Software Maintenance Maintenance Productivity
Controlling the Customer Expectations

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AGENDA

1 - Context
2 – Software Maintenance Challenges
3 – Maintenance Measurement Programme
4 - Management Indicators
5 - Benefits
CEO TOOLS TO MANAGE

. How do we manage our business today?

. Current MBA models for business management

. Engineering models for cost prediction and control

Based on quantitative methods that use performance data supplied by financial systems and operational systems

CEO TOOLS TO MANAGE

Performance Data

- Passed
- Current
- Future

- By production lines and services
- Calculate Production/Financial ratios and trends
CIO TOOLS TO MANAGE SOFTWARE

. Can tell you what was spent where

. How much was done by high level category

. Use mainly customer surveys and Benchmarks

. Knows IT is strategic but has a hard time giving hard numbers to his customers on:
  - productivity by service, quality of service
  - profitability of his business

To answer the CIO Questions

NEED A CHANGE IN SOFTWARE MANAGEMENT CULTURE

. Push Towards I.S. charge back
  - Software development projects
  - Software maintenance and support
  - Operations & Infrastructure

. Business decisions are moving to systems owners which will have a service contract (SLA)
PROCESS DEFINITION & MATURITY LEVEL

And
. Maturity Model Level 3 achievement:
  MANAGED & DEFINED PROCESSES

. STRONG INFLUENCE OF QUALITY PROCESS
  OVER THE DEVELOPMENT CYCLE;

SOFTWARE MAINTENANCE CHALLENGES

A. Maintenance Culture

B. Definitions of Software Maintenance Work

C. Usual Indicators

D. Management perceptions
A. MAINTENANCE CULTURE

- SUPPORT THE OPERATIONS (MOVE QUICKLY)
- SHORT AND REPEATABLE MANAGEMENT PROCESS
- RELIABLE TIME RECORDING SYSTEM BASED ON SERVICE REQUESTS AND MAINTENANCE SCHEDULES
- STRONG INFLUENCE IN OPERATIONAL QUALITY REVIEWS

B. SOFTWARE MAINTENANCE DEFINITIONS

- All activities associated with alteration, modification or changes of software
  - Sharpe et al., 1991

- Any work done on a software application after it has been implemented
  - Gill & Kemerer, 1990; Parik & Zvegintzov, 1983
B. DEFINITIONS

A USEFUL CONCEPT TO DISTINGUISH MAINTENANCE FROM DEVELOPMENT:

Service Request ↔ Development Project

B. Software DEVELOPMENT PROJECT

- A complex problem that needs:
  - a variety of practitioners
  - a specific project structure

- Executive priorities
  - cost benefits study
  - work program
  - deadlines

- Limit: UKSMA* IS more than 5 days of effort

*also ISBG
B. SERVICE REQUEST

- Small request or problem:
  - 1, rarely 2 practitioners
  - no project structure
  - At C&W less than 5 days of effort

- Incoming on a random basis

- Priority:
  - First to the operations failures
  - Second requests prioritized by end-users

B. In Summary

SOFTWARE MAINTENANCE = SERVICE REQUEST
C. USUAL SOFTWARE MAINTENANCE INDICATORS

. Number of request on waiting list
. Average time in queue
. Estimated number of days in queue
. Number of completed requests
. Number of in process requests
. Days: ACTUALS versus ESTIMATES

C. USUAL CONCEPT OF SOFTWARE MAINTENANCE

. QUEUE SERVICING:
  - Queue management
  - Short term management
  - Reactive management

. IMPACT
  - Poor control on the demand
  - 6 to + 12 months
D. MANAGEMENT PERCEPTIONS CIO)
limited information available

. FEW INFORMATION ON MEASURES OF SOFTWARE UNDER MAINTENANCE

. FEW INFORMATION ON MAINTENANCE OUTPUT

. DIFFICULTY TO MEASURE PRODUCTIVITY (compared to development)

D. MANAGEMENT (CIO) PERCEPTIONS

GOOD MANAGEMENT:
- OF SHORT TERM
- OF THE LEVEL OF SERVICE

BUT

LACK OF ADEQUATE CONTROL:
- USERS : BUDGET/COSTS, SERVICE SPEED, UNAUTHORIZED WORK
- SUPPORT SERVICES ARE UNCLEAR
- NO PERFORMANCE & TRENDS
IMPROVE THE MAINTENANCE MEASUREMENT PROGRAMME

A: LIST THE AREAS TO IMPROVE

B: KEY MEASUREMENT CORNERSTONES

C: DEFINE COMMON MEASURES

A) DELIVERABLE-BASED APPROACH

PRODUCTIVITY IS DERIVED FROM THE OUTPUTS AND THE INPUTS

“IT IS ESSENTIAL TO HAVE A DEFINITION OF THE OUTPUTS OF THE MAINTENANCE”
- Abran & Nguyenkim, 1993
A) PREREQUISITES TO MEASUREMENT

- Defined Process for Maintenance (ex: ISO14764, IEEE1219)
- Control and Follow-up
  - Of Requests (with Ticket systems)
  - Of Effort (with time recording systems)
- Formal Approval Process of Requests
- Sign A Customer Service Level Agreement

B) I.S.O. 14764 CATEGORIES

- Enhancements
  - Adaptive
  - Perfective
- Correction
  - Preventive
  - Corrective

Taken from ISO14764, 1999-11-15
B) DOCUMENT THE REQUEST PROCESSING

REQUEST

ROUTE TO ACCOUNT MANAGER

CORRECTIVE
STOP other work

ADAPTIVE
PRIORITY LIST

Existing System ?

Production Failure ?

Functional Improvement < 5 days ?

Latent Error detected?

Optimization ?

Change to Environment ?

Yes

Yes

Yes

Yes

No

No

No

No

Yes

Yes

Yes

No

No

No

Yes

Yes

Yes

No

No

No

No

No

No

Yes

Yes

Yes

No

No

No

No

No

No

No

No

No

ROUTE TO ACCOUNT MANAGER

B) RECORDING THE EFFORT

. DIRECT CHARGES:

- ALL EFFORTS DIRECTLY RELATED TO A SERVICE REQUEST

AND

- THAT COULD BE BILLED CHARGED AS A SERVICE FOR THE END USER

. INDIRECT CHARGES

- TRAINING & BOOKS
- TRAVEL & MEALS
- PRAYER
- SICKNESS & LEAVE
B) FOLLOW-UP & CONTROL

. DAILY COLLECT

. CONTROLS
  - VALIDATION ON RECORDING
    (Integrity)
    - COMPLETE (All & all the time)

. ANALYSIS OF DATA

. BUDGET ON A SYSTEM BASIS

C) ANALYSIS OF MAINTENANCE BUDGET

. IS INTERNAL ANALYSIS
  - PER MAINTENANCE GROUP
    - PER APPLICATION
    - PER PERSON

. ANALYSIS FOR USERS
  - PER APPLICATION
  - PER MAINTENANCE CATEGORY
    - BUDGET COMPARISON
B) COMPARE APPLICATIONS INTERNALLY (INTERNAL BENCHMARK)

B) PRODUCTIVITY INDICATORS

- DELIVERY RATE (Requests/Days) PER
  - CATEGORY
  - APPLICATION
  - SIZE (more mature organisations)

- TRENDS PER
  - DIVISION
  - CATEGORY
  - APPLICATION
  - PERIOD (quarterly, yearly)
  - SIZE and COMPLEXITY
BENEFITS

MANAGEMENT INFORMATION

BENCHMARKING (Internal and External)

BUDGETS BREAKDOWN

STRATEGIC ADVANTAGES

INDUSTRIAL COOPERATION

BENEFITS – MEASURABLE EVIDENCE

JUSTIFY MAINTENANCE ACTIVITIES

- DELIVERY RATE
- TRENDS BY SERVICES

![Graph showing maintenance trends by quarter for Adaptive, Corrective, Query, and Perfective types of maintenance.](image-url)
Conclusion

It is rare to find “IS” software support and maintenance groups that:

- That have a maintenance process defined and under control

- That have one “service level agreement” signed with their customers

- That have a measurement system which reports their activities monthly