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CSI ~~Miami~~ Chicago

Attributes of a Successful Software Forensics Solution

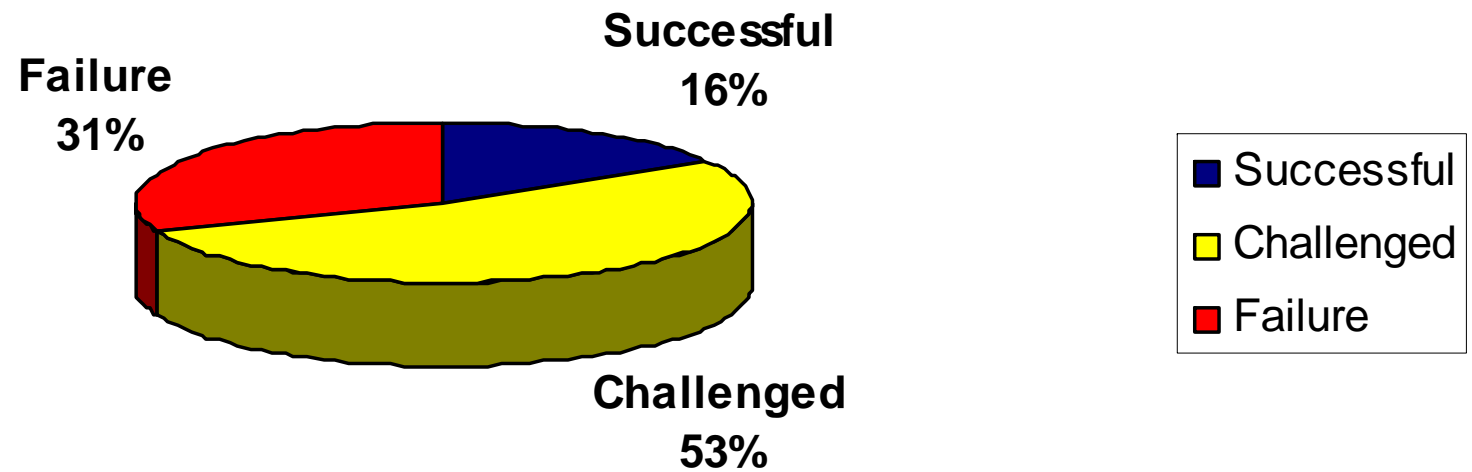
Tom Ticknor, CSQA, CSTE
Chief Operating Officer
QAI Global Institute





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Success of Software Development Projects

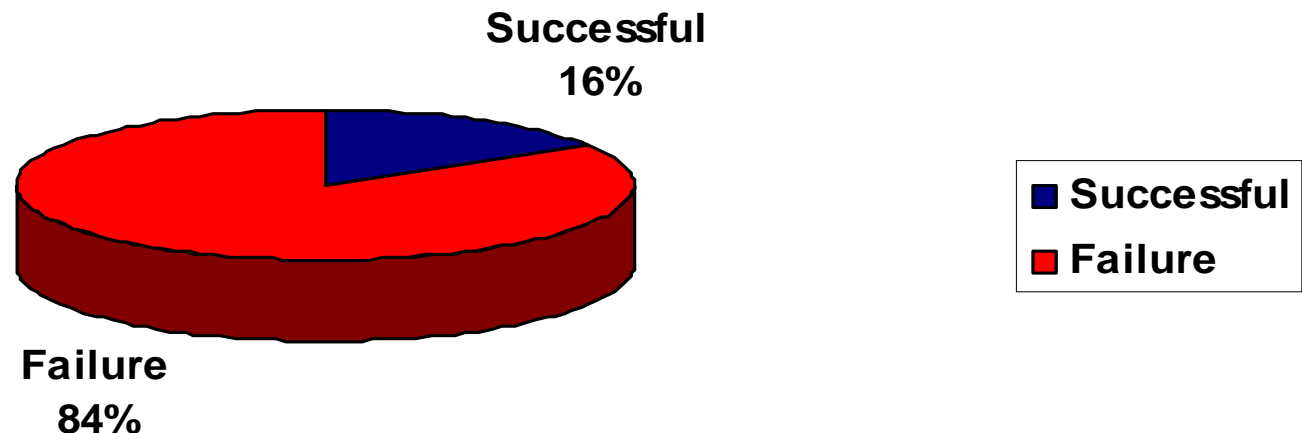


The “CHAOS Report” circa 1994



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Success of Software Development Projects

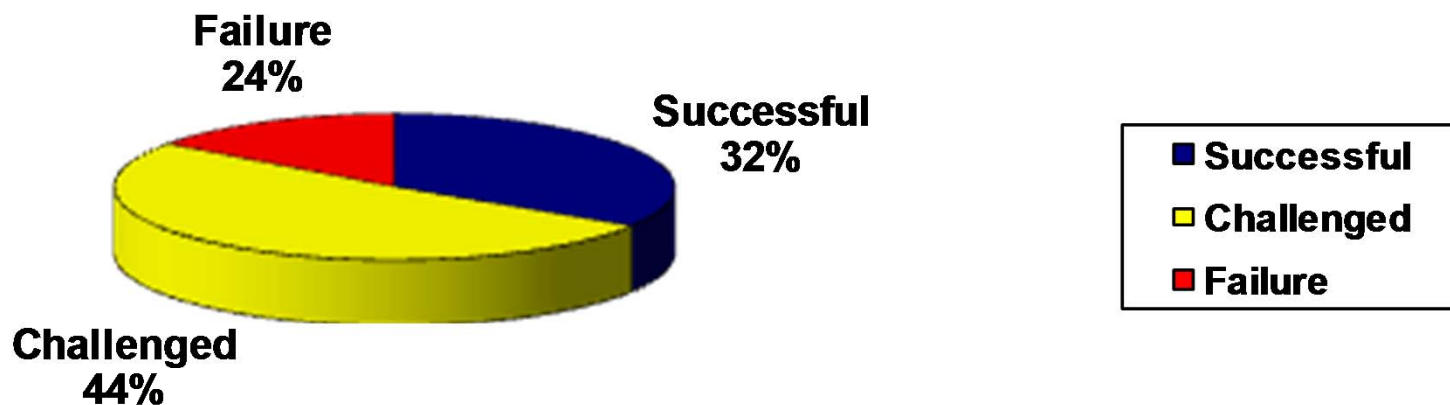


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Success of Software Development Projects

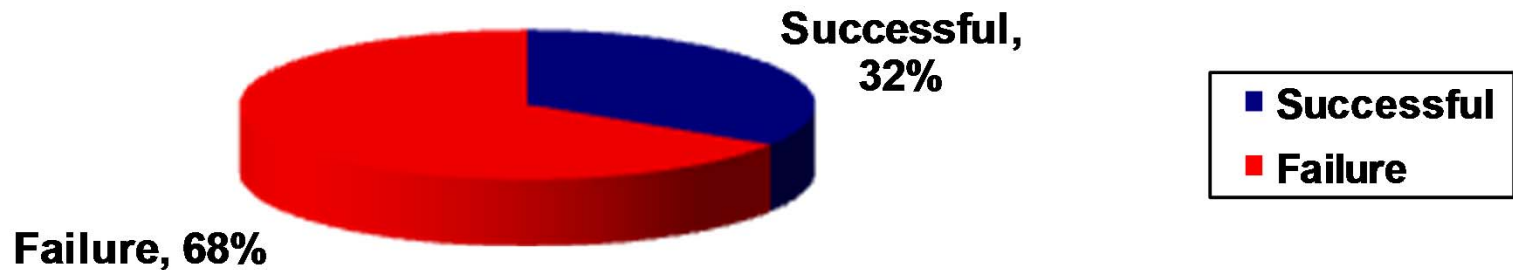


The “CHAOS Report” 2009 Update



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Success of Software Development Projects



The “CHAOS Report” 2009 Update



Maybe the Standish Group
are just a bunch of
pessimists, or maybe their
methodology needs some
“Forensic Investigation”!





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2009 \$6.2 trillion per year in global IT failure costs (R. Sessions, ObjectWatch)

2011 IBM - Only 40% of projects met schedule, budget and quality goals

2009 U.S. Budget, 66% of all Federal IT dollars invested in projects are invested in projects that are "at risk".

UK government estimates 7 out of 10 IT projects fail (70%)

PricewaterhouseCoopers – 75% of IT projects fail





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2012 Survey by McKinsey & Company in conjunction with the University of Oxford of 5,400 large scale IT projects

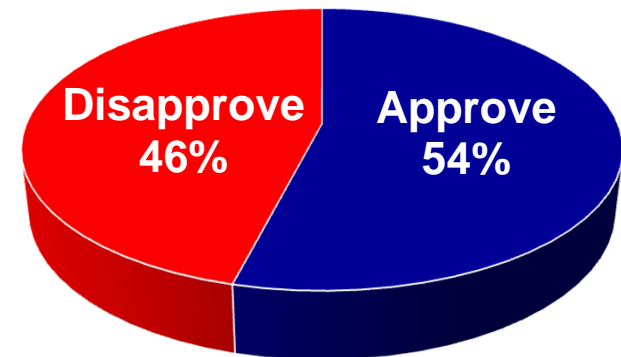
A key finding quoted from the report:

- 17 percent of large IT projects go so badly that they can threaten the very existence of the company

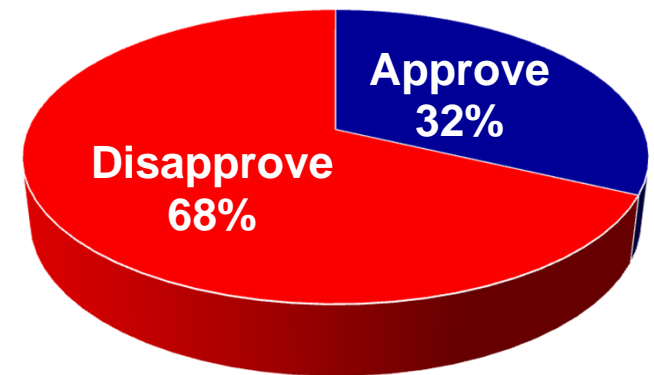


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President Obama's Job Approval Rating Before Launch of the Government Health Insurance Website



President Obama's Job Approval Rating After Launch of the Government Health Insurance Website





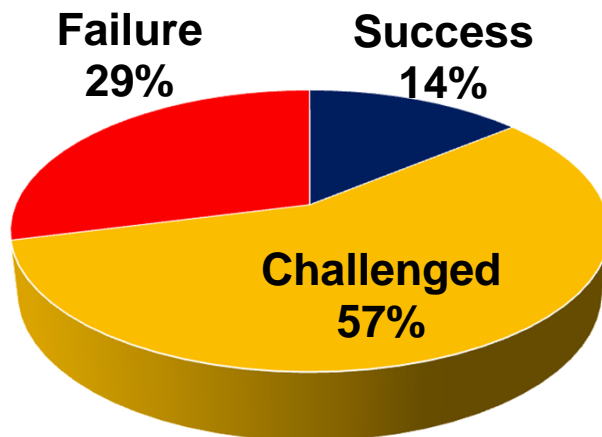
Agile! .. Our Silver Bullet!



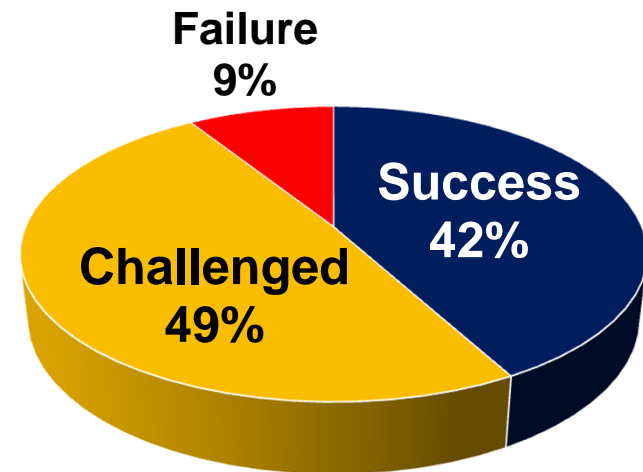


Agile! .. Our Silver Bullet!

Waterfall



Agile

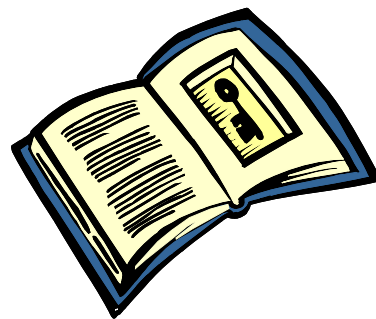


Source: The CHAOS Manifesto, Standish Group, 2012



Software Forensic Analysis *Defined:*

***“An investigation to determine the
cause of a software failure”***





Software Forensic Analysis

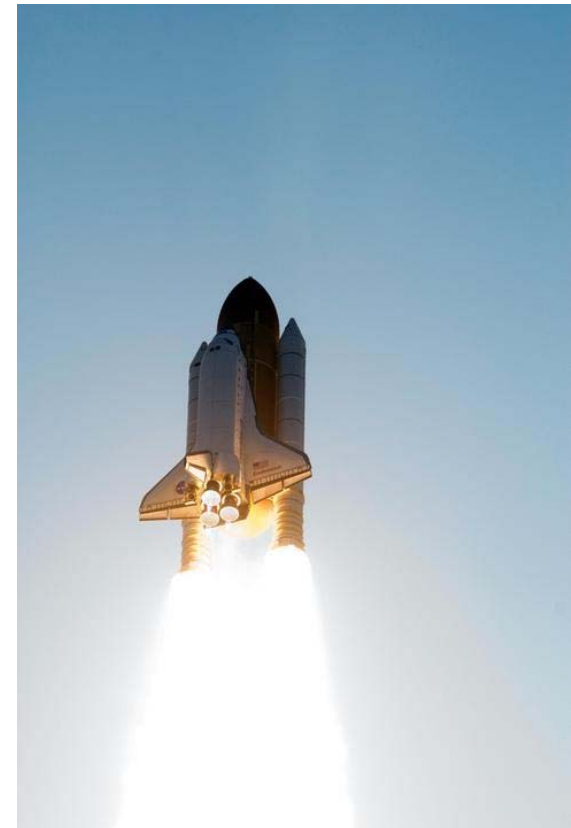
Process Focused
not
Product Focused



STS-51L - Challenger

The Space Shuttle Challenger Disaster – January 28, 1986

What do you remember
as the cause of the
Challenger Disaster?





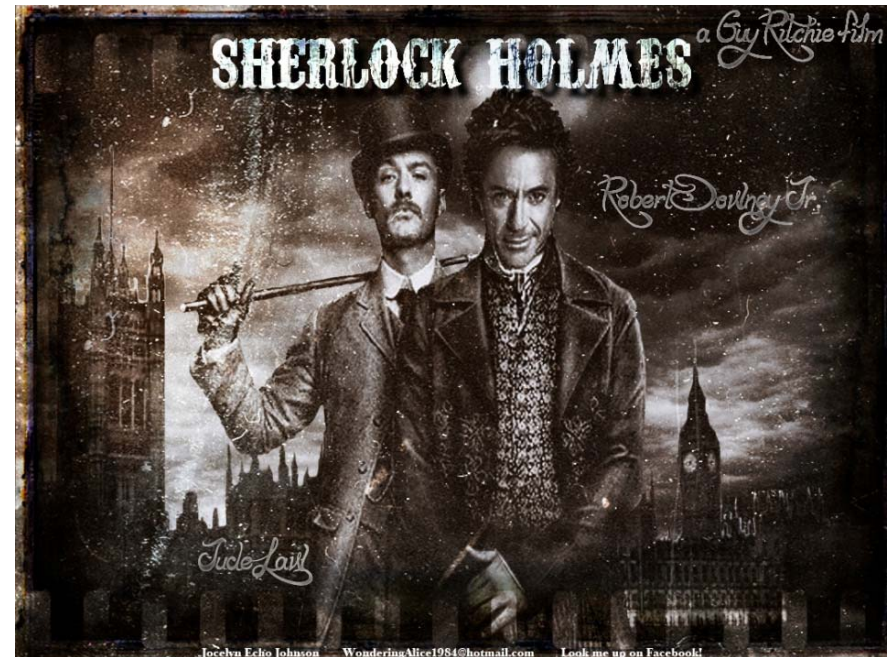
Software Forensic Analysis (SFA)

- **Physical Causes** are the tangible causes of failures – “the o-ring failed”.
- **Human Causes** almost always trigger a physical cause of failure – these could be errors of commission (we did something we shouldn’t do) or omission (we didn’t do something we should have done) – “cold temperature risks were ignored” would be an example of a human cause.
- **Process Causes** are the systems that people used to make their decisions – “control process did not require sign-off by all critical risk managers”.



Who Does Forensic Analysis?

- **NASA**
- **Police**
- **Medical**
- **FAA**
- **Auditors**





Eastern Flight 401

Crashed in Florida's Everglades on December 29, 1972

Airline safety has a very low fatality rate of 0.0002 deaths per million passenger miles, which is way-way better than 6-sigma performance!



Why investigate airplane crashes?

Why investigate small plane crashes?



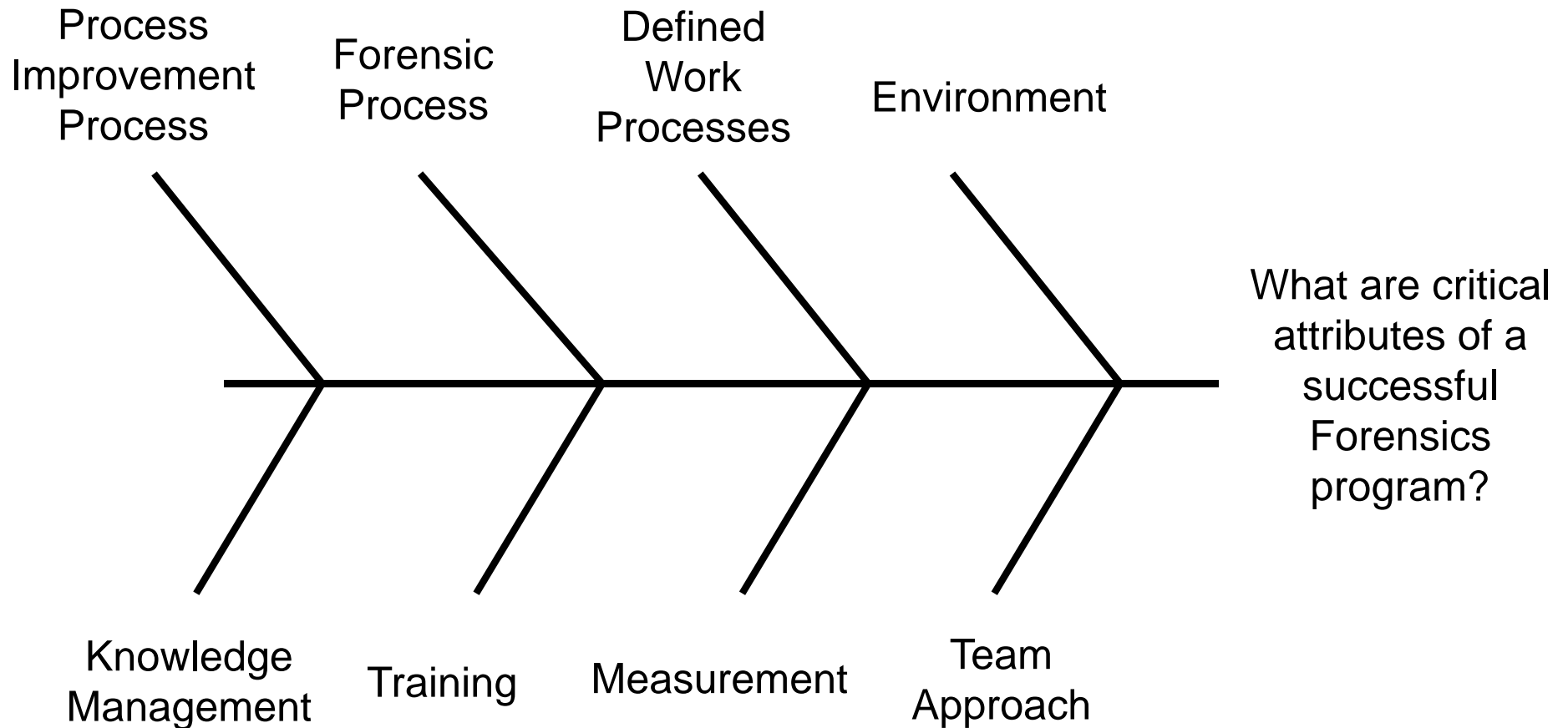
Asiana Flight 214 .. SFO



What are the critical
attributes of a
successful Forensics
program?

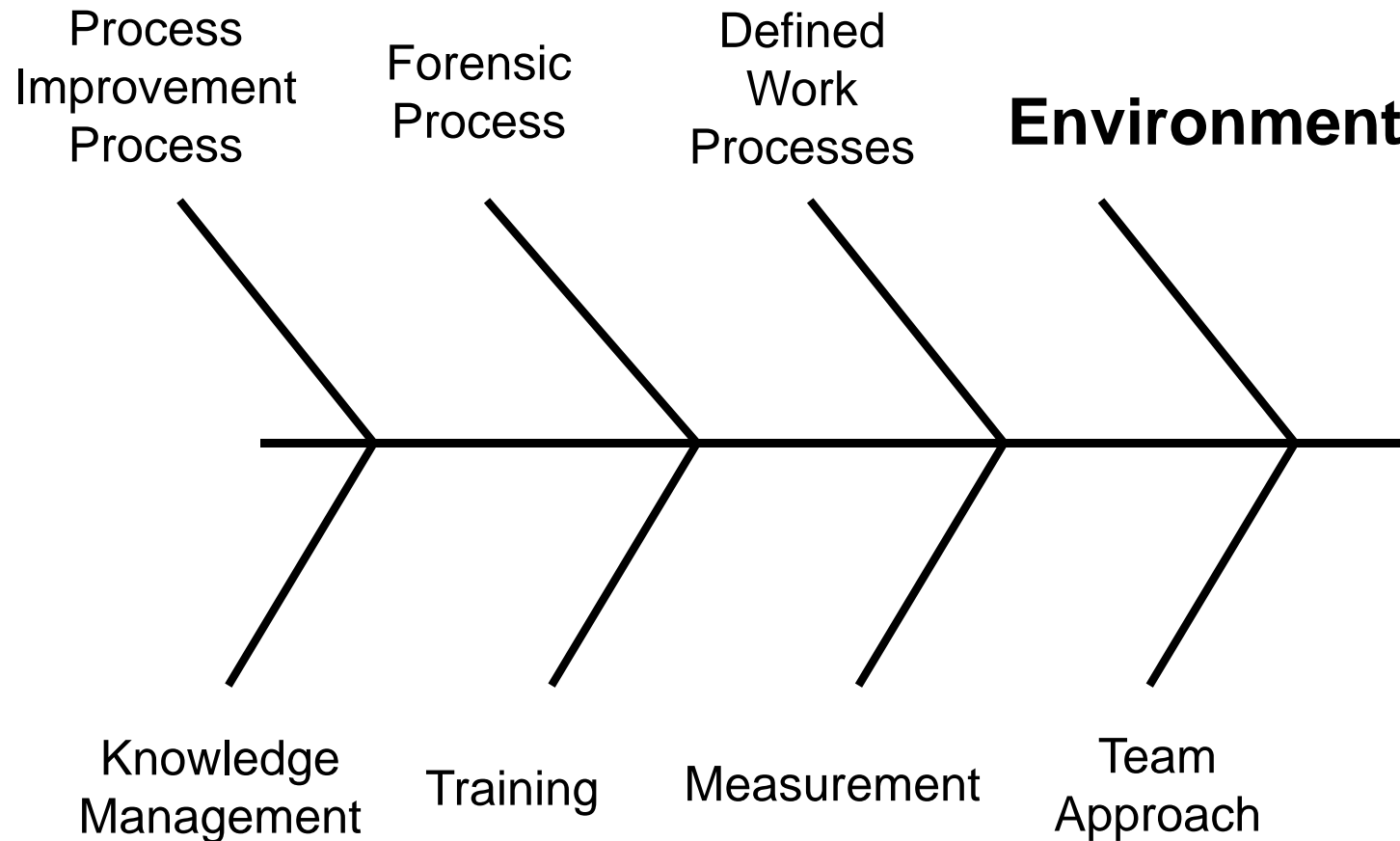


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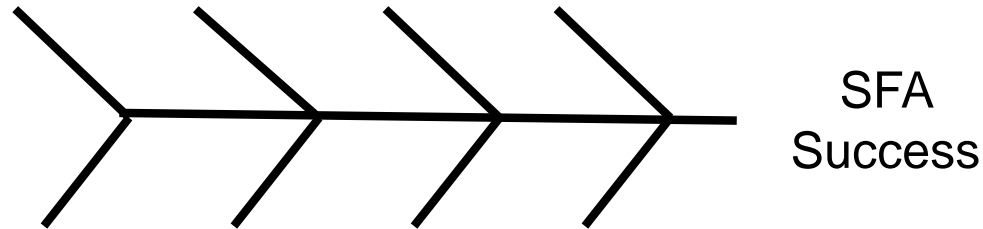
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What are critical attributes of a successful Forensics program?



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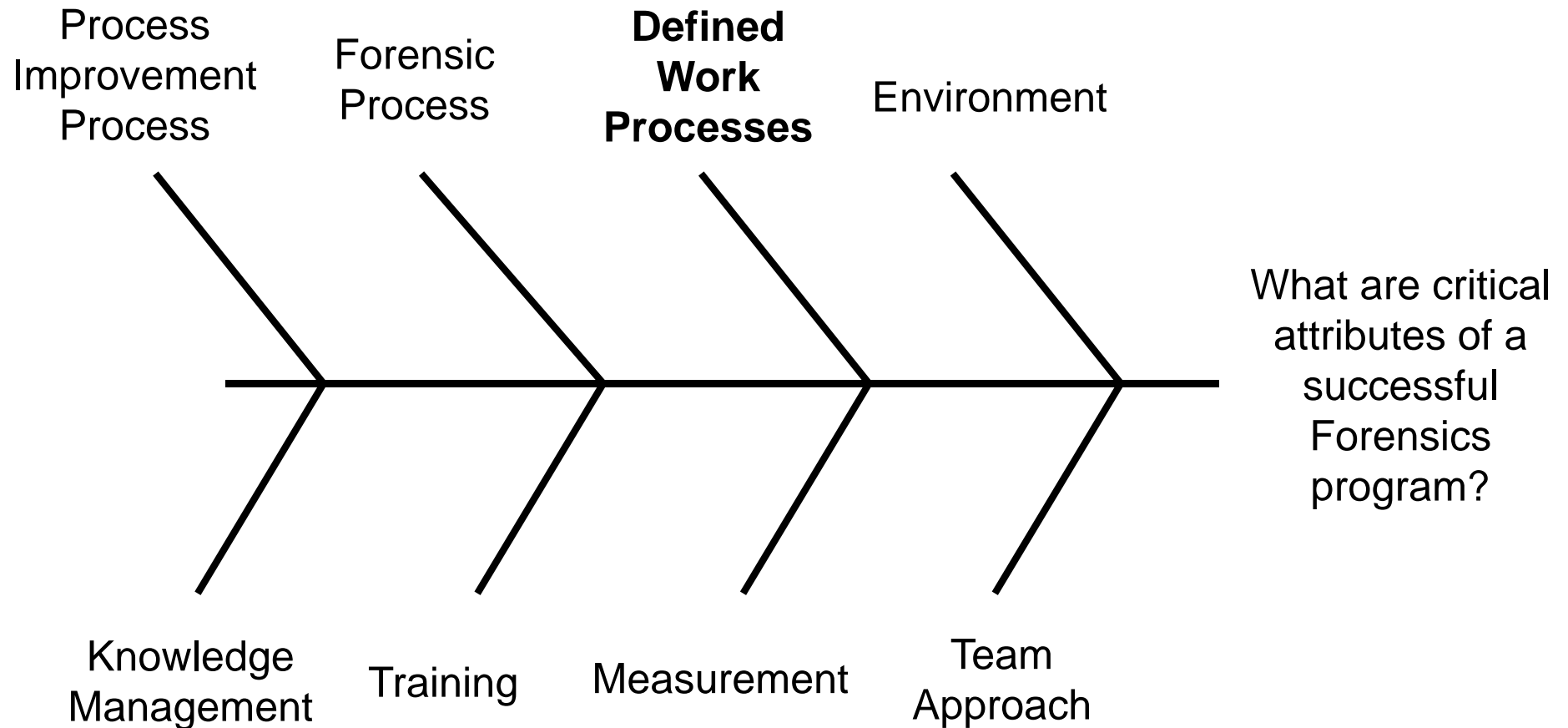
SFA Environment / The Culture



- Executive Management Support
- Recognize the Value of Individuals
- Must Make SFA a High Priority
- Willingness to Tackle Big Issues
- Eliminate the “Blame Game”
- Respect and Appreciate Failure

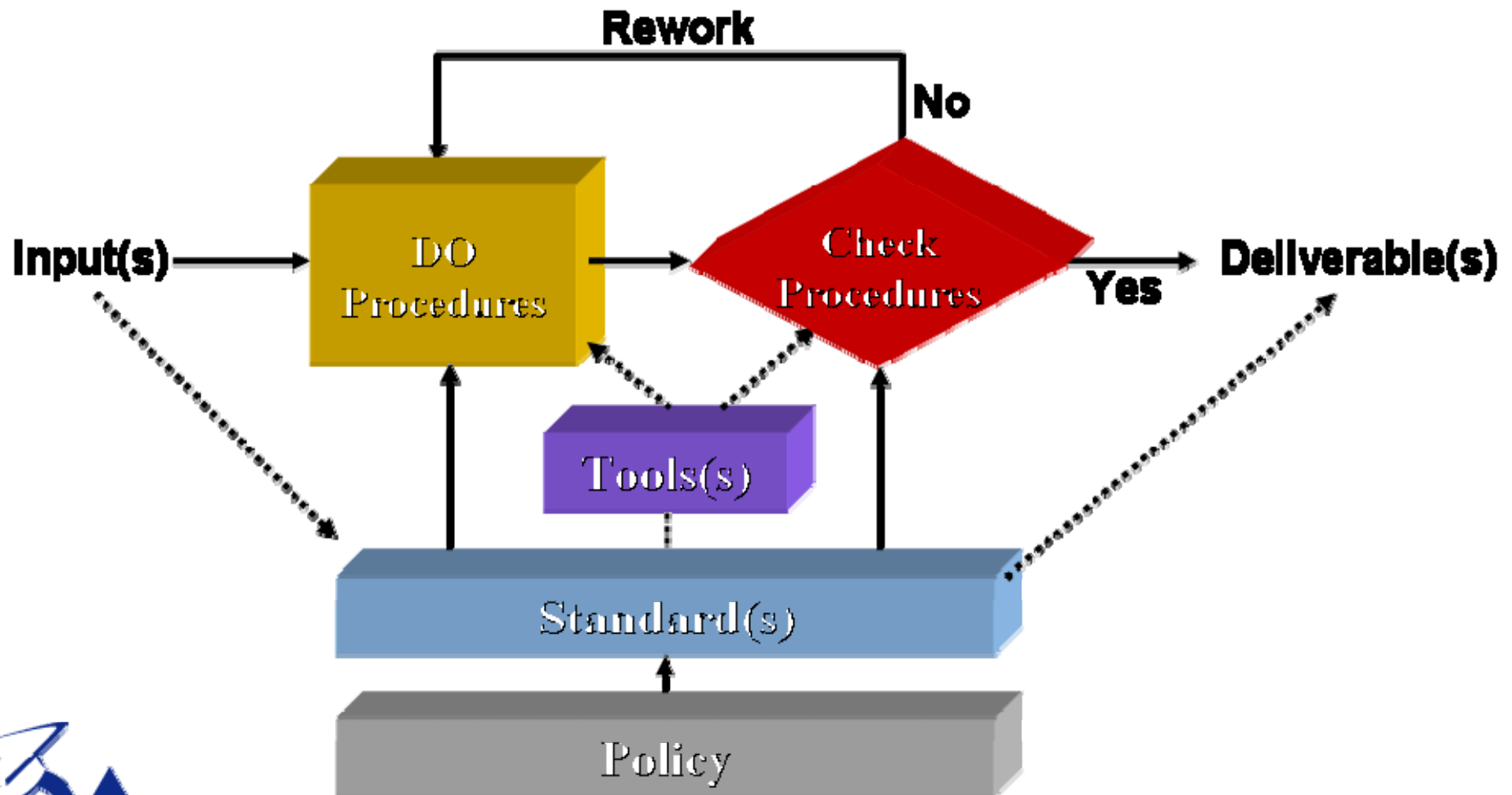


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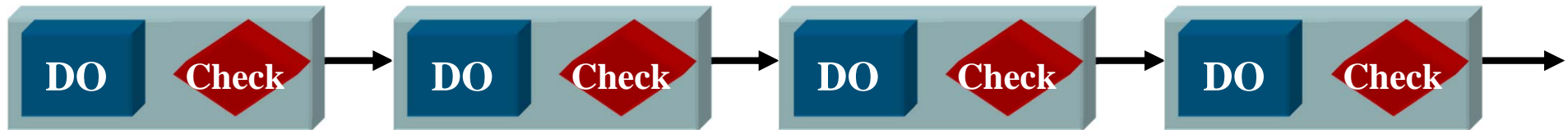
The Process Workbench





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The Development Process





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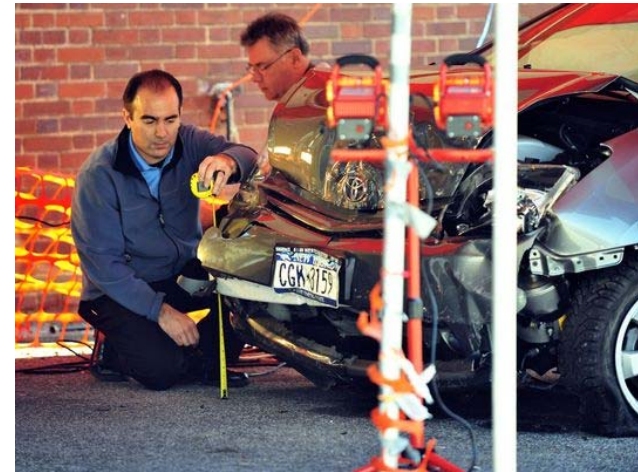
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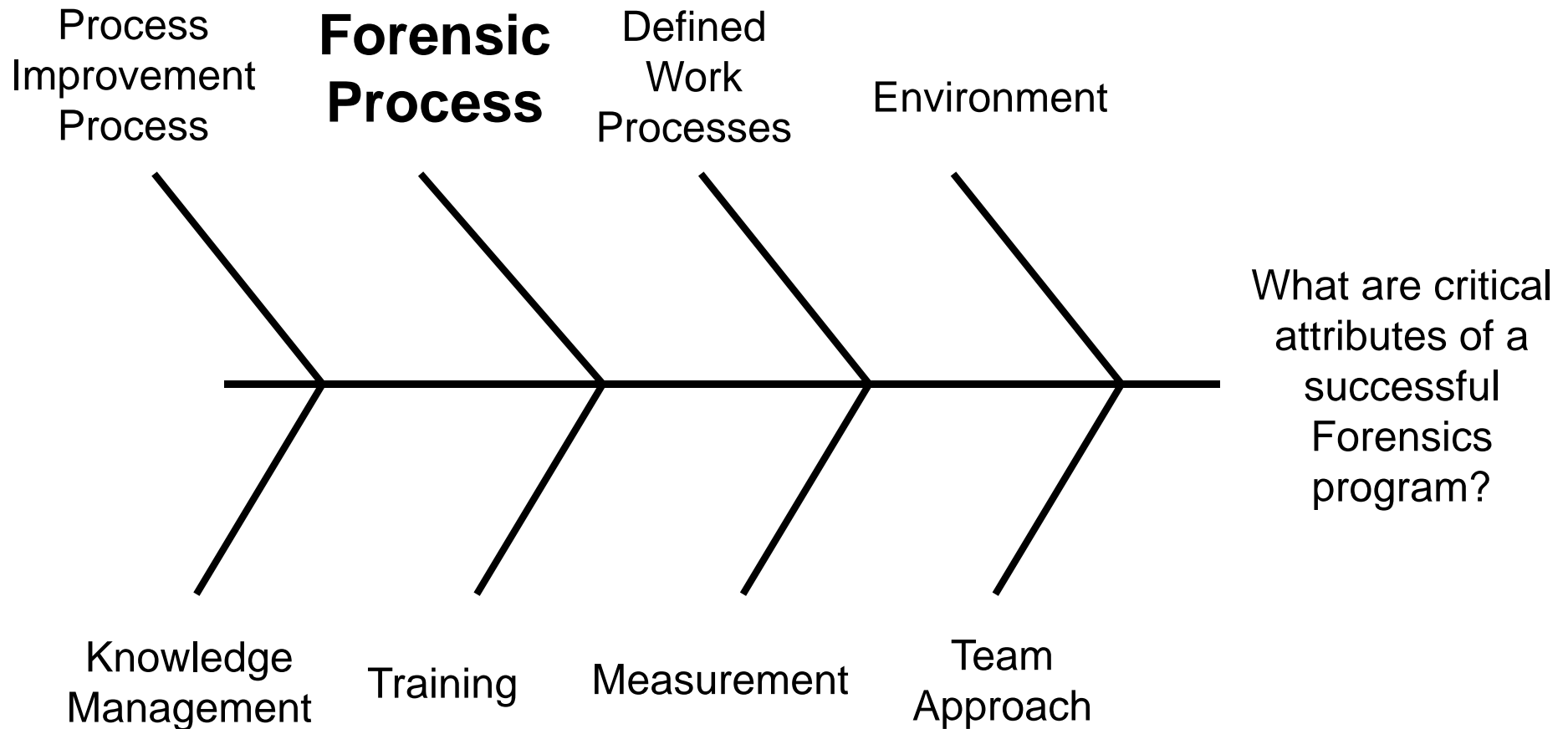
Toyota to pay \$1.1B in 'unintended acceleration' cases



"After two years of intense work, including deposing hundreds of engineers, poring over thousands of documents and examining millions of lines of software code, we are pleased that Toyota has agreed to a settlement that was both extraordinarily hard fought and is exceptionally far-reaching," says Steve Berman, co-lead counsel for plaintiffs in the cases.

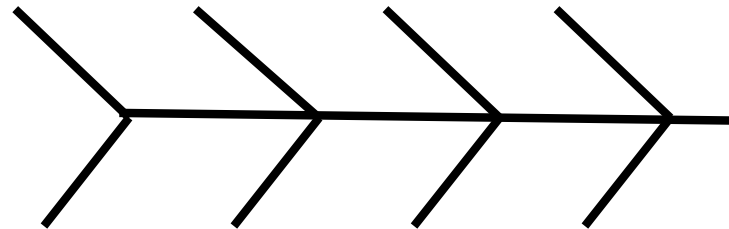


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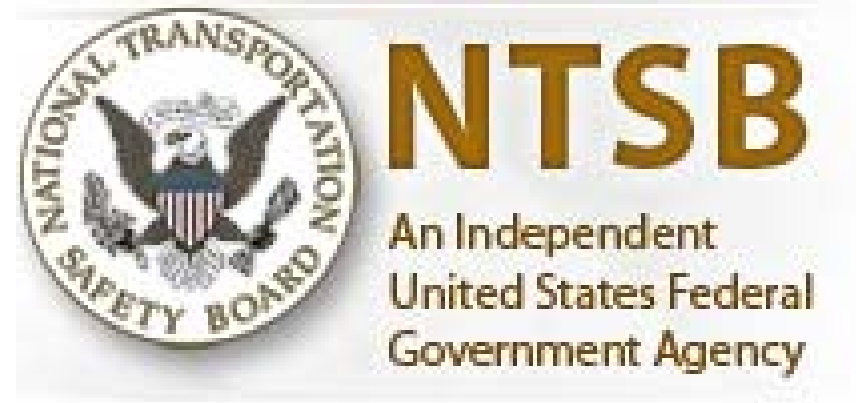
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SFA
Success

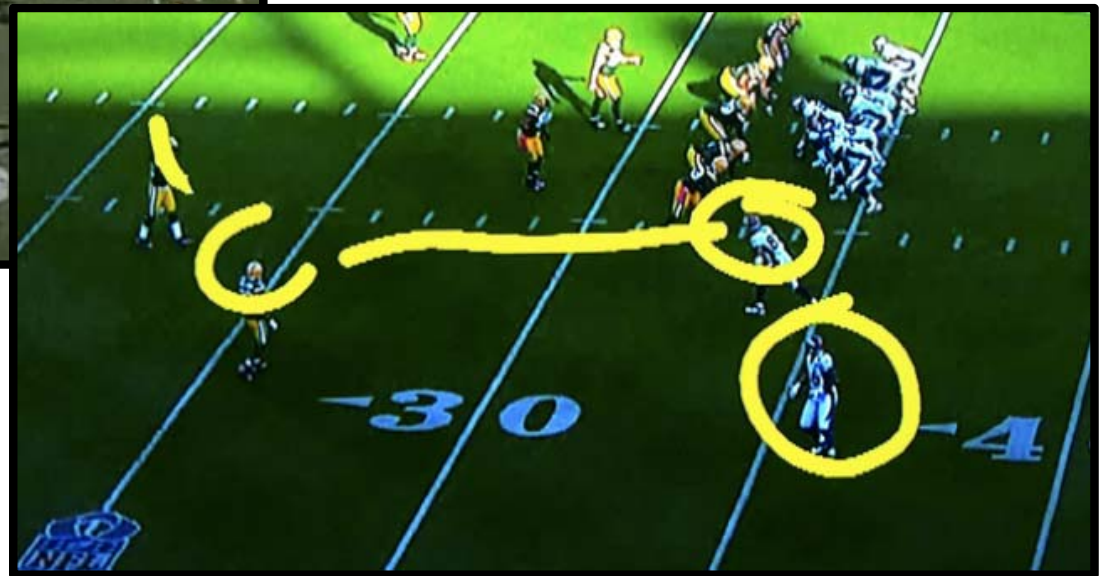
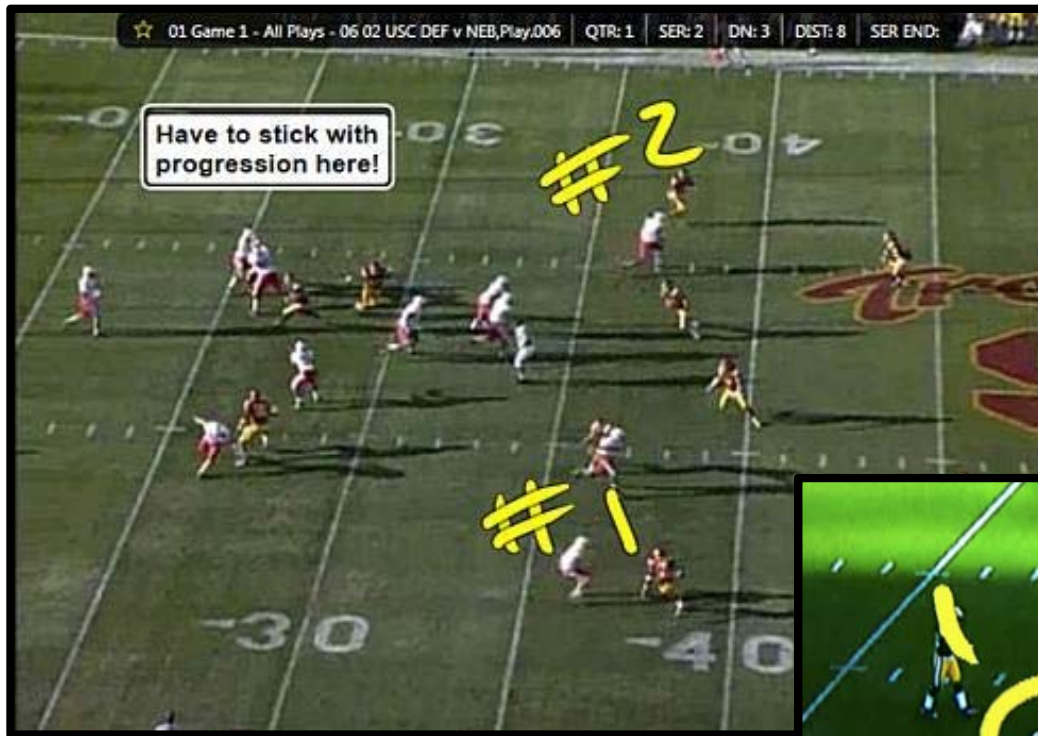
Qualities of the Forensic Process

- Repeatability
- Objective
- Logical
- Predictable



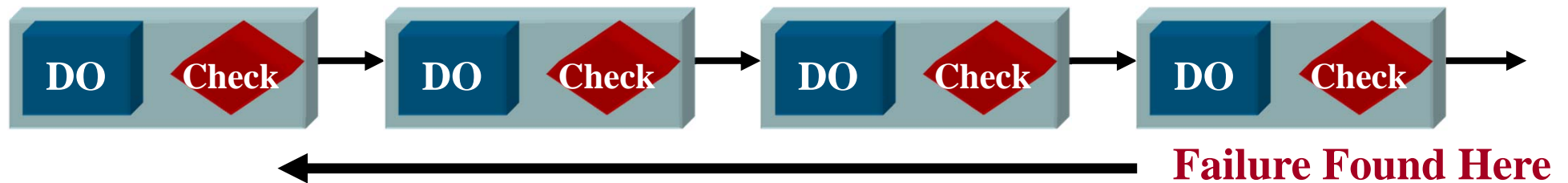


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Software Forensic Analysis Process

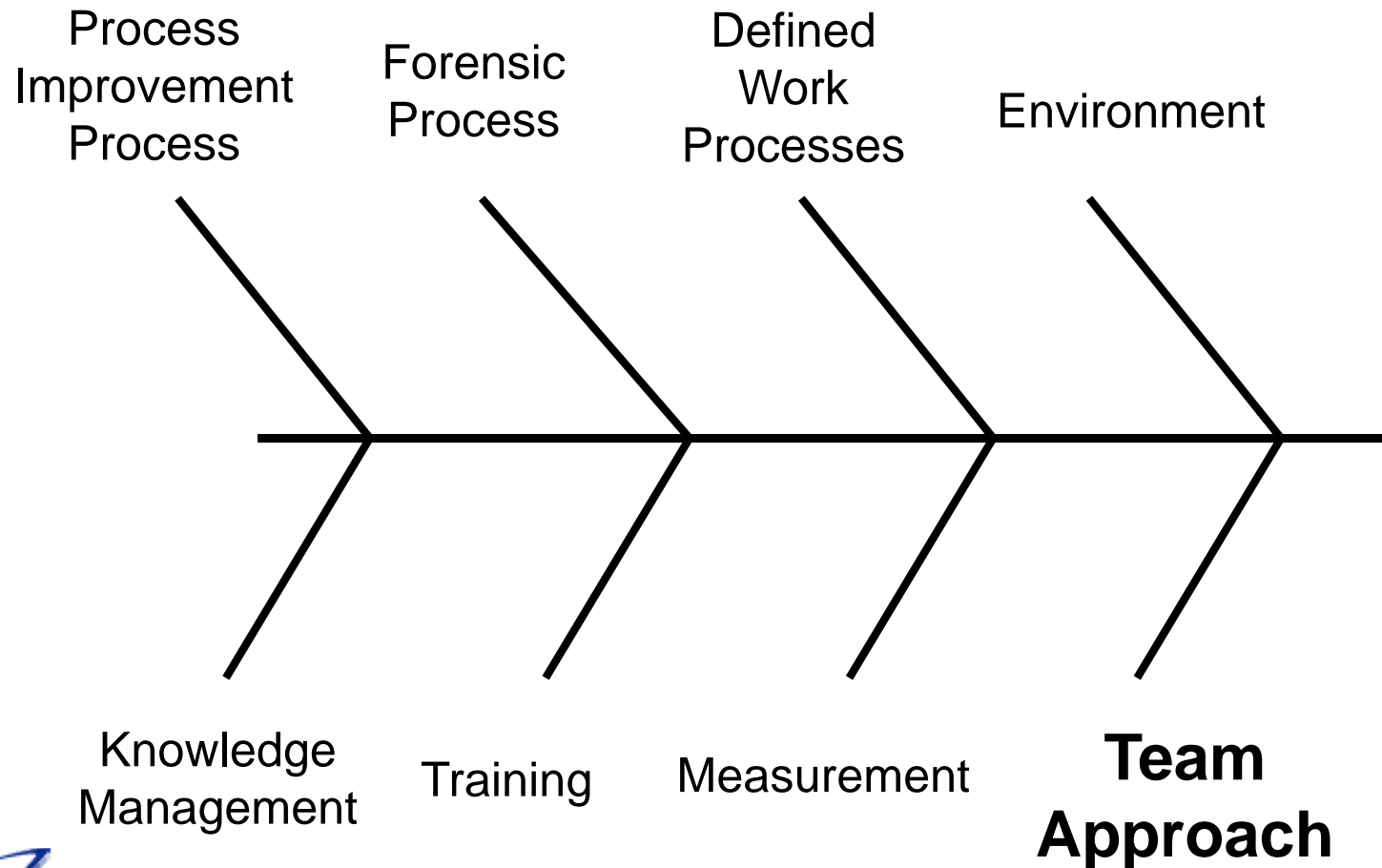


Track Problem to the Root Cause





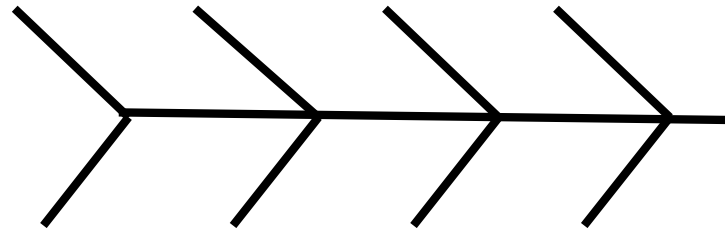
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What are critical attributes of a successful Forensics program?



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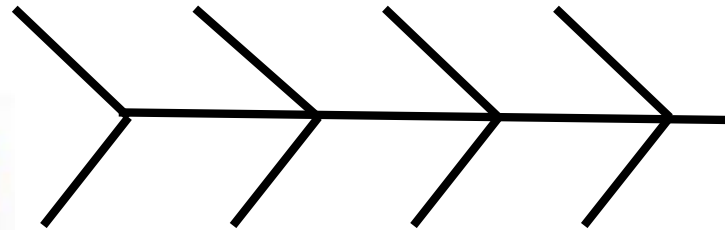
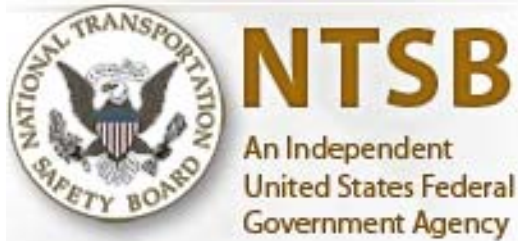
A Team Approach

- Experts
- Non-experts
- All hands on deck
- Empowerment
- Willingness to Challenge Status Quo





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SFA
Success

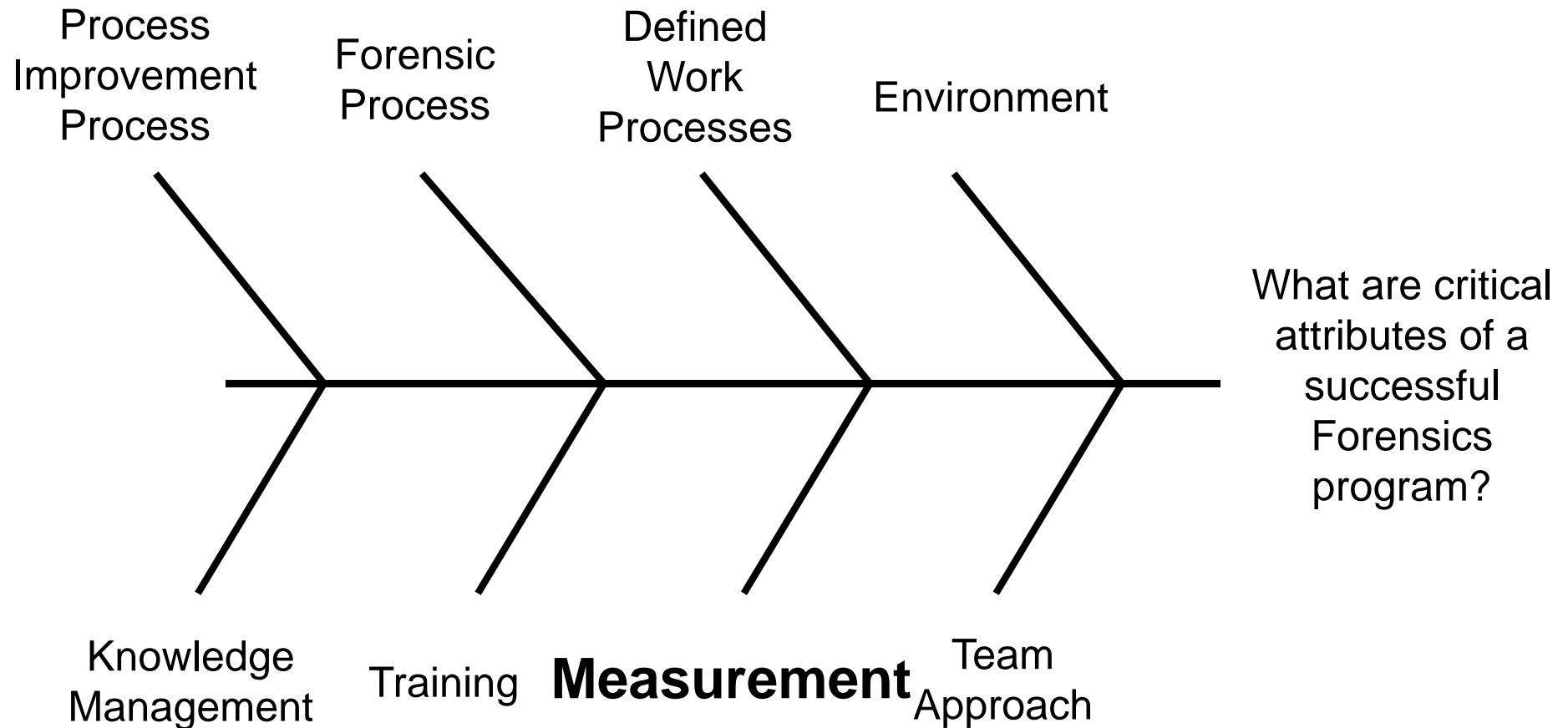
A Team Approach

At the core of NTSB investigations is the "Go Team." The purpose of the Go Team is simple and effective: Begin the investigation of a major accident at the accident scene, as quickly as possible, assembling the broad spectrum of technical expertise that is needed to solve complex transportation safety problems.





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Wisdom from a leading CSI

--'This is indeed a mystery,' I remarked. 'What do you imagine that it means?'

--'I have no data yet. It is a mistake to theorize before one has data. Otherwise one begins to twist facts to suit theories, instead of theories to suit facts...'

--(from 'Sherlock Holmes, A Scandal in Bohemia', 1891)
Sir Arthur Conan Doyle



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So what was Holmes telling Dr. Watson?

You can not perform Forensic Analysis without having a good measurement program in place.





Collect Both Types of Measurement

Objective - This is usually hard data such as defects, hours, and completed deliverables.

Subjective - This is usually the customer's perception of product and service quality.



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What could Perry Mason have done with CODIS?



Good measurement is a requirement for your Forensic Analysis.



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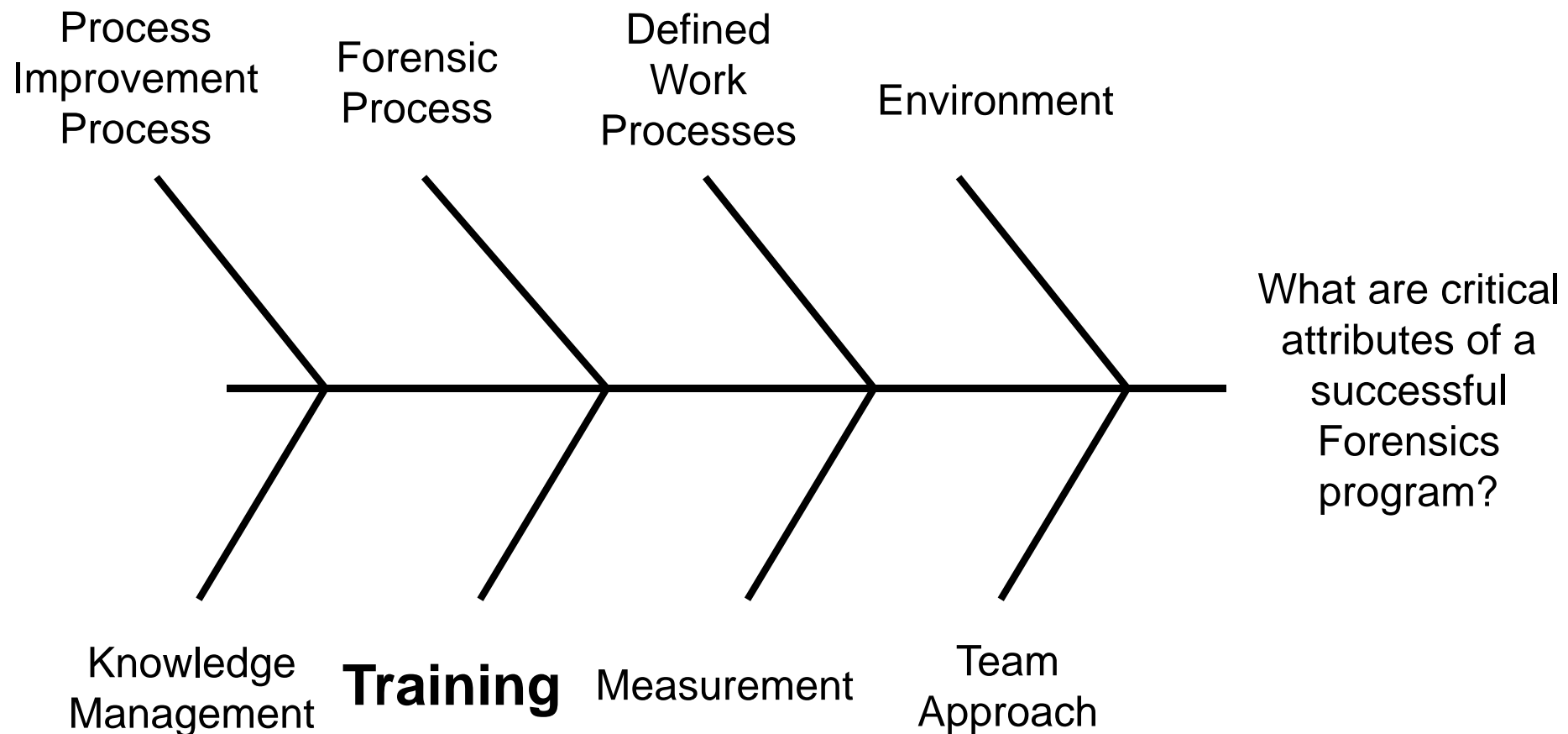
Freeze Crime Scene

Secure the Evidence



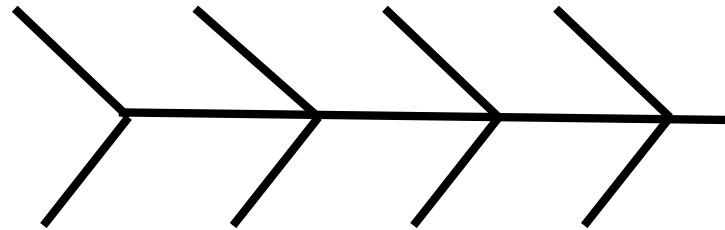


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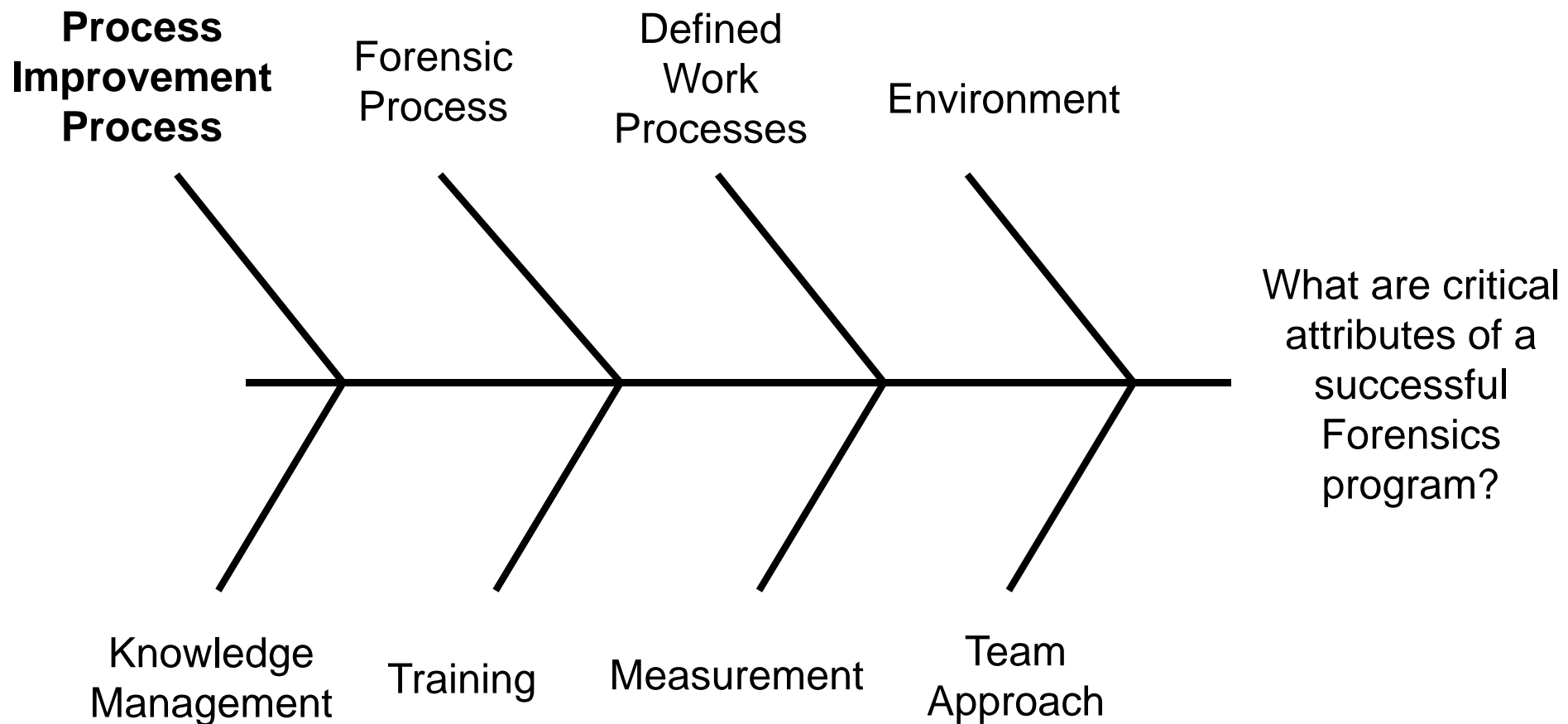
The Need for Trained CSI's

- **Common Sense is not so Common**
- **Teach problem solving skills**
- **What the problem is / What the Problem Isn't**
- **When Forensic Analysis is needed**





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Process Improvement

1. Defined Process Improvement Process
2. Feedback to all Stakeholders
3. Move to Institutionalization





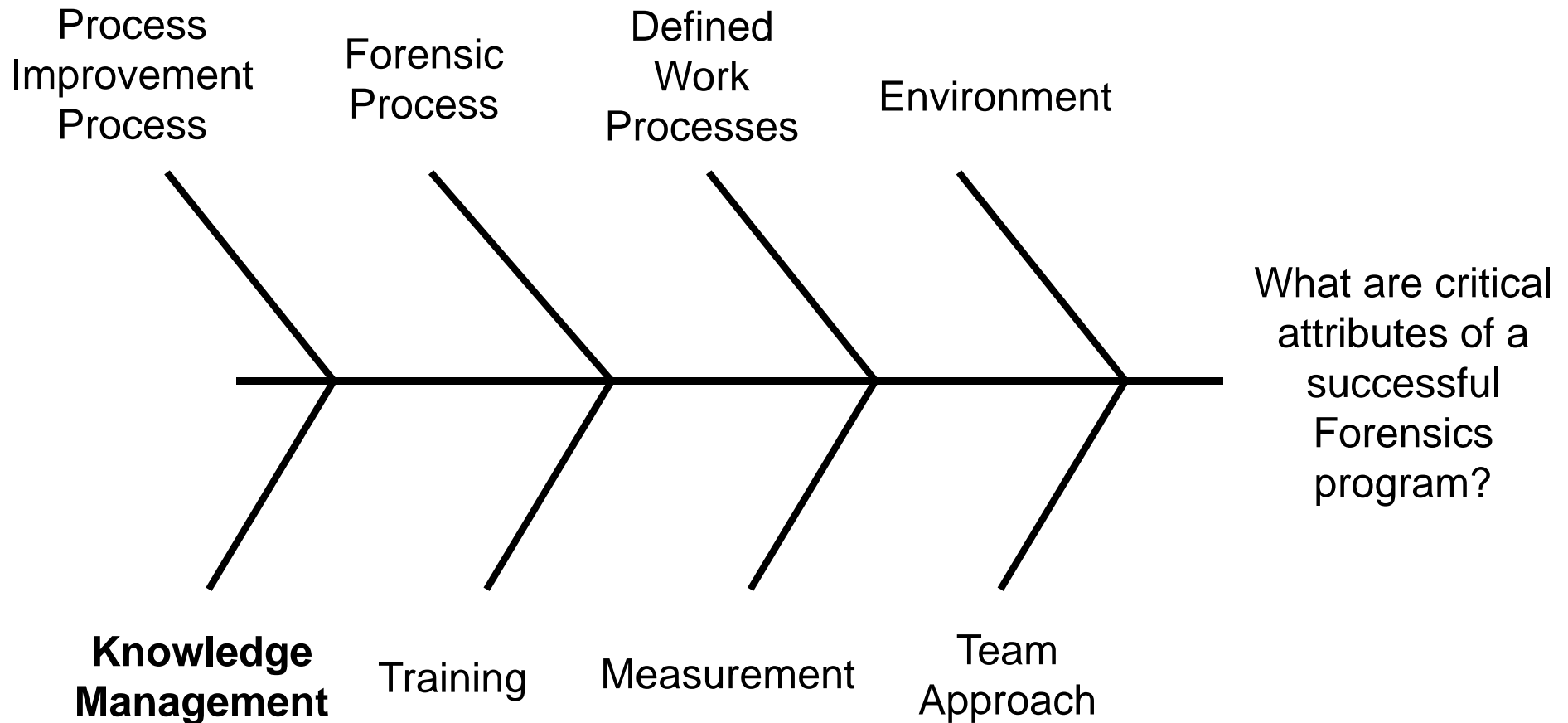
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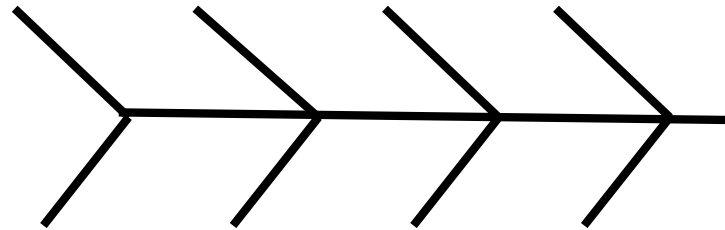


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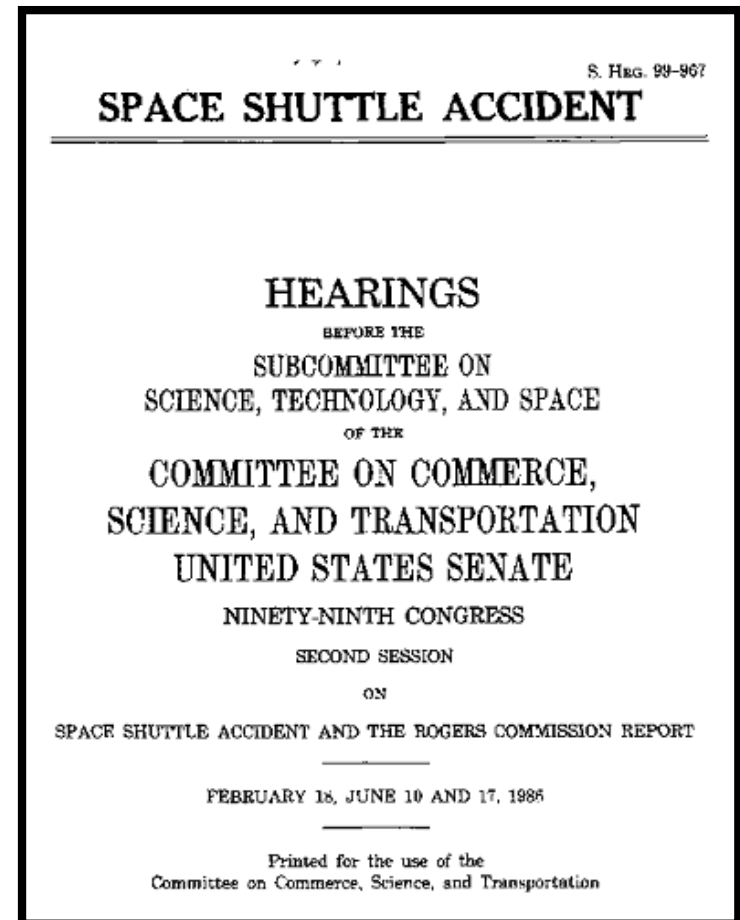
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SFA
Success



Understand the Value
of ALL CONCLUSIONS
AND FINDINGS





Four Prerequisites to Forensics

1. Culture
2. Stable documented processes
3. Complete definition of failures and related measures
4. Staff trained in forensics analysis



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**Who should be the Sherlock Holmes,
Leroy Gibbs, or Horatio Cane?
Who is on the “go team”?**



**QAI suggests it is headed by SQA
leadership, managed by SQA team
and embraced by everyone
throughout the application
lifecycle!**





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How might final conclusions about the failure of Eastern Flight 401 differ between an NTSB Forensic Investigation and an IT Forensic Investigation?

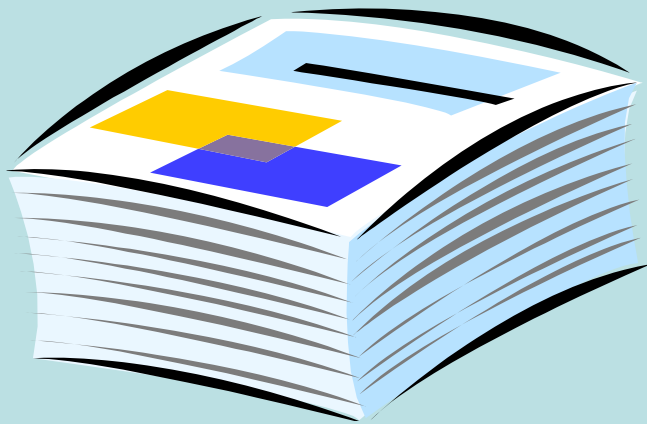




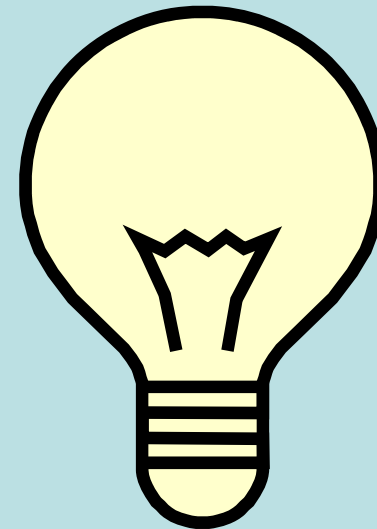
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NTSB

**Comprehensive Report with
Improvement Recommendations**



IT Solution





The time has come for IT professionals to borrow a page from the NTSB's playbook. We must investigate when things go wrong, learn to learn from those failures, and use that knowledge to prevent future failures.

Why? There are 6.2 trillion reasons why.



Root Cause Analysis The 8 D Way

1 & 2 Day Format



April 20-24



15 classes



30 EXPO exhibitors



60 expert sessions



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www.qaiQUEST.org/2015
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