CS 442: Mobile Applications Development
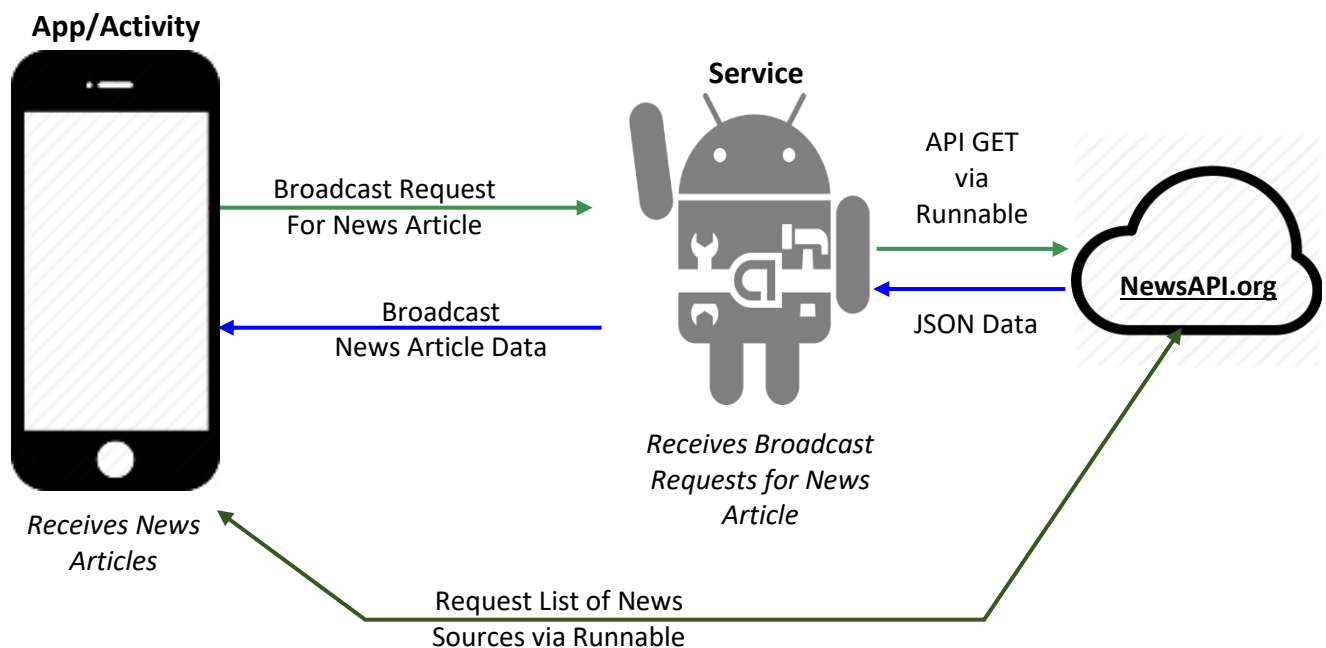## Assignment 5 – News Gateway *(450 pts)*

Uses: Service, Broadcasts & Receivers, Drawer Layout, Fragments, ViewPager, Internet, APIs

App Highlights:

- This app displays current news articles from a wide variety of news sources covering a range of news categories.

- NewsAPI.org will be used to acquire the news sources and news articles.

- Selecting a news source will display up to 10 top stories from that news source

- Selecting a news category will limit the news source choices to only those offering that category of news.

- News articles are viewed by swiping right to read the next article, and left to go back to the previous article

- You *will not* need to develop separate landscape layouts

- The user can go to the complete extended article on the news source's website by clicking on the article title, text, or image content.

- You must add a professional looking launcher icon to your app.

NO LATE SUBMISSIONS WILL BE ACCEPTED FOR THIS ASSIGNMENT

Application Architecture:

App/Activity

Broadcast Request For News Article

Broadcast News Article Data

Receives News Articles

Service

Receives Broadcast Requests for News Article

API GET via Runnable

JSON Data

NewsAPI.org

Request List of News Sources via Runnable

A) News Data:

Acquiring news source and news article data will be done via the [NewsAPI.org](https://newsapi.org) news aggregation service. This service allows you to download news sources (all or by news type/category) and news articles (by news source)

NOTE: You MUST sign up get an API key in order to access the NewsAPI.org services. Your API KEY must be supplied with NewsAPI.org queries. You can do this by registering at:

https://newsapi.org/register

Register with a first name, an email address, a password, select "individual", and agree to the terms and click *Submit* to register and get your API key (the key is displayed to you right after you click the Submit button).

The API:

The NewsAPI.org service offers 2 API calls – one to get news *sources* (organizations offering news – CNN, Time, etc.) and one to get top news *articles* from a selected news source.

1) **News <u>Sources</u> Query Format (to be used in our assignment):**

   To get all sources:

   https://newsapi.org/v2/sources?<u>language=en</u>&<u>country=us</u>&category=_____&apiKey=_____

   NOTE, using an <u>empty string</u> for the <u>category</u> returns sources for <u>all</u> categories. (Do not use "all", it will not work.)

   For example, if your category was "business" and your API Key was "ABC123xyz", the URL would be:

   https://newsapi.org/v2/sources?language=en&country=us&category= business &apiKey= ABC123xyz

2) News **<u>Article</u>** Query Format (to be used in our assignment):

   https://newsapi.org/v2/top-headlines?sources=_____&language=en&apiKey=_____

   For example, if your API Key was "ABC123xyz" and you wanted "cnn" news, the URL would be:
   https://newsapi.org/v2/top-headlines?sources=**cnn**&language=en&apiKey=***ABC123xyz***

   NOTE, be sure to use the source's "id" and not the source's string "name".

NOTE: This API requires the "User-Agent" request property be provided with connection requests. The value this property is set to does not matter, but it must be set (See example below):

```
…
connection = (HttpURLConnection) url.openConnection();
connection.setRequestMethod("GET");
connection.addRequestProperty("User-Agent","");
…
```

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1) NewsAPI.org _Sources_ Query Results Example:

https://newsapi.org/v2/sources?language=en&country=us&<mark>category=</mark>&<mark>apiKey= _ABC123xyz_</mark>

The above query will return results for <u>all</u> sources since the category is empty: <mark>_category=_</mark>

The results come in the form of a JSON Object that contains a JSON Array of source entries as shown below. Each entry represents an individual news source. The highlighted fields below each define a source. Example:

```
{
    "status": "ok",
    "sources": [{
            "id": "abc-news",
            "name": "ABC News",
            "description": "Your trusted source for breaking news, analysis, exclusive
                            interviews, headlines, and videos at ABCNews.com.",
            "url": "https://abcnews.go.com",
            "category": "general",
            "language": "en",
            "country": "us"
    }, {
            "id": "al-jazeera-english",
            "name": "Al Jazeera English",
            "description": "News, analysis from the Middle East and worldwide, multimedia and
                            interactives, opinions, documentaries, podcasts, long reads and
                            broadcast schedule.",
            "url": "http://www.aljazeera.com",
            "category": "general",
            "language": "en",
            "country": "us"
    }, {
            "id": "ars-technica",
            "name": "Ars Technica",
            "description": "The PC enthusiast's resource. Power users and the tools they love,
                            without computing religion.",
            "url": "http://arstechnica.com",
            "category": "technology",
            "language": "en",
            "country": "us"
    }, {
            . . .
    }]
}
```

2) NewsAPI.org Articles Query Results Example:

https://newsapi.org/v2/top-headlines?sources=<mark>cnn</mark>&language=en&apiKey=<mark>ABC123xyz</mark>

The results come in the form of a JSON Object that contains a JSON Array of article entries as shown below. Each entry represents an individual news article. The highlighted fields below each define a story. Example:

```
{
    "status": "ok",
    "totalResults": 10,
    "articles": [{
            "source": {
                    "id": "cnn",
                    "name": "CNN"
            },
            "author":       "Maeve Reston and Stephen Collinson, CNN",
            "title":        "President-elect Joe Biden seeks to unite nation with victory speech",
            "description":  "President-elect Joe Biden speaks to a deeply divided nation Saturday
                            night, making a plea for unity after four years of turmoil and
                            conflict fomented by President Donald Trump.",
            "url":          "http://us.cnn.com/2020/11/07/politics/biden-victory-speech-2020-
                            election/index.html",
            "urlToImage":   "https://cdn.cnn.com/cnnnext/dam/assets/201107192144-biden-event-1107-
                            super-tease.jpg",
            "publishedAt":  "2020-11-08T01:18:14Z",
            "content":      "(CNN)President-elect Joe Biden will speak to a deeply divided nation
                            tonight, making a plea for unity and understanding after four years of
                            turmoil and conflict fomented by President Donald Trump, wh… [+8553
                            chars]"
    }, {
            "source": {
                    "id": "cnn",
                    "name": "CNN"
            },
            "author":       null,
            "title":        "Presidential Election Results and Electoral Map 2020",
            "description":  "View maps and real-time presidential election results for the 2020 US
                            election. For more information, visit cnn.com/election.",
            "url":          "https://www.cnn.com/election/2020/results/president?iid=politics
                            _election_bop#mapmode=lead",
            "urlToImage":   "https://politics-static.cnn.io/2020/dev-static-assets/images/share/ge
                            /results/president.jpg",
            "publishedAt":  "2020-11-03T23:37:22.0160245Z",
            "content":      null
    }, {
    . . .
    }]
}
```

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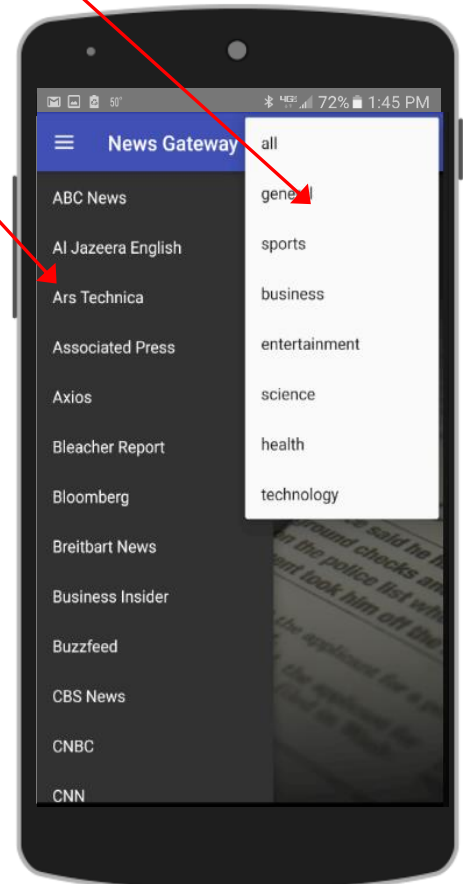## B) Application Behavior Diagrams:

1) Overview

A News category (i.e., "business") can be selected using the options menu. ***This menu is dynamically created – NOT hardcoded with values. Category values will vary over time****.*

A News Source (i.e., "cnn") can be selected by opening the "drawer" and selecting a source ***This drawer content is dynamically created – NOT hardcoded with values. News sources will vary over time.***
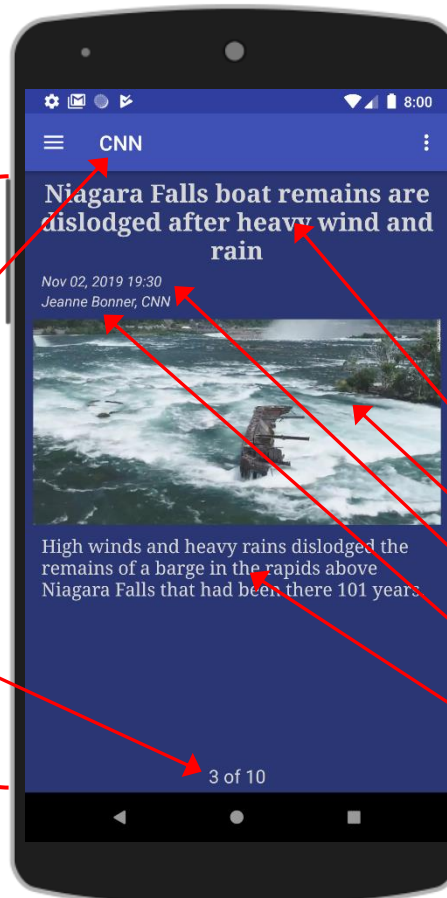
A news-related background image is shown before any articles are loaded

The selected news source is displayed in the Navigation Bar

News articles from the selected source are displayed in a "view pager" allowing left & right-swipe navigation between articles.

Article count is maintained at the bottom of the screen
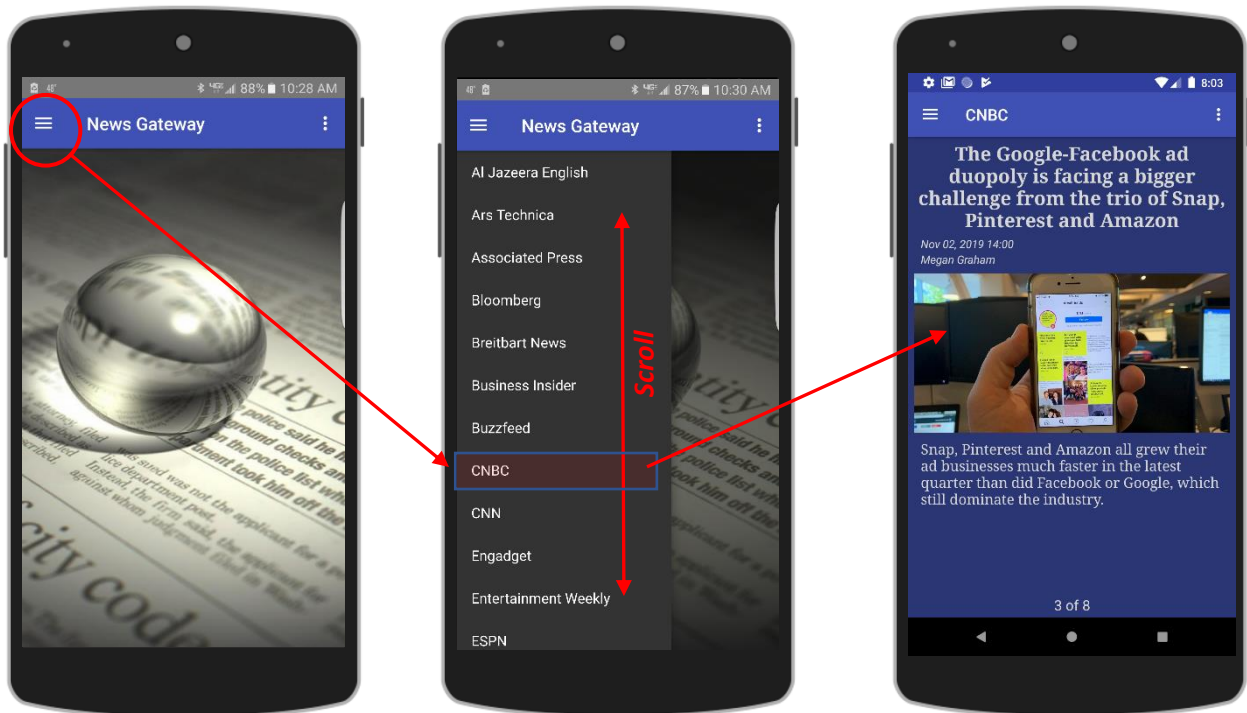
News Article Headline (can be null/blank)

News Article Image (can be null/blank)

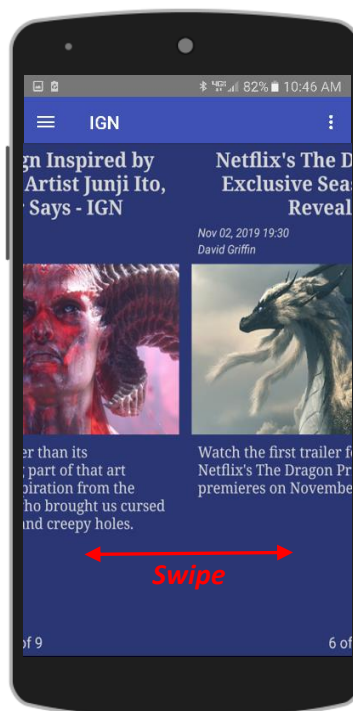*News Article Date (Provided in "Z" format)*

News Article Author(s) (can be null/blank)
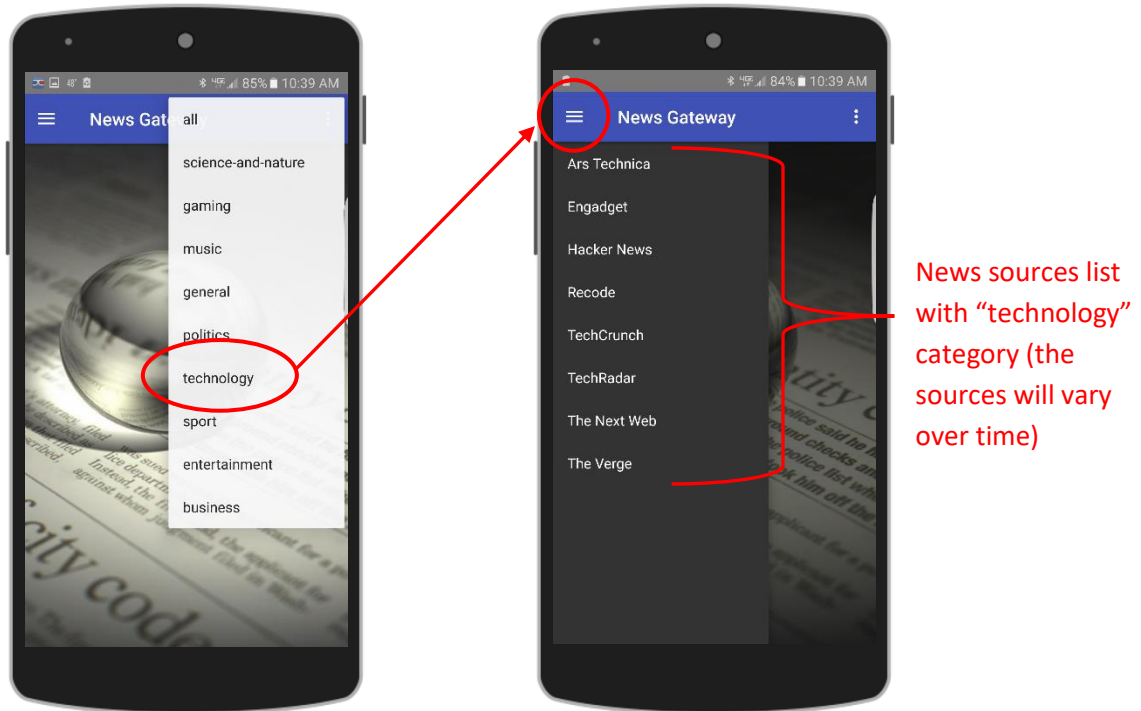
News Article Text (can be null/blank)

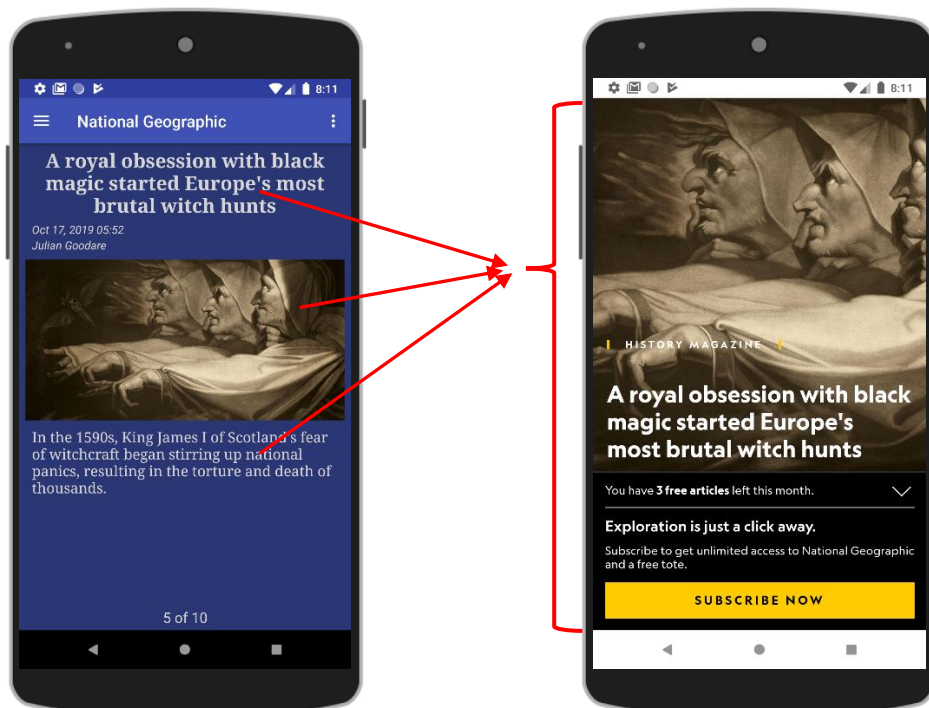2) Selecting a news source (available sources will vary over time):

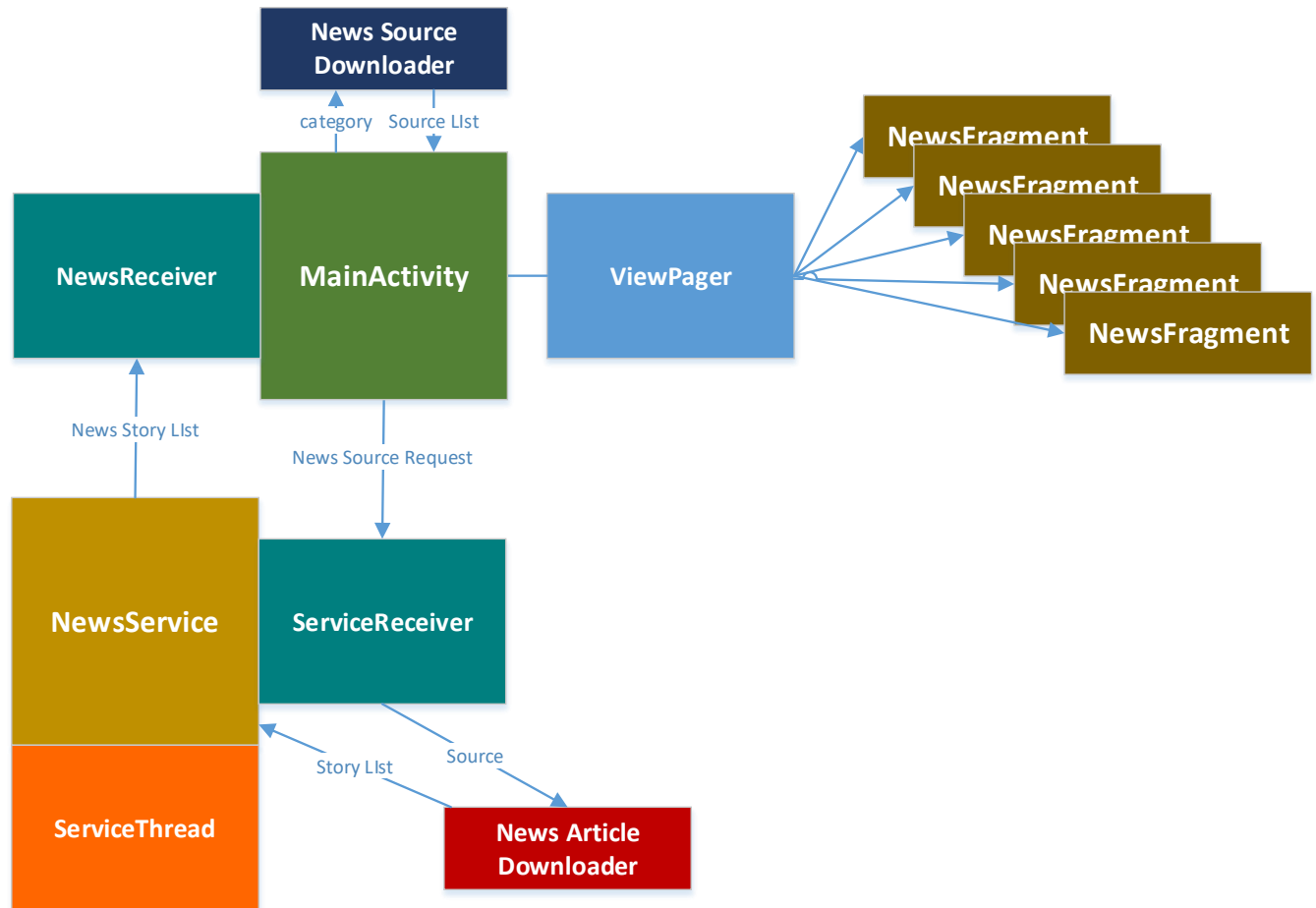3) Swipe Right (or Left) to scroll through articles from the selected new source:

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4) Select a news *category* from the options menu to limit the news source choices to only those offering that category of news.

News sources list with "technology" category (the sources will vary over time)

5) Click on article content (title/image/text) to go to extended article on the news source web site

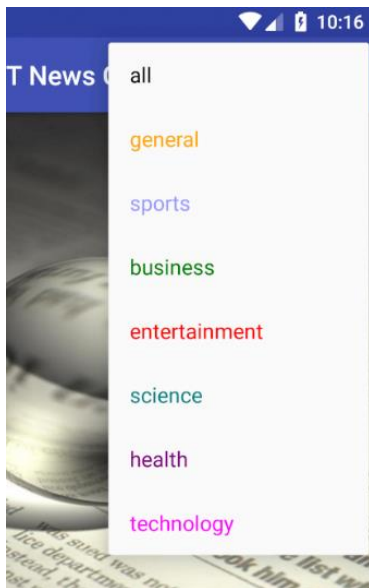## C) Application Content:

NO LATE SUBMISSIONS WILL BE ACCEPTED FOR THIS ASSIGNMENT

D) Extra Credit (2 options, do none, do 1, or do both):

1) Up to 25 points of extra credit will be awarded if you save and restore the app state when transitioning between portrait and landscape layouts to ensure a smooth user experience. Without this, the app reverts to the start state upon rotation. If this is done properly, the current category selection, the current source list (in the drawer), and the displayed articles will be maintained upon device orientation change.

2) Up to 25 points of extra credit will be awarded if you display the news categories in the options menu different colors, and then color the news sources in the drawer according to their category:

Options menu example: Drawer list of news sources: example

Assignment Assistance

The TAs for our course are available to assist you with your assignment if needed. Questions on assignment requirements and course concepts can be sent to the instructor.

<p align="center"><strong style="color:red">NO LATE SUBMISSIONS WILL BE ACCEPTED FOR THIS ASSIGNMENT</p>

Submissions & Grading

1) Submissions must consist of your zipped project folder *(please execute Build =>Clean Project before generating the zip file)*.

2) Submissions should reflect the concepts and practices we cover in class, and the requirements specified in this document.

3) **NO LATE SUBMISSIONS WILL BE ACCEPTED FOR THIS ASSIGNMENT**

4) Grading will be based upon the presence and proper functionality of all features and behaviors described in this document.

NOTE

This assignment is worth 450 points. This means (for example) that if you get 89% on this assignment, your recorded score will be:

(89% * 450 points = 401 points)

If you do not understand anything in this handout, please ask.

Otherwise the assumption is that you understand the content.

Unsure? Ask!

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