3.3
MILLION

Android apps on Google Play

2.2
MILLION

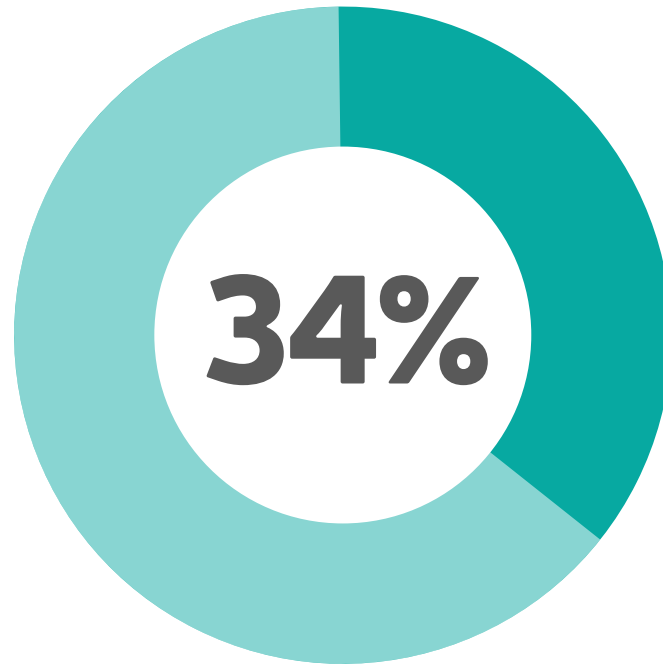*iOS apps on the App Store*
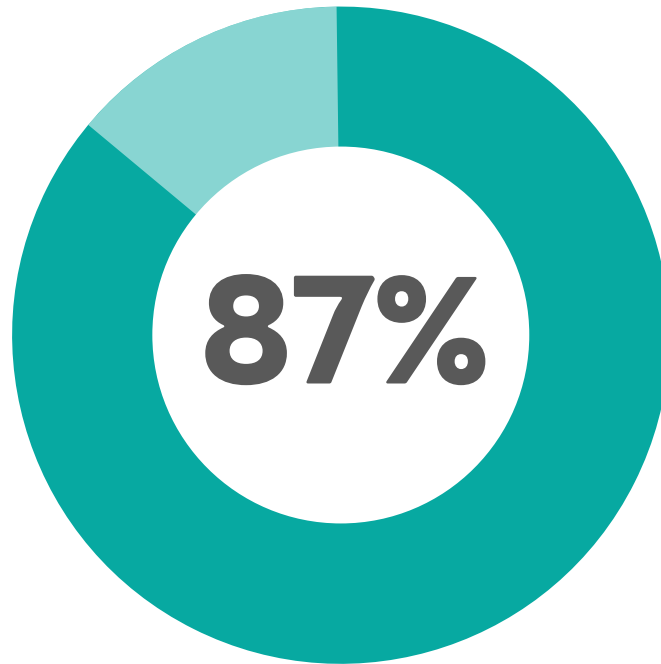
25%
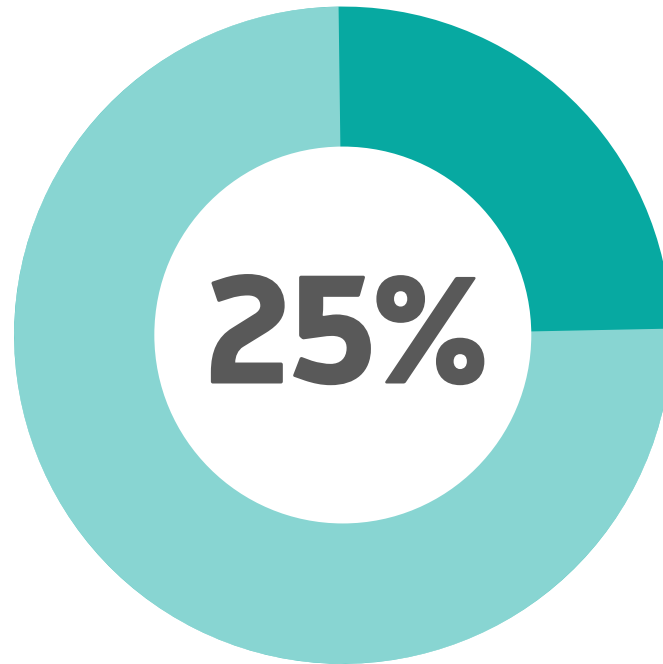
of apps aren't used more than once

34%

of apps aren't opened more than 11 times

87%

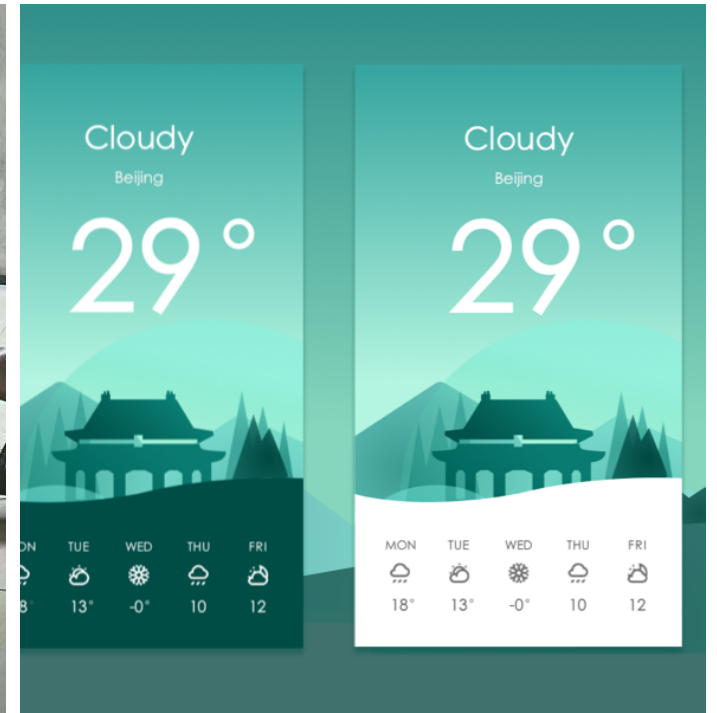mobile users spend 87% of their time in apps

Competition is fierce and users are fickle

Strive for **App Elegance**

Our goal, as mobile developers, should be to build **useful, elegant** and **beautiful** applications

Our applications should **look and feel natural** on each platform, taking advantage of the platform's unique style and patterns

Humans have an innate attraction to beautiful design...

User Interface Design

The basics in Xamarin.Forms
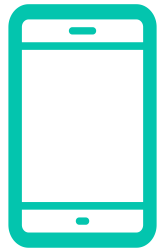
Kym Phillpotts

Senior Content Developer - Microsoft

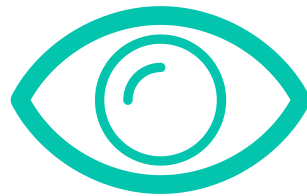**UX** deals
with purpose

UI deals with appearance
and functionality

Elements of *Design*

LAYOUT

CONSISTENCY

ANIMATION

Layouts
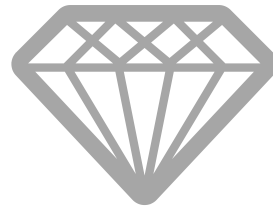
Choosing the right layout

Layout *Goals*

"Perfection is achieved when there is nothing left to take away."

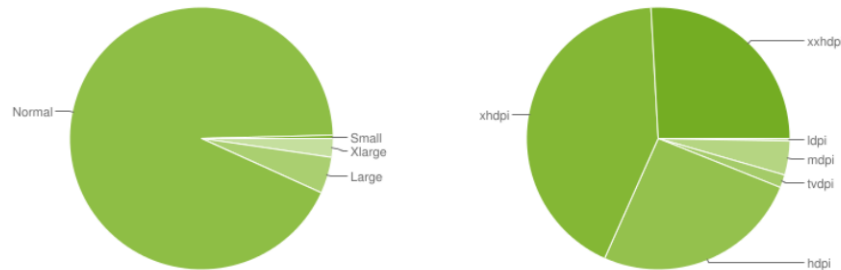*Antoine de Saint-Exupéry*

Strive for
Minimalism

Prioritise one primary
Action per screen

Design good
Information
Architecture

Fragmentation... *Oh My!*

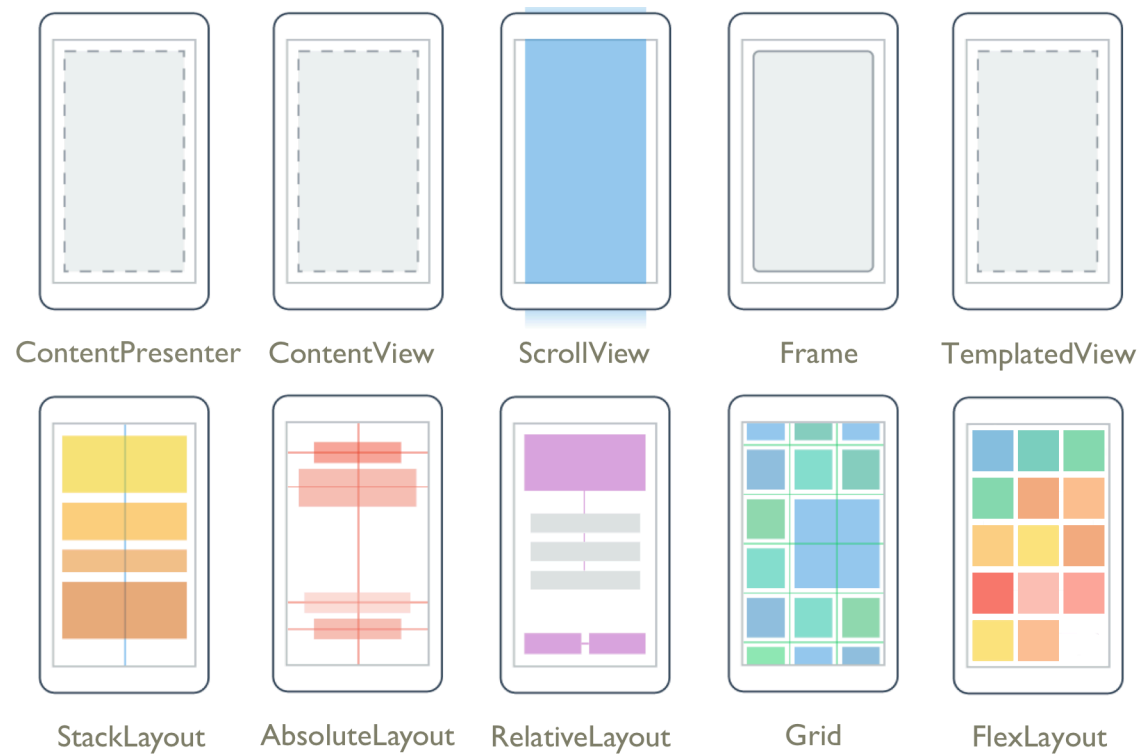|	ldpi	mdpi	tvdpi	hdpi	xhdpi	xxhdpi	Total
Small	0.3%					0.1%	0.4%
Normal		0.7%	0.3%	24.7%	41.9%	25.2%	92.8%
Large		2.0%	1.3%	0.4%	0.3%	0.5%	4.5%
Xlarge		1.5%		0.5%	0.3%		2.3%
Total	0.3%	4.2%	1.6%	25.6%	42.5%	25.8%	

Data collected during a 7-day period ending on October 26, 2018.
Any screen configurations with less than 0.1% distribution are not shown.

Device	Asset Resolution	PPI	Display Size
iPhone XS Max	@3x	458	6.5"
iPhone XR	@2x	326	6.1"
iPhone X, XS	@3x	458	5.8"
iPhone 6+, 6S+, 7+, 8+	@3x	401	5.5"
iPhone 6, 6S, 7, 8	@2x	326	4.7"
iPhone 5, 6SE 5, 5S, 5C, 6SE	@2x	326	4.0"
iPhone 4 4, 4S	@2x	326	3.5"
iPhone 1st, 2nd & 3rd Generation	@1x	163	3.5"
iPad Pro	@2x	264	12.9"
iPad Air / Retina iPad 1st & 2nd Generation/ 3rd & 4th	@2x	264	9.7"
iPad Mini 2nd, 3rd & 4th Generation	@2x	326	7.9"
iPad Mini 1st Generation	@1x	163	7.9"
iPad 1st & 2nd Generation	@1x	132	9.7"

DPI vs Points vs Effective Pixels?
Xamarin.Forms just passes it down to the platform!

Choose the *Right Layout*

ContentPresenter

ContentView

ScrollView

Frame

TemplatedView

StackLayout

AbsoluteLayout

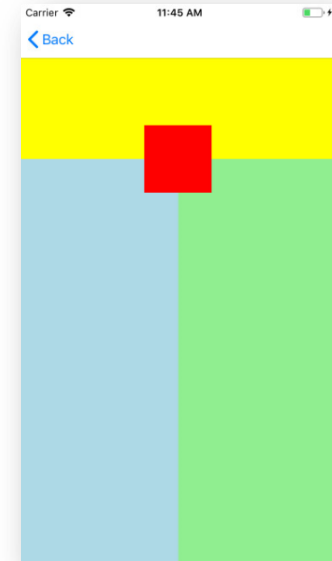RelativeLayout

Grid

FlexLayout

Xamarin.Forms layouts make it easier to handle responsive design

Grids are **Pretty Awesome**

```xml
<Grid ColumnSpacing="0" RowSpacing="0">
    <Grid.RowDefinitions>
        <RowDefinition Height="120" />
        <RowDefinition Height="*" />
    </Grid.RowDefinitions>

    <Grid.ColumnDefinitions>
        <ColumnDefinition Width="*" />
        <ColumnDefinition Width="*" />
    </Grid.ColumnDefinitions>

    <BoxView Grid.Row="0" Grid.ColumnSpan="2" BackgroundColor="Yellow" />
    <BoxView Grid.Row="1" Grid.Column="0" BackgroundColor="LightBlue" />
    <BoxView Grid.Row="1" Grid.Column="1" BackgroundColor="LightGreen" />
    <BoxView Grid.ColumnSpan="2" HeightRequest="80" WidthRequest="80"
            HorizontalOptions="Center" VerticalOptions="End"
            TranslationY="40" BackgroundColor="Red" />
</Grid>
```
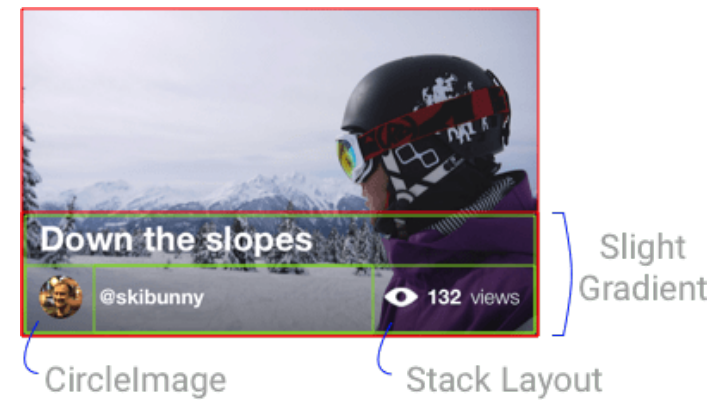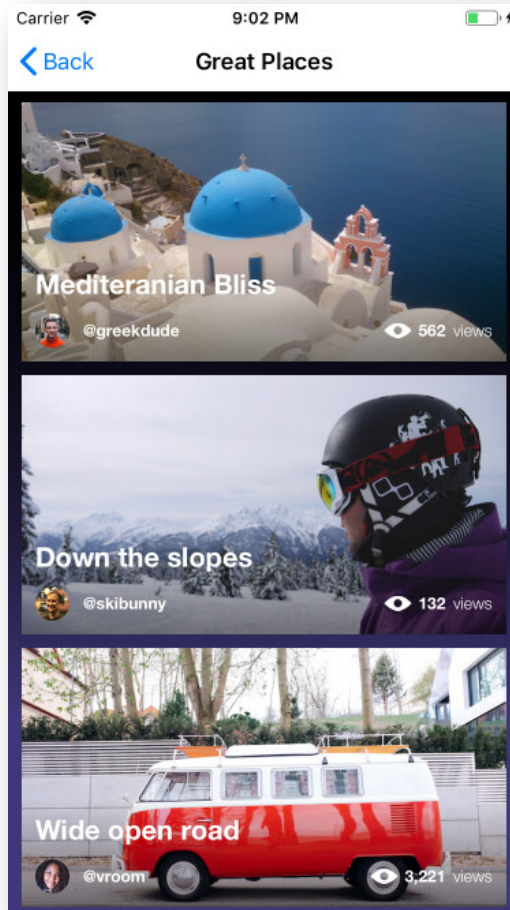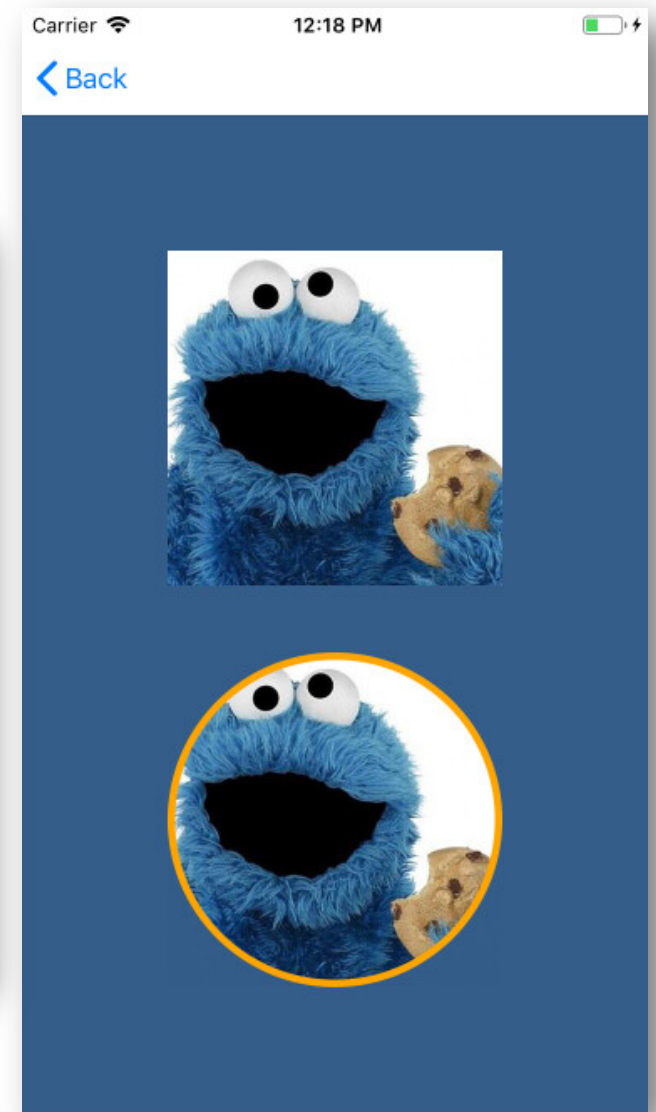
Overlapping **Elements**

Slight Gradient

CircleImage

Stack Layout
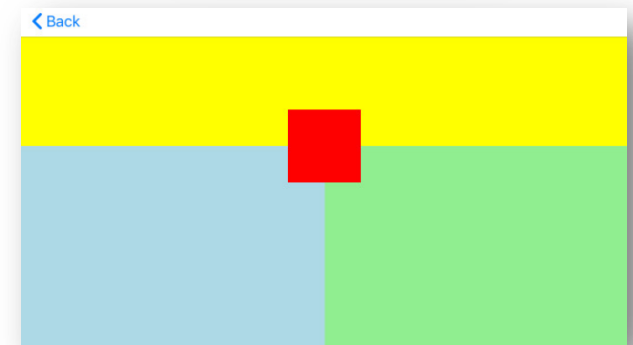
Non Rectangular *Elements*

```xml
<ContentPage
    x:Class="Layouts.CircleImagePage"
    xmlns="http://xamarin.com/schemas/2014/forms"
    xmlns:x="http://schemas.microsoft.com/winfx/2009/xaml"
    xmlns:circle="clr-namespace:ImageCircle.Forms.Plugin.Abstractions;assembly=ImageCircle.Forms.Plugin"
    BackgroundColor="#345d89">

    <ContentPage.Content>
        <StackLayout Spacing="40" VerticalOptions="Center">
            <Image
                HeightRequest="200"
                HorizontalOptions="Center"
                Source="CookieMonster"
                WidthRequest="200" />
            <circle:CircleImage
                Aspect="AspectFill"
                BorderColor="Orange"
                BorderThickness="5"
                HeightRequest="200"
                HorizontalOptions="Center"
                Source="CookieMonster"
                WidthRequest="200" />
        </StackLayout>
    </ContentPage.Content>
</ContentPage>
```

https://github.com/jamesmontemagno/ImageCirclePlugin

Non Rectangular **Elements**

SkiaSharp provides an excellent cross platform drawing library

```csharp
void OnCanvasViewPaintSurface(object sender, SKPaintSurfaceEventArgs args)
{
    // work out points for the path considering denisity of device
    float densityMultiplier = args.Info.Height / (float)SkiaCanvas.Height;
    var curveAmount = 40 * densityMultiplier;
    float curveStart = args.Info.Height - curveAmount;
    float curveEnd = args.Info.Height + curveAmount;

    args.Surface.Canvas.Clear();

    // create the clipping path
    SKPath path = CreatePath(curveStart, curveEnd, args.Info.Width);
    args.Surface.Canvas.ClipPath(path, antialias: true);

    // render bitmap into clipping rectangle
    using (SKPaint paint = new SKPaint())
    {
        // Create bitmap tiling
        paint.Shader = SKShader.CreateBitmap(resourceBitmap,
                                    SKShaderTileMode.Repeat,
                                    SKShaderTileMode.Repeat);
        // Draw background
        args.Surface.Canvas.DrawRect(args.Info.Rect, paint);
    }
}
```
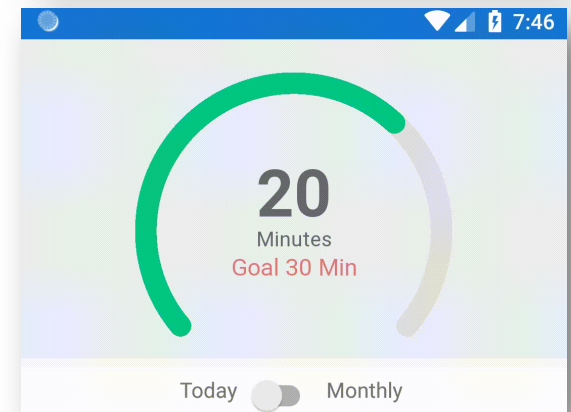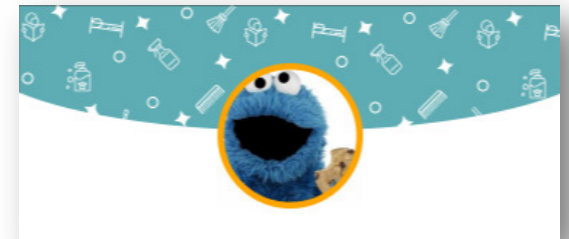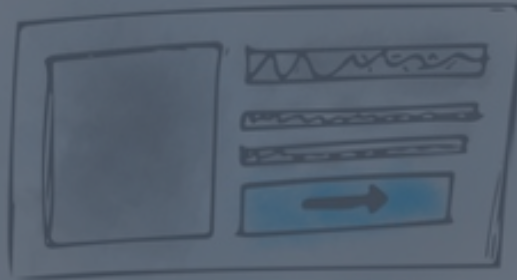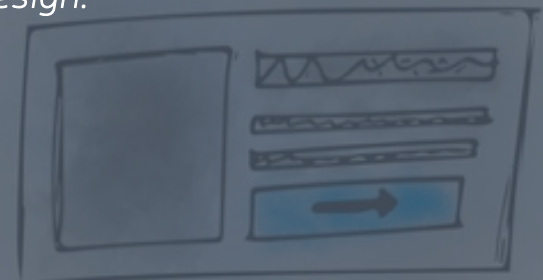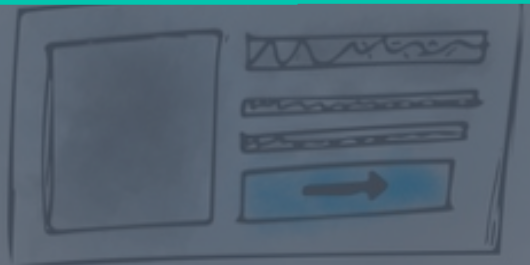
Consistency

Consistent design is intuitive design.

Benefits of **Consistency**

- Users will learn faster how to use your app
- Consistency eliminates confusion.
- Consistency saves money and time.
- Humans like consistency.

Fonts, sizes, buttons, labeling, colors need to be consistent across the product to keep visual consistency.

*Fonts and **Typography***

- Typography is a fundamental basis for design
- Fonts can convey emotion
- Critical element of branding
- Typography can make or break a design

It's both a science and an art that some people devote their entire careers to
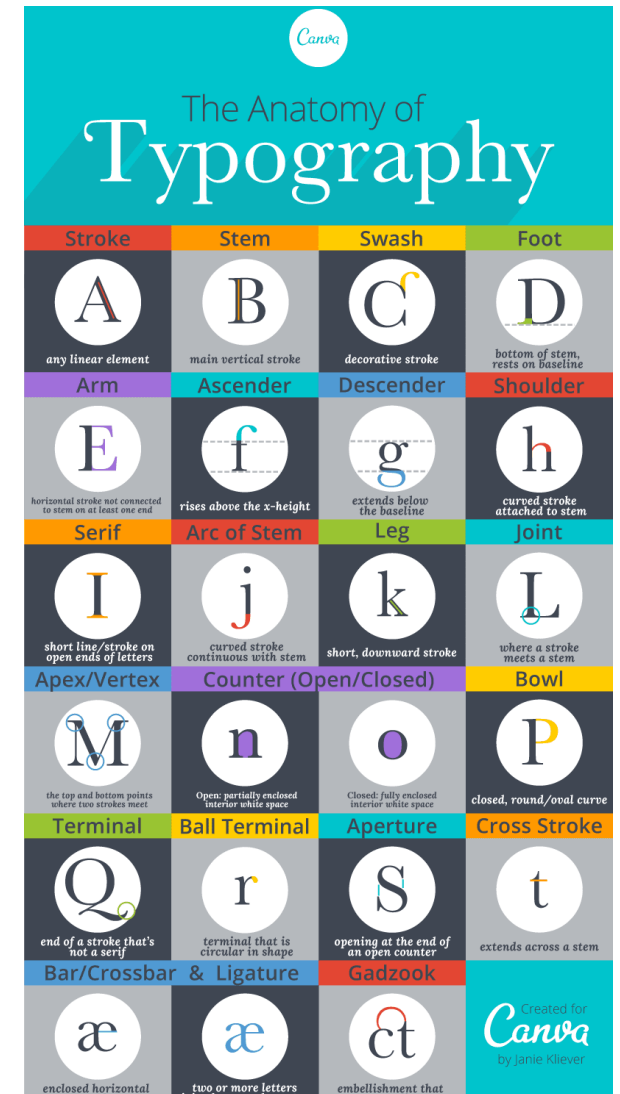
Custom *Fonts*

Custom fonts are platform specific

iOS
- Font goes into *Resources* folder
- BuildAction: BundleResource
- Include in *info.plist*
- Font Family: font name

Android
- Font goes into *Assets* folder
- BuildAction: AndroidResource
- FontFamily: fontfilename.ttf#fontfamilyname

UWP
- Font goes into *Assets* folder
- Build Action: Content
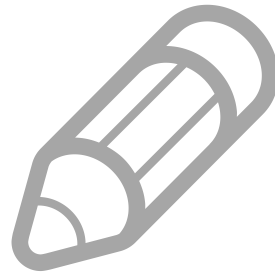- FontFamily: fontfilename.ttf#fontfamilyname

Gotchas
- The name of the font is not always the same as the filename
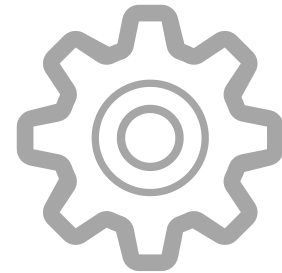
Consider **Icon Fonts**

There are some great icon font libraries which web developers have been using for years. FontAwesome is one of the best known but there are others

Resizeable

Can Adjust Colours

Small Footprint

A really good option is to use the **Iconize Plugin**
https://github.com/jsmarcus/Iconize

Options for *Styling*

Xamarin.Forms apps are really still native apps

Styling per platform
- Android Themes
- iOS Appearance API

Consistency across platforms
- Xamarin.Forms Style API
- CSS

Style **Structure**

Styles get verbose. Break your XAML Styles into merged dictionaries.

- Colors
- Fonts
- Global Styles
- Literals
- Sizes
- Styles

Selectable *Themes*

It is often beneficial to allow the user to select a theme they would like. Some apps even do this automatically.

Think of Google Maps which changes themes depending on the time of day
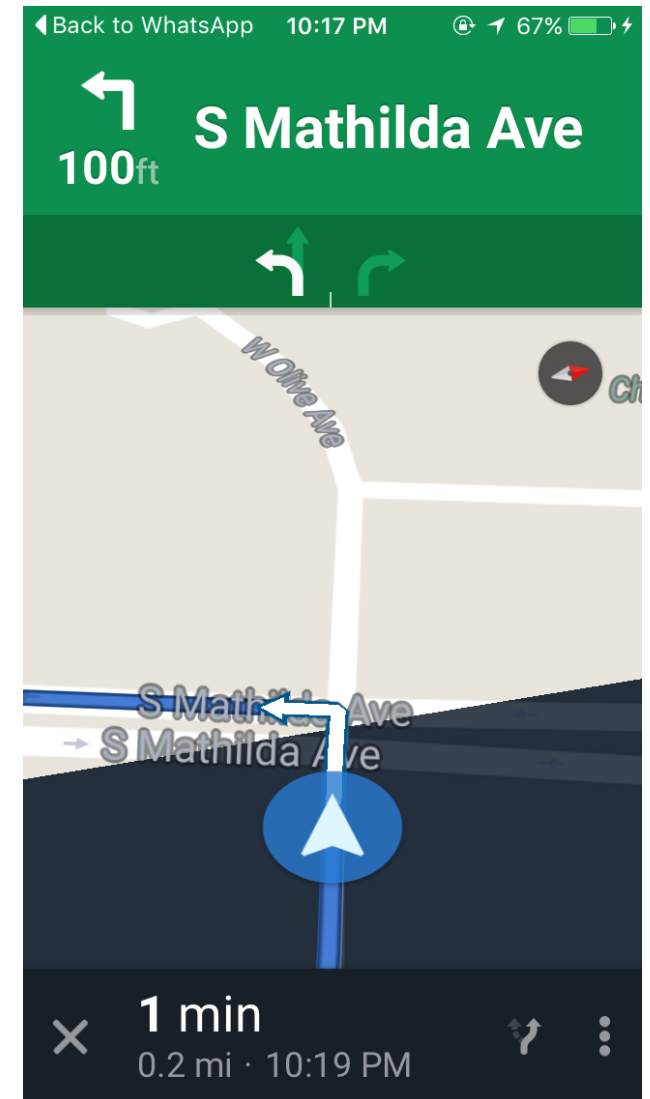
Animation

Bringing some fun to your app

Animation *Theory*

Animations are should serve a purpose

Visual Feedback   Change Blindness   Entertain

Will the animation get annoying on the 100th use?

Simple Animations

ViewExtensions has extension methods on all **VisualElements**

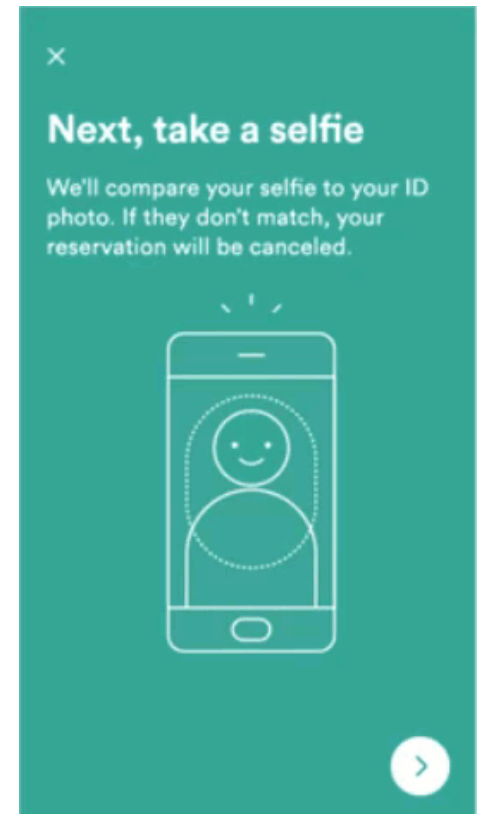| VisualElement Property	Animation Extension
TranslationX, TranslationY	TranslateTo
Scale	ScaleTo, RelScaleTo
Rotation	RotateTo, RelRotateTo,
RotationX	RotateXTo
RotationY	RotateYTo
Opacity	FadeTo

Advanced animation with **Lottie**

For complex animations

Lightweight files

Huge community

Scaleable

Resources

Dig into these resources for more information

Resources

Xamarin.Forms good looking UI Samples
https://github.com/jsuarezruiz/xamarin-forms-goodlooking-UI

Snppts – Xamarin Forms UI Snippets
https://snppts.dev/

Principles of Mobile App Design – Google Study
https://aka.ms/PrinciplesOfMobileAppDesign

Code from this session:
https://github.com/kphillpotts/XF-UserInterfaceTechniques

My Other Resources

Twitch Streaming Live Coding Xamarin.Forms UI's
https://twitch.tv/kymphillpotts

Weekly Xamarin – Your best source of Xamarin news
http://weeklyxamarin.com/

Melbourne Xamarin Meetup
https://www.meetup.com/Melbourne-Xamarin-Meetup/

My Blog:
https://kymphillpotts.com

Thank you

and any questions?

Kym Phillpotts

kym.phillpotts@microsoft.com

@kphillpotts