‘Building Mission-Critical IT systems’
an Exciting and Fulfilling Journey

Dr Deepak B Phatak, Umesh Bellur, Om Damani
Kanwal Rekhi Building
Department of Computer Science and Engineering
IIT Bombay

Presentation at Institute award lecture series

IRCC, 17 August 2011
Mission Critical Systems
Must function …
Correctly
Continuously
- Disaster Recovery
Effectively
- Response time
- Throughput
- Cost per transaction
Some Characteristics
LoC: 1 Million +
Typical life - 20 Years
- Change is the way of life
- Software changes are "special"
- Growth in Volumes
- Number of transactions
- Number of users
- Technology obsolescence
Depository System
Trading in Stocks (shares)
Settlement
Transfers
Reconciliation
Processing Window
- Daily cycle
- EoD duration
Existing System
- CICS, COBOL, DB2
- IBM Mainframe
1595 MIPS

- 3 Lakh Transactions/Hour
Projections – Tx/Hour

3rd Year - 5 L (20L/day)
5th Year - 10L (40L/day)
Projections – No of users

3rd Year - 160L
5th Year - 200L
Projections for 10th Year

- Peak Tx/Hour 40L
- No of Users 500L
Decision to rewrite
- Multi-tier Architecture
- Java, App Servers
- DBMS

- Query Parallelism

- Partitions
- Product agnostic
Expectations
- Better performance
- Superior Scaling
- Lower cost
Proof of Concept
- Rewrite sample TXs
- Run on Multiple platforms
The ‘Rewrite’ Project
NSDL to manage
TCS to execute
IIT to advise
Architecture, Design
Use of ‘Hibernate’
- Reviews at each stage
Development, testing
The ‘story’

- after 400 person-years
Performance: Throughput

13 L Tx/Hr on 890 MIPS
13 L Tx/Hr on 890 MIPS

As against

3 L Tx/Hr on 1595 MIPS
Performance:
Typical turn-around time

2 Minutes
2 Minutes

As against

30 to 40 minutes
The people

- who ‘wrote’ this story
IIT Bombay

- Om Damani
- Umesh Bellur
- Deepak Phatak
TCS
- Shekhar Shukla
- Manish Dhall
- Sunil Batra
- ...
NSDL

- Rajesh Doshi
- Yatin Nerurkar
- ...
The Visionary Leader

Chandrakant Bhave
And the New system

- happily lives hereafter