

PRACTICAL SOFTWARE MEASUREMENT

The Effective Use of Performance Measurement A CIO's Perspective

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AGENDA

- **An Overview of the Corporate Executive Board**
- **Guiding Principles for “Great” IT**
- **Expectations of IT**
 - Client
 - CIO
- **Acknowledgment of the Challenges**
- **A Framework for Change**
 - Baseline Performance
 - Model Process Improvements
- **What We've Learned**



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CORPORATE EXECUTIVE BOARD (EXBD)

WHAT THE BEST COMPANIES DO

The Corporate Executive Board is the leading provider of best practices research and analysis to the world's leading enterprises. Services include **connecting a premier executive network** and **providing essential resources** to enable **superior outcomes** by executives, professionals and their organizations.

CEB's network includes:

- More than 4,700 Institutions as part of our Membership
- More than 16,000 Senior Executives
- More than 120,000 Professionals
- Serve companies headquartered in more than 50 countries around the world

CEB's membership includes:

- 96% of the Fortune 100 Companies
- 86.4% of Fortune 500 Companies
- 77.3% of Fortune 1000 Companies
- 2,500 employees

CEB is headquartered in Washington DC with additional offices located in Chicago, San Francisco, New Delhi, London, West Chester, Scottsdale, and Sydney



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GUIDING PRINCIPLES FOR “GREAT” IT

- **Run IT like a business**
 - Establish metrics and measurable goals
 - Allocate investment dollars to highest return and new growth areas
 - Focus relentlessly on execution
- **Deliver a compelling experience to internal clients**
 - Set and consistently exceed high expectations
 - Ensure work processes enable a consistent, repeatable experience
 - Concentrate technology on enabling the business strategy
- **Provide Total Transparency**
 - Expose IT processes and performance metrics
 - Allow clients to allocate resources and funding
 - Engage clients in internal IT improvement activities



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UNDERSTANDING CLIENT EXPECTATIONS

- **High availability systems and infrastructure**
- **Reliable delivery of new products and services**
- **Rapid deployment of market-leading innovation**
- **Cost effective technology operation**
- **Collaborative partnership to achieve business area objectives**



UNDERSTANDING CIO NEEDS

- **Consistent, predictable delivery of products and services**
- **Ability to measure performance and assess progress against goals**
- **Concentrate resources around client/customer to enable business capability and drive innovation**
- **Highly engaged workforce and very satisfied clients**
- **Opportunity to add value; contribute to business success**



ACKNOWLEDGING THE CHALLENGES

- **Resistance to change**
- **Appetite for strong process discipline**
- **NIH Syndrome (not invented here)**
- **“Just Do It” attitude**
- **Expectation for immediate and visible results**
- **Justification for the investments to improve IT**

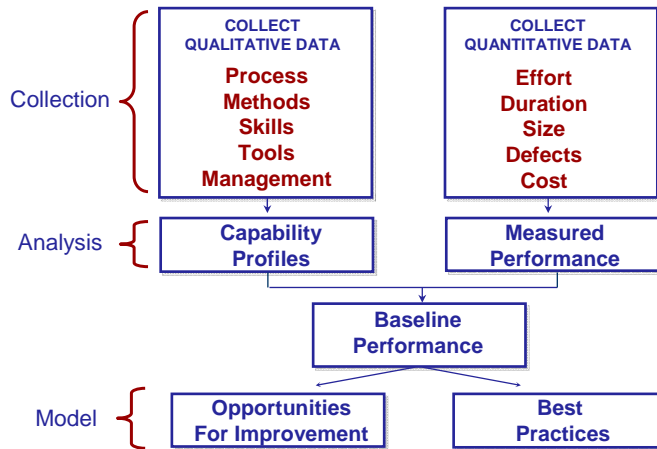


OVERCOMING THE OBSTACLES

- **Baseline current performance; quantitative and qualitative**
- **Benchmark performance against the industry average and top tier companies**
- **Establish measurable improvement goals that close the gap to top tier companies**
- **Create a compelling, future state vision for IT and clients**
- **Implement measures that compare future performance to past performance**



A FRAMEWORK FOR CHANGE



APPLYING THE FRAMEWORK AT CEB

- **The baseline generated quantitative and qualitative data that describe how functionality is delivered**
 - Measured Performance (Quantitative)
 - Productivity (Hours / Function Point)
 - Time-to-Market
 - Cost Per Function Point **
 - Defects Per 100 Function Points **
 - Capability Profile (Qualitative)
 - Project Risk and Behavioral Profiles
 - Process Gaps
- **Comparisons to benchmarks enabled us to specifically target software process improvement effort and budget to areas that will maximize the ROI**

** Data not available for baseline at CEB



MEASURED PERFORMANCE BASELINE

Projects selected are representative of common work activity completed in 2007

Measured Performance Data

Project	Start Date	Completion Date	Duration	Effort Hrs	Function Points	Productivity
A	4/1/2007	7/8/2007	3.3	1873	90.0	19.3
B	3/1/2007	1/31/2008	11.2	3810.24	139.0	27.4
C	5/7/2007	7/9/2007	2.1	92.61	28.0	3.3
D	2/1/2007	9/17/2007	7.6	2041.2	200.0	10.2
E	3/5/2007	11/1/2007	8.0	2041.2	188.0	10.9
F	2/12/2007	9/26/2007	7.5	630	132.0	4.8
G	2/1/2007	9/13/2007	7.5	6773.76	276.0	24.5
H	2/15/2007	7/26/2007	5.4	2402.4	115.0	20.9
I	1/1/2007	3/30/2007	2.9	273	58.0	4.7
J	7/2/2007	9/27/2007	2.9	235.2	70.0	3.4
K	7/1/2007	11/1/2007	4.1	5913.6	202.0	29.3
L	9/3/2007	12/20/2007	3.6	1890	81.0	23.3

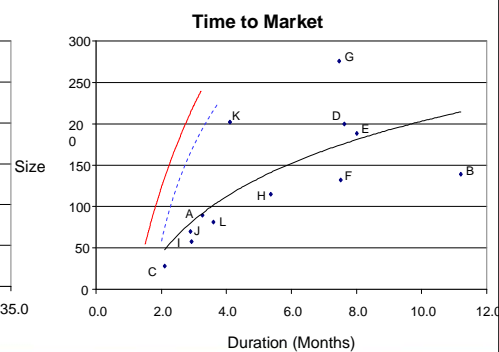


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BASELINE RESULTS: PRODUCTIVITY & DURATION

- Small size projects are the norm
- Performance levels vary across all projects
- The extent of variation is greater than desired
- Variation potentially driven by mixing support and development tasks
- Duration on small projects reflects industry norms
- Relatively high degree of consistency seen in duration data suggests a basis for an estimation model
- Size to duration relationship suggests that current methods are scalable



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CEB Baseline
Industry Avg.
Top Quartile

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QUALITATIVE SCORES

Profiles reflect the "effectiveness" of the development practices for a given project. Six categories are evaluated and scored. The lack of consistency is indicative of not having common practices. Scoring and color coding does not necessarily reflect a positive or negative outcome.

Profile score of 60 and above
Profile score from 30 to 59
Profile score below 30

Project	Score	Mngmnt	Req	Des	Build	Test	Environ
A	56.2	68	62	68	58	41	35
B	44.3	68	49	57	35	28	35
C	60.2	73	74	68	65	41	27
D	36.4	57	44	32	46	22	27
E	37.5	50	51	25	46	28	27
F	46.6	68	62	57	38	25	27
G	53.6	77	64	50	46	50	31
H	53.2	61	72	48	58	41	31
I	43.7	61	54	20	58	44	31
J	47.3	61	54	20	58	41	31
K	59.8	77	69	55	58	53	31
L	44.2	61	54	20	65	41	31



PROFILE ASSESSES KEY PROJECT VARIABLES

Qualitative data is based upon an evaluation of selected project attributes in six categories known to have a measurable impact on productivity and quality.

Management	Requirements	Design
<ul style="list-style-type: none"> Team Dynamics Morale Project Tracking Project Planning Automation Management Skills 	<ul style="list-style-type: none"> Clearly Stated Requirements Formal Process Customer Involvement Experience Levels Business Impact 	<ul style="list-style-type: none"> Formal Process Rigorous Reviews Design Reuse Customer Involvement Experienced Development Staff Automation
Build	Test	Environment
<ul style="list-style-type: none"> Code Reviews Source Code Tracking Code Reuse Data Administration Experienced Staff Automation 	<ul style="list-style-type: none"> Formal Testing Methods Test Plans Staff Testing Experience Effective Test Tools Customer Involvement 	<ul style="list-style-type: none"> New Technology Automated Process Adequate Training Organizational Dynamics Certification

MODELED IMPROVEMENTS

Project	Score	Mngmnt	Req	Des	Build	Test	Environ
A	56.2	68	63	68	58	41	35
B	44.3	68	49	57	35	28	35
C	60.2	73	74	68	65	41	27
D	36.4	57	44	32	46	22	27
E	37.5	50	51	25	46	28	27
F	46.6	68	62	57	38	25	27
G	53.6	77	64	50	46	50	31
H	53.2	61	72	48	58	41	31
I	43.7	61	54	20	58	44	31
J	47.3	61	54	20	58	41	31
K	59.8	77	69	55	58	53	31
L	44.2	61	54	20	65	41	31

	Baseline Productivity
Average Project Size	130 - 134
Average HRS/FP	12.6 - 17.6
Average Time-To-Market (Months)	4.4 - 6.6
Average Cost/FP	\$
Delivered Defects/FP	

Target Improvement Areas:

- Requirement Management
- Configuration Management
- Defect Tracking
- Planning and Control

Performance Improvements:
Productivity ~ +15% - 30%
TTM ~ 7% - 16%

Project	Score	Mngmnt	Req	Des	Build	Test	Environ
A	68.9	75	77	68	69	63	58
B	59.1	75	62	64	54	50	58
C	71.1	80	82	68	77	63	50
D	53.8	64	59	48	65	44	50
E	54.9	57	67	41	65	50	50
F	59.6	75	67	64	58	47	50
G	56	77	69	50	46	50	46
H	58.1	66	77	48	58	50	46
I	53.9	66	67	36	58	53	46
J	58.0	66	67	36	58	50	46
K	63.6	77	74	55	58	53	46
L	54.4	66	67	36	65	50	46

	Productivity Improvement
Average Project Size	130 - 134
Average HR/FP	10.1 - 14.1
Average Time-To-Market (Months)	3.9 - 5.9
Average Cost/FP	\$
Delivered Defects/FP	

CURRENT STATUS OF PROCESS IMPROVEMENTS AT CEB

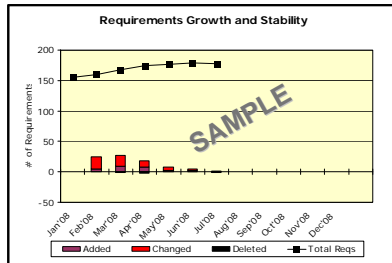
• Implementing the target process improvements

- Requirements Management
- Configuration Management
- Defect Tracking
- Planning and Control

And added a few others along the way

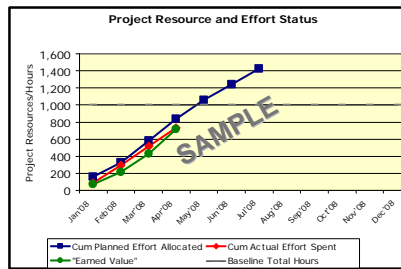
- Peer Reviews
- Estimation
- PPQA
- Created and staffed an EPG function; searching for a PPQA lead
- Implemented base set of Key Performance Indicators (KPIs) to assess our progress

CEB PROJECT DASHBOARD



Cost Category	Q1			Q2			Q3		
	Budgeted	Committed	Actual	Budgeted	Committed	Actual	Budgeted	Committed	Actual
Hardware costs Capex	\$0	\$0	\$0	\$130,000	\$0	\$0	\$0	\$0	\$0
Hardware costs Opex	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Software costs Capex	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Software costs Opex	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Services costs Capex	\$24,300	\$23,120	\$15,230	\$174,800	\$80,000	\$82,885	\$25,420	\$25,420	\$0
Services costs Opex	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capex Total	\$24,300	\$23,120	\$15,230	\$174,800	\$80,000	\$82,885	\$25,420	\$25,420	\$0
Capex Budgeted	\$1,180						\$0		
Capex Budgeted									
Actual	\$9,600						\$25,420		
Opex Total	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Opex Budgeted							\$0		
Opex Budgeted									
Actual	\$0			\$0					
Grand Total	\$24,300	\$23,120	\$15,230	\$174,800	\$80,000	\$82,885	\$25,420	\$25,420	\$0
Variance (Budgeted-Actual)	\$14,700			\$173,620			\$25,420		

Milestone	Baseline	Plan	Actual	% Var.
Checkpoint A - Charter & Kickoff	1/10/2008	1/10/2008	1/10/2008	0%
Requirements Complete	1/28/2008	1/28/2008	1/28/2008	0%
Vendor Selection Complete	2/4/2008	2/4/2008	2/15/2008	79%
SMP/Schedule Complete	2/12/2008	2/12/2008	2/28/2008	115%
Checkpoint B - Planning & Req.	2/28/2008	2/28/2008	2/28/2008	0%
Design Complete	3/19/2008	3/19/2008	4/15/2008	115%
Development Complete	4/15/2008	4/15/2008	4/15/2008	100%
Checkpoint C - Midpoint	4/30/2008	4/30/2008	4/30/2008	100%
Testing Complete	4/30/2008	5/15/2008	5/15/2008	109%
Training Complete	5/10/2008	5/30/2008	5/30/2008	110%
Go Live	5/30/2008	6/15/2008	6/15/2008	110%
Lessons Learned/Exit Sur. Survey Complete	6/17/2008	6/30/2008	6/30/2008	100%
Checkpoint D - Deploy & Close	6/17/2008	6/30/2008	6/30/2008	100%



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WHAT DID WE LEARN?

- This is hard work and progress is not readily apparent
- Requires a compelling future state vision and strong commitment to stay the course
- Celebrate successes often to keep employees engaged
- You have to do the heavy lifting for Software Process Improvement (SPI) to be successful and sustainable; consultants can help accelerate the activity and develop performance baseline
- A performance baseline and an estimation process can revolutionize the relationship with your clients



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