

Crash Report 2017

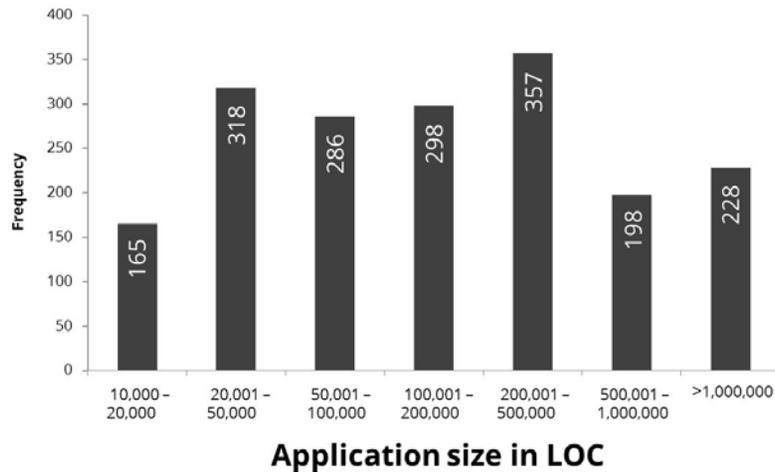
Stack the Software Quality Deck in Your Favor



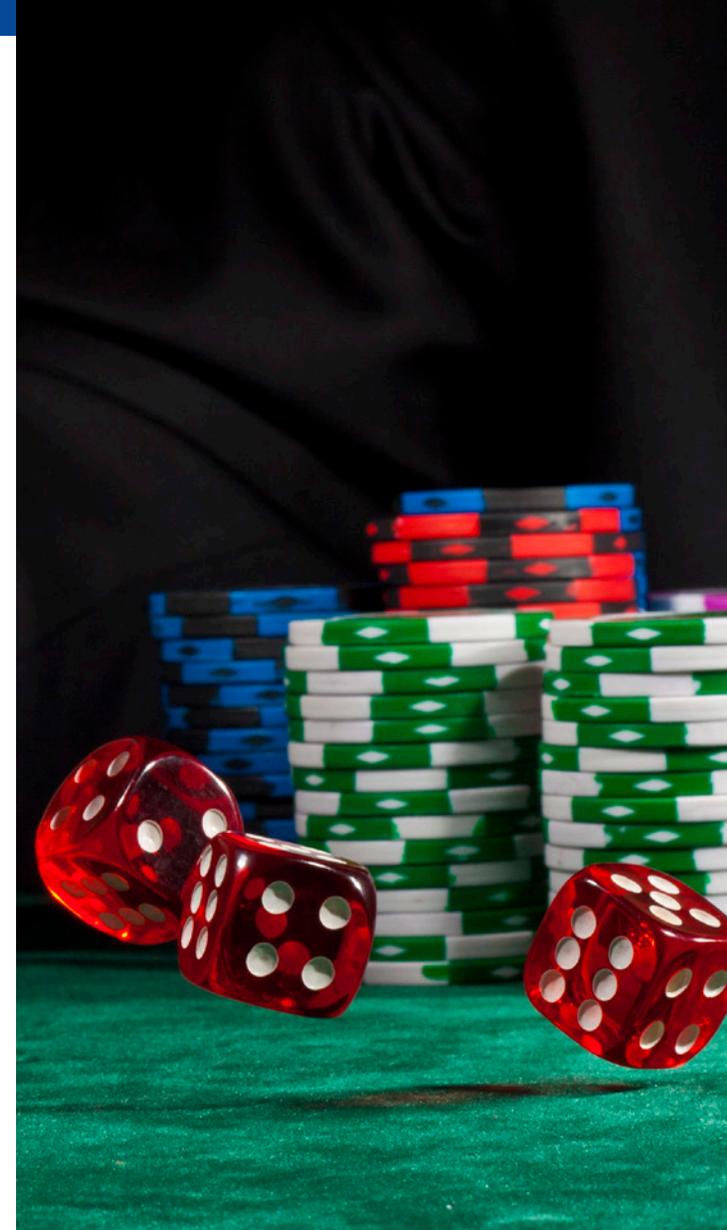
What is the 2017 CRASH Report?

CAST Research on Application Software Health (CRASH)

- + Global trends in the structural quality of large IT systems
- + Structural quality = extent to which software violates good architectural and coding practices in **5 Health Factors**
- + Data from CAST's Appmarq repository, the world's largest source of structural quality data in IT
- + Analysis includes 1850 applications, 300 organizations, 10 industries, 3 continents, 1.3 billion lines of code



The 2017 CRASH sample presented by size category in Lines of Code (LOC)



CRASH Report Health Factors



ROBUSTNESS

An application's susceptibility to outages, slow recovery, and data corruption



SECURITY

An application's susceptibility to unauthorized entry, theft of data, or malicious behavior



PERFORMANCE EFFICIENCY

An application's susceptibility to degraded performance or excessive use of resources?



CHANGEABILITY

An application's susceptibility to complexity making it difficult to change or correct code?



TRANSFERABILITY

How hard is it to understand an application or transfer development work to other teams?

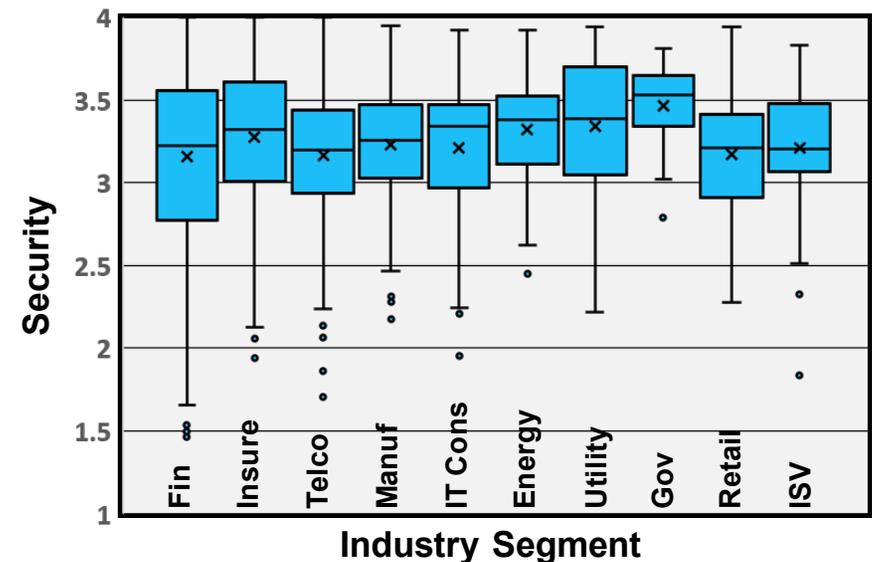
Are You Gambling with Security?

- + Globally, Security scores vary widely.
- + Scores below 3.0 are considered bad, indicating applications that harbor too many weaknesses that can be exploited to steal confidential information.
- + Alarming, apps in Financial Services posted the lowest average Security scores.

With Cybersecurity Spending Topping \$1 Trillion by 2021, Why Aren't Scores Getting Better?

“Lack of security architecture combined with porous code in legacy systems produce easy targets for hackers. This is especially concerning in Financial Services applications.”

– Bill Curtis, SVP & Chief Scientist
CAST Research Labs



Up Your Maturity Level: Know When to Leave the Table

Capability Maturity Model Integration (CMMI)
Guidelines to transform from an undisciplined to
an innovative enterprise.

+ LEVEL 1: UNCONTROLLED RISK

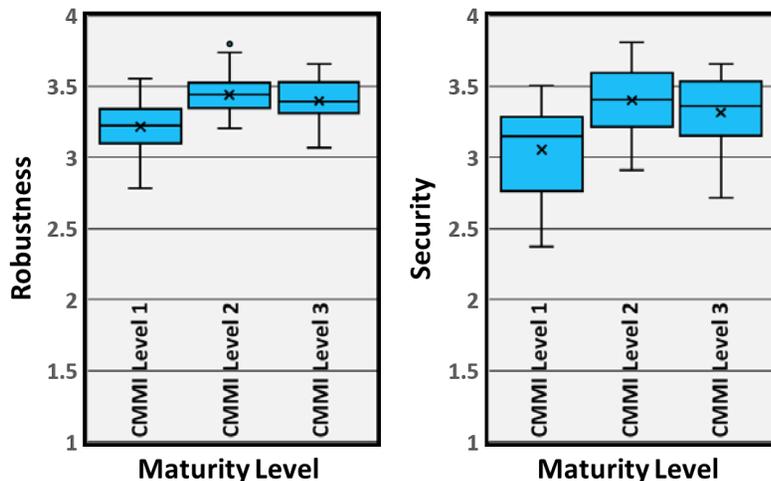
Poor planning and discipline create unachievable schedules rushing developers into excessive defects with little time to find them. Organizations at CMMI Level 1 post the weakest Security scores.

+ LEVEL 2: LIMITED RISK

Projects use their own practices, but commitments and baselines are managed to ensure developers have time for quality work.

+ LEVEL 3: CONTROLLED RISK

Projects use standard, organizational processes created from practices that developers trust to deliver high-quality systems.



**“Since the 1990s,
organizations using CMM or
CMMI have demonstrated
continued growth in quality
and productivity.”**

- Dr. Bill Curtis
CMM Co-Author



“The killer defects for large, critical business systems, especially those written in multiple languages, are at the system, architectural level. They must be eliminated early.”

- Thomas Hjelm

Director of Product Management

CAST

Hybrid Deals the Best Hand

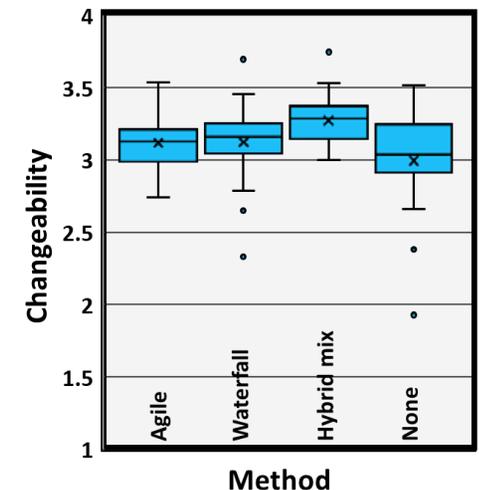
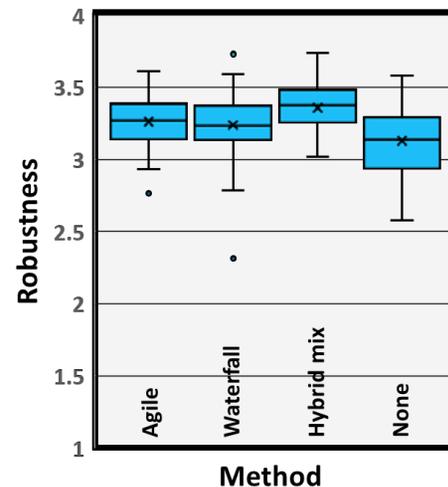
Hybrid methods produce higher structural quality than Agile or Waterfall methods alone!

Hybrid Methods — combined development practices from agile and waterfall methods

Hybrid benefits come from combining:

- + Up-front analysis and design of application architectures
- + Rapid feedback on defects during short, iterative coding sprints

Works with Continuous Delivery and DevOps, which are driving performance at innovative, fast-paced companies.

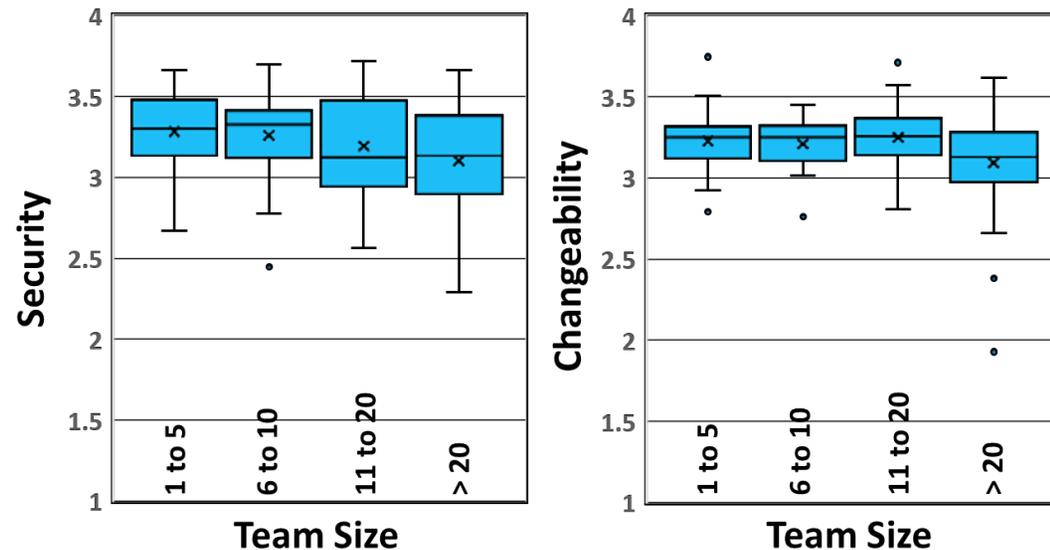


Smaller Teams Can Beat the House

Team size makes a difference in structural quality:

- + Teams **under 10** typically perform best across most areas of structural quality
- + Teams of **10 to 20** occasionally perform worse than smaller teams, but better than larger teams.
- + Teams of **more than 20** consistently perform the worst on structural quality.

The challenge with larger teams is maintaining consistency in design and coding decisions across a large system.



“Large systems exceed the comprehension of individuals and teams. Developers must be aided by advanced analytic technology to manage the size and complexity of modern IT systems. This is a sweet spot for CAST AIP.”

- Bill Curtis

SVP and Chief Scientist
CAST Research Labs



7 Steps to Hit the IT Jackpot

Don't be stuck bluffing the business with a bad hand. Get the odds in your favor with these 7 steps:

- + Train your staff in secure coding practices and incentivize their use.
- + Shift structural quality left in your development cycle.
- + Augment your development staff with advanced measurement and analysis technology.
- + Avoid creating teams of over 20 developers. Teams of less than 10 are optimal.
- + Set measurable goals to adopt mature development practices from CMMI Levels 2 and 3.
- + Adopt hybrid methods for developing large, business-critical applications.
- + Analyze your software regularly to detect structural flaws early. Assess applications with CISQ size and quality measures. System-level analysis solutions from CAST can help you identify and remediate quality issues fast, without disrupting development.

**LIKE WHAT YOU SEE?
[READ THE FULL REPORT NOW](#)**

About CAST Research Labs

➤ **CRASH REPORT 2017** is produced by CAST and provides benchmarks on the structural quality of IT applications developed across the globe. The benchmark was developed using Appmarq, the world's largest repository of structural quality data on IT systems.

➤ **APPMARQ** houses data collected during system-level structural analyses of large IT applications. Structural quality refers to the engineering soundness of the architecture and coding of an application, rather than to

the correctness with which it implements the customer's functional requirements. Structural quality is occasionally referred to as non-functional, technical, or internal quality.

➤ **CAST RESEARCH LABS (CRL)** conducts advanced empirical research on software-intensive IT systems. CRL provides practical advice and periodic benchmarks to the global application development community, as well as interacting with the academic community.

➤ **CAST** is a pioneer and world leader in Software Analysis and Measurement, an automated approach to capture and quantify the reliability, security, complexity and size of business applications. CAST introduces fact-based transparency into application development, maintenance and sourcing to transform it into a management discipline. More than half of Fortune 500 companies across all industry sectors and geographies rely on CAST to prevent business disruption and risk while reducing IT costs.