

Cross Platform Mobile Programming

IF733

Andre Rusli

This Week

- Course Introduction
- Cross Platform Mobile App Development Concept
- Ionic Framework: What and Whys
- Getting Started with Ionic

Course Introduction

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“

The goal is not to sail the boat, but
rather to help the boat to sail herself.

- John Rousmaniere

”



Andre Rusli

andre.rusli@umn.ac.id



Syllabus (1)

First Half

- Cross-platform mobile application development
- Getting started with Ionic Framework
- Ionic project structures and navigation stacks
- Ionic components: button, list, card, grid, alert, dialog, modal, menu, toast, action sheet
- Angular services and model
- Requirements engineering
- Working with forms – template-driven and reactive approach

Syllabus (2)

Second Half

- Lesson review
- SQL vs NoSQL
- Google Firebase: Authorization
- Working with native device features: Maps
- Working with native device features: Geolocation
- Working with native device features: File system
- Using the device storage
- (optional) Deploying your app
- (optional) Progressive web apps

Scoring

Assignments, Class Activities & Participation	30%
Mid-term Exam	30%
Final Project	40%

Cross Platform Mobile App Development Concept

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The Mobile Delivery Gap

Demand for mobile experiences is growing 5x faster than internal IT teams can deliver.

Gartner

Back in the early days of mobile, there was really only one way to give users the performance and features they expected. We had to use a native SDK.

Meaning?

- Building product for each mobile platform
- Managing multiple codebases
- Hiring and retaining specialized and costly native developers

Hybrid App

Hybrid App

Is a native app. In the sense that:

- Downloaded from the platform's app store
- Can access native features and hardware-based performance acceleration

The differences?

Built using open web technologies like HTML, CSS, and JavaScript.

Runs in a full-screen browser called a **webview**.

Accesses the native features of specific mobile devices using native plugins.

Why Hybrid

Write Once,
Run Anywhere

Use the
Talent You
Already Have

The Best UX
Across
Platforms

Building for
the Future

Why not Hybrid

System
Overhead

Third-Party
Plugins

Framework
Dependencies

Native App

Developed specifically for one particular mobile operating system, using the **native language** of the device

Mobile Web

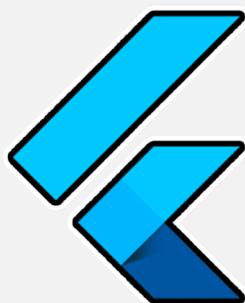
Websites that look and behave like native apps, run by a **browser**. Can be “installed” by creating a bookmark to that page.

Hybrid App

Part native, part web app. Like native apps, must be downloaded through an app store and can utilize any **native features** a device has. While also relying on **web technologies** packed in a native container.

Cross Platform Mobile App Development Frameworks

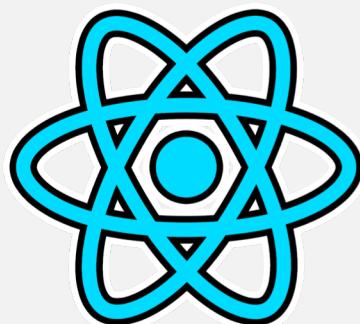
Flutter



|

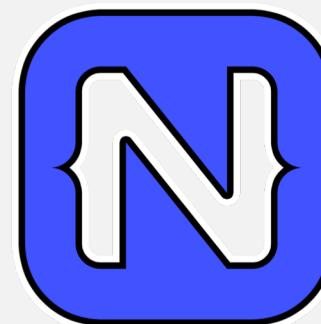
Dart

React Native

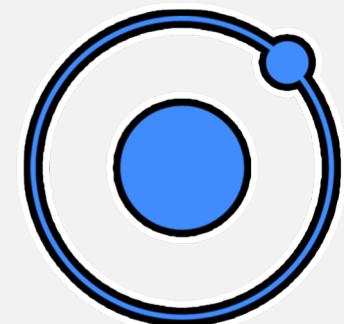


JavaScript

NativeScript



Ionic



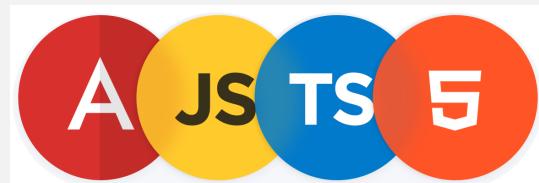
<https://academind.com/learn/flutter/react-native-vs-flutter-vs-ionic-vs-nativescript-vs-pwa/>

Ionic Framework: What and Whys

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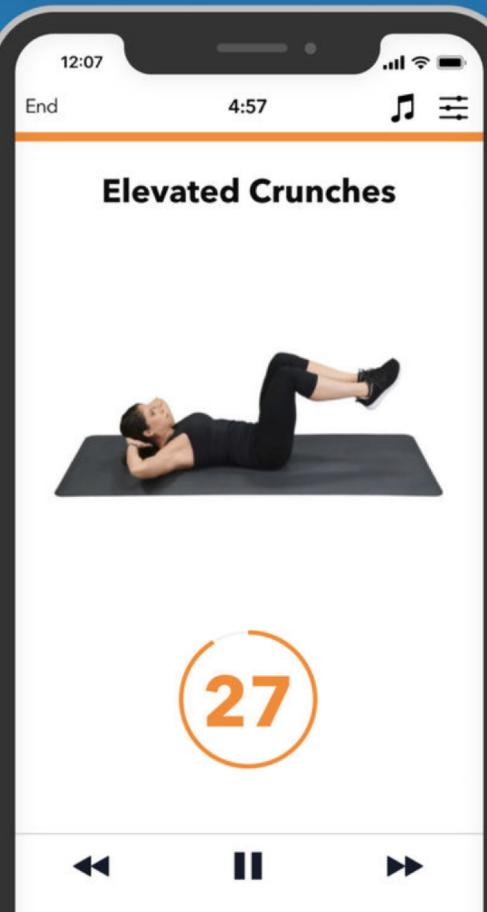
Ionic Framework

An open source framework that allows developers to create hybrid mobile apps using web technologies like HTML5, JavaScript, and CSS with native capabilities.



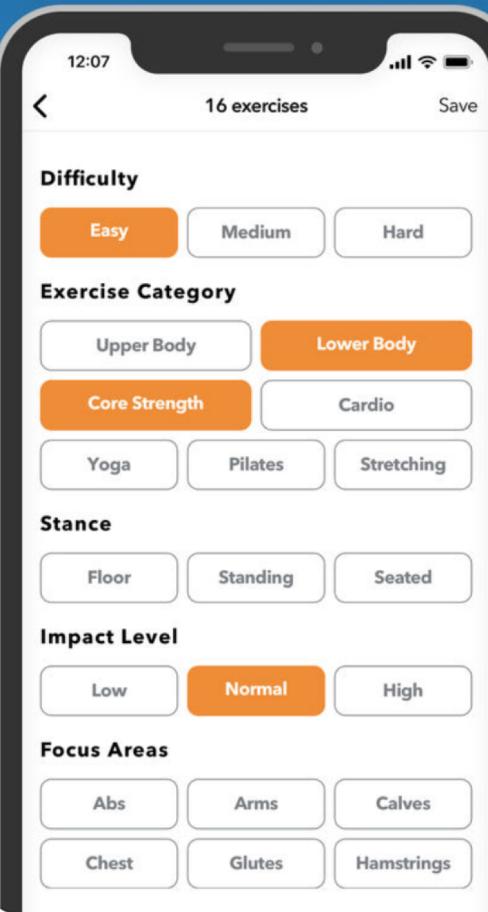
Guided Video Workouts

Your virtual personal trainers
are just a tap away



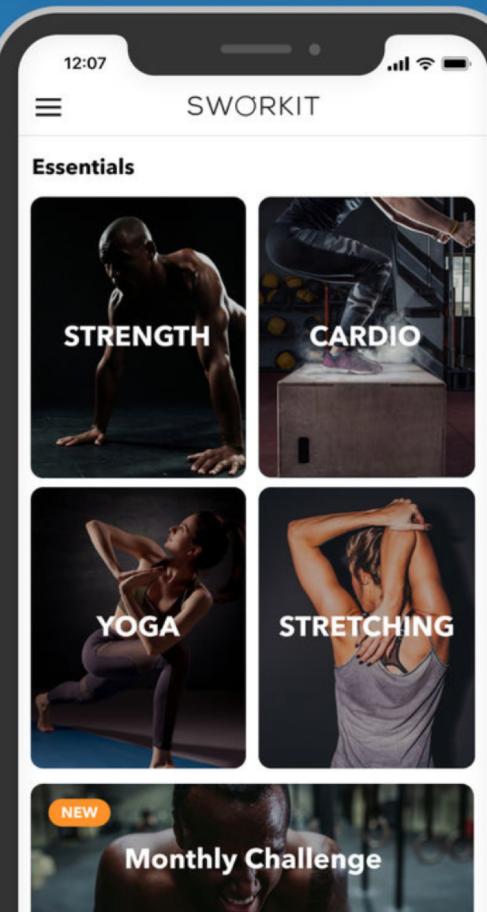
You Choose What to Sculpt

Target any body area with
customizable filtering

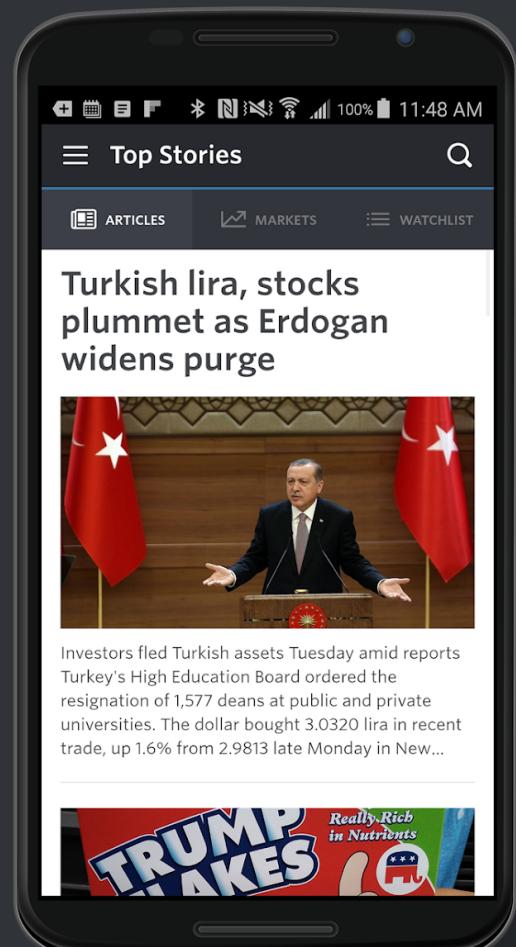


Tons of Variety

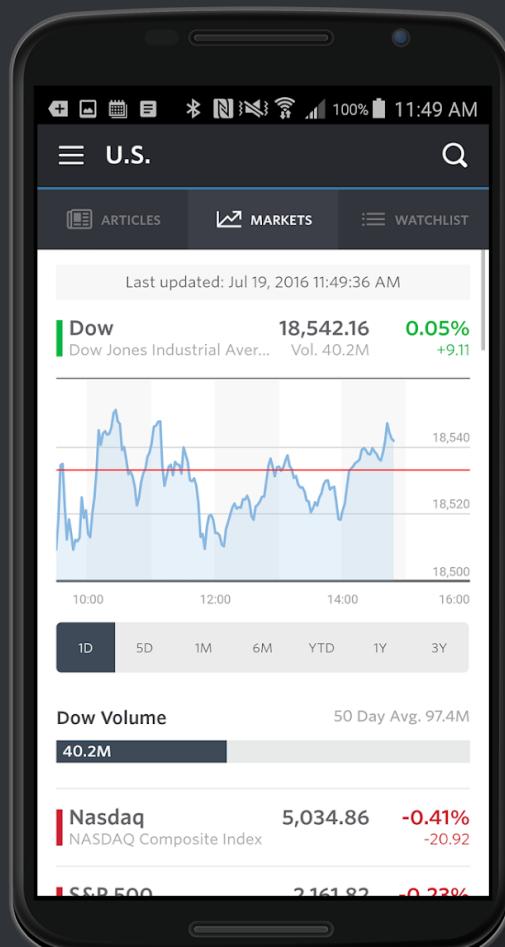
New workouts added
every month



A full list of headlines, updated constantly and at the tips of your fingers.



Keep up to date with all of the world markets in real time.



Track and organize all of your tickers with multiple watchlists.

A smartphone screen showing the 'My Watchlist' section of a financial application. The top navigation bar is identical to the previous screens, with the time being 11:51 AM. The main content area is titled 'My Watchlist' and displays a table of tracked securities. The table has columns for SYMBOL, COMPANY NAME, PRICE, and CHG %. The data includes:

SYMBOL	COMPANY NAME	PRICE	CHG %
GM	General Motors Co.	\$31.0000	+0.1300
AA	Alcoa Inc.	\$10.6600	-0.2600
VZ	Verizon Communications ...	\$55.7000	-0.2300
AAPL	Apple Inc.	\$99.8500	+0.0200
SPY	SPDR S&P 500 ETF Trust	\$215.9050	-0.5042

Each row also includes columns for SHARES, BASIS, DAILY GAIN, OVERALL GAIN, and VALUE.

Getting Started with Ionic Framework

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Core Concepts

UI Components

Platform
Continuity

Navigation

Native Access

Theming

Ionic Components: Basics

```
<ion-button fill="outline" color="danger" id="btn-delete">Delete</ion-button>
```

DELETE

- Used like a normal HTML elements
- Supports attributes and properties
- Emits event (ion-change, click, etc.)

Budget Planner

Input Pengeluaran

Nama Pengeluaran

Jumlah Pengeluaran

x Hapus + Tambah

Makan siang: Rp. 25000,00

Uang tol: Rp. 15000,00

Total Pengeluaran : Rp. 40000,00

Budget Planner

Input Pengeluaran

Nama Pengeluaran

Terjadi Kesalahan

Mohon masukkan nama dan jumlah pengeluaran.

[Tutup](#)

Total Pengeluaran : Rp. 0,00

Importing Ionic Components from CDN

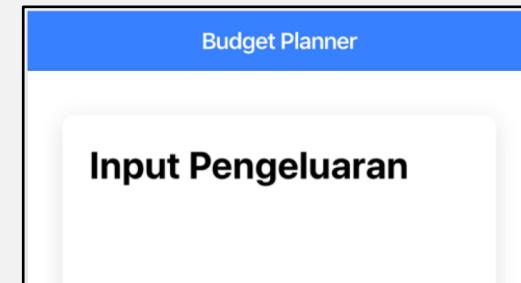
```
↳ index.html ✘   JS app.js

↳ index.html ▶ 📄 html ▶ 📄 head ▶ 📄 link
1   <!DOCTYPE html>
2   <html lang="en">
3     <head>
4       <meta charset="UTF-8" />
5       <meta name="viewport" content="width=device-width, initial-scale=1.0" />
6       <meta http-equiv="X-UA-Compatible" content="ie=edge" />
7       <script src="https://unpkg.com/@ionic/core@latest/dist/ionic.js"></script>
8     </link>
9       href="https://unpkg.com/@ionic/core@latest/css/ionic.bundle.css"
10      rel="stylesheet"
11    />
12    <title>Budget Planner</title>
13  </head>
14  <body>
```

Creating Header with `<ion-header>`

<https://ionicframework.com/docs/api/header>

```
</head>
<body>
  <ion-app>
    <ion-header>
      <ion-toolbar color="primary">
        <ion-title>Budget Planner</ion-title>
      </ion-toolbar>
    </ion-header>
    <ion-content>
      <ion-grid>
        <ion-row>
          <ion-col>
            ...
          </ion-col>
        </ion-row>
      </ion-grid>
    </ion-content>
  </ion-app>
</body>
```



Using the Documentation

<https://ionicframework.com/docs/api/header>

The screenshot shows a web browser window displaying the Ionic Framework documentation for the `ion-header` component. The URL in the address bar is <https://ionicframework.com/docs/api/header>. The page title is "ion-header". On the left, there is a sidebar with a dropdown menu set to "Angular" containing various component names like `ion-tab-button`, `TOAST`, `ion-toast`, `ion-toast-controller`, `TOGGLE`, `ion-toggle`, `TOOLBAR`, `ion-toolbar`, `ion-header` (which is highlighted), `ion-footer`, `ion-title`, `ion-buttons`, `ion-back-button`, `TYPOGRAPHY`, `ion-anchor`, `ion-text`, `RESOURCES`, and `API Index`. The main content area has a large heading "ion-header". Below it, a paragraph of text states: "Header is a parent component that holds the toolbar component. It's important to note that `ion-header` needs to be one of the three root elements of a page". To the right of the text are two sections: "CONTENTS" with links to "Usage" and "Properties", and a "Usage" section which includes a "JAVASCRIPT" tab selected, showing the following code snippet:

```
<ion-header>
  <ion-toolbar>
    <ion-buttons slot="start">
      <ion-back-button></ion-back-button>
    </ion-buttons>
    <ion-title>My Navigation Bar</ion-title>
  </ion-toolbar>

  <ion-toolbar>
    <ion-title>Subheader</ion-title>
  </ion-toolbar>
</ion-header>

<ion-content></ion-content>
```

Tasks:

Create a responsive web page using Ionic components via CDN without Angular

Budget Planner

Input Pengeluaran

Nama Pengeluaran

Jumlah Pengeluaran

Terjadi Kesalahan
Mohon masukkan nama dan jumlah pengeluaran.

+ TAMBAH

TUTUP

Total Pengeluaran

Budget Planner

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Budget Planner

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Tutup

Total Pengeluaran : Rp. 0,00

Budget Planner

Input Pengeluaran

Nama Pengeluaran

Jumlah Pengeluaran

x Hapus + Tambah

Makan siang: Rp. 25000,00

Uang tol: Rp. 15000,00

Total Pengeluaran : Rp. 40000,00

Questions?

Comments?

Next Week

Ionic Framework with Angular

Thank you.