

# Software Resiliency

April 2020

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The better the question. The better the answer.  
The better the world works.

The EY logo consists of the letters 'EY' in a bold, white, sans-serif font. A yellow triangle is positioned to the right of the 'Y', pointing towards the top right corner of the logo.

Building a better  
working world

# Frederic Veron

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Frederic is currently a Principal at EY. Prior to EY, He was the Group CIO Global Head of Safety and Soundness at Deutsche Bank, the Enterprise CIO at Fannie Mae and over the previous years consulted to many global financial institutions.

A tenured IT executive with extensive experience in the financial services and global technology consulting industries, Frederic is well versed in the challenges of IT service delivery and governance models. He has led countless transformation and risk management programs to help companies complete the shift to digital business models while managing security and risk exposure.



*The opinions expressed in this presentation are those of Frederic Veron and do not necessarily represent those of EY, LLP, its parent, subsidiaries or affiliated companies nor his previous employers.*



# How can EY help?

## Technology Resiliency Offerings

### 01 Technology Resiliency transformation

- ▶ Technology Resiliency target operating model, Framework and Policy development
- ▶ Contingency Service & Processing Planning & Integration
- ▶ Path To Production and SRE Services Implementation
- ▶ IT Production and operations improvement services
- ▶ Design for Resiliency Services and Planning (Microservices Architecture, Cloud, O365, SaaS, etc.)
- ▶ Software Intelligence Analysis
- ▶ Resiliency Management Solution Implementation

### 02 Technology Resiliency Assessments

- ▶ Technology Resiliency (Program) Maturity Assessment
- ▶ Resiliency Design and Architecture Reviews
- ▶ Recoverability Capability Assessment
- ▶ Technology criticality assessments
- ▶ Technology Resiliency Controls Assessment

### 03 Asset Mapping Services

- ▶ Technology Asset Mapping Assistance / Improvement Planning
- ▶ IT Asset Mapping Tools and Technology Transformation
- ▶ Automated technology identification and inventory application
- ▶ Automated process identification, enumeration and inventory

The Technology Resilience suite of offerings include mapping critical key business services to supporting assets, continuous testing and assessments, responding to and recovering from disruption scenarios, and resuming these services for a sustained period of time limiting significant business disruption.



### 04 Data Resiliency and Recovery

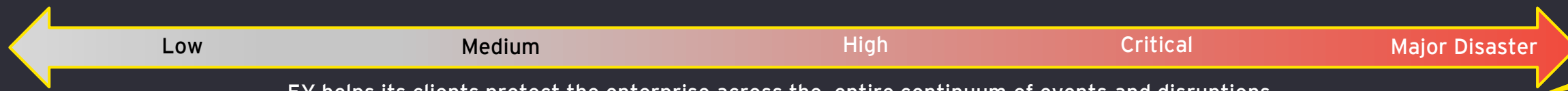
- ▶ Data Resiliency strategy, architecture review and assessments
- ▶ Air-gapped / Isolated environment (Sheltered Harbor certification) solutions design and implementation assistance
- ▶ Data Extract, Encryption, Vaulting and Recovery Solutions
- ▶ Disaster Recovery Strategy, Framework and Assessments
- ▶ Rapid cyber resilience assessment and proactive remediation to uncover and fix single points of failure and vulnerability.
- ▶ Design, enhance, and implement rapid cyber response capabilities.

### 05 Technology Resiliency Testing

- ▶ Resiliency Testing Strategy and Framework
- ▶ Resiliency Testing Assistance (including independent validation)
- ▶ Resiliency Testing Management Services
- ▶ EY approaches simulation exercises based on the type of simulation (either table top or functional)

### 06 Operations Resiliency and Crisis Management

- ▶ BC/CM program Assessments & Development
- ▶ Resiliency Supervision & Monitoring Services
- ▶ Availability Management and Operations Resiliency reviews
- ▶ Incident Root Cause Analysis and Post Mortems
- ▶ Service Management Transformation
- ▶ Crisis Management Framework



EY helps its clients protect the enterprise across the entire continuum of events and disruptions

# Problem

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What is the root cause and most sensitive area of most incidents?

The Network?

The Hardware?

A Human Error?

Change?

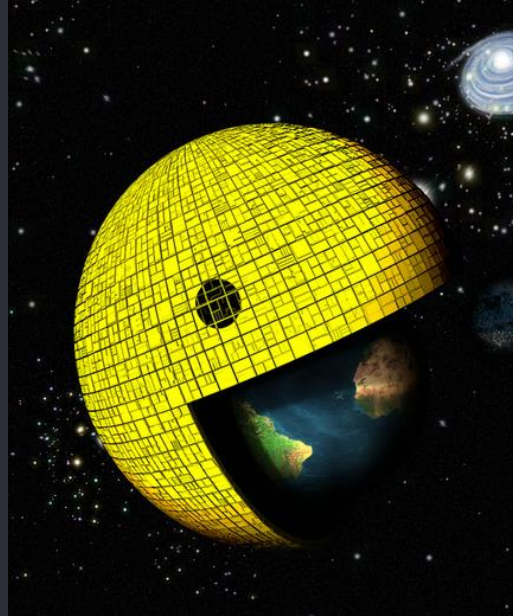
**But at the end... The SOFTWARE!**

# Software

## Good Business Digitalization Requires Safe and Sound Software

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- Adaptable
- Resilient
- Secure
- Safe



- Properly tested
- Operational ready
- Cost effective
- Architecturally sound

Deliver a better customer experience

*"Software solution resiliency refers to the ability of a solution to absorb the impact of a problem in one or more parts of a system, while continuing to provide an acceptable service level to the business." IBM*

# One Million Lines of Code...

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- ▶ 223 Person-years to write
- ▶ 67 people working 40 months
- ▶ Cost
  - ▶ \$20m to \$40m
  - ▶ \$15 for one line of code
  - ▶ \$40 for one line of GOOD code (robust design and testing)
  
- ▶ The Space Shuttle took .4 million lines of code (primary flight software)
- ▶ Windows 3.1 (1992) took 2.5 million lines of code
- ▶ HealthCare.gov took 500 million lines of code to write, and 5 million lines of code to repair
- ▶ Google took 2 BILLION lines of code

# Code is EVERYWHERE

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Software source code doubles every **42 months**.

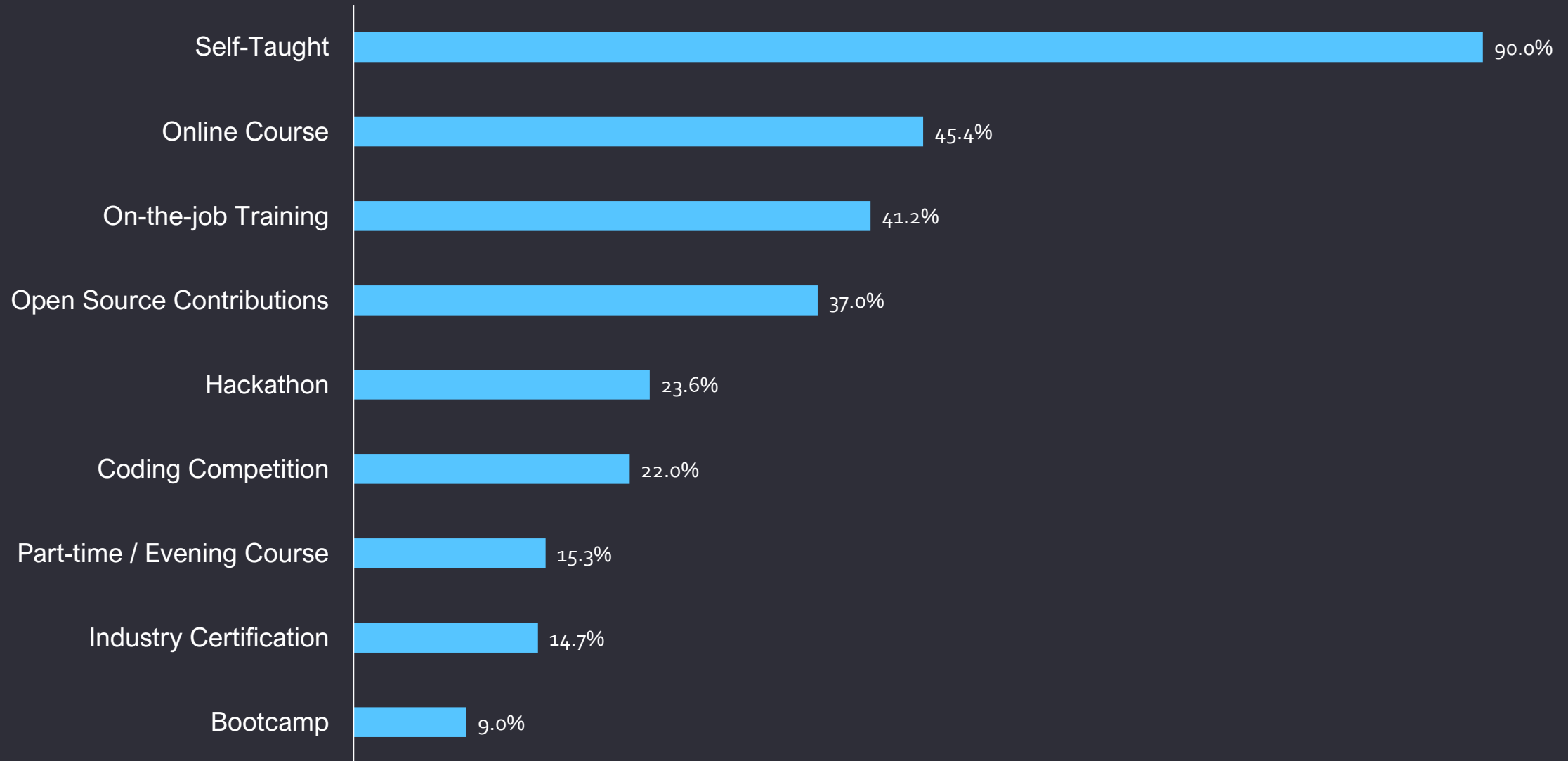
Gates' Law: the speed of commercial software slows by **50% every 18 months**.

Moore's Law: compute speed doubles and cost reduces by **50% every 24 months**.

Average tenure for CIOs (2016) is **51.6 months**.

Average tenure for CIOs (2019) is **58.8 months**.

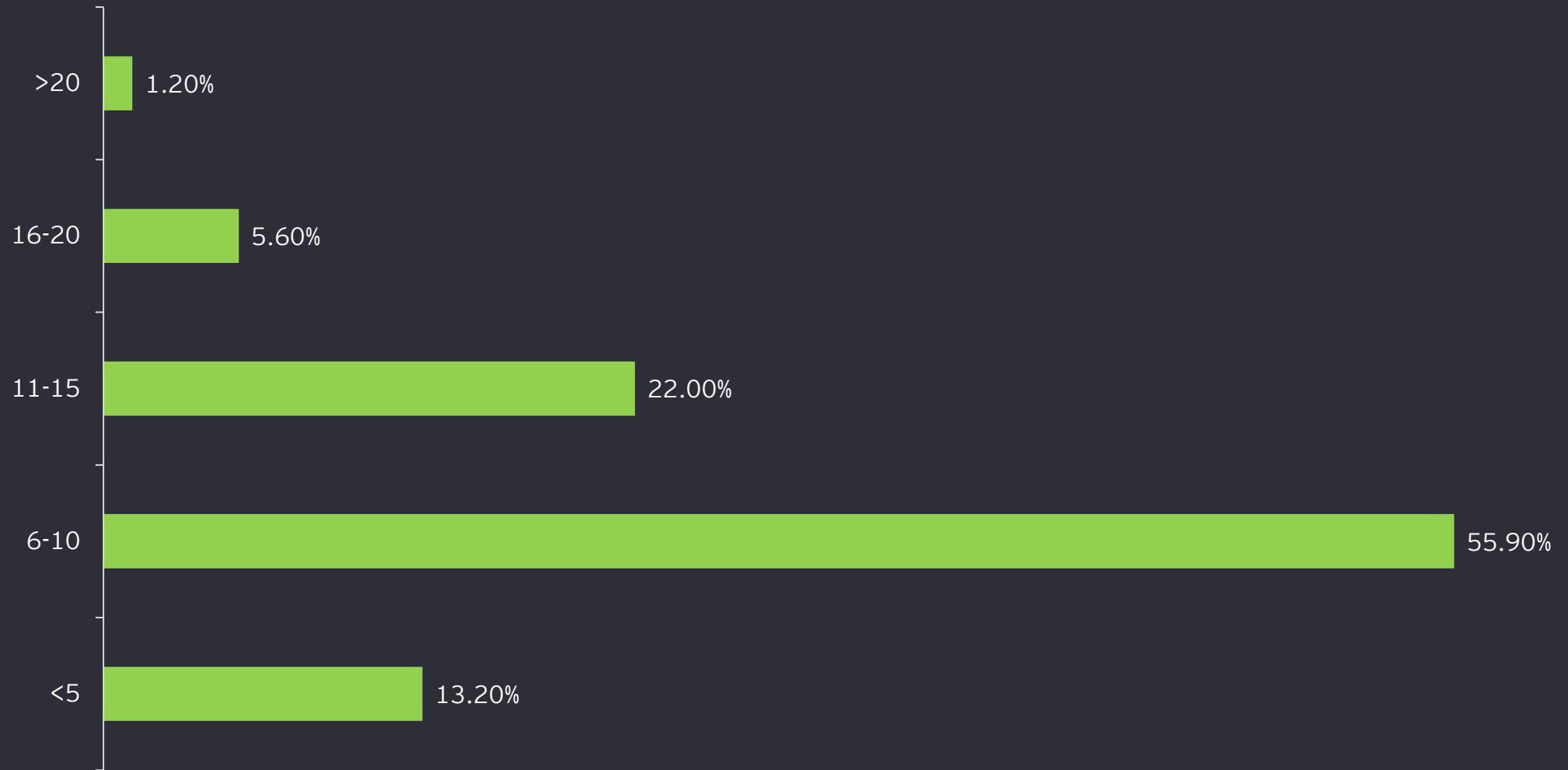
# Developer Training





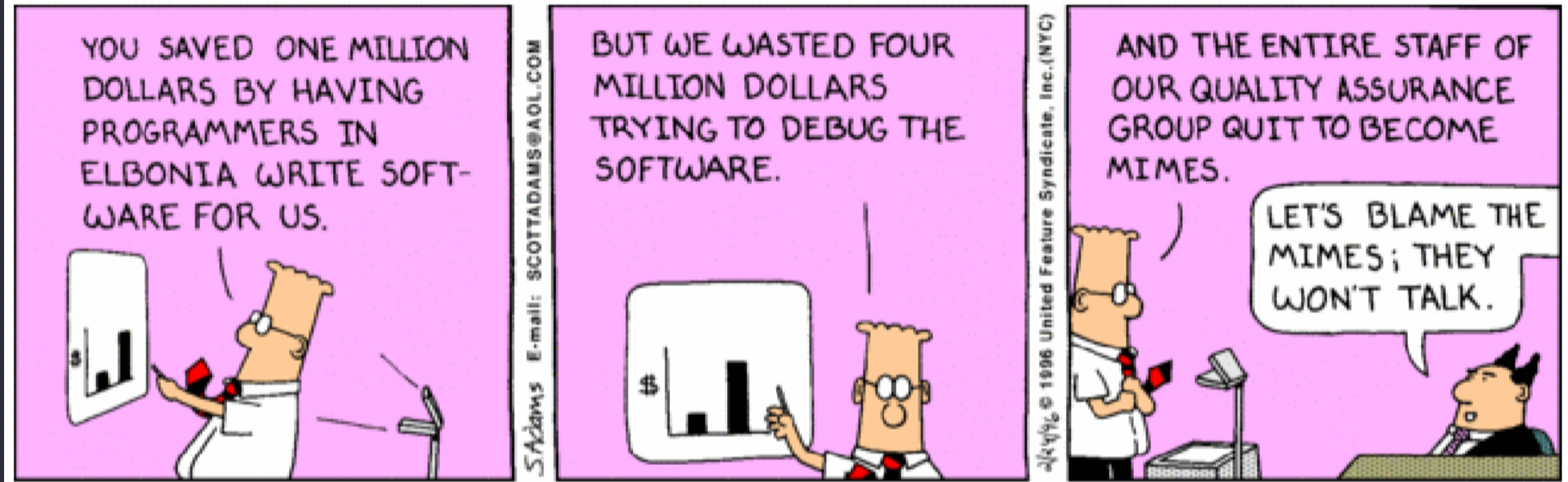
# Developer Experience

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The Software Developer Cycle: Career Demographics and the market clock or, is SQL the new COBOL?, David Parsons, ResearchGate, September 2015  
[https://www.researchgate.net/figure/Participants-experience-levels\\_fig1\\_283347582](https://www.researchgate.net/figure/Participants-experience-levels_fig1_283347582)

# Quality of Outsourced Software is No Laughing Matter



# 10 Things CIOs Must Absolutely Know About their Software

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- ▶ A Standards-based view of Software Health
- ▶ Prevalence and criticality of application security vulnerabilities
- ▶ Cloud readiness of applications
- ▶ System-level analytics
- ▶ Application portfolio rationalization
- ▶ Technical Debt
- ▶ Open source and IP license risk
- ▶ Data privacy and compliance risk exposure
- ▶ Architecture compliance
- ▶ Source code inventory

## Moving to the Left...

### Integrate Ops into Planning, Design, Construction...

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- ▶ Create library of NFRs
- ▶ Participate in IT Governance and budget meeting
- ▶ Recommend safety and soundness investments
- ▶ Participate in Steercos
- ▶ Require the complete set of releases in release schedule
- ▶ Conduct Look Ahead / Collision meetings
- ▶ Conduct operational readiness reviews – toll gates
- ▶ Infrastructure requirements early in the process
- ▶ Production support user stories in the body of work
- ▶ Consider degraded performances configuration
- ▶ Automate anything you can
- ▶ Integrate all tools as part of the CI/CD
- ▶ Single repository of config, runbooks, doc, etc.
- ▶ Understand Critical Business Events
- ▶ Implement IT Risk scoring

## Moving to the Right...

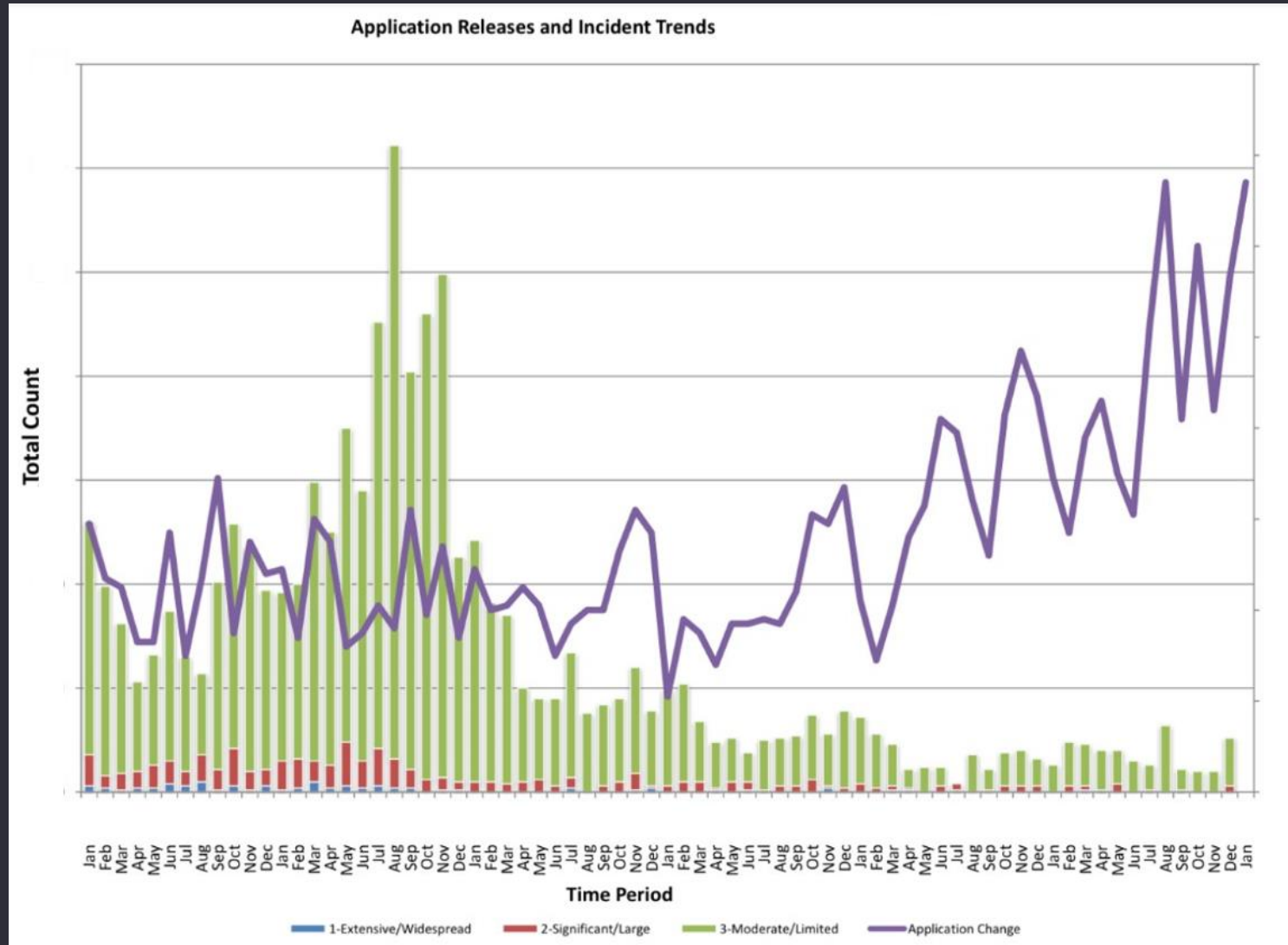
### Integrate Planning, Design, Construction...into Ops

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- ▶ Create ICU (Intensive Care Unit) for application experiencing difficulties
- ▶ Review production health regularly with dev teams
- ▶ Product owner or Dev lead on all major incidents and present post mortem to key stakeholders
- ▶ Participate in Look Ahead meetings and some in SuperCAB
- ▶ Set "\$1 test" in production, blue/green environment
- ▶ Define priority matrix and SRE error/risk budget, service level objectives, notion of the streak (how long since my last incident) -- slow down releases when getting close to the budget. Stop when at budget
- ▶ Institute a "warrant period"
- ▶ Educate and tool production teams to be able to deploy low risk code as long as controls are in place (break glass, access broker, etc.) and trail is auditable

# Successful Transformation

The better the software, the better the business results





# Metrics

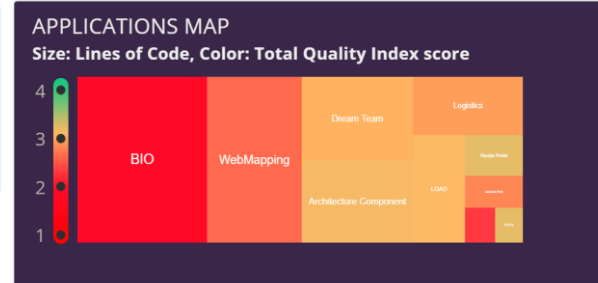
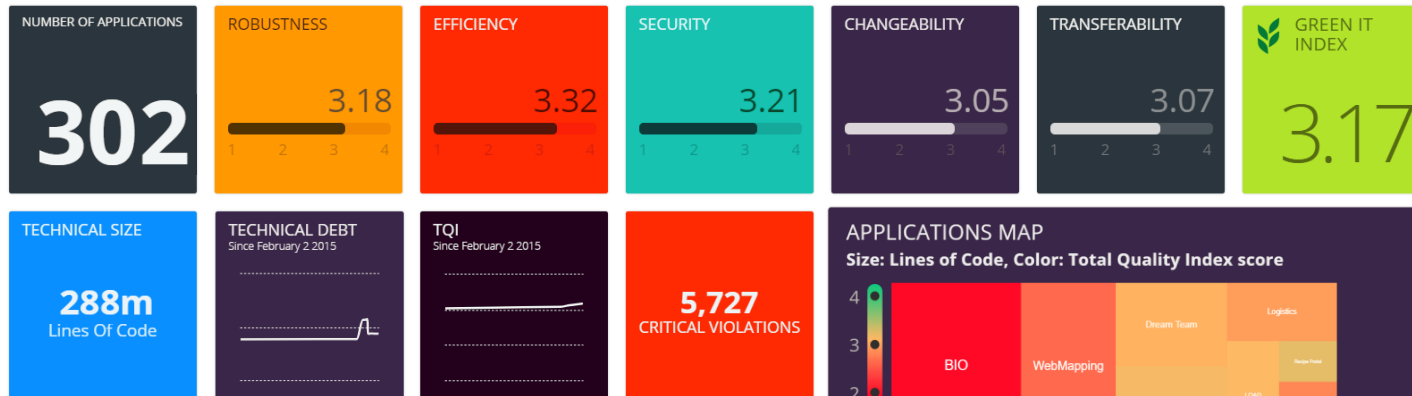
Measure Software Behavior with an IT Risk Score



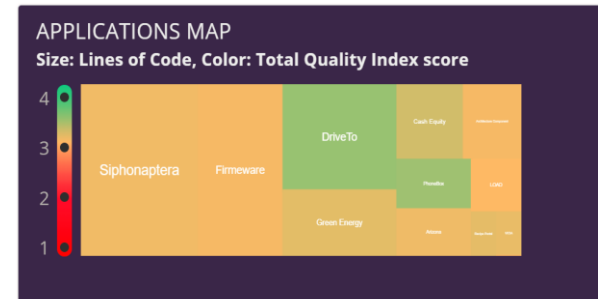
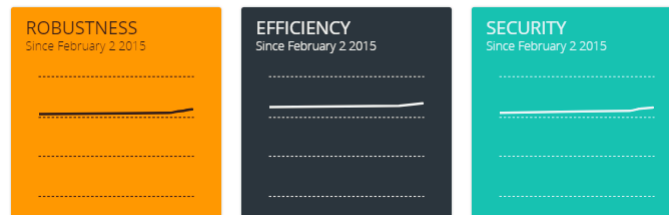
# Metrics

## Standard Measurement of Software Quality

### Overview



### Evolution



**Become Hyper-Aware**

**Operationally Ready**

**Fail & Learn Fast**

**But Most Importantly Know Your Software**

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