Construx®

Software Development Best Practices

Seven Critical Insights for C-Level Executives

www.construx.com

Construx®

Software Development Best Practices

My Perspective

My Perspective

- Software Engineering Expert
- Contact with C-Level Executives
- Business Owner/CEO
- Preoccupation with estimation...

Construx®

Software Development Best Practices

Six Insights that C-Level Executives Already Know

Six Insights That C-level Executives Already Know

- Software projects are late
- Software projects are out of control
- Answers from software staff are often incomprehensible
- C-Level executives are rational and intelligent enough to understand these concepts
- Answers from software staff often seem evasive
- Software is the most unpredictable part of the business

Construx®

Software Development Best Practices

The Seven Critical Insights

Construx®

Software Development Best Practices

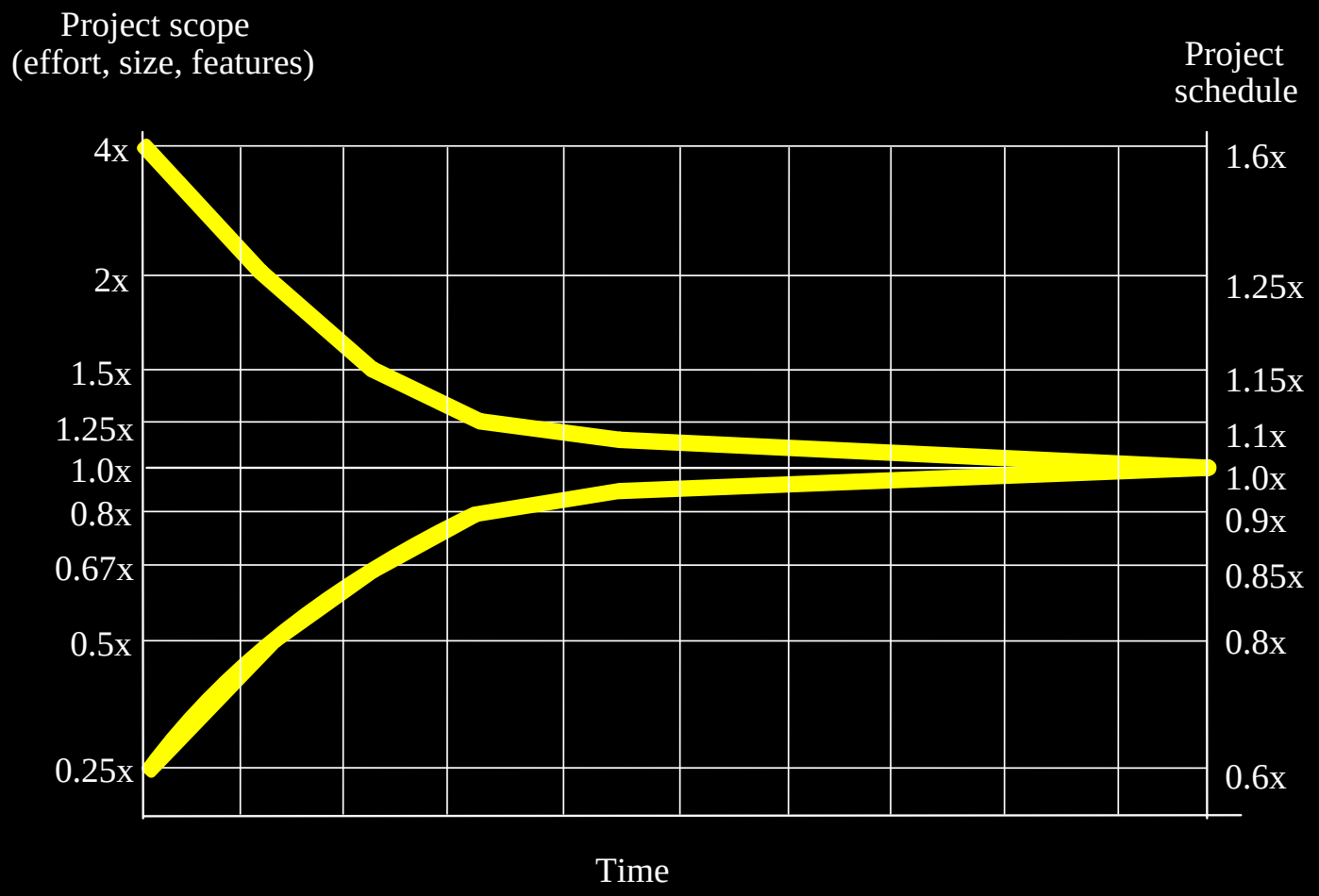
Insight #1

Typical Budgeting Processes Undermine Effective Development

Typical Budgeting Processes Undermine Effective Development

- Many organizations use “One Phase” budgeting processes
- This is a poor match for the nature of software development

The Cone of Uncertainty



Construx

A Too-Common Response to the Cone…

"You encourage range-based reporting. At three places I have managed, it simply has not been an option. In fact, at one board meeting our Director of Program Management was asked to leave the board meeting because of an attempt to use ranges. The quotation was approximately, 'You don't seem to understand that your job is to give me a date. If you can't give me a date, you can't do your job.'"

Implications of the Cone

- Accurate budgets can't be set before significant preliminary work is done
- Accurate budgets can be set after about 10-20% of the total project budget has been expended*

* You won't know what the total project budget is until you expend the 10-20%, and so you can't accurately calculate the 10-20% ahead of time

Construx®

Software Development Best Practices

Insight #2

Stage-Gate Processes Are Prevalent In Leading Companies

Stage-Gate Processes Are Prevalent In Established Companies

- Example companies
- Some amount of preliminary work is necessary before an accurate budget or schedule can be set, because of the Cone

Construx®

Software Development Best Practices

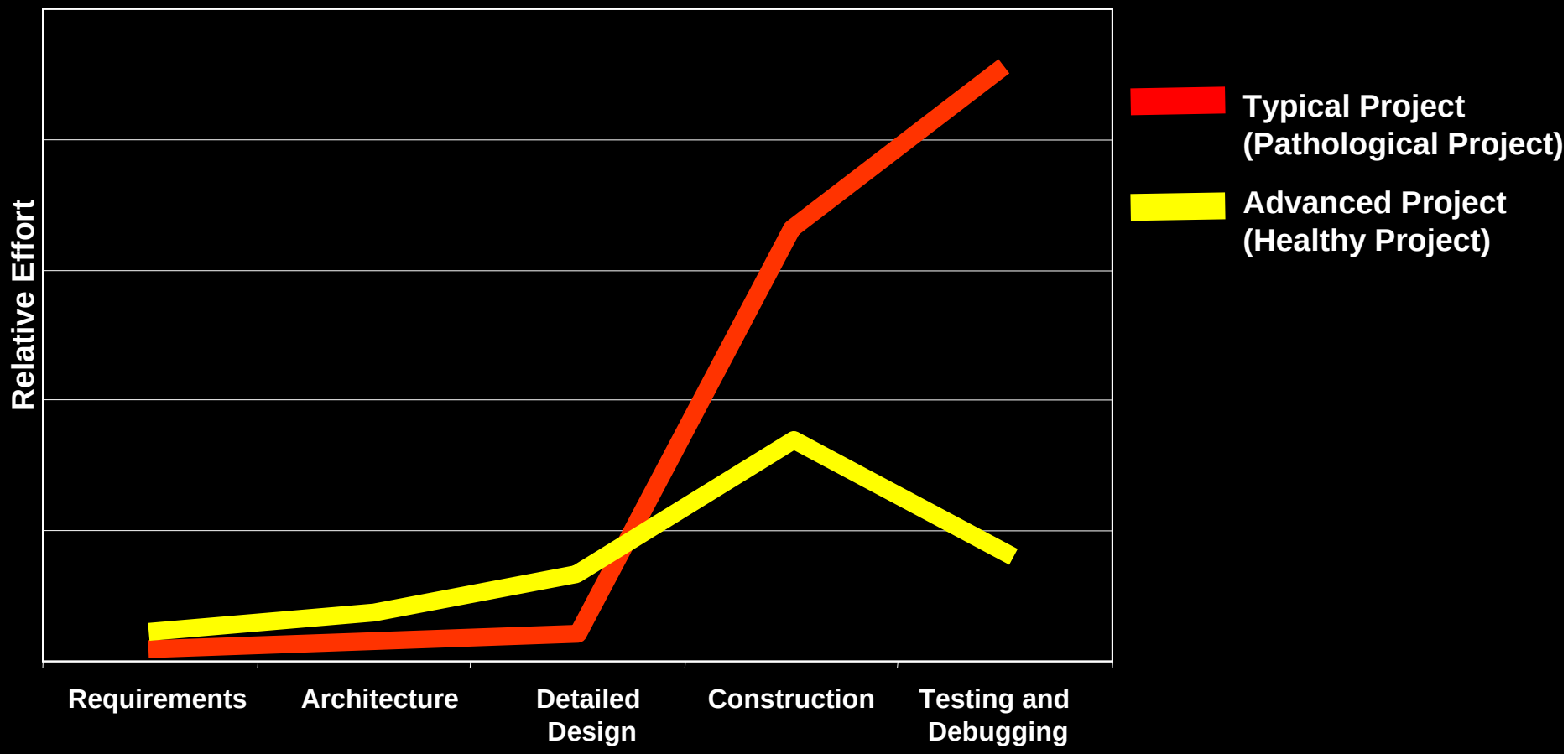
Insight #3

Low Quality Is The Single Largest Cost Driver

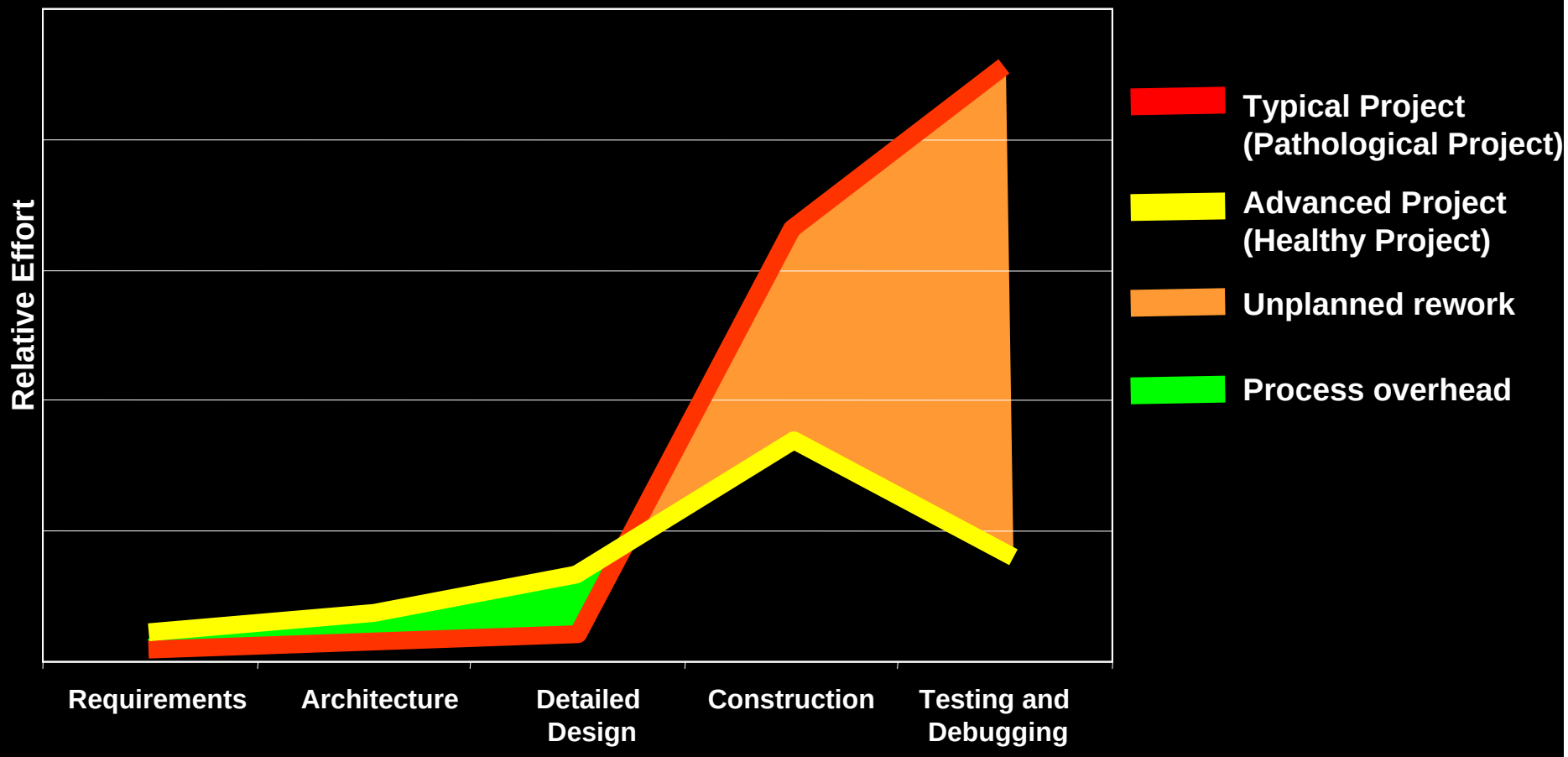
Low Quality Is The Single Largest Cost Driver

- 50-80% of the typical project's expense goes into unplanned rework
- The most common reasons for this are
  - Poorly defined requirements, which lead to changing requirements
  - Inadequate project planning
  - Inadequate project management
  - All of which are exacerbated by committing too early in the Cone

Lifecycle Cost Profile



Lifecycle Cost Profile (cont.)



How to Respond to Low Quality

- IBM Study

  Projects that focused primarily on schedule tended to overrun their schedule goals and were delivered with low quality; projects that focused primarily on quality tended to meet their schedule goals and were delivered with good quality”
- Typical reaction when this is done well: “This project must not have been a good test case”

Construx®

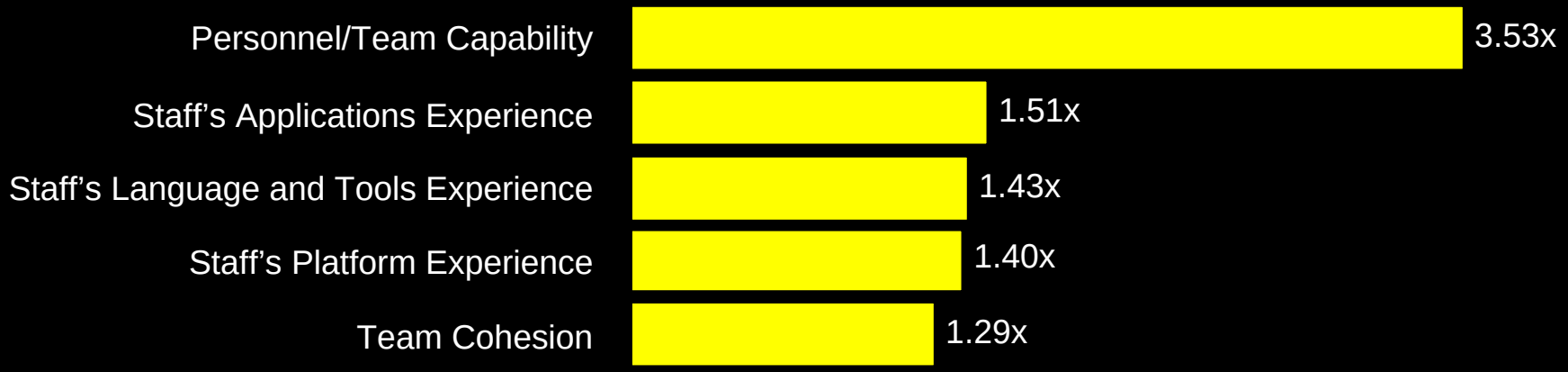
Software Development Best Practices

Insight #4

People (Staff) Exert The Largest Impact On Project Outcomes

Significance of Individual Variability

- According to Cocomo II calibrations, worst personnel will require 14x as much effort to produce software as best personnel



- This basic finding has been replicated many times

Source: *Software Cost Estimation with Cocomo II,* Barry W. Boehm, et al, Prentice Hall, 2000

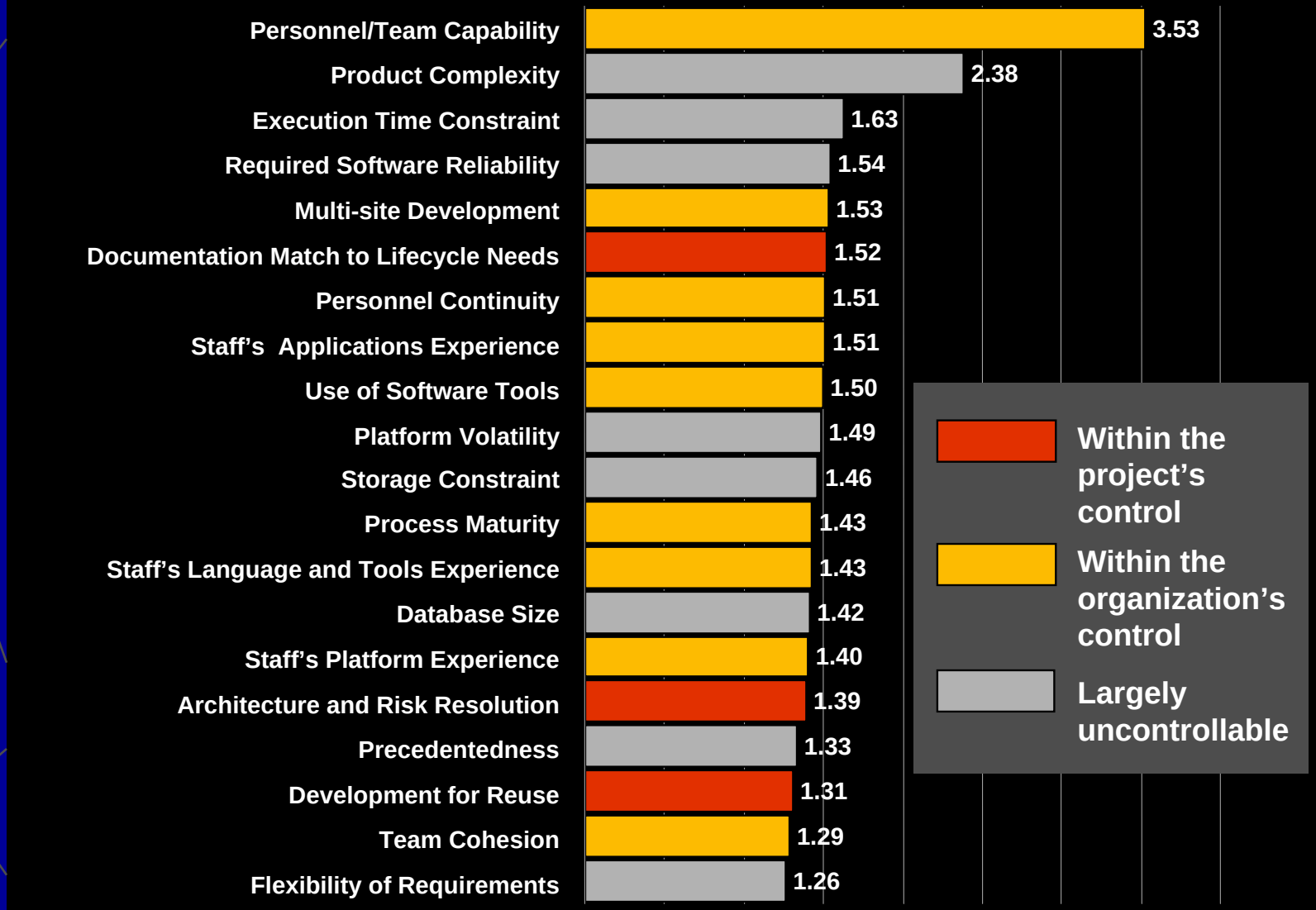
Construx®

Software Development Best Practices

Insight #5

Software Improvement Works Best When Supported at the Organizational Level

Where Can Organizations Improve?



"Software Development Best Practices"

Construx

Organizational Level

- Many factors must be addressed at the organizational level
- Such as, the Cone
- Some work requires trading off short-term project performance to benefit long-term organizational effectiveness

Construx®

Software Development Best Practices

Insight #6

The Tradeoffs Between Cost, Schedule, And Quality Might Not Be What You Think They Are

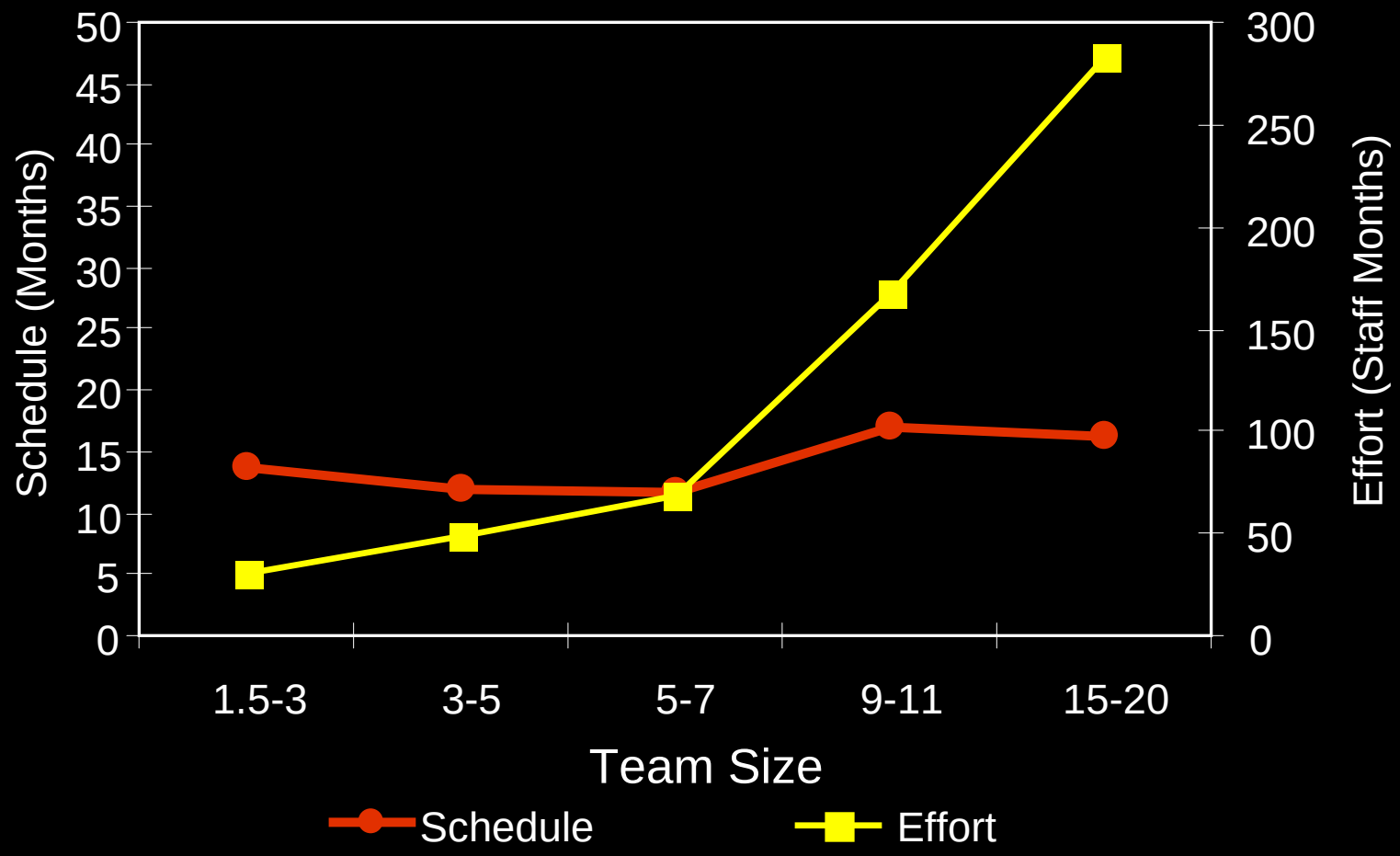
Tradeoffs Between Quality and Cost or Schedule

- Low quality is already the largest cost driver for many organizations
- Attempting to tradeoff quality makes cost and schedule worse
- In addition, short schedules increase defects
- Focus on improving quality, and cost and schedule will follow

Interrelationships Between Cost and Schedule

- Shorter-than-nominal schedules *increase* cost disproportionately
- Longer-than-nominal schedules *reduce* cost disproportionately
- Larger teams tend to take more time, introduce more defects, and cost more

Example: Team Sizes on Similarly-Sized Business Systems Projects



Construx®

Software Development Best Practices

Insight #7

Improved Software Practices Offer Exceptionally High ROIs

ROI for Selected Practices

Practice	12-month ROI	36-month ROI
Formal code inspections	250%	1200%
Formal design inspections	350%	1000%
Cost and quality estimation tools	250%	1200%
Long-range technology planning	100%	1000%
Productivity measurements	150%	600%
Process assessments	150%	600%
Management training	115%	550%
Technical staff training	90%	500%

Source: Capers Jones, Assessment and Control of Software Risks, Prentice Hall, 1994.

Overall ROI

- Improved software practices pay an average ROI of 500% (including false starts), and continued improvement is sustainable for many years
- The best organizations have sustained ROIs of 900% from software improvement initiatives for many years

Overall ROI

- Much of the ROI comes from avoiding rework (reducing costs)
- Some of the ROI comes from improving predictability (increasing business opportunities)

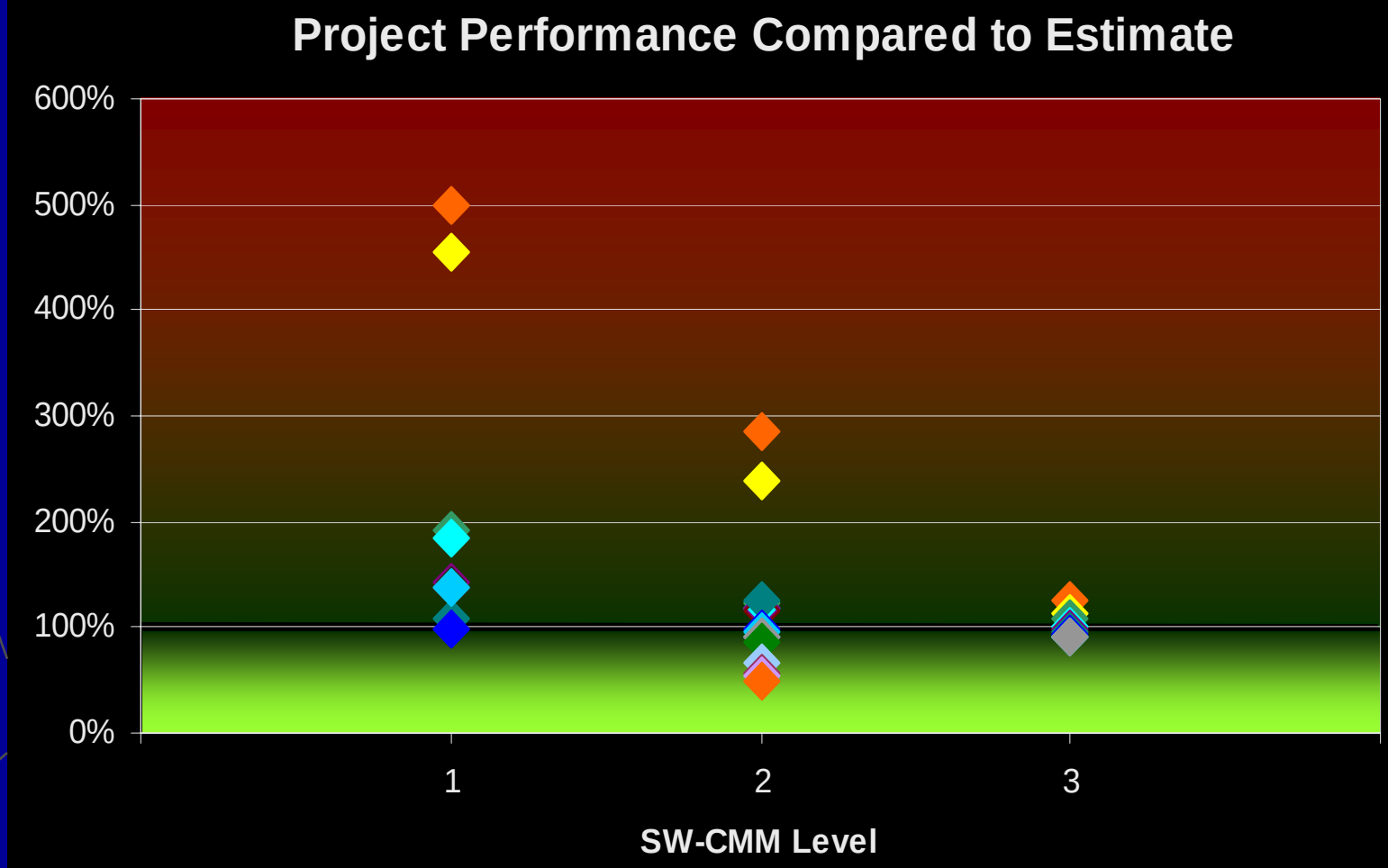
Construx®

Software Development Best Practices

Bonus Insight

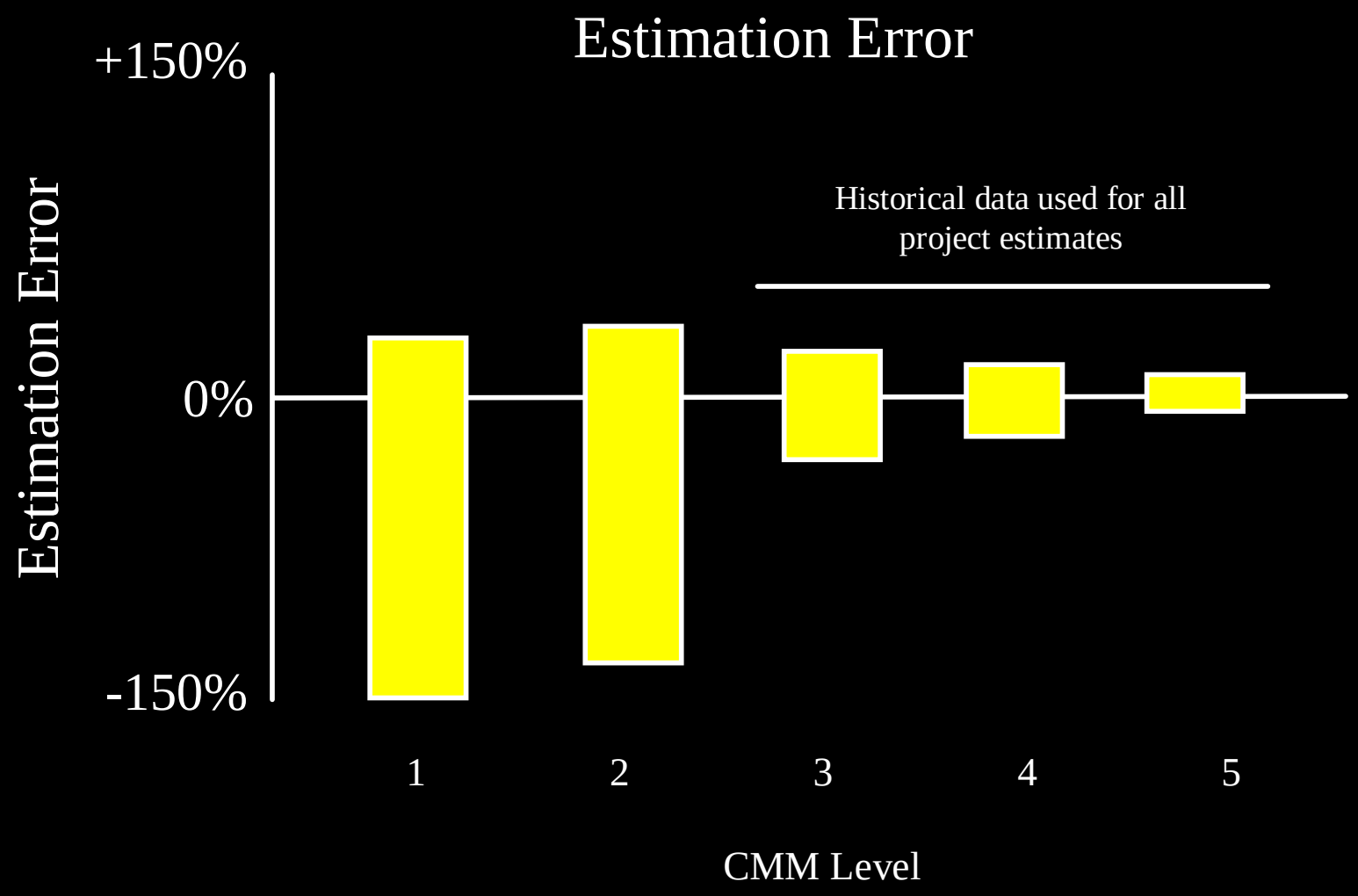
Some Organizations Are Doing Very Well Indeed

Improved Predictability in Air Force Projects



Construx

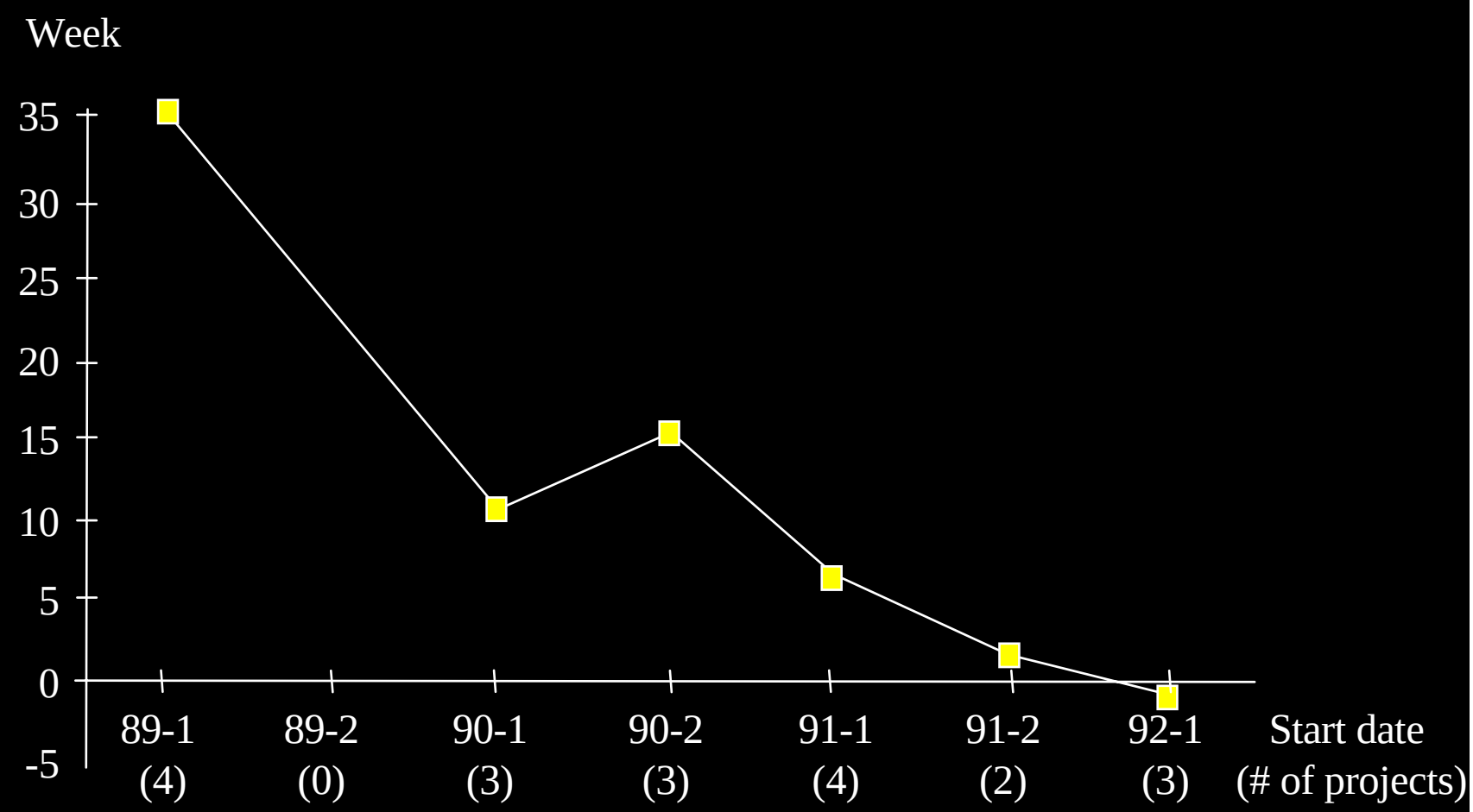
Improved Predictability at Boeing



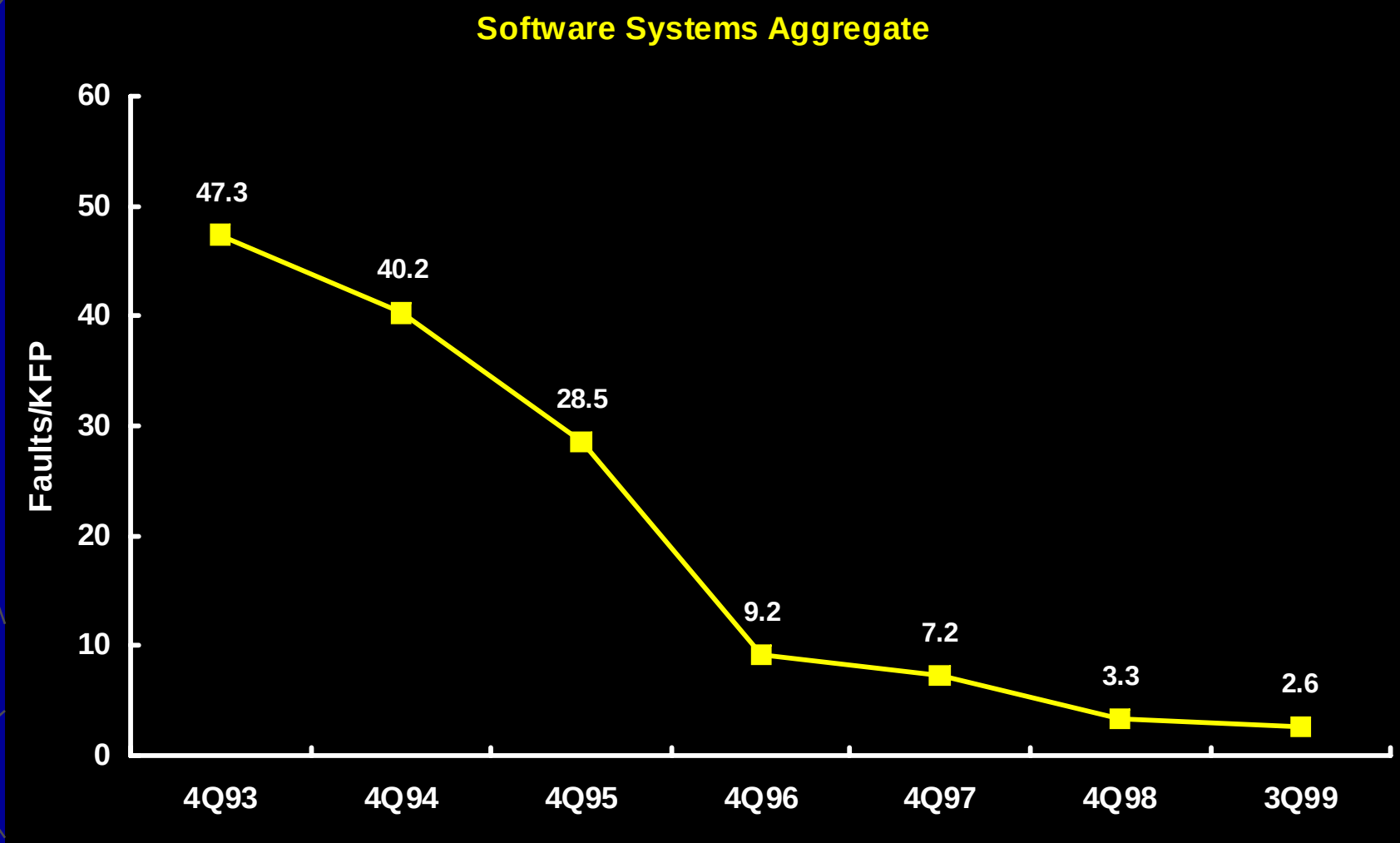
Construx

"Software Development Best Practices"

Improved Predictability at Schlumberger



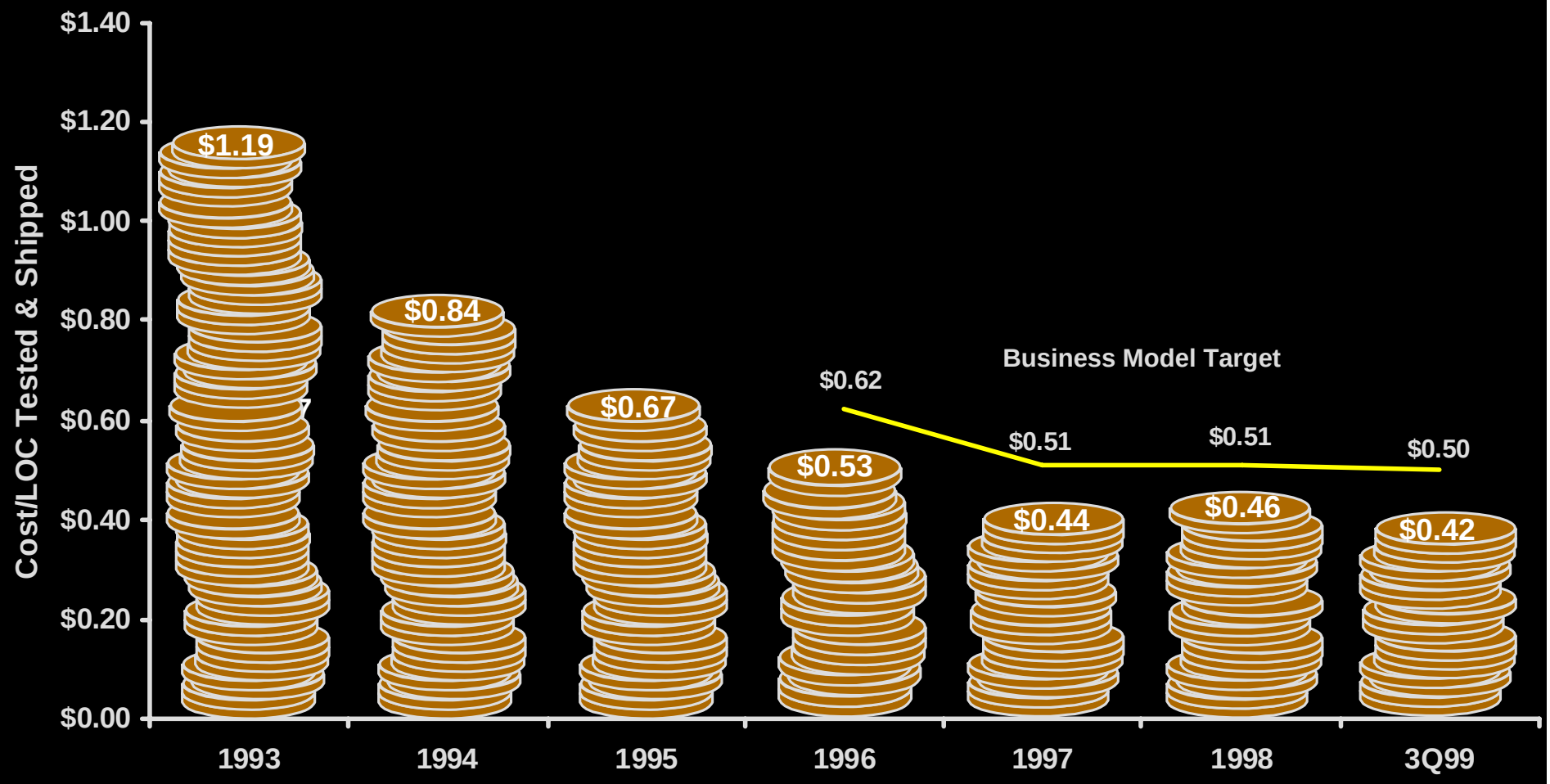
Improved Quality at Telcordia



Construx

"Software Development Best Practices"

Reduced Cost at Telcordia



Construx®

Software Development Best Practices

To Help Achieve These Results in Your Organization:

sales@construx.com

www.construx.com

(866) 296-6300