15** through a wired LAN cable, through wireless internet such as Wi-Fi, 3G/4G/5G data networks at locations equipped with wireless access points (APs), or by transmitting and receiving wireless signals with peripheral devices to connect to the network **15**. The specific method of connection is not limited.

[0054] The calendar management server **20** may be a server for providing, servicing, and managing the calendar application. As an example, the calendar management server **20** may provide services and updates for the calendar application, collect various data related to the calendar application, and generate and provide statistical information. The calendar management server **20** may provide the calendar application in the form of a cloud service or deliver calendar-related services through communication with the calendar application installed on the user device **10**. The specific operational methods are not limited.

[0055] Referring to the system shown in FIG. **1***b*, the user device **10** and the institution server **12** may be connected to a calendar management server **20** via a network **15**. The institution server **12**, for example, may be a server operated by various institutions such as companies, schools, public institutions, or research institutes, and the user device **10** may be a personal device belonging to an individual affiliated with such an institution. In this case, the user device **10** may use the calendar application provided through the institution server **12** or, similar to the example in FIG. **1***a*, use the calendar application installed on the user device **10** itself or by utilizing the resources of the calendar management server **20**.

[0056] However, unlike the examples in FIGS. **1***a* and **1***b*, the calendar application may be used solely on the user device, or it may operate in the form of an intranet only between the institution server and the user device without being connected to the calendar management server **20**. The specific implementation methods are not limited.

[0057] In the example of the system in FIG. **1***a* and the example of the system in FIG. **1***b*, the user device **10** connects to the calendar management server **20** via the network **15**, and the schedule data generated by the user utilizing the calendar application on the user device **10** may be collected by at least one of the calendar management server **20** or the institution server **12**. For such schedule data to be collected and meaningful statistical data to be generated, the utilization of the calendar application must be enhanced. To achieve this, users need to be provided with motivation to actively use the calendar application. The calendar application and its user interface according to an embodiment of the present disclosure include various elements that enable users to gain positive experiences, such as improved work efficiency and prompt work feedback, through the use of the calendar application. These elements will be described in detail later. Meanwhile, in this regard, there may be issues related to privacy concerns, however, the present disclosure focuses solely on the technical aspects, irrespective of such issues.

Configuration of the Main Screen of the User Interface for the Calendar Application

[0058] FIG. **2** is an exemplary diagram illustrating the main screen of the user interface for the calendar application according to an embodiment of the present disclosure.

[0059] In the user interface of the calendar application according to an embodiment of the present disclosure, the term "main screen" refers to the screen presented to the user upon first logging into the calendar application. However, the term "main screen" is used merely for convenience of explanation, and the user may customize the initial screen settings of the calendar application, the configuration may vary depending on the display size of the user device, or the layout of the initial screen may change according to updates to the calendar application. Therefore, the configuration of the main screen described below is merely exemplary.

[0060] Additionally, for convenience of explanation, this specification describes "a first time range" as referring to today, "a second time range" as referring to tomorrow and the future (dates after tomorrow), and "a third time range" as referring to the past (yesterday and dates before yesterday). However, the first to third time ranges may each be defined as different time ranges, and they are not limited thereto.

[0061] Referring to FIG. **2**, the main screen **200** of the user interface for the calendar application may include: a category selection window **210** that allows for the selection and input of one or more categories of schedules; an input panel **220** for entering the time, category, and detailed work description for schedules of today (i.e., the first time range) or tomorrow and the future (i.e., the second time range); a timeline **230** that includes a planned timeline and a completed timeline, which respectively display in chronological order the planned schedules the user intends to carry out today and the completed schedules actually carried out; and a schedule display table **240** that displays the schedules for today and for tomorrow and the future in the form of separate tables.

[0062] Here, the schedules displayed on the timeline **230** and those displayed in the schedule display table **240** may be at least partially synchronized. Specifically, since the timeline **230** pertains to today's planned schedules and completed schedules, it may be synchronized with the table **240***a*, which represents today's schedules within the schedule display table **240**. Additionally, as will be described later, the user interface of the calendar application may include not only the timeline **230** for today but also a timeline for tomorrow and the future, as well as a timeline for the past. Among these, the timeline for tomorrow and the future may be synchronized with the table **240***b*, which represents schedules for tomorrow and the future within the schedule display table **240**.

[0063] Additionally, the schedules entered through the input panel **220** may either be newly registered schedules that will be created in the timeline **230** and the schedule display table **240**, or schedules selected for editing from among those already displayed in the timeline **230** and the schedule display table **240**. The specific methods for creating and editing schedules will be described in detail later.

[0064] Additionally, the main screen **200** may further include: a goal display section **239** for graphically displaying the progress of work goals; a call history check button **245** that allows the user to save and view key call records; a work completion button **247** that enables the user to select

between leaving work or working overtime; and a date display section **232** that displays schedule-related dates, work locations, and other schedule-related information. Additionally, below the category selection window **210**, there may be a weekly notification display section **211** that provides information on the planned schedules for the current week and a personal notepad (not shown).

[0065] Here, the call history check button **245** allows the user to save and view key call records. The user may simply save such call records (e.g., incoming/outgoing status, call time, counterpart, call details), associate them with specific schedules, or store related call recording files. Additionally, functionalities such as automatically saving call records or recording files by syncing with devices like mobile phones may also be implemented.

[0066] As seen in the example of FIG. **2**, the main screen **200** may include a category selection window **210** located in the left area of the main screen **200** and a main window **215** located to the right of the category selection window **210**. Additionally, the timeline **230** may be located in the upper area of the main window **215**, with the goal display section **239** and the input panel **220** positioned in the lower left section of the timeline **230**, and the schedule display table **240** positioned in the center and lower right section of the timeline **230**. However, the category selection window **210** may also be displayed in a location adjacent to the main window **215**, and its position is not limited thereto.

[0067] In the user interface of the calendar application according to an embodiment of the present disclosure, by placing the category selection window **210**, which allows for schedule input, in the left section of the main screen **200**, and the input panel **220** in the lower central section, the user is enabled to perform schedule input intuitively and easily. Additionally, by arranging schedules in two formats, namely a timeline and a table, respectively in the upper section and the lower right section of the main screen **200**, the user can conveniently and intuitively view and manage their schedule.

[0068] FIGS. **3** and **4** are exemplary screens illustrating the main window of the user interface for the calendar application according to an embodiment of the present disclosure when scrolled upward and downward, respectively. Referring to FIGS. **3** and **4**, the main window **215** of the user interface for the calendar application according to an embodiment of the present disclosure is scrollable in the vertical direction.

[0069] First, referring to FIG. **3**, in an exemplary screen **200***b* where the main window **215** is scrolled upward by manipulating the scrollbar or similar elements on the right side of the main window **215**, one or more past timelines **230***c*, which display the schedules of yesterday (e.g., Tuesday) and the day before yesterday (e.g., Monday) in chronological order, may be displayed on the timeline **230** that chronologically shows today's (e.g., Wednesday's) schedules.

[0070] According to an embodiment of the present disclosure, the date range for the current week (e.g., "Current Week's Work Log 2002 Jul. 4~2022 Jul. 10") is displayed at the top of the main window **215**, and only the timelines for the displayed current week, i.e., the schedule for a one-week period (Monday to Sunday of the week), may be viewed by scrolling. In the example of FIG. **3**, today is Wednesday, and the past timeline **230***c* is shown to include two timelines corresponding to Tuesday and Monday. However, the number of past timelines **230***c* may vary depending on which day of the week today is. According to an embodiment, the past timeline **230***c* pertains to schedules prior to today (past) and may include both the timelines for planned schedules the user had set in the past and the timelines for completed schedules the user actually performed. For efficient use of display space, the planned schedules and completed schedules may each be displayed in a collapsed form. This will be described in detail later with reference to FIG. **5**.

[0071] Referring to FIG. **4**, in an exemplary screen **200***c* where the main window **215** is scrolled downward by manipulating the scrollbar or similar elements on the right side of the main window **215**, one or more future timelines **230***d*, which display the schedules for tomorrow and the future in chronological order by date, may be displayed below the input panel **220** and the schedule display table **240**. In the example of FIG. **4**, since today is Wednesday, four future timelines **230***d* corresponding to Thursday through Sunday of the current week are displayed. Since the future timeline **230***d* pertains to the future, it does not include completed schedules and may only contain planned schedules.

[0072] FIGS. **5***a* and **5***b* are exemplary diagrams illustrating the basic form and the expanded form of the timeline for dates other than today in the user interface of the calendar application according to an embodiment of the present disclosure.

[0073] Referring to FIG. **5***a*, the past timeline **230***c* for dates prior to today, in the basic (default) form, may display the planned schedules in a thin format where only the time slots of the schedules are visible, while the completed schedules may be displayed in a state where only the category information of the schedules is visible, with the detailed work descriptions omitted. Overall, it may take the form where the simplified timeline for planned schedules is displayed in a thin format on the simplified timeline for completed schedules, and in this case, the planned schedules and completed schedules may be distinguished by different colors. Displaying the past timeline **230***c* in a simplified form (i.e., the basic form) is intended to efficiently utilize the display space of the main screen and the main window and to allow users to quickly grasp the details of the week's schedules and whether planned schedules have been established.

[0074] Referring to FIG. **5***b*, when the user selects or hovers over any position on the past timeline **230***c* using an input such as a mouse or touch, the past timeline **230***c* may transform into an expanded timeline **230***c*'. In the case of the expanded past timeline **230***c*', similar to the timeline **230** for today's date (refer to FIGS. **2** and **3**), it may include two timelines: a planned timeline for planned schedules and a completed timeline for completed schedules. The planned schedules and completed schedules may be displayed chronologically, allowing users to view both the category information and detailed schedule information for each schedule.

[0075] Hereinafter, each component of the user interface for the calendar application according to an embodiment of the present disclosure will be described in detail.

Category Selection Window

[0076] From the user's perspective, entering categories for schedules in addition to inputting the schedules themselves in the calendar application may feel cumbersome. On the

other hand, from the perspective of the institution that introduced the calendar application or the calendar management server, being able to categorize individual users' schedule data allows for the collection of meaningful statistical data. Taking these points into consideration, an embodiment of the present disclosure newly introduces a category selection window and proposes a method that enables effective category input for schedules while minimizing the process of users spending time directly selecting categories.

[0077] FIG. **6***a* is an exemplary diagram illustrating the category selection window **210** of the user interface for the calendar application according to an embodiment of the present disclosure.

[0078] In the example of FIG. **6***a*, as a non-limiting example, the category selection window **210** is described in the case where four categories may be input. However, the number of enterable categories is one or more and is not limited to a specific number. Additionally, although the number, items, or configuration of each category are described below with specific examples, these may vary depending on the needs of users, institutions, or other entities using the calendar application, and the configuration of the categories is not limited thereto.

[0079] Referring to FIG. **6***a*, among the four categories included in the category selection window **210**, the first category **211** may be the highest-level category and, for example, may represent the "Department" category. The second category **212** may be the next-level category, which, for example, may classify "Fields" or "Teams." The third category **213** may be a lower category of the second category **212** and may classify "Projects," while the fourth category **214** may be a lower category of the third category **213** and may classify "Works." That is, the first category may represent general themes, the second category may represent specific themes, the third category may represent general works, and the fourth category may represent specific works. However, if necessary, the user may change to another category belonging to the first category **211** by selecting an arrow **211***b*, and in this case, the item buttons of the second to fourth categories, which are lower categories of the first category **211**, as well as the names of each category, may also be changed accordingly.

[0080] In another example, the category selection window **210** may include only two categories. For instance, the category selection window **210** may include only the third category **213** and the fourth category **214**, without including the first and second categories. That is, the detailed configuration within the category selection window **210** may be modified based on user selection or other factors, and the form shown in FIG. **6** is merely exemplary.

[0081] First, according to one embodiment, the first category **211** may be the "Department" category and, for example, may include departments such as "General Affairs," "Engineering," "Sales," "Strategy," and "HR."

[0082] As the first category **211**, the default category displayed on the main screen **200** may be the category of the department to which the user currently belongs (in the example of FIG. **6**, "General Affairs") or the department category most recently used by the user for adding or editing schedules in the calendar application. This takes into account the fact that a user of the calendar application is relatively more likely to newly create or edit a schedule for the department to which they belong or for the department for which they have recently created or edited a schedule.

[0083] Through the default setting of the first category **211**, the user of the calendar application is effectively considered to have already made a selection for the first category, even without explicitly selecting it. As a result, this allows category input to be received while minimizing the user's input.

[0084] The second category **212** may be a category that classifies "Fields" or "Teams" (hereinafter referred to as the "Field" category). Such a "Field" category may be designed considering that various fields of work or teams may exist within a department in an institution or organization and that a user may belong to or be involved in one or more fields of work or teams. That is, the second category **212** may be a category that enables the user to select a specific field of work or team when multiple fields of work or teams exist within a department.

[0085] Similar to the aforementioned example of the first category, if necessary, the user may change to another category belonging to the second category (**212**) by clicking the arrow (**212***c*), and in this case, the item buttons and category names of the third and fourth categories may also be changed accordingly.

[0086] In the example of FIG. **6***a*, the "Field" category **212** may include fields such as Purchasing, Taxation, and Human Resources, and each field may be selected through the item buttons **212***a* of the second category **212**. Furthermore, when a specific field is selected, the project items corresponding to the selected field may be displayed in the third category **213**. For example, when selecting the item button **212***a* for the Purchasing field, the item buttons **213***a* for projects corresponding to the Purchasing field may be displayed in the third category **213**. Additionally, by selecting the "All" button **212***a*' among the item buttons **212***a*, all project item buttons **213***a*, regardless of the field or team, may be displayed in the third category **213**.

[0087] Furthermore, the second category **212** includes a "Recent" button **212***b*, and by selecting the "Recent" button **212***b*, the item buttons **213***a* for projects that the user recently created or edited schedules for may be displayed in the third category **213**. According to an embodiment, in the second category **212**, the "Recent" button **212***b* may be set as the default selection. Setting the "Recent" button **212***b* as the default takes into account the fact that users of the calendar application are relatively more likely to continuously create or edit schedules for projects they recently worked on.

[0088] Additionally, according to another embodiment, in the second category **212**, the "All" button **212***a*' may be set as the default selection. Setting the "All" button **212***a*' as the default is intended to allow the user to select all project item buttons **213***a* when the number of project items the user of the calendar application is involved in does not exceed a predetermined number (e.g., 10).

[0089] When the "Recent" button **212***b* or the "All" button **212***a*' is set as the default in this way, it does not constitute a direct selection of the category (i.e., the second category). However, when the user selects any one (or more) of the multiple recent or all project item buttons displayed in the third category **213** by selecting the "Recent" button **212***b* or the "All" button **212***a*', the second category corresponding to the user-selected project item may be naturally selected. That is, through this default setting, the user of the calendar

application is effectively considered to have selected the second category **212** without any separate input for the second category **212**. As a result, the user may receive category input with minimal input and without feeling any inconvenience.

[0090] The third category **213** may be a lower category of the second category **212** and may represent the "Project" category. The items for multiple projects performed within the selected field of work or team by the user may be displayed in the third category **213**. For example, if the user selects the item button **212***a* corresponding to the "Purchasing" field in the second category **212**, the third category **213** may display item buttons **213***a* associated with the "Purchasing" item button **212***a*. Additionally, if the user selects the "Recent" button **212***b* or the "All" button **212***a*' in the second category **212** instead of a button corresponding to a specific field, or if these buttons are set as the default (i.e., the user has not explicitly made a selection for the second category), the item buttons **213***a* for recently performed projects or all projects may be displayed in the third category **213**.

[0091] Meanwhile, due to limitations such as the display size of the user device, the display area of the third category **213** within the category selection window **210** may have a limited size. Consequently, only a predetermined number of item buttons **213***a* (e.g., **10**) may be displayed in the display area of the third category **213**, and if the remaining item buttons exist, they may be displayed using a scrolling method.

[0092] The first category **211**, the second category **212**, and the third category **213** may collectively be referred to as "context categories." In one embodiment, the first to third categories **211**, **212**, and **213** have the characteristic of practically showing which context (i.e., type or nature) of category the user is performing a schedule within. By including these context categories, the schedule data of the calendar application's user may be meaningfully categorized. Such categorized schedule data not only enables the user to systematically manage their schedules and plans but also provides the institution the user belongs to or the calendar management server with the significant benefit of generating meaningful statistical data.

[0093] Referring again to FIG. **6***a*, the fourth category **214** may be a lower category of the third category **213** and may represent a "Task" category related to the detailed works the user actually performs. The item buttons **214***a* of the "Task" category may include, for example, works such as internal approval processing, product proposals, account deposits, product development, and meetings. Due to the area limitations of the display region of the fourth category **214**, only a predetermined number of item buttons (e.g., **10**) may be displayed, while the remaining item buttons may be displayed using a scrolling method. Additionally, the composition of the item buttons **214***a* in the fourth category **214** may vary depending on which item button(s) in the third category **213** are selected.

[0094] Furthermore, multiple item buttons **214***a* in the task category may be selected simultaneously by the user. This is because users may perform multiple works simultaneously or sequentially. For example, a user may simultaneously perform works such as "Price Research" and "Data Research," in which case the user may select the two corresponding item buttons at the same time.

[0095] The selection of the item buttons **213***a* and **214***a* in the aforementioned third category **213** and fourth category **214**, respectively, may be carried out in various ways. For instance, users may select the item buttons **213***a* and **214***a* through a mouse click (single click or double click) or by dragging and dropping a specific item button into the item display section **223** of the input panel **220**.

[0096] According to one embodiment, the fourth category **214** may also include a "Recent" button **214***c* and an "All" button **214***b*, similar to the second category **212**, and may additionally include a "Top **10**" button. The "Recent" button **214***c* may be set as the default selection in the fourth category **214** when the user has not selected any item button in the third category **213** or in similar situations. This is based on the consideration that users of the calendar application are relatively more likely to continuously create or edit schedules for the detailed works they recently worked on.

[0097] Additionally, when the "All" button **214***b* is selected in the fourth category **214**, all detailed works present in the fourth category **214** may be displayed as item buttons.

[0098] When the "Top **10**" button is selected in the fourth category **214**, the top 10 (or fewer) most frequently used item buttons among the detailed works in the fourth category **214** associated with the item button selected in the third category **213** (i.e., a specific project) may be displayed.

[0099] Additionally, according to one embodiment, when an item button corresponding to a work requiring communication with other users, such as "Meeting," is selected from the item buttons in the fourth category **214**, a person icon (e.g., see reference number **226***c* in FIG. **7***b*) for adding other users associated with the "Meeting" may be added to a certain area of the input panel **220**. This will be described in more detail later.

[0100] FIGS. **6***b* and **6***c* are diagrams illustrating additional usage examples of the category selection window in the calendar application according to an embodiment of the present disclosure.

[0101] Referring to FIG. **6***b*, the user may remove unnecessary item buttons **213***a* or **214***a* from the category selection window **210**. For example, when the user clicks and holds the mouse button while dragging an item button **214***a* displayed in the category selection window **210** that they wish to remove (e.g., the "Annual Contract Proposal" item button in the fourth category in the example of FIG. **6***a*), a delete button **208**, such as a trash bin icon, may appear at the bottom of the category selection window **210**. By dragging the item button **214***a* and dropping it on or near the delete button **208**, the item button **214***a* may be removed. The removable item buttons **213***a* or **214***a* may belong to the third category and/or the fourth category, but they are not limited thereto.

[0102] Referring to FIG. **6***c*, the user may drag an item button **213***a* or **214***a* displayed in the category selection window **210** and drop it, for example, onto a search icon **209** displayed at the top of the category selection window **210**. By doing so, the user may search for the history of schedules performed for the selected item button **213***a* or **214***a*. For example, in the case of FIG. **6***b*, when the item button **213***a* of the third category labeled "Incheon High School" is dragged and dropped onto the search icon **209**, as shown on the right, the history of schedules **218** related to "Incheon High School" that the user has performed so far may be

retrieved and displayed. This schedule history **218** that the user has performed not only allows the user to quickly grasp their own performance history for specific works at a glance but also enables the institution to obtain meaningful statistical data regarding project performance, individual user productivity, and efficiency.

[0103] As described above, the category selection window **210** according to an embodiment of the present disclosure may provide a method that enables effective category input while minimizing the process of the user spending time directly selecting categories. According to one embodiment, the user of the calendar application may input all four categories by performing only one or two actions, such as selecting item buttons related to their schedule in the third category and/or the fourth category, out of the four total categories. Furthermore, the category input method using the category selection window **210** may synergize with the category input via the item display section of the input panel **220**, which will be described later, enabling the user's category input to be carried out more easily.

Input Panel

[0104] Referring again to FIG. **2**, the main window **215** of the user interface for the calendar application according to an embodiment of the present disclosure may include an input panel **220** for receiving inputs such as time and categories for schedules. The position of the input panel **220** may be located approximately in the lower central area of the main screen **200**. Specifically, it may be positioned below the timeline **230**, to the right of the category selection window **210**, and to the left of the schedule display table **240**.

[0105] In the example of FIG. **2**, the goal display section **239** may be located directly below the timeline **230**, and the input panel **220** is shown positioned below the goal display section **239**. However, its position is not limited thereto, and the location of the input panel may vary depending on the design of the user interface. For example, in another example, the input panel **220** may be presented in the form of a popup window when the user directly inputs schedules through the schedule display table or the timeline. Various modifications are possible, and the position or implementation method of the input panel is not restricted.

[0106] FIG. **7***a* is a diagram illustrating the input panel **220** according to an embodiment of the present disclosure.

[0107] Referring to FIG. **7***a*, the input panel **220** may include a time input section **221** for entering or editing the time for a schedule; and an item display section **223**, which displays item buttons for categories already selected by the user for the schedule and one or more item buttons recommended for the categories by the calendar application, allowing the user to make selections.

[0108] Additionally, the input panel **220** according to an embodiment of the present disclosure may include multiple quick buttons **224** for quickly adding repetitive or routine schedules such as meals, recharge (rest), or move; a detailed description input section **225** for entering detailed work information for the schedule; a link creation button **226** for adding attachments or links related to the schedule; an external work button (not shown) for indicating that the schedule is an off-site activity; a focus button **227***b* for indicating that the schedule requires concentration; a registration button **228***b* for registering the created schedule; and a consecutive registration button **228***a* for registering sequential schedules.

[0109] For example, the consecutive registration button **228***a* is a button that, when adding sequential schedules, sets the start time in the time input section **221** to the end time of the previously added schedule after adding a specific schedule, thereby enabling the user to quickly input consecutive schedules. For example, after entering a schedule for 9:00 AM to 9:30 AM and selecting the consecutive registration button **228***a*, a schedule item for 9:00 AM to 9:30 AM is created, while the time input section **221** automatically updates to 9:30 AM to 10:00 AM, allowing the user to conveniently input the subsequent schedule.

[0110] The time input section **221** of the input panel **220** according to an embodiment may include a first time input section **221***a* and a second time input section **221***b*. The first time input section **221***a* is for inputting schedules within the first time range, for example, today's schedules, and may include a first time input box **222***a* that allows the user to input the start time and end time for today's schedule. Additionally, the second time input section **221***b* is for inputting schedules within the second time range, which follows the first time range, for example, schedules for tomorrow and the future, and it may be positioned below the first time input section **221***a*. The second time input section **221***b* may include a second time input box **222***b* that allows the user to input the start time and end time for the schedules of each date (day of the week) within the second time range. Additionally, the second time input section **221***b* may include a day-of-the-week selection section **222***c* that displays the dates for tomorrow and the following days as days of the week. As in the example of FIG. **4**, if today is Wednesday, the five days displayed in the day-of-the-week selection section **222***c* may be Thursday (Thu), Friday (Fri), Saturday (Sat), Sunday (Sun), and Monday (Mon).

[0111] However, the time input section **221** of the input panel **220** may be implemented with a single time input section instead of being composed of two separate time input sections. In this case, a single time input section may include both a time input box and a day-of-the-week selection section. However, the specific form of the input panel is not limited.

[0112] Referring to FIG. **7***a*, the input panel **220** may include an item display section **223** that displays the item buttons of categories selected by the user for the schedule or the recommended category item buttons suggested by the calendar application for the schedule, enabling the reception of user selection for categories.

[0113] The item display section **223** may include a first item display section **223***a* and a second item display section **223***b*. More specifically, the first item display section **223***a* may display one or more item buttons selected by the user from the item buttons **213***a* of the third category **213** in the category selection window **210** or up to a predetermined number of recommended item buttons (e.g., up to 5) suggested by the calendar application. Additionally, the second item display section **223***b* may display one or more item buttons selected by the user from the item buttons **214***a* of the fourth category **214** in the category selection window **210**, or up to a predetermined number of recommended item buttons (e.g., up to 5) suggested by the calendar application.

[0114] In a non-limiting example, the recommendation of one or more item buttons in each of the first item display

section **223***a* and the second item display section **223***b* may be based on the usage frequency of each item button.

[0115] In another example, the calendar application may recommend item buttons by comprehensively considering factors such as the usage frequency, time, cycle, ongoing works, and projects of each item button within the categories through an artificial neural network module. Examples of such an artificial neural network module will be described later.

[0116] FIG. **7***b* is a diagram illustrating an additional usage example of the input panel according to an embodiment of the present disclosure. Referring to FIG. **7***a*, when an item button corresponding to a work requiring communication with other users, such as "Meeting," is selected from the item buttons in the fourth category **214**, a person icon **226***c* for adding other users may be added to a certain area of the input panel **220**. If the user selects the person icon **226***c*, a user interface allowing the addition of other users who attended or are scheduled to attend the meeting may be displayed. Through this user interface, the user may add other users associated with the meeting, and the added users may be viewable through the schedule boxes **231***a* and **231***b* on the timeline **230** or the schedule items **241** in the schedule display table **240**.

[0117] FIG. **7***c* is a diagram illustrating a user interface in which counterparts for a schedule and attached files have been added, according to an embodiment of the present disclosure.

[0118] Referring to FIG. **7***c*, when the user selects the counterpart addition icon **226***c* through the input panel **220** of the calendar application and selects and adds other users associated with the schedule via the user interface, the addition of these users may be displayed through the schedule boxes **231***a* or **231***b* on the timeline **230** and the schedule items **241***a* or **241***b* in the schedule display table **240**.

[0119] Specifically, when the user selects the counterpart addition icon **226***c* and selects and adds other users associated with the schedule, a first identifier **231***h*, indicating the presence of other users associated with the schedule, may be generated in the schedule box **231***a* or **231***b* on the timeline **230**. For example, the first identifier **231***h* may be generated in the bottom-right corner of the first area (colored area) of the schedule box **231***a*. Furthermore, when the user interacts with the schedule box **231***a* (e.g., by hovering the mouse cursor, mouse clicking, or touching), a first popup window **232***b* may be displayed adjacent to the schedule box **231***a*. This first popup window **232***b* may display information such as the photos and names of other users associated with the schedule, allowing the user to confirm these other users.

[0120] Additionally, when the user selects the counterpart addition icon **226***c* and selects and adds other users associated with the schedule, the photos **242***b* of the other users associated with the schedule may be displayed in the schedule items **241***a* or **241***b* in the schedule display table **240**. The photos **242***b* of these other users may be displayed in the bottom-right area of the schedule item **241***a*, but the display position is not limited thereto.

[0121] Additionally, when the user selects the link creation button **226** through the input panel **220** of the calendar application, a separate user interface may be displayed, allowing the user to select and add attachments or links. When the user adds attachments or links associated with a schedule, a second identifier **231***g*, indicating the presence of attachments or links associated with the schedule, may be generated in the schedule box **231***a* or **231***b* on the timeline **230**. The second identifier **231***g* may, for example, be generated in the top-left corner of the first area (colored area) of the schedule box **231***a*. Additionally, when the user interacts with the schedule box **231***a* or the second identifier **231***g* (e.g., by hovering the mouse cursor, mouse clicking, or touching), a second popup window **232***a* may be displayed adjacent to the schedule box **231***a*. This second popup window **232***a* may display an identifier (e.g., an icon representing the type of attachment) for the attachment or link associated with the schedule.

[0122] Additionally, when the user selects the link creation button **226** through the input panel **220** of the calendar application to add attachments or links associated with a schedule, an identifier **242***a* for the attachment or link associated with the schedule may be displayed in the schedule items **241***a* or **241***b* in the schedule display table **240**. This identifier **242***a* for the attachment or link may be displayed to the right of the time range display of the schedule item **241***a*, but its display position is not limited thereto.

[0123] In this way, the user may easily add other users or attachments associated with a schedule through the counterpart addition icon **226***c* and the link creation button **226** in the input panel. Additionally, the user may easily identify information about other users associated with each schedule and/or attachments through the user interface of the calendar application, thereby improving the user's work efficiency. Furthermore, when the categories of schedules, counterpart-related information, attachments, and other data entered by the user are set to be shared with the institution's administrators or other users within the department, such information may contribute to improving the overall work efficiency of the institution or department.

[0124] Meanwhile, the user may also remove unnecessary item buttons from the input panel **220**. For example, when the user double-clicks an item button displayed in the first item display section **223***a* or the second item display section **223***b* of the input panel **220** that they wish to remove, the corresponding item button may be removed.

[0125] FIG. **8** is an exemplary diagram illustrating a method for entering time through the time input section **221** according to an embodiment of the present disclosure.

[0126] Referring to FIG. **8**, the first time input box **222***a* of the time input section **221** may include a start time box and an end time box. When the user clicks/touches or hovers over the start time box of the first time input box **222***a*, a scrollable drop-down box **222***d* displaying time in 30-minute intervals may be presented. The user may then select any one of the 30-minute intervals from the drop-down box **222***d*. When a time is selected for the start time box, the end time box may automatically be populated with a time that is 30 minutes after the time entered in the start time box. If the user wants to change the time in the end time box, they may click/touch or hover over the end time box and select the desired time through the drop-down box. Input for the second time input box **222***b* may also be performed in the same manner.

[0127] Dividing time into 30-minute intervals in this way is intended to improve work efficiency by encouraging users to perform works divided into 30-minute time intervals, rather than having users directly input specific times. However, depending on the implementation of the calendar application, time may be presented in 1-hour intervals,

15-minute intervals, or other time units rather than 30-minute time intervals. Additionally, variations such as combining the drop-down box with a method that allows users to directly input times are also possible, and these implementations are not limited thereto.

[0128] FIGS. **9***a*, **9***b*, **9***c*, and **9***d* are diagrams illustrating, by way of example, the operation method of the item display section in the input panel of the calendar application according to an embodiment of the present disclosure.

[0129] Referring to FIG. **9***a*, when the user of the calendar application selects one or more item buttons **213***a* within the third category **213** of the category selection window **210**, the selected one or more item buttons **213***a* of the third category **213** may also be displayed in the first item display section **223***a* of the input panel **220**.

[0130] However, if the user does not select any item button in the third category **213** within the category selection window **210**, at least some of the default item buttons (e.g., the item buttons of the third category that were recently selected if the "Recent" button is set as the default) may be displayed in the first item display section **223***a* of the input panel **220**.

[0131] In the second item display section **223***b* of the input panel **220**, one or more item buttons **214***a* of the fourth category associated with one or more item buttons **213***a* displayed in the first item display section **223***a* may be displayed. At this time, the calendar application may display, as recommended item buttons in the second item display section **223***b*, item buttons **214***a* corresponding to works of the fourth category associated with the item button **213***a*, among which a predetermined number (e.g., up to 5) of works with high usage frequency are selected.

[0132] Specifically, as illustrated in the example of FIG. **9***a*, the first item display section **223***a* of the input panel **220** may display an item button for a project selected by the user, such as "EunSung" (i.e., the third category). Additionally, the user may input a time range, such as 10:00 AM to 10:30 AM, in the time input section.

[0133] Next, referring to FIG. **9***b*, if the user selects one or more recommended item buttons **214***a*' (i.e., two or more item buttons may also be selected) among recommended item buttons **214***a* displayed in the second item display section **223***b* of the input panel **220**, inputs schedule-related details into the detailed description input section **225** (although input into the detailed description input section is not necessarily required), and selects the registration button **228***b* or the consecutive registration button **228***a* shown in FIG. **7**, the schedule may be registered (or modified) and saved.

[0134] In the example of FIG. **9***b*, the user may select one or more item buttons **214***a*' (e.g., "Process Map Creation") from among the recommended item buttons **214***a* suggested by the calendar application (e.g., item buttons for each of "Internal Approval Processing," "Phone Call," and "Process Map Creation") in the second item display section **223***b*. Additionally, the user may input detailed schedule-related descriptions into the detailed description input section **225**, such as "Product Introduction and Quotation Delivery."

[0135] FIGS. **9***c* and **9***d* illustrate examples of schedule items **241** in the schedule display table **240** and schedule boxes **231***a* on the timeline **230**, respectively, which were created through the process exemplified in FIGS. **9***a* and **9***b*. As shown in FIG. **9***c*, the schedule item **241** in the schedule display table **240** may include the schedule's time, category information (i.e., information on the item buttons of each of the third category and the fourth category), and detailed schedule-related descriptions. Additionally, as shown in FIG. **9***d*, the schedule box **231***a* on the timeline **230** may also include the schedule's category information (i.e., information on the item buttons of each of the third category and the fourth category) and detailed schedule-related descriptions. The schedule item **241** and the schedule box **231***a* will be described in more detail later.

[0136] Meanwhile, in the examples of FIGS. **9***a* through **9***d*, a case was illustrated where the user of the calendar application selected a specific item button **213***a* from the third category **213** in the category selection window **210**. However, there may also be cases where the user does not select any item button from the third category **213**. In such cases, the first item display section **223***a* may display recently used item buttons or all item buttons based on the default settings, or up to a certain number (e.g., up to 5) of item buttons **213***a* from the third category, recommended by the calendar application based on usage frequency, may be displayed. Then, if a selection of one of the item buttons **213***a* in the third category is received from the user, the processes described in FIGS. **9***a* through **9***d* may be performed.

[0137] FIGS. **10***a* and **10***b* are diagrams illustrating exemplary usage methods of the quick buttons in the input panel of the user interface of the calendar application according to an embodiment of the present disclosure.

[0138] Referring to FIGS. **10***a* and **10***b*, the quick buttons **224** of the input panel **220** may include a first quick button **224***a*, a second quick button **224***b*, a third quick button **224***c*, and a first extended quick button **224***d* located below the first time input box **222***a* of the first time input section **221***a*, as well as a fourth quick button **224***e*, a fifth quick button **224***f*, and a second extended quick button **224***d*' located below the second time input section **222***b*. However, the number and arrangement of the quick buttons are not limited.

[0139] In the examples of FIGS. **10***a* and **10***b*, the first quick button **224***a* is a quick button related to meals, the second quick button **224***b* is a quick button related to recharging (rest), the third quick button **224***c* is a quick button related to move, and the extended quick button **224***d* may be a quick button for displaying the fourth quick button **224***e* and the fifth quick button **224***f* in the item display section **223-1**. Additionally, the fourth quick button **224***e* may be a quick button related to specific products (e.g., time spent by an individual writing on the coHere application), and the fifth quick button **224***f* may be a quick button related to entertainment. The second extended quick button **224***d*' may be a quick button for displaying the first quick button **224***a*, the second quick button **224***b*, the third quick button **224***c*, and so on in the item display section **223-1**. However, the functions of the quick buttons may vary depending on the implementation of the calendar application, and they are not limited thereto.

[0140] The example in FIG. **10***a* illustrates a case where the first quick button **224***a* related to meals is selected from the quick buttons **224**. When the first quick button **224***a* related to meals is selected, the first quick button **224***a* may be highlighted (e.g., colored and surrounded by a circle), and the item display section **223-1** may display buttons **223-1***a* corresponding to the first quick button **224***a*. For instance, buttons for Korean cuisine, Japanese cuisine, Chinese cuisine, and Western cuisine may be displayed. Additionally,

the name of the item display section **223-1** may be changed to a name corresponding to the first quick button, such as "Quick Registration-Meal," and the name of the detailed description input section **225-1** may also be changed to "Menu" to encourage the user to add descriptions related to meals. For example, the user may easily register a schedule related to meals by inputting a time in the time input section **222***a* of the input panel, selecting the first quick button **244***a* related to meals, selecting the Korean cuisine button, and then selecting the registration button **228***b*.

[0141] The example in FIG. **10***b* illustrates a case where the fifth quick button **224***f* related to entertainment is selected from the quick buttons **224**. When the fifth quick button **224***f* related to entertainment is selected, the fifth quick button **224***f* may be highlighted (e.g., colored and surrounded by a circle), and the item display section **223-1** may display buttons **223-1***b* corresponding to the fifth quick button **224***f*. For instance, buttons for exercise, casual conversation, music, and events may be displayed. Additionally, the name of the item display section **223-1** may also be changed to a name corresponding to the fifth quick button, such as "Quick Registration-Entertainment." For example, the user may easily register a schedule related to entertainment by inputting a time in the time input section **222***a* of the input panel, selecting the fifth quick button **244***f* related to entertainment, selecting the event button, and then selecting the registration button **228***b*.

[0142] The introduction of such quick buttons **224** is one of the various factors that allow the calendar application according to the present disclosure to have a clear distinction from existing calendar applications. In existing calendar applications, the process of adding schedules is cumbersome, making it very rare for users to continuously add repetitive or routine schedules. In contrast, the calendar application according to the present invention achieves a remarkable effect by introducing quick buttons **224**, allowing users to quickly add repetitive or routine schedules through a simple and intuitive process involving only 1 or 2 selections. Furthermore, the introduction of such quick buttons **224** becomes a critical factor that enables users to continuously (or effectively without gaps) create their daily schedules (i.e., timeline).

Schedule Display Table

[0143] Referring to FIG. **2**, in the user interface of the calendar application according to an embodiment of the present disclosure, a schedule display table **240** may be positioned to the right of the input panel **220** and the goal display section **239**. The schedule display table **240** may display at least some of the schedules for the first time range (e.g., today) and the second time range thereafter (e.g., tomorrow and the future) in a table format.

[0144] FIG. **11** is a diagram illustrating the schedule display table **240** in the user interface of the calendar application according to an embodiment of the present disclosure.

[0145] In the example of FIG. **11**, the schedule display table **240** may include a first schedule display table **240***a* for displaying today's schedules in chronological order from top to bottom, and a second schedule display table **240***b* for displaying tomorrow's and future schedules in chronological order from top to bottom. The first schedule display table **240***a* and the second schedule display table **240***b* each include one or more schedule items **241**, which, as previously described, may be input by the user through the input panel **220**.

[0146] Unlike conventional calendar applications, which typically display only schedule title and time for each schedule item, the schedule item **241** according to an embodiment of the present disclosure may include information such as the start and end times of the schedule **241***a*, the third category of the schedule **241***b* (e.g., project), the fourth category of the schedule **241***c* (e.g., work), and the detailed description of the schedule **241***d*. As previously described, the information of such schedule items **241** may be effectively input while minimizing the process of the user spending time directly selecting them through the category selection window **210** and the input panel **220**.

[0147] In a non-limiting example, among the schedule items in the first schedule display table **240***a*, the schedule items prior to the current time may correspond to completed schedules already performed by the user. In this way, schedule items corresponding to completed schedules may include an identifier (e.g., a label, flag, etc.) **241***e* in a first color (e.g., blue) in the left area of the schedule item **241**.

[0148] Among the schedule items in the first schedule display table **240***a*, schedule items currently in progress at the current time may include an identifier in a third color (e.g., green) in the left area of the schedule item.

[0149] Additionally, among the schedule items in the first schedule display table **240***a*, the schedule items corresponding to schedules after the current time may pertain to planned schedules that the user is scheduled to perform in the future. The schedule items for such planned schedules may include an identifier **241***f* in a second color (e.g., purple) that is different from the first color or the third color, in the left area of the schedule item **241**.

[0150] The schedule items in the second schedule display table **240***b* pertain to schedules for tomorrow and the future (i.e., the second time range) and may therefore correspond to planned schedules that the user is scheduled to perform in the future. These schedule items in the second schedule display table **240***b* may also include an identifier **241***f* in a second color (e.g., purple), different from the first color, on the left side of the schedule item. However, the identifiers **241***e* and **241***f* may be distinguished by methods other than color, such as using icons or other means, and are not limited thereto.

[0151] Furthermore, the first schedule display table **240***a* may include a "Work Information Identifier" indicating the work start time and location, a "Morning Identifier" representing the morning, and an "Afternoon Identifier" **246** distinguishing between the morning and the afternoon, placed between the schedule items. Additionally, the second schedule display table **240***b* may include identifiers **247** for the days-of-the week of tomorrow or subsequent days placed between the schedule items, allowing the user to easily grasp their schedules.

[0152] Furthermore, each schedule item **241** in the schedule display table **240** according to an embodiment of the present disclosure may include a recycle button **243**, an edit button **244**, and a delete button **245** in the top-right corner. Among these, the delete button **245** may be used to delete the corresponding schedule item **241** to which the delete button **245** belongs. The usage methods of the recycle button **243** and the edit button **244** will be described below with reference to FIGS. **12** and **13**.

[0153] FIG. **12** is an exemplary diagram illustrating a method for adding a schedule using a recycle button of the schedule items according to an embodiment of the present disclosure.

[0154] Referring to FIG. **12**, the recycle button **243** may be used when the user wants to add a schedule while retaining the category information or detailed description information of the corresponding schedule item **241** to which the recycle button **243** belongs, but changing only the time. When the recycle button **243** is selected, the same category information (e.g., the third category and the fourth category) and detailed schedule description information as the schedule item **241** to which the recycle button **243** belongs are automatically entered into the item display section **223** of the input panel **220**. Additionally, if the schedule item **241** is linked to an attachment, information about the attachment is associated with the link creation button **226**. If the schedule pertains to a meeting, information about other users who attended the meeting is associated with the person icon **226***c* (see FIG. **7***a*) and is automatically entered. Only the time information **222***a* or **222***b* remains empty and unfilled. Thus, the user may quickly and easily register a new schedule by simply entering the time information **222***a* or **222***b* for the schedule and then selecting the registration button.

[0155] FIG. **13** is an exemplary diagram illustrating a method for adding a schedule using the edit button of the schedule items according to an embodiment of the present disclosure.

[0156] Referring to FIG. **13**, the edit button **244** may be used when the user wants to modify the category, time, detailed schedule information, or other details of the schedule item **241** to which the edit button **244** belongs. When the edit button **244** is selected, the category information (e.g., the third category to the fourth category), time information, and detailed schedule information of the schedule item **241** to which the edit button **244** belongs are automatically entered into the item display section **223** of the input panel **220**. The user may then modify some of this information and simply press the edit button **222***t* to complete the editing of the schedule item.

[0157] By including category-related information in each schedule item, distinguishing schedule items for completed schedules, schedules currently in progress, and planned schedules using identifiers of different colors, enabling users to quickly and easily register schedule items using existing schedule items, and allowing schedule items to be quickly and easily edited or deleted, the calendar application enables users to systematically and effortlessly manage and grasp their schedules. Furthermore, such systematic and convenient schedule management may ultimately improve the user's work efficiency and serve as a motivation for the user to actively utilize schedule management through the calendar application.

Timeline

[0158] FIG. **14** is a diagram illustrating the timeline **230** of the user interface of the calendar application according to an embodiment of the present disclosure. The timeline **230** may display completed schedules and planned schedules within the first time range (e.g., today) in chronological order in the form of schedule boxes **231***a* and **231***b*.

[0159] According to one embodiment, the timeline may be configured to display schedule boxes for the time range within the first time range, specifically from 8 AM to 7 PM on the day referred to as today. However, this time range may vary depending on the user of the calendar application or the implementation of the calendar application.

[0160] Additionally, in one embodiment, if the user of the calendar application selects "Overtime Mode," the time range displayed on the timeline may be extended from 8 AM to 12 AM. The selection of such "Overtime Mode" may be made, for instance, through a popup window generated after the user selects the end-of-work button **247** on the main screen **200** of FIG. **2**, but it is not limited thereto.

[0161] Referring to FIG. **14**, the timeline **230** for today, according to an embodiment of the present disclosure, may include a first timeline **230***a* that displays schedule boxes **231***a* for one or more completed schedules of the user for today in chronological order from left to right, and a second timeline **230***b* that displays schedule boxes **231***b* for one or more planned schedules of the user for today in chronological order from left to right. According to another embodiment, the timeline **230** may display only the first timeline **230***a*, or it may display both timelines, with the second timeline **230***b* in a folded state (e.g., see the timeline in FIG. **5***a*). The specific display method of the timeline is not limited thereto.

[0162] The schedule boxes **231***a* for one or more completed schedules of the user for today, displayed on the first timeline **230***a*, may be those entered by the user on the same day. Such user input may be made through the input panel **220** and/or the category selection window **210**, as described above. The addition of schedule boxes **231***a* in the first timeline **230***a* may be at least partially synchronized with the addition of schedule items **241** in the first schedule display table **240***a* within the schedule display table **240**.

[0163] Each schedule box **231***a* in the first timeline **230***a* may include a first area for displaying the third category **231***b* of the schedule (e.g., project) and the fourth category **231***c* of the schedule (e.g., work), as well as a second area for displaying detailed description information **231***d* of the schedule. The first area of the schedule box **231***a* in the first timeline **230***a* has a first color (e.g., blue) that identifies the schedule as a completed schedule of the user. This first color may be the same as the first color of the identifier **241***e* of the schedule item **241** in the aforementioned first schedule display table **240***a*.

[0164] The schedule boxes **231***b* for one or more planned schedules of the user for today, displayed on the second timeline **230***b*, may be schedules that the user entered before the current time. The schedule boxes **231***b* for the user's planned schedules generally have the same or a similar structure as the schedule boxes **231***a*. However, the first area displaying the third category and the fourth category of the planned schedule may have a second color (e.g., purple) different from the color of the schedule boxes **231***a*. This second color may be the same as the second color of the identifier **241***f* of the schedule items in the second schedule display table **240***b*.

[0165] Additionally, the timeline **230** may include a vertical time axis **237** that indicates the current time. This vertical time axis **237** may be displayed crossing both the first timeline **230***a* and the second timeline **230***b*. The vertical time axis **237** may operate to gradually move to the right as time progresses. The schedule box **231***a* in the first timeline **230***a* that overlaps with the vertical time axis **237** may have a third color (e.g., green) different from the first

and second colors. This third color may be the same as the third color of the schedule item currently in progress in the first schedule display table **240***a*, as previously mentioned.

[0166] In this way, the calendar application of the present disclosure aligns the color of the schedule boxes **231***a* in the first timeline **230***a* with the color of the identifiers **241***e* of the schedule items **241** in the first schedule display table **240***a*, and the color of the schedule boxes **231***b* in the second timeline **230***b* with the color of the identifiers **241***f* of the schedule items **241** in the second schedule display table **240***b*. By also distinguishing the color of schedules currently in progress, the application enables the user to easily and visually identify and distinguish completed schedules, planned schedules, and schedules in progress on both the timeline and the schedule display table through the use of color.

[0167] FIG. **15** is an exemplary diagram illustrating a process for determining the status of a schedule box for a planned schedule in the second timeline according to an embodiment of the present disclosure.

[0168] Referring to FIG. **15**(*a*), according to one embodiment, when the current time has passed for a schedule box **231***b* corresponding to a specific planned schedule displayed in the second timeline **230***b*, the calendar application may prompt the user to determine the status of the schedule box **231***b* for the corresponding planned schedule. Such a prompt may be provided by displaying a prompt icon **233** (e.g., a question mark) at the top of the schedule box **231***b*.

[0169] Referring to FIG. **15**(*b*), when the user hovers the cursor or touches the schedule box **231***b* for a planned schedule that is past the current time (i.e., for which time has elapsed), the prompt icon **233** (e.g., a question mark) previously displayed at the top of the schedule box **231***b* may disappear, and the adopt icon **234**, defer icon **235**, and cancel icon **236** may be displayed. The user may select one of the three icons **234**, **235**, or **236** based on the current status of the planned schedule.

[0170] FIGS. **16***a*, **16***b*, and **16***c* are exemplary diagrams illustrating the cases where the user selects the adopt icon, defer icon, and cancel icon for the schedule box of a planned schedule prior to the current time, respectively.

[0171] Referring to FIG. **16***a*, when the user selects the adopt icon **234** for the schedule box **231***b* of a planned schedule prior to the current time, the schedule box **231***b* is displayed with a fade effect, and the adopt icon (e.g., a check mark) **234***c* may be displayed at the top center of the schedule box **231***b*. Additionally, when the mouse hovers over (or a touch is performed on) the schedule box **231***b* where the adopt icon **234***c* has been selected, the schedule box **231***b* may be displayed prominently along with a color label in the first color at the top. At the same time, the schedule box **231***a* for the corresponding completed schedule may be highlighted so that it can be recognized to which completed schedule among the completed schedules of the first timeline **230***a* the adopted planned schedule corresponds.

[0172] Referring to FIG. **16***b*, when the user selects the defer icon **235** for the schedule box **231***b* of a planned schedule prior to the current time, the schedule box **231***b* for the planned schedule may be displayed with a fade and hashed pattern, and the defer icon (e.g., a rightward arrow) **234***d* may be displayed at the top center of the schedule box **231***b*. Additionally, when the mouse hovers over (or a touch is performed on) the schedule box **231***b* where the defer icon has been selected, the schedule box **231***b* may be displayed prominently along with a color label in a second color (different from the first color) at the top. At the same time, the deferred planned schedule may be displayed as a separate highlighted schedule box at the rightmost end of the second timeline **230***b*.

[0173] Additionally, referring to FIG. **16***c*, when the user selects the cancel icon **236** for the schedule box **231***b* of a planned schedule prior to the current time, the schedule box **231***b* for the canceled planned schedule may be displayed with a fade effect and a strikethrough applied to the text, and a cancel icon (e.g., "X") **234***e* may be displayed at the top center of the schedule box **231***b*. Additionally, when the mouse hovers over (or a touch is performed on) the schedule box **231***b* where the cancel icon has been selected, the schedule box **231***b* may be displayed prominently along with a color label in a third color (different from the first color and the second color) at the top.

[0174] As described above, according to an embodiment of the present disclosure, through the process of determining the status of the schedule box for a planned schedule in the second timeline as described above, the user may easily identify whether their planned schedule has actually been performed, deferred, or canceled. Furthermore, data regarding the execution status of planned schedules may be effectively collected, allowing it to be utilized as meaningful statistical data by the calendar management server and/or the institution server.

a Method of Inputting Categorized Schedules

[0175] According to an embodiment of the present disclosure, in the calendar application, the user may input a categorized schedule using at least one of the category selection window, input panel, timeline, or schedule display table. Hereinafter, a detailed method for this process will be described.

[0176] FIG. **17***a* is a flowchart illustrating a method of inputting categorized schedules through the calendar application according to an embodiment of the present disclosure.

[0177] Referring to FIG. **17***a*, in step S**10**, the calendar application may provide one or more selectable item buttons corresponding to a specific category for a schedule in the user interface. According to one embodiment, the one or more selectable item buttons corresponding to a specific category for the schedule may be provided in at least one of the category selection window **210** and the input panel **220**.

[0178] According to an embodiment of the present disclosure, as illustrated in FIG. **6**, the calendar application may be configured to allow the input of four categories for a schedule. In the example of FIG. **6**, the category selection window **210** may provide an item button **211***b* for the first category **211**, one or more item buttons **212***a*, **212***a*', **212***b*, and **212***c* for the second category **212**, one or more item buttons **213***a* for the third category **213**, and one or more item buttons **214***a* for the fourth category **214**. For example, the first category may be a department category, the second category may be a category for classifying fields or teams, the third category may be a category for classifying projects, and the fourth category may be a category for classifying works.

[0179] However, referring to FIG. **18**, which illustrates examples of category selection windows **210***a* and **210***b* in the calendar application according to other embodiments of the present disclosure, the category selection window **210***a*

may include only the item buttons for the first to third categories **211**, **212**, and **213**, while the category selection window **210***b* may include only the item buttons **213***a* for the third category **213**. The configuration of such a category selection window **210***b* may vary depending on the environment of the user device (e.g., in mobile devices such as smartphones, where display space is limited, only item buttons for some categories may be displayed) or on the design of the calendar management server or institution server, and is not limited thereto.

[0180] Meanwhile, according to one embodiment, in step S**10**, the one or more selectable item buttons provided in the user interface of the calendar application may be one or more item buttons recently used by the user (i.e., when the default setting is the "Recent" item button) or all item buttons of a specific category (i.e., when the default setting is the "All" item button).

[0181] In step S**11**, a selection may be received from the user for at least one of the one or more selectable item buttons corresponding to a specific category for the schedule, which are provided in the user interface. That is, if necessary, the user may select two or more item buttons simultaneously, allowing flexible input of categories for the schedule.

[0182] In step S**12**, one or more item buttons of a lower or upper category associated with at least one item button selected by the user may be presented in the user interface. As a non-limiting example, when the user selects one of the item buttons provided in the category selection window **210**, the item buttons of the lower or upper category associated with the selected category of the item button may be presented in a certain area of the category selection window **210** and/or in a certain area of the input panel **220** (e.g., the item display section **223**).

[0183] Alternatively, if the user has selected one of the item buttons provided in the category selection window **210**, but no user selection has been made for an upper category, the item buttons of the upper category associated with the category of the selected item button may be presented in a certain area of the category selection window **210** and/or a certain area of the input panel **220** (e.g., the item display section **223**).

[0184] According to one embodiment, one or more item buttons of a lower or upper category may be ranked based on the user's frequency of use and presented in the user interface (e.g., at least one of the category selection window **210** and the input panel **220**), or only a predetermined number of item buttons may be recommended and presented in the user interface based on the frequency of use. As will be described later, in another embodiment, recommendations for item buttons may be performed based not on frequency of use but on an artificial neural network module.

[0185] Meanwhile, according to a non-limiting example, when the item buttons of a lower or upper category are displayed in both the category selection window **210** and the input panel **220**, the number of item buttons presented in the input panel **220** may be smaller than the number of item buttons presented in the category selection window **210**. The item buttons presented in the input panel **220** and the category selection window **210** may be a predetermined number of item buttons recommended by the calendar application based on factors such as frequency of use. However, various modifications may be possible regarding the specific method of presenting the item buttons, and the present disclosure is not limited thereto.

[0186] As previously described, the calendar application according to an embodiment of the present disclosure may associate two or more categories with a schedule. However, from the user's perspective, manually entering two or more categories for every schedule may feel cumbersome. Accordingly, through step S**12**, even if the user selects a category, i.e., an item button, for the schedule they intend to enter at least once using at least one of the category selection window **210** and the input panel **220**, the calendar application may automatically present or recommend item buttons for lower categories or upper categories associated with the selected item button. This may assist the user in easily performing lower or upper category input.

[0187] That is, according to an embodiment of the present disclosure, by the user selecting an item button for a lower category, one or more item buttons for upper categories may be automatically selected or recommended, and conversely, by the user selecting an item button for an upper category, one or more item buttons for lower categories may be automatically selected or recommended.

[0188] Each item button presented to the user for selection is associated with one or more item buttons for upper categories. Therefore, when the user selects a specific item button, it is equivalent to selecting not just a single category but also all associated upper categories. Through this, the user may significantly reduce the effort required to manually enter the schedule's categories one by one.

[0189] In step S**13**, a selection of at least one among the item buttons of the lower category may be received from the user.

[0190] In step S**14**, a selection of the registration button for registering the schedule may be received.

[0191] In step S**15**, in response to the user selecting the registration button, a schedule item may be generated in at least one of the timeline and the schedule display table of the calendar application's user interface. The generated schedule item pertains to a categorized schedule that has undergone the category input process (steps S**10** to S**13**).

[0192] Through the categorized schedule input method as described above, the calendar application according to embodiments of the present disclosure enables institutions or the calendar management server to collect categorized schedule data from individual users. Such categorized schedule data has a significant qualitative difference compared to general schedule data that is not classified. Particularly, when four categories may be assigned to schedule data, meaningful statistical data may be obtained to effectively grasp not only the work efficiency and work progress status of individual users but also those of an entire institution, organization, or group.

[0193] FIG. **17***b* is a flowchart illustrating a method of inputting a categorized schedule through a calendar application according to another embodiment of the present disclosure. FIG. **17***a* relates to a case where four categories are associated with a schedule that may be input through the calendar application.

[0194] Referring to FIG. **17***b*, in step S**20**, a category selection window displaying four categories, as illustrated in FIG. **6**, may be provided in the user interface of the calendar application, and item buttons for each category may be displayed in the category selection window according to the default settings for each of the four categories.

[0195] Describing in more detail the default settings for each of the four categories associated with the schedule, first, among the four categories, the first category may be a "department" category and may be set by default to the department to which the user currently belongs (e.g., General Affairs Department).

[0196] Additionally, the second category may be a "field" or "team" category, and instead of selecting a specific field or team within the second category, the recent button **212***b* (in FIG. **6**) may be set as the default. This is based on the consideration that there is a relatively high likelihood that the user will continue performing works in the field or team where they recently worked. Alternatively, in another example, the "All" button **212***a*' (in FIG. **6**) may be set as the default.

[0197] Additionally, the third category may be a "project" category, and if the recent button is set as the default in the second category, one or more item buttons **213***a* related to the field or team of the most recently performed schedule may be displayed. Alternatively, if the all button is set as the default in the second category, all item buttons **213***a* of the second category may be displayed.

[0198] Furthermore, the fourth category may be a task category, and similarly, if the recent button is set as the default, one or more item buttons **214***a* corresponding to the works recently performed by the user may be displayed. Alternatively, item buttons corresponding to all works performed by the user may be displayed as an option.

[0199] Optionally, in addition to the category selection window, item buttons may also be displayed by default in the first item display section **223***a* and/or the second item display section **223***b* of the input panel **220**. The item buttons displayed by default in the input panel may be item buttons recommended by the calendar application based on usage frequency or other criteria.

[0200] In step S**21**, at least one selection may be received from the user among the selectable item buttons for the four categories of the schedule provided in the category selection window or the input panel. For example, the user may change the first category in the category selection window or select at least one item button corresponding to a field/team or project in which they wish to enter a schedule from among the second category (field or team category), the third category (project category), and the fourth category (work category).

[0201] In step S**22**, at least one item button associated with a lower category related to the at least one item button selected by the user may be displayed in the category selection window and/or the input panel.

[0202] For example, when the user selects an item button of the second category (team or field), the item buttons of the third category, which are related to the team or field corresponding to the selected item button of the second category, may also be displayed on the first item display section of the category selection window and the input panel. Similarly, the item buttons of the fourth category may also be displayed on the second item display section of the category selection window and the input panel accordingly.

[0203] As another example, when the user selects an item button in the third category (project), the item buttons in the fourth category, which are associated with the selected item button in the third category, may also be displayed in at least one of the category selection window and the second item display section of the input panel accordingly.

[0204] Meanwhile, according to one embodiment, one or more item buttons in the lower category may be ranked based on the user's usage frequency and displayed in the category selection window and/or the input panel, or only a predetermined number of item buttons may be displayed based on the usage frequency. Additionally, in another example, recommendations for item buttons may be performed based on an artificial neural network module rather than usage frequency.

[0205] Meanwhile, according to a non-limiting example, when the item buttons in the fourth category are displayed in both the category selection window and the input panel, the number of item buttons displayed in the second item display section of the input panel may be smaller than the number of item buttons displayed in the category selection window and may be recommended based on usage frequency. However, the specific method of displaying item buttons may be implemented in various modified forms and is not limited thereto.

[0206] As previously described, the calendar application according to an embodiment of the present disclosure may be configured to allow input of four categories for a schedule. However, requiring the user to manually input all four categories for every schedule may be perceived as cumbersome from the user's perspective. Accordingly, through step S**22**, even if the user selects a category, i.e., an item button (e.g., a third category) for the schedule they wish to input at least once through at least one of the category selection window and the input panel, the calendar application may automatically display or recommend item buttons of a lower or upper category (e.g., a fourth category) associated with the user-selected item button. This may assist the user in easily performing the input of lower or upper categories.

[0207] That is, according to an embodiment of the present disclosure, by the user selecting an item button of a lower category (e.g., a fourth category), at least one item button of an upper category (e.g., a third category) may be automatically selected or recommended, and conversely, by the user selecting an item button of an upper category, at least one item button of a lower category may be automatically selected or recommended.

[0208] More specifically, since each item button presented for selection to the user is associated with at least one item button of an upper category, for example, when the user selects a specific item button of the third category, it is effectively equivalent to selecting the first category and the second category associated with the selected item button.

[0209] Additionally, in another example, when the user selects a specific item button of the fourth category without having selected an item button of the third category, there may be cases where the selected item button of the fourth category is associated with two or more item buttons of the third category. In this case, in the first item display section **223***a* of the input panel **220**, item buttons of the third category that are associated with the selected item button of the fourth category may be displayed.

[0210] In step S**23**, a selection of at least one among the item buttons of the lower category may be received from the user.

[0211] In step S**24**, a selection of the registration button for registering the schedule may be received.

[0212] In step S**25**, in response to the user selecting the registration button, a schedule item may be generated in at least one of the timeline and the schedule display table of the

calendar application's user interface. The generated schedule item pertains to a categorized schedule that has undergone the category input process (steps S**20** to S**23**).

[0213] As described above, when four categories may be assigned to schedule data, a significant effect occurs in that meaningful statistical data may be obtained to effectively grasp the work efficiency and work progress status of not only individual users but also those of an entire institution, organization, or group.

Artificial Intelligence-Based Category Recommendation Mechanism

[0214] FIGS. **19** and **20** are diagrams illustrating a method for recommending categories for a schedule through an artificial neural network module according to another embodiment of the present disclosure.

[0215] As described above, according to another embodiment of the present disclosure, presenting recommended item buttons in the item display section **223** of the input panel **220**, specifically in the first item display section **223***a* and the second item display section **223***b*, or presenting item buttons belonging to a lower category of the currently selected category in the category selection window **210**, as briefly described above, may be based on selecting recommended item buttons through a recommendation mechanism utilizing artificial intelligence (AI).

[0216] The recommendation mechanism utilizing artificial intelligence in this case may, for example, use at least one of artificial neural network modules such as Transformer, Long-Short Term Memory (LSTM), Recurrent Neural Network (RNN), Convolutional Neural Network (CNN), Generative Adversarial Network (GAN), and AutoEncoder (AE). Alternatively, machine learning techniques such as multi-layer perceptron, Naive-Bayesian classification, and random forest classification may also be employed.

[0217] Referring to FIG. **19**, as a non-limiting example, in a pre-training session of the artificial neural network module **300** for selecting recommended item buttons for schedule categories, pre-training schedule data **310** from multiple existing users may be provided as input to the artificial neural network module **300**. Such pre-training schedule data may include schedule data of each existing user over a predetermined period.

[0218] The artificial neural network module **300** may output at least one piece of schedule prediction data **320** based on each piece of input pre-training schedule data **310**. The schedule prediction data **320** may be data that predicts which schedules will be performed by the corresponding user in the future based on the input schedule data.

[0219] Then, in the pre-training session, the schedule prediction data **320** output by the artificial neural network module **300** may be compared with the actual schedule data **330** of real users. Based on this comparison, the artificial neural network module **300** may be pre-trained so that the loss function ($-\Sigma y_i \log p_i$) between the schedule prediction data **320** and the actual schedule data **330** is minimized. For example, the artificial neural network module **300** may adopt a method of updating the weights of the hidden layer based on the loss function or error between the schedule prediction data **320** and the actual schedule data **330**. A plurality of pre-training schedule data **310** is input into each node of the input layer, such as x1, x2, and x3, and based on weights such as w1, it passes through hidden layers such as h1, h2, and h3. Then, using a cost function such as softmax, the predicted schedule prediction data is output as y1 in the output layer. Then, based on the error ($-\Sigma y_i \log p_i$) between the schedule prediction data **320** and the actual schedule data **330**, the weights of the artificial neural network module **300** may be updated through backpropagation.

[0220] Referring to FIG. **20**, in the inference session, when schedule data **310***a* is input into the pre-trained artificial neural network module **300***a*, the pre-trained artificial neural network module **300***a* may output schedule prediction data **320***a* based on this input. Then, based on the schedule prediction data **320***a*, the calendar application **340** may present one or more recommended item buttons **213***a*, **214***a* for a lower or upper category corresponding to the category of the item button selected by the user in the currently input schedule. As a non-limiting example, these recommended item buttons may be presented in at least one of the category selection window and the input panel of the calendar application.

[0221] As described above, an artificial intelligence-based category recommendation mechanism may be introduced into the calendar application by utilizing the artificial neural network modules **300**, and **300***a*. However, various modifications may be made to the specific implementation method of the artificial neural network module, and it is not limited thereto.

Computer-Readable Recording Medium

[0222] The fact that each step or operation of the method according to the embodiments of the present disclosure may be performed by a computer including one or more processors by executing a computer program stored in a computer-readable recording medium is apparent.

[0223] The computer-executable instructions stored in the aforementioned recording medium may be implemented through a computer program programmed to perform the corresponding steps, and such a computer program may be stored in a computer-readable recording medium and executed by a processor. The computer-readable recording medium may be a non-transitory readable medium. At this time, the non-transitory readable medium refers to a medium that does not store data for a brief moment, such as registers, cache, or memory, but rather stores data in a semi-permanent manner and is readable by a device. Specifically, programs for performing the various methods described above may be stored in and provided via non-transitory readable media, such as semiconductor memory devices including erasable programmable read-only memory (EPROM), electrically erasable programmable read-only memory (EEPROM), and flash memory devices; magnetic disks such as internal hard disks and removable disks; magneto-optical disks; and non-volatile memory including CD-ROM and DVD-ROM disks.

[0224] The methods according to various examples disclosed in this document may be provided as part of a computer program product. The computer program product may be distributed in the form of a machine-readable storage medium (e.g., compact disc read-only memory (CD-ROM)) or may be distributed online through an application store (e.g., Play Store™). In the case of online distribution, at least a portion of the computer program product may be at least temporarily stored in a storage medium such as the memory of a manufacturer's server, an application store server, or an intermediary server, or may be temporarily generated.

[0225] As described above, those skilled in the art to which the present disclosure pertains will understand that the present disclosure may be embodied in various specific forms without departing from the technical spirit or essential characteristics thereof. Therefore, the above-described embodiments should be understood as illustrative in all respects and not as limiting. The scope of the present disclosure is defined by the claims set forth below rather

than by the detailed description, and all modifications or variations derived from the meaning, scope, and equivalent concepts of the claims should be interpreted as being included within the scope of the present disclosure.

[0226] The features and advantages described herein do not encompass all possible features and advantages, and in particular, numerous additional features and advantages will become apparent to those skilled in the art upon consideration of the drawings, the specification, and the claims. Furthermore, it should be noted that the language used in the present specification has been primarily selected for readability and instructional purposes and may not have been chosen to describe or limit the subject matter of the present disclosure.

[0227] The foregoing description of the embodiments of the present disclosure has been provided for illustrative purposes. This is not intended to limit the present disclosure to the exact form disclosed or to be made without omission. Those skilled in the art will appreciate that numerous modifications and variations are possible in light of the above disclosure.

[0228] Accordingly, the scope of the present disclosure is not limited by the detailed description but is defined by any claims of the application based thereon. Thus, the disclosure of the embodiments of the present disclosure is exemplary and does not limit the scope of the present disclosure as set forth in the following claims.

1. A method of inputting schedules including multiple categories, comprising:

providing, on a category selection window of a user interface of a calendar application, selectable item buttons corresponding to each of at least two categories of a schedule simultaneously, wherein the at least two categories are associated with each other, and the provided item buttons are set differently for each user;

receiving a selection of at least one item button among item buttons belonging to one of the at least two categories on the category selection window; and

in response to the selection of the at least one item button, modifying and presenting item buttons belonging to the other one of the at least two categories on the category selection window, wherein the number of the modified item buttons is smaller than the number of the item buttons before modification.

2. The method of inputting schedules including multiple categories according to claim **1**, wherein the at least two categories have a relationship as an upper category and a lower category.

3. The method of inputting schedules including multiple categories according to claim **1**,

wherein the user interface includes an input panel configured to input a time and a category for a schedule, and

the method further comprises:

displaying the selected at least one item button on the input panel in response to receiving a selection of at least one item button among item buttons belonging to one of the at least two categories on the category selection window.

4. The method of inputting schedules including multiple categories according to claim **3**,

wherein the modifying and presenting item buttons belonging to the other one of the at least two categories on the category selection window in response to the selection of the at least one item button comprises:

presenting at least some of the modified and presented item buttons belonging to the other one of the at least two categories on the input panel.

5. The method of inputting schedules including multiple categories according to claim **4**,

wherein the input panel includes a first item display section and a second item display section,

wherein the selected at least one item button is presented in the first item display section of the input panel, and

wherein at least some of the modified and presented item buttons belonging to the other one of the at least two categories are presented in the second item display section of the input panel.

6. The method of inputting schedules including multiple categories according to claim **1**,

wherein the modifying and presenting item buttons belonging to the other one of the at least two categories on the category selection window in response to the selection of the at least one item button comprises:

presenting the modified and presented item buttons by ranking them based on usage frequency.

7. The method of inputting schedules including multiple categories according to claim **1**, wherein:

the categories of the schedule include a first category, a second category, a third category, and a fourth category in order from upper to lower;

the one of the at least two categories on the category selection window is the third category, and the other of the at least two categories is the fourth category; and

by selecting the selected at least one item button, the first category and the second category are automatically determined.

8. The method of inputting schedules including multiple categories according to claim **1**,

wherein, before receiving the selection of an item button, the selectable item buttons corresponding to each of the at least two categories of the schedule presented on the category selection window include either item buttons recently used by the user or all item buttons of a specific category.

9. The method of inputting schedules including multiple categories according to claim **1**, further comprising:

receiving a selection of at least one of the modified and presented item buttons;

receiving a selection of a registration button for registering the schedule; and

in response to the selection of the registration button, generating a schedule item in at least one of a timeline or a schedule display table of the user interface.

10. A method of inputting schedules including multiple categories, comprising:

providing, on a category selection window of a user interface of a calendar application, at least one selectable item button for a specific category of a schedule;

receiving a selection of at least one item button among the at least one item button on the category selection window; and

presenting, on an input panel of the user interface, at least one item button for a category associated with the category to which the selected at least one item button

belongs, wherein the input panel is configured to receive user input for time and category of the schedule.

11. The method of inputting schedules including multiple categories according to claim **10**,

wherein the category associated with the category to which the selected at least one item button belongs is an upper category or a lower category of the category to which the selected at least one item button belongs.

12. The method of inputting schedules including multiple categories according to claim **10**,

wherein the categories of the schedule include a first category, a second category, a third category, and a fourth category in order from upper to lower;

wherein the category to which the selected at least one item button belongs is the third category;

wherein the category associated with the category to which the selected at least one item button belongs is the fourth category; and

wherein by selecting the selected at least one item button, the first category and the second category are automatically determined.

13. An apparatus implementing an application for inputting schedules including multiple categories, the apparatus comprising:

a processor; and

a memory including computer-executable instructions,

wherein the computer-executable instructions, when executed by the processor, cause the processor to:

provide, on a category selection window of a user interface of a calendar application, selectable item buttons corresponding to each of at least two categories of a schedule simultaneously, wherein the at least two categories are associated with each other, and the provided item buttons are set differently for each user;

receive a selection of at least one item button among item buttons belonging to one of the at least two categories on the category selection window; and

in response to the selection of the at least one item button, modify and present item buttons belonging to the other one of the at least two categories on the category selection window, wherein the number of the modified item buttons is smaller than the number of the item buttons before modification.

14. A computer-readable recording medium storing computer-executable instructions,

wherein the computer-executable instructions, when executed by a processor, cause the processor to:

provide, on a category selection window of a user interface of a calendar application, selectable item buttons corresponding to each of at least two categories of a schedule simultaneously, wherein the at least two categories are associated with each other, and the provided item buttons are set differently for each user,

receive a selection of at least one item button among item buttons belonging to one of the at least two categories on the category selection window; and

in response to the selection of the at least one item button, modify and present item buttons belonging to the other one of the at least two categories on the category selection window, wherein the number of the modified item buttons is smaller than the number of the item buttons before modification.

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