

Software Model Clashes Identification

Software Engineering I, Fall 2002

Mohammed Al-Said

Software Model Clashes Identification Experiment

- What are the experiment's objectives?**
- Who will do it?**
- How will it be done?**
- What are the experiment benefits?**

Software Models

Success Models

- Win-Win • Business Case Analysis
- Software Warranties • QFD
 - 10X • Six Sigma
- Award Fees • IKIWISI
- JAD

Product Models

- UML
- CORBA • COM
- Requirements
- Architectures
- Product Lines
- OO Analysis & Design
- Domain Ontologies
- COTS • GOTS

MBASE

- COCOMO
- COCOTS • Checkpoint
 - System Dynamics
 - Metrics • -ilities
- Simulation and Modeling

Property Models

- Spiral
- Waterfall
- Risk Management

- Business Process Reengineering
- CMM's • Peopleware
- IPT's • Objectory
- Groupware

Process Models

Assumptions and Models

Assumption: A statement that is taken for granted as “true”

Model: a consistent set of assumptions and their logical derivations that represent a viewpoint

Example: COTS

A1: COTS product’s source code is not generally provided to the customer

A2: a COTS product is supported by its vendor

Both A1 and A2 are true and represent “maintenance” view point of COTS products

Model-Clash:

An incompatibility among the assumptions of a set of models used in a software project

Example:

***IKIWISI* success model assumes requirements are generated after something is implemented (prototype)**

***Waterfall* process model assumes nothing is implemented until requirements are completely specified.**

There is no model in which both of above statements are consistent (There is at least an implementation or a requirement that can not satisfy both)

MasterNet Project

Bank of America' MasterNet Project:

- 1980: Develop the MasterNet system update and automate the online generation of monthly statements for the bank's trust accounts.
- Estimate: \$22M , 2 years to complete.
- Project developer: Premier Systems
 - Scale up an existing small-trust system.
- Result: Took five years, cost \$80 million

MasterNet Model-Clashes*

- **Product(PD)-Property(PY):**
 - many desired features resulted in 3.5 million lines of code
 - limited budget and schedule.
 - ✓ large overrun in budget and schedule.
- **Product(PD)-Property(PY)**
 - the customer's assumed stable requirements
 - the users and developer made frequent feature changes
 - ✓ large overrun in budget and schedule.
- **Product(PD)-Property(PY):**
 - the developer's COTS choice of Prime H/W
 - the users' desired level of service
 - ✓ the Prime system suffered repeated performance overloads and crashes.

MasterNet Model-Clashes

• **Product(PD)-Product(PD):**

- the developer's model of COTS-choice H/W platform
- the users' and maintainers' applications compatibility product model, as BofA had relied exclusively on IBM hardware and software up to that point.
 - ✓ New system did not interface properly with existing applications

• **Product(PD)-Product(PD):**

- the developer's provided features such as full customer access
- users wanted accurate and timely reports
 - ✓ Conflict with real-user needs

• **Process(PS)-Property(PY):**

- the maintainers' tightly scheduled transition process model
- conflicted with the testing delays brought on by the customer's limited development budget and schedule model.

MasterNet Model-Clashes

Consequences:

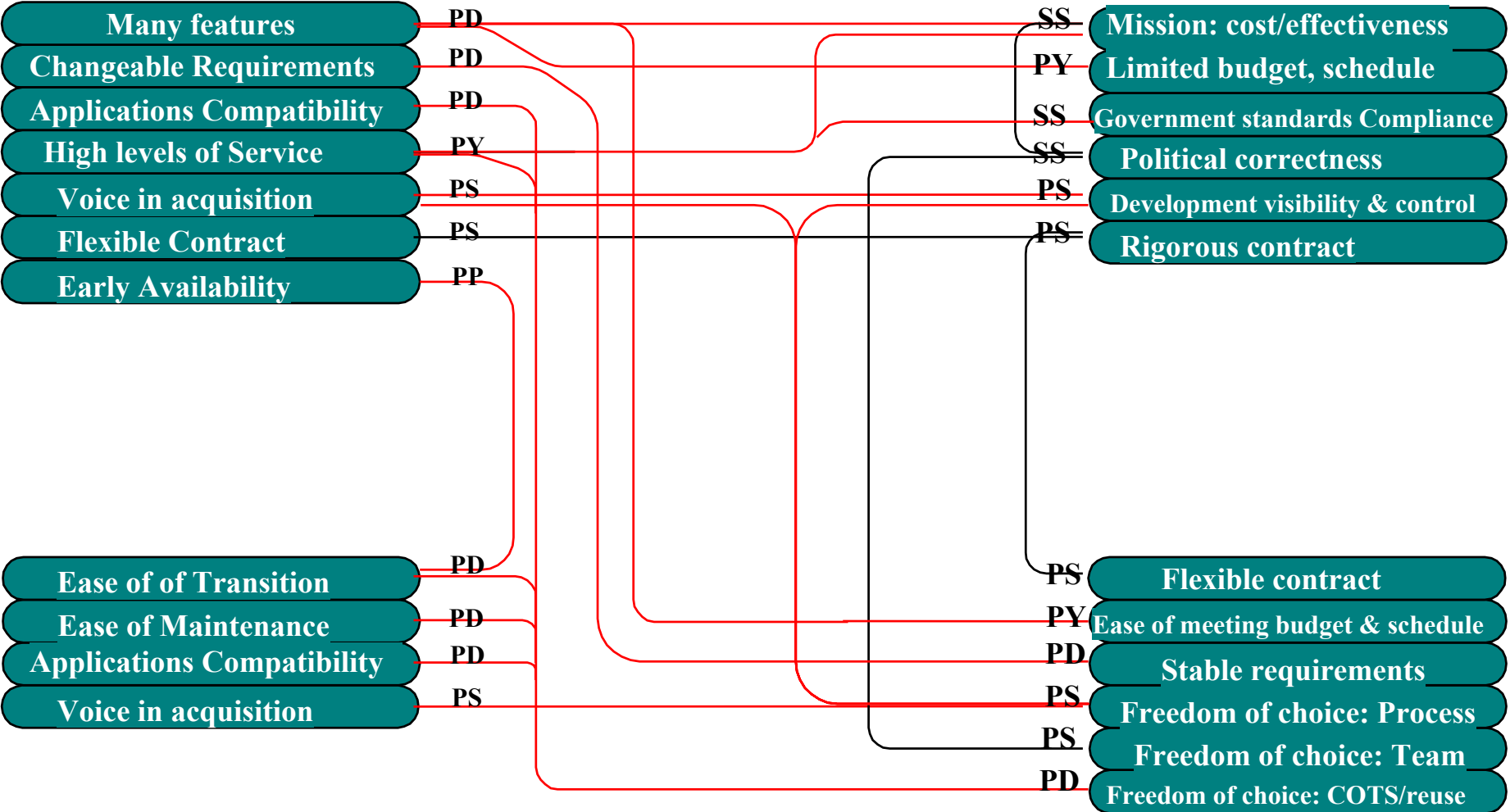
- The system was rejected by Bank of America
- Tarnished BofA's reputation
- Institutional accounts dropped from 800 to 700
- Managed assets shrank from \$38 billion to \$34 billion.
- Loss of the business.

Success Model-Clashes profile

MasterNet

Users

Acquirers



Maintainers

Developers

Identifying Model-Clashes in Your project

Until End of Fall 2002 Semester Do:

Step1: Identify Your Project stakeholders (Clients, Users, Developers, Maintainers, Operators, Vendors, etc ..)

Step2: For each MBASE model, list the critical assumptions for each stakeholder identified in step1 (some may not have)

Step3: Identify assumptions that clash (SpiderWeb)

Step4: Assess associated risk with each model clash

Step5: Report clashes into Model-Clash collection form

Data are reported weekly as part off project progress report

Step1: Identify Your Project stakeholders

MasterNet Stakeholders:

- **Client:** Bank Of America
- **Developer:** Premier System
- **Users:** Other Banks' (including BofA) Employees and General Public
- **Maintainers:** Bank of America Staff

Step2: For each MBASE model, list the critical assumptions for each stakeholder identified in step1 (some may not have)

Project Requirements: SSRD 2.4 (PY)

PR01: Prime HW and SW will be used to run MasterNet System

Stakeholders' Assumptions:

Users:

1. MsterNet System Provides High Levels of Service

Developer:

1. Prime HW and SW will satisfy MasteNet Users' Level of Service Demands

Client:

1. Prime HW and SW Cost are within the Project's Budget limits

Step2: For each MBASE model, list the critical assumptions for each stakeholder identified in step1 (some may not have)

System Requirements: SSRD 5.0 (PD)

SR01:MasterNet Interfaces with Existing Software Applications
Running on the Bank's IBM Mainframe

Stakeholders' Assumptions:

Users:

1. MasterNet is Compatible with Existing Bank Applications

Maintainers:

1. MasterNet Integrates Easily with Existing Bank Applications

Step3: Identify assumptions that clash (SpiderWeb)

SSRD2.4:PR01: Prime HW and SW will be used to run MasterNet System

SSRD5.0:SR01: MasterNet Interfaces with Existing Software Applications
Running on the Bank's IBM Mainframe

Users

SSRD 2.4: PR01: MasterNet System provides High Levels of Service

SSRD5.0:SR01: MasterNet is compatible with existing bank applications

Client

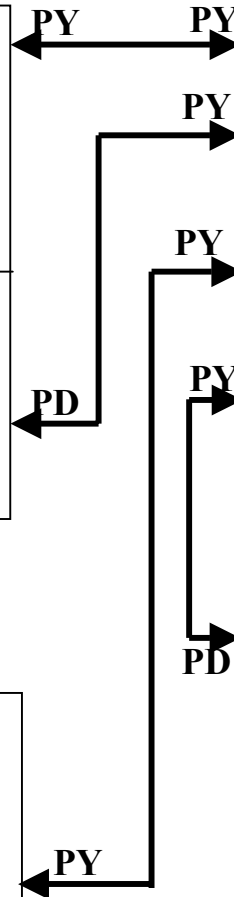
SSRD 2.4: PR01 Prime HW and SW cost are within the project budget limits

Developers

SSRD 2.4: PR01: Prime HW and SW will satisfy MasterNet users' level of service demands

Maintainers

SSRD5.0:SR01: MasterNet integrates easily with existing bank applications



Step4: Assess associated risk with each model clash

Assumptions:

- **SSRD 2.4: PR01: Developer:** MasterNet System Provides High Levels of Service
- **SSRD 2.4: PR01:Users:** Prime HW and SW will Satisfy MasteNet Users' Level of Service Demands

Risk: Prime HW and SW never been used in large scale projects, therefore it is uncertain if it can provide the needed performance levels

Consequence: Users will not use the system, therefore the customer will reject the product.

Calculate Risk Exposure:

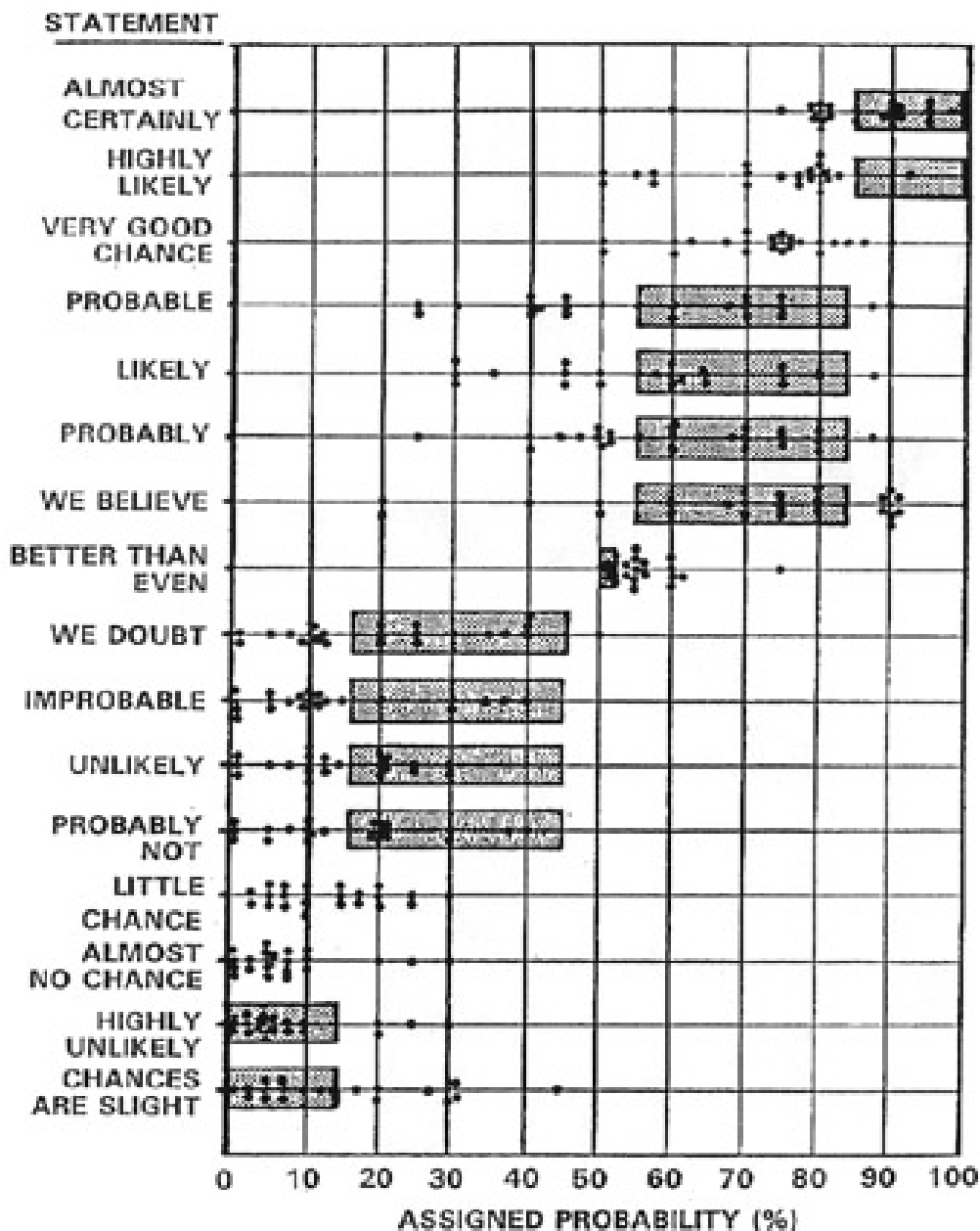
Probability Of Risk: 9 , Size of Loss: 9 , RE: 81

Clash-Resolution Approach:

1. Do large scale performance test → Budget + Schedule?
2. Buy new IBM HW & SW → Budget + Schedule + Functionality?
3. Buy another Vendor HW & SW → Budget + Schedule + Functionality?
4. Use Existing BofA IBM HW & SW → Functionality?

Risk Probability Assessment

WHAT UNCERTAINTY STATEMENTS MEAN TO DIFFERENT READERS



Step5:Report clashes into Model-Clash collection form

Model-Clash Source and Cause						Risk			
Model Clash Type	MBASE Section	Assumption	MBASE Section	Assumption	Associated Risk	P	R	RE	Clash Resolution Approach
PY-PY	SSRD 2.4	Prime HW and SW will Satisfy MasteNet Users' Level of Service Demands	SSRD 2.4	MasterNet System provides High Levels of Service	Prime HW & SW may not provide the needed performance levels	9	9	81	Buy new IBM HW & SW

Summary

- Identify the riskiest model clashes
- Report them in your project's weekly progress report
 - Report will be used for IVnV
 - Report will be further checked during ARBs
 - Good MC Work → Less risk → Less rework
- Separate grading points will be assigned to MC reports
- Report will be analyzed and graded rigorously