



OpenOffice.org

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Running OOo on Mobile Internet Device

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Agenda



- MID Profile
- Basic office requirements
- Design and implementation
 - Bootstrap process
 - Menubar and Toolbar
 - Document thumbnails arrangement Styles
 - Dialog Box
- Issues and future tasks
- Summary

Terminology



- MID

Mobile Internet Device, is term used by several vendors, including Intel, ARM and TI to describe a multimedia-capable handheld computer providing wireless Internet access

- OOo

OpenOffice.org, the most famous cross-platform opensource office suit

- RedOffice

Based on OpenOffice.org , designed by RedFlag 2000 team since 2001

- D-BUS

D-Bus is a system for low-latency, low-overhead, easy to use interprocess communication (IPC). Please see:

<http://dbus.freedesktop.org/doc/dbus-specification.html#introduction>

MID Product



Hardware & Software of MID



- **Screen Size and resolution:** 4.81" WVGA 800x480 TFT touch screen
- **CPU:** Intel Silverthorne, 800MHz 512K L2 400/533 FSB 45nm
- **Memory:** On-board SDRAM design, 512MB DDR2 533MHz SDRAM
- **HardDisk:** PATA(Parallel Advanced Technology Attachment) interface, SSD (solid state disk): 4G
- **Input Device:** Stylus touch pen
- **OS:** Linux, based on China's Red Flag Linux known as Red Flag MIDINUX

Basic Requirements

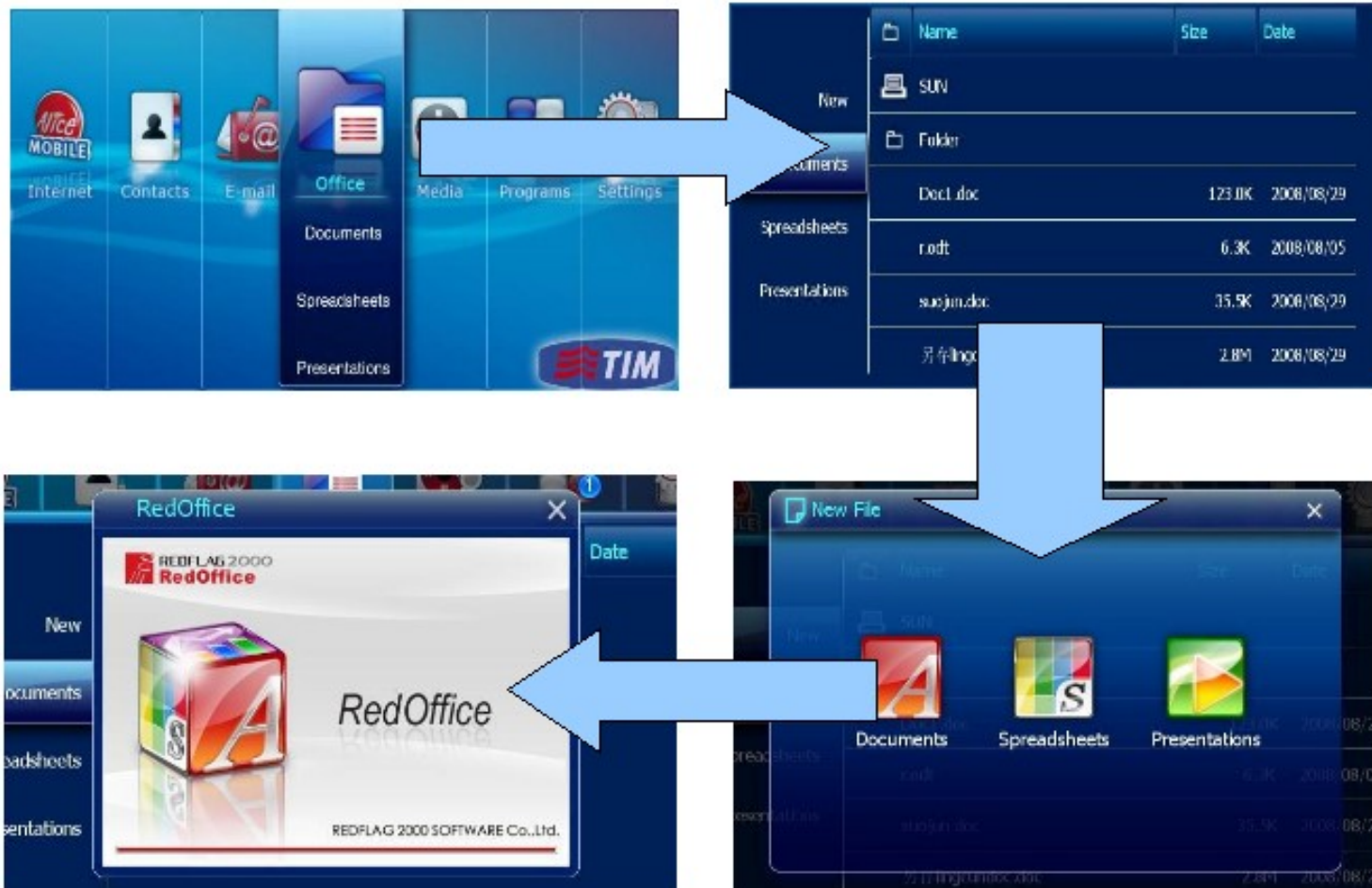


- More editing and reading area should be left for end users because the small screen size and lower screen resolution on MID.
- Redesign the UI to make the MID Office interface more friendly on MID OS, such as Menu, Toolbar, Dialog, workflow.

RedOffice on MID



Office Bootstrap Process



Redesign the Menubar and Toolbar



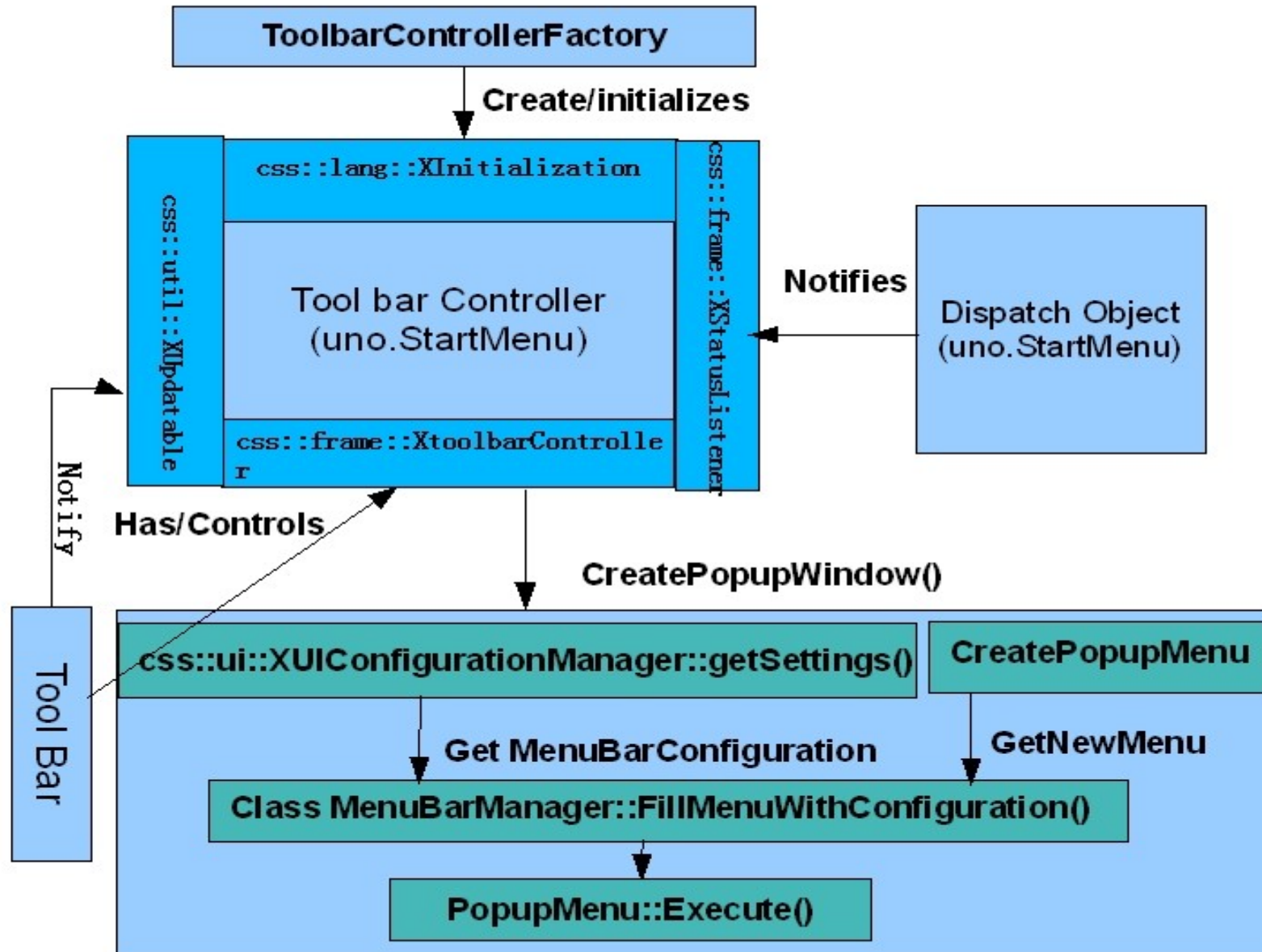
•Issues:

It is too big to MID if we display Menubar and Toolbars at the same time.

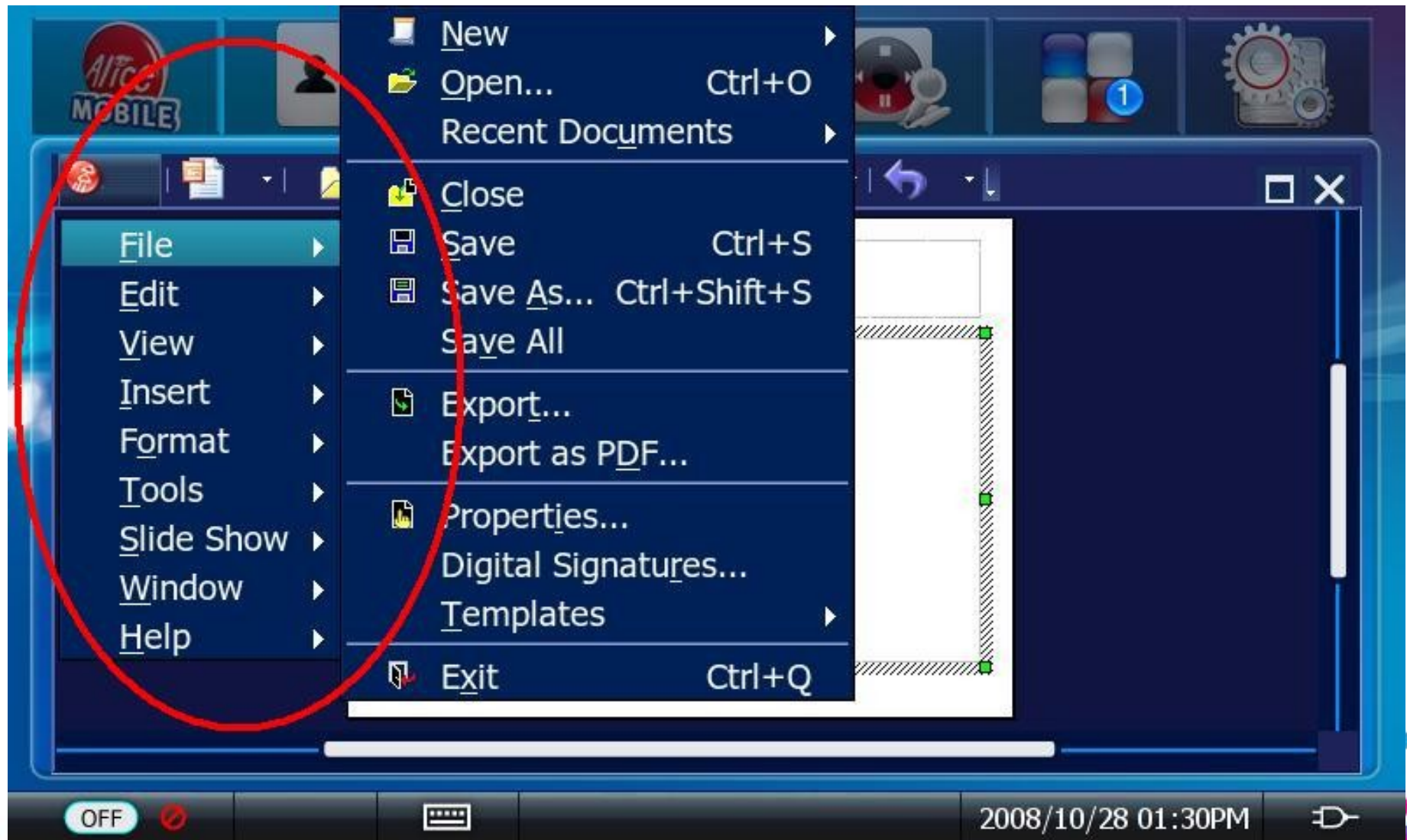
•Ideas:

- ✓ Removed the original Menubar, a new root menu button added to Toolbar in order to trigger the whole pop-up menu.
- ✓ The relationship of OOo multi-level menu remains
- ✓ Cut off less frequently used menu items
- ✓ Put the new designed Toolbar on the top of the screen.

Implementation



Snapshot of combining Menubar and Toolbar



Customized Toolbar



•Issues:

Toolbar button look very small

•Solutions:

- ✓ **Only keep one Toolbar with seven popular buttons**
- ✓ **End-user can customize these seven buttons if they dislike these default buttons**
- ✓ **The max button number of Toolbar is seven**
- ✓ **Change the alignment of Toolbar from “left-align” to “justified” to make the UI more elegant**

Toolbar reorganization



Idea: Toolbar buttons can be handled by modifying the toolbar configure files with the suffix.xml in source dump . The configure xml file define what the toolbar contains sub-items, what functions the button do, as well as whether it can be visible or not. By this way, we can achieve the custom toolbar.

For example:

```
<?xml version="1.0" encoding="UTF-8"?>
<toolbar:toolbar xmlns:toolbar="http://openoffice.org/2001/toolbar" ">
  <toolbar:toolbaritem xlink:href=".uno:DesignerDialog" toolbar:visible="false"/>
  <toolbar:toolbarseparator/>
  <toolbar:toolbaritem xlink:href=".uno:StyleApply" toolbar:visible="false"/>
  <toolbar:toolbarseparator/>
  <toolbar:toolbaritem xlink:href=".uno:CharFontName" />
  <toolbar:toolbarseparator/>
  <toolbar:toolbaritem xlink:href=".uno:FontHeight" />
</toolbar:toolbar>
```

Implementation



In toolbox.cxx

Change the width of toolbar button in

```
ToolBox::ImplCalcItem(){
```

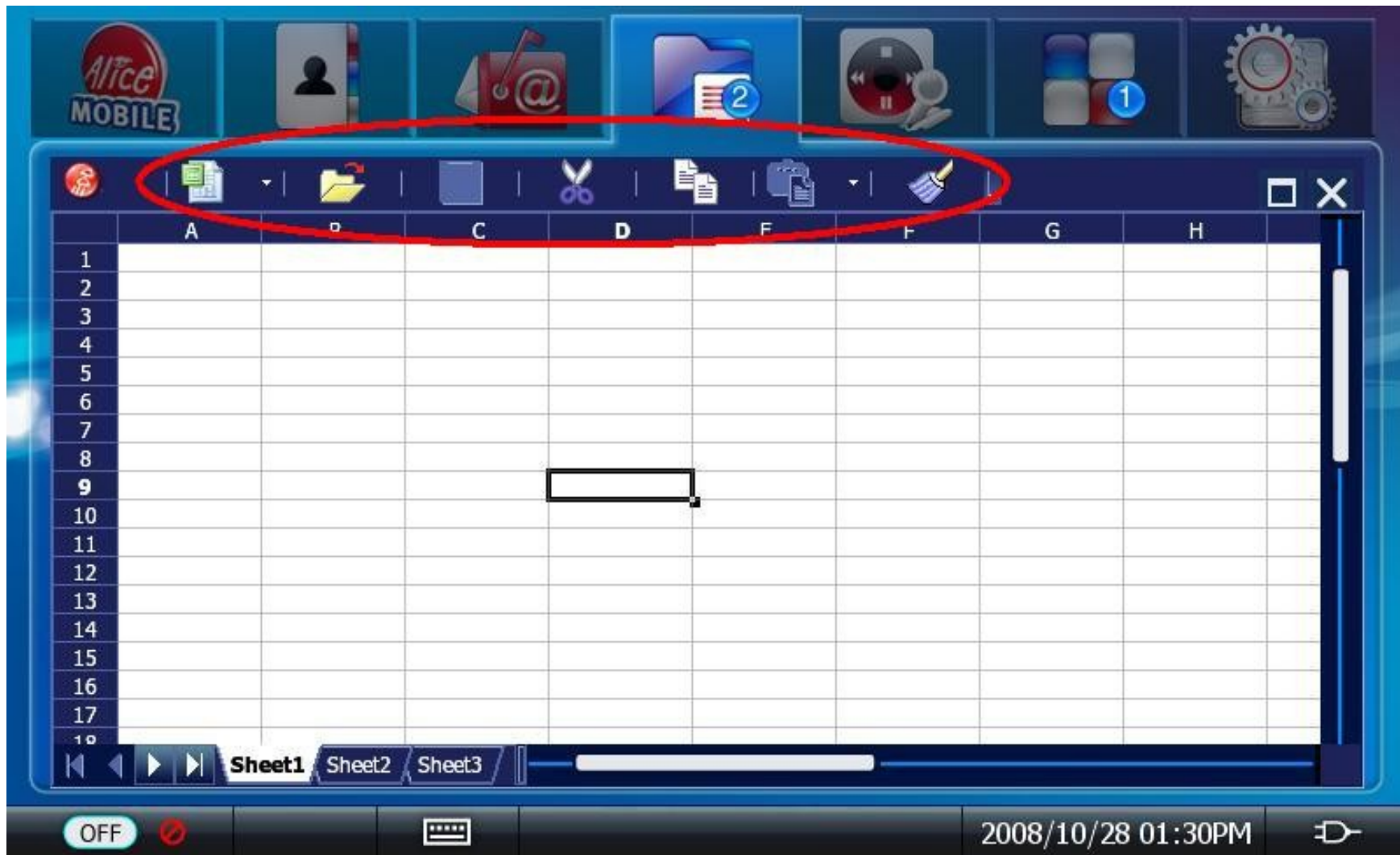
```
Rectangle aScreen = GetDesktopRectPixel();
```

```
rUmpcBtnWidth = (aScreen.GetWidth() -  
    (UMPC_MAXBUTTON_NUMBER*2*UMPC_SEPARATOR  
    BUTTON_WIDTH) - 10) /  
    (UMPC_MAXBUTTON_NUMBER +  
    UMPC_SYSBUTTON_NUMBER);
```

```
rUmpcBtnHeight = UMPC_ITEMBUUTTON_HEIGHT;
```

```
}
```

New Toolbar after Cutoff

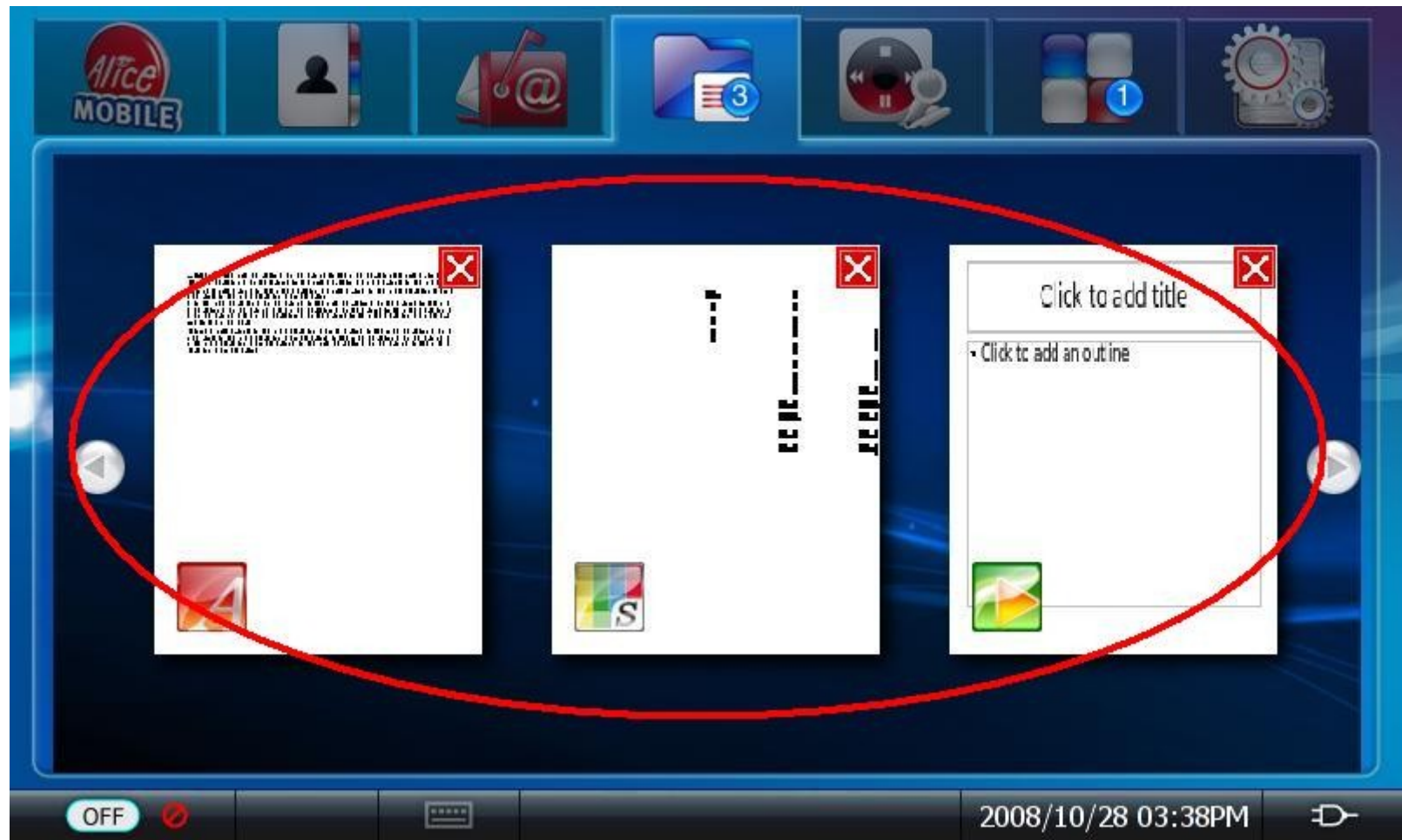


Arrangement of editing documents



- ✓ The thumbnails with Redflag2000 logo of documents would be arranged on the screen in a special order when pressing one Function key down as RedOffice is running.
- ✓ Return to editing mode - press one of thumbnails
- ✓ Close the document - press close icon in the upper right corner of its thumbnail.

Arrangement Style: Array



Arrangement styles : Array and Random



- Array Style:

The thumbnails are arranged from left to right in one line on the screen. There is two arrows to handle the theme pages down and up.

- Random Style:

The thumbnails are arranged randomly on the screen. They Can be covered each other. User can move the theme by drag and drop.



Arrangement Style: Random

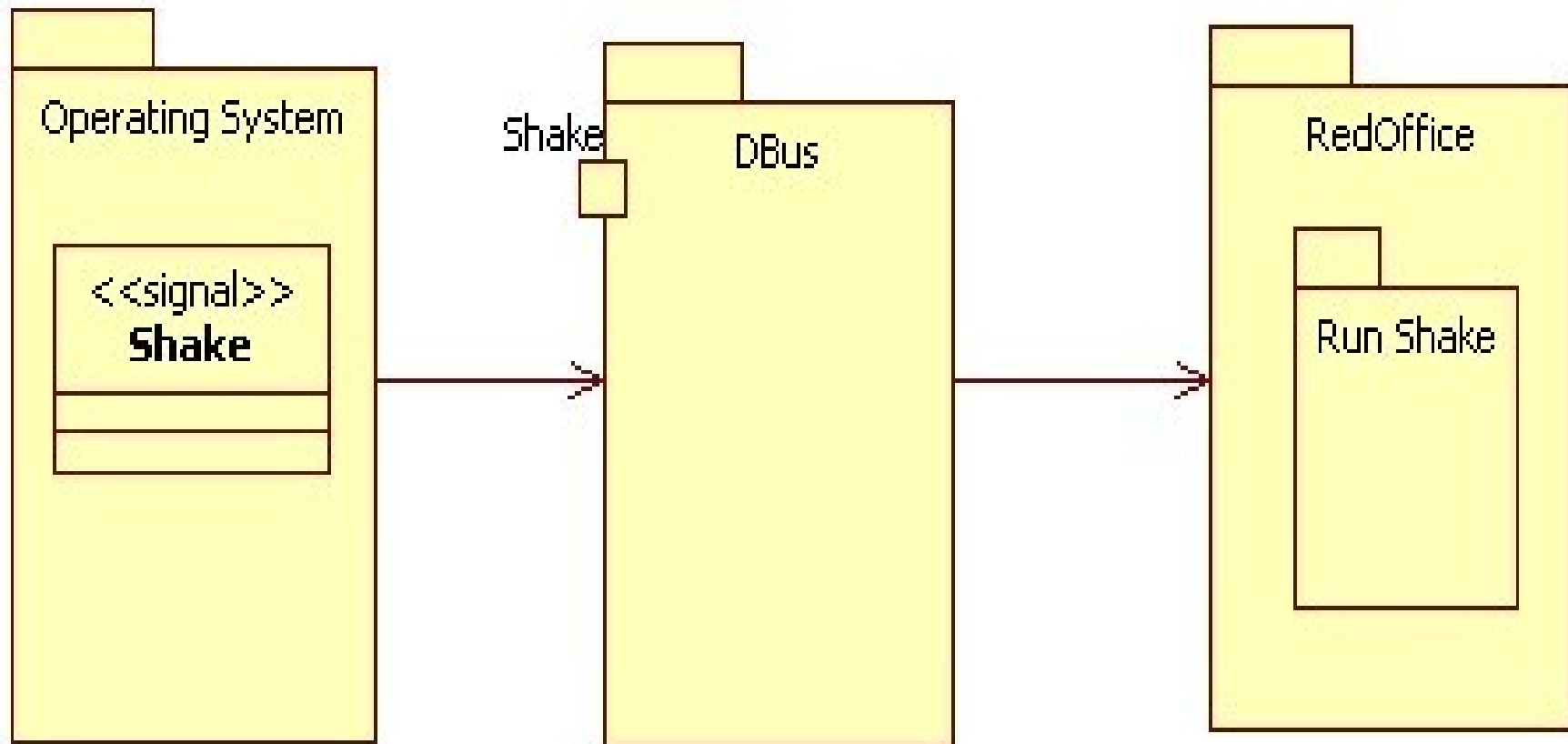


D-bug message



- A message consists of a header and a body. If you think of a message as a package, the header is the address, and the body contains the package contents. The message delivery system uses the header information to figure out where to send the message and how to interpret it; the recipient interprets the body of the message.
- Both header and body use the same type system and format for serializing data. Each type of value has a wire format.

Principle of Implementation



Step 1:



Receiving the message from OS.

- The system will send a message “shaked” to OOO by D-bus when user is willing to do shaked arrangement.
- OOO need add a module to support the the D-bus message access.
- Creating a new thread to monitor the D-bus message. The process to D-bus message cycle is built in this thread. It can filter “Shaked” message from system D-bus messages ,and communicate to UNO services. Then OOO will trigger the operation of ” shaked assignment ” by UNO service.

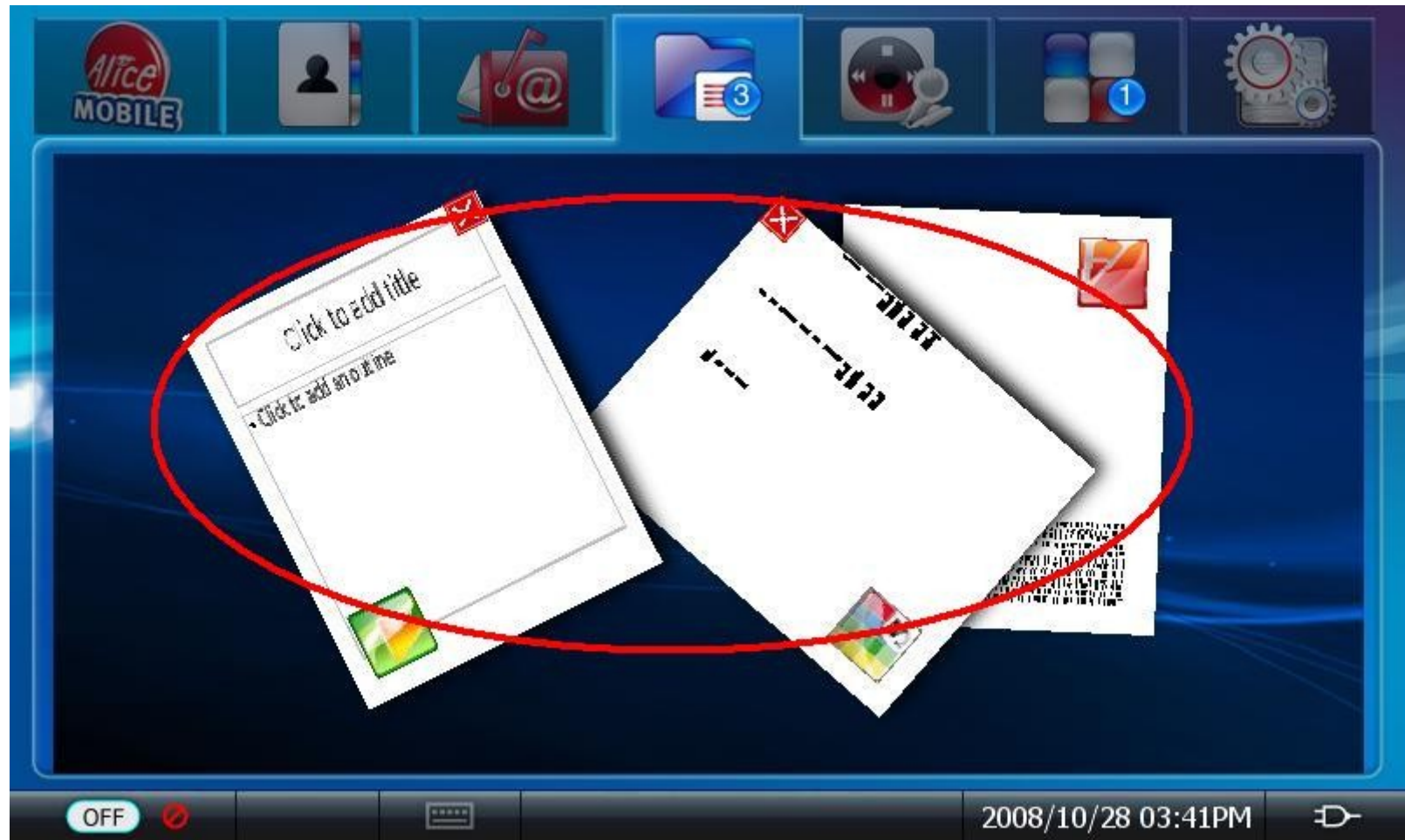
Step 2:



Get the thumbnails from office and then arrange these thumbnails randomly on screen

- Firstly, the thumbnails should be get. It can be achieved by print the current page to an virtual device and transfer them to meta format, then re transfer to the format that we need.
- Secondly, arrange the thumbnails by the rule “ random ” . Every document has one thumbnail

Arrangement Style: Random



Dialog issues



1. As the screen size limitations, some OOo dialogs are too big to MID, out of the MID screen while they can display on Desktop PC correctly.
2. Even worse MID can not support mouse and can not move Dialog by drag and drop.
3. The number of the Dialog effected depends on the screen size/resolution.

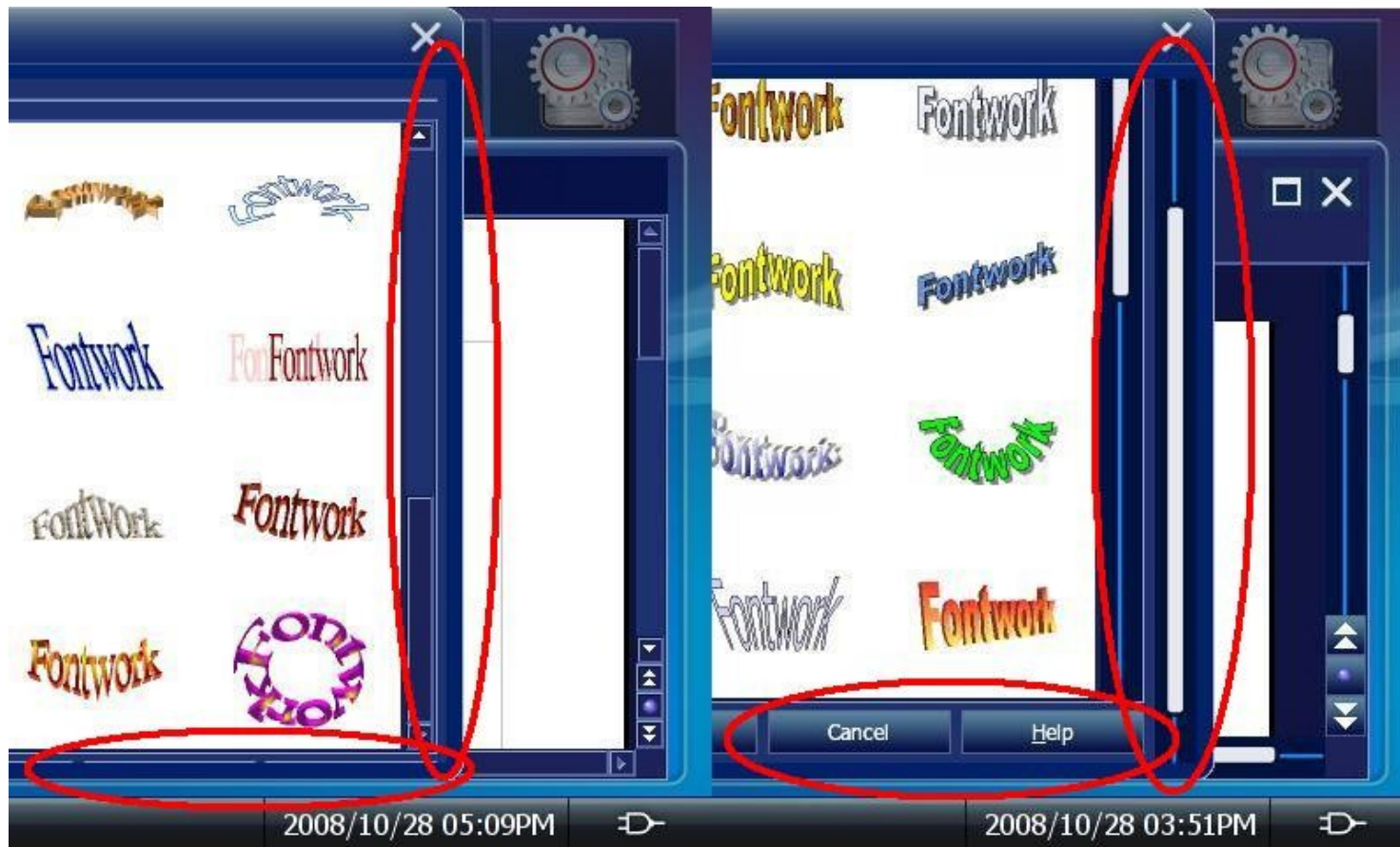
Solution of improvement Dialog

Solution 1 :

- **Change the positions of items on dialog or cut off some items to make the size smaller.**
- **disadvantage: Too many dialog boxes must be resized. The number is uncertain to different screen size.**

Solution 2:

- **Reform the dialog class: add a scroll bar on the big dialogs class.**



Before

After

Implementation of the new Dialog -1

Step1: Create class DlgBorderWindow

```
class DlgBorderWindow : public ImplBorderWindow
```

```
{ ScrollBar mScrollBar;
```

```
  PushButton mCloseButton;
```

```
public:
```

```
  DlgBorderWindow( Window* pParent,
```

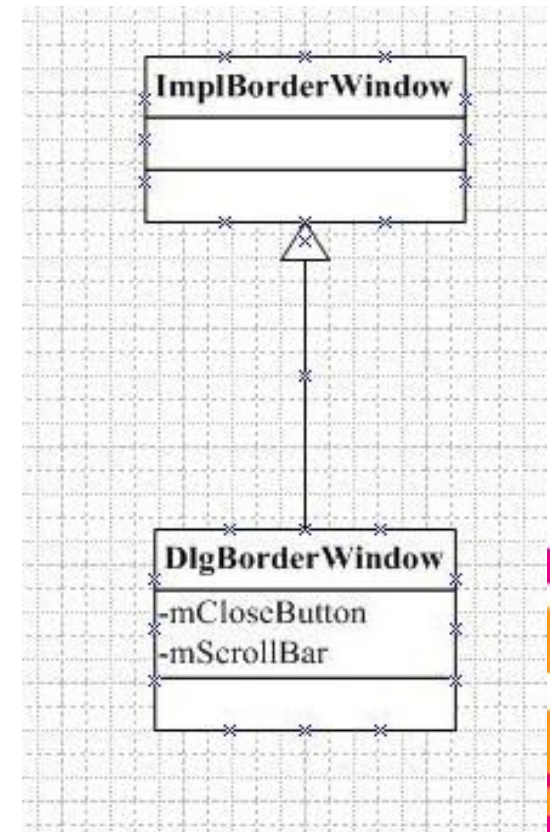
```
  WinBits nStyle = 0, USHORT nTypeStyle = 0 );
```

```
  ~DlgBorderWindow();
```

```
  DECL_LINK(ScrollHdl,void *);
```

```
  DECL_LINK(CloseDialog,void *);
```

```
};
```



Implementation of the new Dialog -2



Step2 : Use DlgBorderWindow instead of ImplBorderWindow in the Dialog Init method.

```
void Dialog::ImplInit( Window* pParent, WinBits nStyle )
```

```
{...
```

```
ImplBorderWindow* pBorderWin = new  
ImplBorderWindow( pParent, nStyle,  
BORDERWINDOW_STYLE_FRAME );
```

```
DlgBorderWindow* pBorderWin = new  
DlgBorderWindow( pParent, nStyle,  
BORDERWINDOW_STYLE_FRAME );
```

```
...}
```

Disable function keys



To avoid the conflicts to Midinux function keys, all function keys of the RedOffice are disabled.

This can be done by delete the items in the configure:

```
<accel:acceleratorlist >  
<accel:item accel:code="KEY_Q" accel:mod1="true" xlink:href=".uno:Quit"/>  
<accel:item accel:code="KEY_O" accel:mod1="true" xlink:href=".uno:Open"/>  
<accel:item accel:code="KEY_OPEN" xlink:href=".uno:Open"/>  
<accel:item accel:code="KEY_P" accel:mod1="true" xlink:href=".uno:Print"/>  
<accel:item accel:code="KEY_S" accel:mod1="true" xlink:href=".uno:Save"/>  
<accel:item accel:code="KEY_N" accel:mod1="true" xlink:href=".uno:AddDirect"/>  
<accel:item accel:code="KEY_W" accel:mod1="true" xlink:href=".uno:CloseWin"/>  
<accel:item accel:code="KEY_F4" accel:mod1="true" xlink:href=".uno:CloseWin"/>  
</accel:acceleratorlist >
```

Issues and ToDos



Size:

The OOo size is too big to MID: need cut off OOo features.

Performance:

OOo runs slowly on MID, e.g. Bootstrap speed.

Display refresh:

Refresh issues on MID.



Summary



- To make RedOffice run smoothly on MID, Some improvements must to be done such as UI,Dialog and other workflows of application
- After the efforts and series of improvement, RedOffice can run on MID stably
- Many challenge need to overcome, such as the huge size of office, performance and so on.

Q & A





Thanks!

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