Driving Innovative IT Metrics

By Embracing Human Nature

CAI
Computer Aid, Inc.®

John Bowen

Director **– Global Partnerships, Computer Aid, Inc. – 2009-present**

CIO **– PPL Global - 1999-2009**

President **– Management Envision – 2012-present - research and consulting**

Lived in Argentina and Chile for four years

Project management experience:

Multinational projects in Latin America, Europe, Middle East, Asia, Africa

4-year project in US and UK (WMS, OMS, GIS, CIS, MMS)

5-year project in 8 companies in 5 countries (ERP, CIS, GIS, WMS, SCADA)

Education: DePauw University - Mathematics, Computer Science, Symbolic Logic

Visiting lecturer: Lehigh University, Iacocca Institute, Global Village,

Drexel University, DePauw University, DeSales University, Muhlenberg College –

Information Engineering, International IT, Global Business,
Project/Program/Portfolio/Process Management

CAI
Computer Aid, Inc.®

Computer Aid, Inc.

Lehigh Valley, PA based privately-held corporation, founded in 1981

4,000+ employees: 6 continents, 15 countries

IT services: software solutions, application development, application maintenance, management consulting, system engineering, project/program/portfolio management, IT outsourcing, process engineering

CAI
Computer Aid, Inc.®

Objective of Session

1. To establish the need for monitoring the metrics that really matter.
2. To identify why this is such a challenge.
3. To identify the types of metrics that really matter.
4. Show how familiar framework can be adapted for metrics identification (and communication).
5. Give you enough to use back at your office to improve your metrics program.

CAI
Computer Aid, Inc.®

Agenda

1. The Innovative Metrics Opportunity
2. Why Do These Opportunities Still Exist?
3. What Metrics Should We Monitor?
4. Working With Conditions Data
5. Developing Innovative Metrics for Your Organization

CAI
Computer Aid, Inc.®

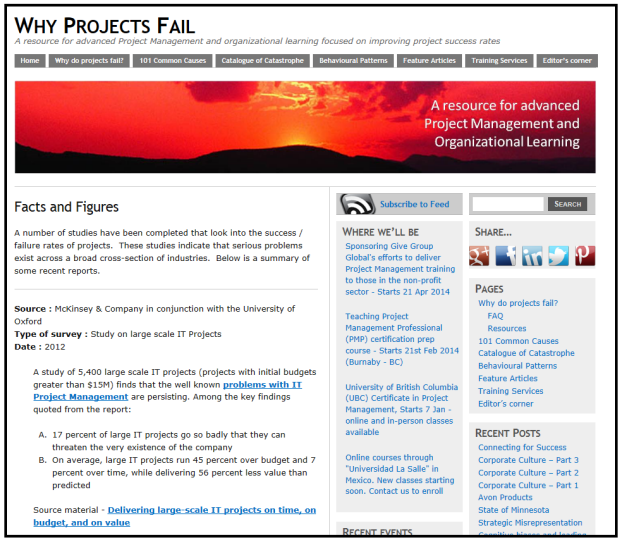
Part One

The Innovative Metrics Opportunity

CAI
Computer Aid, Inc.®

The Innovative Metrics Opportunity

- **Despite Everything We've Tried, Project Success Rates Little Changed in 30 Years**
  - McKinsey (17% threaten company)
  - IBM (40% met exp 10X range)
  - KPMG (70% orgs with failure)
  - Standish CHAOS Report



Source: http://calleam.com/WTPF/?page_id=1445

"So many software projects fail in some major way that we have had to redefine success to keep everyone from becoming despondent..."
Source: Tom DeMarco in his book, **Controlling Software Projects**

CAI
Computer Aid, Inc.®

The Innovative Metrics Opportunity

- There Is **Plenty of Opportunity** for Improving ***Challenged*** Project Success Rates

RESOLUTION

	2004	2006	2008	2010	2012
Successful	29%	35%	32%	37%	39%
Failed	18%	19%	24%	21%	18%
Challenged	53%	46%	44%	42%	43%

Project resolution results from CHAOS research for years 2004 to 2012.

Source: http://versionone.com/assets/img/files/ChaosManifesto2013.pdf

CAI
Computer Aid, Inc.®

IT Project Management Success is Abysmal

- US Dept of Defense Integrated Human Resource System (DIMHRS)
  Delivered no functionality; 199% original cost
- UK's Fire Control Project
  11% functionality; 391% original cost
- California Court Management System
  10% functionality; 214% original cost
- US Social Security Administration Disability Case Processing System
  No functionality; 100% original cost
- British Columbia Integrated Case Management System
  30% functionality; 100% original cost

Spectrum IEEE Org

The Innovative Metrics Opportunity

- **It's About Competitive Capability**

  Organizations **with a mature PMO outperform** those with an immature PMO by:

  28% for on-time project delivery;

  24% for on-budget delivery; and

  20% for meeting original goals and business intent of projects.

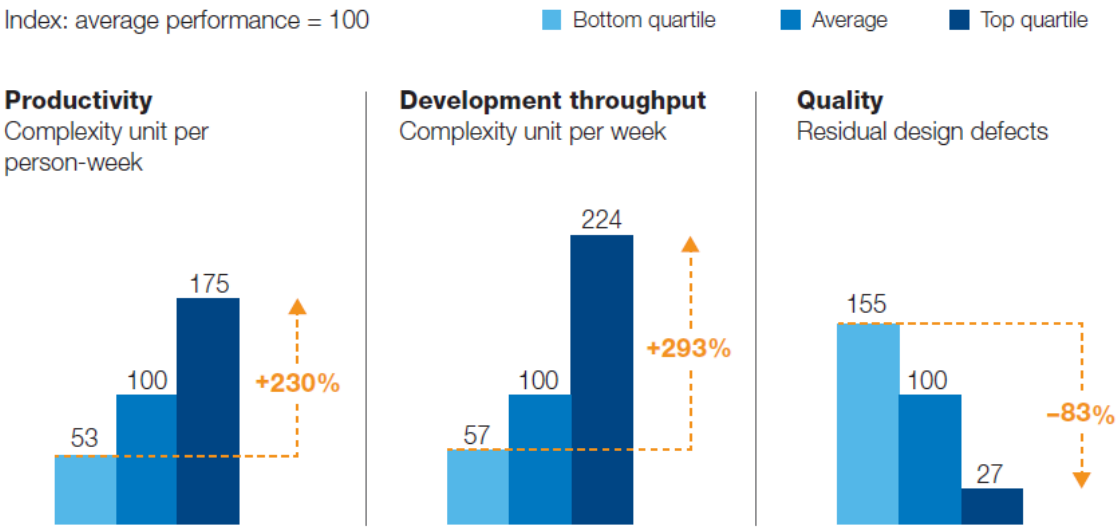
Source: www.metier.com, According to PMI

CAI
Computer Aid, Inc.®

The Innovative Metrics Opportunity

- **It's About Competitive Capability**

Software-development performance varies significantly across development groups and companies.



Source: Numetrics-embedded software project (a McKinsey Solution), October 2013, including data on software-development projects at 1,300 companies across global markets

CAI Computer Aid, Inc.®

The NEW Software Reality

"***We believe that every industrial company will become a software company***."

Source: GE CEO, Jeffrey Immelt, 2013 GE Annual Report, Letter to shareholders.

It's Happening NOW

- Number of top 100 product and service companies - that are now dependent on software – has DOUBLED (to nearly 40%) in the past 20 years.
- Revenues from digitized products and channels are expected to **exceed 40%** in industries such as insurance, retailing and logistics.

CAI
Computer Aid, Inc.®

Part Two

Why Do These “Opportunities” Still Exist?

CAI
Computer Aid, Inc.®

Why Do These Opportunities Still Exist?

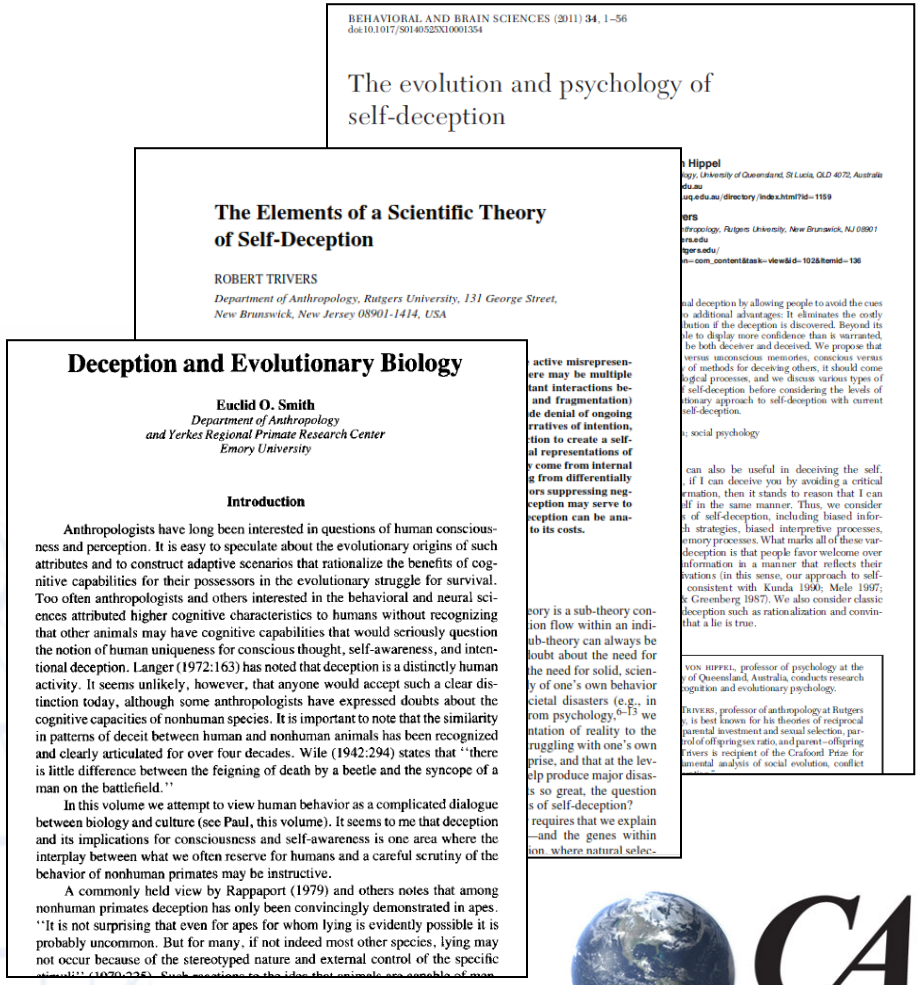
Self-deception

People (including PMs) are predisposed to see a perfect end state (e.g., successful project completion, and tend to practice self-deception (confirmation bias, fact filtering, etc.) to support this expectation.

CAI
Computer Aid, Inc.®

It's Who We Are

- Outside of IT for Neurophysiological Perspective
  - Anthropology Research
  - Psychology Research



BEHAVIORAL AND BRAIN SCIENCES (2011) 34, 1–56
doi:10.1017/S0140525X10001354

The evolution and psychology of self-deception

The Elements of a Scientific Theory of Self-Deception

ROBERT TRIVERS

Department of Anthropology, Rutgers University, 131 George Street, New Brunswick, New Jersey 08901-1414, USA

Deception and Evolutionary Biology

Euclid O. Smith
Department of Anthropology
and Yerkes Regional Primate Research Center
Emory University

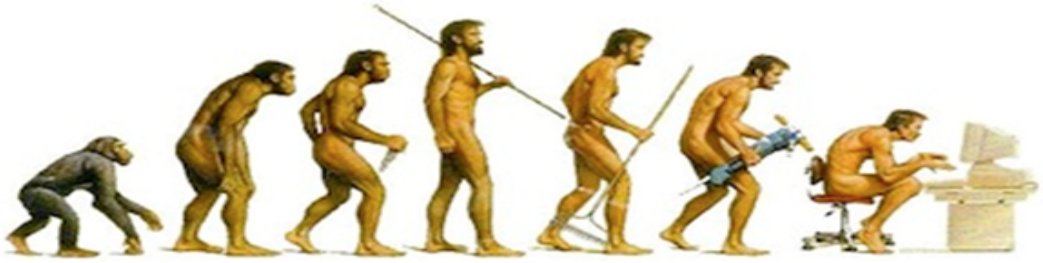
Introduction

Anthropologists have long been interested in questions of human consciousness and perception. It is easy to speculate about the evolutionary origins of such attributes and to construct adaptive scenarios that rationalize the benefits of cognitive capabilities for their possessors in the evolutionary struggle for survival. Too often anthropologists and others interested in the behavioral and neural sciences attributed higher cognitive characteristics to humans without recognizing that other animals may have cognitive capabilities that would seriously question the notion of human uniqueness for conscious thought, self-awareness, and intentional deception. Langer (1972:163) has noted that deception is a distinctly human activity. It seems unlikely, however, that anyone would accept such a clear distinction today, although some anthropologists have expressed doubts about the cognitive capacities of nonhuman species. It is important to note that the similarity in patterns of deceit between human and nonhuman animals has been recognized and clearly articulated for over four decades. Wile (1942:294) states that "there is little difference between the feigning of death by a beetle and the syncope of a man on the battlefield."

In this volume we attempt to view human behavior as a complicated dialogue between biology and culture (see Paul, this volume). It seems to me that deception and its implications for consciousness and self-awareness is one area where the interplay between what we often reserve for humans and a careful scrutiny of the behavior of nonhuman primates may be instructive.

A commonly held view by Rappaport (1979) and others notes that among nonhuman primates deception has only been convincingly demonstrated in apes. "It is not surprising that even for apes for whom lying is evidently possible it is probably uncommon. But for many, if not indeed most other species, lying may not occur because of the stereotyped nature and external control of the specific

Self-deception Is “Natural”



In fact, all humans self-deceive:

- **“self-deception** is a kind of strategy which **allows us to better deceive others by first deceiving ourselves**…”
- **“self-deception occurs as a social intelligence strategy”**
- **“there is a neuro-physiological basis for self-deception in humans**.”

Paper by: James Sage, Ph.D, Vice Chancellor @ Univ. of Wisconsin
Research by: Robert Trivers, Ph.D, Evolutionary Biologist, Crafoord Prize recipient
Research by: V.S. Ramachandran, Ph.D, Neuroscientist, Center for Brain and Cognition

CAI
Computer Aid, Inc.®

Quick Survey

- How many people consider themselves to be above average drivers?

> “For driving skills, 93% of the U.S. sample and 69% of the Swedish sample put themselves in the top 50%“
> Svenson, Ola (February 1981). "Are We All Less Risky and More Skillful Than Our Fellow Drivers?". *Acta Psychologica* **47** (2): 143–148. doi:10.1016/0001-6918(81)90005-6.

> “almost 80% of participants had evaluated themselves as being an above-average driver.”
> Iain A. McCormick; Frank H. Walkey; Dianne E. Green (June 1986). "Comparative Perceptions of Driver Ability: A Confirmation and Expansion". *Accident Analysis & Prevention* **18** (3): 205–208. doi:10.1016/0001-4575(86)90004-7.

CAI Computer Aid, Inc.®

We Deceive Ourselves So As To Persuade Others of Our Worth

- “A survey of university professors found that 94% thought they were better at their jobs than their average colleague”

- “A survey of 1 Million high school seniors found that all thought they were above average [in their] ability to get along with others”

- Thomas Gilovich, 1993, ***How We Know What Isn’t So***

CAI
Computer Aid, Inc.®

The “Problem State” Takeaways

1. Stop expecting PMs to ‘do the right thing’.
   Despite all the training and encouragement, PMs are still human and will tend to self-deceive (and then pass it on).

2. Make self deception impossible.
   Provide PMs with timely, objective, action-compelling information.

3. Make ignoring important information impossible.
   Provide PM management with information necessary to hold PMs accountable.

CAI
Computer Aid, Inc.®

Project Manager Development Must Improve

“Successful projects are led, not managed.”

Great Project Management

Project Management	Project Leadership
Methodology	Leadership
Process	Communication
Project Plans	Tenacity
Status Reports	Focus
Project Meetings	Motivation
Software Skills	Inspiration
Time Tracking	Action
Issues Tracking	Energy

CAI
Computer Aid, Inc.®

Part Three

What Metrics Should We Monitor?

CAI
Computer Aid, Inc.®

What Metrics Should We Monitor?

- **Backward Looking**
  - Lagging Indicators
  - Tracking Progress
- **Forward Looking**
  - Leading Indicators
  - Managing Risk

CAI
Computer Aid, Inc.®

Tracking Progress
Looking Backward

What did we do?

- Volume
- Quality
- Cost

CAI
Computer Aid, Inc.®

Tracking Progress
Looking Backward – Enterprise Level

- Alignment of IT Investments to Business Strategy
- Cumulative Business Value of IT Investment
- IT Spend Ratio – New Versus Maintenance
- Critical Business Services
  - Customer Satisfaction
  - Service Level Performance
- Operational Health
  - Outages
  - Security Incidents
  - Project Success Rate
  - Average Defect Rate

Source: Craig Symons, Forrester Research, 4-4-08

CAI
Computer Aid, Inc.®

Tracking Progress
Looking Backward – Project Level

Metric	Description
Scope Change Requests	# of scope changes requested by the client or sponsor
Scope Change Approvals	# of scope changes that were approved
Overdue tasks	# of tasks that were started but not finished on time
Tasks	# of task that should have started but have been delayed
Over budgeted tasks	# of tasks that have cost more to complete than expected
Earned Value	Budgeted Cost of Work Performed (BCWP)
Over allocated Resources	# of resources assigned to more than one task.
Turnover	# of project team members who quit or terminated.
Training Hours	# of training hours per project team member.

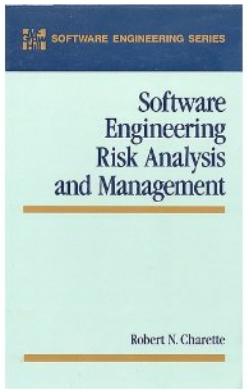
http://www.slideshare.net/anandsubramaniam/project-metrics-measures

CAI
Computer Aid, Inc.®

Managing Risk
Looking Forward – Experts Agree on EWS

What <u>should</u> we do?

The Four Horsemen of IT Project Doom
Material Financial Risks of IT Projects: The Early Warning Signs of Failure
Leon A. Kappelman, Ph.D.



Journal of Information Technology (2000) 15, 317–327
Risk factors in enterprise-wide/ERP projects
MARY SUMNER
School of Business, Southern Illinois University, Campus Box 1106, Edwardsville, IL 62026, USA

CAI
Computer Aid, Inc.®

Managing Risk
Looking Forward – Kappelman Research

- **Kappelman Research**
  - Derived List of
    - Six People Factors
    - Six Process Factors
- For In-process Audits

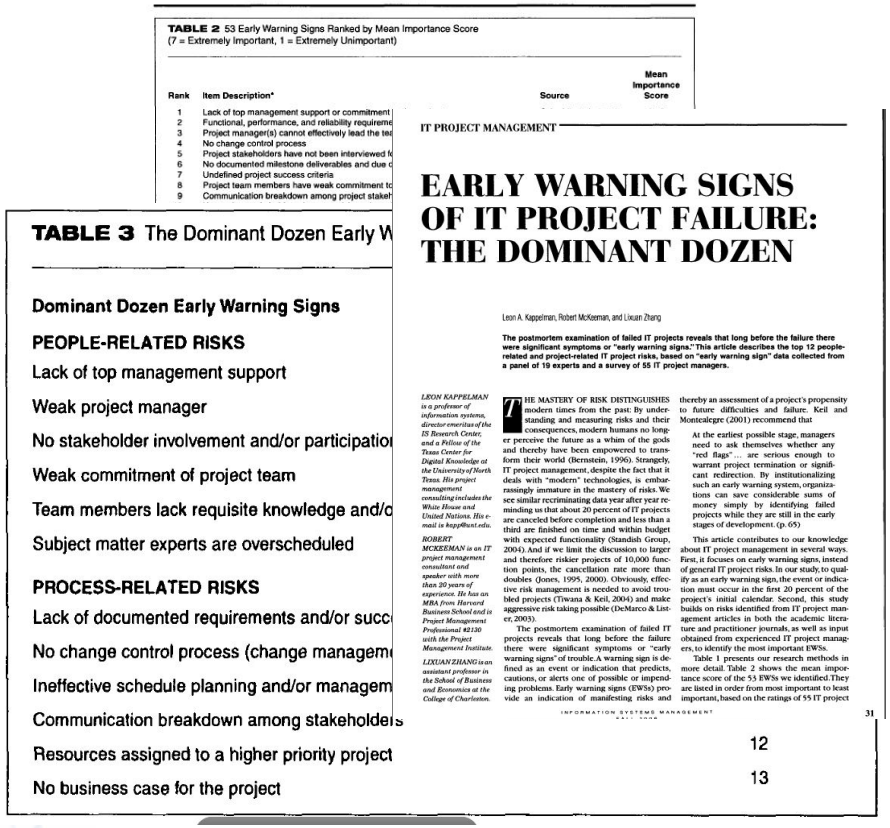


TABLE 2 53 Early Warning Signs Ranked by Mean Importance Score
(7 = Extremely Important, 1 = Extremely Unimportant)

Rank	Item Description*	Source	Mean Importance Score
1	Lack of top management support or commitment		
2	Functional, performance, and reliability requireme		
3	Project manager(s) cannot effectively lead the te		
4	No change control process		
5	Project stakeholders have not been interviewed f		
6	No documented milestone deliverables and due d		
7	Undefined project success criteria		
8	Project team members have weak commitment to		
9	Communication breakdown among project stakeh		

TABLE 3 The Dominant Dozen Early W

Dominant Dozen Early Warning Signs

PEOPLE-RELATED RISKS

Lack of top management support
Weak project manager
No stakeholder involvement and/or participatio
Weak commitment of project team
Team members lack requisite knowledge and/c
Subject matter experts are overscheduled

PROCESS-RELATED RISKS

Lack of documented requirements and/or succ
No change control process (change managem
Ineffective schedule planning and/or managem
Communication breakdown among stakeholders
Resources assigned to a higher priority project
No business case for the project

IT PROJECT MANAGEMENT

EARLY WARNING SIGNS OF IT PROJECT FAILURE: THE DOMINANT DOZEN

Leon A. Kappelman, Robert McKeeman, and Lixuan Zhang

The postmortem examination of failed IT projects reveals that long before the failure there were significant symptoms or "early warning signs." This article describes the top 12 people-related and project-related IT project risks, based on "early warning sign" data collected from a panel of 19 experts and a survey of 55 IT project managers.

LEON KAPPELMAN is a professor of information systems, director emeritus of the IS Research Center, and a Fellow of the Texas Center for Digital Knowledge at the University of North Texas. His project management consulting includes the White House and United Nations. His e-mail is kapp@unt.edu.

ROBERT MCKEEMAN is an IT project management consultant and speaker with more than 20 years of experience. He has an MBA from Harvard Business School and is Project Management Professional #2130 with the Project Management Institute.

LIXUAN ZHANG is an assistant professor in the School of Business and Economics at the College of Charleston.

THE MASTERY OF RISK DISTINGUISHES modern times from the past. By understanding and measuring risks and their consequences, modern humans no longer perceive the future as a whim of the gods and thereby have been empowered to transform their world (Bernstein, 1996). Strangely, IT project management, despite the fact that it deals with "modern" technologies, is embarrassingly immature in the mastery of risks. We see similar recriminating data year after year reminding us that about 20 percent of IT projects are canceled before completion and less than a third are finished on time and within budget with expected functionality (Standish Group, 2004). And if we limit the discussion to larger and therefore riskier projects of 10,000 function points, the cancellation rate more than doubles (Jones, 1995, 2000). Obviously, effective risk management is needed to avoid troubled projects (Tiwana & Keil, 2004) and make aggressive risk taking possible (DeMarco & Lister, 2003).

The postmortem examination of failed IT projects reveals that long before the failure there were significant symptoms or "early warning signs" of trouble. A warning sign is defined as an event or indication that predicts, cautions, or alerts one of possible or impending problems. Early warning signs (EWSs) provide an indication of manifesting risks and thereby an assessment of a project's propensity to future difficulties and failure. Keil and Montealegre (2001) recommend that

> At the earliest possible stage, managers need to ask themselves whether any "red flags"... are serious enough to warrant project termination or significant redirection. By institutionalizing such an early warning system, organizations can save considerable sums of money simply by identifying failed projects while they are still in the early stages of development. (p. 65)

This article contributes to our knowledge about IT project management in several ways. First, it focuses on early warning signs, instead of general IT project risks. In our study, to qualify as an early warning sign, the event or indication must occur in the first 20 percent of the project's initial calendar. Second, this study builds on risks identified from IT project management articles in both the academic literature and practitioner journals, as well as input obtained from experienced IT project managers, to identify the most important EWSs.

Table 1 presents our research methods in more detail. Table 2 shows the mean importance score of the 53 EWSs we identified. They are listed in order from most important to least important, based on the ratings of 55 IT project

Managing Risk
Looking Forward – Dominant Dozen

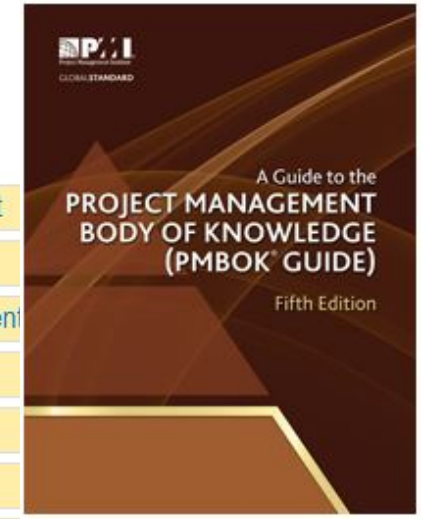
Table: The Early Warning Signs of IT Project Failure

The Deadly Dozen EWSs	The Four Horseman of IT Project Doom			
	Stakeholders	Requirements	Processes	Team
People-Related Risks				
1. Lack of top management support.	X			
2. Weak project manager.				X
3. No stakeholder involvement.	X			
4. Weak commitment of project team.				X
5. Team members lack requisite knowledge and/or skills.				X
6. Subject matter experts overscheduled.	X			
Process-Related Risks				
7. Lack of documented requirements and/or success criteria.		X		
8. No change control process or change management.			X	
9. Ineffective schedule planning and/or management.			X	
10. Communication breakdown among stakeholders.			X	
11. Resources assigned to higher priority project.		X		
12. No business case for the project.		X		

CAI
Computer Aid, Inc.®

Managing Risk
PMI Knowledge Areas

- **PM Competency Conditions**
  - 10 Knowledge Areas
  - Things You Should Know
  - Things You Should Do



- Project Communications Management
- Project Cost Management
- Project Human Resources Management
- Project Integration Management
- Project Procurement Management
- Project Quality Management
- Project Risk Management
- Project Scope Management
- Project Stakeholder Management
- Project Time Management

CAI
Computer Aid, Inc.®

Adapted from *PMBOK® Guide* – Fifth Edition,

The eight subjective (human) dimensions of Project Management - are responsible for 85% of all project failures (NASA study)

- Time management (schedule)
- Cost management (budget)
- Scope management
- Quality
- Human resources
- Risk
- Procurement (contractors)
- Integration
- Communication
- Stakeholder management

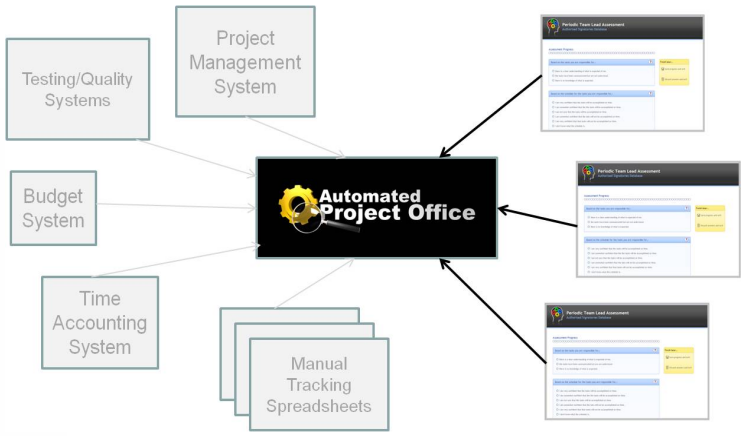
So, then…What Metrics Should We Monitor?

- **In addition to traditional**
  - Key Performance Status
- **What To Collect**
  - Key Performance Conditions
    - Intra-process Conditions
    - Inter-process Conditions
  - Key Process/Practice Compliance

CAI
Computer Aid, Inc.®

What Metrics Should We Monitor?

- **How to Collect the Metrics that Matter**
  - Intuition
  - MBWA
  - Survey Software
  - Purpose Designed Software



CAI
Computer Aid, Inc.®

Part Four

Working with Conditions Data

(The Tale of the Four Missing Metrics)

CAI
Computer Aid, Inc.®

Managing Risk
You Need "ESP" to Know "PRP"

Three Important CONDITIONS to Monitor

- **Expectations Management**
- **Sponsor Involvement**
- **Process Compliance**

To Minimize One Project Risk Factor

- **Project Rework Probability**

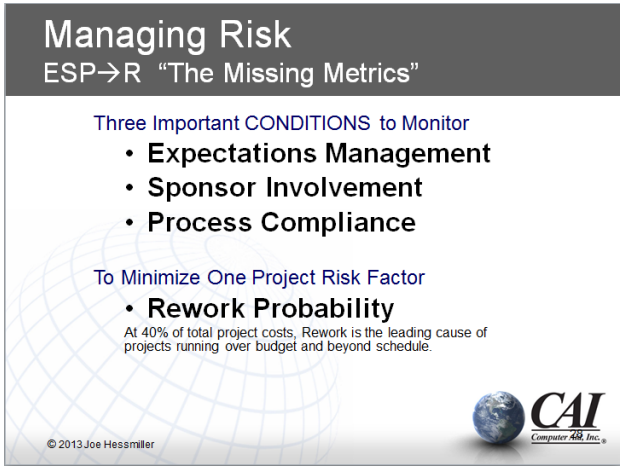
According to the Carnegie Mellon Software Engineering Institute, "Data indicate that 60-80% of the cost of software development is in rework."

Source: Paul D. Nielsen, "About Us: From Director and CEO Paul D. Nielsen," Carnegie Mellon Software Engineering Institute, http://www.sei.cmu.edu/about/message/

CAI
Computer Aid, Inc.®

The Four Missing Metrics

- SMART – Are expectations clear?
- SMPL – Is sponsor engaged?
- PAL - Are processes being followed?
- PRPL – Are causes of Rework being avoided?

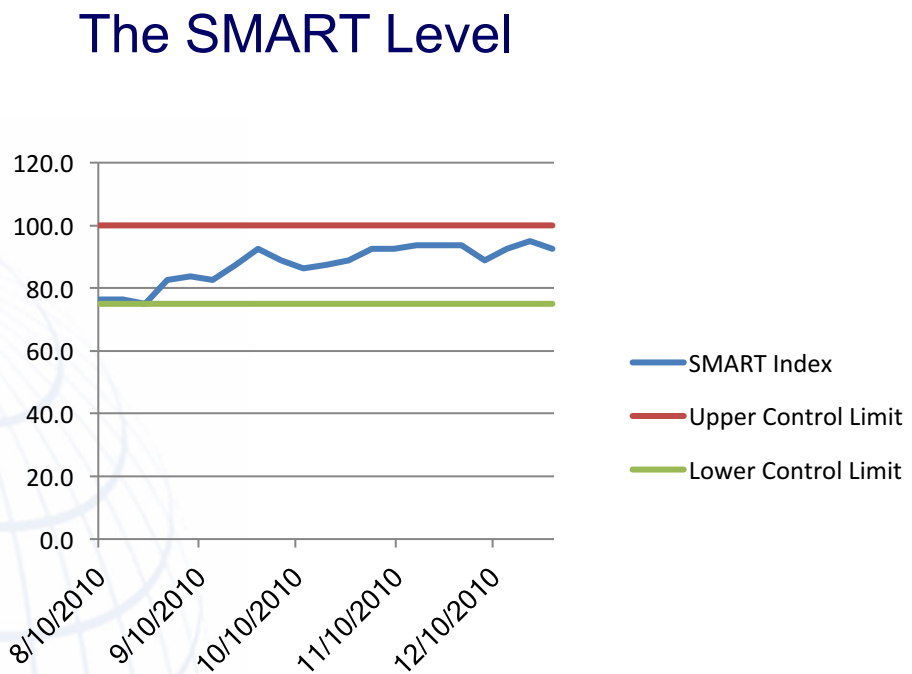


CAI
Computer Aid, Inc.®

The SMART Level

SMART Level

Tracks the clarity of assignments. The higher the SMART Level, the higher the level of understanding of what is expected. Therefore, less Rework and less management intervention required.

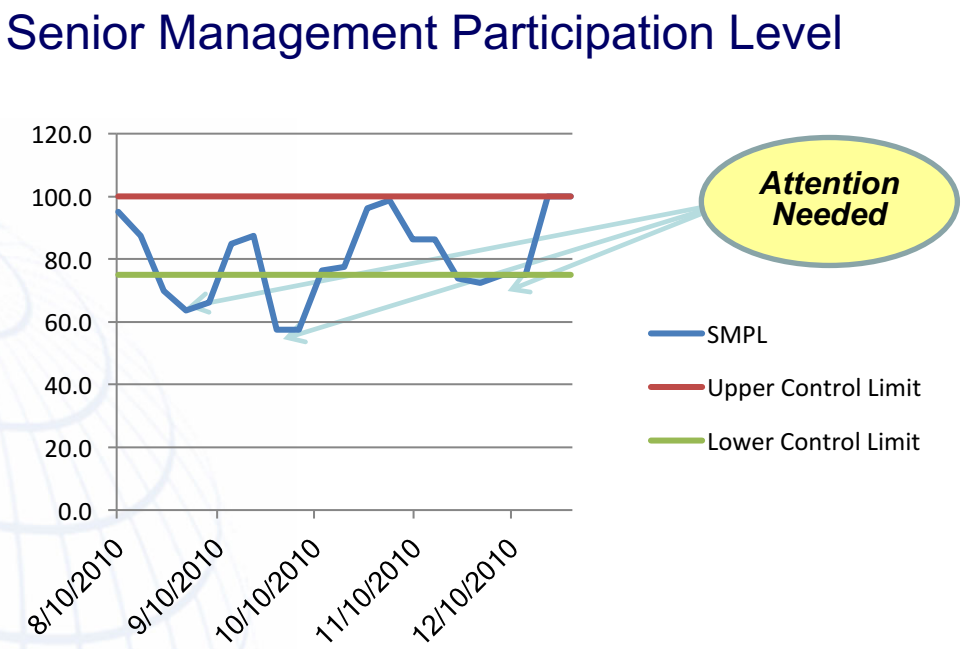


CAI
Computer Aid, Inc.®

The SMPL Line

SMPL Line

Tracks the participation level of the senior management and/or sponsor.

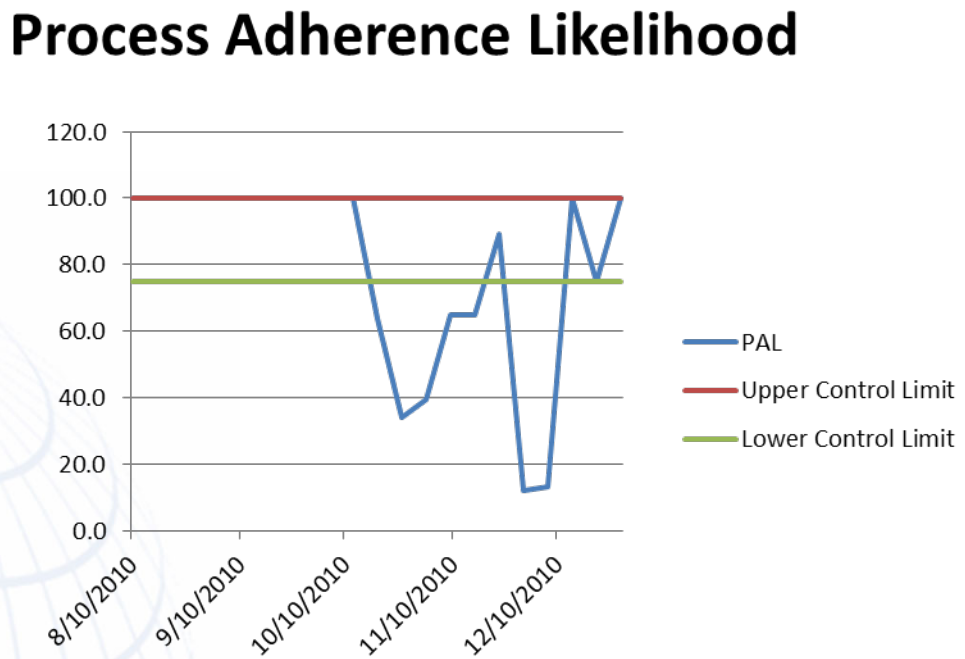


CAI
Computer Aid, Inc.®

Process Adherence Likelihood

PAL

Measures likely level of process adherence based on conditions that would tend to lead to ‘short cuts’ on process..

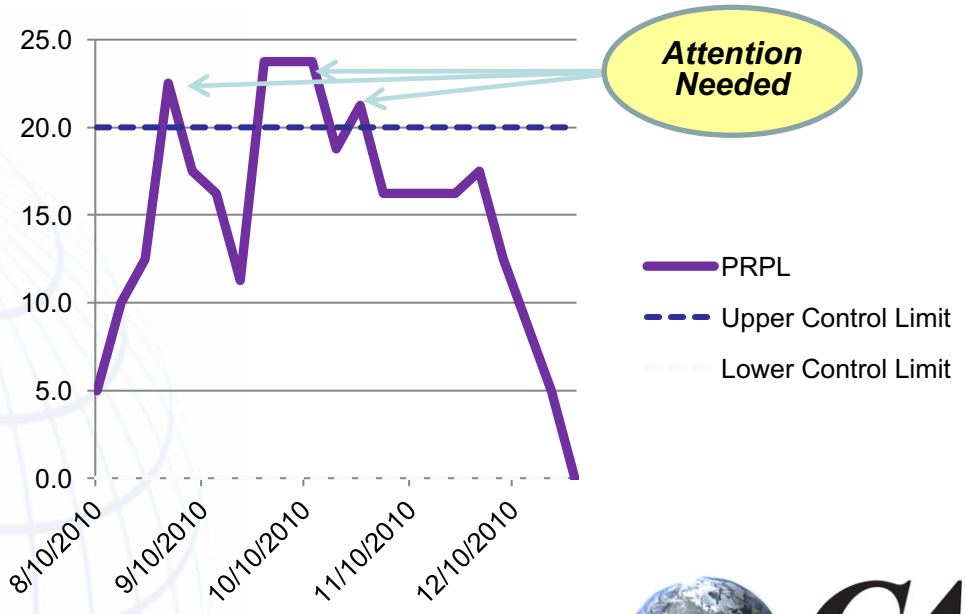


CAI
Computer Aid, Inc.®

The PRPL Line

PRPL Line

Tracks the ‘probability’ of Rework based on changes in the conditions that are known to cause Rework.



CAI
Computer Aid, Inc.®

Part Five

Developing Innovative Metrics for Your Organization

CAI
Computer Aid, Inc.®

How Did You Get Here?

In one of these?

CAI Computer Aid, Inc.®

A Gauge for Every Condition

Automotive Engineers Long Ago Defined the Critical Measures for Safe, Effective Engine Operation.

Fuel Gauges

Fuel pressure, fuel level or combustion—if it has to do with monitoring the go-juice, you'll find it here.

Air/Fuel Ratio Gauges: By measuring and d
Gauge is helpful when accurate readings are
on highly-modified vehicles. **Narrow Band**
running at the ideal ratio of 14.7:1. **Wide Ba**
important for high-performance vehicle tuner

Fuel Level Gauges: One of the easiest gauge
of fuel. Aftermarket Fuel Level Gauges usual
don't always work with factory gear. Make su

Fuel Pressure Gauges: Sitting between your
Fuel Pressure Gauge basically measures how much fuel is being delivered. Since t
of actual fuel pressure, never mount one of these gauges in your cockpit unless you
fuel isolator.

Knock Gauges: Knock Gauges measure knock or detonation—the engine-killing
much boost, over fueling, mistuning and inadequate cooling.

Electrical Gauges:

Nothing knocks your ride out of co
dashboard with accurate electrical

Voltmeters: Meet the ammeter's m
fuel pressure gauge, only it measur
always preferred over an ammeter.

Timers:

Tachs and Speedos:

Every car has a speedometer, and eve
serious about seeking speed and readi

Speedometers: The most common o
fast—or slow—you're going. Afterma
work with your factory gear, so make

Tachometers: Also known as a tach, an RPM Gauge or rev-counter, a Tachometer measures your engine's revolutions per minute. Performance drivers use tachs to time shifts, to know when the engine is in its power band, and to keep from over-revving and destroying the motor.

Pressure Gauges:

When the pressure's on to take the
pressure, boost and vacuum with g

Oil Pressure Gauges: From a sing
oil is the lifeblood that keeps it mo
with an Oil Pressure Gauge.

From amplifiers to transmissions, vital components in your vehicle simply get hot when you're running hard. Make sure you keep tabs on the temps with gauges that can handle the heat.

Oil Temperature Gauge: Perfect for keeping your engine's lifeblood—oil—within the proper operating temperatures. An Oil Temperature Gauge is a great way to monitor overall engine temps, too.

Transmission Temperature Gauges: Excessive automatic transmission temperatures can signal some expensive repairs are coming your way. A Transmission Temperature Gauge keeps tabs on the temps, especially when you're towing or racing, and lets you know to let off well before meltdown.

Water Temperature Gauges: If you've ever been that guy on the side of the road, hood open with steam spewing out like an old locomotive, you've experienced overheating. Since hot coolant is the first indication that something's wrong, a Water Temperature Gauge is your first line of defense against an overheating engine.

Water Pressure Gauge: A loss of pressure from your water pump means there's probably a leak in your cooling system—which spells disaster for your engine. A Water Pressure Gauge delivers an early indication that pressures are fluctuating.

CAI
Computer Aid, Inc.®

The Basic Measures

Automotive Gauge	***Asks the Question***	***To Measure***
Odometer	How far?	Deliverables Delivered
Clock	How long?	Duration
Fuel Level	How much further?	Input Units Available
Speedometer	How fast?	Deliverables per Unit of Time
Tachometer	How intensely?	Effort Intensity
Oil Pressure	Do we have enough lubrication to smooth interactions?	Supply of Lubricant to Smooth Interaction Between Components
Oil Temperature	How smooth are interactions?	Ability of Lubricant to smooth Interaction Between Components
Water Pressure	Do we have enough coolant to keep the engine producing?	Supply of Coolant to dissipate excess engine heat
Water Temperature	How effective is the coolant in keeping the engine cool?	Ability of Coolant to dissipate engine heat
Voltmeter	Is enough energy being applied to the other important systems?	Ability to Support other Control and Comfort Systems

CAI
Computer Aid, Inc.®

Comparative Metrics

To Measure	***Automotive Metric***	***IT Metric***
Deliverables Delivered	Miles	Milestones Met, Service Level Achieved, Function Point Delivered
Duration	Hour	Hour
Input Units Available	Gallons	Resource Hour
Deliverables per Unit of Time	Miles Per Hour	Earned Value Per Clock Hour
Effort Intensity	RPM	Hours Worked Per Week/Available Hours
Supply of Lubricant to Smooth Interaction Between Components	PSI	Stakeholder Interaction Satisfaction
Ability of Lubricant to Smooth Interaction Between Components	Degrees	Number of Open Issues from Stakeholder Interactions
Supply of Coolant to dissipate excess engine heat	PSI	Duration to Close Issues/Number of Issues
Ability of Coolant to dissipate engine heat	Degrees	Number of Escalated Issues
Ability to Support other Control and Comfort Systems	Volts	On Time Process Deliverables (Status, Reporting, Training)

CAI
Computer Aid, Inc.®

This is the State of PM Monitoring and Control Today

CAI
Computer Aid, Inc.®

This is Where We Need to Be

CAI
Computer Aid, Inc.®

Did We Accomplish Our Objectives?

- To establish the need for monitoring the metrics that really matter.
- To identify why this is such a challenge.
- To identify the types of metrics that really matter.
- Show how a familiar framework can be adapted for metrics identification (and communication).
- Give you enough to use back at your office to improve your metrics program.

CAI
Computer Aid, Inc.®

QUESTIONS

MORE INFORMATION

John M. Bowen
Managing Director - International Partnerships
John_M_Bowen@Compaid.com
Phone: 610-530-5205
Mobile: 610-393-4425

Computer Aid, Inc.
1390 Ridgeview Drive
Allentown, PA 18104
www.compaid.com