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# Group Prototype

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# Chapter 1

## Introduction

The user interface of a desktop environment is extremely important for the user because it is used whenever he/she accesses the computer. The user interface forms a layer between the user and the computer, the applications, the documents etc. Therefore, it is very important to make the user feel comfortable and not to create any interaction obstacles. The main goal is high task efficiency.

To achieve this objective, we decided to make the metaphor of the system as realistic as possible.

The desktop environment will look like a real office with all its appropriate equipment. Working in this environment should be as straightforward as working in a real office. The user interface will be rendered in a 3D fashion to make the metaphor even more realistic.

We expect to achieve very high level of learnability because many actions the user can take will be very similar to the real life. Even beginners, who will have never worked with a computer, will be able to carry out many tasks with only a little or no time needed for learning.

Moreover, all the items in the office will have a little effect on the “mouse over” event, which will give the user a hint on what can be done with that object. A door or a drawer will open a little bit, desktop will show its preview etc.

The user will be allowed to personalize the environment and the layout, i.e. to change the placement of the furniture and other equipment; to change color of the furniture and the walls; and also to reshape some of the items in the office.

# Chapter 2

## Working in the office

### 2.1 The 3D office environment

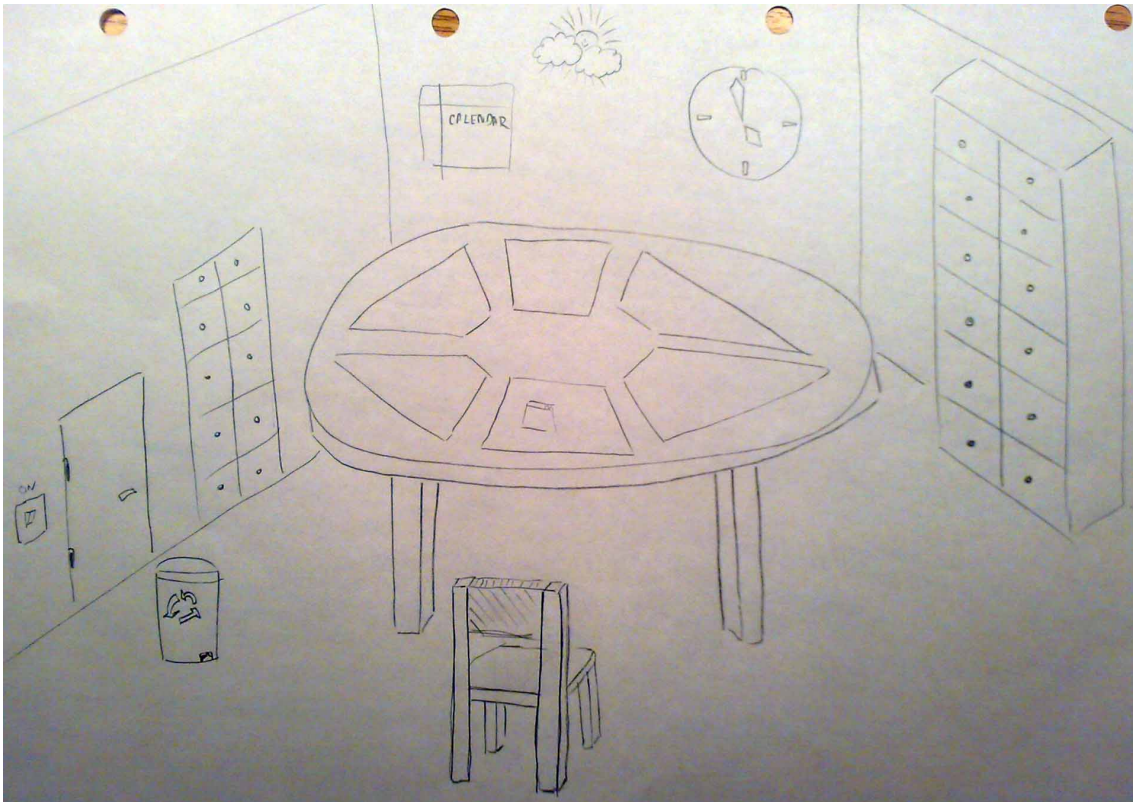


Figure 2.1: General view

When the user logs in, he will be located in his/her own office. This is illustrated by figure 2.1.

In the center of the office, there is a work table. The table is round because its desk can be rotated (explained later). On the desk of the table, there are several virtual desktops. The purpose of these desktops is similar to desktops in classical desktop environments. The number of the desktops is customizable. The chair

denotes which virtual desktop the user was working with last. This is effectively always the foremost desktop but it is good to draw the chair in order to follow the metaphor.

The back wall serves for placing widgets. Again, the purpose of the widgets is similar to widgets in classical desktop environments (i.e. calendar, clock, weather forecast etc.).

At the right wall, there is a cabinet which is basically only a set of drawers. The drawers serve mainly for accessing documents and other files. Additionally, installed applications and applications repository will be accessible through the drawers (explained later).

At the left wall, there is another cabinet. This one has very similar purpose as the first cabinet, but is meant to be used for shared documents and folders etc.

The door is a metaphor for logging out. There are several ways how to log out and this depends on the state of the light switch which is located near the door (explained later).

The last important thing we can see in the office is the recycle bin. The recycle bin can accept multiple heterogeneous object, e.g. documents, folders, applications, widgets etc.

## 2.2 Views

The user interaction with the environment will be based mainly on using mouse. The user will be able to move around the office to some extent. The movement will usually be initiated by clicking some object in the environment.

In the following text, every position the user can move into, is called a “view”.

After logging in, the user will be located in the “general view”.

Clicking on any desktop on the table will result in displaying the desktop in a “desktop view”, i.e. the desktop will be displayed in a full screen fashion.

Clicking anywhere else on the table will bring the “virtual desktops view”. This view will display only the table desk from above showing all the virtual desktops. This could come in handy if the user were using many desktops because it will be easier to see what each desktop contains (documents, applications etc.). Desktop switching is explained later.

Clicking on the back wall will bring the “widgets view”. This is illustrated by figure 2.2.

Clicking on a widget in the general view or in the widgets view will bring the “widget view” which will be different for each of the widgets. For example the user may have the clock all over the screen, or the calendar etc.

Clicking on the cabinet will bring a “cabinet view”. The user can open the drawers and view its contents from the general view. Although, doing this in the cabinet view will be more comfortable because the items will be bigger. Nevertheless, the best view for viewing the contents of a drawer will be the “drawer view” which is the metaphor analogy for a file browser.

Figure 2.4 illustrates the drawer view. The documents in a drawer are organized hierarchically. This hierarchy is illustrated by the left pane of the window (classical

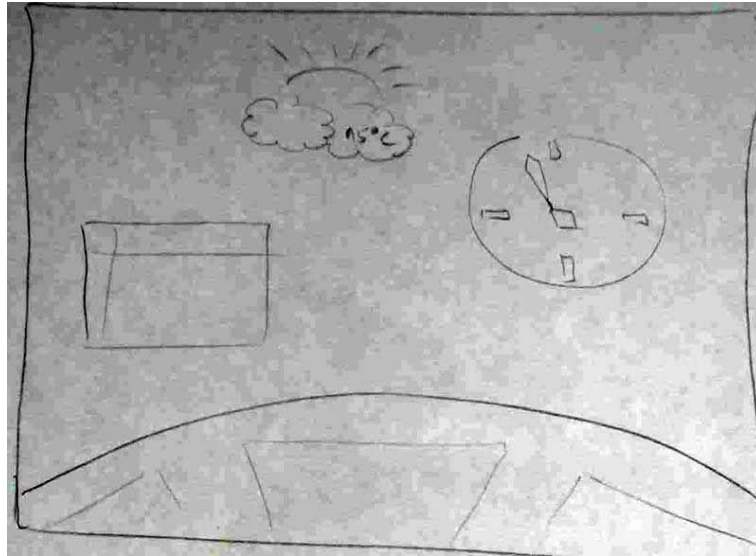


Figure 2.2: Widgets view

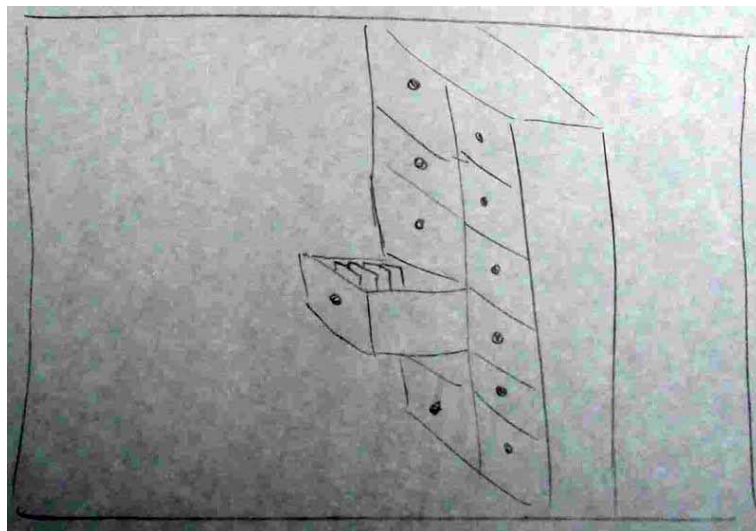


Figure 2.3: Cabinet view

directory tree view). The right pane displays the content of the currently active folder. The top pane displays the path of the current location.

## 2.3 Navigating among views

The main way of navigating among views is clicking on objects. As described earlier, user can click on the back wall, the cabinet, the drawer, the table and other objects.

The other way is using “named views”. The most important views (e.g. general view, cabinet view, widgets view, applications drawer view) already have their names which cannot be changed. The other views can be named. First, the user navigates

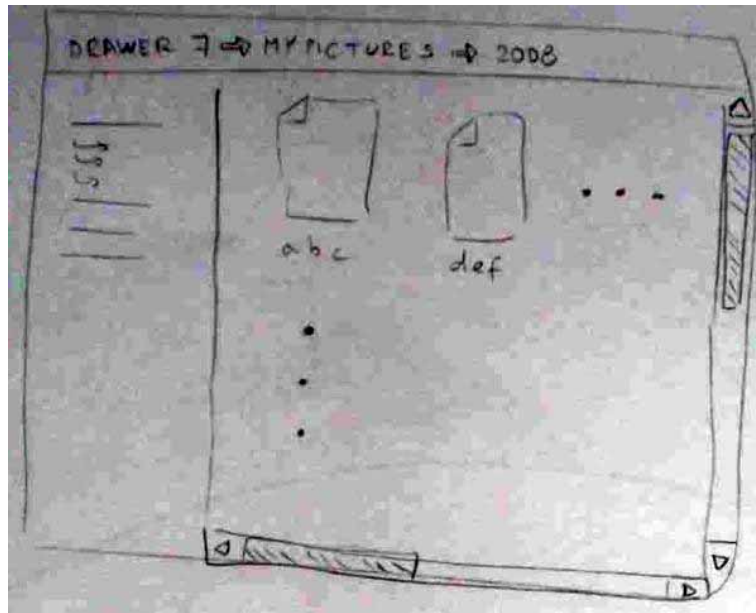


Figure 2.4: Drawer view

his way by clicking all the way to the desired view. Then the user sets a name for the view (invoking a naming command, the way of doing this is not yet decided). Subsequently, a shortcut will be automatically placed to a “navigation panel”.

There are three “navigation panels”, placed on the left, top, and right border of the screen. They are hiding automatically and will show up after moving the cursor to the most left, top, or right position (respectively). A “navigation panel” is simply a set of shortcuts to the named views. The shortcuts are created automatically for all named views.

Let’s give an example. The user navigates to a drawer and then to some folder. Then, the user gives a name to this view. From this time, a shortcut is available in the navigation panel.

The position of the shortcut depends on the actual location of its target. This means, for example, that shortcuts for the cabinet on the right side of the office will be located in the right navigation panel. Similarly, shortcut for the widgets view and all named “widget” views will be located in the top navigation panel.

Figure 2.5 shows the top navigation panel in use. There are only three shortcuts for simplicity now. The first one is a shortcut to the virtual desktops view; the second one is a shortcut to the widgets view; and the last one is a shortcut to the view named by the user as e.g. “my calendar”.

If the shortcut leads to a view which is located in a drawer, staying with the mouse cursor at the shortcut for a specific time period will invoke a preview of what can be found in the target view. This is illustrated by figure 2.6.

Navigating from one view to the other will always be accompanied by a nice effect of fast flying from the current location to the new one. This will support the user’s mental model and keep it up-to-date.

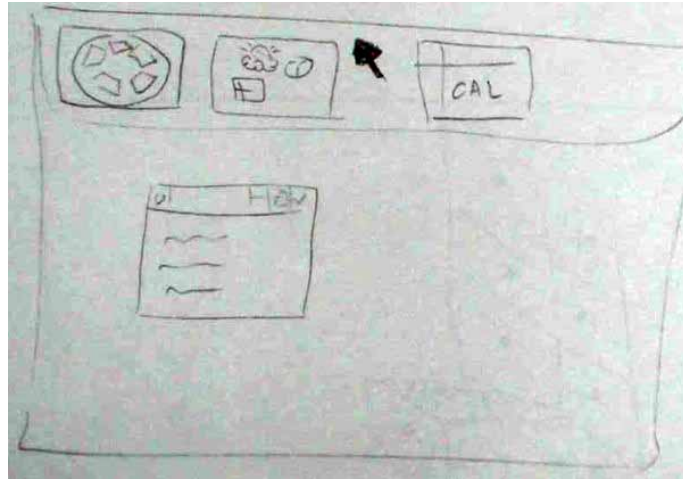


Figure 2.5: Navigation panel

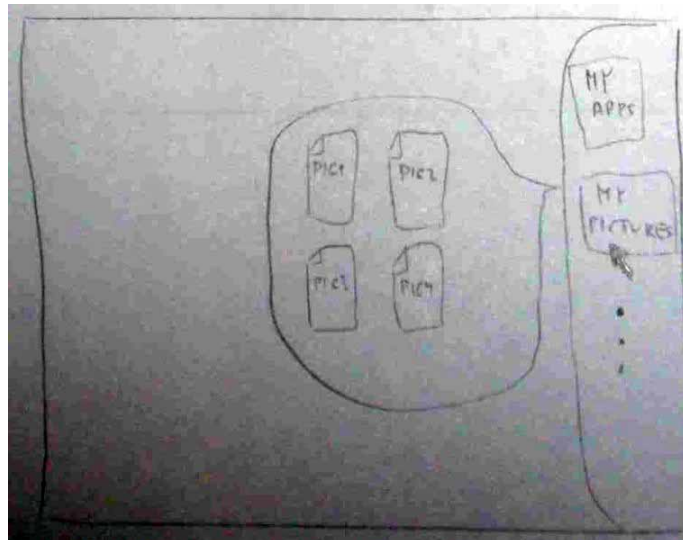


Figure 2.6: Previewing the target of a shortcut

## 2.4 Integrated concept of Drag & Drop

### 2.4.1 General idea

All the objects (documents, folders, widgets, applications, etc) in the whole office environment should be able to move to different places like in the manner as in a real office. Therefore the best way is the use of the “Drag & Drop” feature through the mouse.

### 2.4.2 Features

With the Drag & Drop method the user is able to do the following scenarios:



- Moving objects (widgets, documents, folders, pictures, movies) from one place to another,
- Copying objects (documents, folders, pictures, movies) from one place to another,
- Remove objects (documents, folders, pictures, movies) from the local place by moving to the Recycle bin,
- Installing applications by moving from the drawer “Application Repository” to the drawer “Installed Applications”,
- Uninstall applications by moving from the drawer “Installed Applications” or from the appropriate navigation panel to the Recycle bin,
- Adding widgets to the wall by moving from the drawer “Widget Repository” to the wall,
- Positioning a widget on an special place on the wall,
- Removing widgets from the wall by moving to the Recycle bin

### 2.4.3 Visual effects

In order to facilitate the understanding and learning process what this feature make and how it can be used the user get a visual feedback if he drags one or more objects. The simplest way to achieve a realistic feedback is to put a visual representation of the objects on the mouse cursor during the while “Drag & Drop” process (see figure 2.7). This visual representation is further facilitated through an visual effect which let the dragged objects dangle.

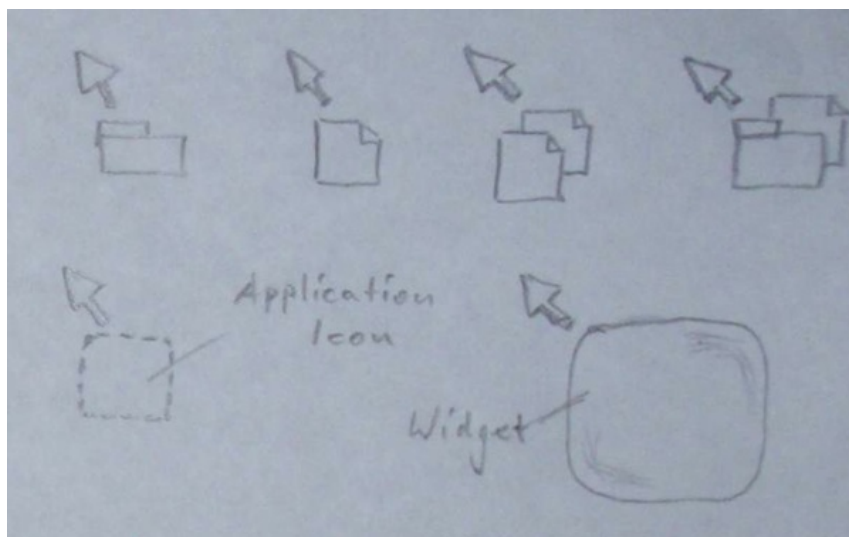


Figure 2.7: Drag & Drop concept

The objects are bound on the mouse cursor until the user terminates this process either through the ESC key or through a cancel option in a context menu or the user finishes the process. In the case of moving and copying documents, folders, pictures, etc. the user has to finish the Drag & Drop process by choosing the desired option from the context menu of the desired location.

In the whole meantime of the process the user is able to all things in the environment. He can change to an other view, navigate through a folder structure or can open drawers. The process will not cancel until the user terminates or finish the process.

# Chapter 3

## Items in the central Office view

### 3.1 Office Table and virtual desktops

The desktop environment enables to have several virtual desktop. We see here how it is possible to switch of desktops.

#### 3.1.1 The office table

In our desktop environment, the office desk is the center of all and one of the main parts of the metaphor. The desk contains, on its table, all the virtual desktops. They are represented by work areas (you can see that on figure 2.1, page 3, or on the figures of that chapter). That should make the mental model that using the computer is rather the same than working on its own desk, having some stacks of papers and documents, going from one to another. So it is that table that will be the support of virtual desktops management: selecting, switching...

#### 3.1.2 Go to / switch of virtual desktop

When the user logs in, he arrives in the view of the whole office. Then he can go to a virtual desktop, to work. For that, the only thing is to click on the wanted desktop, that makes the user go to the desktop. Once on one desktop, to switch of desktop, the user has to come back to the general view, and then click on the wanted desktop. There are several means to re-display the general view it: putting the mouse on the left bottom corner, by a mouse gesture going down, and by keyboard shortcut (press and release of super/windows key).

#### 3.1.3 To which desktop should I go?

A problem can occur, when looking at the table, and seeing the desktop representations. Indeed, how the user can know which is the desktop he wants to go? We can't assume that the user will remember which windows is in which desktop, because the user will necessarily forget some or all of these. So we provide a mean to preview the desktops, in order for the user to know where to go. This is rather simple: when putting the mouse over the table, and clicking on the table (like in figure 3.1), the

table comes wider in the screen. Like that, the user will be able to see miniatures of the windows which are opened in each desktop.

Moreover, there is a problem of previewing: as the table is round, the desktops opposite to the user are in the wrong sense, upside-down. So the preview also rotates the desktops, with the goal to make them appear in the right position, so that it would be able to see / read / view things correctly.

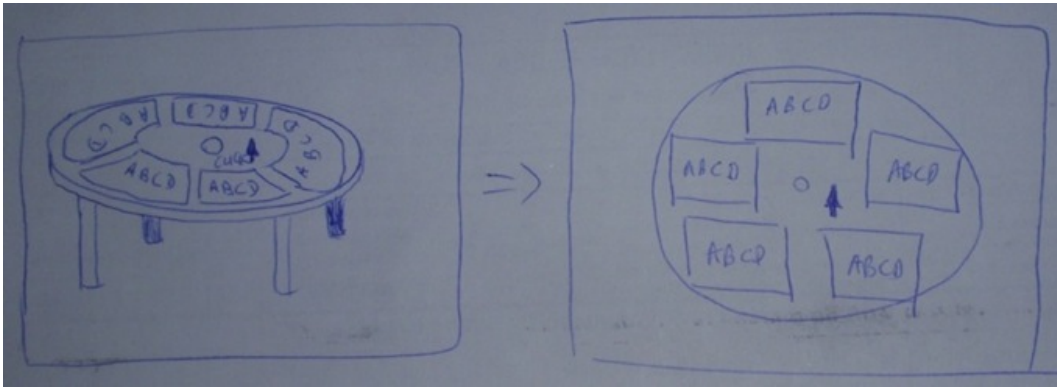


Figure 3.1: How to have a better preview of desktops

Once the user has seen the right virtual desktop, he can click on it, and then the action to go to this virtual desktop is launched. The desktop becomes maximized in full screen, the user is on the select desktop (like in figure 3.2).

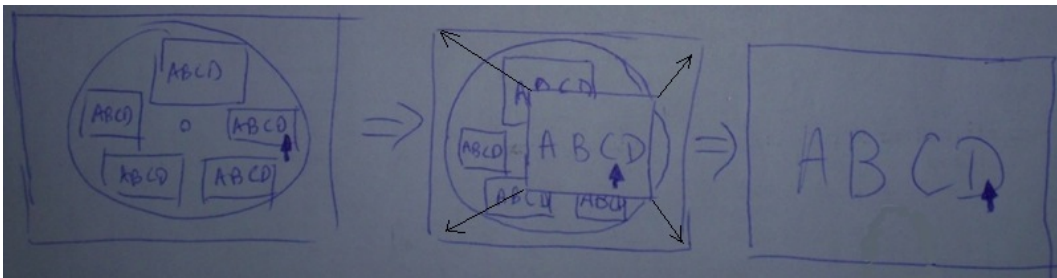


Figure 3.2: How to go to a virtual desktop

### 3.1.4 To be in front of the right desktop

So, the user can select a desktop far from “him”, in other words, far from the chair. That can be disturbing: why am I working in a place far from my chair? It can destroy the metaphor effect, and the mental model created by the user. So it is necessary to put the desktop right in front of the chair. For that, when a user selects a desktop to go to, the table is automatically turned, before the desktop would be full screened, like in figure 3.3.

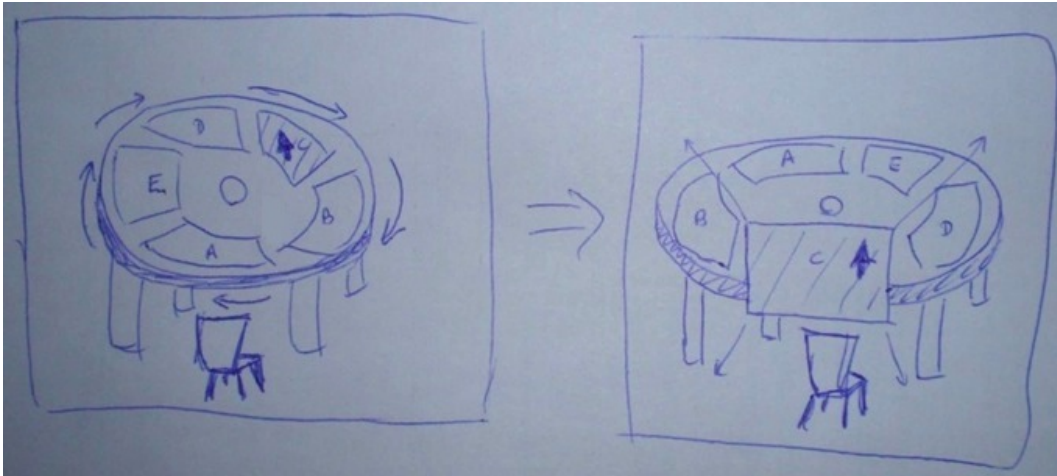


Figure 3.3: Putting the desktop in front of the user

## 3.2 Cabinets

### 3.2.1 General idea

Many users do not have the technical knowledge what a file system is, how it works and where are the documents in the file structure are stored or how application can be installed. To improve this situation the cabinets in the 3D office environment shall give the user a better understanding how to find all the documents, applications, widgets or other objects which can be useful on a computer system. The cabinets and their drawers give the user a feeling comparable to the real world which improves the retrieving of the several objects and speeds up the learning process for beginners.

### 3.2.2 Features

In the 3D office environment there exists two different cabinets (see figure 2.1). In the default setting the user can find on the right side of the office a cabinet for all local things on the computer system. This cabinet is placed in the virtual office. On the left side of the room standard is a cabinet in the wall. This shall symbolise that the contents of the drawers are remote or shared with other users. These drawers are useful in a network, for instance in an organisation or company.

The local cabinet on the right side contains drawers for different areas. Here the user can find the installed applications, an application repository, a widget repository, access to all system control options and by default a drawer to the user's documents. Further the user is able to customise empty drawers, for instance to the location of pictures, movies, etc.

### 3.2.3 Visual effects and use

In order to give the user a good handling of all items in the office environment all the items are equipped with a visual feedback. In the case of the cabinets the drawers

are opening if the user moves the mouse over and are closing if he leaves the drawer with the mouse (see figure 3.4).

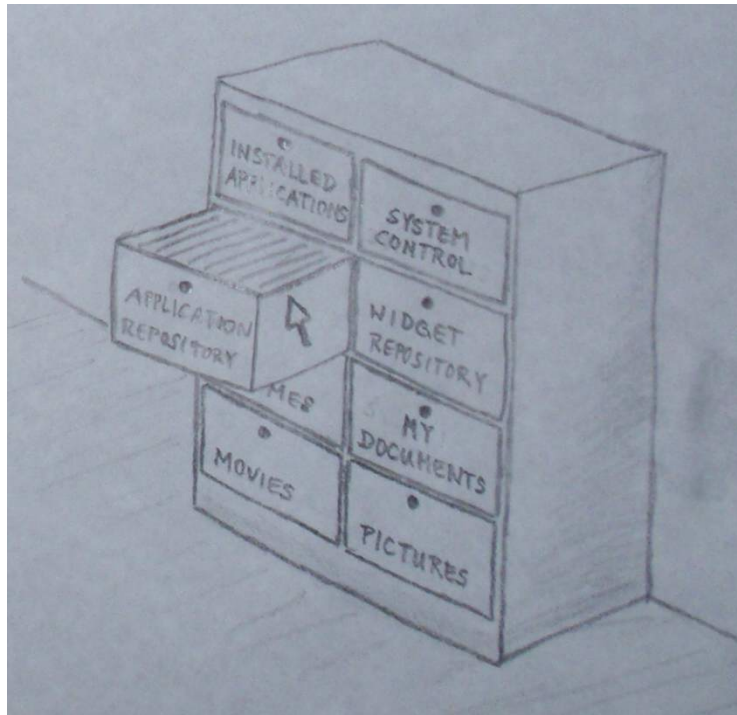


Figure 3.4: Cabinet and the visual effect

To see the content of the drawer the user has to click on the opened drawer. This will change to the view of the chosen drawer with an zooming-in effect. The view of the drawer's content can either be an overview of further options or a hierarchical view like in a file browser. The second case is useful to navigate through the folder structure to find a desired document, to copy, move or remove documents/folders or to create folders. For design of the hierarchical view see the description in section 2.2.

The first case, the overview of further options is shown if the user look in the drawer of the application and widget repository, but also in the case of the installed applications and the system control. Here, the user can only select, drag or click on an object. In the case of selection the user is able to enable the context menu of the selected object. If the user clicks on the object (or depending on the settings double clicking) a appropriate action is started. This can be a installation process, a process to launch a application or to put a widget on a default place on the wall (depending on the chosen object). Except the system control the user can further drag objects with the mouse, for example to add a widget to the wall or to install a new application from the repository. In the last case the user has to drop the chosen application to the drawer with the installed applications and the installation process will be started.

How all the items in the whole 3D office environment the drawers can also accessed from outside the central office view. Therefore the user can choose the desired

drawer from the navigation panel on the edges of the screen where the appropriate cabinet is placed. All the customised drawers and their content are automatically organised in the right order and on the right edge in the dynamic navigation panel.

## 3.3 Recycle bin

### 3.3.1 General idea

The concept of a recycle bin in the desktop environment is a meaningful idea. The metaphor of this concept to put documents or other working objects which are not longer needed to a bin is very realistic and easy to understand.

In the 3D office environment the recycle bin is placed on the bottom of the virtual room. The 3D office allows the user to move the bin to a desired place. To remove documents or other objects from the computer system the user is able to use the Drag & Drop functionality to put the objects in the recycle bin, but also he could use the remove option from the context menu of the item. From outside the 3D office he has just to enter with the dragged object on the mouse or he can drop the object on the bin icon in the navigation panel on the appropriate edge of the screen. This functionality works from every place in the whole environment.

### 3.3.2 Visual effects

To follow the concept of the 3D office environment the recycle bin is equipped with a mouse over effect. This effect opens the cap of the bin and shows the user that he could do anything with the bin (see figure 3.5).

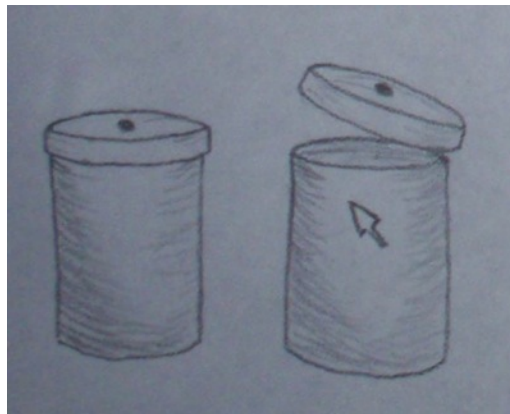


Figure 3.5: Recycle bin and mouse over effect

If the user click on the bin the system changes the view from the office environment or in case of use the icon in the navigation panel from the current displayed view to the view of the recycle bin which shows the user all the objects inside. The transition is aided with a zooming effect.

## 3.4 Walls and Widgets

### 3.4.1 General idea

Widgets are small applications that make the user feel more comfortable or help him/her to accomplish some tasks.

### 3.4.2 Widget management

Widgets can be added from the repository. The main mean of doing this is again drag & drop. The procedure is very similar to installing applications. The difference is that the destination location for the widgets is the back wall.

Positioning the widgets is as simple as moving it with the mouse.

Removing is done by dropping the widget in the recycle bin or by choosing the remove option from the widget's context menu.

### 3.4.3 Access

Clicking anywhere on the back wall or using a shortcut from the navigation panel will bring the "widgets view" (see figure 2.2). This shortcut is automatically present in the navigation panel because the widgets view is a system defined view and its name cannot be changed or removed.

## 3.5 Office Door and corridor

### 3.5.1 Office door

We remind that a user will have three ways of logging out:

1. Logging out leaving all the current applications running and opened windows;
2. Logging out closing all the running applications and opened windows;
3. logging out saving the current session: in this case all the applications and windows will actually close but when the user logs again his session is restored.

A door displayed in the desktop environment will be used to log out (voir Fig.3.6). When the mouse comes over this door it half-opens to show to the user than an action is available. This door leads to a corridor described later.

A button switch will be displayed next to the door with three possible positions (voir Fig.3.6 and Fig.3.7):

1. The first position is to turn off the light.
2. The second position is to turn on the light. It's the default position.
3. The last position is to turn the light in red.



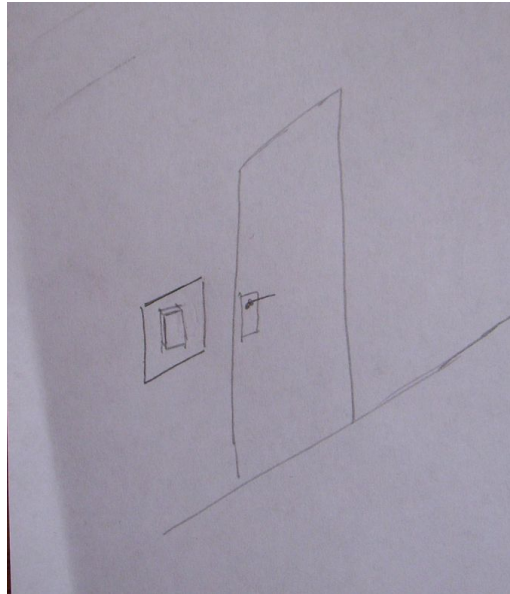


Figure 3.6: Door to log out

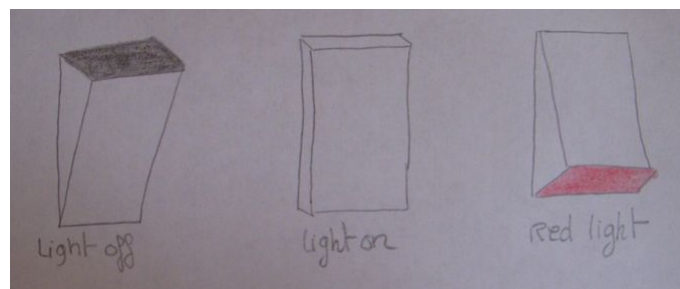


Figure 3.7: Button switch to choose how to log out

So, depending on the position of this switch, the log out will be different.

If the user simply wants to log out (1) he just has to click on the door and then the camera goes through the door, comes into a corridor and turns itself to show the door being closed. At this stage the user now sees the logging interface (with all the doors representing the registered users).

If the user wants to log out, closing all the running applications and windows (2), the action will be quite similar to the one above except he will have to turn off the light before. When the light is off, the desktop environment is still quite visible but it is dark.

Finally, if the user wants to log out saving his session (2), the action will still be the same except he will have to turn the light in red before. The room will then be displayed in red.

### 3.5.2 The corridor

To fit with the metaphor, the logging interface will be represented by a 3D corridor. A certain number of doors will be displayed in this corridor, one door for each user registered in the system. Signs with names of the users will be hanged up to each door to identify users (like in a real office, voir Fig.3.8). When overing a door with the mouse there will be some effect : the door overed will half opens. If the user clicks on a door, the door will completely open and then the camera will come into the room and go in front of the desk.

When he is in the corridor the user easily sees which session are running, which ones are completely closed and which ones are saved : if there is no light around the door, that means that the session is closed, if a yellow light comes out from the room that means that the session of the user is still running, if it is a red light, that means that the user has saved his session.

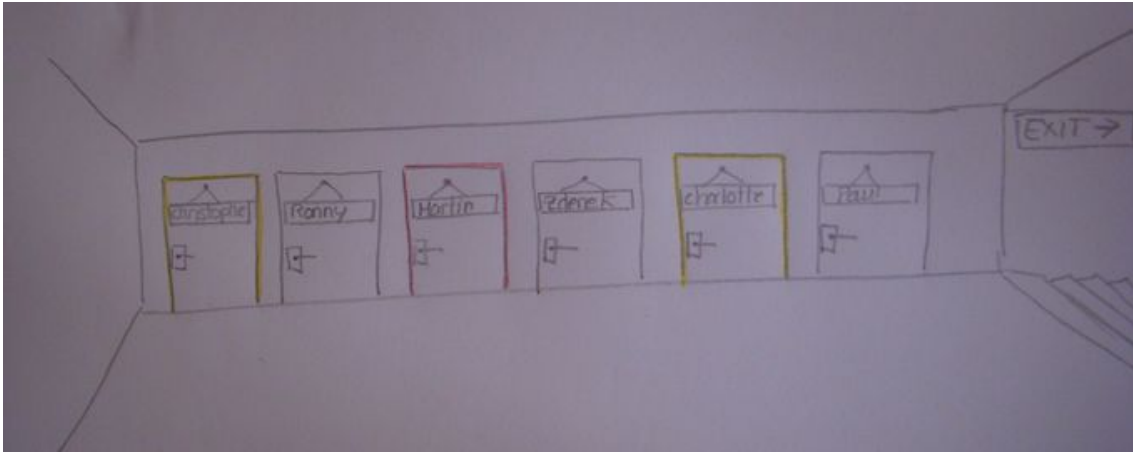


Figure 3.8: Interface for logging in : a 3D corridor

To turn off the computer, the user simply needs to click with the mouse on the stairs.

The interface for logging in will be different for local and remote machines. Indeed, a local machine will be able to display all its users in the log interface (so will display the corridor interface) while it's not possible for a machine as a lot of people can log into it (a computer in an unversity for example, where all students are likely to use it). So, when there is a lot of users in the same computer a common logging in interface will be used. The user will have to manually enter his name in a text area. Once the user has validated his action, he will see a door opening and the camera coming into the room as described earlier. The logging out will be the same than the one described above.