# Introducing A Functional Language At Work

A Developer's Guide



### Benefits of FP

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### FP. How do I love thee?



#### Code is easier to reason about?



#### Fewer surprises?



#### Decrease in defects?



#### Reduced development time and effort?



#### Basically, it is better in every way.





#### Right???







### Background Story

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#### We were very friendly to new tech



# Our CTO encouraged pushing the limits and being aggressive



#### Open to anything that could be better



#### Including beta technologies



#### It was who we were



### Scala

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#### Brace yourself...



#### This is a sad, sad tale



#### Context

Good fit for FP, and scala in particular

Critical Project

Tight timeline

Project Overview



#### Context

**Team Overview** 

- Relatively newly formed team
- Two highly skilled team members
- Several less-experienced team members
- Most had some familiarity with FP
- New to production Scala



### There was one very vocal supporter of Scala



#### Most of the team was indifferent



### Little practical experience, but that's OK



# The Scala fan went off the Scala deep end



# The Scala indifferent wrote mostly functional code



#### The junior devs wrote java





#### Everyone wrote different stuff



The lack of consistency and variety in coding styles within libraries proved challenging—even with the fans



#### SBT was a necessity



#### No one liked SBT



### Despite being JVM based, it did not fit into our infrastructure



#### It ended in pain and disagreement







#### This was not an issue with Scala



### It was an issue with

```
us ++ scala ,err
```

us ::: scala



# It was **too flexible for our** level of experience, size, corp **culture**



# We picked a terrible project, given our circumstances



### A hidden mistake...





### We didn't intentionally ignore the costs



### We thought flexibility would help



# We expected JVM to help



# We thought being able to write Java would help







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# "Pythonic"



## Easy to identify



### One "obvious" way to do things



# **"Pythonic" was** ingrained into **our culture**



## Why were we interested in FP?



### We were writing distributed systems



# Within some teams, we realized OOP practices lead to many, many defects





# Hard to debug defects



# We started naturally writing functional code



# Bugs could take hours or weeks to trace down



# We had real problems to solve



### We actively wanted a solution





# We introduced golang almost by mistake



### Prototype that ran away on us



## It spread like wildfire



### Everyone was redoing stuff in golang



## It was new, it was exciting, ...



## it was premature



# No one was shipping stuff



### (Note: we did eventually ship stuff)



#### But it was a success!





#### The lack of flexibility helped us



### Golang is crazy opinionated



### Its tooling enforces code style



### It gave us a "Pythonic" feel



### And, it is limited, in many ways...



### Its type system is very simplistic



#### The lack of flexibility helped us



#### It fit our culture



#### An observation



# We should have shipped one thing first!



# Doing too much all at once turned out to be a very risky idea



### This strained many parts of the org



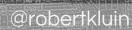
### It was extremely high risk



#### But, we learned from that mistake









### Pushed by management



#### Full disclosure, that was me



## Opinionated



### Outstanding tooling



#### Shipped full new product within 1 month



# Eliminated bugs we had been chasing for months in the prior stack



#### The defect rate bottomed out



# Proved a massive refactor was not only possible, but safe!



# The product was a huge value gain, but non critical path



#### It was also isolated





## Like golang, it **fit our culture**



# Starting with an isolated, ancillary product helped



### The value was immediately proven



# A management champion was useful for getting started



### Sadly, it has been replaced now



# The **promoters moved on** to other companies



# Promotion and evangelism is critical



# The Little Rascal who snuck in Haskell

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### Used Haskell to create a runnable API spec



## Documented the expected behaviors of the system



#### Made experiments possible



#### Documented the API



### Got a larger group interested in Functional Programming



### Clojure

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### Rapidly built a prototype that solved the business problem



### The immutable data model was an awesome fit



### They offered to build and maintain support into the ecosystem



## Immutability was completely unnatural in other languages



### Had to provide "native" feeling client libraries for consumers





## Team is focused purely on proving value



### And, hitting deadlines with minimal defects



#### They worked with inf & ops



### They actively try to ensure it is not about the language, but the value



### Key Takeaways

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### Manage risks



#### Pick a low-risk area / project



#### Go slow, be careful going all-in



#### Demonstrate the value



#### Learn first!



### Encourage usage of functional paradigms in non-functional langs



#### Plan for hiring



### Be mindful of "disruption"



## Demonstrate fitting into your ecosystem



#### Help your Ops / Infrastructure Eng staff



#### Find a management champion



# The Language Doesn't Matter



## We had numerous attempts to introduce favorite languages



### Focusing on the tech, not the value, rarely worked out



### Your culture is key



## Pick solutions that can fit into your culture



### Languages and tooling can shape and alter a company's culture



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### Promotion, evangelism, and education are critical for success



