# Using Process Maturity to Better Integrate IT within Business

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**TeraQuest**

# Recent Gartner Projections

**By 2003, 75 percent of IS organizations will refocus their role on brokering resources and facilitating business-driven demands, rather than on being direct providers of IT services**

**The CMM® is increasingly the standard by which outsourcers will be evaluated**

® Capability Maturity Model, CMM, and CMMI are registered with the U.S. Patent and Trademark Office

# Crisis-Driven IT Organizations

**Inaccurate estimates**
inaccurate requirements
no historical data
schedule/resource shortfalls

**Ad-hoc Processes**
improvised
continually reinvented
sacrificed to schedule

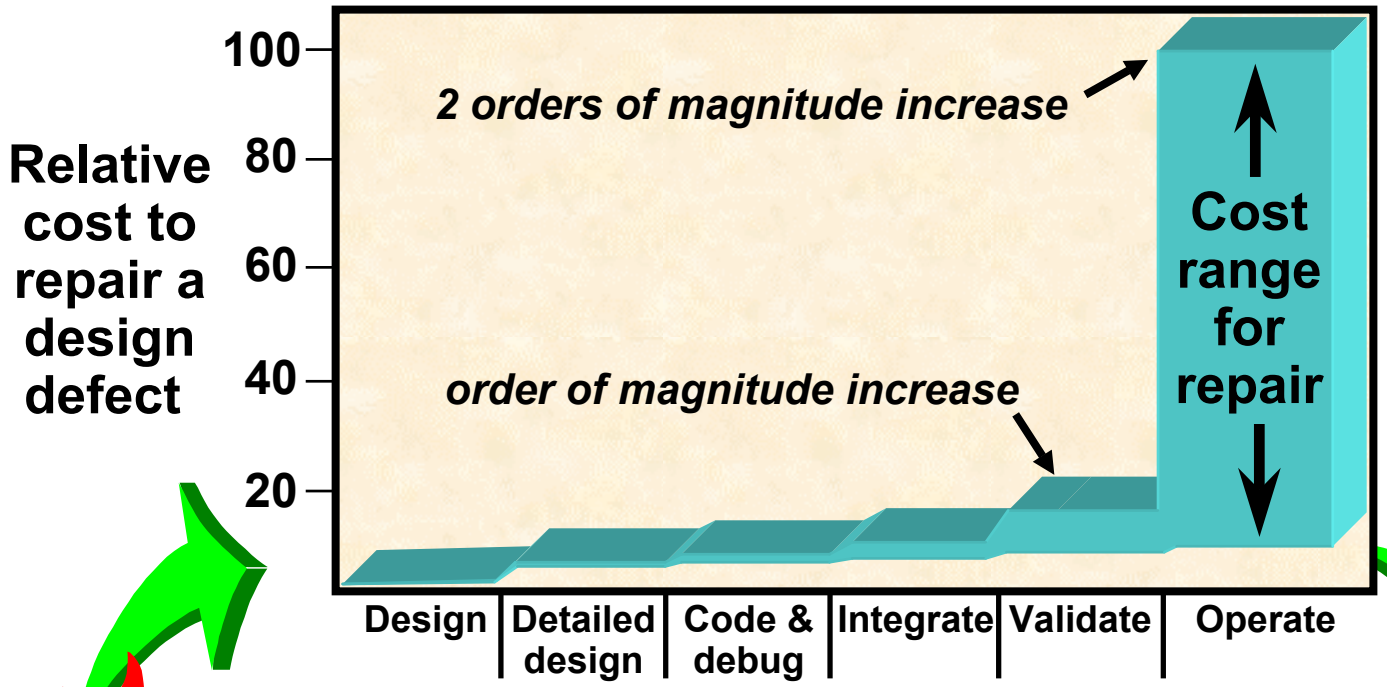
**Survival**
heroes
overtime
fire-fighting

**Results**
late
too costly
defect-prone

**Volatile baselines**
changing requirements
uncontrolled versions

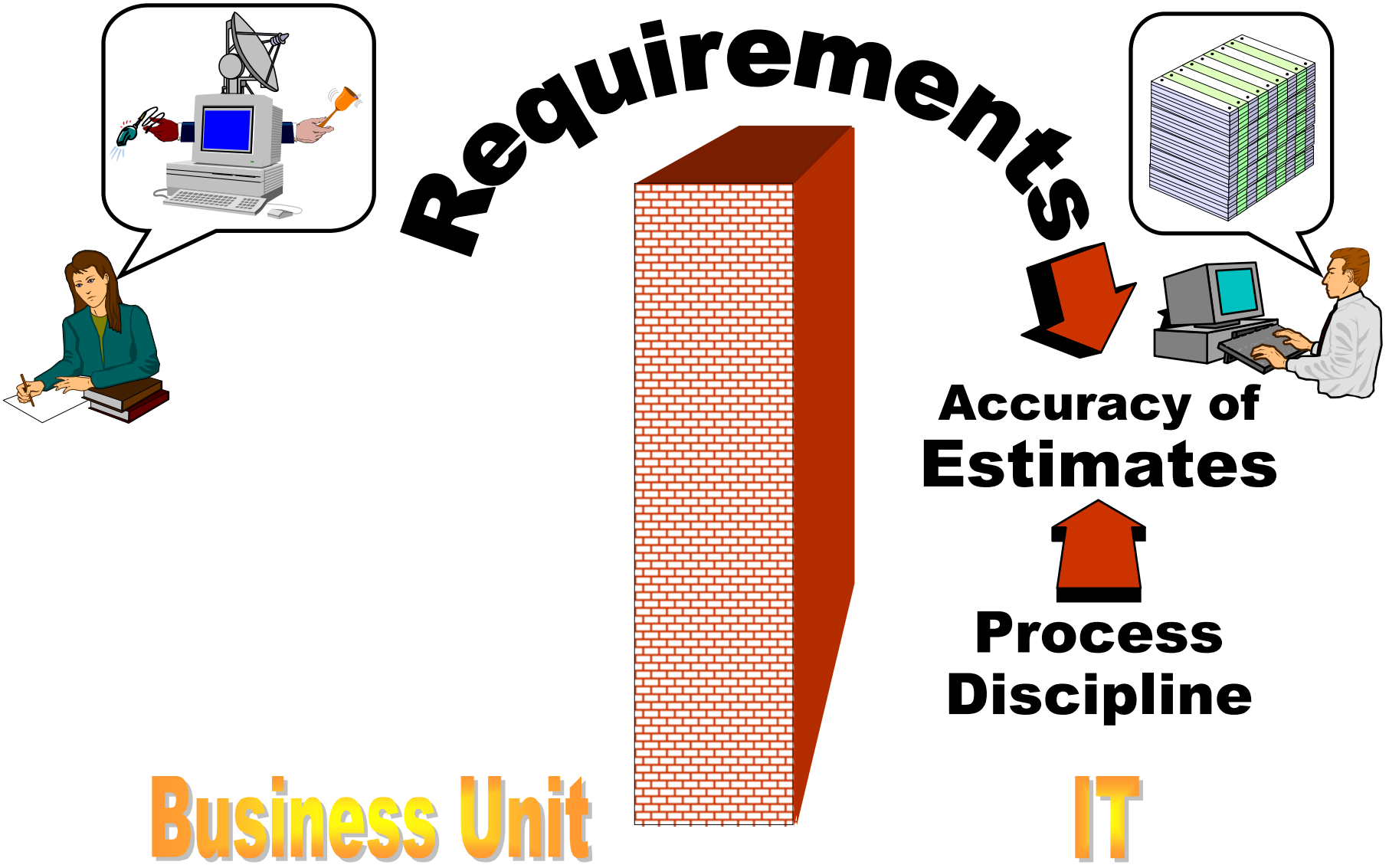
**Unmanaged work**
poor tracking
unmanaged contractors

# The Economics of Crisis

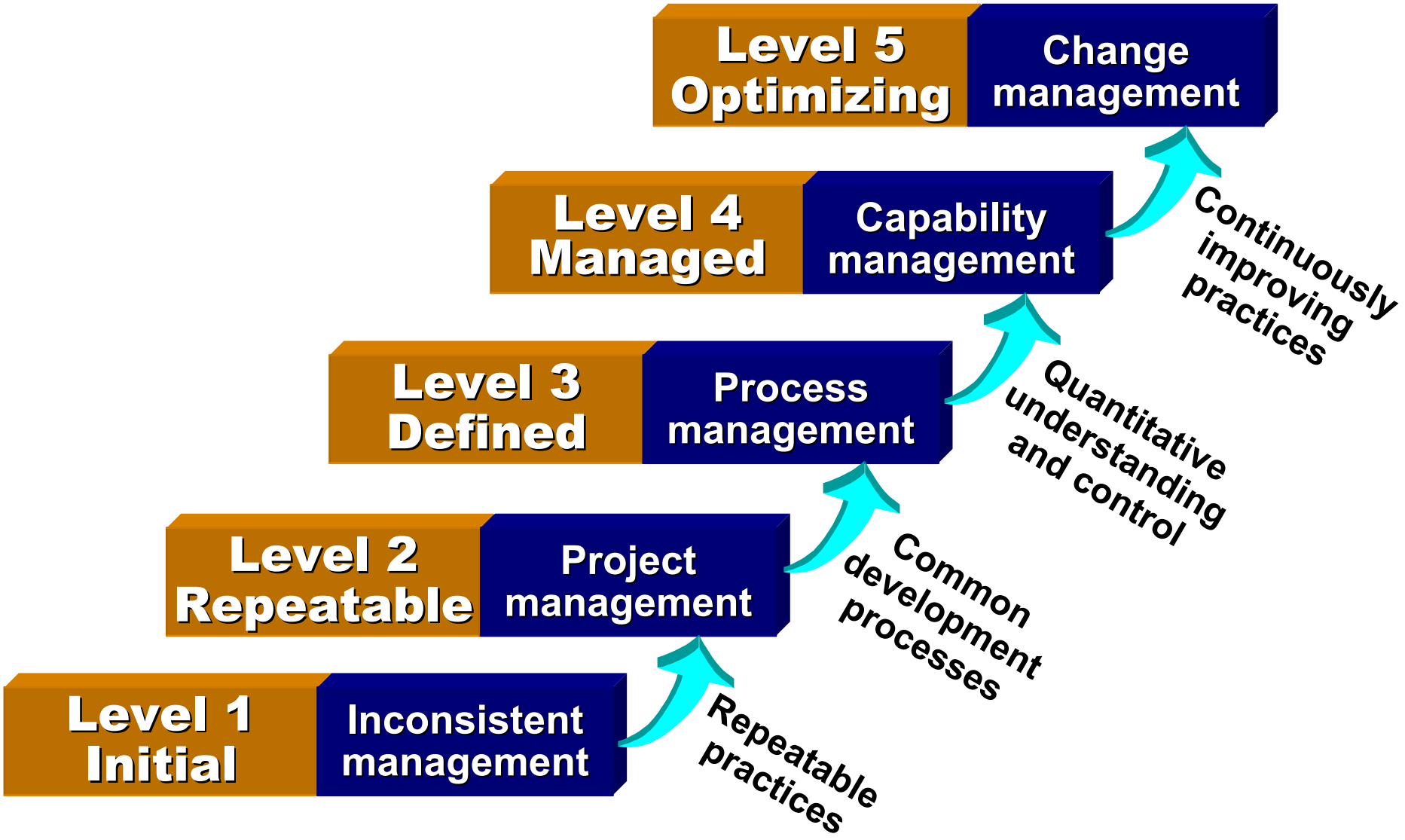


| Company | Initial rework |
|---|---|
| TRW | 30% |
| NASA-SEL | 40% |
| Hewlett-Packard | 33% |
| Raytheon | 41% |

# The Business—IT Divide



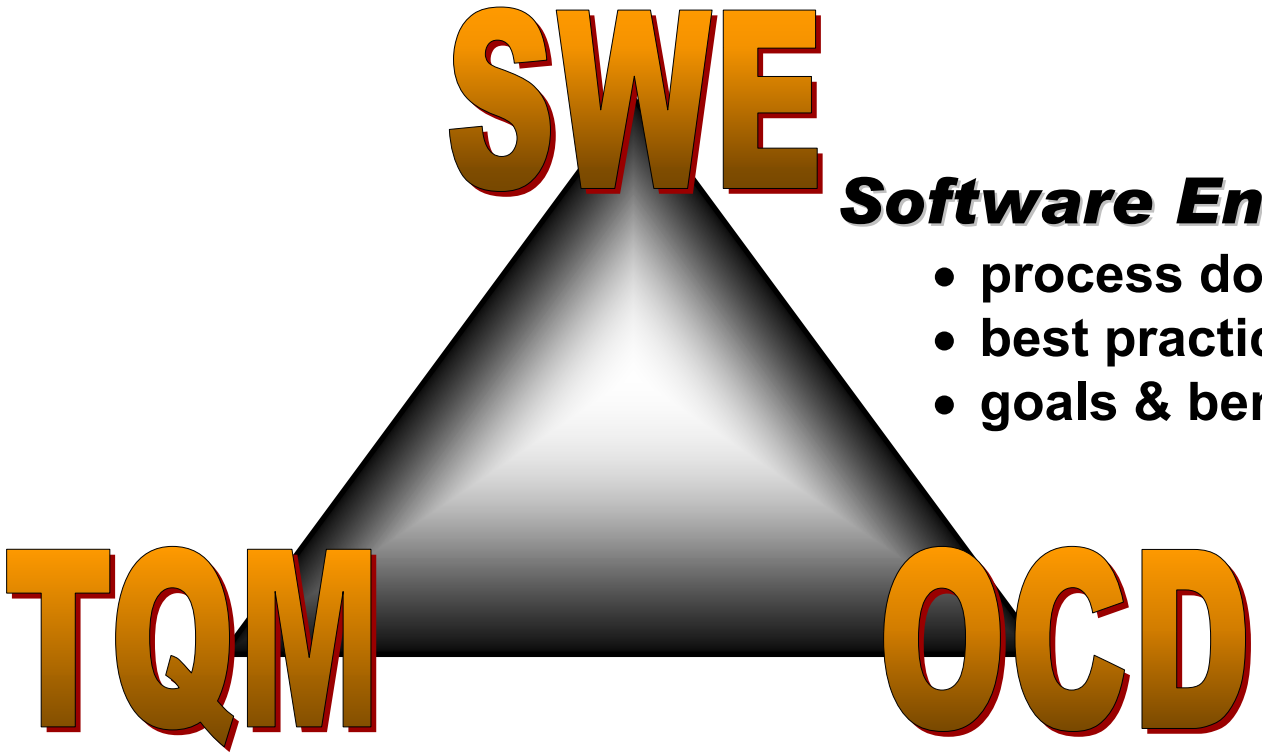
# Capability Maturity Model®



# CMM & Organization Building

| Levels | CMM Objectives |
| --- | --- |
| 5 Optimizing | Continuously improve the processes |
| 4 Predictable | Manage & exploit the capabilities enabled by standardized processes |
| 3 Defined | Establish standardized organization-wide processes |
| 2 Managed | Create a management foundation within units |

# Process Maturity Foundations




***Software Engineering***

- process domain
- best practices
- goals & benefits

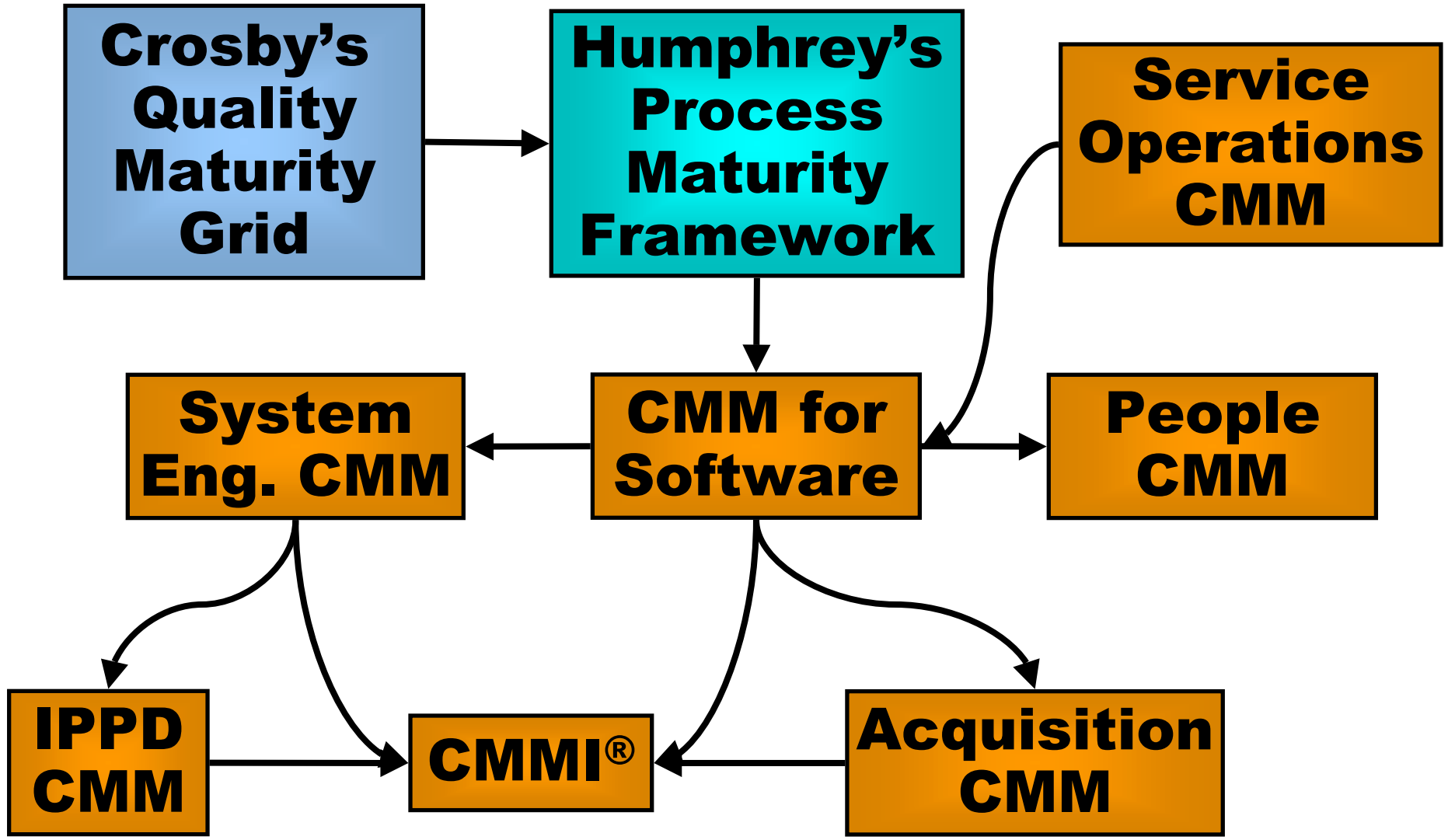
***Total Quality Management***

- Deming, Juran, Crosby
- quantitative management
- continuous improvement

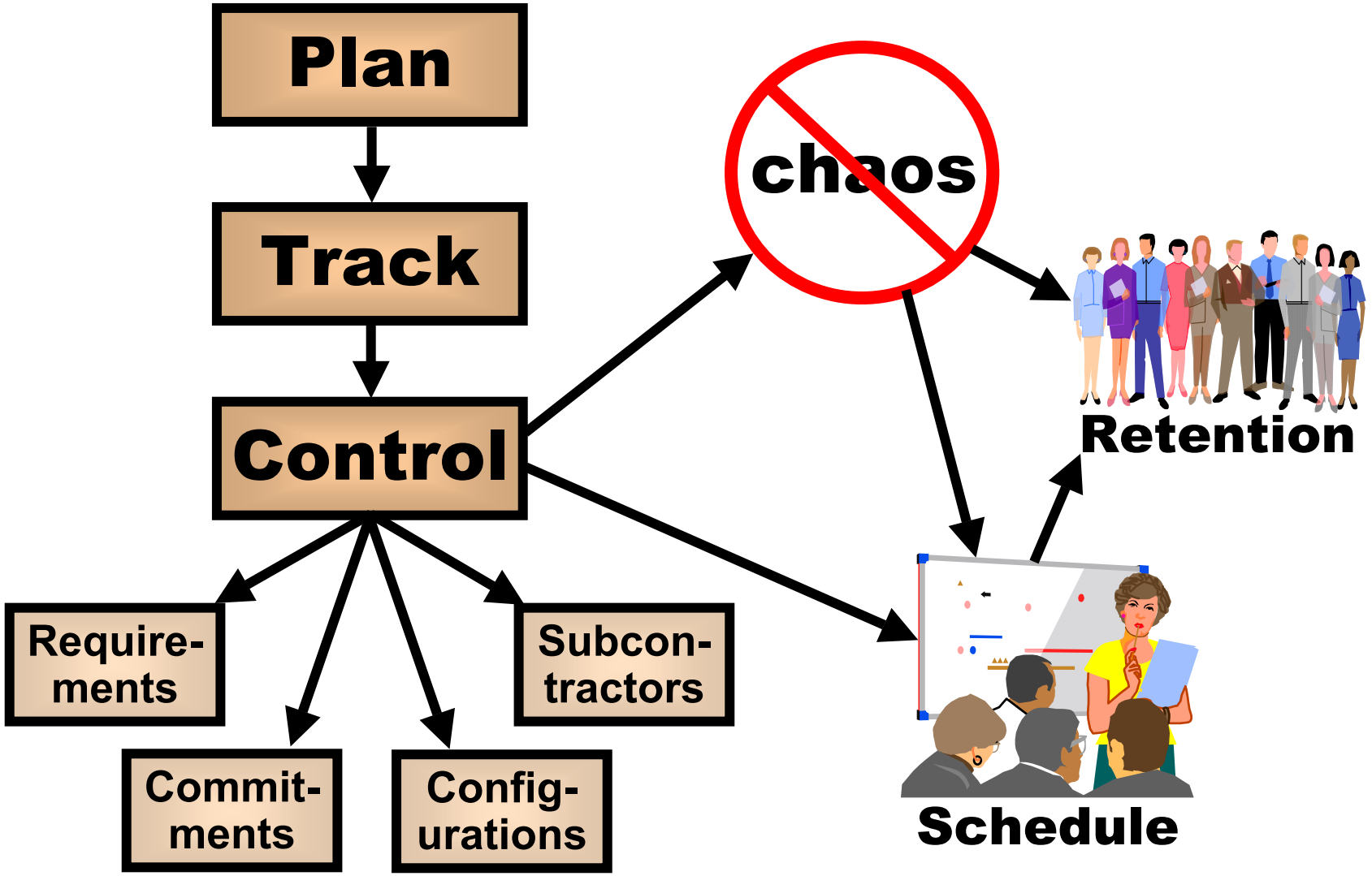
***Organizational Change and Development***

- cultural evolution
- organizational learning
- change management

# A Family of Maturity Models

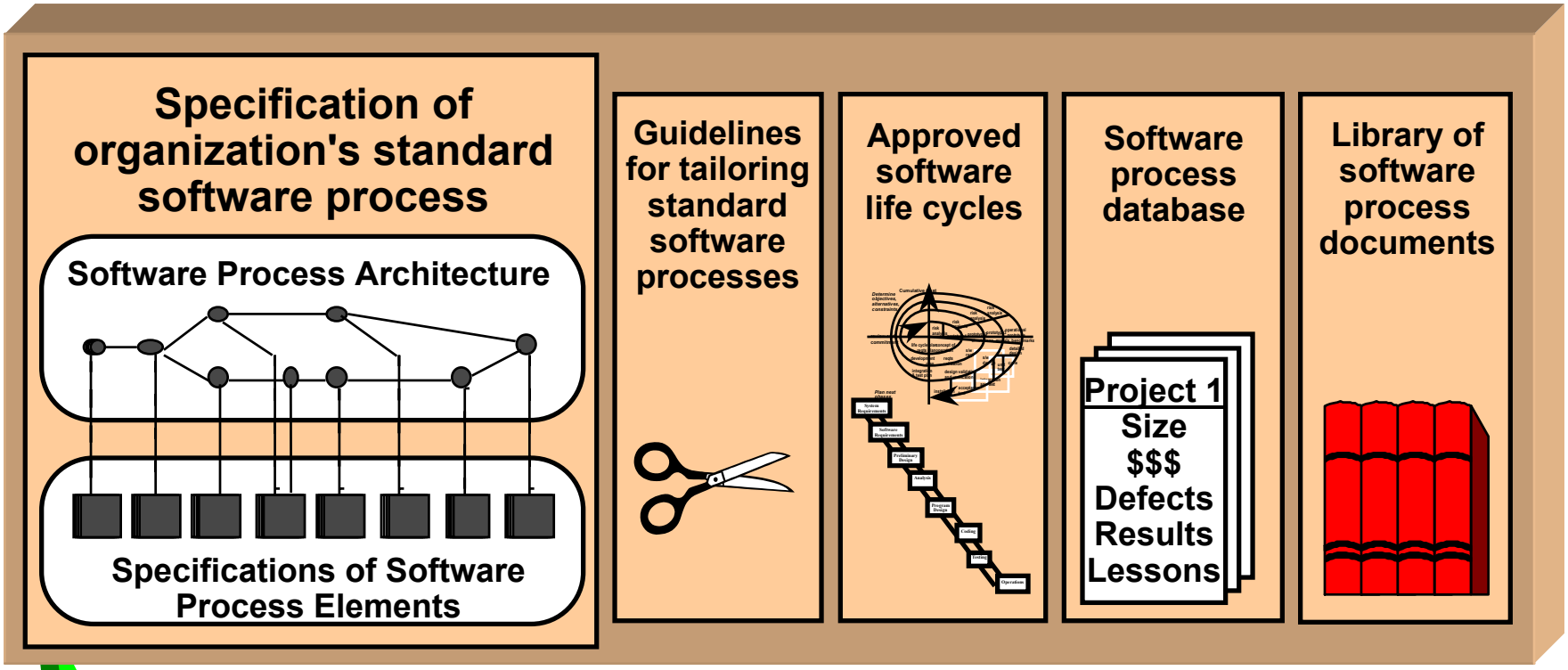


# Level 2 — Repeatable



# Level 3 — Defined

## Organization's Software Process Assets




- best practices
- consistent work products
- comparable measurements
- transfer of learning

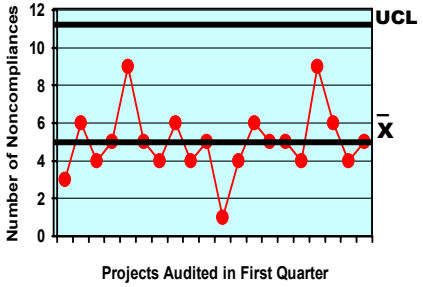
**Cost**
**Function**
**Quality**

# Level 4 — Managed

## Decide

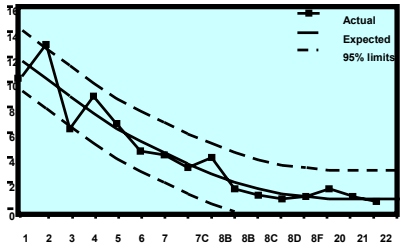
*Business objectives*

## Control



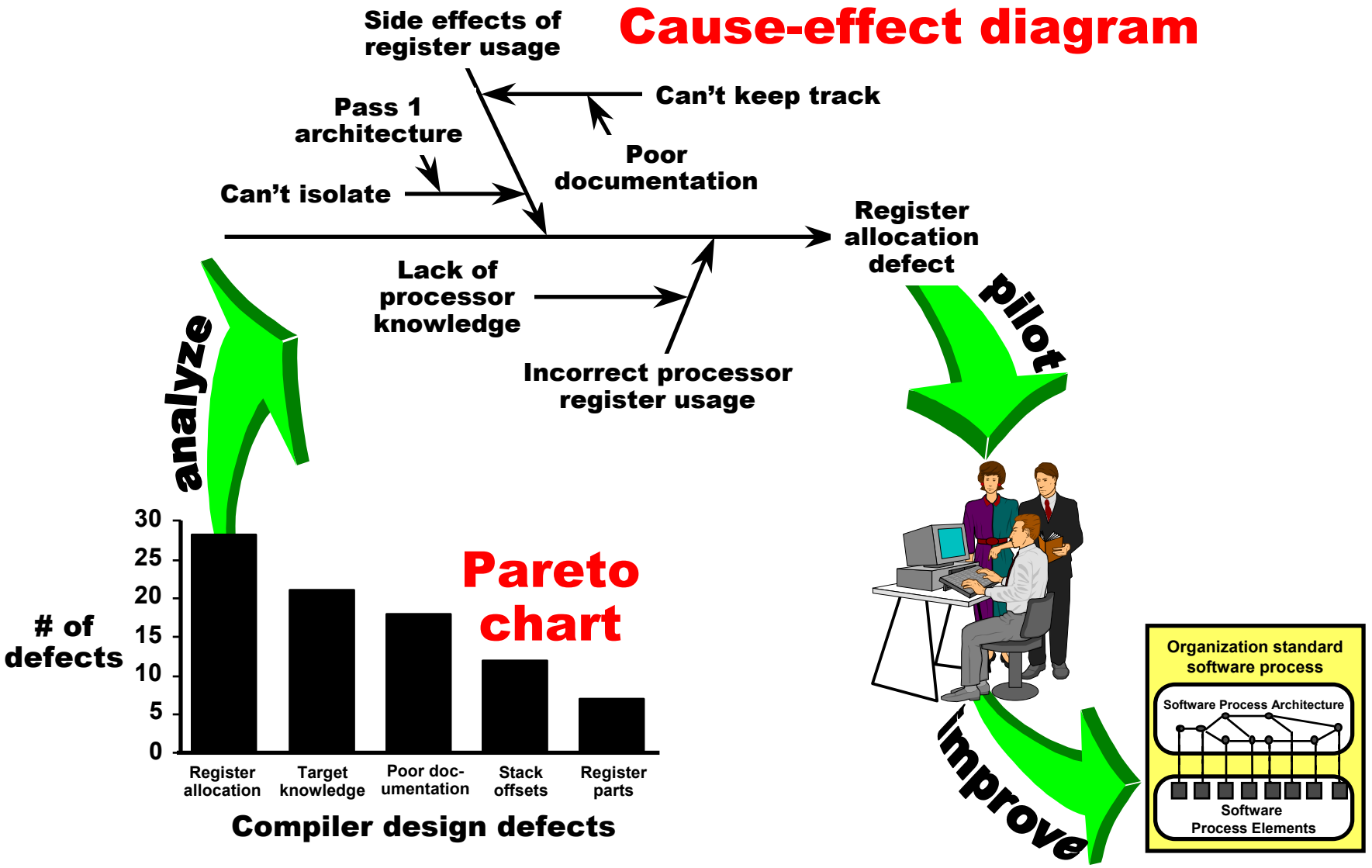

*Process variation*

## Predict

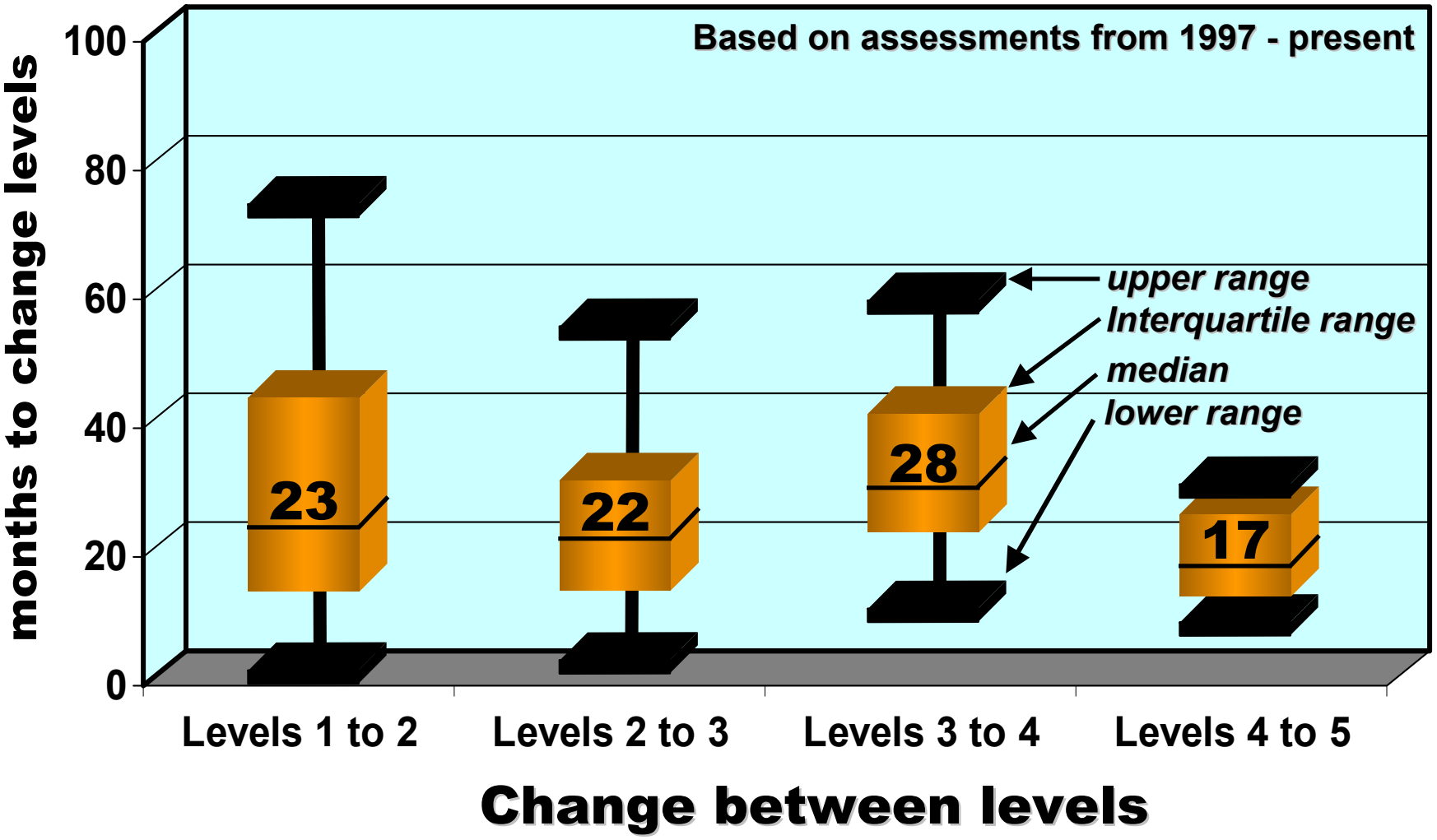



*Process capability*

# Level 5 — Optimizing

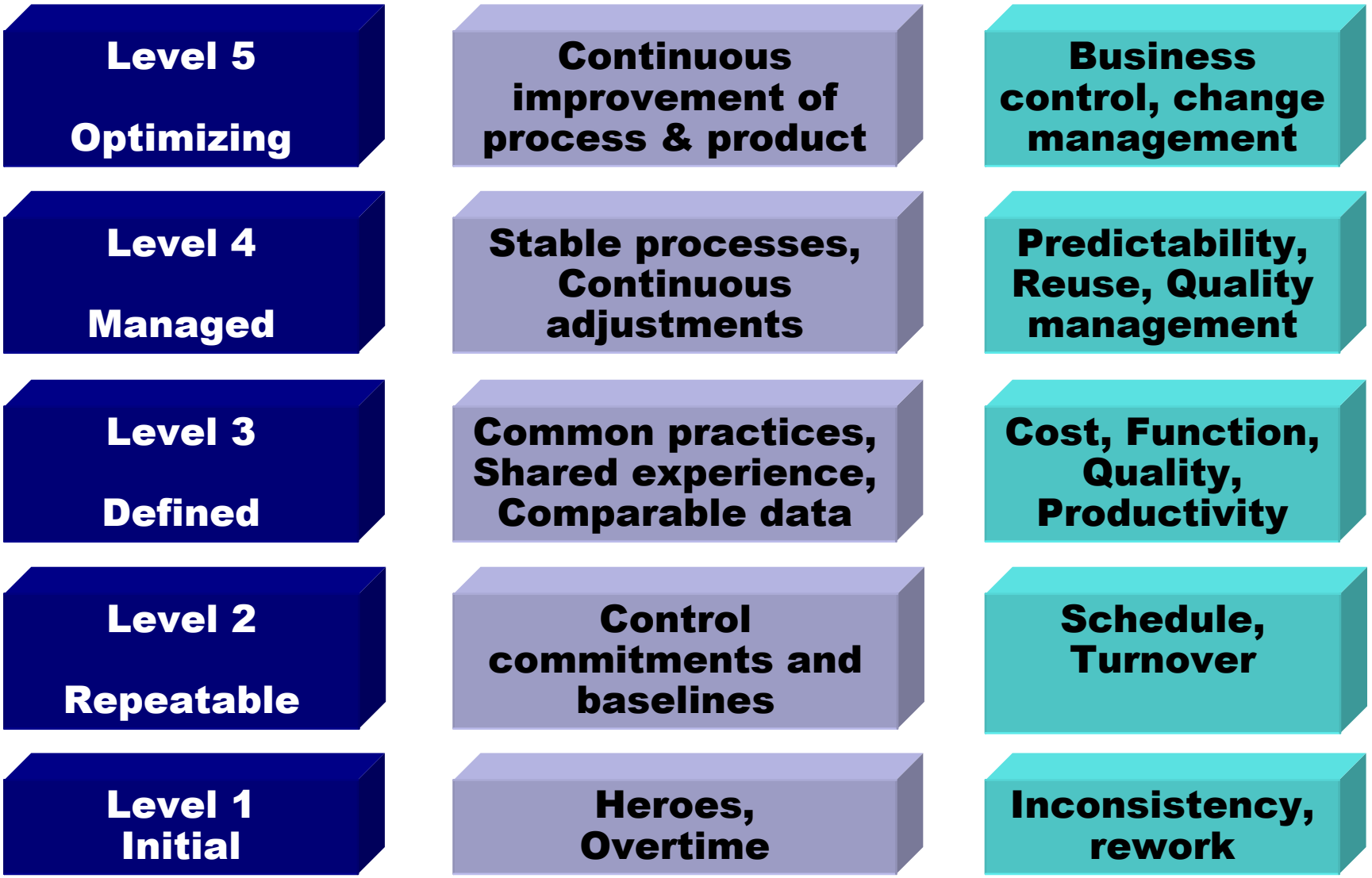


# Months to Achieve Levels




Source: Process Maturity Profile , 8-02, SEI

# Capability Maturity Model®



# Raytheon's Cost of Quality

**Performance** — *cost of building it right first time*

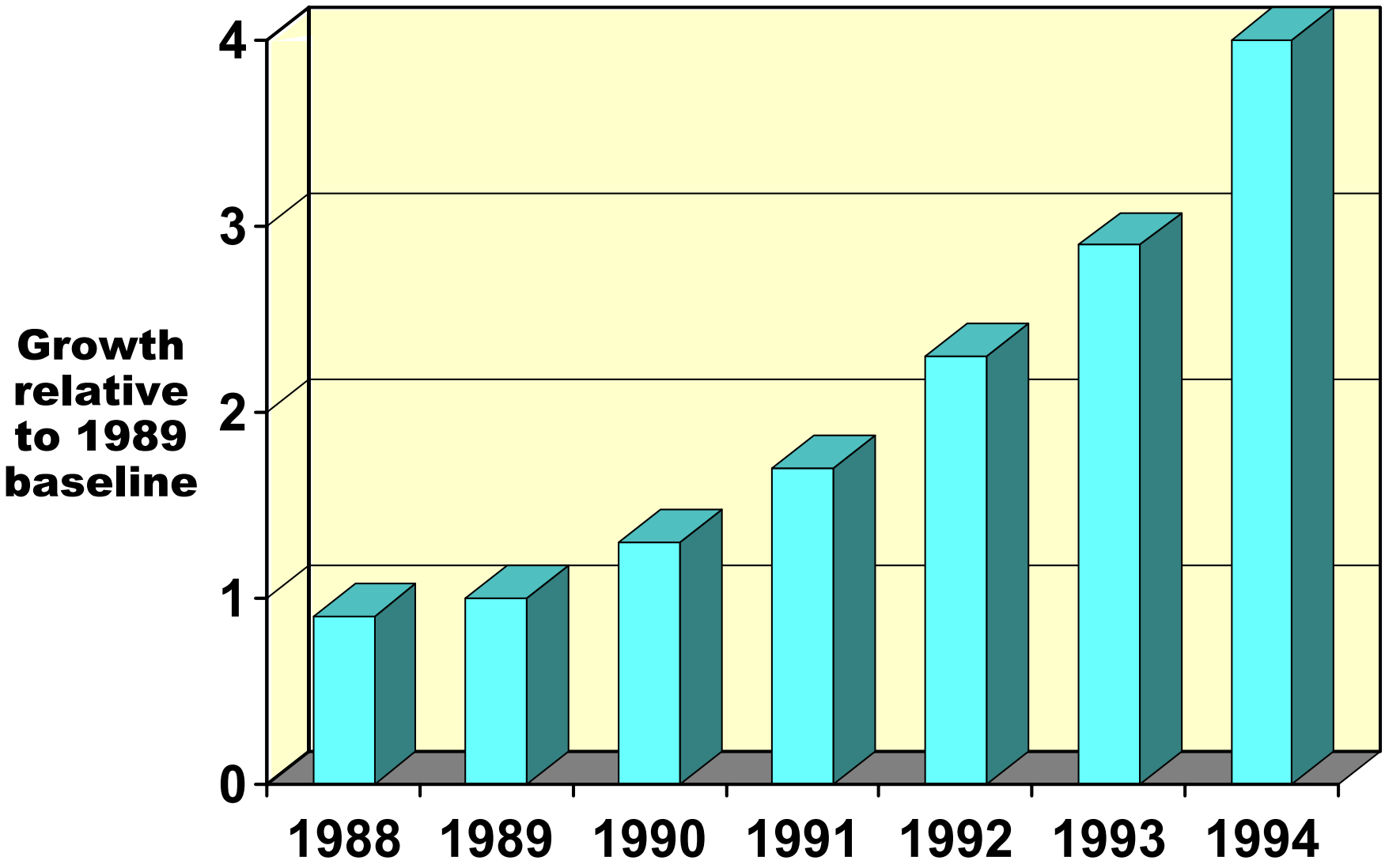
**Nonconformance** — *cost of rework*

**Appraisal** — *cost of testing*

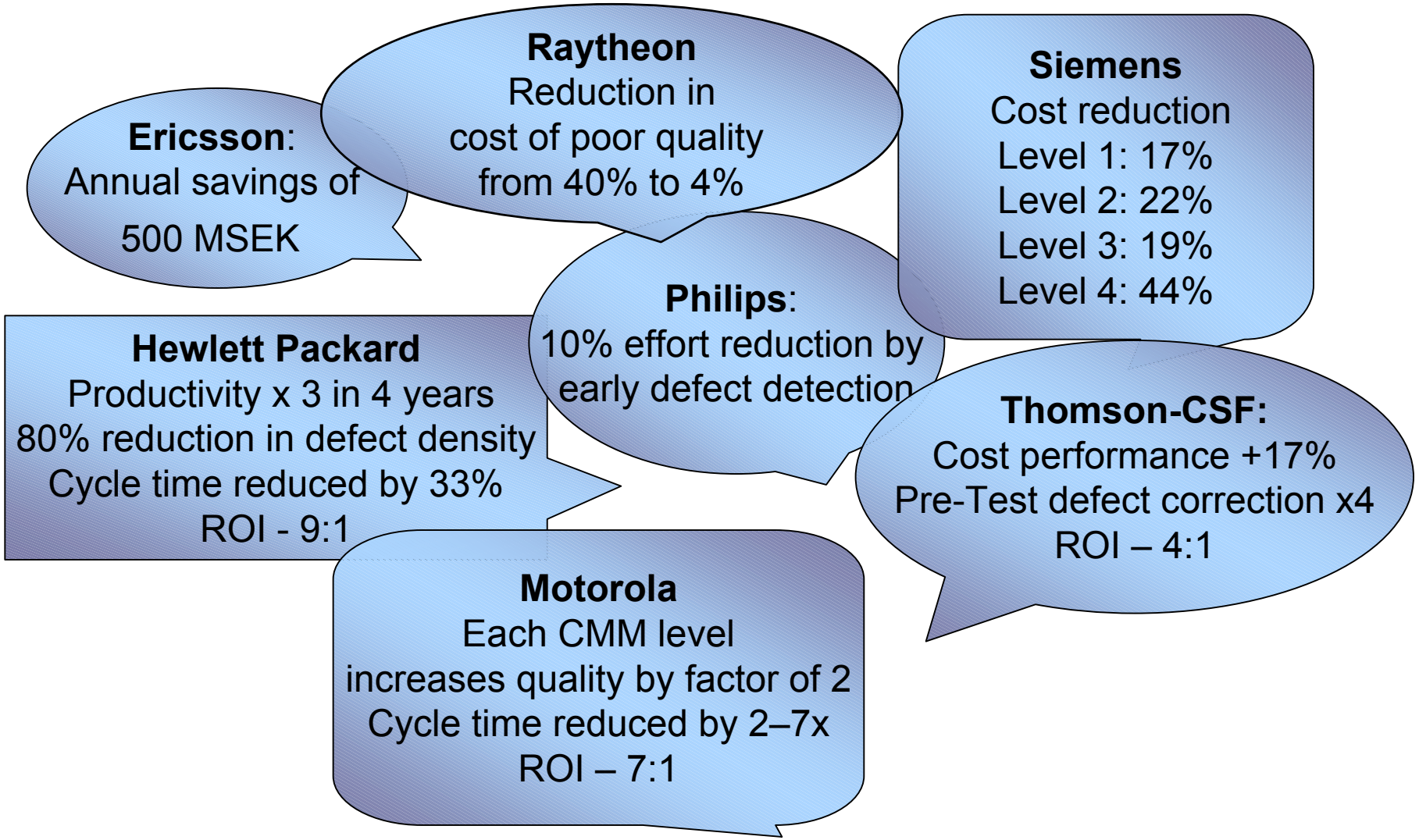
**Prevention** — *cost of preventing nonconformance*

| Year | Level | Perform | Nonconf. | Appraise | Prevent |
|---|---|---|---|---|---|
| 1988 | 1 | 34% | 41% | 15% | 7% |
| 1990 | 2 | 55% | 18% | 15% | 12% |
| 1992 | 3 | 66% | 11% | { 23% | } |
| 1994 | 4 | 76% | 6% | { 18% | } |

# Raytheon's Productivity Growth



# Process Improvement Pays Off !



# High Maturity Organizations

1) Cannot get paid on time and materials contracts

2) Want fixed price contracts

3) Can underbid time and materials people to get them, and still make higher margins

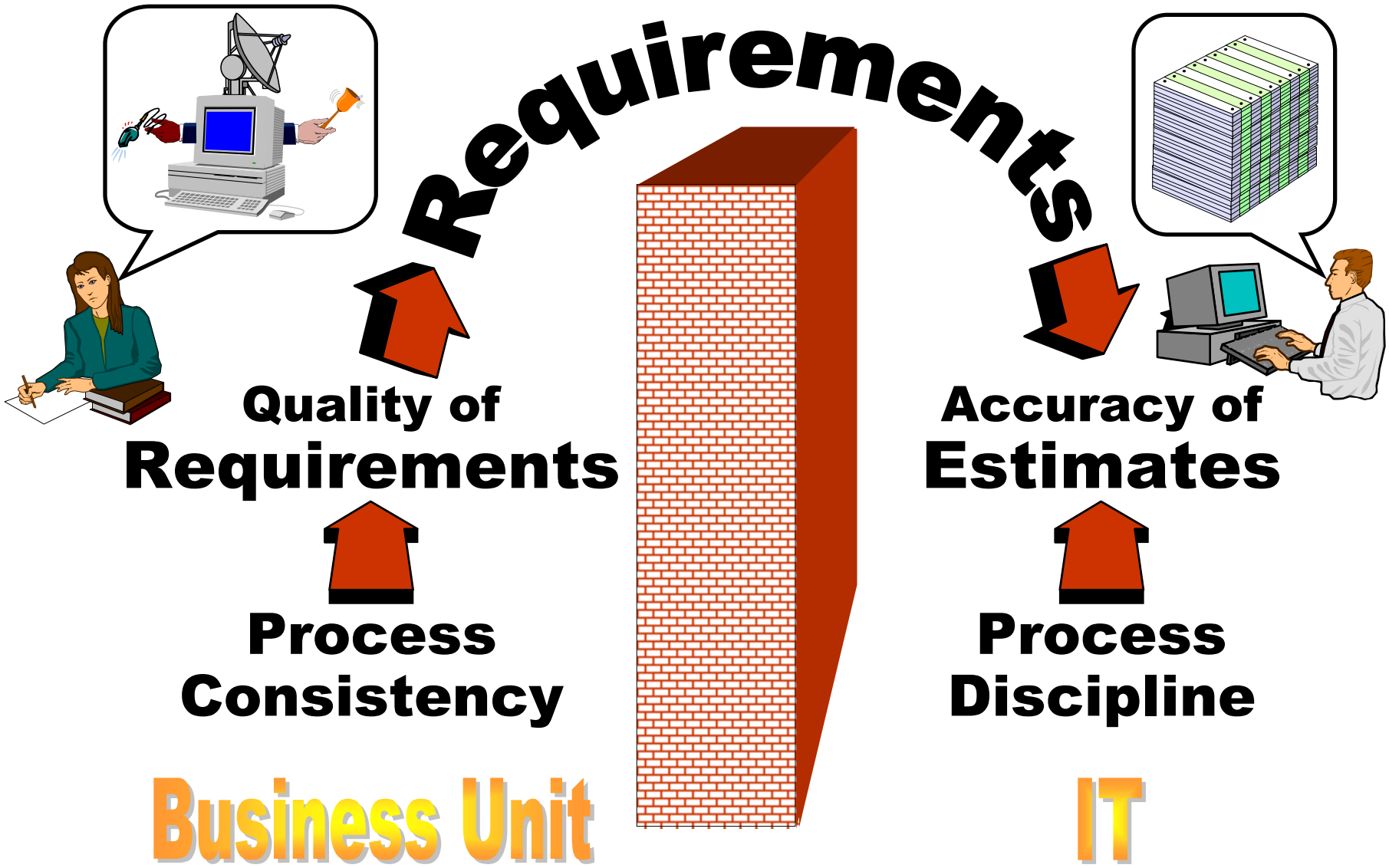
4) Will use quantitative process management techniques to ensure service level targets

5) Run software development like a business, using the CMM for guidance

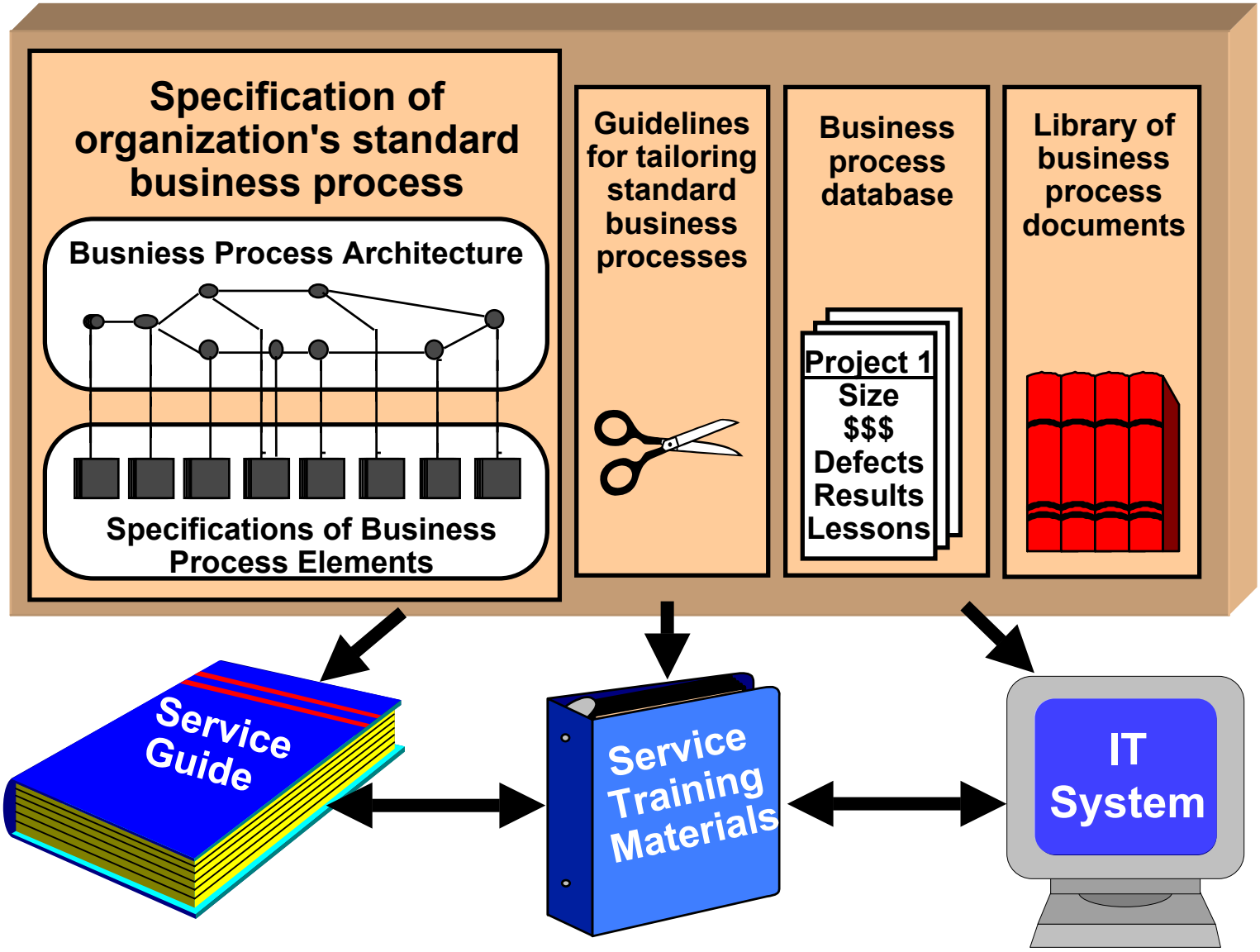
# A Funny Thing Happened on the Way to Level 3

| Level | The Business | IT |
|---|---|---|
| 3 | "We're now the problem" | "We know" |
| 2 | "Non-responsive" | "No, it will take longer!" |
| 1 | "You're not a reliable partner" | "We know" |

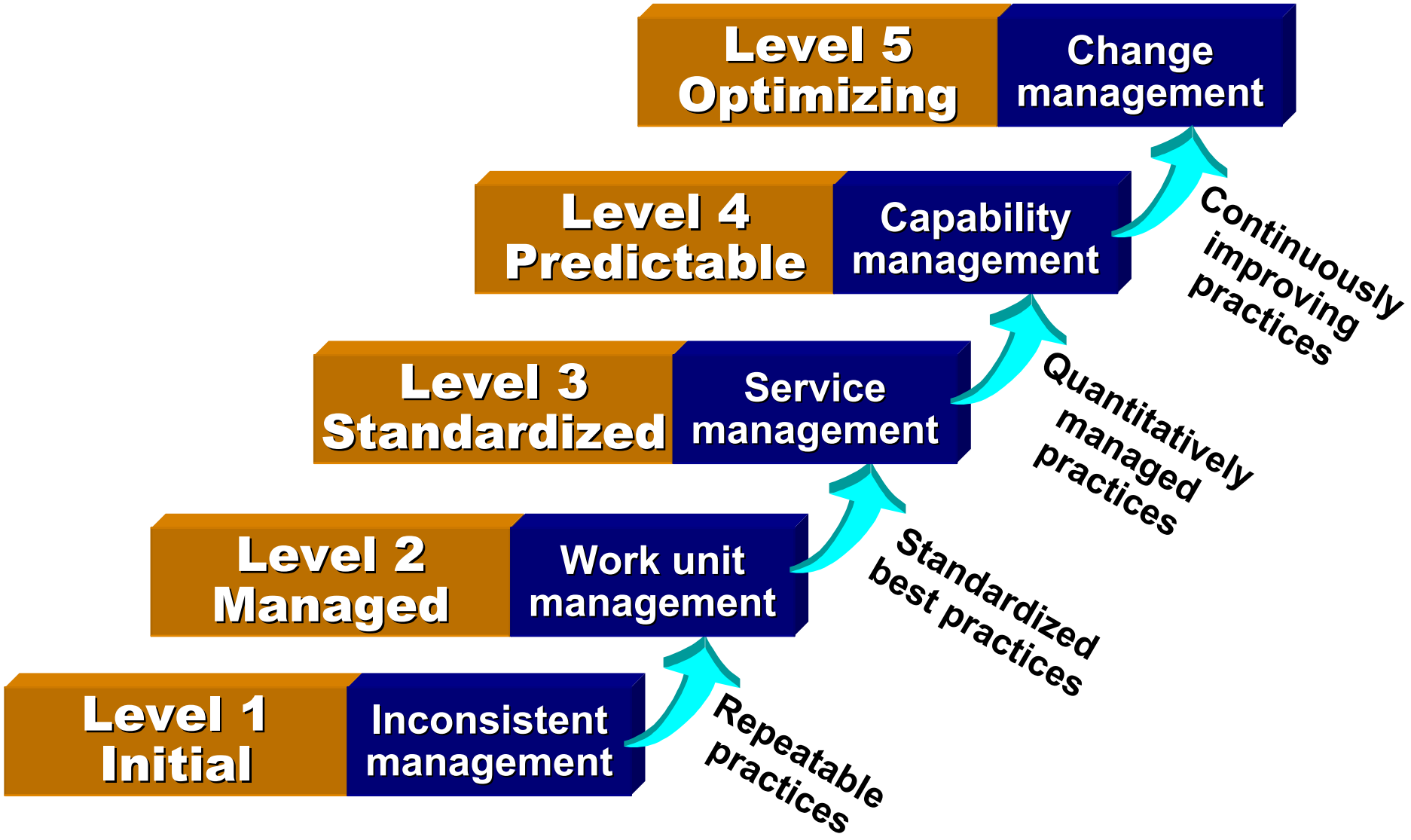
# The Business—IT Divide



# The Business at Level 3



# Service Operations CMM



# Organizational Traits by Level

| Levels | SO-CMM Objectives |
| --- | --- |
| 5 Optimizing | Continuously improve the framework at all organizational levels |
| 4 Predictable | Increase predictability of service outcomes using the framework |
| 3 Standardized | Establish an organizational framework for services |
| 2 Managed | Create a management foundation within work units |
| 1 Initial | Inconsistent methods for performing work, occasionally over-committed |

# What IT Can Teach the Business

- **Process consistency**
- **Business process architecture**
- **Configuration management**
- **Process release management**

**A business process is a lot like… software!!**

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**Bill Curtis** is Co-founder and Chief Scientist of TeraQuest in Austin, Texas where he works with organizations to increase their software development capability. He is a former Director of the Software Process Program in the Software Engineering Institute at Carnegie Mellon University. He is a co-author of the Capability Maturity Model for Software, and is the principal architect of the People CMM. Prior to joining the SEI, Dr. Curtis directed research on advanced user interface technologies and the software design process at MCC, developed a global software productivity and quality measurement system at ITT's Programming Technology Center, evaluated software development methods in GE Space Division, and taught statistics at the University of Washington.