

Metrics for Managing Customer View of Quality: Recent Results

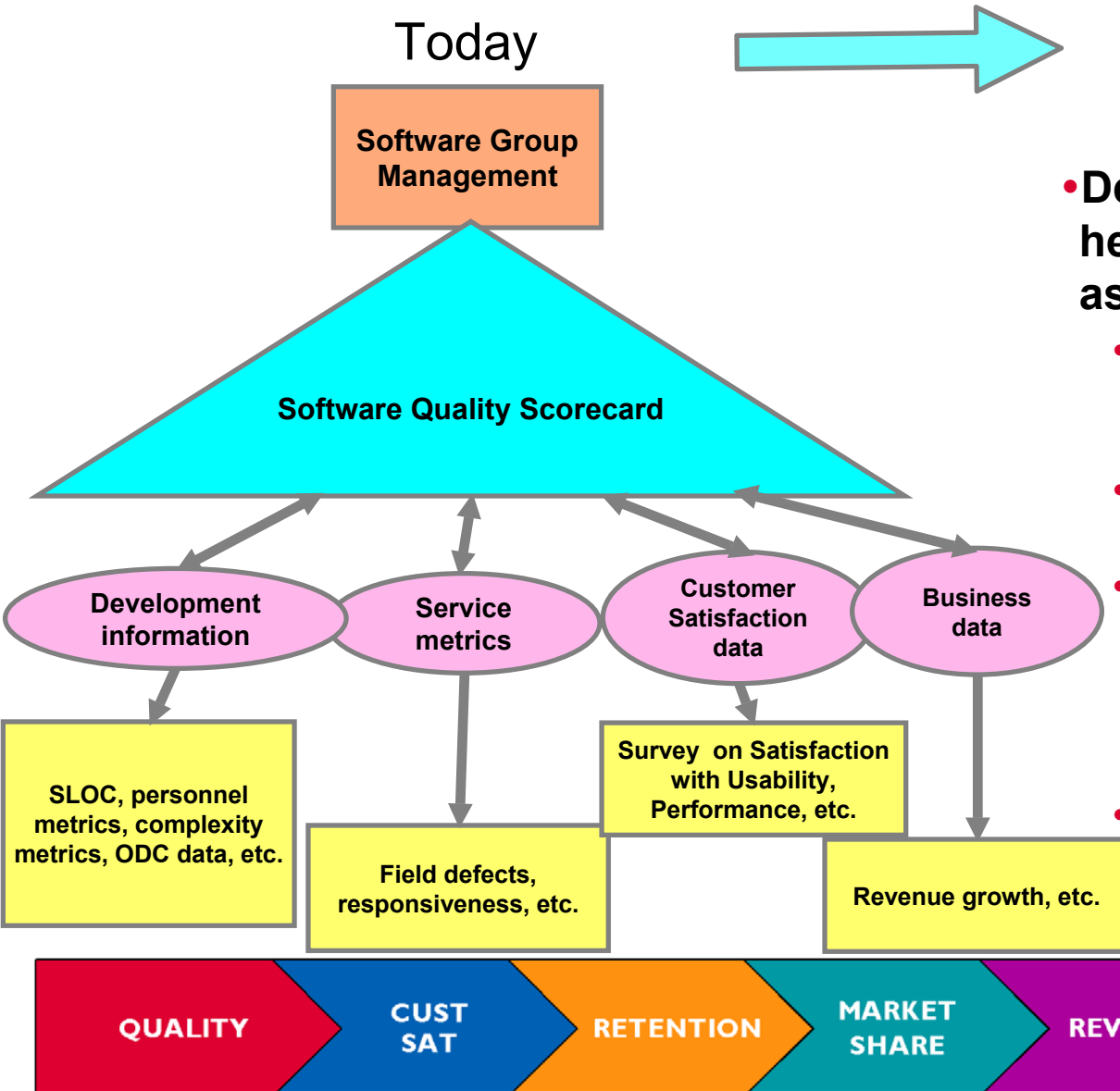
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October 2003

Information Needs of an On Demand Business

- On Demand business requires accurate and timely data – across the breadth of business operations.
- Data must inform executives and other decision makers
 - Not sufficient to simply present data.
 - Allow them to immediately understand situations
 - Enable them to respond quickly
 - Recognize and capitalize on opportunities
 - Identify and control costs
- Our prototype target domain is Software Products Development
 - Current practice: Executive business operation reviews
 - Relying mostly on manual data extraction and summary analysis as executive-level presentations
 - Labor intensive, error-prone, subject to interpretations and bias, and above all, not timely.

Knowledge Management across Product Life Cycle: **Vision**



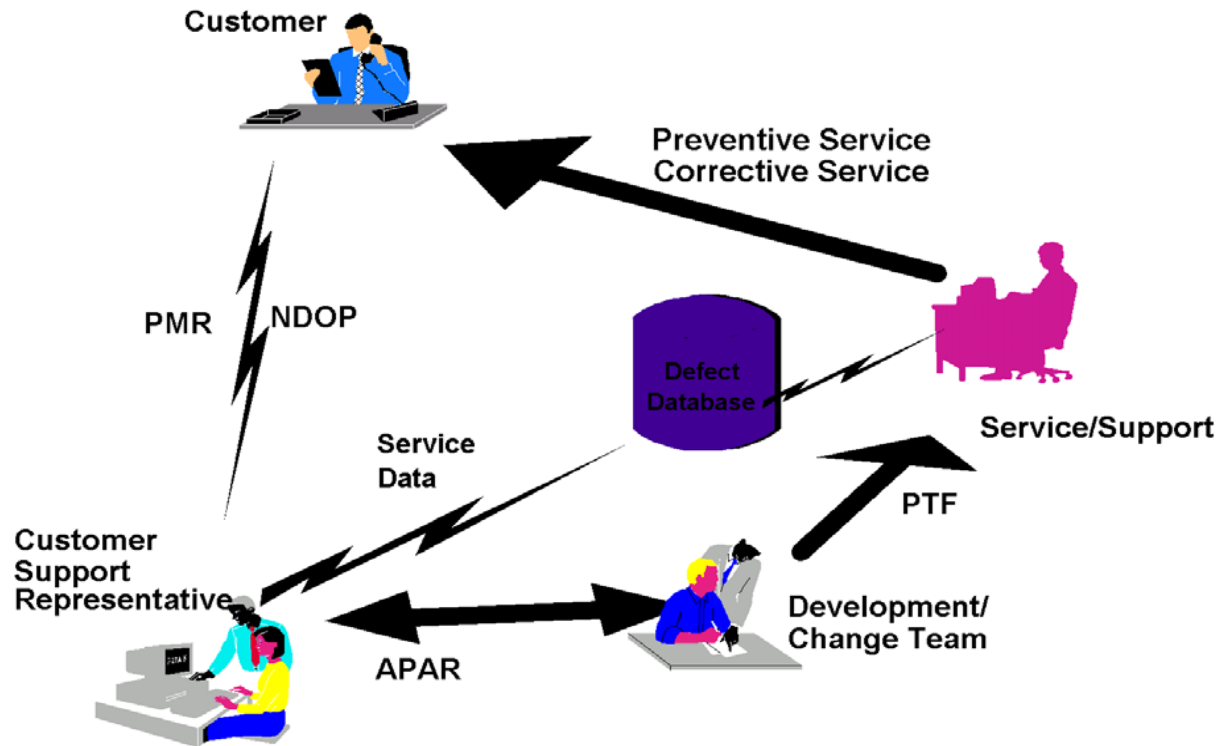
• **Decision Support System to help answer questions such as:**

- What can we do in Service to improve Overall Customer Satisfaction by 5%?
- What should we focus on to improve, say, Performance?
- How can we improve our product quality to retain our existing customers and acquire new customers, maybe achieve 5% annual growth?

• ...

Typical IBM Service Process and Data Collection: Customer Support

- Customer calls with a PMR which is recorded as a DOP (APAR) or an NDOP: a good metric to correlate to Cust Sat



- Alternately, service data may be critical situations

Customer Satisfaction Data for Software Products

C - Capability

U - Ease of Use

P - Performance

R - Reliability

I - Ease of Installation

M - Maintainability

D - Documentation

S - Service/Support

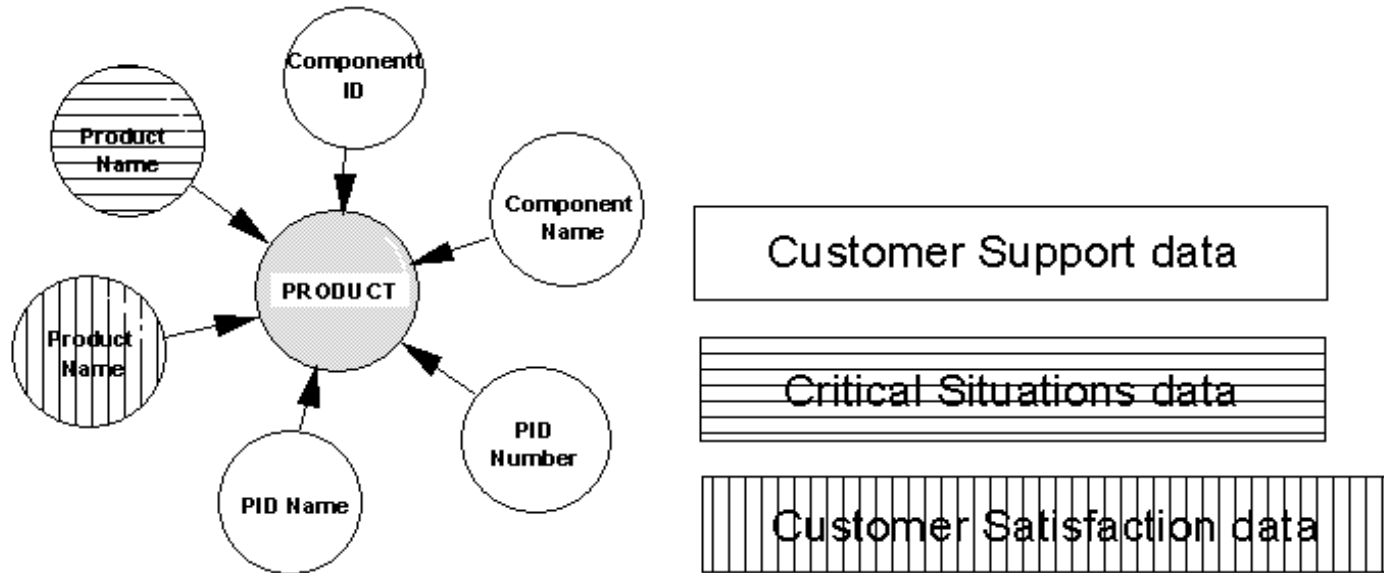
O - Overall Sat

... such as Price, Availability, etc.

For each of the dimensions, a qualitative scale is used which has ratings such as (i) Very Dissatisfied (ii) Dissatisfied (iii) Neutral (iv) Satisfied (v) Very Satisfied.

Net Satisfaction Index is computed using the responses on the rating scale as a weighted satisfaction index.

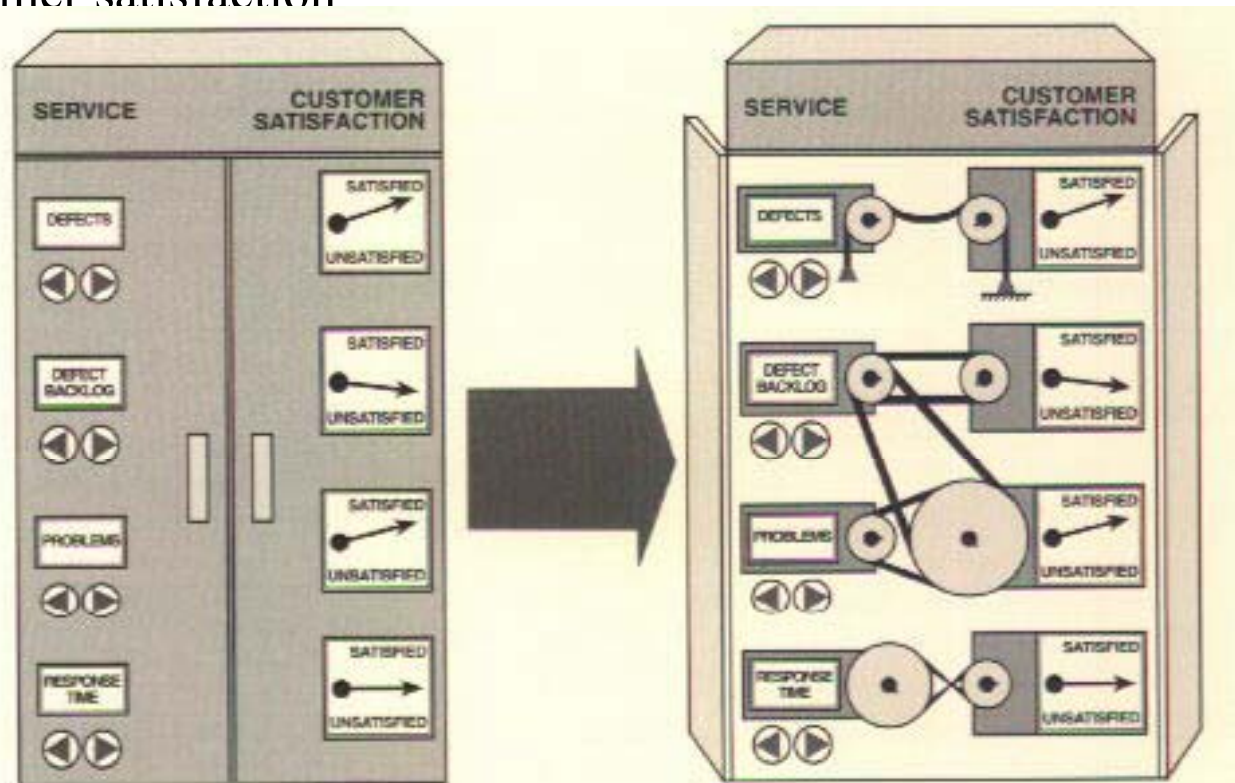
Information Integration



- Availability of data at the product level
- Availability of customer information
- Limitations imposed by the database design
- Limitations in analyzing structured and unstructured information together
- Different hosts systems

Advanced Analysis: Correlation Study Goals

- Determine the Service metrics that have the most impact on Customer Satisfaction metrics
- Determine whether the impact is positive or negative, i.e. does the satisfaction metric increase or decrease with changes in service?
- Determine the amount of time before changes in service can be seen to affect customer satisfaction



Analysis Steps

Create Integrated data tables



Perform robust regression across all metric pairs (Cust Sat and Service metric) for lags 0-6



Retain those pairs meeting threshold criteria (eg. $R^2 > 0.5$)



Retain subset of above pairs meeting business criteria (eg. consistency amongst products)



Derive decision support system incorporating significant relationships

Example of Robust Regression

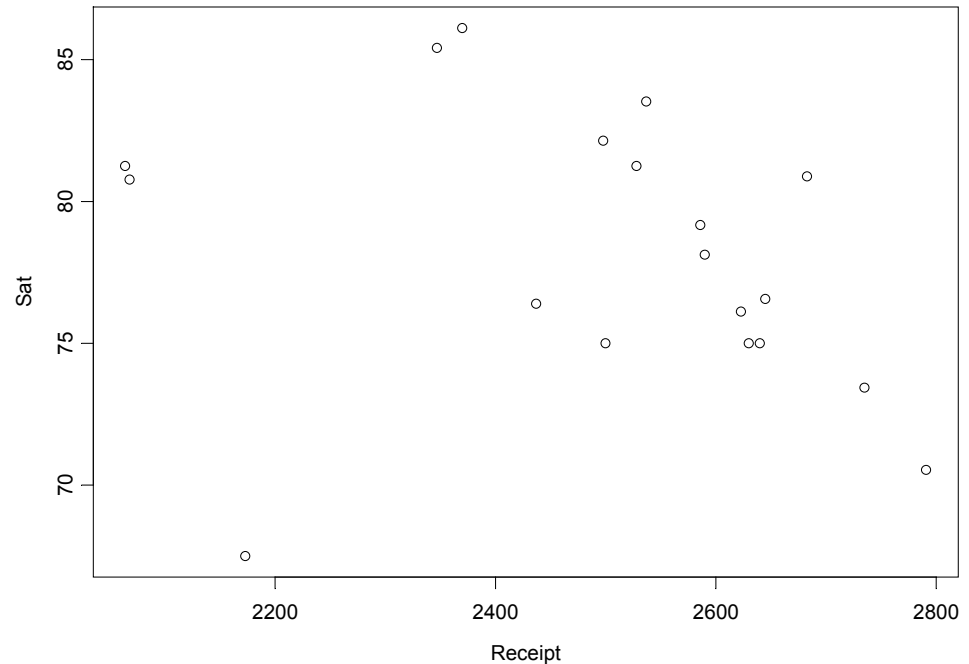
Sat.metric	CQDB.metric	lag	R2	Coeff	Product	# of repeats	# of products	positive reln	negative reln
Capability	PMR receipts	3	0.96	-0.036	Product 1	11	5	1	10
Capability	PMR receipts	6	0.53	-0.120	Product 2				
Capability	PMR receipts	4	0.75	-0.202	Product 2				
Capability	PMR receipts	2	0.91	-0.229	Product 2				
Capability	PMR receipts	5	0.93	-0.198	Product 2				
Capability	PMR receipts	3	0.95	-0.295	Product 2				
Capability	PMR receipts	6	0.67	-0.521	Product 3				
Capability	PMR receipts	3	0.57	-0.209	Product 4				
Capability	PMR receipts	5	0.61	-0.306	Product 4				
Capability	PMR receipts	6	0.96	-0.758	Product 4				
Capability	PMR receipts	2	0.53	0.171	Product 5				
Reliability	Crit Sit Recpts	2	0.64	-9.08	Product 3	4	4	0	4
Reliability	Crit Sit Recpts	3	0.54	-9.58	Product 2				
Reliability	Crit Sit Recpts	5	0.91	-87.5	Product 7				
Reliability	Crit Sit Recpts	2	0.71	-32.29	Product 4				

Highly Correlated Metric Pairs

Cust Sat Metric	Service Metric	# of repeats	# of products	#of +ve relns	#of -ve relns
Capability	PMR receipts	11	5	1	10
Reliability	Crit Sit receipts	4	4	0	4
Overall Satisfaction	PMR receipts	7	3	6	1
Reliability	PMR backlog index	8	4	1	7

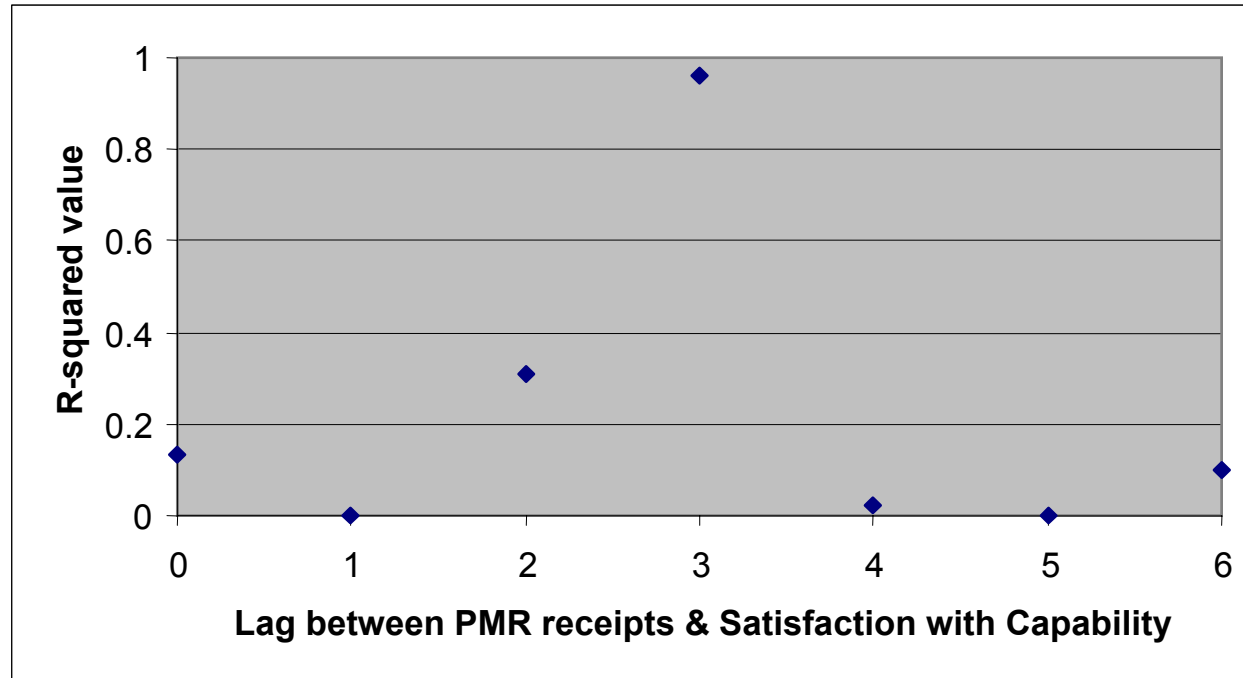
Example of Results

- The pair <Satisfaction with Capability, PMR receipts>
 - Significant ($R^2 > 0.5$) 11 times
 - Representing 5 products
 - With a mostly negative relationship (10 times negative and 1 time positive)
- As PMR receipts increases, Satisfaction with Capability decreases
- For Product 1:
 - As PMR receipts for a particular month increases by 100 PMRs then Satisfaction with Capability decreases by 3.6% after 3 months.



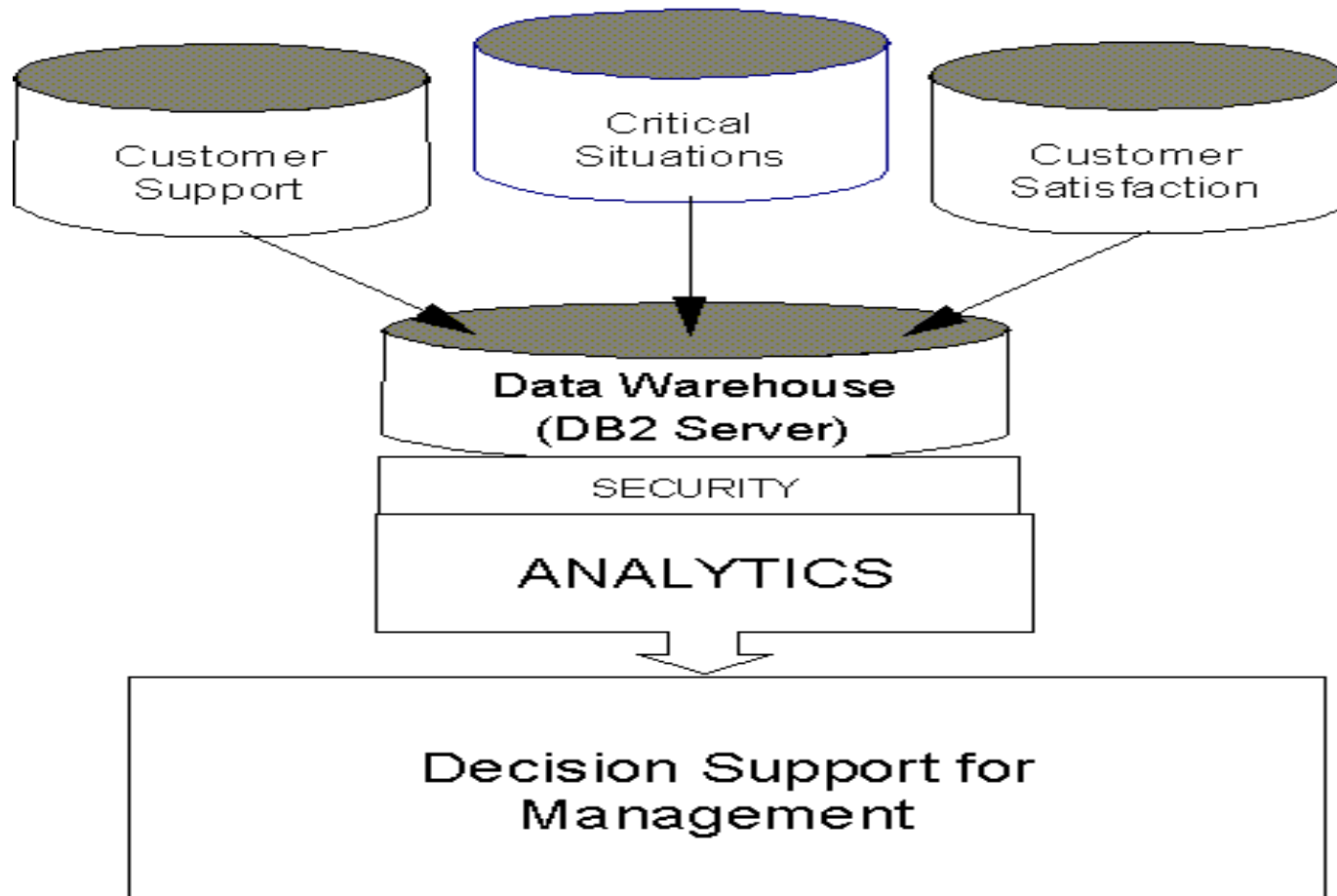
Sat.metric	Service.metric	Lag	R2	Coeff.
Capability	PMR receipts	3	0.96	-0.036

Example (continued)

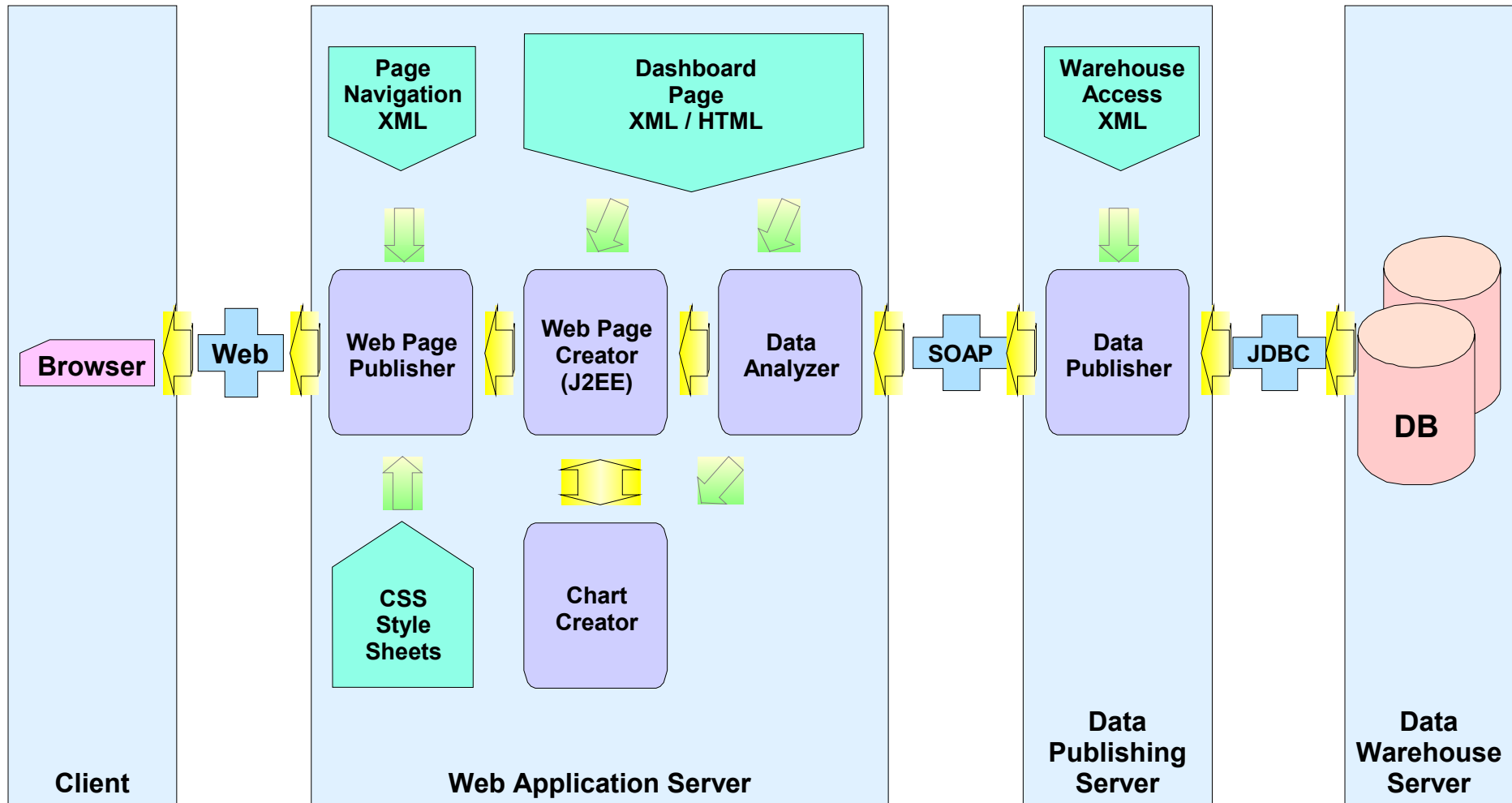


- For Product 1: Lag 3 is the most significant for the relationship between PMR receipts and Satisfaction with Capability.

High-Level Design



Implementation



Snapshot of Executive Dashboard tool

Product group:

Period ending:

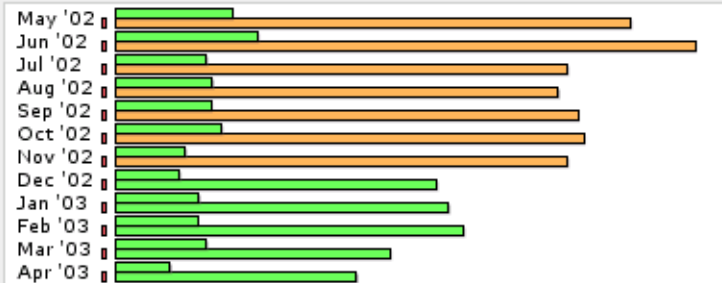
Satisfaction



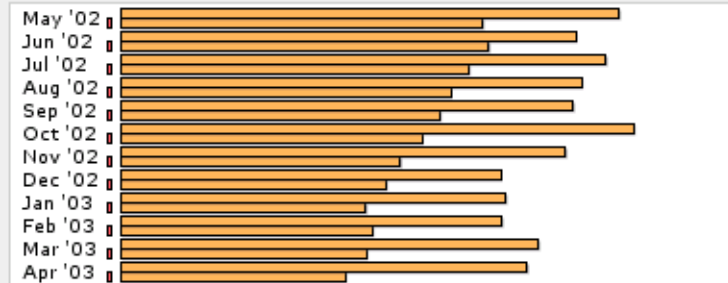
Priority 1 Responsiveness



APARs



PMRs



Customer Situations

