

The Severity of Bugs: Are We Doomed?



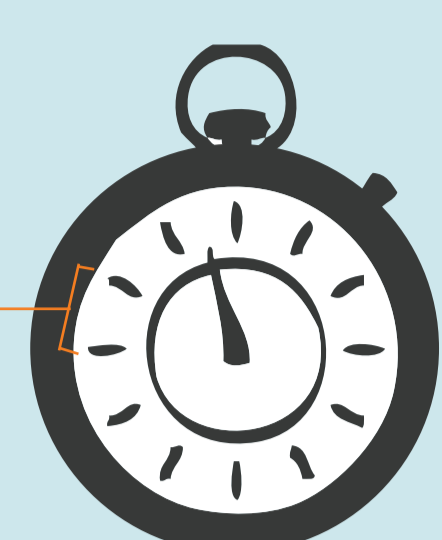
Software defects cost the US economy alone over **\$60 billion** yearly

This is over \$6.8 million per hour

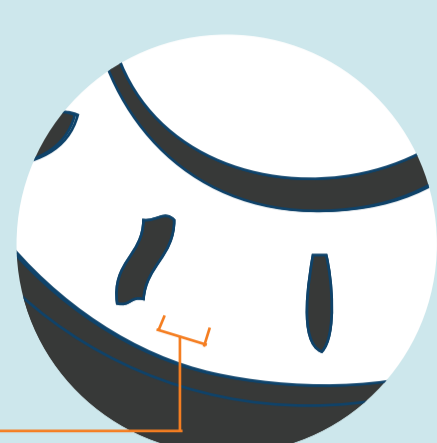
Which is over \$113,333 per minute

And \$1,888 per second

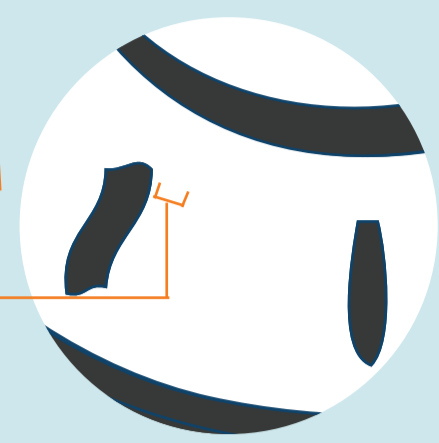
\$6.8M



\$113,333M



\$1888M



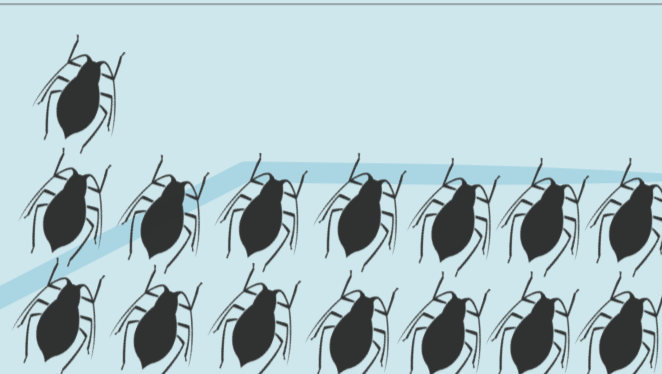
This is as much money as the US spent on airport security in the last decade, and more valuable than Rupert Murdoch's News Corp

Source: NIST



The cost of correcting bugs during the testing (QA) stage

\$7,136



The cost of correcting bugs after release is

\$14,102

The cost of correcting bugs during coding is **\$937**

Source: B. Boehm and V. Basit, Software Defect Reduction Top 10 List, IEEE Computer, January 2001

The Waterfallmodel was established in 1970.

It was originally developed for the manufacturing and construction industries.

Developers suffered for **another 31 years**,

until Agile was developed in **2001**.

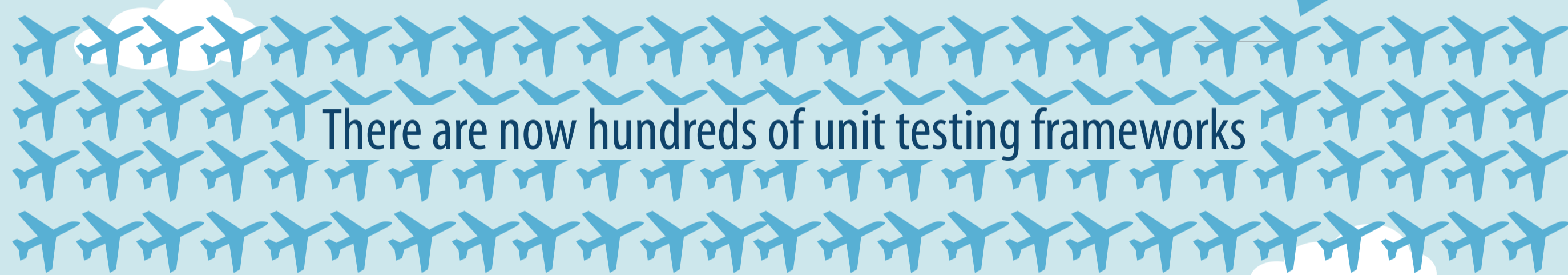
Agile

1970

The first unit testing framework was written on a **plane ride**



There are now hundreds of unit testing frameworks



Agile projects are

300% more successful than non-agile projects

Not Agile

Agile

Agile adoption is on the rise

Source: 2011 CHAOS Manifesto from the Standish Group

78%



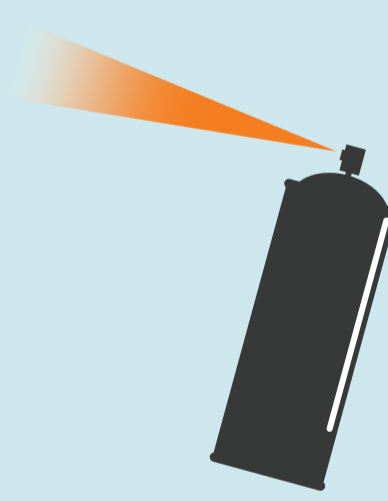
of software developers viewed Test Driven Development (TDD) as **improving programmers' productivity**

Source: Bobby George, Laurie Williams, An Initial Investigation of Test Driven Development in Industry

According to developers:



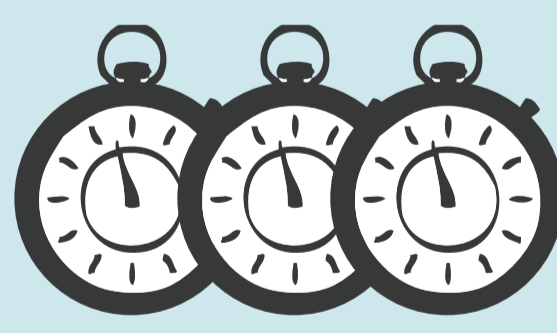
It's not a bug if it's found before QA



It's a feature if your user found it



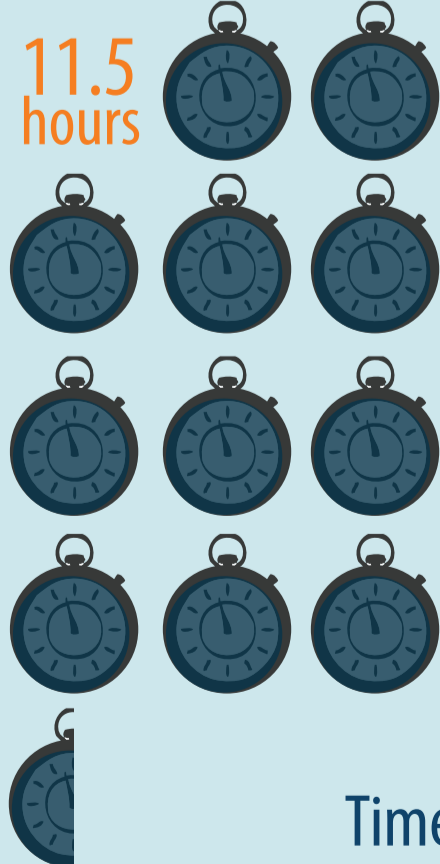
Unit testing is **twice** as effective as integration testing



and more than **three times** as cost effective as system testing

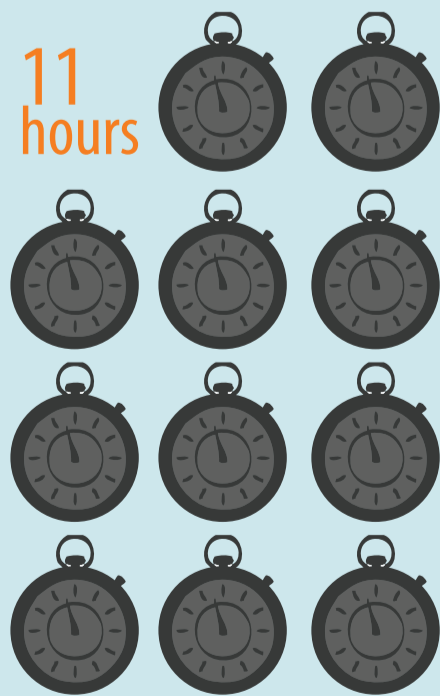
System Test

11.5 hours



Field Test

11 hours



Integration Test

6.25 hours



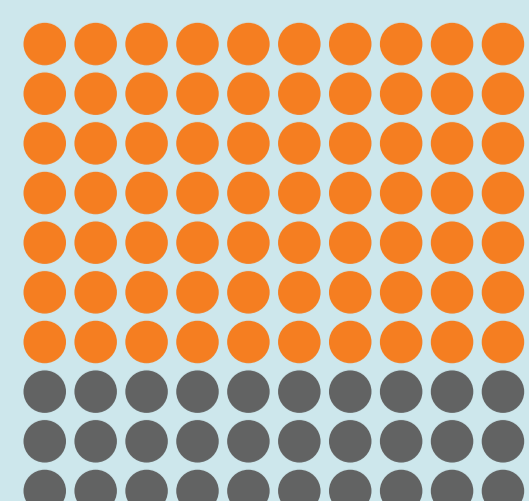
Unit Test

3.25 hours



Time it takes to prepare tests, execute tests, and fix defects

Source: Capers Jones, "Applied Software Measurement"



70%

of individuals who use Agile methodologies, do unit testing

Source: Version One 2011 State of Agile Survey



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