# Development of Mobile Appliations 7.5 p
# 5DV155

## User Interface for Mobile Systems

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# Contents

# 1   Introduction

The aim of this assignment is to translate a desktop mail client application to a mobile app. This includes both functional and design related aspects. The functionality shall be described in terms of Android elements and concepts such as activities, layouts, menues, dialogs, fragments and messages. A main aspect is to decide and reason which functionality should be stripped from the desktop version and eventual additional functionality needed in the mobile app.

The design shall account for usability aspects following concepts from the course litterature [2] and platform guidelines [5]. The report has to include several prototype designs of which at least one shall be made in 'Android Studio' and one by hand or any design/drawing application of choice.

Further, one section of the report shall describe differences and changes in the design when the proposed Android application would be ported to another mobile platform of choice.

# 2   The Desktop Mail Client - Apple Mail

Here the 'Apple Mail' client was chosen as desktop application to be ported to an Android mobile app. The version at hand was 10.3 (3273) in a macOS Sierra Environment (10.12.5). Initially, a systematic inventory of the available functionality in Apple Mail was conducted.
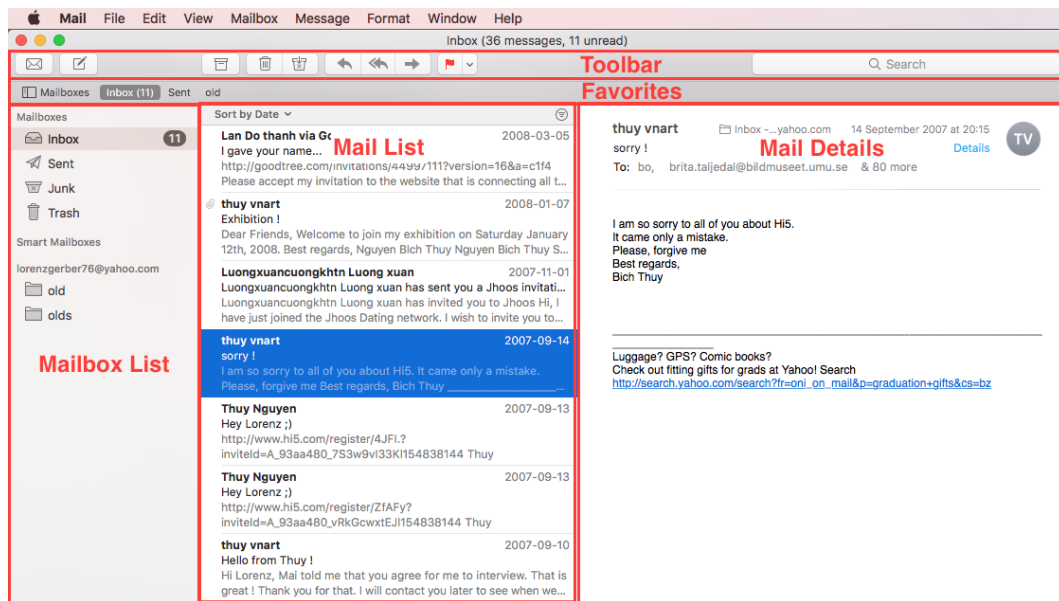
## 2.1   Description of main UI of Apple Mail

The main UI of Apple Mail is shown in figure **??**. It consists of three columns of which only the 'Mail List' and 'Mail Details' column are shown by default. The 'Mail List' presents all mails of the active mailbox. the list entry can be customised in the 'Preferences', accessible through the 'File' drop down menu. The 'Mail List' has by default a sort/filter bar with a drop down menu for various list sort methods and an icon button to apply filters. The 'Mail List' scrolls vertically when not all mails of the mailbox fit on the screen. Inspired by the Apple iOS interface, mail list items implement horizontal swipe actions. By default, to the right for deleting and to the left for toggling read/unread.

The 'Mail Details' frame shows the detail view of one email, the one selected in the 'Mail List'. This view scrolls if needed both vertically and horizontally. Various options regarding the visualization can be chosen in the 'Preferences' menu. By default, the header of the mail contains a number of 'hyperlink' style functionality for toggling visibility of some less often needed information but also as shortcut for the common mail actions 'Delete', 'Reply', 'Reply to all', 'Forward' and access to attachments.

The 'Mailbox List' column can be toggled visible/invisible by a button in the 'Favorites' bar which otherwise contains text buttons for the available mailboxes. The 'Mailbox List' in combination with the 'Mail List' offers extensive 'drag & drop' functionality to put mail messages from one folder to another.

Above the 'Favorites' bar there is the 'Toolbar' that contains in the default setup nine buttons and a search field. The buttons are from left to right: 'Get new messages', 'Compose new mail', 'Archieve selected', 'Delete selected', 'Selected to junk', 'Reply', 'Reply All', 'Forward' and 'Flag selected'. The search field allows for text search in all or in a specific mailbox. Both the content and the layout of the 'Toolbar' is freely customizable with a number of addtional functions/buttons not visible in the default setup.

Both the 'Mail Message' and the 'Folder' object on the screen provide context sensitive

**Figure 1:** *The main view of Apple Mail has three columns: 'Mailbox List', 'Mail List' and 'Mail Details'. The 'Mailbox List' column is however hidden in the standard configuration.*

menu on 'right-click'.

## 2.2 Description of Menu accessible Functionality in Apple Mail

The 'Menu Bar' contains the dropdown menus 'File', 'Edit', 'View', 'Mailbox', 'Message', 'Format', 'Windows' and 'Help'. Most of the menu items are functionality that is also directly accessible in the UI. The menu shows keyboard shortcuts for much of the functionality. Menu items not found in the UI are either for configuration and customizing the UI, or for setting up and configuring the user data such as mailboxes accounts and smart assitant functions.

## 2.3 Notifications

Being a an application developed by 'Apple' itself, 'Apple Mail' is fully integrated with the OSX notification center and offers as such a wide range of configuration to adapt notification behaviour to the users preferences [1]. The main elements of the notification system is a small badge that shows up in the upper right screen corner and floats for several seconds over all other content on the screen until it dissapears again. Apple Mail uses this notification badge when a new a new mail message is received. All notification messages are collected and archieved in the notification center which slides in as a drawer on the right side of the screen when pressing the notifications icon in the main menu bar. Further, the number of unread mails is shown in the application icon on the macOS 'Dock'.

## 3 Establishing the Mobile Application Profile

The core functionality of a mail application is receiving, writing and sending mail messages. Mail Message, Mail account and Mailbox administration is secondary functionality. A desktop application like 'Apple Mail' offers the full package of primary and secondary

functionality. More over, a wealth of settings to tailor parts of the layout and application envelope according to the user preferences.

Here it is assumed that the application profile of mobile mail client users is by default more limited. A mobile application does not need to offer the same flexibilty for customization and the profile of available functions will be more narrow.

The most important functionality for a mobile mail client user is to have easy access to the newest information. This includes receiving messages, getting informed about new messages, quick access to new messages but also convenient access methods for old messages. Writing new mail messages is of lower importance. For quick informal messages most people use nowadays special message/chat application that offer a more direct type of communication and interaction with people. Further, it is not very convenient to type and layout longer mail messages with the on-screen keyboard on mobile device compared to a real physical keyboard. All sort of administration functionality besides setting up multiple mail accounts is considered of lowest priority in the mobile mail client.

Hence the following prioritized list of functionality resulted for the mobile application.

1. Receive and Present new Mail Messages

2. Search for Mail Messages

3. Write and Send Mail Messages

4. Account Administration and Organization

## 4  Transforming the Desktop Applicatin to an Android App

### 4.1  The Application Structure

While a desktop application has very little space constraints and can compartmentalize the main screen in different sub containers, the mobile app uses mostly one screen for one purpose. In Android Framework terms: One 'Activity' for one purpose. For reasons of modularization and reuseability, there is often used a second layer of abstraction, the Fragment. The desktop app has two main containers, 'Mail List' and 'Mail Details'.

The Android app is will split the containers into separate screens or in Android Framework terms, 'Activities'. As a second layer of abstraction, there will also be used 'Fragments'. The overall layout is showcased in figure 2: The 'Mail List', represented by the middle outline, there will be one fragment in the corresponding activity. For 'Mail Details', the right-most outline in figure 2, there will be a 'Show Mail' and a 'Edit Mail' fragment in the same 'Mail Details' activity. The desktop 'Mailbox List' which is a foldable column in the desktop application is translated into a material design 'navigation drawer' (see [3]) that slides in from the left side, (left-most outline in figure 2).

For notifications, the usual Android infrastructure is used: On arrival, new messages peek for a short period into the active screen. This notification will allow support opening up the 'Mail Detail' view. Then unread messages are indicated by an icon in the status bar. The notifciation is also added to the Android 'Notification Drawer' [4].

### 4.2  Application Design Elements and User Experience

While studying the Android Material Design guidelines, it was striking how well they align with the topics in the course litterature [2]. Material Design Components offer many
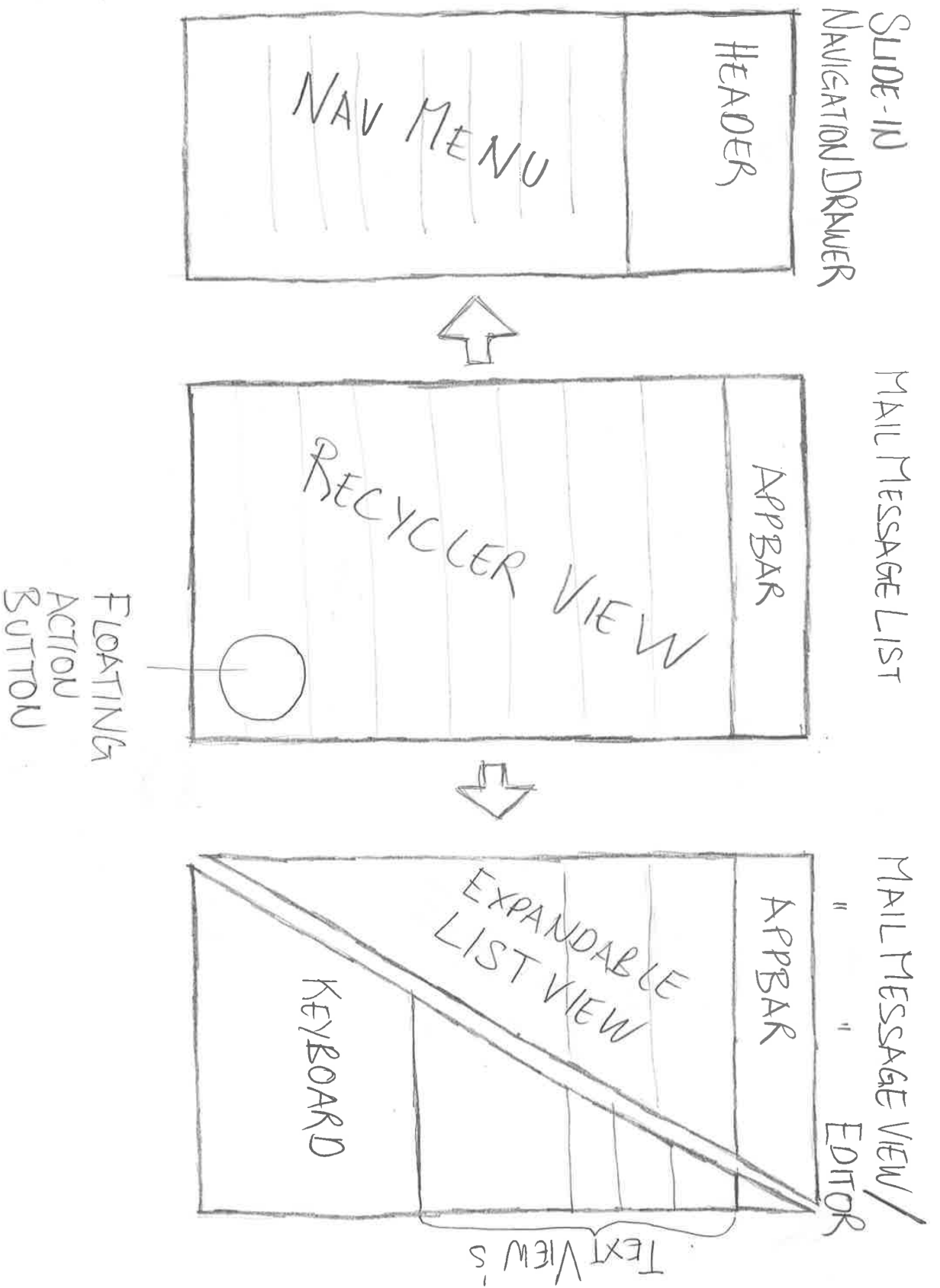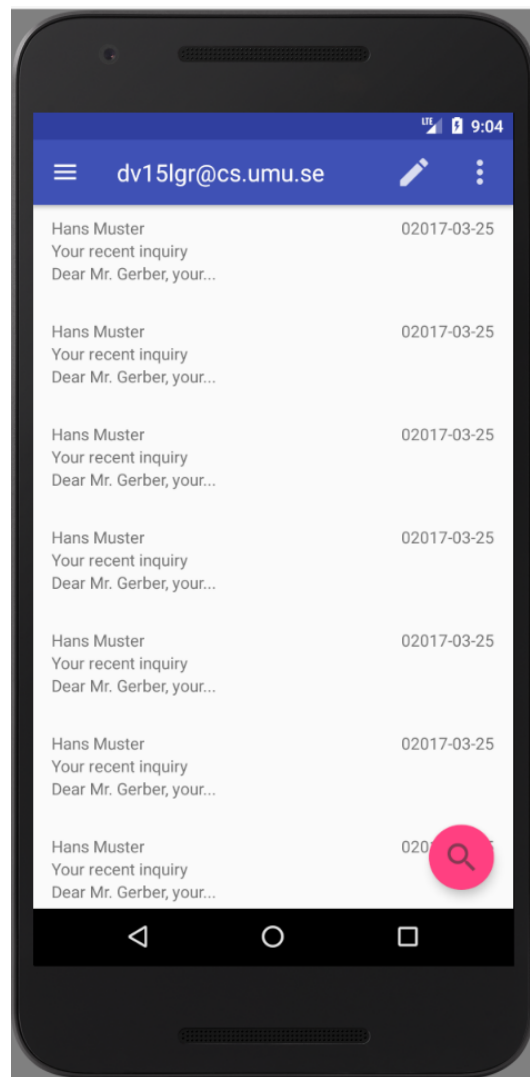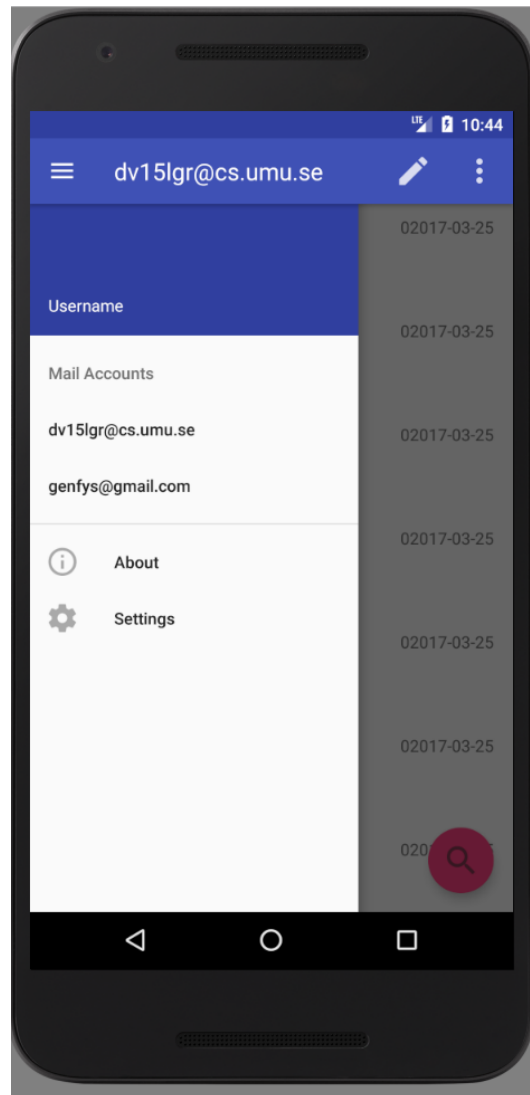
**Figure 2:** Design draft on the Android Mail Client.

**Figure 3:** *The main view of Apple Mail has three columns: 'Mailbox List', 'Mail List' and 'Mail Details'. The 'Mailbox List' column is however hidden in the standard configuration.*

ways of direct interaction that allow building a fast and intuitive UI as described in Clark [2, chapter 3, 'Enable primary tasks directly from list view'].

**Figure 4:** *The main view of Apple Mail has three columns: 'Mailbox List', 'Mail List' and 'Mail Details'. The 'Mailbox List' column is however hidden in the standard configuration.*

### 4.3 Detailed Layout and Design Description

**Scrollable Mail Message List**

**Navigation Drawer**

**Mail Message Viewer**

**Mail Message Editor**

## 5 Describe needed changes for another mobile platform

## References

[1] macos sierra: Use noticiation center. `https://support.apple.com/kb/PH25142`, 2017. accessed: 2017-07-26.

[2] Josh Clark. *Designing for Touch*. A book apart, New York, USA, 2015.

[3] Navigation drawer. `https://material.io/guidelines/patterns/navigation-drawer.html`, 2017. accessed: 2017-07-22.

[4] Notifications. `https://material.io/guidelines/patterns/notifications.html`, 2017. accessed: 2017-07-22.

[5] Google material design. `https://material.io`, 2017. accessed: 2017-07-18.