The F# Community – What it is and How it works

@dsyme, researcher at microsoft, f# community contributor

First, a little about F#

F# is the open-source, cross-platform functional language for .NET

Get Started with F#

Supported on Windows, Linux, and macOS

www.microsoft.com/net/

TRY ONLINE

GET STARTED

Fable is a compiler powered by Babel designed to make F# a first-class citizen of the JavaScript ecosystem

Functional programming and more

Immutable by default. Powerful pattern matching. Lightweight syntax. Units of measure. Type providers. Enjoy!

Type safety without the hassle

Don't panic about verbose signatures. Let the compiler infer the types and catch the bugs for you before they ever get into runtime!

Modern Javascript output

Fable produces readable JavaScript code compatible with ES2015 standards and popular tooling like Webpack!

Easy JavaScript interop

Call JavaScript from Fable or Fable from JS! Use NPM packages! Everything's ready for you!

A <u>functional-first</u> approach makes a huge difference in practice

fsharp.org/testimonials

An analysis (Simon Cousins, Energy Sector)

The C# project took five years and peaked at ~8 devs. It never fully implemented all of the contracts.

The F# project took less than a year and peaked at three devs (only one had prior experience with F#). All of the contracts were fully implemented.

350,000

lines of C# OO
by offshore team

30,000

lines of robust F#, with
parallel +more features

An application to evaluate the revenue due from Balancing Services contracts in the UK energy industry

http://simontcousins.azurewebsites.net/does-the-language-you-use-make-a-difference-revisited/

Implementation	C#	F#
Braces	56,929	643
Blanks	29,080	3,630
Null Checks	3,011	15
Comments	53,270	487
Useful Code	163,276	16,667
App Code	305,566	21,442
Test Code	42,864	9,359
Total Code	348,430	30,801

TL;DR – Where we are now

F# is open, cross-platform, neutral, independent

All F# language and tooling is accepting contributions

The F# community is self-empowered

fsharp.org

Xamarin tools for Android, iOS, macOS etc.

VSCode, VS for Windows, Mac

.NET Core for Linux/OSX

The F# Compiler Service powers other tools

Fable for F#-to-Javascript

SAFE for F# fullstack

F# 4.7 now complete!

F# and .NET Core (Linux, OSX, Windows)

```
dotnet new -lang F#

dotnet build
```

docs.microsoft.com/dotnet/core/

But how did we get here?

How did the F# community get created and how does it work?

The Early History of F# - HOPL IV (2020)

fsharp.org/history

Technique #1

The Community at the Centre of the Technology

The F# Pivot of 2013 - From Proprietary to Open

Old think…

New think…

Microsoft

Visual Studio, .
.NET, SDKs, Tools

…

nuget

Microsoft® Research

Visual F# Tools

F# Open Source Group

F# Language

F# Software Foundation

tryfsharp.org

F# Community Groups

fpish.net

tryfs.org

fssnip.net

QuantAlea

tryfs.org

IntelliFactory
Your Functional Experts

fsharpforfunandprofit.com

Xamarin Studio

Xamarin

mono

StatFactory
F# Numerics

Flying Frog Consultancy
Putting the fun in functional since 2005

{m}brace
the cloud

TSUNAMI

Technique #2

The Community at the Centre of Design & Implementation

Suggestions: github.com/fsharp/fslang-design
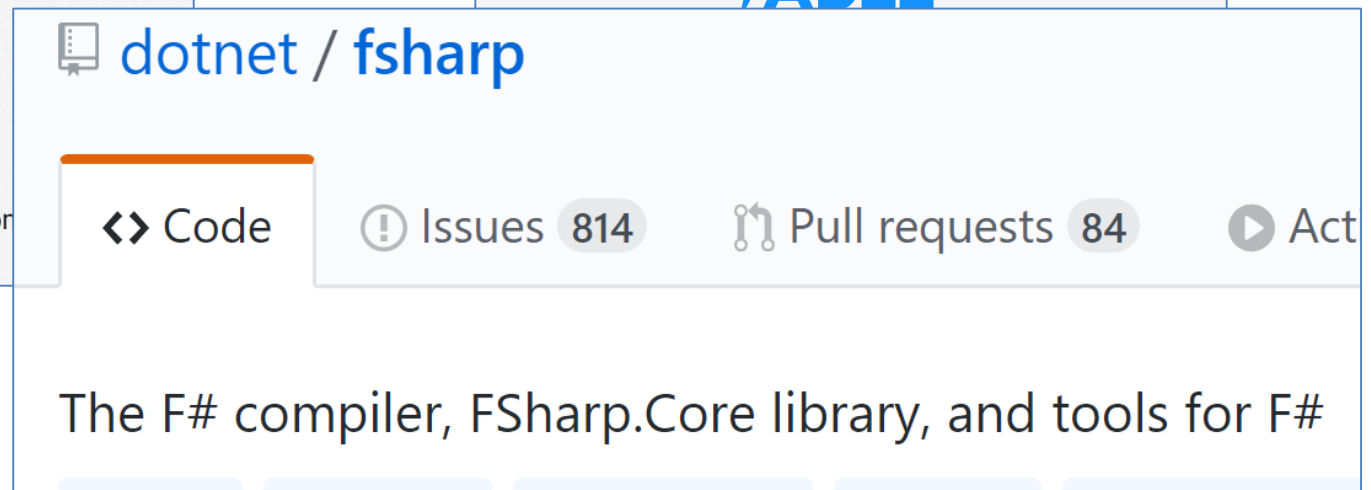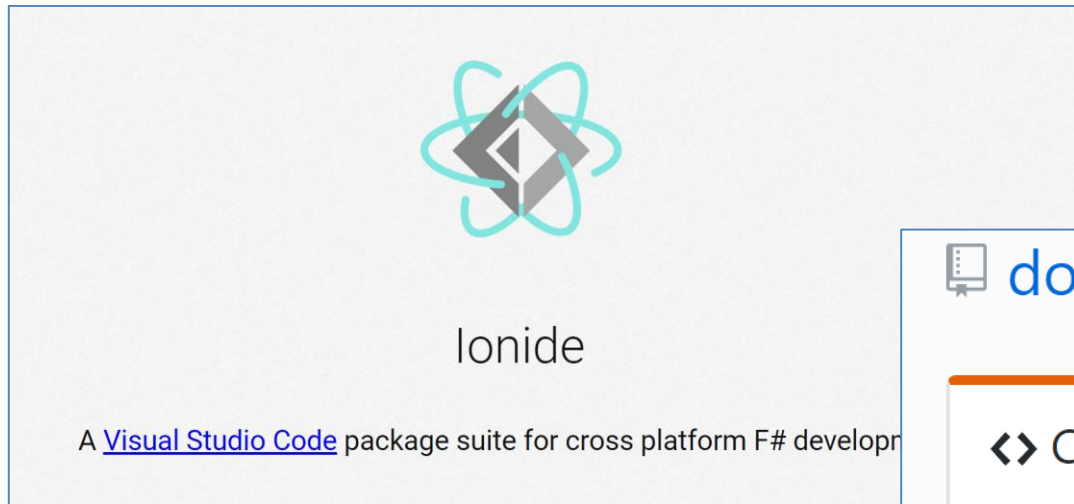Designs   github.com/fsharp/fslang-suggestions
Implementation   github.com/dotnet/fsharp

Technique #3

The Community at the Centre of Tooling

Ionide

A Visual Studio Code package suite for cross platform F# developm

Fable   Docs   Blog   REPL   Community   FableConf

TRY ONLINE

GET STARTED

ABLE

dotnet / fsharp

<> Code   ! Issues 814   Pull requests 84   Act

The F# compiler, FSharp.Core library, and tools for F#

Technique #4

A Foundation at the Centre of the Community…

…that embodies the ethics and spirit of the community and represents its interests positively

http://foundation.fsharp.org

Technique #5

The Community at the Centre of Incubation

http://fsprojects.github.io and much more

Balancing trust, consistency and innovation

Technique #6

The Community owns the Message

The core message about F# is decided by the community

Microsoft is part of the community, so are many other interests

F# Conferences are F# Events run by the F# Community

Technique #7

Balance the Forces in the Community

Communities are a balance of interests and forces
There need to be truly neutral zones
Commercial interests are important but must not dominate
Take the long term into account

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Questions?

DYLAN AND THE LINEBREAKERS

F# 4.0

✅ True shift to cross-platform open engineering
✅ Long laundry list of language items
✅ Normalized core library
✅ Type providers more powerful

✅ Better debugging, tooling, performance
✅ ~20% compiler perf improvement

https://github.com/fsharp/fslang-design/tree/master/FSharp-4.0

F# 4.1

✔ Optional large scope cycles more on this later)
✔ Result<T,Error> in standard library
✔ Unboxed (struct) tuples
✔ Unboxed (struct) records
✔ Unboxed (struct) unions

✔ More bits and pieces

https://github.com/fsharp/fslang-design/tree/master/FSharp-4.1

F# 4.5

✔ Span<T> high perf type-safe non-allocating code
✔ Improved async debugging

✔ More bits and pieces

F# 4.6

✔ Anonymous records

✔ More bits and pieces

https://github.com/fsharp/fslang-design/tree/master/FSharp-4.5