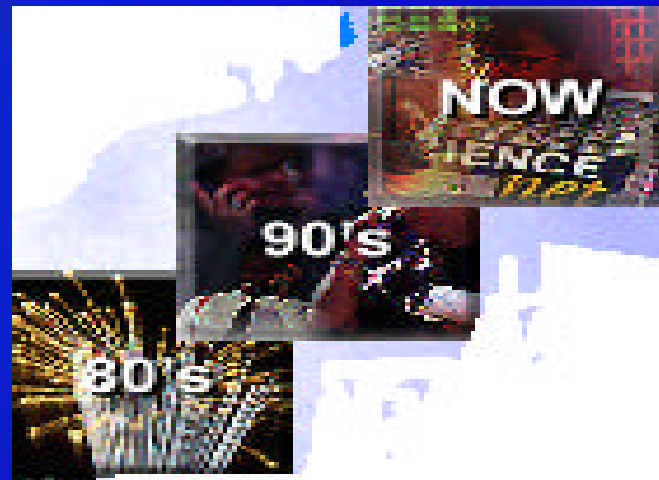
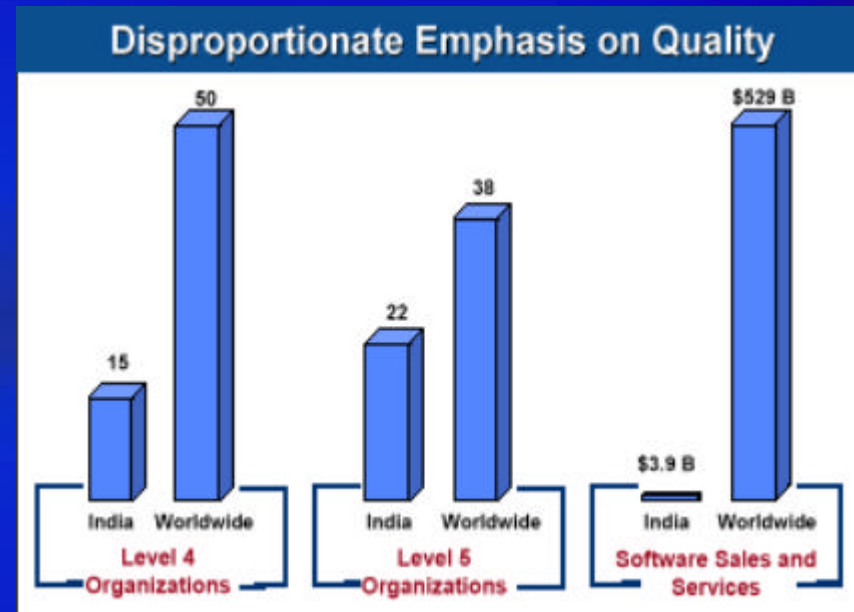
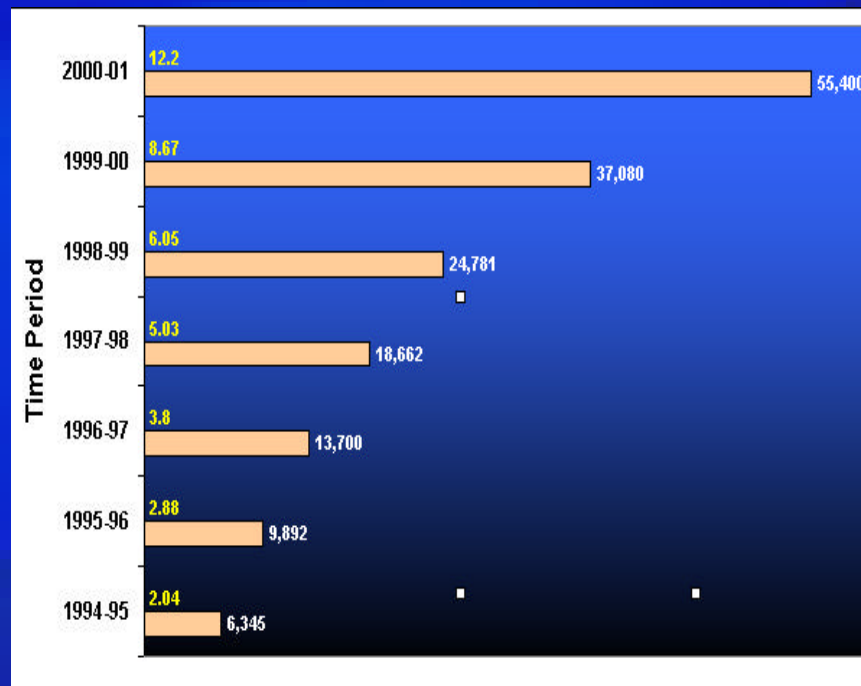

Software Reliability engineering ISSRE 2001

Business Value of Quality



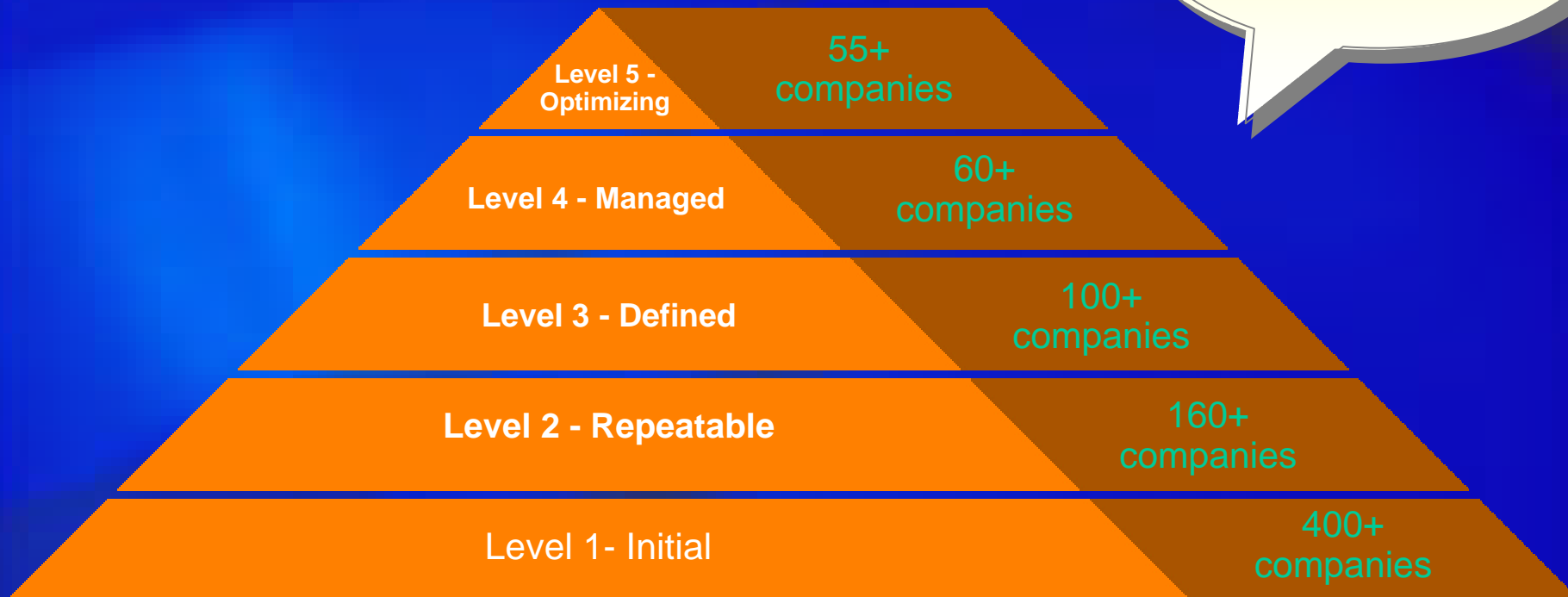
The Process Journey Indian S/W industry

- *Scaling up process maturity*
- *CMM Level 5 and software factory*



Distinctive business drivers for process wrapping

The Process Journey a/c



"Only 58 organizations across the world have acquired Level 5 assessment"

The quality maturity of Indian software industry can be measured from the fact that already 201 Indian software companies have acquired quality certification and about 64 more companies are in pipeline

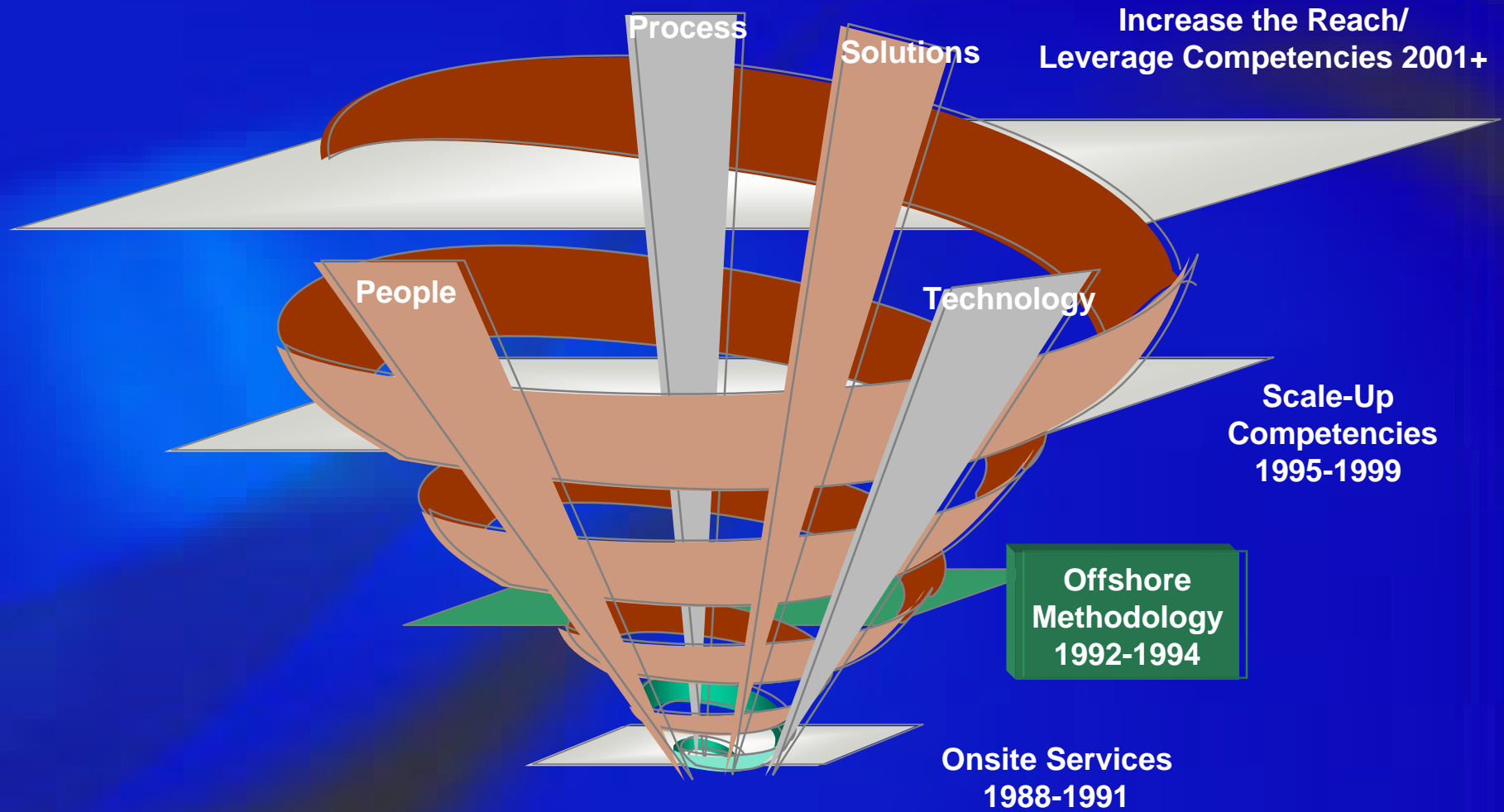
Satyam's growth

Revenue & Manpower

Year	1995	1998	1999	2000
Revenue (US\$Mn)	12.09	87.94	156.22	287
Manpower	300	2498	4040	9,700
↓ in effort variance		22%	34%	41%
↑ In Productivity			15%	21%

Driven by mature processes

Evolution



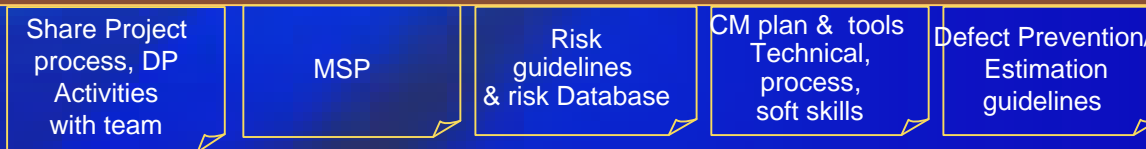
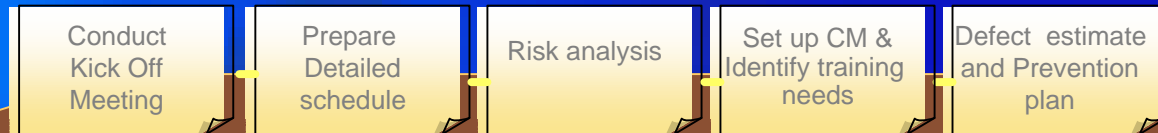
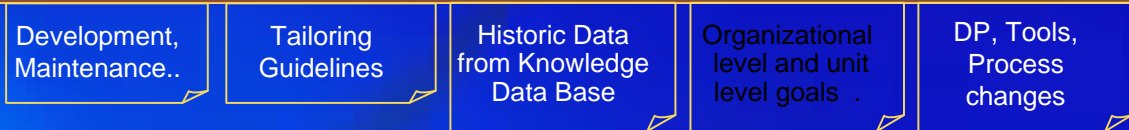
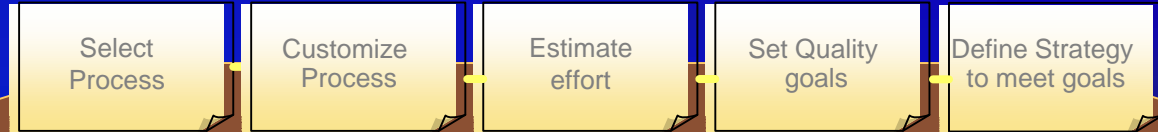
Guided by Innovation....

Satyam Computer Services Ltd

How did we do this?

- CTQs
 - Tools
 - predictability and Visibility
-

Project Cycle



Project Plan



Perspectives, Roles and Metrics



**Business
Orientati**



**Proces
Oriente**



**Technic
metrics**

Time to Market	Functional Behaviour, Time to Market	Reliability, Performance, Stability
Productivity, Code re use. Review effcncy	Schedule Deviation Effort Deviation	% of zero Defect Chng rqsts
Fault Density,	Phase Wise Defects	Change Requests

**Development
Staff**

**Project
Management**

**Business
Management**

Typical Usage Scenario

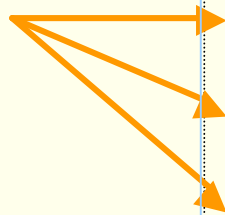


Business Head

Project Compliance Sheet

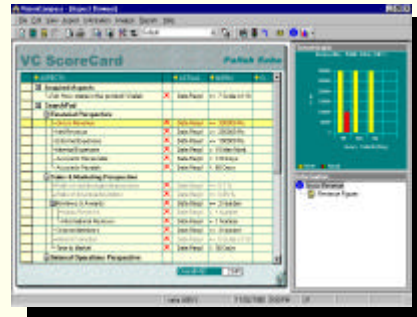
Support Group Scorecard		Team A Scorecard	
Strategic Objective	Measure	Control Store Costs	Team Measure
2 Control Store Cost	Cost psf by division	Reduce Point Cost Reduce Store Assembly Process Reduce Store by Construction	Customer Satisfaction Cost of Stores Store Cost
4 Customer Partnership	# of cooperative / productive effort	Customer Relationships Reduce Store with 20% & 40% of production stores Reduce Store with 20% & 40% of specialty licensed stores Reduce Store with 20% & 40% of specialty licensed stores	Customer Satisfaction Number of sign with the Division All members work in store
Construction Excellence	Time / quality and cost standards met	Construction Excellence Area covered by stores open in 12 weeks Store open cost savings	Customer Satisfaction Documented cost savings
4 Optimize People Resources	% of people qualified for key positions	Optimize People Resources Provide cross training Store in different stores	Customer Satisfaction Number of sign with the Division Assignment in different stores

KPAs
Goals
KPs



Project Manager

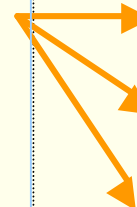
Project Performance Sheet



Group Aspect

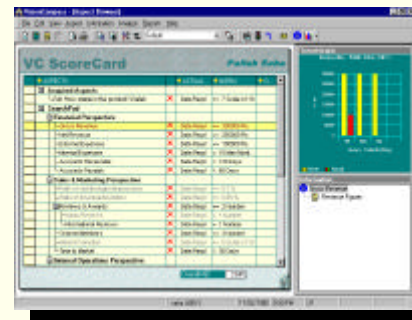
Group Aspect

Group Aspect



Project Leader

Performance Sheet



Aspect

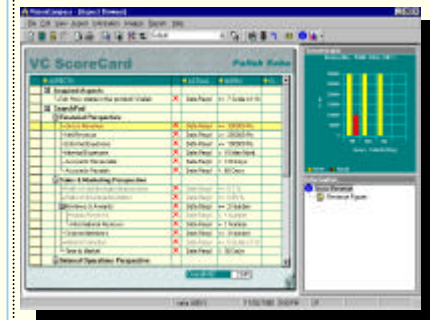
Aspect

Aspect



Team Member

Performance Sheet



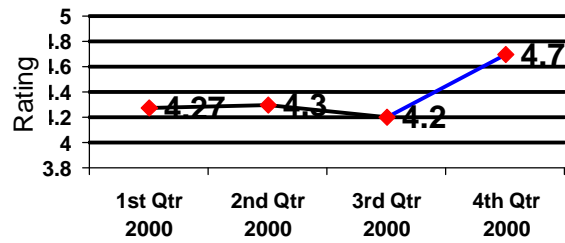
Aspect

Aspect

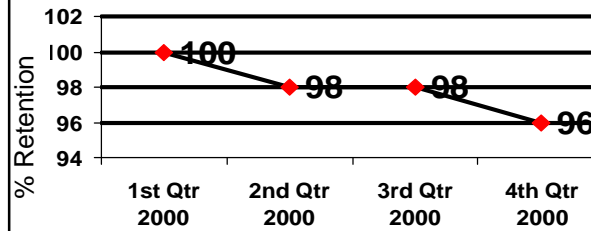
Aspect

Performance Metrics Q4 - 2000

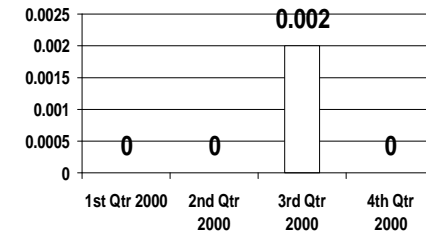
Business Rating



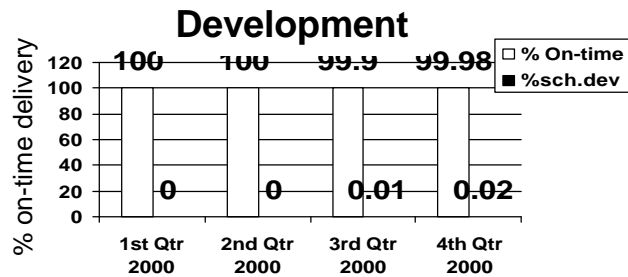
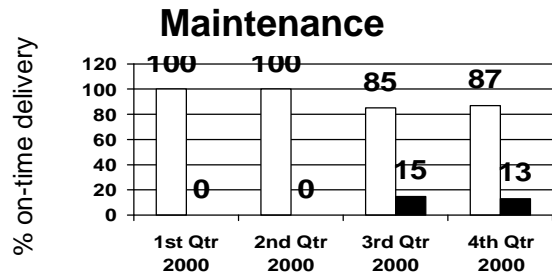
Retention Rate



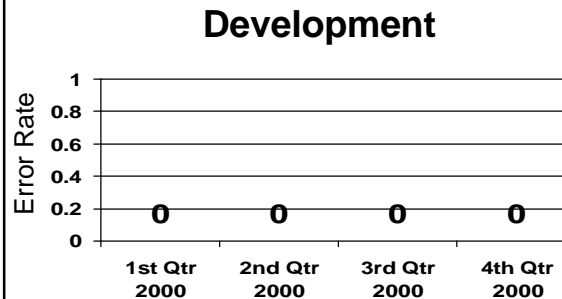
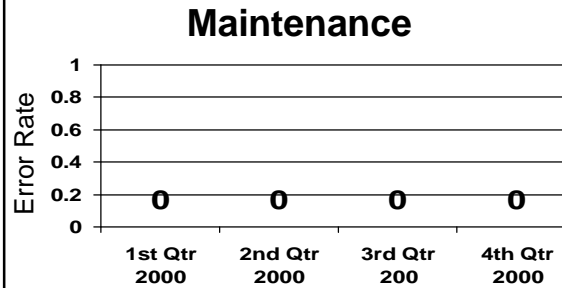
Idle Time Billed



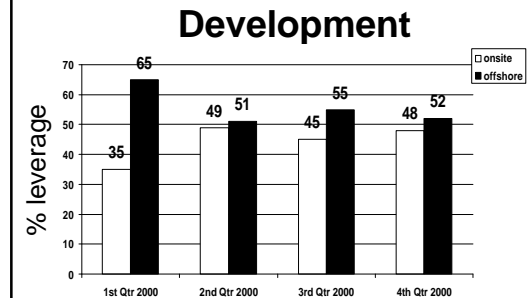
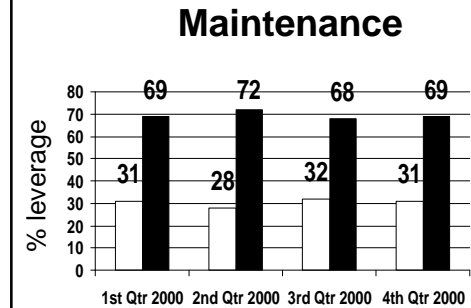
On-Time Delivery



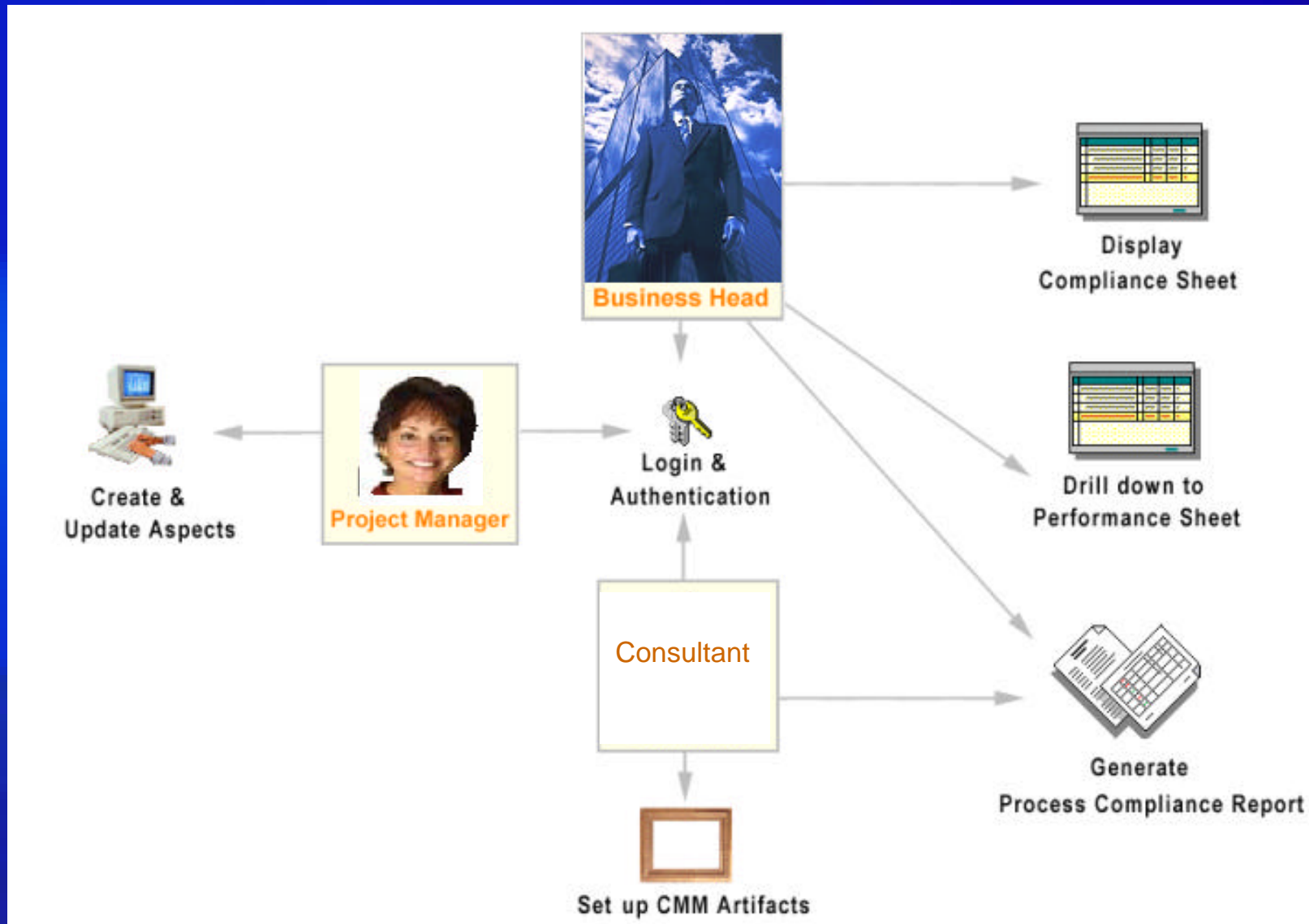
Field Error Rate



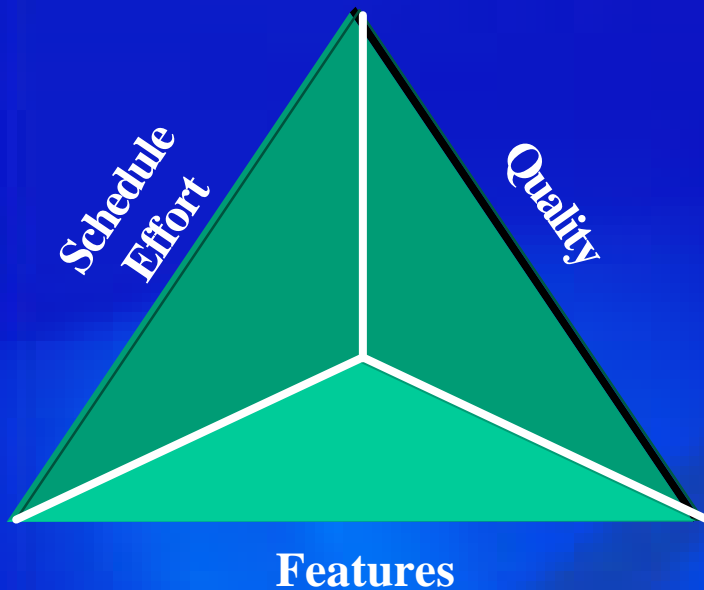
Man Power Leverage



Enterprise View of CMM Scenarios



Predictability and visibility



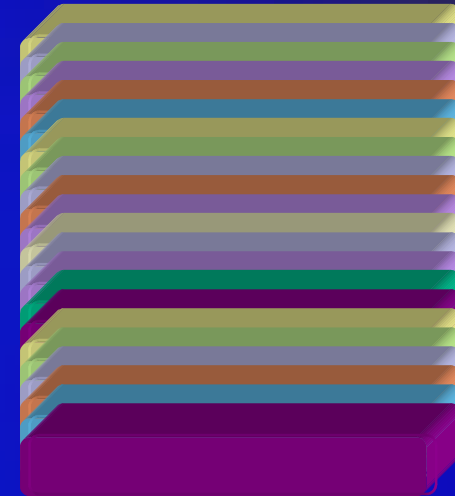
f unction of (effort deviation, Defect density, productivity, zero defect request delivery)

Increased project predictability in three ways:

- **Accuracy** : Decrease difference between goals and actual
 - **Variability** : Increase the number of projects which achieve their goals
 - **Performance**: Improvement of the goal itself as continuous process
-

Case Studies

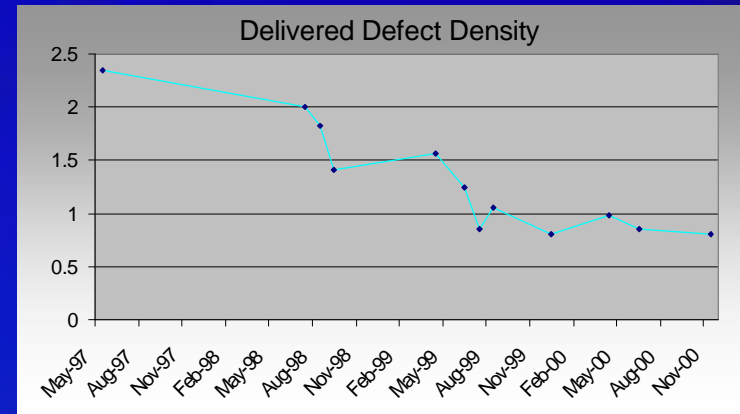
- ▶ Metrics driven APAC ODC (Development)
- ▶ SLA driven Maintenance ODC
- ▶ Capacity based development ODC
- ▶ Design Studio
- ▶ Development project Look Ahead design review



Business Value and Results

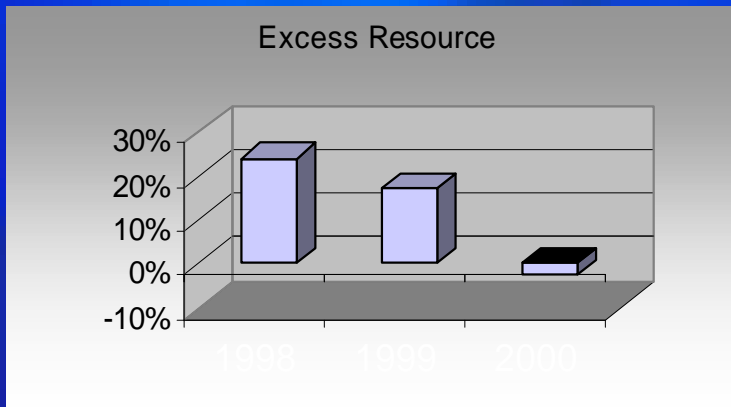
BUSINESS VALUE

✍️ 25 Million\$ saving
✍️ 29% to 52 % market share



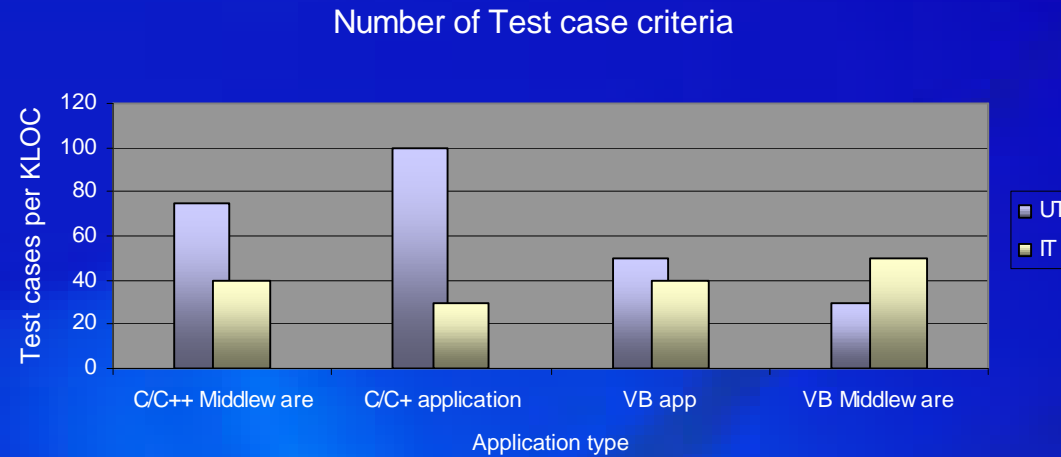
ODC Results

✍️ 112 out of 120 deliveries on time
✍️ Average 17% excess resources were used. Now reduced to 2.5 %



Metrics driven process tuning

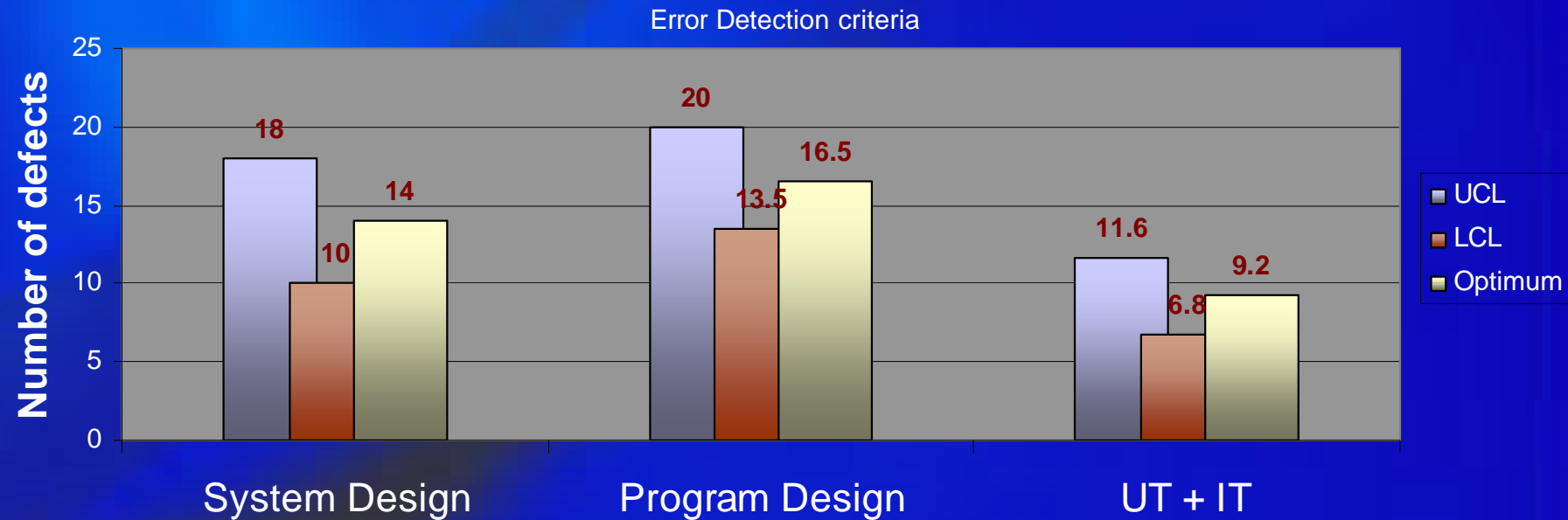
Software factory



Define Success and Failure

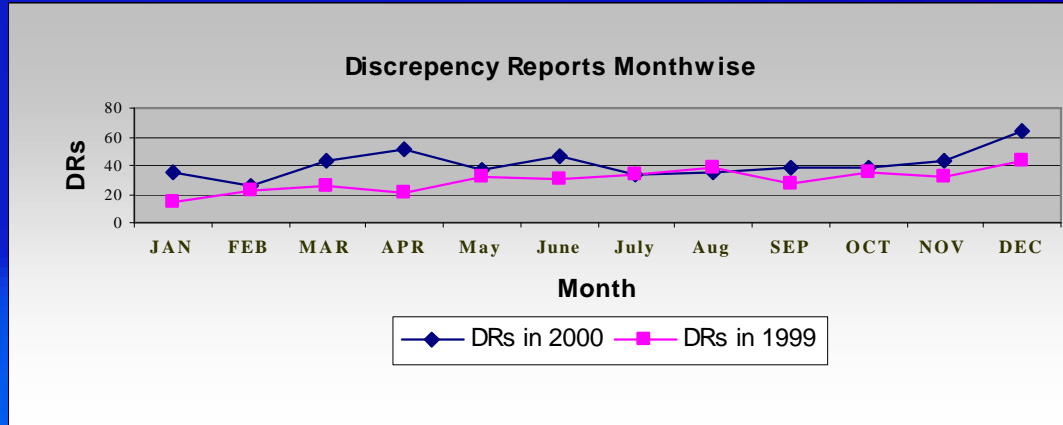
Phase-wise alignment

Software production line



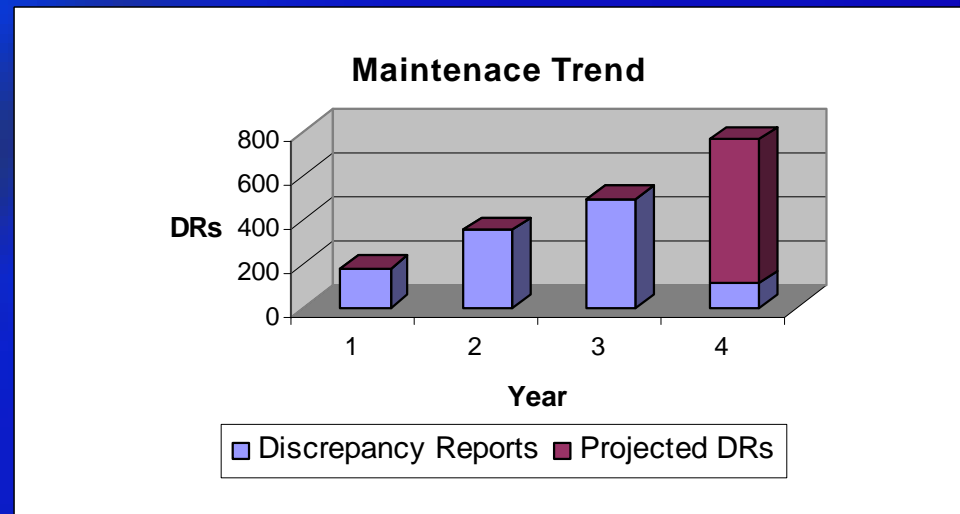
Process tuning by threshold management

ODC for specific Maintenance



Facts

- 15% staff reduction in 2 years.
- 60% improvement per year in bugs solved per FTE.
- 2 fold improvement in MTTR



Medium Size projects

Old data

Effort Variance : 30
Delivery on Time : 3 out of 8
Test effort : 50%
Customer Satisfaction : 3

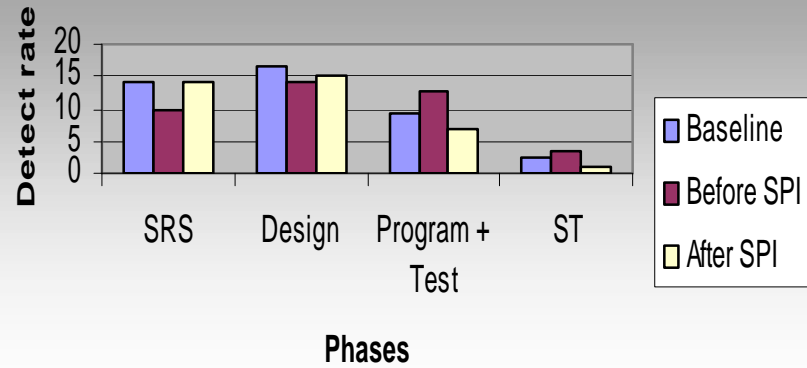
Process enhancements

Effort Variance : 6.2
On Time delivery : 7 out of 8
Test effort : 30%
Customer Satisfaction : 4.5

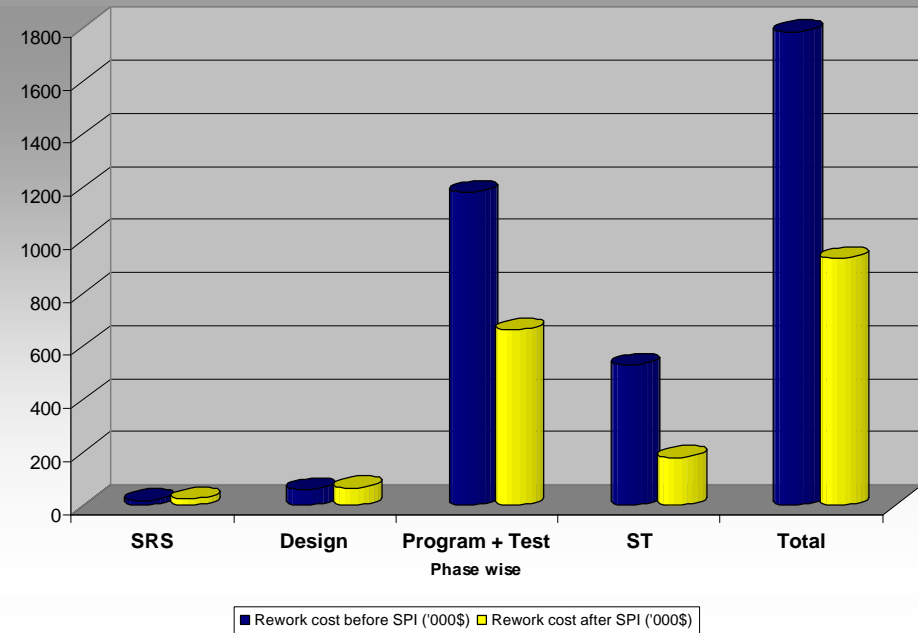
Improved Data

Benefits

Phase-wise defect detection rate



Benefits



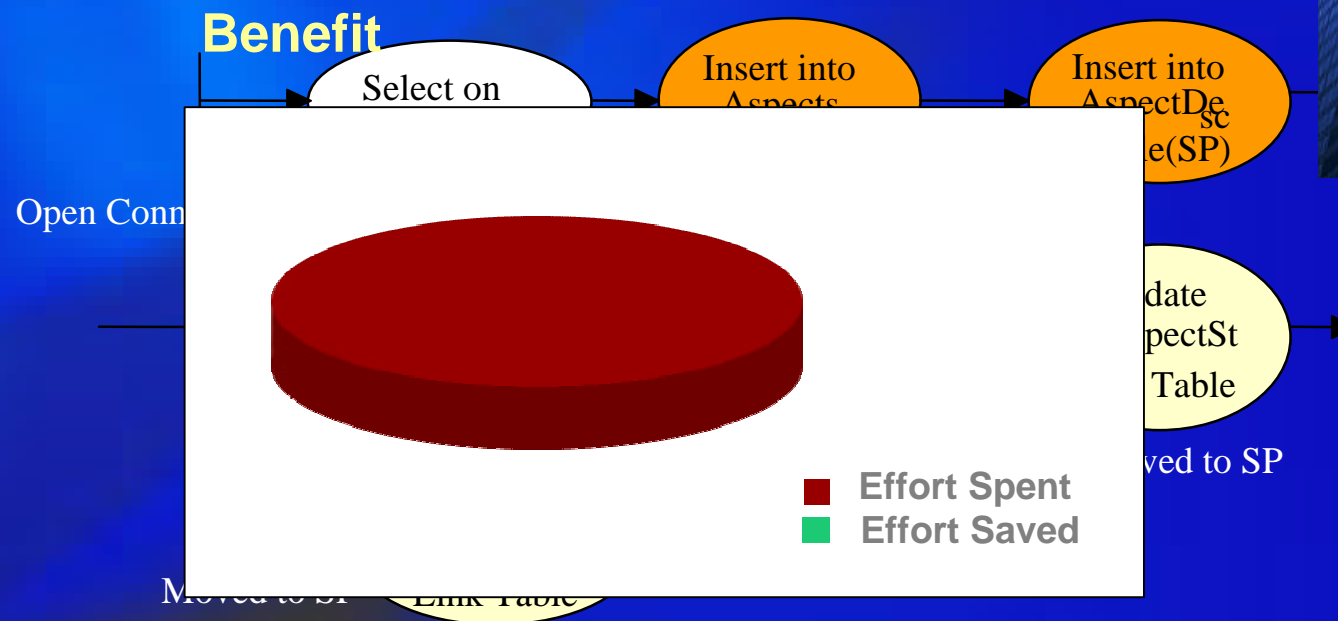
Looking Back...Looking Ahead...

Look Ahead - Concurrency

- ✍ 10 most often used Use Cases
- ✍ Transaction Analysis using Diagrams – Transaction Span Diagram



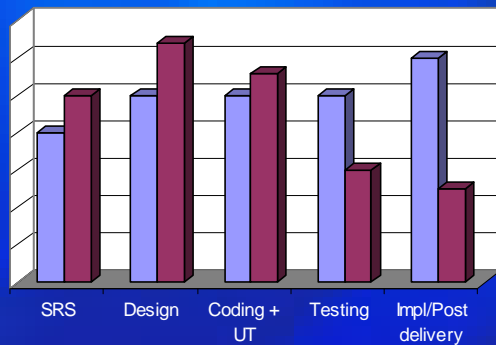
Transaction Span Diagram



Development project Look Ahead design review

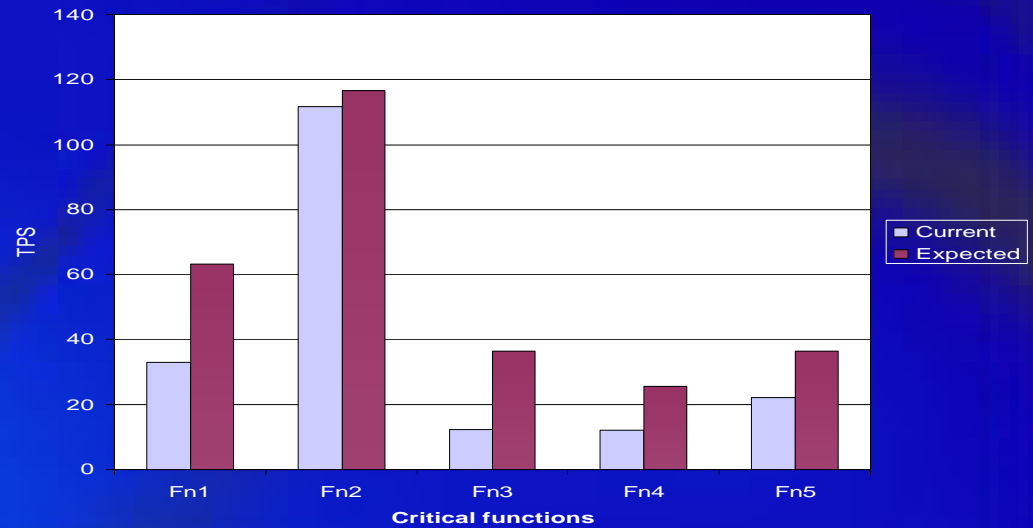
- ✍ Project Details
- ✍ Type: E-Commerce
- ✍ Domain: Cable TV, DTH
- ✍ 250 Kloc/ 20 Myrs: 30

Development Effort reduction

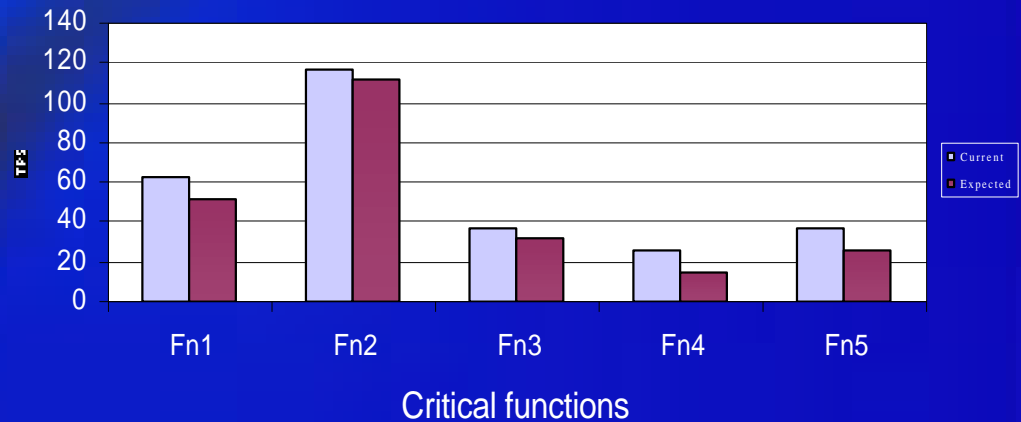


- ✍ Caching
- ✍ Query optimization
- ✍ Threading
- ✍ Connection pooling

TPS with current design

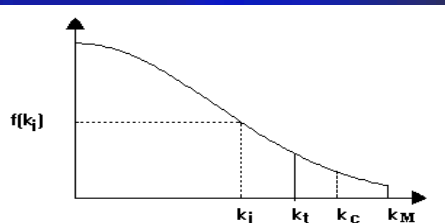
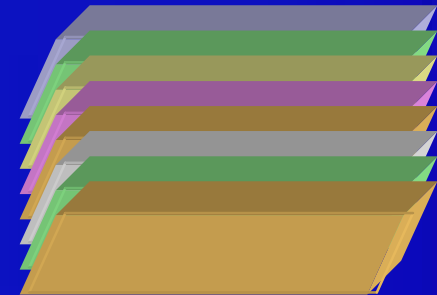


TPS after optimization



Some of the best current practices

- ✍ Team Feedback
- ✍ Use case scenario driven peer review
- ✍ Base the process on an architecture-first approach
- ✍ Design methods to emphasize component based development
- ✍ Buyer and Seller across phases
- ✍ Past metric driven Test planning

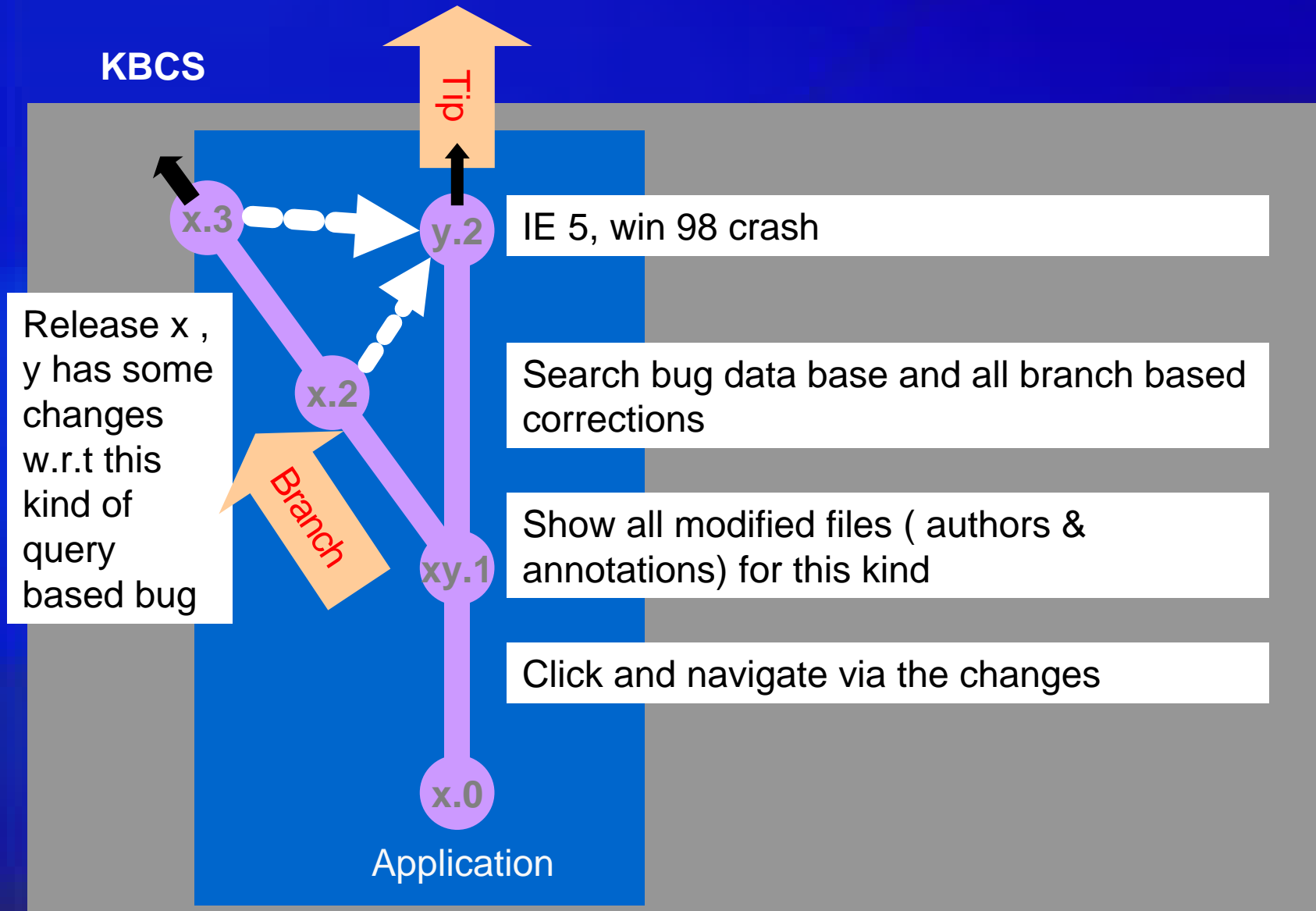


Real Time data on process

What is our Roadmap ?

- Six sigma DPMO
 - Programmer productivity portal
 - Knowledge Management
-

Programmer Productivity Model

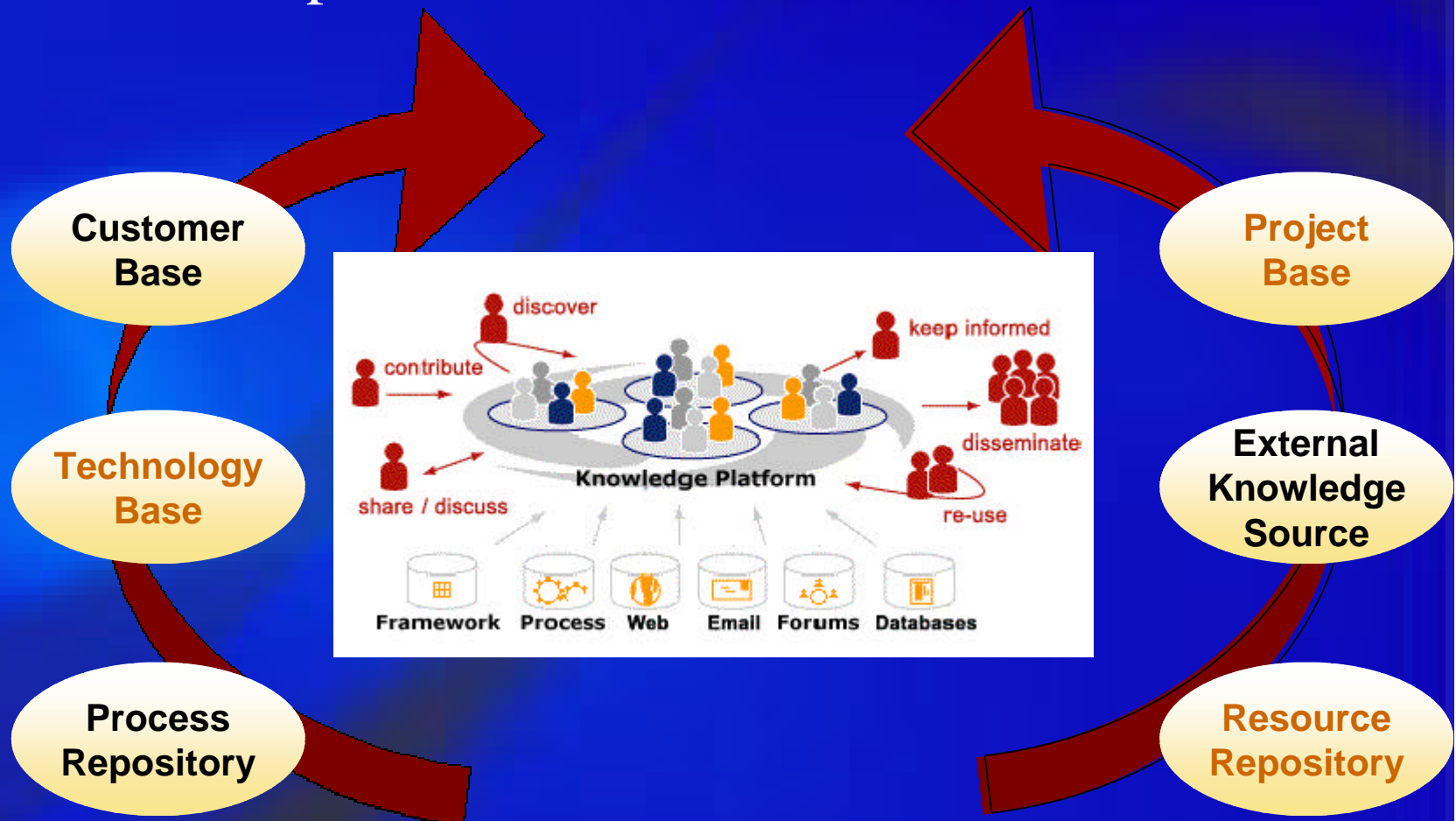


Knowledge Portal @ Satyam- Conceptual View

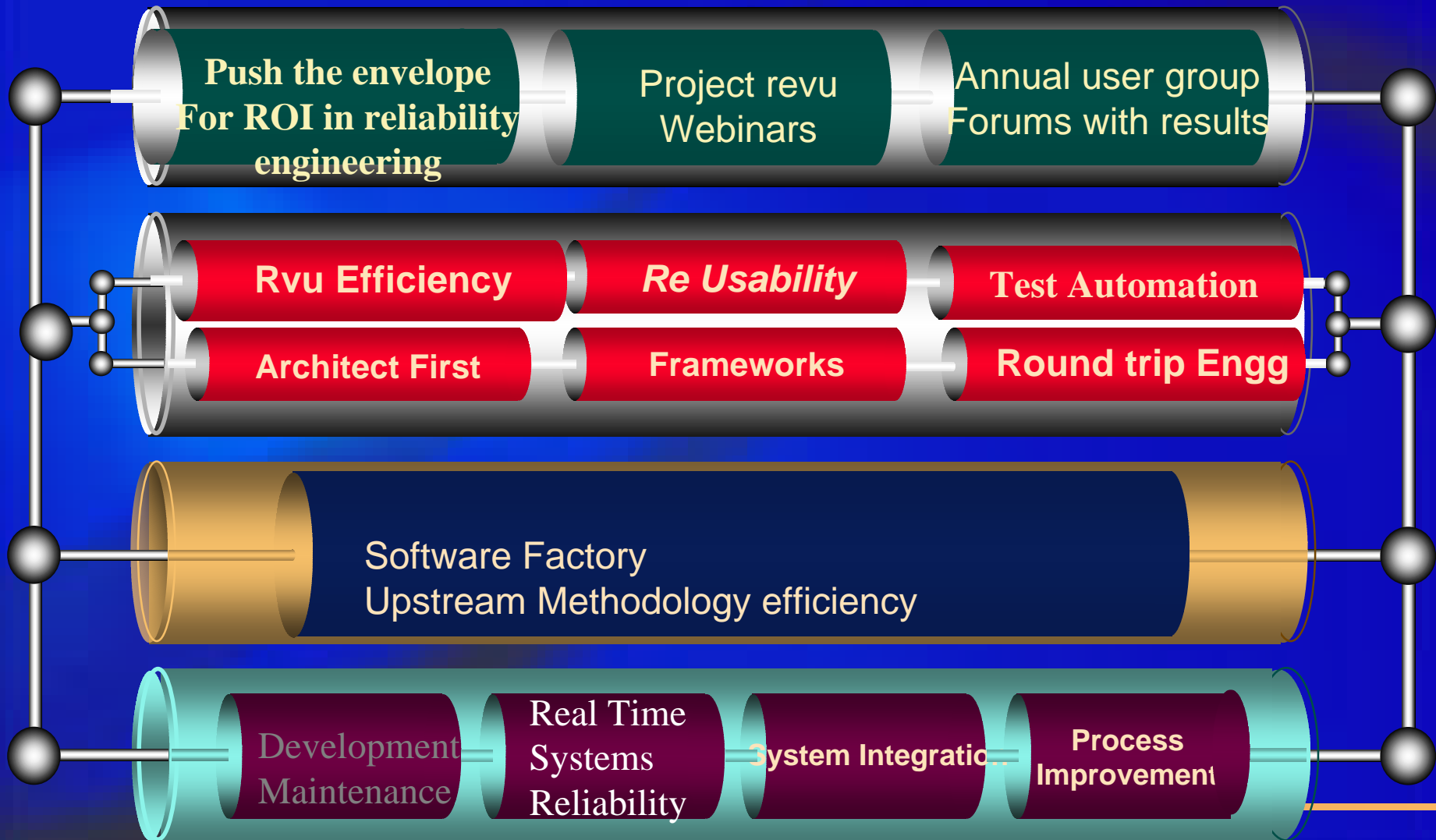
Developer Resource Portal

2002

2005



Q#



Launched e^{SCM} with CMU

Real Time Project Information

Access to Customers

Team Productivity

Halls of Fame & Shame

SIG forums

- Performance
- Reliability
- On Time

Risk Tracking Dashboard

Root Cause Analysis promotion

Knowledge Base with institutionalized

Organizational Memory

Force Multiplying Tools And Techniques.

Text Mining
New workflow bench

Unleashing the New era of software reliability .

Invest in re usable frameworks.

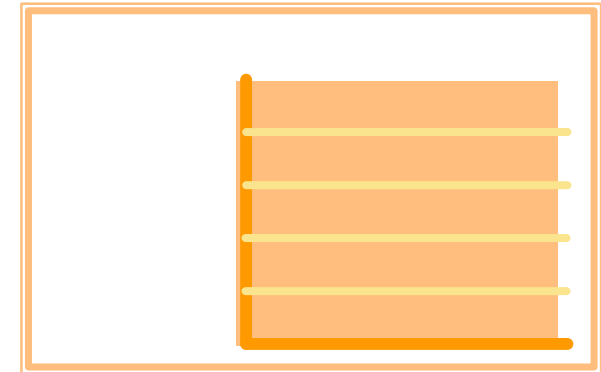
Light weight Methodologies

We are getting ready for another long haul.

Indian Software Industry

Faster,
More reliable.
Now and Next Generation.

**“Who looks outside
dreams; who looks inside
awakes” Carl Jung**



**Every Defect is a Treasure
Treasure Hunt continues**

Thank You

Kalyan@satyam.com
