



NEWS APP 1.0

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Author	Name	Date	Signature
Software Engineer	Praveen	24.03.2022	

Review & Approval	Name	Date	Signature

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23.03.2022	V0.9 Draft	Initial
24.03.2022	V1.0 Draft	Update formal issues

1 General

1.1 Scope

In a first order, Elektrobit was asked to design and development of Android App that shows some top news headlines using this free API from newsapi.org

A more detailed functional description is in chapter [2](#).

This document describes the software architecture of the News App.

1.2 Structure of this document

A system overview of News App is given in chapter [2.1](#). HW Specification is described in chapter [3](#). Software detailed functional description and software architecture is described in chapter [4](#).

1.3 Requirements Traceability

Requirements from [3] are referenced wherever applicable according to the following format:

[Covers: SYRQ-XXyy.y]
[Covers: SYRQ-XXyy.y, RQ-XXyy.y]

New requirements resulting from architectural considerations may be added in this document and use the format:

SWRQ-XXyy.y

1.4 Definitions, acronyms, and abbreviations

Term / Abbreviation	Definition
ADC	Analog to Digital Converter.
APK	Android Package (file for installation)
APP	Application SW running on telephone, tablet, PC etc.
API	Application Programming Interface
GUI	Graphical User Interface
HW	Hardware
IDE	Integrated Development Environment
SOUP	Software of Unknown Provenance
GIT	Global Information Tracker
SW	Software
UI	User Interface
URS	User Requirement Specification



WLAN	Wireless LAN
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1.5 Naming

<i>Naming Development</i>		<i>Naming Product</i>	



1.6 Document References

Id	Document file (link)	Short description	Version
[1]	NEWS_APP_Requirement	Agreed concept	V1.0 23.03.2022
[2]			

2 Overview

NEWS APP is an android app which provide the list of breaking from BBC news headlines of Germany. In this app each headline provides the additional information like image, source, date and time and some description. Moreover, user can click each breaking news headline to detail information.

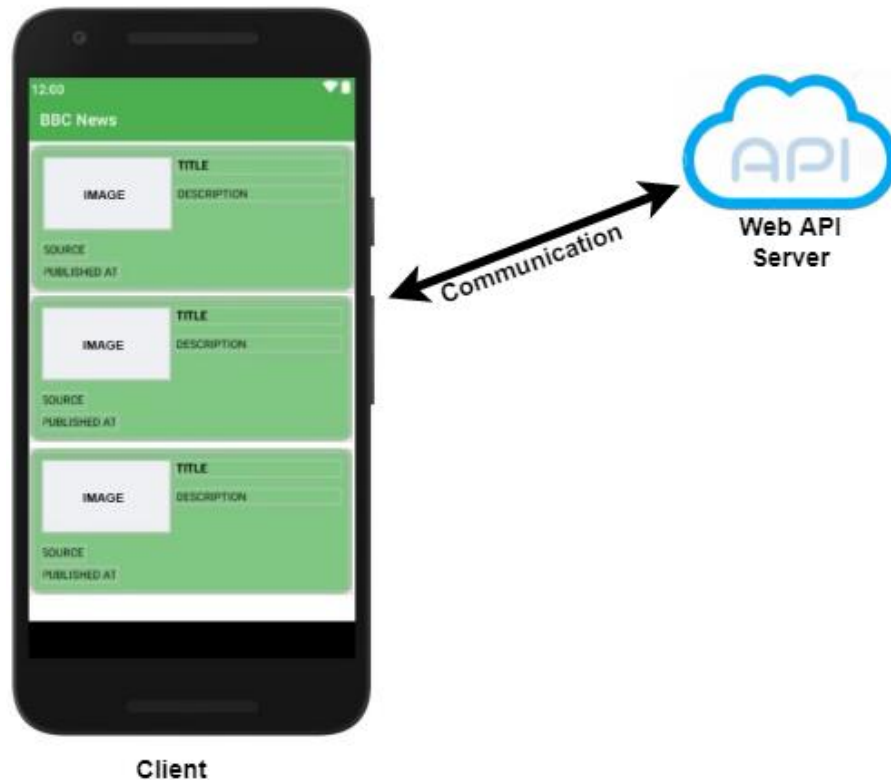


Figure 1: BBC News App

The NEWS APP receives data from the free API from newsapi.org and displays it. This document describes the SW of the Application.

[Covers: SYRQ-1.11]

2.1 NEWS APP System Architecture Overview

The NEWS App provide a user-friendly interface for breaking news headlines. This includes information concerning each headline such as title, image, source, published date and time and finally some in of description. There is also a separate screen for more detailed information about each news.

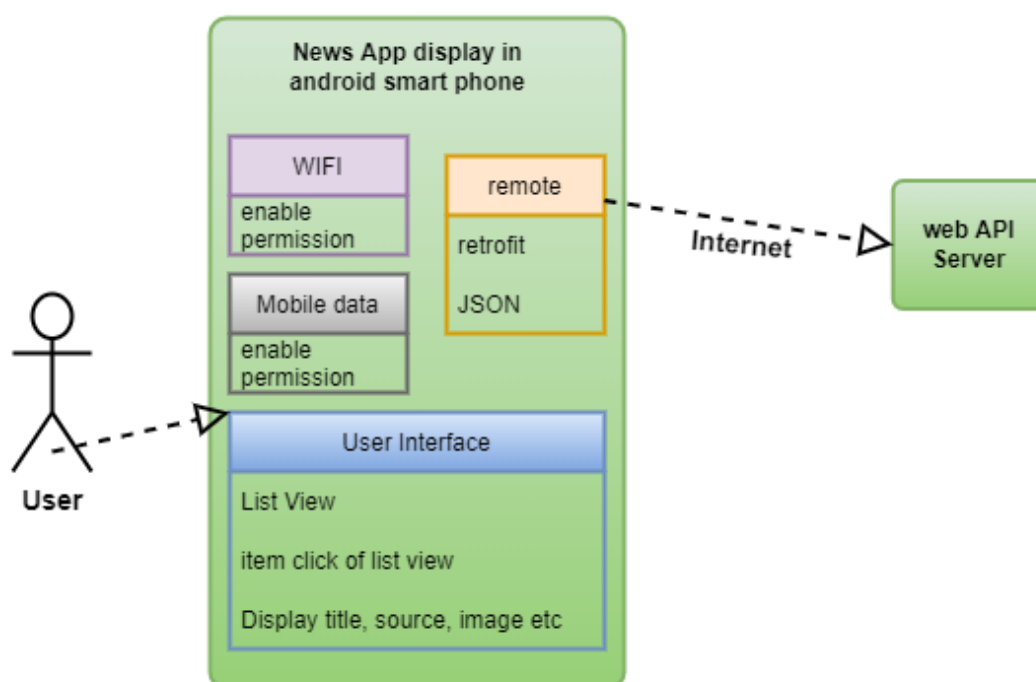


Figure 2: NEWS APP – Actors and devices

3 HW Specification

[Covers: SYRQ-1.11]

The HW of the android device must cover some basic features (as they are listed below) to be applicable in the system.

General	Smartphone with
Connectivity	WLAN(WIFI, Mobile data)

4 SW Architecture

4.1 MVVM Architecture

[Covers: SYRQ-1.4]

MVVM is one of the architectural patterns which enhances separation of concerns, it allows separating the user interface logic from the business (or the back-end) logic. Its target (with other MVC patterns goal) is to achieve the following principle *“Keeping UI code simple and free of app logic in order to make it easier to manage”*.

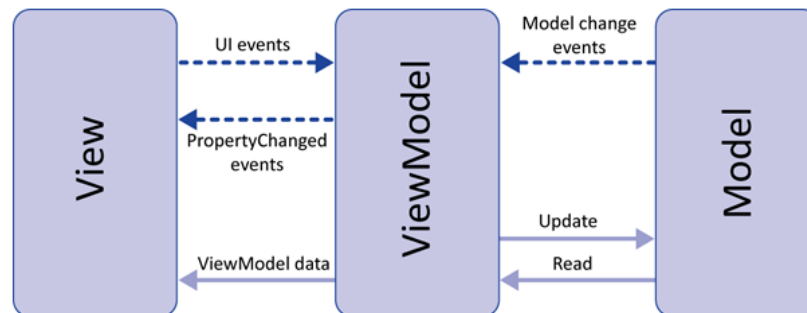


Figure 3 : MVVM components and basic interactions

MVVM has mainly the following layers:

1. Model
Model represents the data and business logic of the app. One of the recommended implementation strategies of this layer, is to expose its data through observables to be decoupled completely from ViewModel or any other observer/consumer (This will be illustrated in our MVVM sample app below).
2. ViewModel
ViewModel interacts with model and also prepares observable(s) that can be observed by a View. ViewModel can optionally provide hooks for the view to pass events to the model. One of the important implementation strategies of this layer is to decouple it from the View, i.e, ViewModel should not be aware about the view who is interacting with.
3. View
Finally, the view role in this pattern is to observe (or subscribe to) a ViewModel observable to get data in order to update UI elements accordingly.

4.2 Overview

The NEWS APP will run the in smartphone which supports Android OS . In an Android application, program behaviour is composed of activities, fragments and transitions between them. In the context of this app, the application will provide an interface for the user to display the list of braking news headlines received from the free API (from newsapi.org). Each headline should provide the overall information of the article.

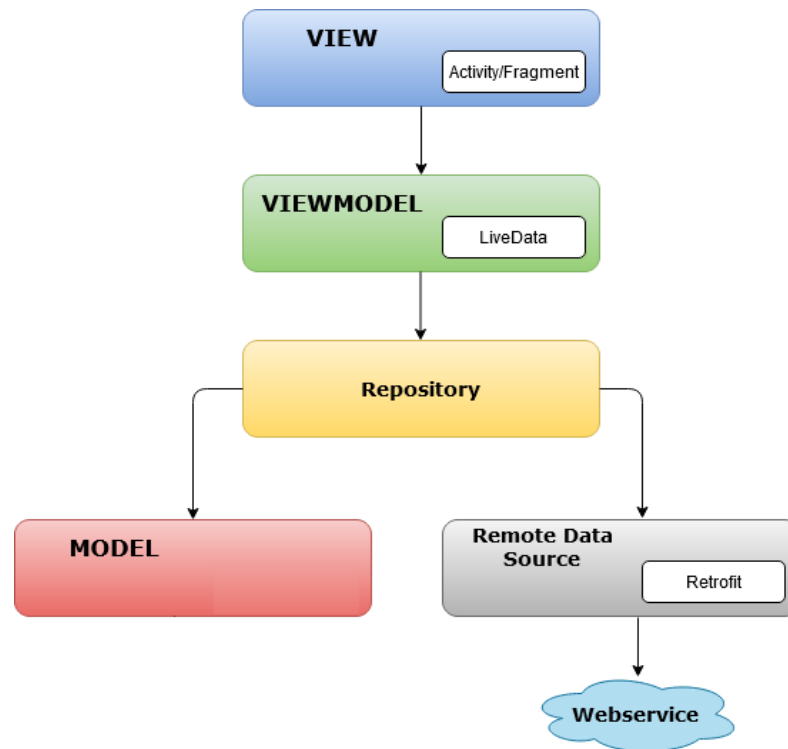


Figure 4: MVVM design for NEWS APP

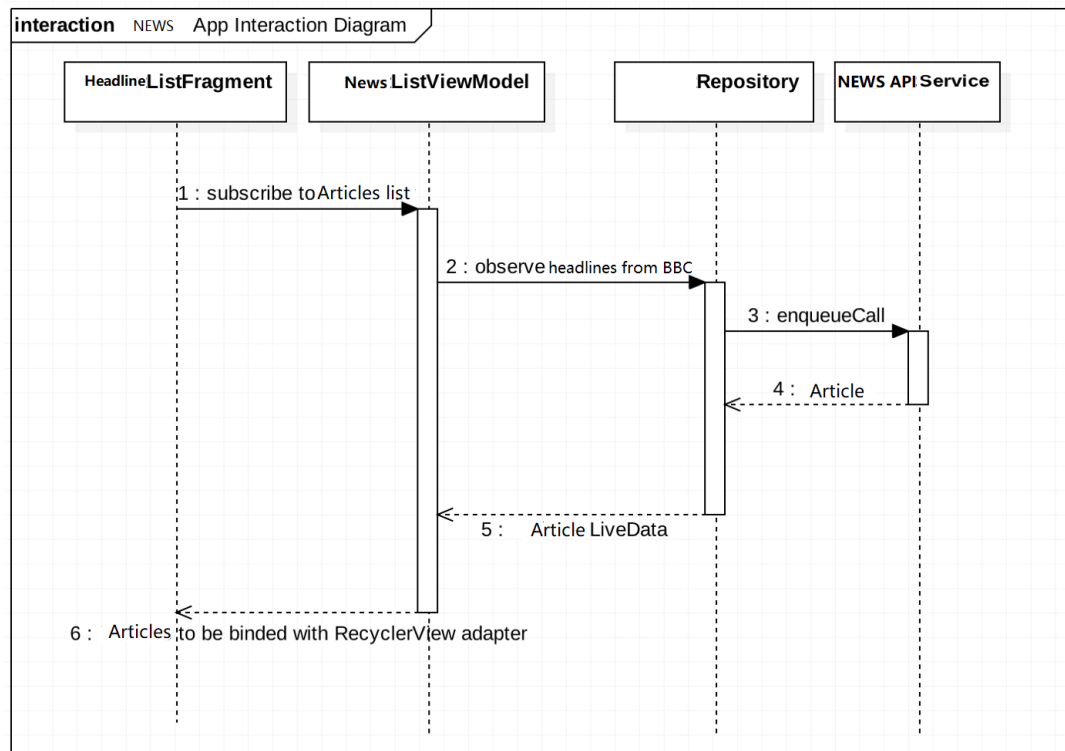


Figure 5: NEWS APP interaction diagram

4.3 User Interface



Figure 6: General application flow

Once the application is loaded, the application contains mainly two screens, which is detailed in Section 3.1.2. The first screen which displays the list of breaking news headlines with some brief information such as title, image, source, published date and time and finally some description. Once the app's end user touches any of the list items, a details screen of the headlines appears displaying with title, image, source, published date and time, description and link of the article.

Remark 1:

Generally, the displayed screens in the document serve as a basis for which fields, data and buttons are needed for NEWS APP. Detailed GUI design shall follow “Android look and feel”.



Figure 7: Screen Overviews

4.3.1 General

4.3.1.1 Restrictions and Used font

No need of development of backend therefore free API from the newsapi.org is used.

Used Font: Helvetica Neue (Roman)

4.3.1.2 Main Screen

Because the app will be developed for Android devices, the “standard” GUI functions/buttons are used and don’t need to developed itself.

[Covers: SYRQ-1.7, Covers: SYRQ-1.6, Covers: SYRQ-1.9]



The first screen which is displays the list of breaking news headlines with some brief information such as title, image, source, published date and time and finally some description.

4.3.1.3 Article Screen

[Covers: SYRQ-1.8, Covers: SYRQ-1.10]



Once the app's end user touch any of the list items, a details screen of the headlines appears displaying with title, image, source, published date and time, description and link of the article.

Figure 9: Article Screen



4.4 Functions without GUI

4.4.1 Data received from API

[Covers: SYRQ-PF01.3]

Receive the data from the web server API. In this case no need to design and develop the backend.

Free API: <https://newsapi.org/docs/endpoints/top-headlines>

4.4.2 Hardcoded

Currently in this app only news from Germany is supported i.e. country code “de”.

4.5 Data Storage

4.5.1 Article image Downloaded

Image of the headline are downloaded in the cache memory of the application.

[Covers: SYRQ-1.12]

5 List of SOUP

5.1 Host Software

Operating system: Android OS

- Name : Android OS
- Producer: <https://www.android.com/>
- License: [Apache Software License, Version 2.0](#)
- Versions no.: all smartphone and table
- Validation necessary: yes

5.2 Host development Tools

[Covers: SYRQ-1.2]

Android Studio

- Name: Android Studio Arctic Fox (Standard edition):
- Producer/vendor: <https://developer.android.com/studio/>
- Version no.: 2020.3.1(for Windows 64-bit)
- Validation necessary: no

Figma

- Name: Figma Free

Producer/vendor: <https://www.figma.com>

- Version no.: online
- Validation necessary: no

5.3 Software Configuration Management

GIT

- Name: git (Standard edition):
- Producer/vendor: <https://git-scm.com>
- Version no.: 2.30.1
- Validation necessary: no

GITHUB

- Name: GitHub (Standard edition):
- Producer/vendor: <https://github.com>
- Version no.: 3.2.0
- Validation necessary: no

6 Development

6.1 Environment

The build environment used will rely on Android Studio Arctic Fox. The SAMSUNG M30 is available for development, the built-in Android emulator will be used as a substitute.

6.2 Version Control

git will be used for software development and maintenance.

7 Miscellaneous Requirements

7.1 App installation and update

The release apk file should be uploaded into the google play store. User can download and install the app in their device.



8 Verification

8.1 Intention

The intention of the verification plan is to define all the necessary verification procedures which were demanded by the Software Development Process.

This plan shall include all planned activities for verification of the Software Units, the Integration of Software Units and the complete Software System, either directly or by linking to the relevant documents.

The verification plan must be reviewed and approved before verification is executed.

The verification activities which are described in the following sections are required for the initial release of the NEWS APP software.

8.2 Verification of Software Units

Omitted: According to IEC 62304 sub clause 5.5.3 “SOFTWARE UNIT acceptance criteria” - no acceptance criteria are required for Class A.

Nevertheless the compiler does a syntactic analysis of the code. Warnings shall not be disabled (-Wall: All warnings enabled). Compilation shall be without any warning (except of SOUP).

Optionally static code analysis tool PC-Lint may be used.

8.3 Verification of Software Integration

In the THYRO project a continuous integration of the software components is performed. This means that no separate integration test is necessary. All software components are integrated into the software system correctly and checked within software system test.

8.4 Verification of the Software System

The planned verification procedure has to cover all relevant requirements in relation of NEWS APP. The system test itself confirms right implementation and functionality, which is described in the requirements.

The traceability between all requirements and the conducting tests are generated with Reqtify.