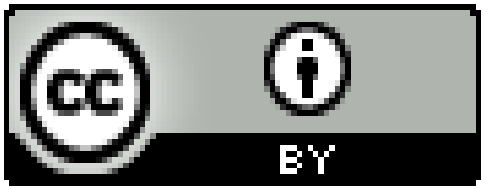

# Software Engineering

## Empirical Results



# Seven Years War

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Unnecessarily

ames Lind (1716-94)

747: first controlled medical

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- vitriol
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Allowed British ships to be effective on long patrols during the Napoleonic Wars

1950: Hill & Doll study comparing smokers and non-smokers

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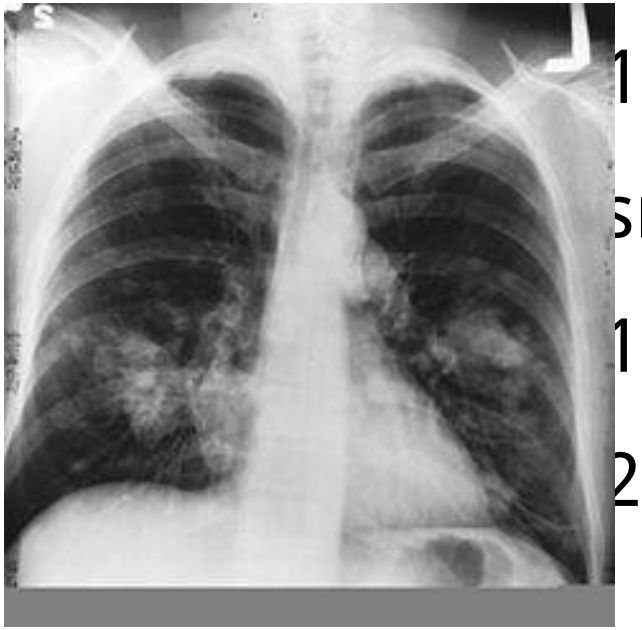
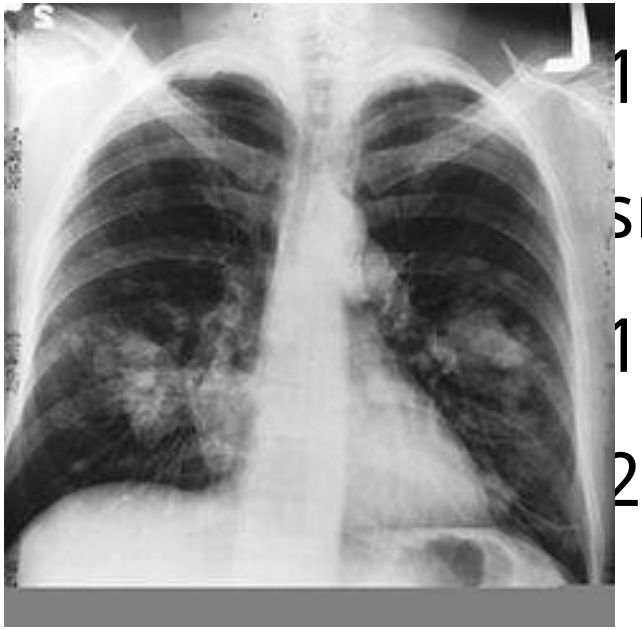
1. Smoking causes lung cancer



1950: Hill & Doll study comparing smokers and non-smokers

1. Smoking causes lung cancer
2. Many people would rather fail than change



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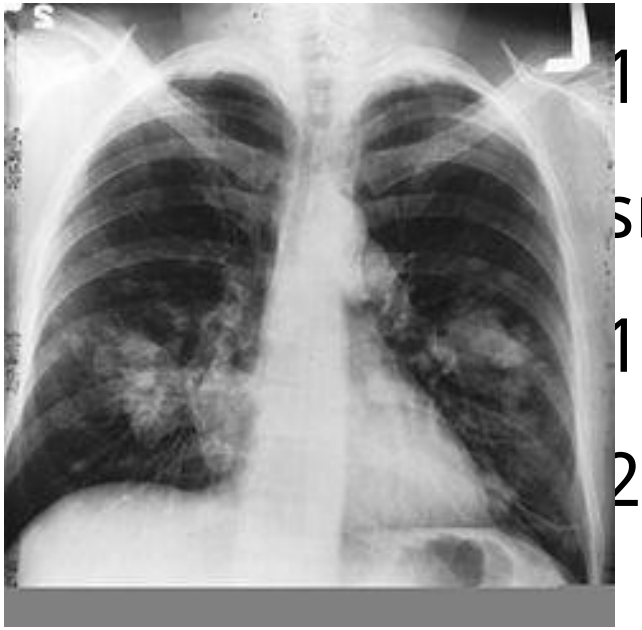

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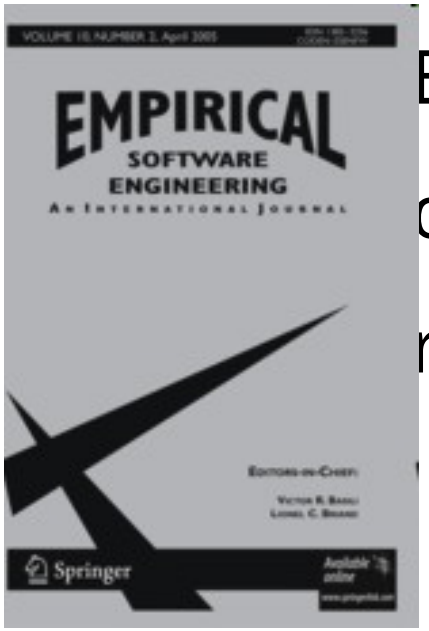


But today, papers describing new tools or working practices routinely include results from empirical studies

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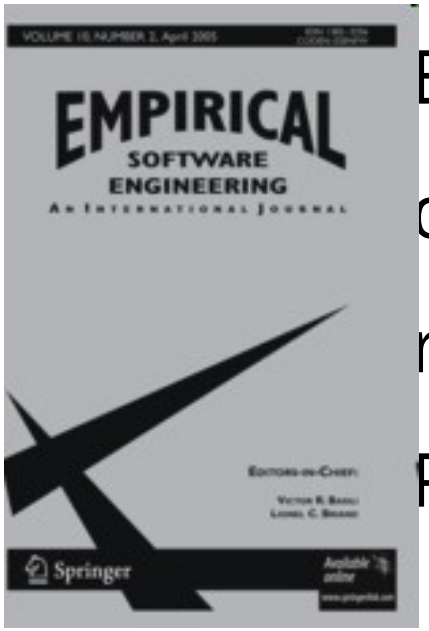


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Particularly ones by young researchers

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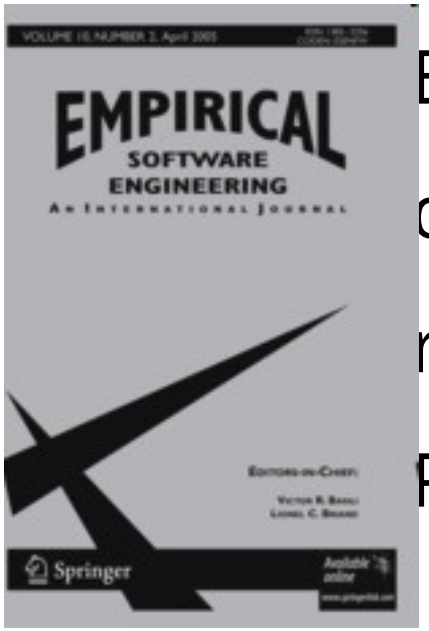


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Many are flawed or incomplete,

but standards are constantly improvin


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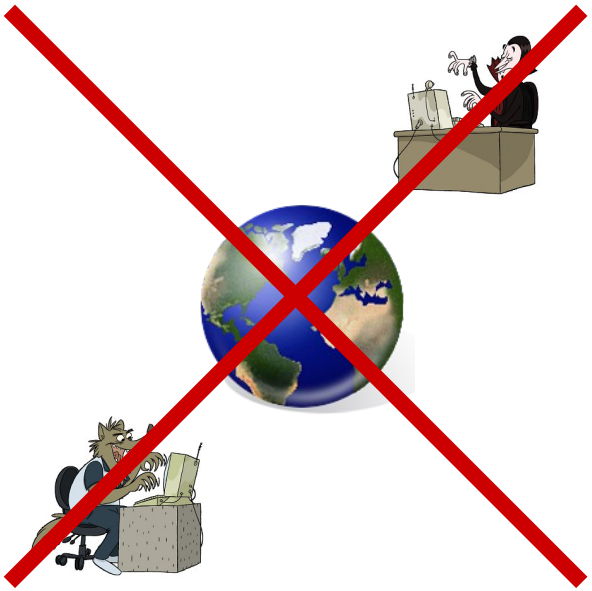

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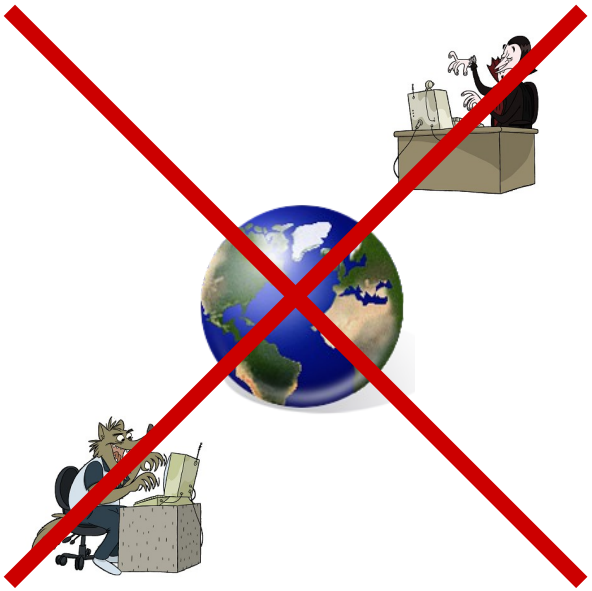
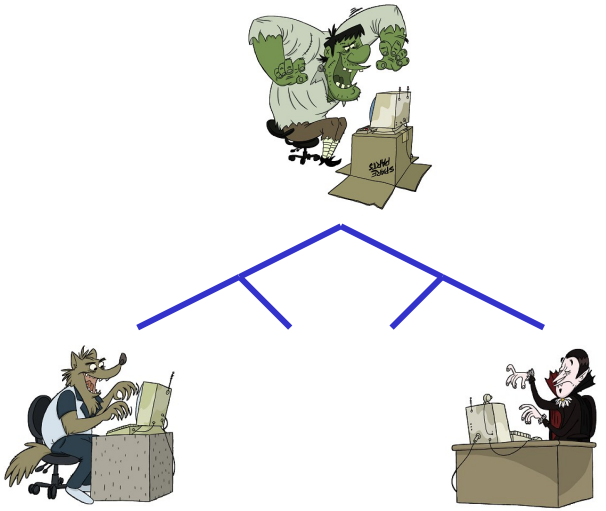
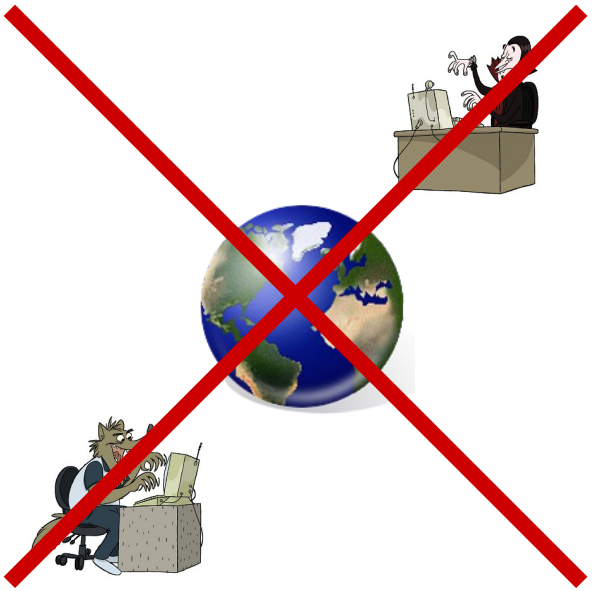
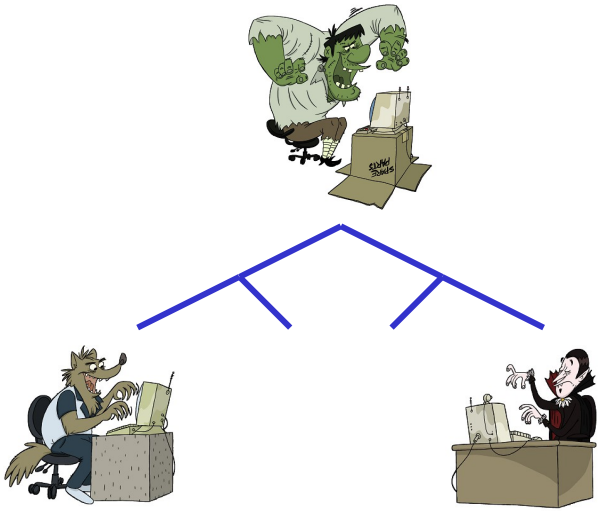
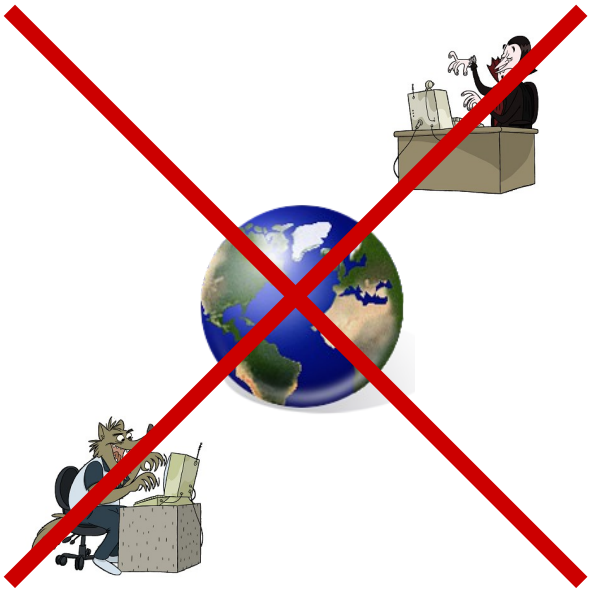


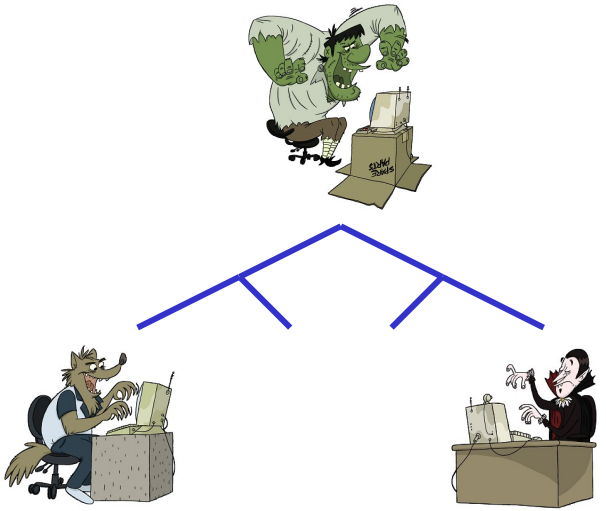






# Unsurprising in retrospect





Unsurprising in retrospect

Actionable

# What goes wrong in developers' first job?

Microsoft®

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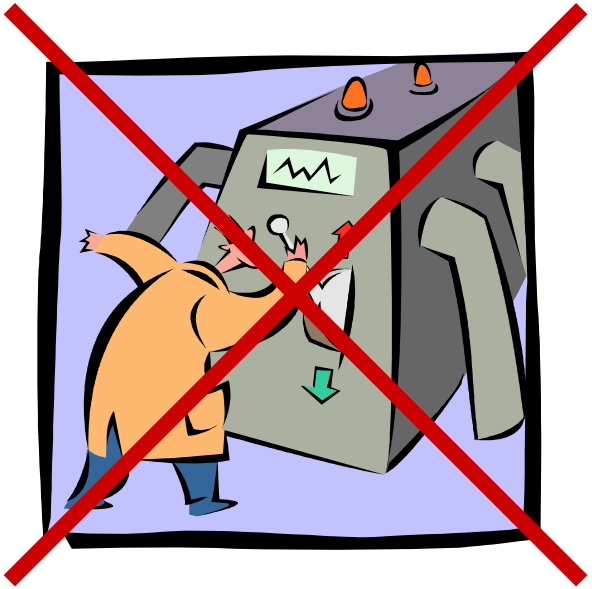

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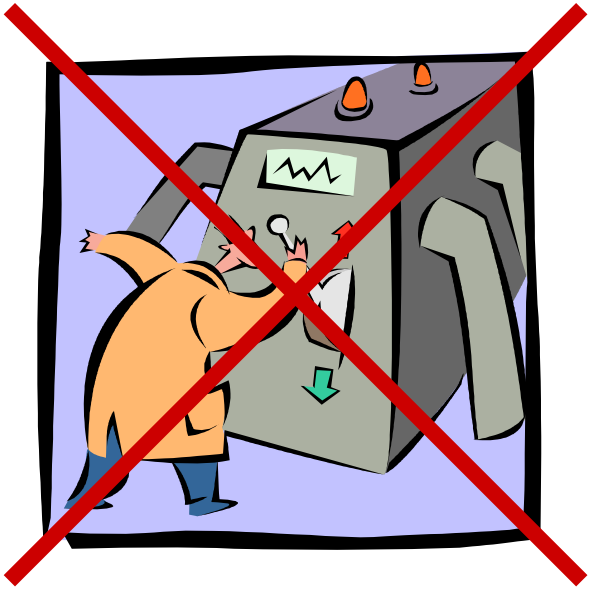

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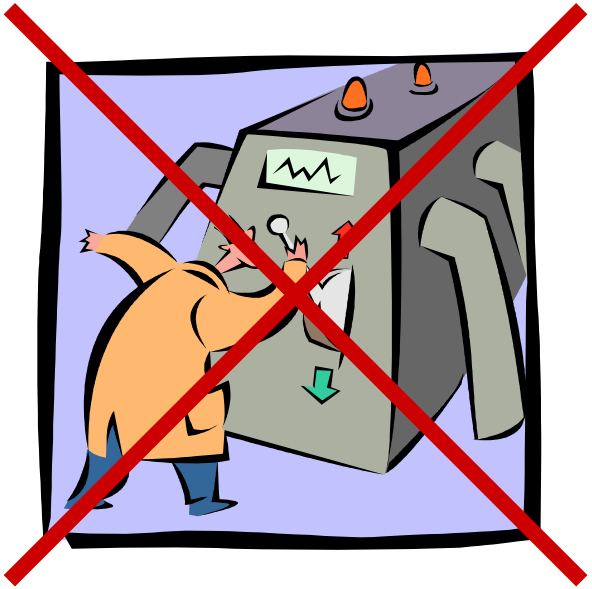

Also unsurprising in retrospect, and actionable

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Biggest hurdle is re-education

# Test-Driven Development

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An article of faith among many programmers

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Meta-analysis of over 30 studies

No consistent effect

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The better the study, the weaker the signal

Boehm et al (1975): "Some Experience with Automated Aids to the Design of Large-Scale Reliable Software"

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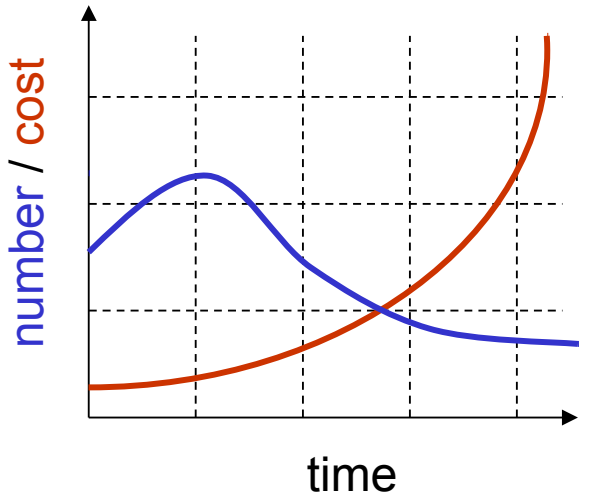
Most errors introduced during requirements analysis and design



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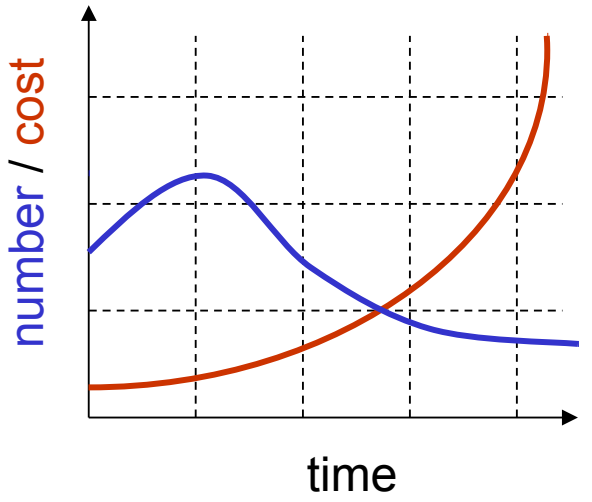
The later they are removed, the more expensive they are



Pessimists

Optimists

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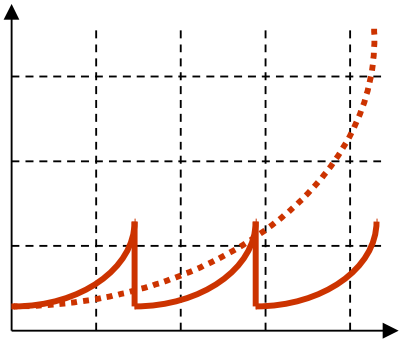

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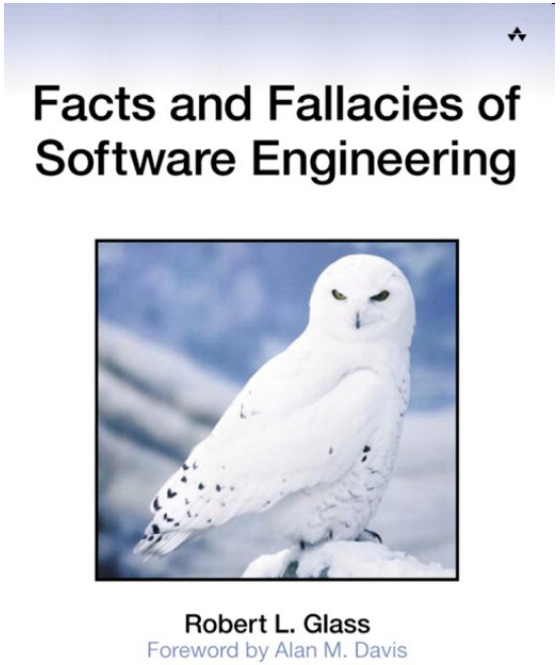
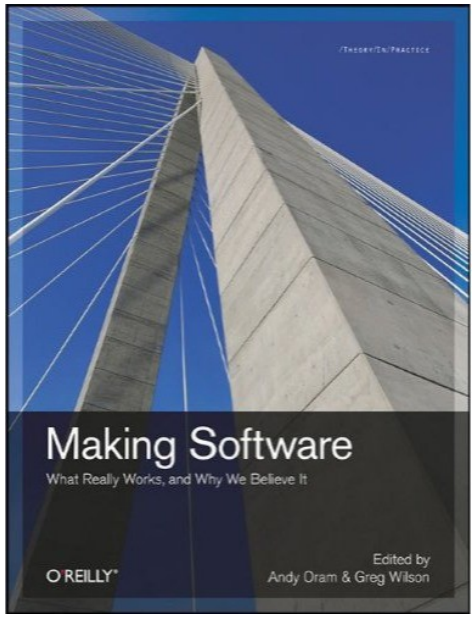
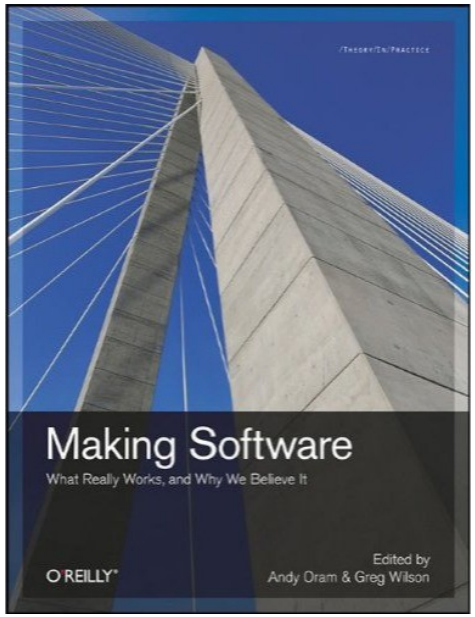
Code review now normal in open source


Facts and Fallacies of
Software Engineering
Robert L. Glass
Foreword by Alan M. Davis


Making Software
What Really Works, and Why We Believe It
O'REILLY
Edited by
Andy Oram & Greg Wilson

# Do programming languages affect productivity?

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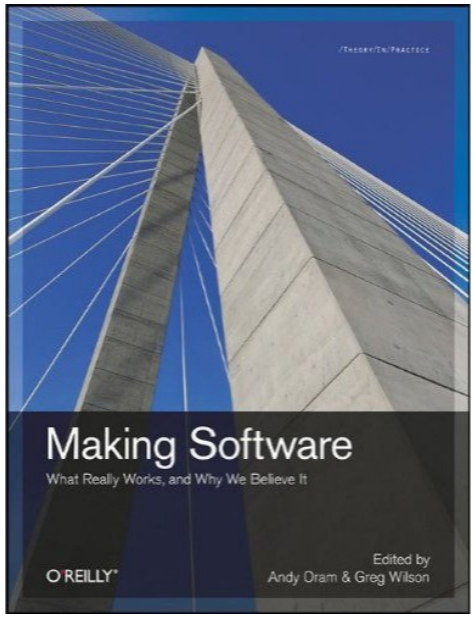
Does using design patterns make for better code?

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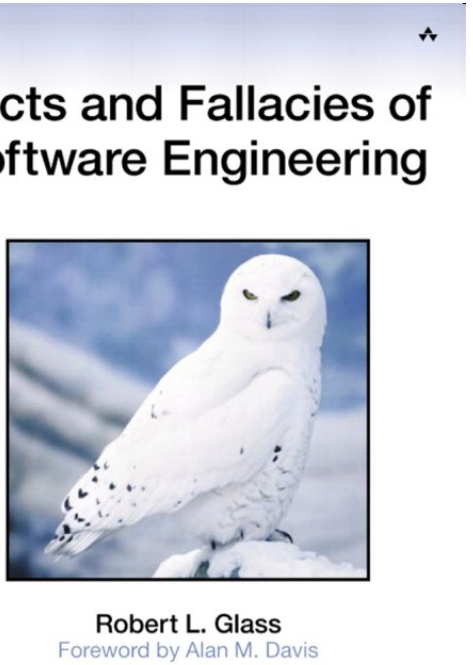


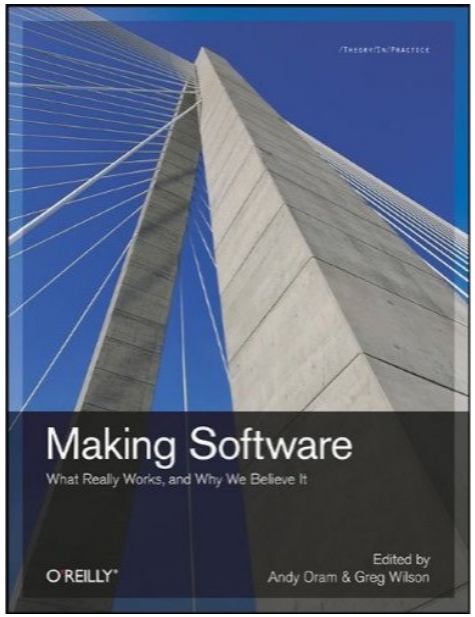

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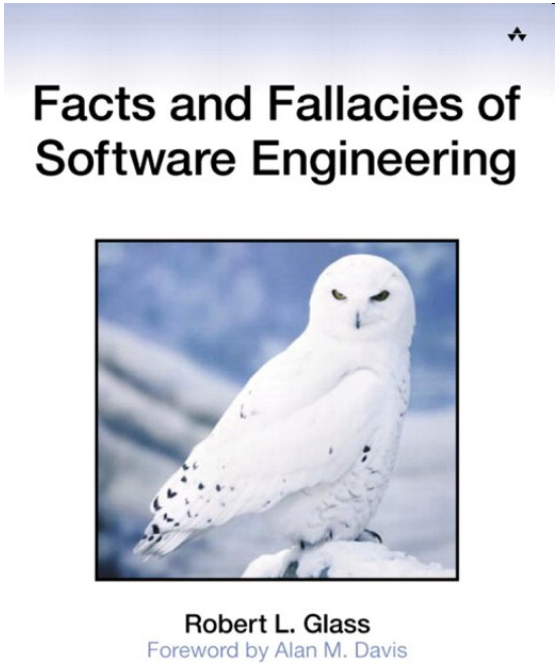


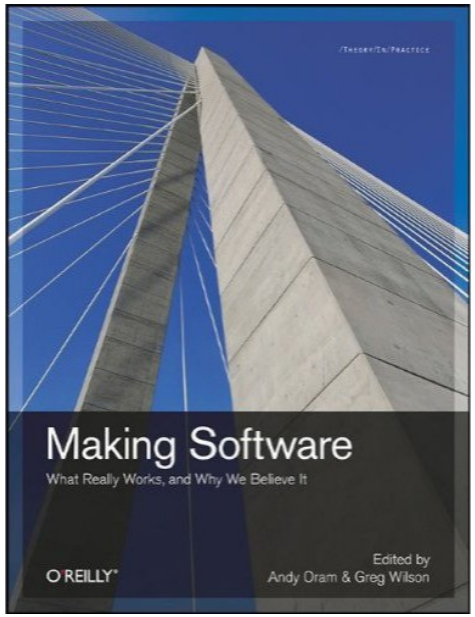


Is up-front design cost-effective?

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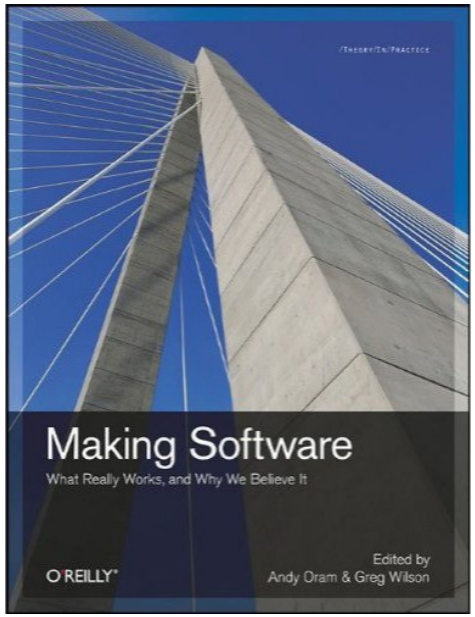


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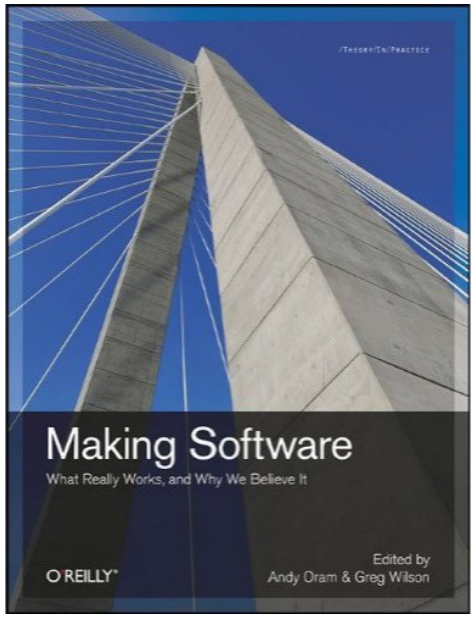


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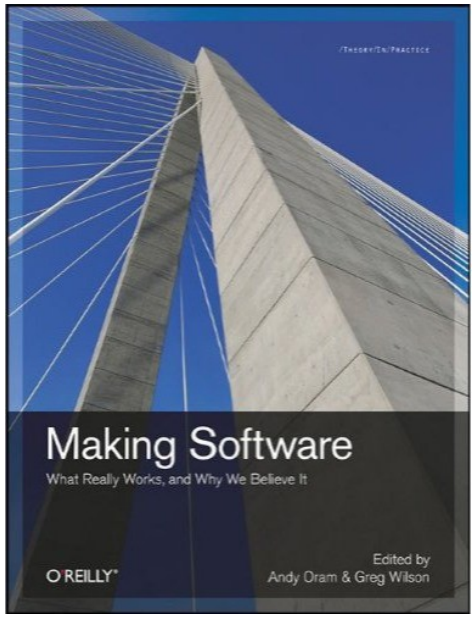


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Are some programmers 10X better?


narrated by

# Greg Wilson

February 2011