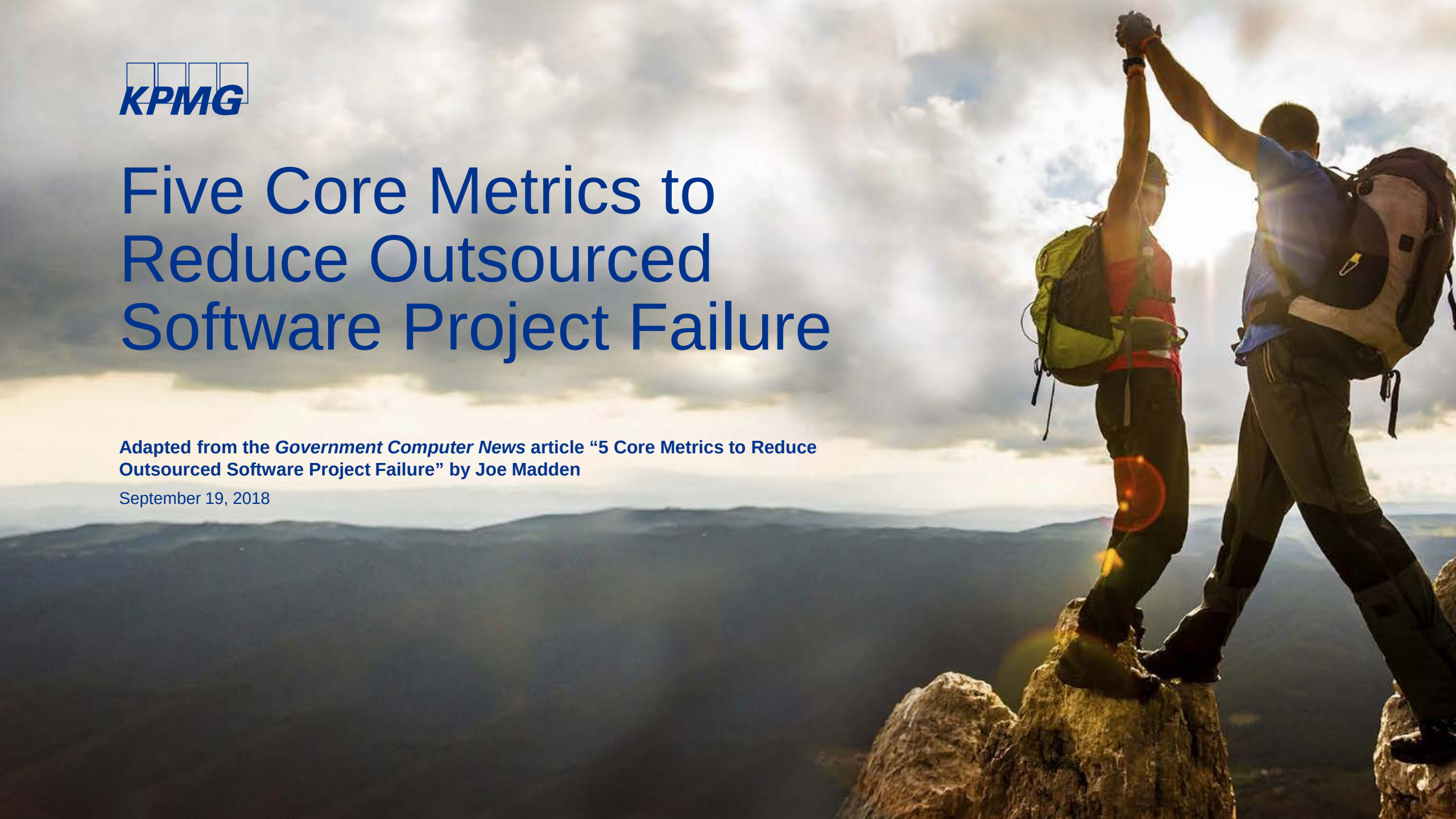
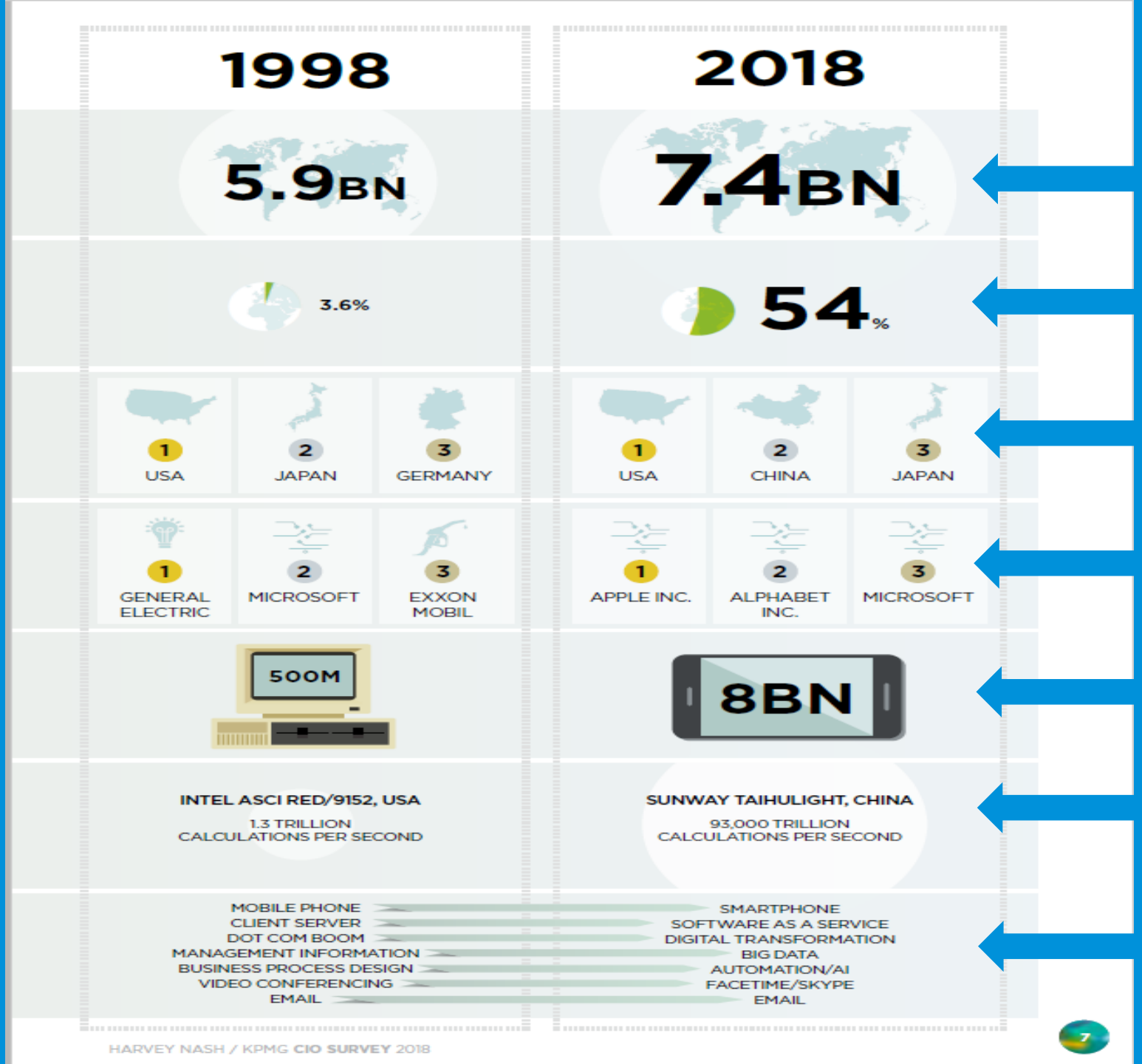


Five Core Metrics to Reduce Outsourced Software Project Failure

Adapted from the *Government Computer News* article "5 Core Metrics to Reduce Outsourced Software Project Failure" by Joe Madden

September 19, 2018



World Population

% World Population With Access to Internet

Largest Economies

Most Valuable Companies

Number of Devices Connected to the Internet

Fastest Computer

Technology Trends

HARVEY NASH
The Power of Talent

THE HARVEY NASH / KPMG CIO SURVEY 2018

KPMG

84 countries represented

12% female IT leaders

3,958 IT leaders surveyed across a wide range of industries and geographies

17% other C-level roles

6% CEOs

42% CIOs or IT Directors

THE TRANSFORMATIONAL CIO

BUDGETS, OUTLOOK & PRIORITIES

IT INVESTMENT GROWS

49% Budget increases at their highest level since tracking began

47% expect IT headcount to increase

COULD INFLUENCE BE STALLING?

Fewer CIOs on executive boards this year (down 9%)

Fewer IT leaders report CIO influence is growing (down 8%)

OPERATIONAL PRIORITIES

Top 3

1. Improving business process
2. Delivering stable IT
3. Increasing operational efficiencies

Top 3 priorities for 'digital leaders'*

1. Developing innovative new products
2. Delivering stable IT
3. Enhancing customer experience

Top 3 priorities that have grown

1. Improving cyber security (+23%)
2. Managing operational risk & compliance (+12%)
3. Improving business process (+5%)

MANAGING TECHNOLOGY

69% have, or expect to implement, intelligent automation within IT and **60%** within customer support

Cyber crime

- **33%** report major cyber attack in the last 2 years
- **9%** increase in concern over organised cyber crime
  Education sector worst affected
- **68%** report their boards are supportive

DIGITAL LEADERS MUCH MORE LIKELY TO BE INVESTING SIGNIFICANTLY IN NEW TECHNOLOGIES COMPARED TO OTHERS

6x more virtual reality

5x more blockchain

2.5x more robotic process automation

PEOPLE, SKILLS & TALENT

SKILLS SHORTAGE CONTINUES

65% report a lack of talent holding their organisation back

67% plan to use automation to remove the need for additional headcount

46% use outsourcing to access skills. Cost savings is a lower priority

OUTSOURCING

32% plan to increase outsourcing spend

Big drop on last year *(from 48%)*

35% of IT leaders believe their country's work visa legislation is holding their organisation back

18% have been unsuccessful at promoting diversity, and only **19%** very successful

MAKING STRATEGY HAPPEN

55% of organisations rate their IT/business alignment *'moderate'* or *worse*

The successful ones

1. Favouring customer/revenue growth over inward-facing activities
2. An acting or dedicated CDO makes organisations more effective at leveraging customer data

General Data Protection Regulation

38% do not expect to be compliant by the May deadline

*'Digital leaders rated the organisation 'very' or 'extremely' effective at using digital technologies to advance their business strategies.

CIO CAREERS

46% of IT leaders enjoyed salary rises in the last year

Leisure, Professional Services and Construction sectors report biggest rises

78% are either quite or very fulfilled in their jobs

Digital leaders are the most fulfilled in their roles*

13% less are 'very fulfilled' this year

The 2018 Harvey Nash / KPMG CIO Survey is the largest IT leadership survey in the world in terms of number of respondents. The survey was conducted of 3,958 CIOs and technology leaders across 84 countries.
www.hnkpmgciosurvey.com

ALL ABOUT DIGITAL

MAKING DIGITAL EFFECTIVE IS TOUGH

78% of CIOs believe their digital strategy is only moderately effective, or worse

32% of organisations have an enterprise-wide digital strategy

This is down on last year, suggesting IT leaders are rethinking their approach on digital

DIGITAL STRATEGIES STILL IN THEIR INFANCY

Most digital investment is focused on "front-end," rather than deeper operational activities

SUCCESSFUL ORGANISATIONS

Organisations with a CDO, either in a dedicated or acting role, are over twice as likely to have a clear and pervasive digital strategy than those without one (**44%** versus **21%**).

38% think their digital strategy would fail without an innovative and experimental culture

The Challenge: Outsourced Software Project Failure in Government

Outsourcing was supposed to make government IT executives' lives easier. Yet in too many cases, it's had the opposite effect, leading to cost overruns, inefficiencies, and solutions that do not work.

High visibility examples:

- **Defense Integrated Military Human Resources System (DIMHRS)**, known as "Dime-ers."
  - DIMHRS was an attempt to bring the four military branches under a single payroll and personnel records system.
  - Defense officials cancelled the program after spending $1 billion and 12 years of effort! In testimony to the Senate Armed Services Committee:
    - Adm. Mike Mullen, chairman of the Joint Chiefs: "This program has been a disaster."
    - Defense Secretary Robert Gates: "Many of the programs that I have made decisions to cut have been controversial within the Department of Defense. I will tell you this one was not."
- **Initial rollout of Healthcare.gov**
  - Speaking on "60 Minutes" on CBS during his final interview as president, President Barack Obama said he "shanked" the rollout of the website provided for the Affordable Care Act.
  - President Obama: "You know, if you know you got a controversial program, and you're setting up a really big, complicated website — website better work on the first day or first week or first month. The fact that it didn't obviously lost a little momentum," he said. "That was clearly a management failure."

A Proven Solution: The Five Core Metrics

- In 1977, Lawrence Putnam Sr. discovered the “physics” of how engineers build software by successfully modeling the nonlinear relationship between the five core metrics of software: product size, process productivity, schedule duration, effort and reliability.
- The five core metrics make a powerful tool that can be used at each phase of the software acquisition life cycle to help government IT program managers make more objective, quantitative decisions.
  - The concepts are described in more detail in the book *Five Core Metrics: The Intelligence Behind Successful Software Management* by Lawrence Putnam and Ware Myers.

Leveraging the Five Core Metrics in Each Phase of the Software Acquisition Life Cycle

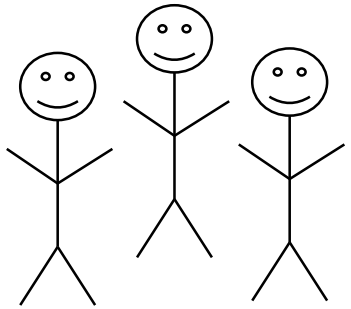
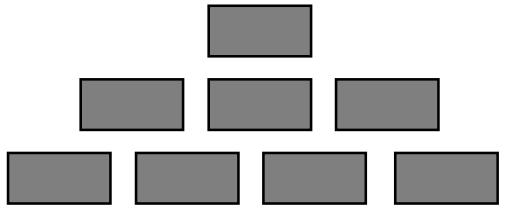
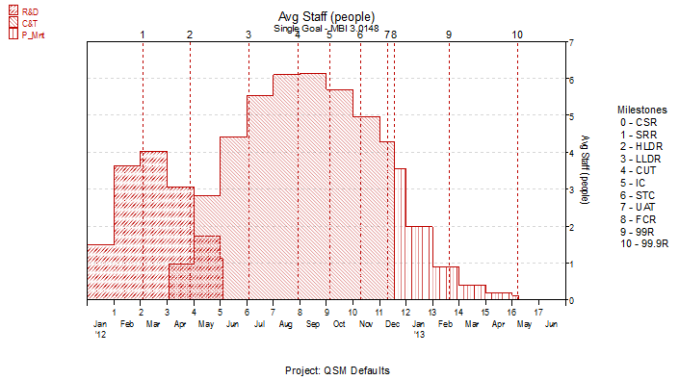
Best Practices

Pre-Acquisition	Request for Proposal	Award	Post-Award
• Thoroughly **quantify the size** and scope of the project and required functionality. • Perform **independent cost and schedule estimate** using an estimation tool that leverages historical data.	• Issue clear RFP so vendors know the scope of required functionality they are bidding on. • State any constraints and set realistic schedule expectations based on historical performance and ranked priorities. • Require vendor to report well-defined and regular status metrics.	• Compare vendor cost proposals with independent internal estimate. • Don’t be misled by the lowest cost and be wary of the highest cost. • Perform technical assessment of vendor past performance. • Perform technical assessment of vendor staffing plan.	• Measure construction, not consumption. • Track vendor performance based on actual status metrics, not subjective reports. • Adjust and forecast to complete based on actual data to minimize surprises.

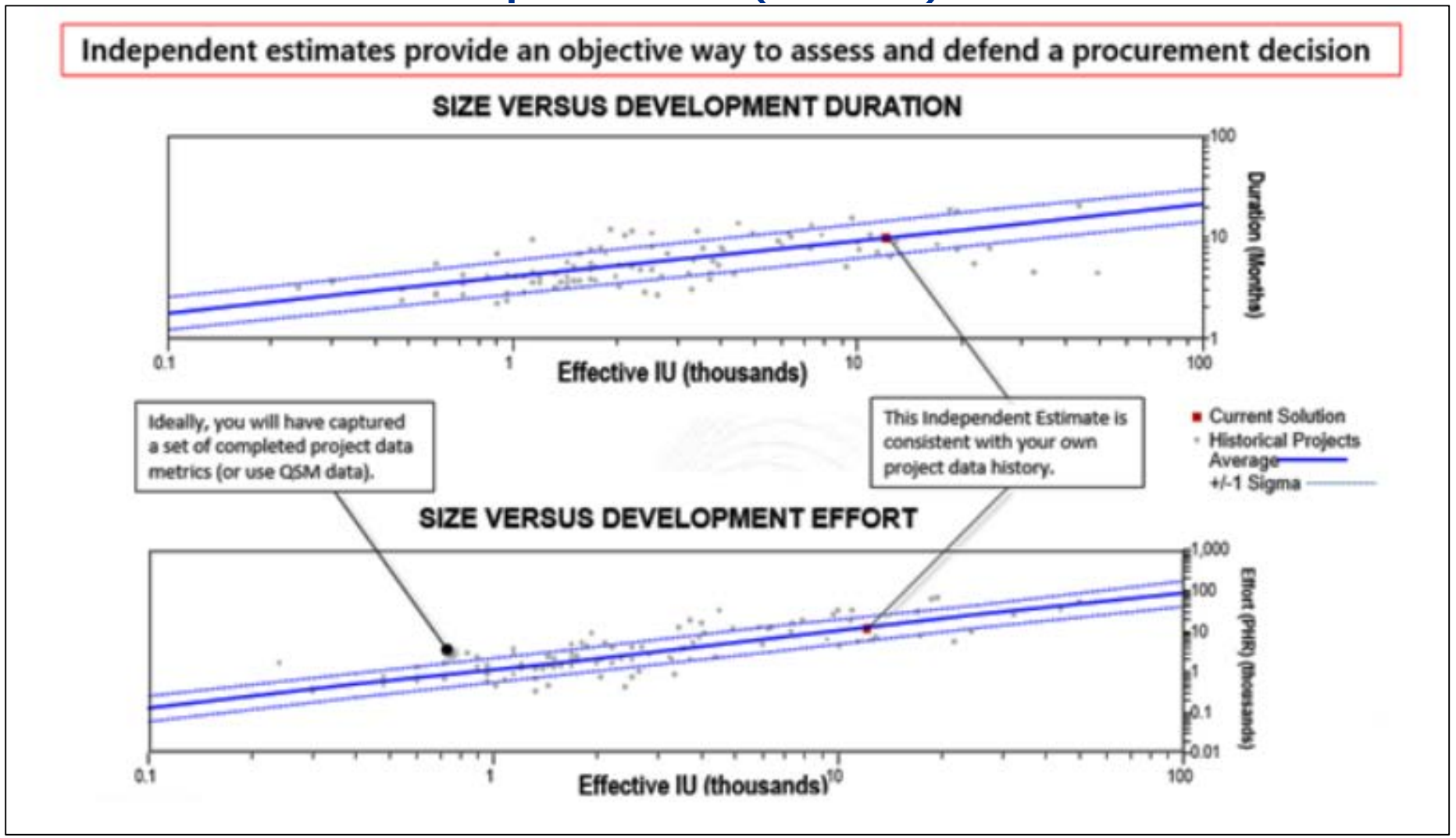
Phase 1: Pre-acquisition

- In this phase the five core metrics are used to develop an independent “should cost” estimate using a parametric estimation tool that includes an assessment of expected effort, staffing and schedule duration to deliver the required scope of functionality at a target reliability.
- The independent government estimate should explore all of the viable options. If done right, this should lead to reasonable program parameters and expectations that will be specified in the request for proposal when it is issued.

Sidebar: Types of Estimates for IT Projects

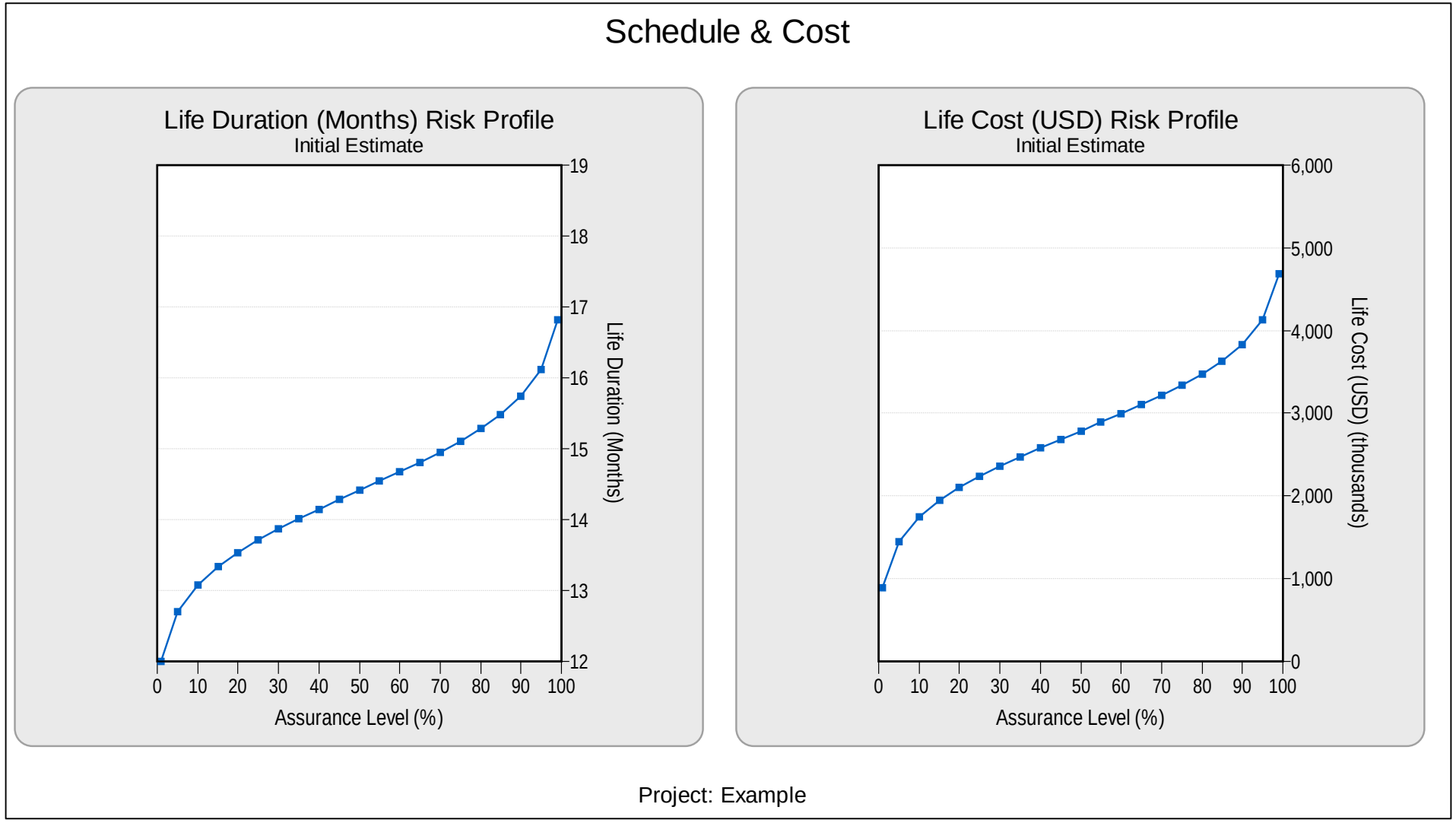
Role Based	Task Based	Scope Based
		
SMEs estimate people/roles required to get the job done	Estimates based on a detailed, bottoms up WBS	Estimates calculated based on scope and expected productivity (calibrated from historical data), usually with a parametric tool
Strengths: Can be done quickly, especially on small projects	**Strengths**: More defensible basis of estimate than role based estimate	**Strengths**: • Most defensible • Can adapt quickly to changes in scope
Weaknesses: • Estimates can vary widely between SMEs • Core assumptions are in someone's head	**Weaknesses**: • Very time consuming to develop • Estimate is often an best case scenario with some arbitrary management reserve	**Weaknesses**: Requires specialized expertise

Phase 1: Pre-acquisition (Cont.)



Note: in the chart above, product size is measured in implementation units (IU), which is equivalent to writing a logical source line of code or a technical step in configuring a commercial off the shelf package.

Probability of Meeting Cost and Schedule Constraints



Phase 2: Request for Proposals

During this phase it is very important to ensure the RFP:

1. Quantifies the scope of required functionality,
2. Identifies any key management constraints and
3. Requires vendors to report regular, well-defined status metrics to include construction progress vs. plan and defects discovered.

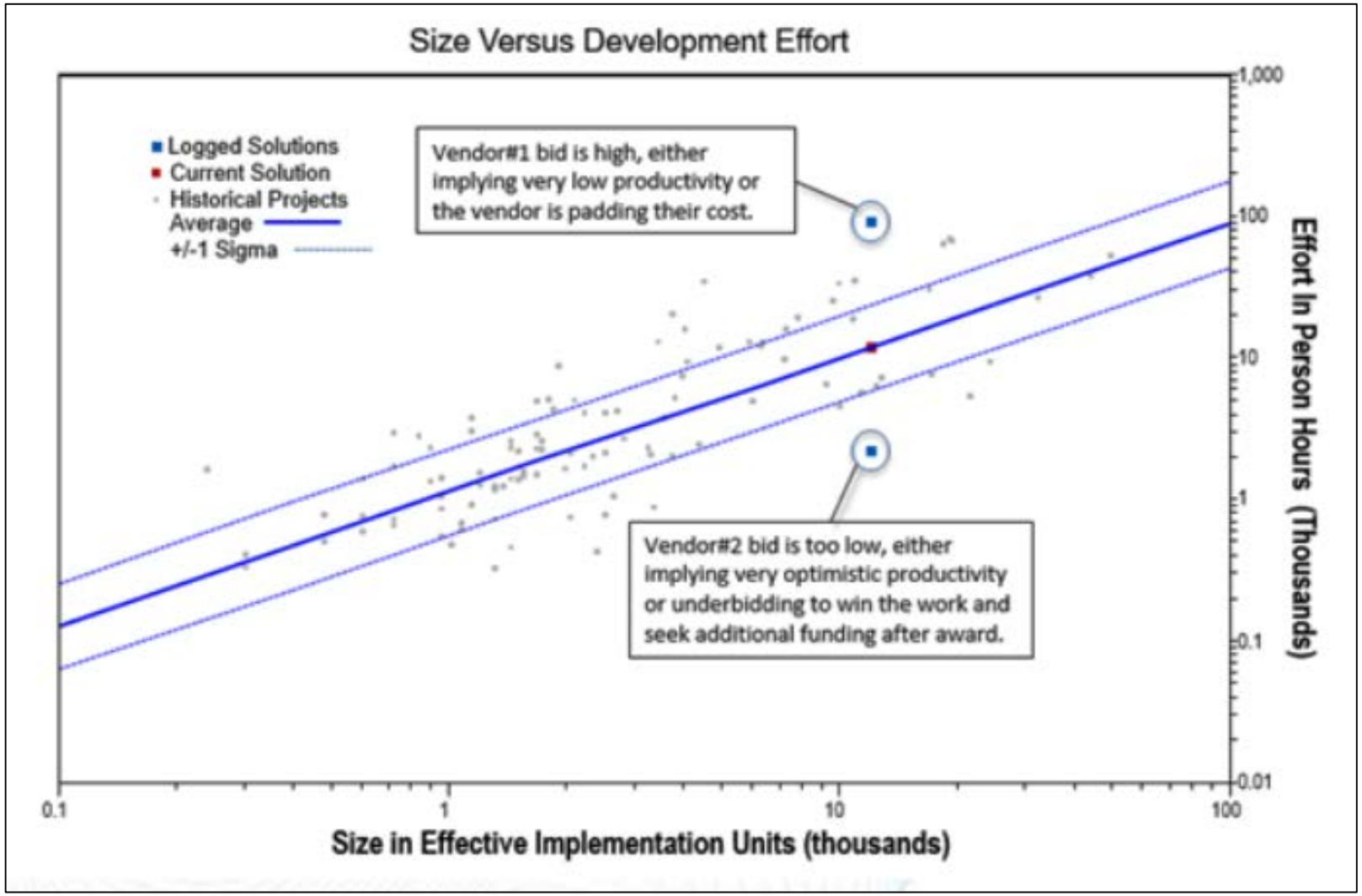
Phase 2: Request for Proposals (Cont.)

Example Status Metrics:

- **Did work on the project start on time?** Many vendors struggle with initial ramp up of a new project after contract award. By monitoring the plan vs. actual staffing curve IT managers can get an early indication of whether the project is actually starting on time.
- **Is the project release on track to deliver?** Measure the amount of functionality planned for the next release that has been developed and unit tested. (Note: this should use an agreed upon sizing unit such as lines of code, function points or user stories.) Unlike percent complete status, which can easily be "fudged," working software is an objective measure of progress that is hard to dispute.
- **Will it be a quality product?** The cost to find and fix defects goes up exponentially over time. Measure development defects discovered by month and by severity, which is an objective benchmark of the vendor's efforts to remove defects early through inspection and testing.
- **Has there been a change in scope?** Change can be embraced as long as those revisions to the scope of required functionality are quantified and schedule and cost estimates are revisited.

Phase 3: Award – Cost Evaluation

The third phase is about the analytical process of objectively assessing the bidders and scoring their cost and technical proposals.



A cost evaluation should weed out vendors who appear to be lowballing to win, as well as those who appear to be padding their estimates.

Phase 3: Award – Technical Evaluation

The technical evaluation should assess the skill of the development team, not the proposal writer.

It should take a hard look at whether bidders are able to provide quantitative data (i.e. the five core metrics) for each of their past performance qualifications to demonstrate they are capable of performing the work.

QUALITY OF METRICS PROVIDED	BENCHMARK COMPARISON W/ INDUSTRY, CLIENT	KEY PERSONNEL INCLUDED	ASSESSMENT	RATING
Incomplete/low quality/cannot be verified	N/A	N/A	High risk. Likely low process maturity (below CMMI Level 2)	Unsatisfactory
Satisfactory	Below Average	N/A	Medium-high risk. Productivity below average.	Marginal
Satisfactory	Average or Above Average	No	Medium risk. Favorable past performance, but proposed personnel did not work on those projects.	Acceptable
Satisfactory	Average	Yes	Low risk. Key personnel worked on past performance projects with average productivity.	Above Acceptable
Satisfactory	Above Average	Yes	Low risk. Key personnel worked on past performance projects with above average productivity.	Outstanding

Phase 4: Post-award

The fourth phase is about assessing progress against the contract baseline. This includes:

— Comparing planned vs. actual metrics to ensure that the program is on track.

— If changes in direction are proposed, they need to be understood and quantified in order to evaluate the impact to schedule and cost.

Conclusion

Transparency is an important component of a healthy vendor/customer relationship, especially on complex software projects.

- The phases described above allow the government customers to have a better understanding of how applications are being developed so they can make sure they are receiving a high quality product without overpaying.
- Likewise, the vendor gets the opportunity to potentially develop a long-term relationship with the agency by sharing valuable quantitative information from beginning to end.

Thank you

Questions? Who to Contact:

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