

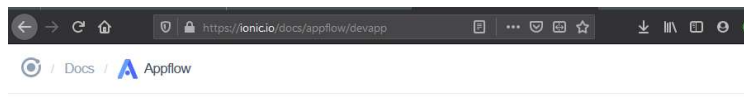
# IN4MATX 133: User Interface Software

Wrap-Up

Reflecting on 133

Technology changes quickly

# Technology changes quickly



## devapp

### Ionic DevApp

The Ionic DevApp was a free app used to run your Ionic app directly on your iOS or Android device.

On January 1st, 2020, DevApp was retired as we move toward embracing native tooling and building apps with [Capacitor](#), Ionic's official native app runtime.

One of the key mantras of Capacitor is that developers should embrace native tools like Android Studio and Xcode when building their app. While using native tooling may initially seem daunting, we think this is the right approach, because it makes it easy to follow existing Native iOS/Android guides, get help on Stack Overflow, and have full control over your project. The reality is that DevApp only got in the way of building an app, delaying developers from seeing their app run on a simulator or phone.

In practice, native tooling is quite easy to use: see our [iOS](#) and [Android](#) documentation for details on how to build native apps using Cordova or Capacitor.

January 23, 2019 | Announcements | Ionic 4 | web components

## Introducing Ionic 4: Ionic for Everyone

 **Max Lynch**  
CEO



February 11, 2020 | All | Announcements

## Announcing Ionic 5!

 **Brandy Carney**



December 13, 2021 | Announcements | Product | Ionic

## Announcing Ionic 6

 **Liam DeBeasi**



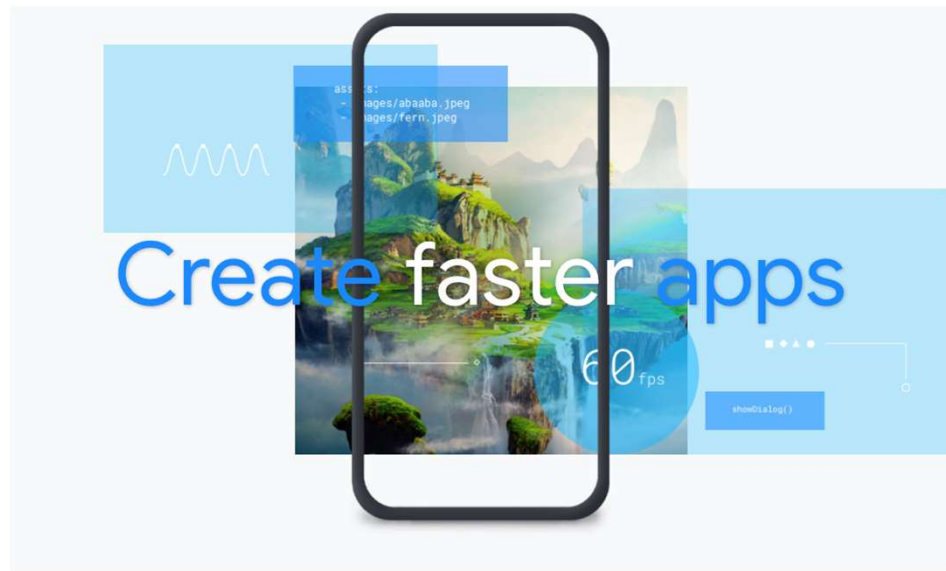
February 1, 2023 | Announcements | Product | Framework | Ionic

## Announcing the Ionic 7 Beta

 **Liam DeBeasi**



# Technology changes quickly



Made by **Google**

Flutter is Google's UI toolkit for building beautiful, natively compiled applications for **mobile**, **web**, and **desktop** from a single codebase.

[Get started](#)

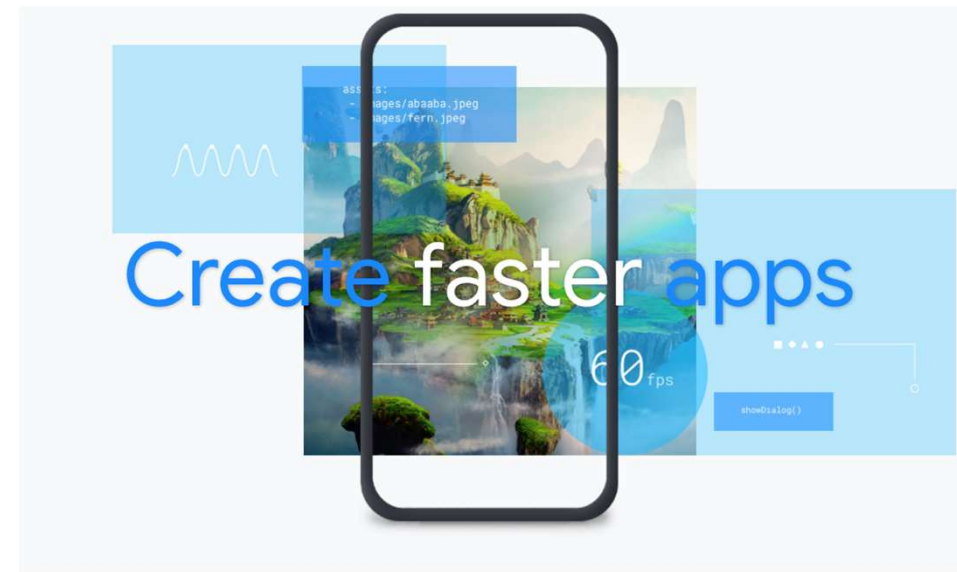
[Watch video](#)

<https://flutter.dev/>

# Technology changes quickly

- A hybrid framework for building Android and iOS apps
- Goal: higher performance
- Written in Dart, an object-oriented language Google has been pushing
  - Downside: new language...
- Includes libraries for some native resources (Camera/photos)
  - May be more reliable than Ionic

<https://flutter.dev/>



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Flutter is Google's UI toolkit for building beautiful, natively compiled applications for **mobile**, **web**, and **desktop** from a single codebase.

Get started

Watch video

Technology changes quickly

Your experiences so  
far...

Take away messages from the course

# Search before you build

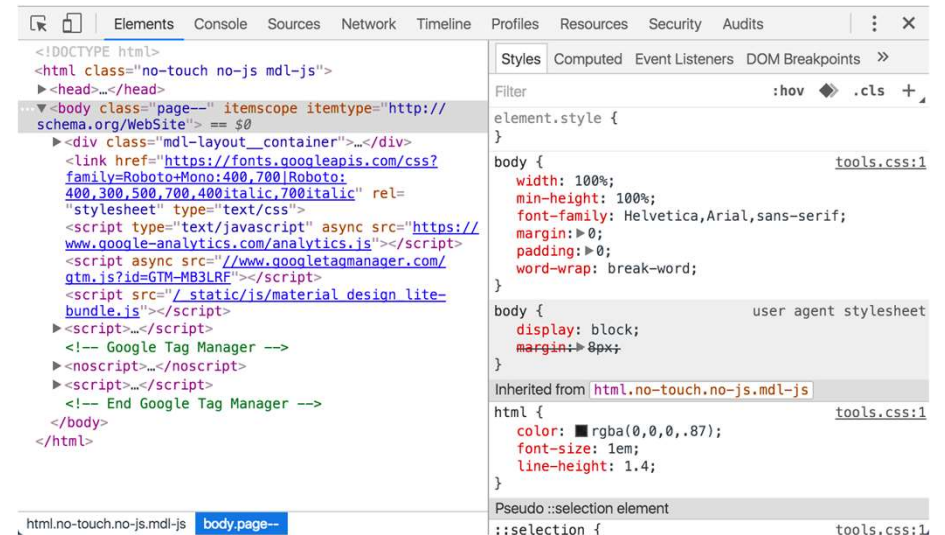
- Do not reinvent the wheel!
- Use interfaces, algorithms, animations, etc. that have been created by other people





# Build by example

- Learn from others (you did a great job this quarter!)
- Read source code on webpages, GitHub, StackOverflow
- Use the element inspector in your browser to see someone's design or implementation



# Build for accessibility

- Keep in mind who you are designing for!
- Make sure your app works for:
  - All users
  - All browsers
  - All devices



# Build with caution

- Use version control!
- Test while you build
- Iteratively refine and debug



# Build on a solid foundation

- A new framework will come out next year
  - Or next month or next week
- But some fundamental principles unite them all
  - Separating interface from data and interaction, for example

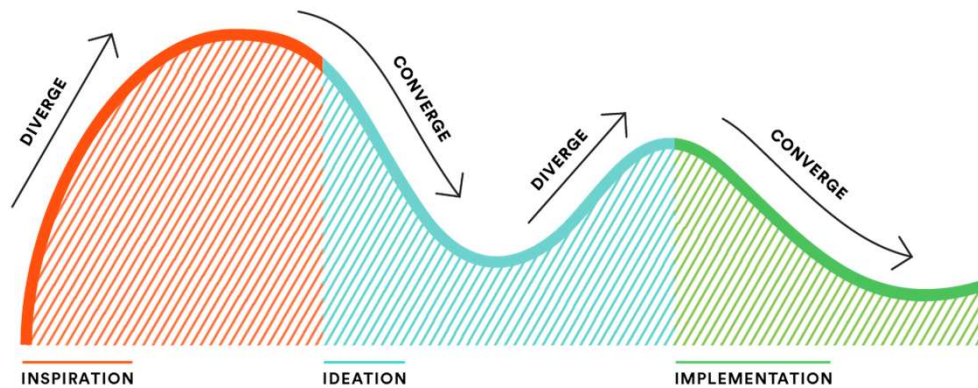


# Take away messages

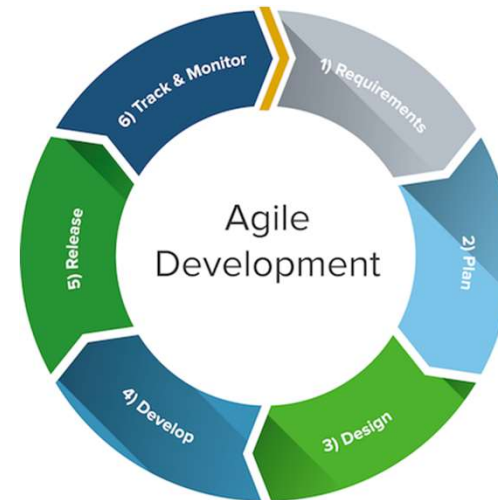
- Search before you build
- Build by example
- Build for accessibility
- Build with caution
- Build on a solid foundation

Applying this course in practice

# Product design process

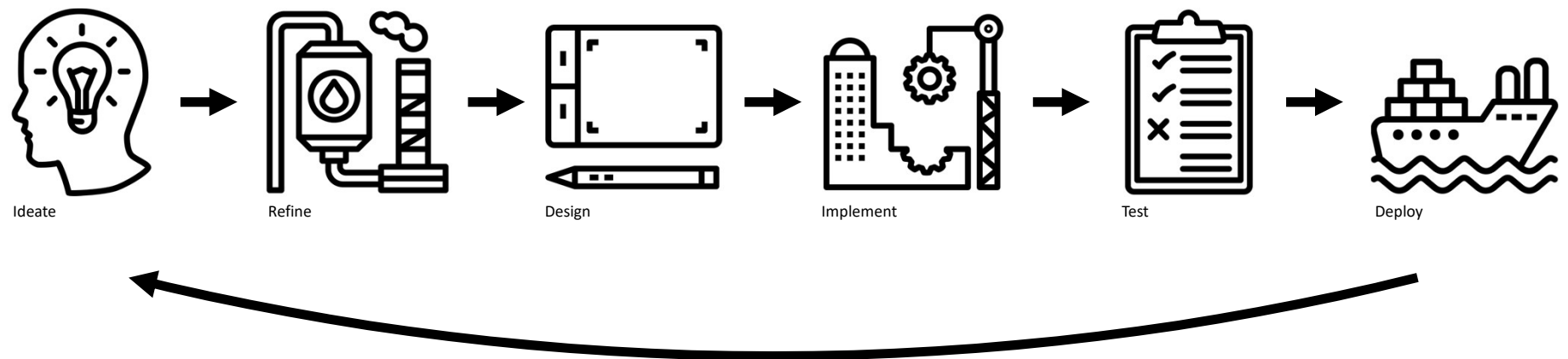


Human-Centered Design, IDEO



Agile Development, Agile Manifesto

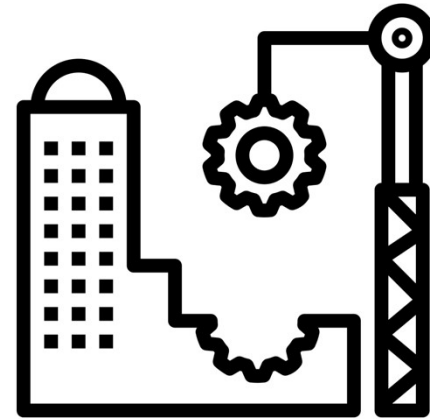
# Product design process, simplified





# User interface implementation

- Has the power to turn ideas into reality
- Often dictates design decisions and timelines, for better or for worse
- Either you will be implementing, or you will need to communicate with your colleagues who are



What job might you get  
when you graduate?

# Some job options

- User experience designer
- User experience researcher
- Front-end software engineer
- Back-end software engineer
- Academic researcher (graduate student)
- Software consultant
- Something unrelated to technology
- ... others?

# If you're going into UX, you can now...

- Follow principles of web, mobile, and interaction design
  - Responsive design! Error prevention! Give clear instruction!
- Be conversational in web and mobile programming
  - Be able to understand what tasks are easy and what are hard
  - Communicate with front-end and back-end developers
- Style a webpage
  - Use CSS to change a design and even add animations

# Front-end software engineering...

- Build a webpage in plain HTML
  - Make it responsive with Bootstrap
- Use a framework to build a richer application
  - Angular for a web frontend
  - Ionic for a mobile frontend
- Style a webpage
  - Use CSS to change a design and even add animations

# Back-end software engineering...

- Build a web server
  - Allow it to respond to requests from a front-end interface
  - Allow it to make requests to APIs made by other developers
- Follow authentication and authorization protocols
  - Enable users to sign on
- Use a database
  - Data can persist between sessions

# Academic research...

- Explain some key problems in a couple of areas
  - Ubiquitous computing
  - Human performance
  - Mixed reality design
  - Smartphone systems security
  - Wearable computing
  - Augmented and virtual reality

# Software consultancy...

- Process and analyze data
  - Retrieve it from an API
  - Parse and process it to answer your question
- Visualize data
  - Use an appropriate tool for the task

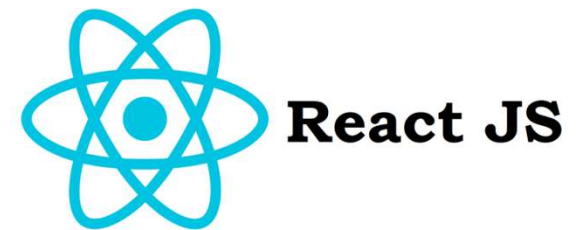


# Something unrelated...

- Make a portfolio to show off your skills
  - Selling yourself is key
  - Remember, portfolios are living documents...always keep it up to date
- Judge new devices and apps that come along
  - Is this solving a real problem?
  - Is this well designed?

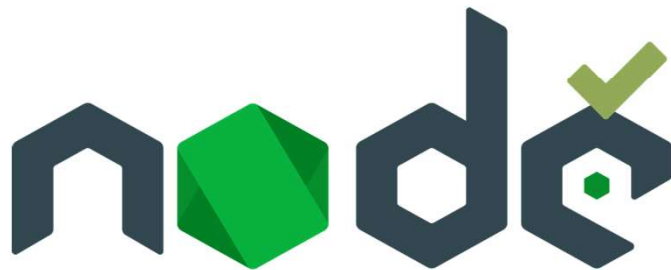
# What is interface implementation today?

Often HTML, CSS, and JavaScript



Bootstrap

METEOR



ember

# Assignments

- A1: Personal web portfolio
- A2: Programming on the web
- A3: Web frameworks
- A4: Mobile development
- A5: Alternative Interaction



# Other skills

- Git and GitHub
- Package management in npm
- Visualization in Vega-Lite
- Gestural control

# Congratulations!

- We said this class would be challenging
- You have risen to the challenge and worked hard (and still are)
- You have created impressive work as a result

It's been an honor  
to be able to teach you.  
(No, seriously, I learned a lot!)

# INF 134 – Spring 2024

- Course refresh!
  - We will be building a web framework from scratch
  - Learn how to build interactive widgets from graphical primitives

I look forward to seeing  
what you do next!