

The Latest Industry Data for Application Development And Maintenance

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Software Quality Group of New England

The David Consulting Group
Achieving Software Excellence

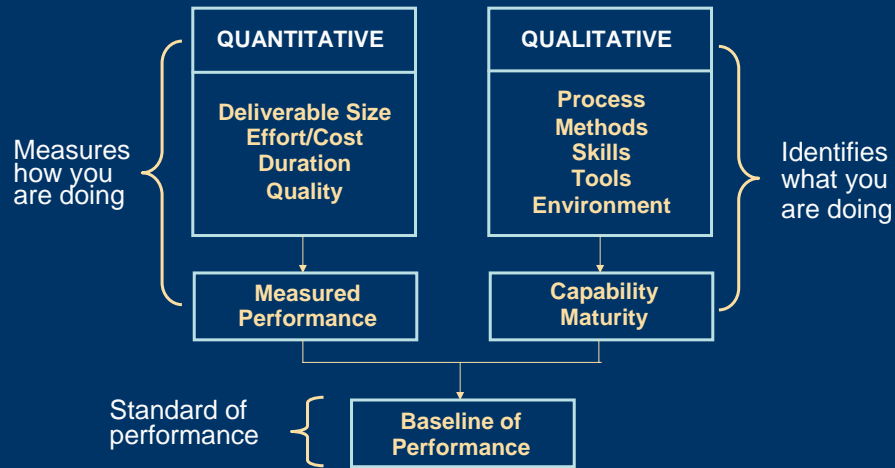
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Presentation Topics

- **Qualitative and Quantitative Measurement**
- Baseline Your Organization's Performance
- Implement Best Software Practices

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Qualitative and Quantitative Measurement



Base Metrics On Goals Of The Process Being Measured

- Business Related Measures
 - Unit Delivery Cost
 - Time To Market
 - Customer Satisfaction
- Process Related Measures
 - Effectiveness
 - Integration
 - Compliance
- Project Related Measures
 - Project Tracking
 - Estimating
 - Change Management

Contribution

Measure the impact of IT on the business

Identify trends and monitor progress

Utilize measures in a pro-active format

Utilize Measurement Results In Decision Making

- Improvements resulting from current and future initiatives must be measured
- The basis for measuring improvements may include:
 - Industry data
 - Organizational baseline data
- It is necessary for the organization to put a “stake in the ground” relative to current performance level in order to improve development practices

Presentation Topics

- Qualitative and Quantitative Measurement
- **Baseline Your Organization's Performance**
- Implement Best Software Practices

Collect & Report

- Identify sample set (typically project oriented)
- Collect baseline data
 - Project measures (e.g., effort, size, cost, duration, defects)
 - Project attributes (e.g., skill levels, tools, process, etc.)
- Analyze data
 - Performance comparisons (identification of process strengths and weaknesses)
 - Industry averages and best practices
 - Performance modeling (identify high impact areas)
- Report results

Quantitative & Qualitative Assessments

Research

MEASURES

Software Size
Level of Effort
Time to Market
Delivered Defects
Cost

CHARACTERISTICS

Skill Levels
Automation
Process
Management
User Involvement
Environment

Analysis

PERFORMANCE LEVELS

PROFILES

Results

- Correlate Performance Levels to Characteristics
- Substantiate Impact of Characteristics
- Identify Best Practices

Analyze Project Attributes

MANAGEMENT

- Team Dynamics
- High Morale
- Project Tracking
- Project Planning
- Automation
- Management Skills

DEFINITION

- Clearly Stated Requirements
- Formal Process
- Customer Involvement
- Experience Levels
- Business Impact

DESIGN

- Formal Process
- Rigorous Reviews
- Design Reuse
- Customer Involvement
- Experienced Development Staff
- Automation

BUILD

- Code Reviews
- Source Code Tracking
- Code Reuse
- Data Administration
- Computer Availability
- Experienced Staff
- Automation

TEST

- Formal Testing Methods
- Test Plans
- Development Staff Experience
- Effective Test Tools
- Customer Involvement

ENVIRONMENT

- New Technology
- Automated Process
- Adequate Training
- Organizational Dynamics
- Certification

Strengths & Opportunities *(An Example)*

Definition

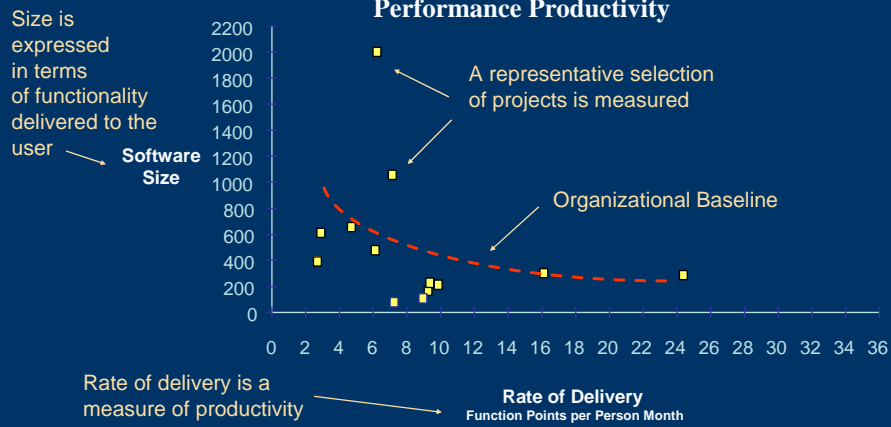
Strengths

- Requirements are clearly stated and stable
- Development and customers are experienced in applications

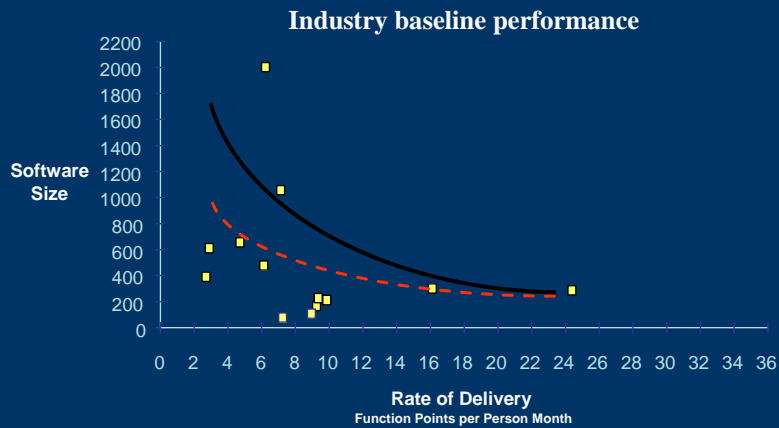
Opportunities for Improvement

- More formal requirements gathering process on larger projects
- More consistent use of prototyping on larger projects
- A formal review process

Establish A Baseline



Compare To Industry Benchmarks



Function Points Per Person Month

Average of Recent Projects Across
Different Platforms

Client Server	17
Main Frame	13
Web	25
e-business Web	15
Vendor Packages	18
Data Warehouse	9

Function Points Supported By One FTE

Average of Support Provided for
Corrective Maintenance by One FTE

Client Server	642
Main Frame	978
Web	756
e-business Web	438
Vendor Packages	740
Data Warehouse	392

Presentation Topics

- Qualitative and Quantitative Measurement
- Baseline Your Organization's Performance
- **Implement Best Software Practices**

Reduce The Gaps

- Model the impact of implementing selected process improvements
- Evaluate the impact on productivity
- Modeling is performed from several perspectives: Management Improvements, Design Improvements, Definition Improvements, Build Improvements, Test Improvements, Environment Improvements and SEI CMM Specific Improvements

EXAMPLE: Improvements as measured from the following baseline --

Average Project Size:	133 Function Points (FPs)
Average Productivity:	10.7 FP/Effort Month (EM)
Average Time-to-Market:	7.3 Months
Average Cost/FP:	\$934.58
Projected Delivered Defects/FP:	.0301

About Performance Modeling

- Develop models that utilize historical data points to analyze the impact of selected process improvements
- Provide a knowledge base for improved decision making
- Identify areas of high impact (e.g., productivity and quality)
- Create an atmosphere of measuring performance
- Opportunity for comparison to industry best practices

DCG Data Base Reveals Best Practices

Characteristics

Project Type
Platform
Data Base
Method
Language

Complexity Variables

Logical Algorithms
Mathematical Algorithms
Data Relationships
Functional Size
Reuse

Code Structure
Performance
Memory
Security
Warranty

Metrics

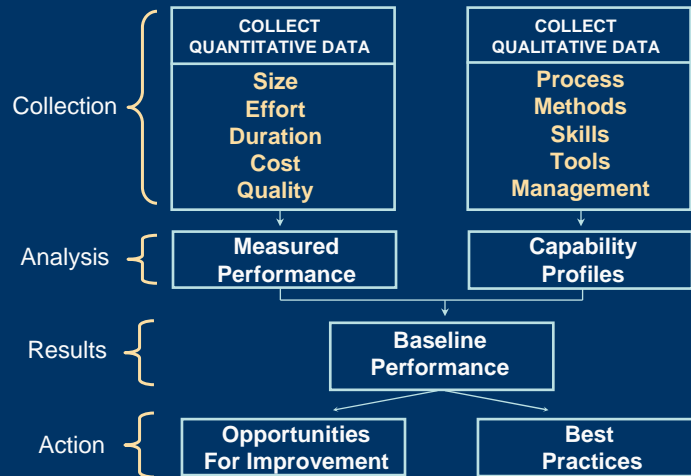
Size
Cost
Effort
Duration
Defects

Attributes

Management
Definition
Design
Build
Test
Environment

} Process
Skill Levels
Quality Practices
Measures

Quantitative & Qualitative Performance Measurement



Quantitative Performance Evaluation



Quantitative Assessment

- Perform functional sizing on all selected projects.
- Collect data on project level of effort, cost, duration and quality.
- Calculate productivity rates for each project, including functional size delivered per staff month, cost per functional size, time to market, and defects delivered.

Results

	Baseline Productivity
Average Project Size	133
Average FP/SM	19.7
Average Time-To-Market (Months)	6.9
Average Cost/FP	\$939
Delivered Defects/FP	0.0301

Qualitative Performance Evaluation



Qualitative Assessment

- Conduct Interviews with members of each project team.
- Collect Project Profile information.
- Develop Performance Profiles to display strengths and weaknesses among the selected projects.

Results

Project Name	Profile Score	Management	Definition	Design	Build	Test	Environment
Accounts Payable	55.3	47.73	82.05	50.00	46.15	43.75	50.00
Priority One	27.6	50.00	48.72	11.35	38.46	0.00	42.31
HR Enhancements	32.3	29.85	48.72	0.00	42.31	37.50	42.31
Client Accounts	29.5	31.82	43.59	0.00	30.77	37.50	42.31
ABC Release	44.1	31.82	53.85	34.09	38.46	53.13	42.31
Screen Redesign	17.0	22.73	43.59	0.00	15.38	0.00	30.77
Customer Web	40.2	45.45	23.08	33.14	53.85	60.00	34.62
Whole Life	29.2	56.82	28.21	22.73	26.92	18.75	53.85
Regional - East	22.7	36.36	43.59	0.00	30.77	9.38	30.77
Regional - West	17.6	43.18	29.08	0.00	26.92	9.38	26.92
Cashflow	40.6	56.82	71.79	0.00	38.46	43.75	38.46
Credit Automation	23.5	28.25	48.72	0.00	38.46	6.25	26.92
NISE	49.0	38.64	56.41	52.27	30.77	53.13	53.85
Help Desk Automation	49.3	54.55	74.36	20.45	53.85	50.00	38.46
Formula One Upgrade	22.8	31.82	38.46	0.00	11.54	25.00	46.15

Modeled Improvements

SAMPLE DATA

Project Name	Profile Score	Management	Definition	Design	Build	Test	Environment
Accounts Payable	55.3	47.73	82.05	50.00	46.15	43.75	50.00
Priority One	27.6	50.00	48.72	11.35	38.46	0.00	42.31
HR Enhancements	32.3	29.85	48.72	0.00	42.31	37.50	42.31
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Process Improvements:

- Code Reviews and Inspections
- Requirements Management
- Defect Tracking Configuration Management

Performance Improvements:

- Productivity ~ +131%
- Time to Market ~ -49%
- Defect Ratio ~ -75%

Project Name	Profile Score	Management	Definition	Design	Build	Test	Environment
Accounts Payable	75.3	61.73	82.05	60.00	60.15	53.75	50.00
Priority One	57.6	57.00	55.72	18.36	45.46	22.00	49.31
HR Enhancements	52.3	32.55	51.72	23.00	42.31	57.50	49.31
Client Accounts	69.5	53.82	69.59	12.00	50.77	67.50	49.31
ABC Release	74.1	55.82	69.85	49.09	52.46	63.13	49.31
Screen Redesign	67.0	43.73	63.59	21.00	36.38	20.00	51.77
Customer Web	69.2	69.45	27.08	63.64	53.85	50.00	49.62
Whole Life	50.2	49.82	52.21	27.73	31.92	24.75	53.85
Regional - East	57.7	59.36	49.59	0.00	30.77	9.38	50.77
Regional - West	52.6	55.18	30.08	0.00	33.92	18.38	26.92
Cashflow	67.6	66.82	71.79	0.00	49.46	53.75	49.46
Credit Automation	60.5	41.55	78.72	0.00	50.46	26.25	46.92
NISE	78.0	68.64	76.41	62.27	65.77	53.13	53.85
Help Desk Automation	78.3	64.55	76.36	47.45	63.85	54.00	58.46
Formula One Upgrade	52.8	49.82	52.46	0.00	31.54	25.00	56.15

Baseline Productivity	Productivity Improvement
Average Project Size	133
Average FP/SM	10.7
Average Time-To-Market (Months)	6.9
Average Cost/FP	\$939
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Contact Information

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