

# State of .NET Online

## Blazor Web Development in .NET 5

**Markus Egger**

President and Chief Software Architect  
CODE Magazine & Consulting

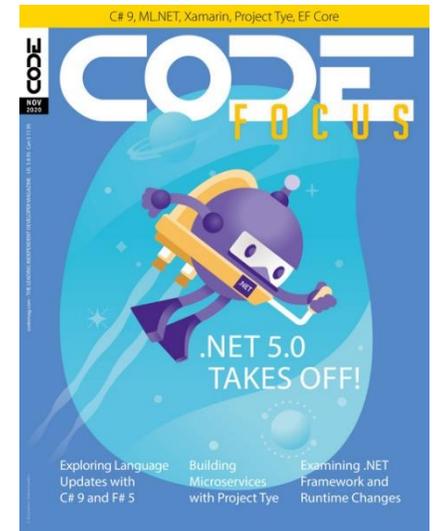
**Dr. Otto Dobretsberger**

Senior Software Developer  
CODE Consulting

# Free Subscription to CODE Magazine!

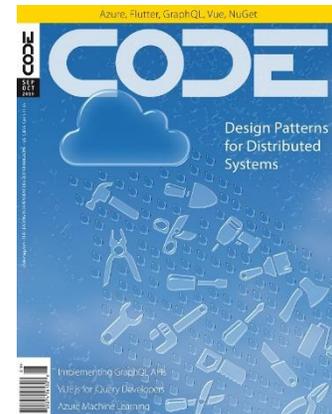
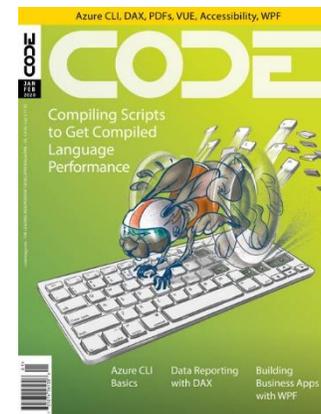
- The leading software development magazine written by expert developers for developers
- All registered attendees will automatically receive a free digital subscription to CODE Magazine – no need to do anything, it'll happen auto-magically.
- Please share this free subscription link with your coder friends, associates, colleagues, team lead, CTO, social media followers, enemies, arch-nemesis, etc. who couldn't make it to the live webinar

<https://bit.ly/39ZynRI>



# About the Presenter

- **Markus Egger**
- President and Chief Software Architect  
EPS Software Corp. (dba CODE Consulting)
- Publisher – CODE Magazine
- International Author and Speaker
- Microsoft RD (Regional Director)
- Microsoft MVP 1995-2019
- [Email: markus@eps-software.com](mailto:markus@eps-software.com)
- Twitter: @markusegger



# About the Presenter

- **Dr. Otto Dobretsberger**
- Senior Software Developer
- Professor at University of Houston
- PhD in Computer Science (UofH)
- [Email: ottod@codmag.com](mailto:ottod@codmag.com)
- ...and able to deadlift 700lbs+ (Texas State record holder) 😊



# About CODE Consulting

## “Helping People Build Better Software”

- Custom Software Development, Training, Mentoring,...
- Web, Cloud, Mobile, Desktop, Serverless, Databases,...
- User Interface and Interaction Design
- Project Rescue, Legacy Conversions (VB, VFP, Access, etc.)
- Development Team Staff Augmentation
- Microsoft Certified Partner



# Your Ticket to Free Consulting

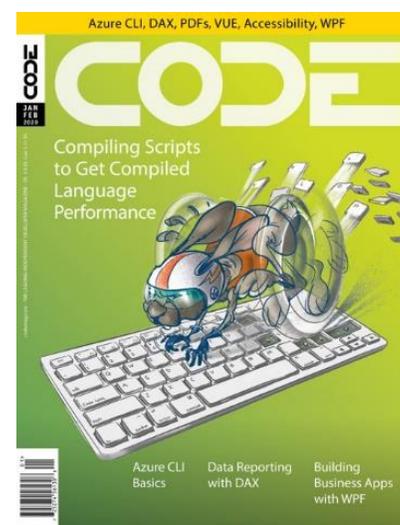
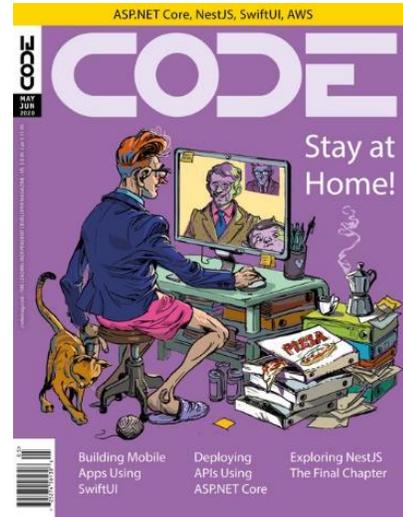
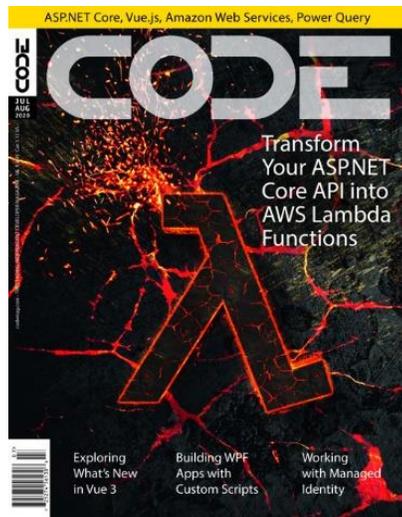
- One hour on us. Really. Schedule a call today. Slots are limited.
- No strings. No commitment. No credit card required.
- Just help from our team of experience software developers.
- Got questions? Stuck on an issue? Platform and/or architecture decisions to make? We can help!



Contact us at [info@codemag.com](mailto:info@codemag.com) or [jduffy@codemag.com](mailto:jduffy@codemag.com)

# Social Networks

- Subscribe to our YouTube channel: <https://tinyurl.com/CODEYTC>
- Follow us on Twitter: @CodeMagazine 
- Facebook: [www.facebook.com/CODEMagazine/](http://www.facebook.com/CODEMagazine/) 



# About CODE Consulting

- Looking for work?

<https://www.codemag.com/Jobs>

- Want to write for us?

<https://www.codemag.com/Write>

- Need to add talent to your development team?

<https://www.codemag.com/Staffing>



# Event Survey

- Please complete this very short 12 question survey

<https://tinyurl.com/cmw0127>

- Event Slides & Videos:

<https://www.codemag.com/StateOfDotNet>



CODE Magazine State of .NET - Blazor Web Development with .NET 5

Thank you for attending! Please complete this brief 12 question survey. Yes, we still want to hear from you if you watch the recorded video. :-)

\* Required

1. Full Name \*

2. Company Name \*

THIS SLIDE WILL BE REPEATED AT THE END AND SURVEY LINK REPEATED IN THE CHAT WINDOW!

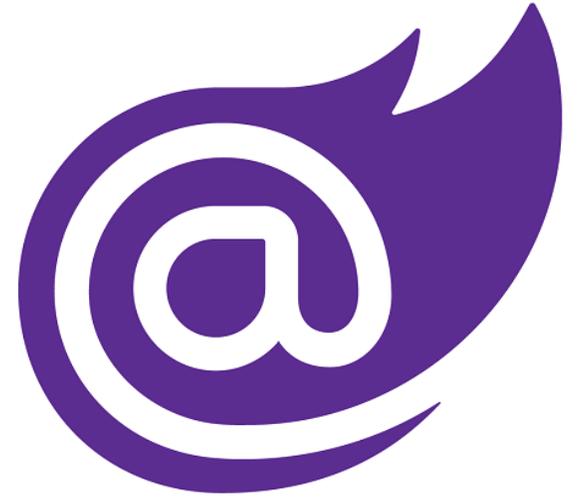
# State of .NET Online

- Due to the Coronavirus Crisis, State of .NET has turned from “sometimes online” to “an online series”
- Expect monthly online events going forward
  - Future topics: Windows Desktop Development, DevOps, Azure, .NET 6,...
  - Let us know what you are interested in!
- Note that live-events will also continue to be scheduled at various locations once that is possible again

# Agenda

- Overview of Blazor and what to expect
- How is Blazor adoption going?
- What is new with Blazor in .NET 5?
- An overview of Client-Side and Server-Side concepts
- Web Assembly vs. Server-Side
- Progressive Web Apps (PWA)
- Code Examples
- Photino

# Blazor Overview



# What is Blazor and why do we need it?

- Blazor is a new web development framework from Microsoft
- Based on the .NET Platform...
- ...both on the Client and the Server
- It is fundamentally different from other client-side frameworks that are based on JavaScript

# Blazor Advantages

- C# Language (yes, even in the browser!)
- Great Tooling/IDE
- Stability
- Ecosystem
- Based on standards (HTML, CSS, Web Assembly,...)
- Code reuse and share
- Component based
- Skill reuse.

# A Tale of Two Blazors

- **Blazor WebAssembly** – Client Side
- **Blazor Server** – Server Side
- Identical code bases
  - Except for some down-line differences, such as being able to access data more directly on the server

# Blazor Features

- Component model
- Routing
- Layouts
- Forms and validation
- Dependency injection
- Live reload
- JavaScript interop
- Server-side rendering
- Debugging (browser & IDE)
- Rich IntelliSense and tooling
- Fallback to asm.js
- Publishing
- App size trimming

# Blazor Release Versions

- Blazor is now included with .NET 5
- Blazor Server originally released with .NET Core 3
- Blazor Web Assembly originally released with .NET Core SDK 3.1.300
- Supported in Visual Studio and VS Code (and other .NET editors and IDEs) on all platforms
- [blazor.net](https://blazor.net)

# Blazor Adoption

# Blazor Adoption

- It is difficult to say how many people use Blazor in how many real-world projects, but...
- ...we do know that Blazor is THE topic that creates the most interest (as is evident in today's event)
- ...that .NET 5 is being adopted very quickly
- ...and that Blazor is the fastest growing workload within .NET 5.

# .NET ecosystem momentum

>2M

.NET Core developers

in Visual Studio

#1 Most Loved

Framework (2019 & 2020)

.NET Core



Top 30

Highest velocity OSS projects

github.com/dotnet  
github.com/aspnet



Top 5

Language on GitHub

C#



7x

Faster than Node.js

ASP.NET Core



40%

New to .NET are students

dot.net download survey

# .NET ecosystem momentum

> 5M

.NET developers

In Visual Studio family

#1

Most Loved Framework (2019 & 2020)

.NET Core

Top 30

Highest velocity OSS projects

[github.com/dotnet](https://github.com/dotnet)  
[github.com/aspnet](https://github.com/aspnet)



Top 5

Language on GitHub

C#



7X

Faster than Node.js

ASP.NET Core

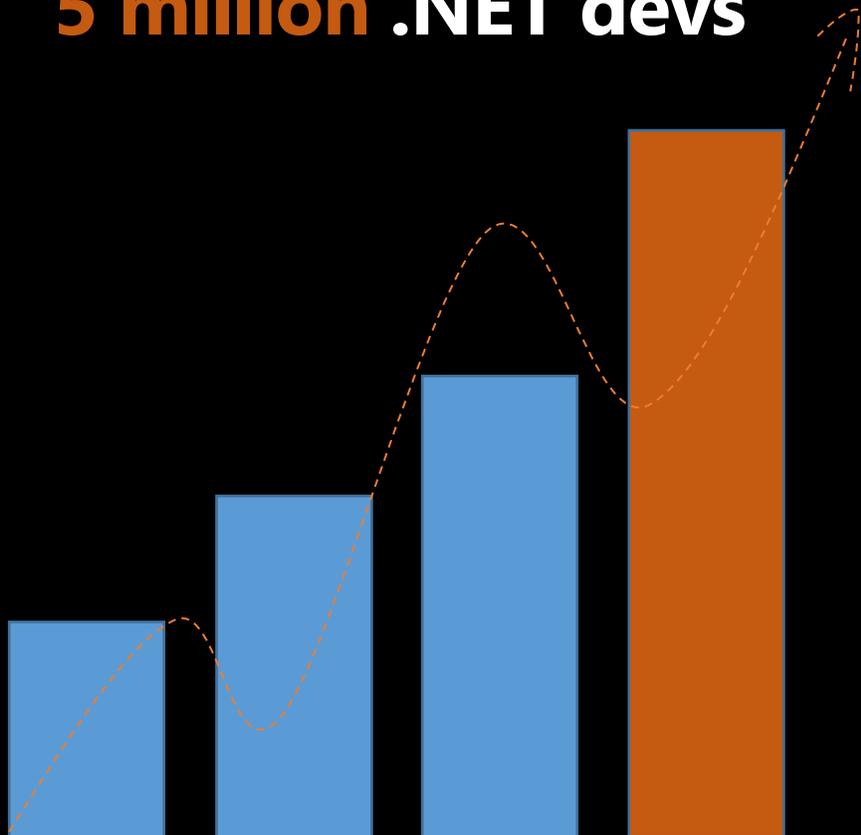
40%

New to .NET are students

dot.net download survey

# .NET adoption

**5 million .NET devs**



**Visual Studio**

**+1 million new**

Monthly active .NET developers in the last year

**.NET Core**

**+600K new**

Monthly active .NET Core developers in the last year

**.NET on Linux**

**2 million**

Publishes to Linux from Visual Studio

# WebAssembly



# WebAssembly is changing the Web

- In simple terms: binary code for web browsers
- Native performance for the web
  - Think of it as executing native compiled code in a browser
- Cross platform compilation target for any language
- Available in all major browsers
- Provides a “compilation target” for all kinds of languages
- Originally, this was mostly used by C++ game developers

# WebAssembly

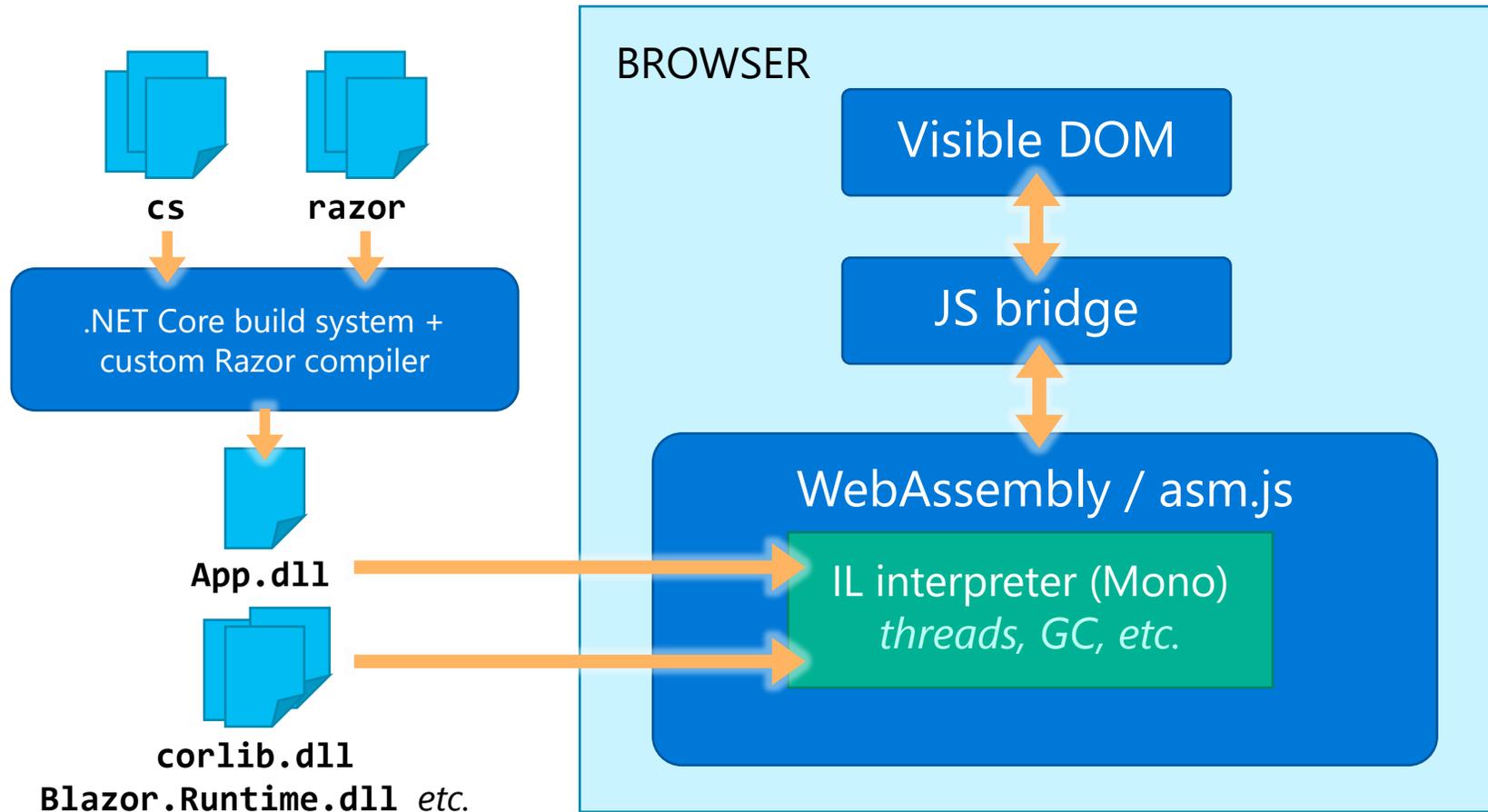


# Can You Use It?

- Yes!
- All major browsers and platform support WebAssembly



# How Blazor works





DEMO

# A First Lap Around Blazor

# Blazor .NET 5



# What's New in .NET 5?

One .NET from Desktop, to  
Web, Mobile, and Beyond!

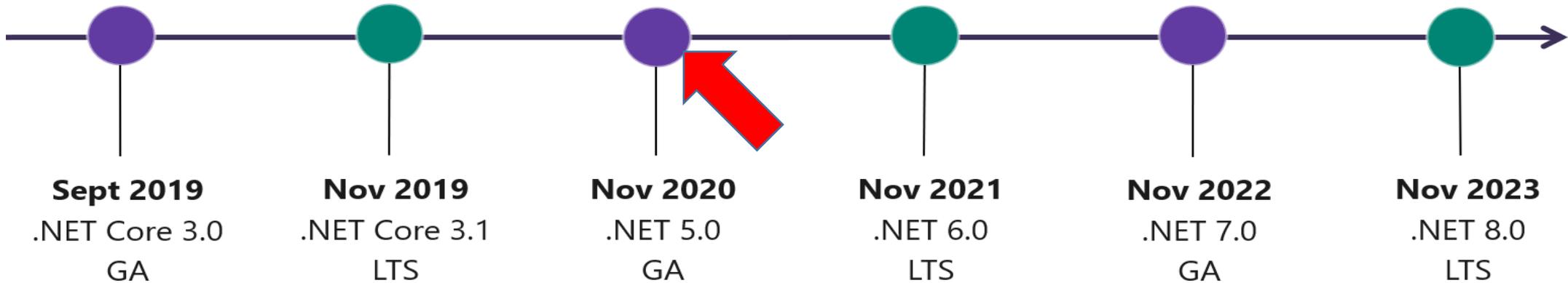
# The Journey to One .NET

- .NET now looks back at a history lasting two decades...
- ...with many twists and turns
- .NET Framework, .NET Core, Mono, Xamarin, UWP, Silverlight, Windows Phone,...
- Different components, project structures, APIs,...
- .NET 5 is a huge step in the journey towards (re)unifying the .NET platform
- The goal is to get away from worrying about “what runs where” and simply “targeting .NET” with code that runs everywhere

# .NET – A unified platform



# .NET Timeline/Roadmap



- .NET 5 Release: November 10<sup>th</sup>, 2020
- Annual, predictable releases (started a year ago with .NET Core 3.1)
- Minor Releases if needed

# CODE Focus Magazine: .NET 5

- We are working on a CODE Focus issue on .NET 5
- Great source of free information
- Produced in conjunction with Microsoft
- All CODE Magazine subscribers get this special issue for free
- Get a free subscription at:  
[www.codemag.com/subscribe/CF2020](http://www.codemag.com/subscribe/CF2020)



# What's New in .NET 5 Blazor?

- Included in .NET 5
- All of .NET 5 is available in Blazor (no more limit for Standard 2.1)
  - Situation-specific limitations still apply
- CSS Isolation
- Lazy Loading
- Hot Reload with **dotnet watch**
- New features aimed to reduce the need for JavaScript
- Debug Improvements

# What's New in .NET 5 Blazor? (cont.)

- Performance Improvements (WebAssembly)
  - Typical CPU intensive operations run about 30% faster
  - UI rendering is about 200-400% faster
    - This is especially true for UI elements with lots of elements, such as grids
  - Virtualization is now supported
  - Prerendering

# What's New in .NET 5 Blazor? (cont.)

- New Blazor WebAssembly SDK replaces the NuGet package used in the past

```
<Project Sdk="Microsoft.NET.Sdk.BlazorWebAssembly">
  <PropertyGroup>
    <TargetFramework>net5.0</TargetFramework>
  </PropertyGroup>
  <ItemGroup>
    <!-- Package references -->
  </ItemGroup>
</Project>
```



DEMO

# Blazor Server vs. Web Assembly

Dr. Otto Dobretsberger

The logo for Progressive Web Apps (PWA) is displayed in the top right corner. It features the letters 'PWA' in a bold, sans-serif font. The 'P' and 'A' are dark grey, while the 'W' is a vibrant purple. The letters have a subtle drop shadow effect, giving them a three-dimensional appearance as if they are floating above the white background.

PWAs (Progressive Web Apps)

# What are PWAs?

- Progressive Web Apps are locally installed apps
- They are not specific to Blazor...
- ...but Blazor WebAssembly makes it very easy to develop them
- All code runs local, and the app can operate offline
- Apps can be started from the local experience (desktop, start menu, phone home screen,...)

# Blazor PWA

Dr. Otto Dobretsberger



# Blazor 3<sup>rd</sup> Party Components

# 3<sup>rd</sup> Party Vendors



# Open Source Community



Blazored



MatBlazor



Ant Design Blazor

<Blazorise/>



BlazorStrap

bUnit

Blazm



# Photino

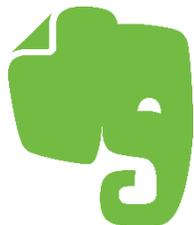


# What is Photino?

- Photino is an Open Source project, based on Steve Sanderson's WebWindow which was based on .NET Core 3.1 and a pre-release version of WebView2
- Check out Steve's blog post on WebWindow  
<https://blog.stevensanderson.com/2019/11/18/2019-11-18-webwindow-a-cross-platform-webview-for-dotnet-core/>

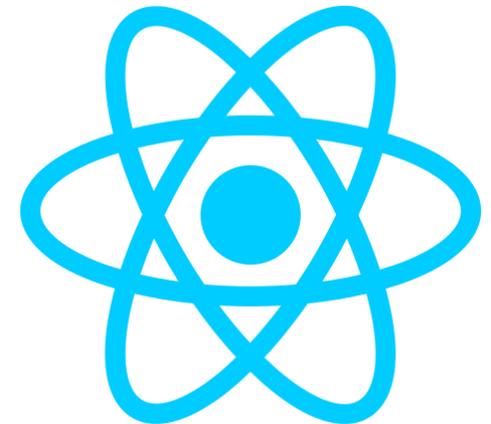
# What is Photino?

- If you're familiar with Electron or Electron applications (VS Code, Slack, Azure Data Studio, Azure Storage Explorer, Evernote...) Photino is also an Open Source project to allow developers to use Web UIs (HTML, JavaScript, CSS, etc.) in native applications across platforms instead of learning platform specific UI technologies.

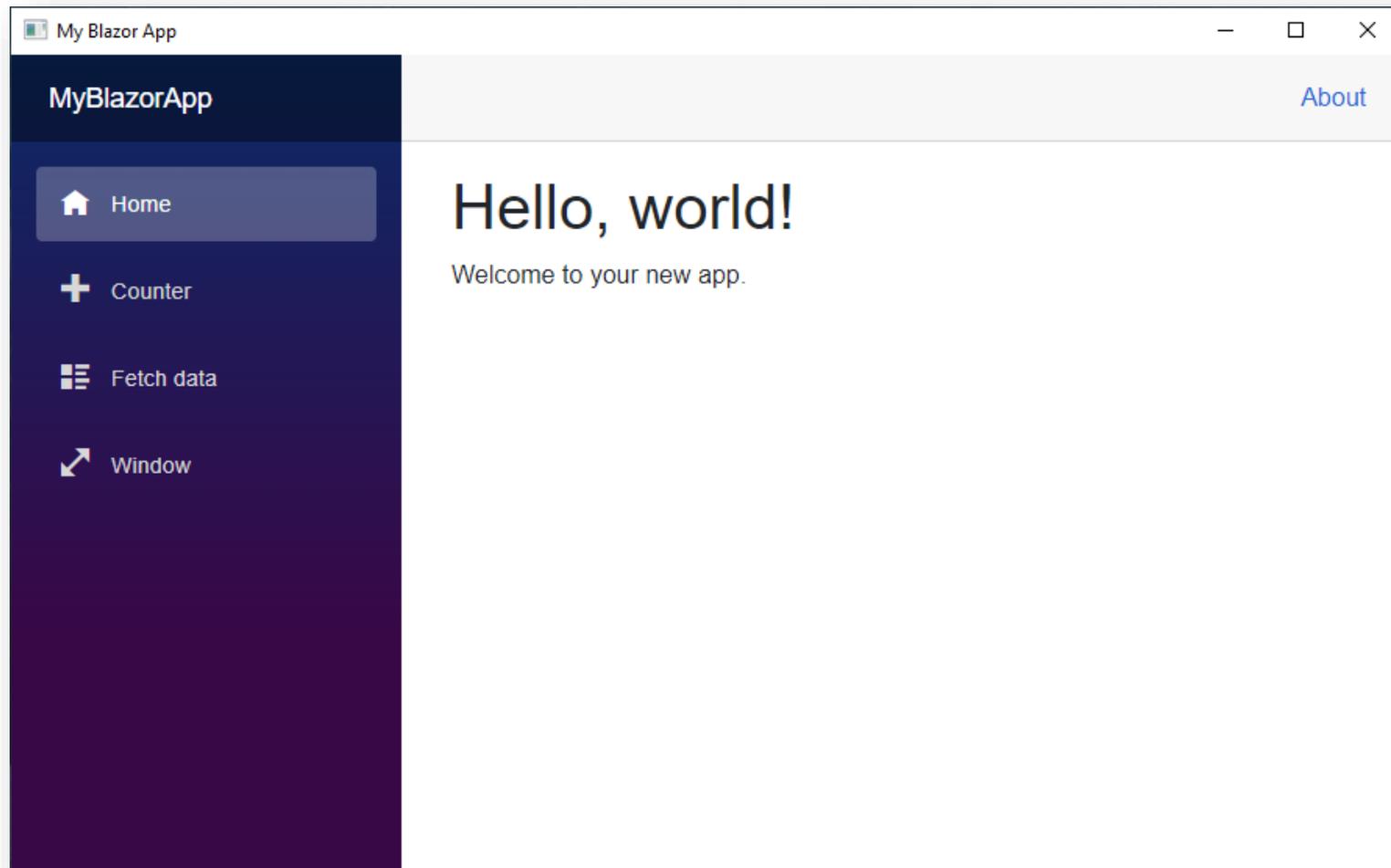


# What can I build with Photino.NET?

- HTML, JavaScript, CSS applications
- ReactJS
- AngularJS
- VueJS
- Etc.
- .NET 5 back end



# Photino.NET.Blazor adds Blazor to Photino.NET



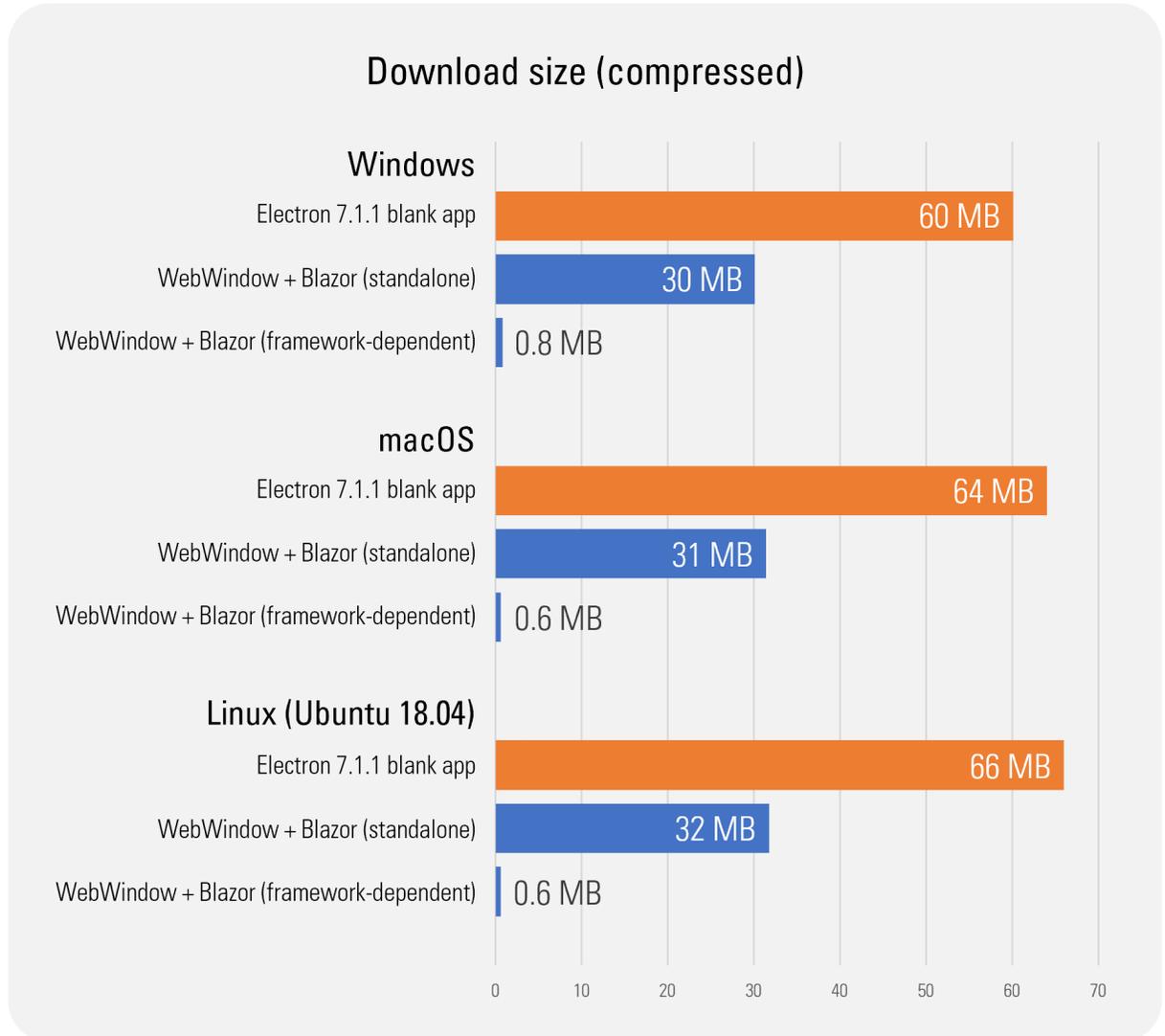
# What can I build with Photino.NET.Blazor?

- Practically anything you can build with Blazor



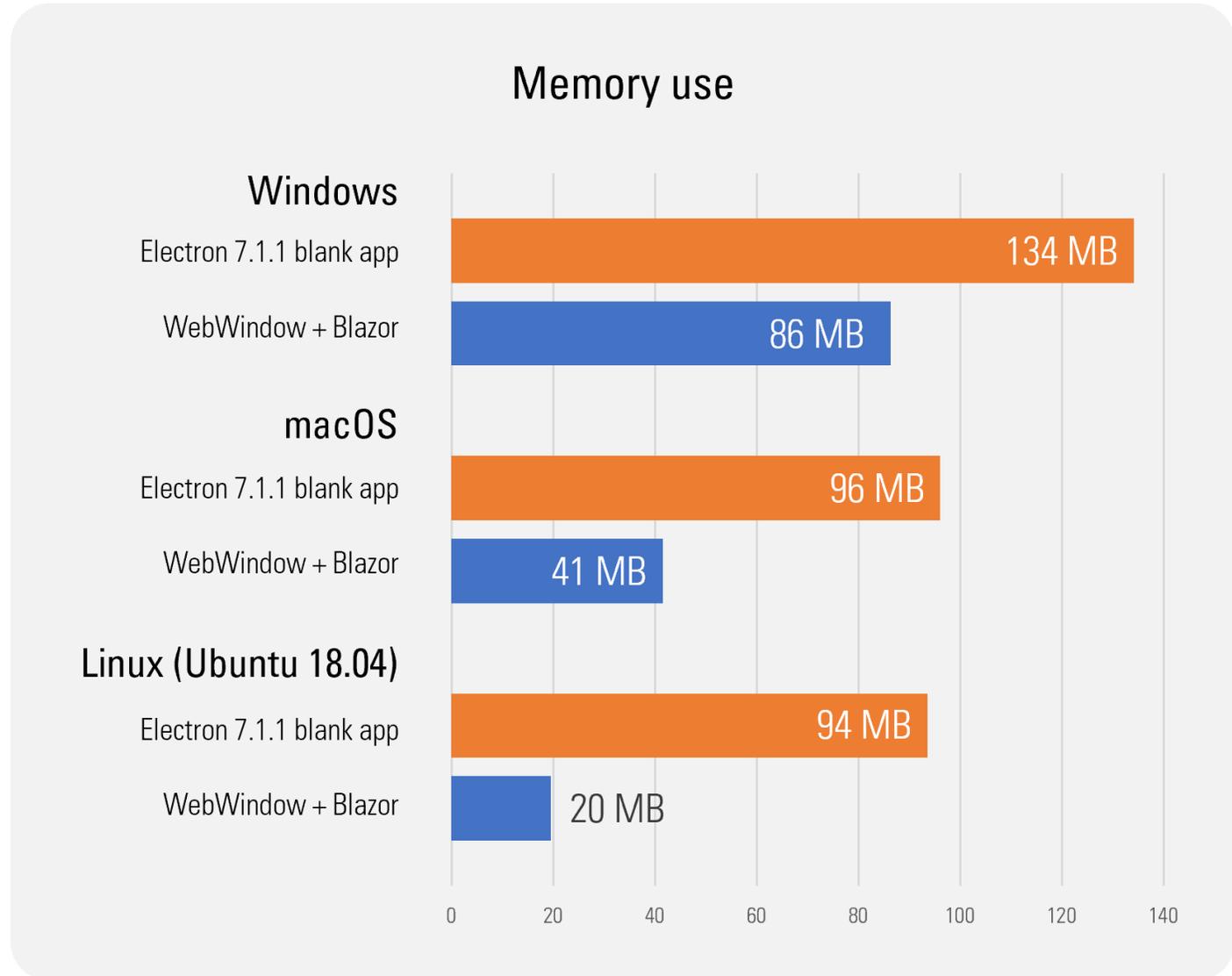
# Photino vs. Electron

- Photino does not require NodeJS for back-end work
- Photino is smaller and lighter weight because it doesn't require downloading and installing the Chromium engine or NodeJS
- If .NET 5 is already installed on the OS, the difference is huge



# Photino vs. Electron

- Photino uses far less memory than Electron
- Especially on Mac and Linux where WKWebView and WebKitGTK+2 use far less memory than Chromium



# Photino vs. Electron

- Electron is much more mature than Photino
- We'll be working with the community to bring features and capabilities to Photino
- You're welcome to join the community, add missing functionality that you need, fix bugs and submit Pull Requests
- And of course, you're always able to sub-class Photino.NET or Photino.NET.Blazor to override or enhance the project

DEMO

# Other Announcements

# Event Survey

- Please complete this very short 12 question survey

<https://tinyurl.com/cmw0127>

- Event Slides & Videos:

<https://www.codemag.com/StateOfDotNet>

## CODE Magazine State of .NET - Blazor Web Development with .NET 5

Thank you for attending! Please complete this brief 12 question survey. Yes, we still want to hear from you if you watch the recorded video. :-)

\* Required

1. Full Name \*

Enter your answer

2. Company Name \*

Enter your answer

# Your Ticket to Free Consulting

- One hour on us. Really. Schedule a call today. Slots are limited.
- No strings. No commitment. No credit card required.
- Just help from our team of experience software developers.
- Got questions? Stuck on an issue? Platform and/or architecture decisions to make? We can help!



Contact us at [info@codemag.com](mailto:info@codemag.com) or [jduffy@codemag.com](mailto:jduffy@codemag.com)

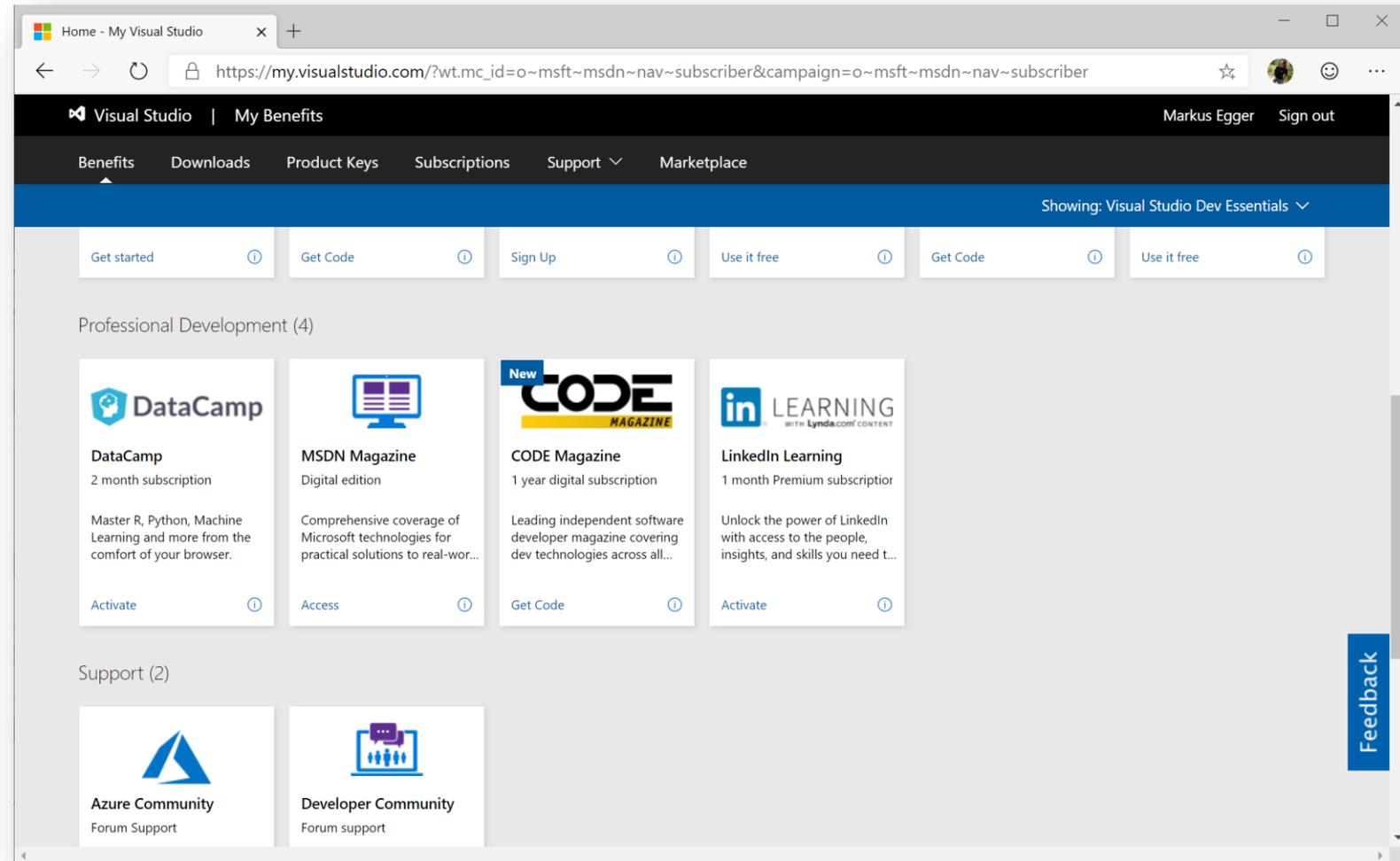
# CODE Magazine App

- Check out the new CODE Magazine Mobile application!
- Available for iOS & Android



# CODE Magazine as a Microsoft Benefit

As a Visual Studio Subscriptions customer, you qualify for a free, one year print and/or digital CODE Magazine subscription!



# Mark Your Calendar!

## Topic: State of Windows Desktop Development in .NET 5

February 24, 2021!

Register Today!

<https://tinyurl.com/sodn0224>

FEBRUARY 2021						
SUN	MON	TUE	WED	THU	FRI	SAT
	1	2	3	4	5	6
7	8	9	10	11	12	13
14 Valentine's Day	15 Presidents' Day	16	17	18	19	20
21	22	23	24	25	26	27
28						

# Q&A

Contact us with questions!

**CODE/EPS Contact:**

[www.codemag.com](http://www.codemag.com)  
[info@codemag.com](mailto:info@codemag.com)  
[facebook.com/codemag](https://facebook.com/codemag)  
[twitter.com/codemagazine](https://twitter.com/codemagazine)

**Presenter Contact:**

[markus@codemag.com](mailto:markus@codemag.com)  
[ottod@codemag.com](mailto:ottod@codemag.com)