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Project Auditing

(Failure to Success in Four Easy Stages)

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The Two Big Questions

- If things go wrong
  - ⇨ Where was Internal Audit?
- If things go right
  - ⇨ What contribution did it make?

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Themes

- Why developments fail
- Moving from failure to success
- Perfect system behaviour
- The importance of data
- Risks & control
- Value added project auditing

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DTI Findings

- One in four projects never complete
- One in four projects cost twice as much as originally estimated
- Most projects are delivered up to a year behind schedule

The performance of Information Technology and the role of human and organisational factors

– Report to the Economic and Social Research Council, UK 1996

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But it's not just I.T.

- Jodrell Bank radio telescope
- Cunard's QE2 ocean liner
- Concorde supersonic jet
- Channel Tunnel
- Any & every defence project

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What Should Be Management's Concerns?

- The Project
  - Delivered on time and to budget
- The Application
  - Meets the requirement
  - is well controlled
  - easily maintained

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What Would You Call Someone Who …..?

- Intends to spend £25 million of his company's money
- Is going to use untried technology
- Cannot get suitably trained staff
- … and some of the technology isn't yet available

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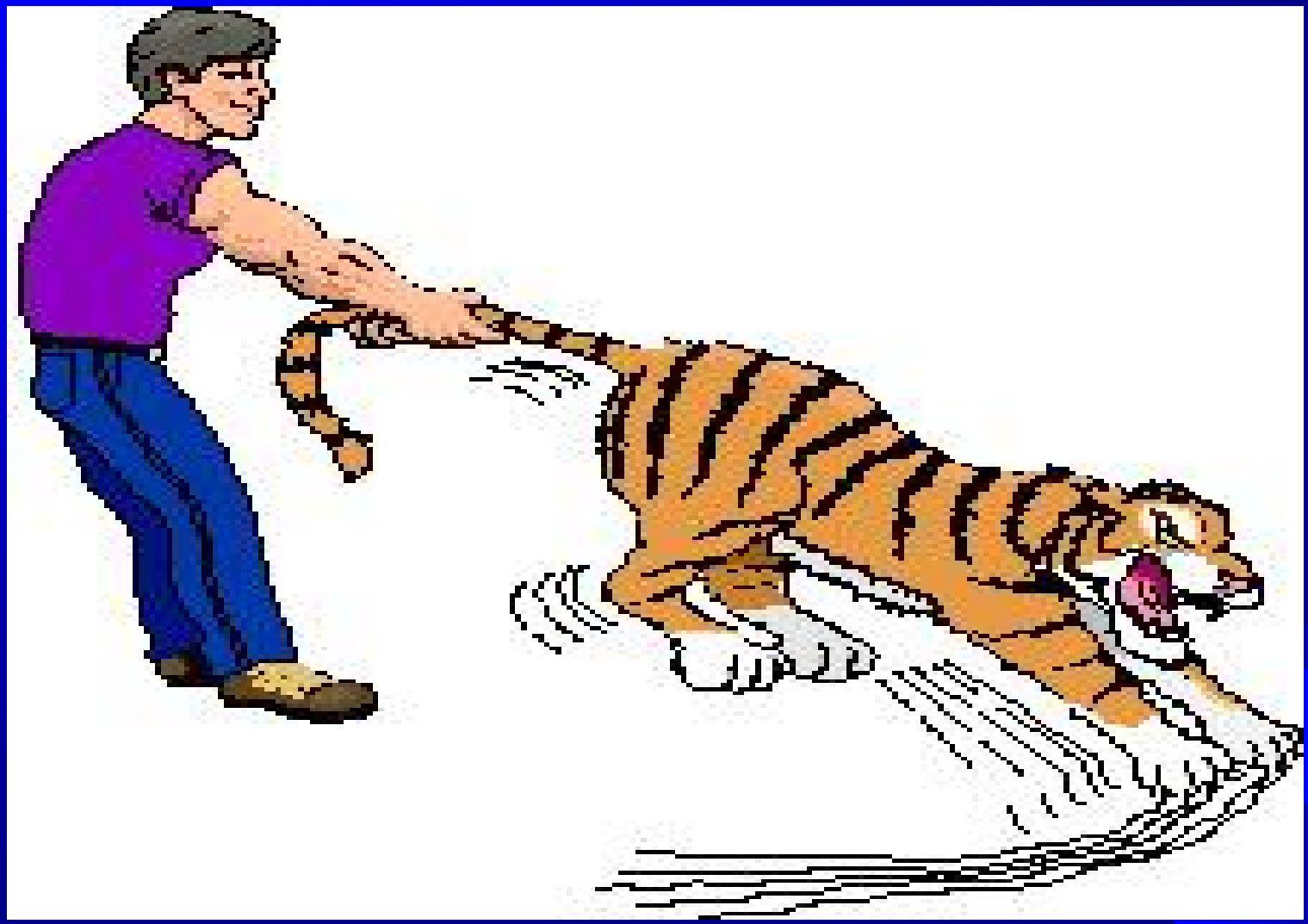
An Optimist!



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The IT Vendor Conspiracy

IT is good for you

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The IT Department Conspiracy

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The Parallel Universe Hypothesis

Current Situation

Constraint (Technology)

Constraint (Legislation)

Constraint (Resource)

Constraint (Time)

Desired Solution

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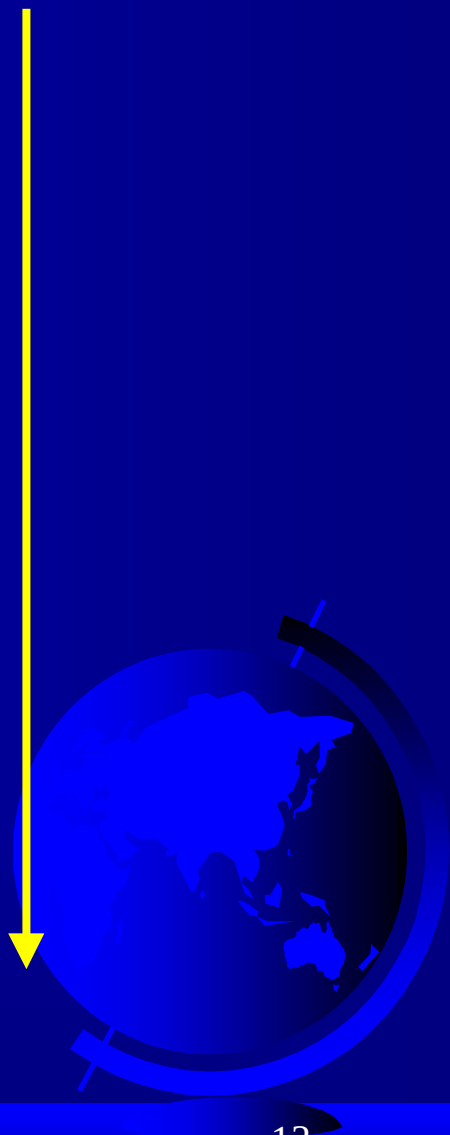
Technology Developments 1970 to Present

- Single batch program
- Batch Multi-tasking
- On-line retrieval
- Real-time update
- Stand alone PCs
- Networking
- File servers & distributed processing
- Internet, Intranet & Extranet
- Palm Devices
- Phone devices
- Implants?



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Sources of Development Risk

- Poor Project Management
- Bad Design
- Inferior Build
- Bad Implementation

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Project Management Risks

- Inexperienced Staff
- Lack of a User Champion
- Unrealistic Senior Management Expectations
- Restrictive Budgets
- Inadequate Time

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Design Risks

- Low User Involvement
- Unfamiliar Technology
- Over Engineering

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Build Risks

- Poor Quality Assurance
- Changing Requirements

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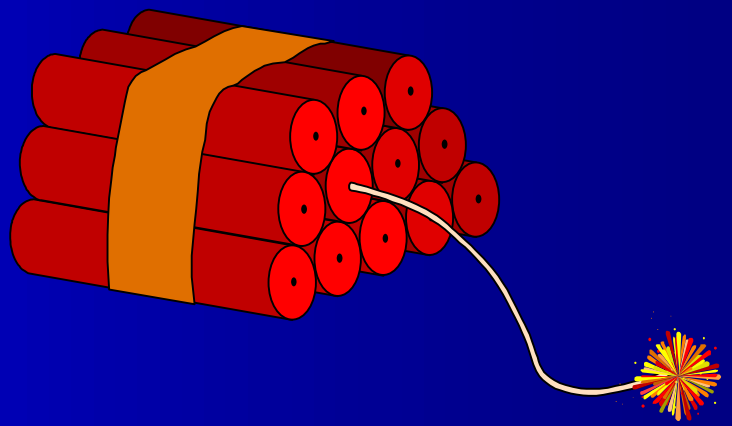
Implementation Risks

- Inadequate Sizing
- Poor User Training
- People Not Ready for Change



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Why Systems Fail

- Technical
  - Poor, or over-engineered functions
  - Poor performance
  - Poor integration with other systems
  - Lack of attention to detail

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DTI Summary

In the majority of cases new systems do not meet their objectives and are counted at best as partial successes, at worst as failures. Most systems are delivered late and over budget. ***Failures in this area are rarely purely technical in origin***. Most organisations are poor at evaluating the effectiveness and impact of their investments in this area.

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Why Systems Fail

- Social
  - Unclear objectives
  - Unclear ownership
  - Failure to change the way things are done
  - Lack of attention to people

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The Dangers Of A New System

"It must be remembered that there is nothing more difficult to plan, more doubtful of success, nor more dangerous to manage, than the creation of a new institution. For the initiator has the enmity of all would profit by the preservation of the old institution and merely lukewarm defenders in those who would gain by the new one"

Machiavelli
Second Principe 1532

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Lesson One

Without any clear measures of success being defined at the start, everything achieved will be viewed as a failure

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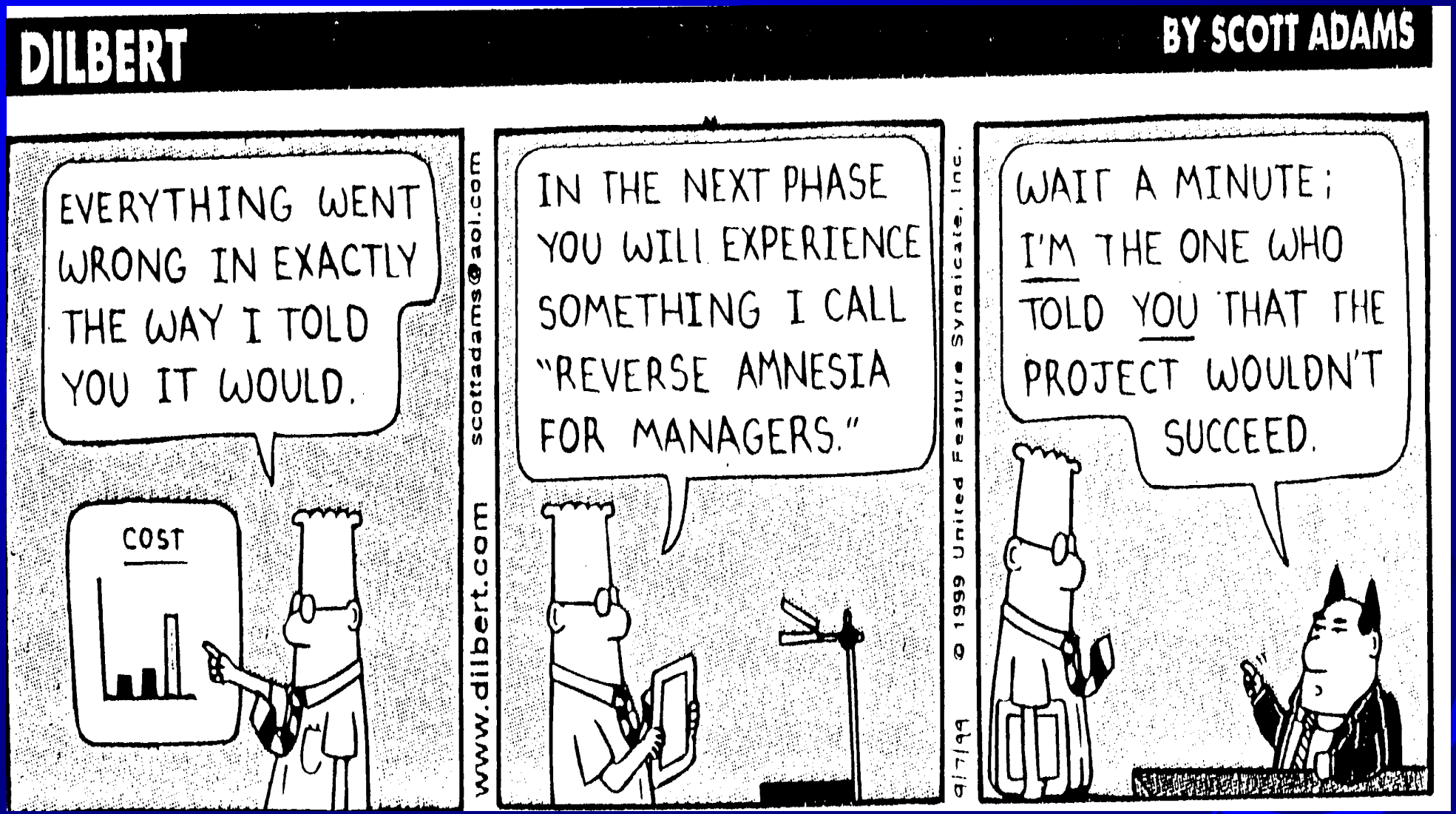
Management Amnesia



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The Real Role Of Project Boards & Steering Committees

Syndicating or transferring risk

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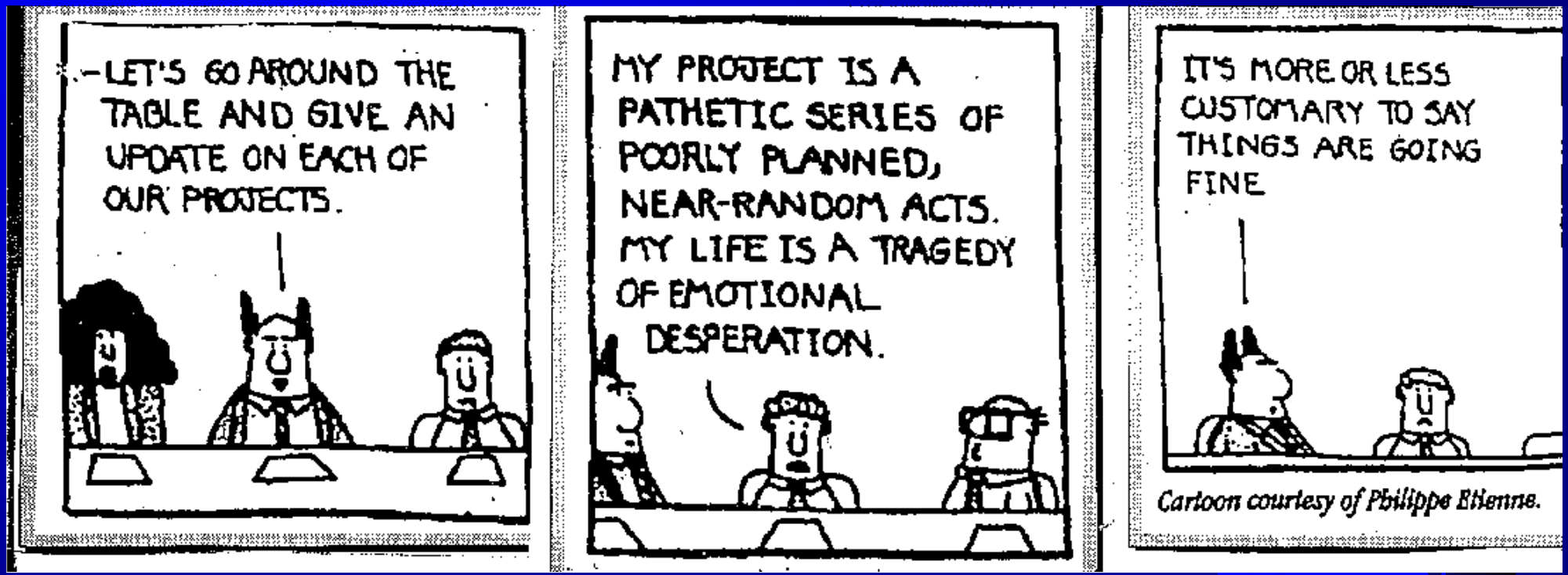
Progress Reporting



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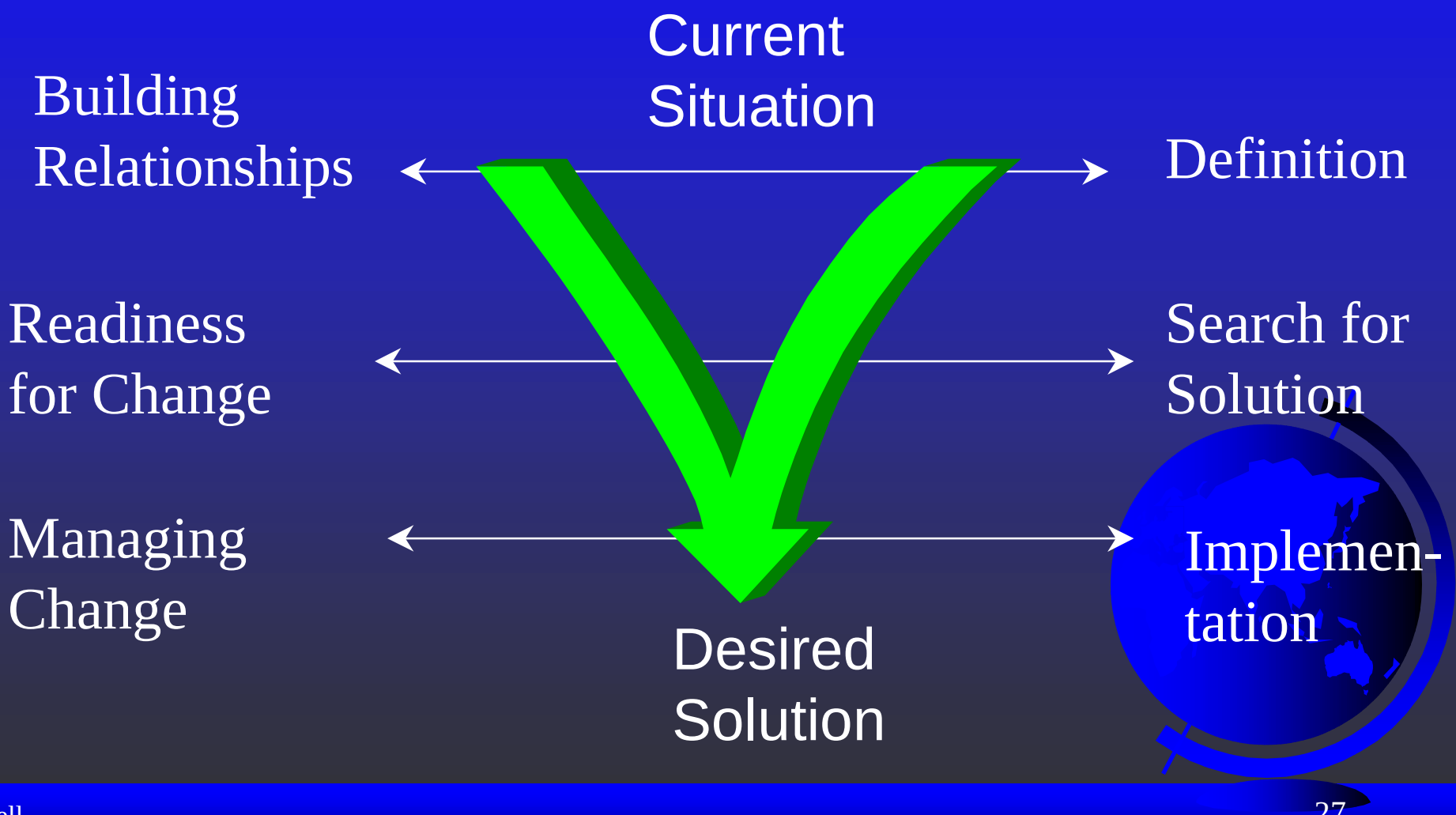
Two Sides of the Project Life Cycle

Social **Technical**



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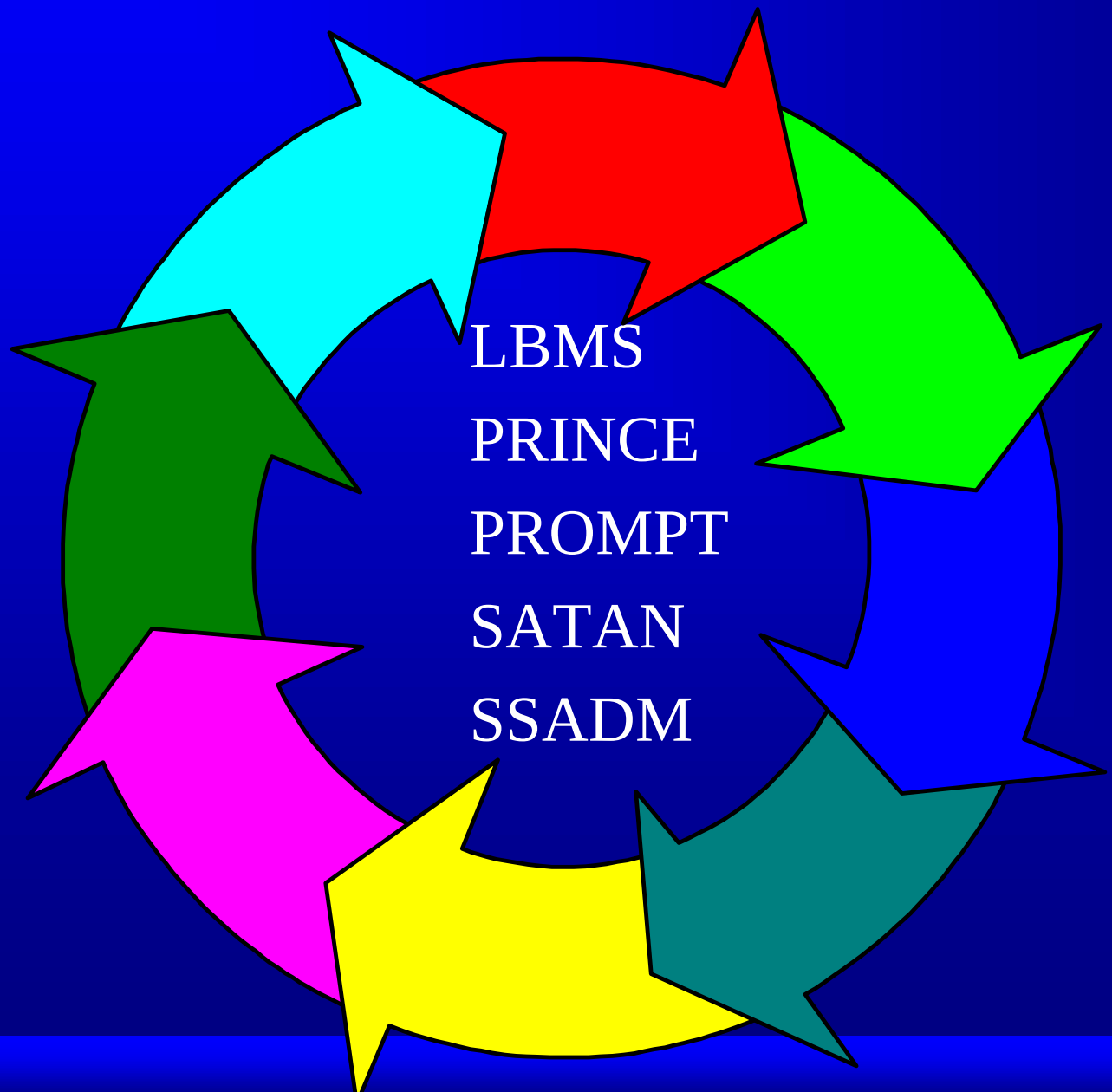
Some Development Methods



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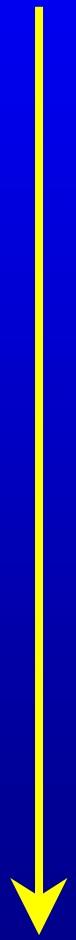
‘Waterfall’ Development Method



- Terms of Reference
- Feasibility Study
- Systems Analysis
- Systems Design
- Program Design
- Program Coding
- Testing (program/system/user)
- Implementation
- Maintenance

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Real Development Life Cycle

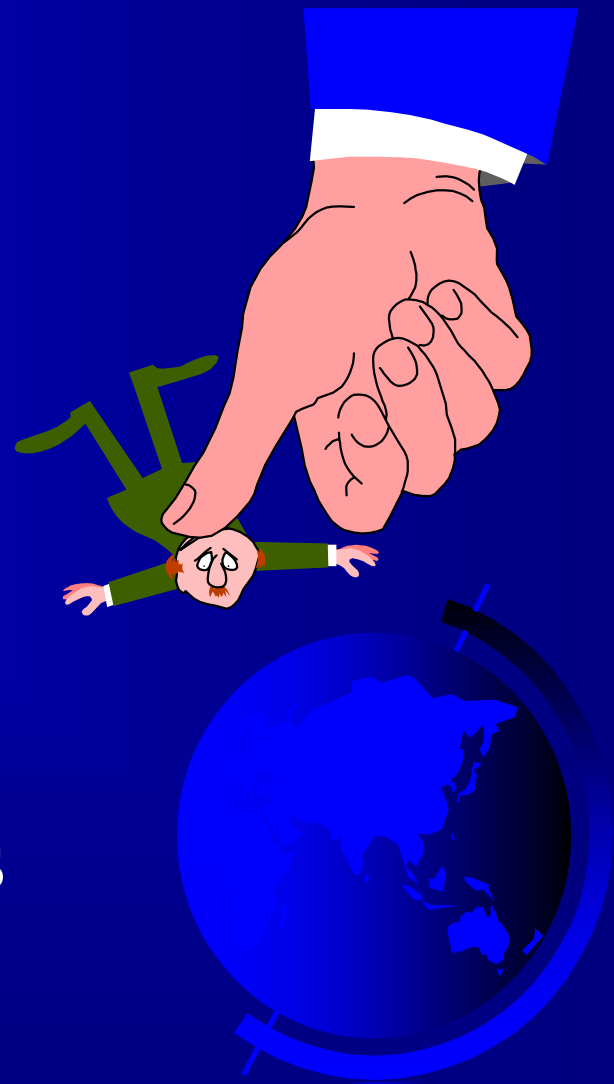
Enthusiasm

Disillusionment

Search for the Guilty

Punishment of the Innocent

Rewards for New Participants



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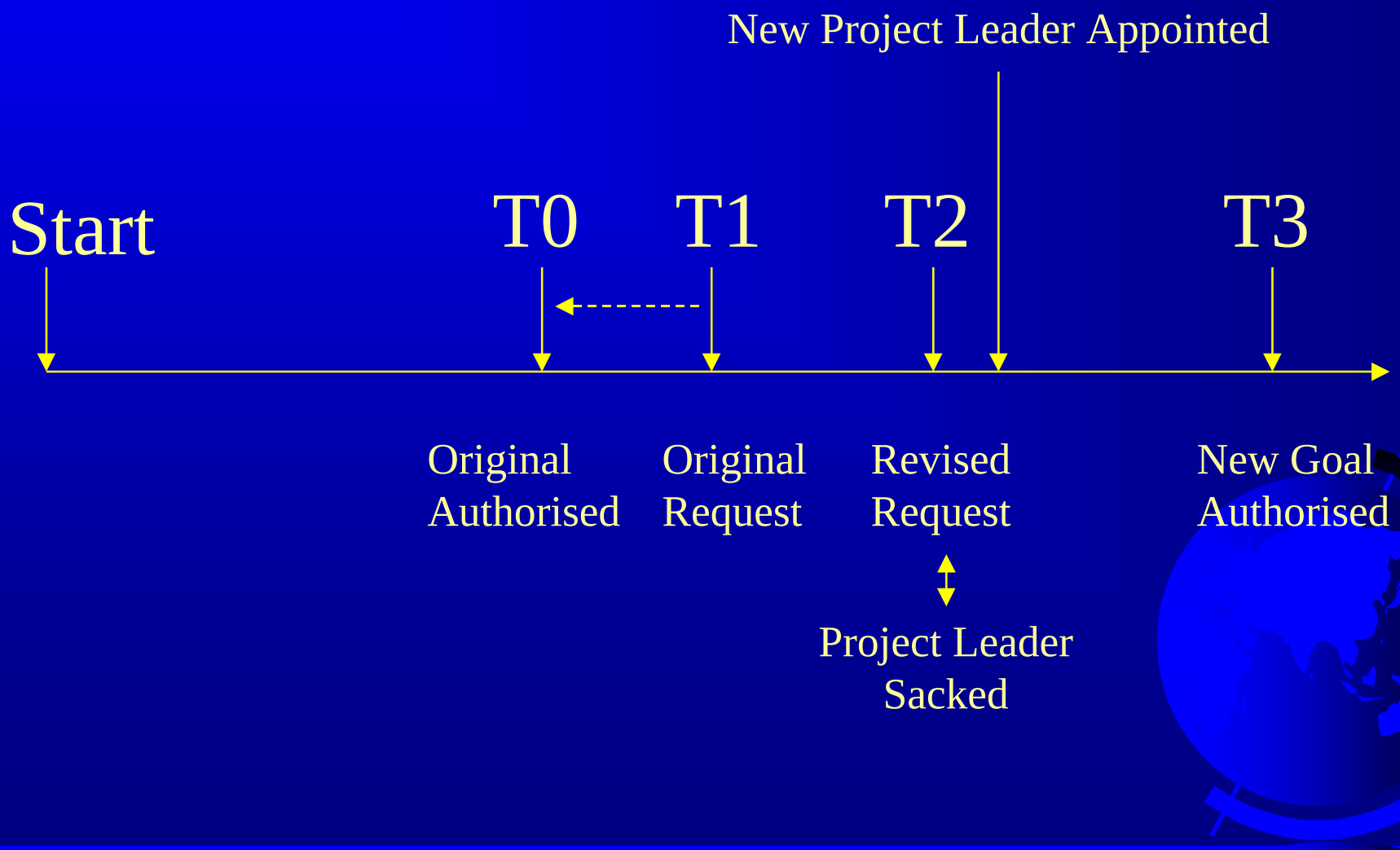
Rewards For New Participants



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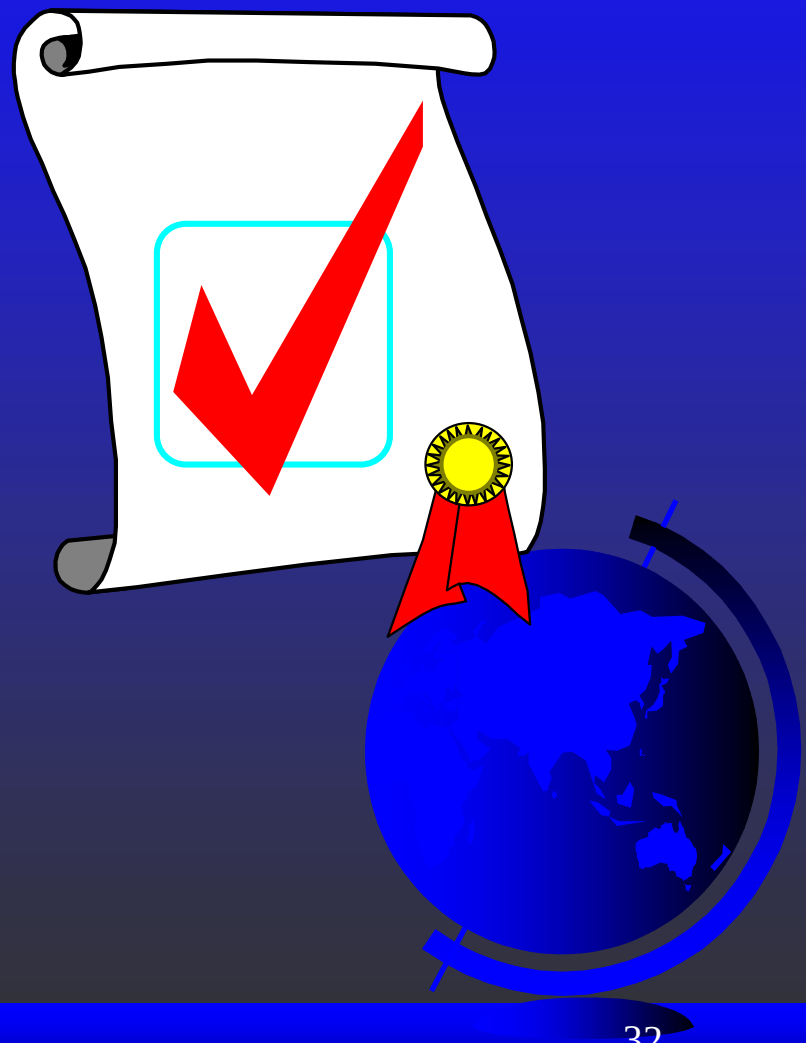
Building Quality Systems Requires Achievement of …..

- Functionality
- Performance
- Timescale
- Cost
- Maintainability



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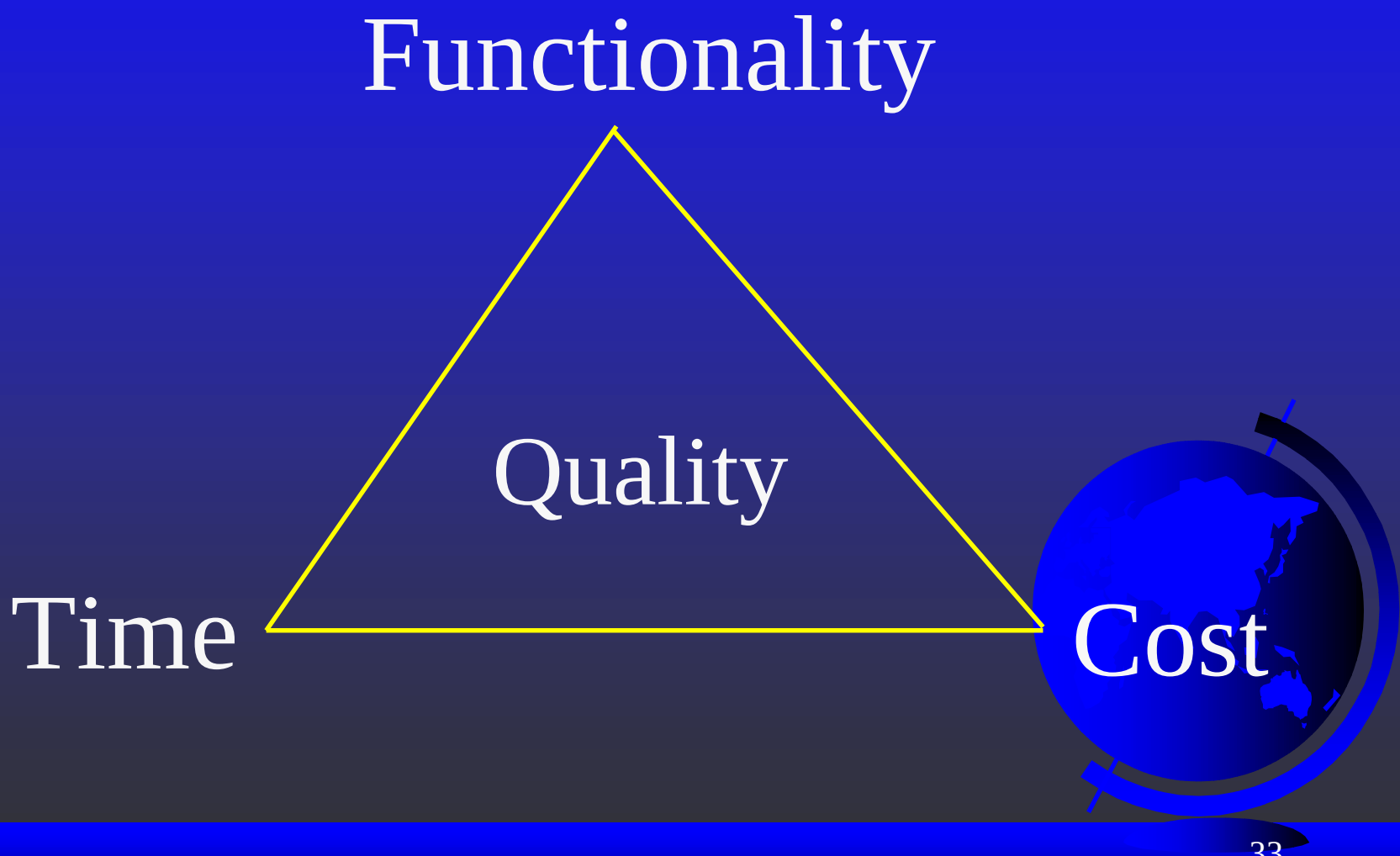
Development Constraints



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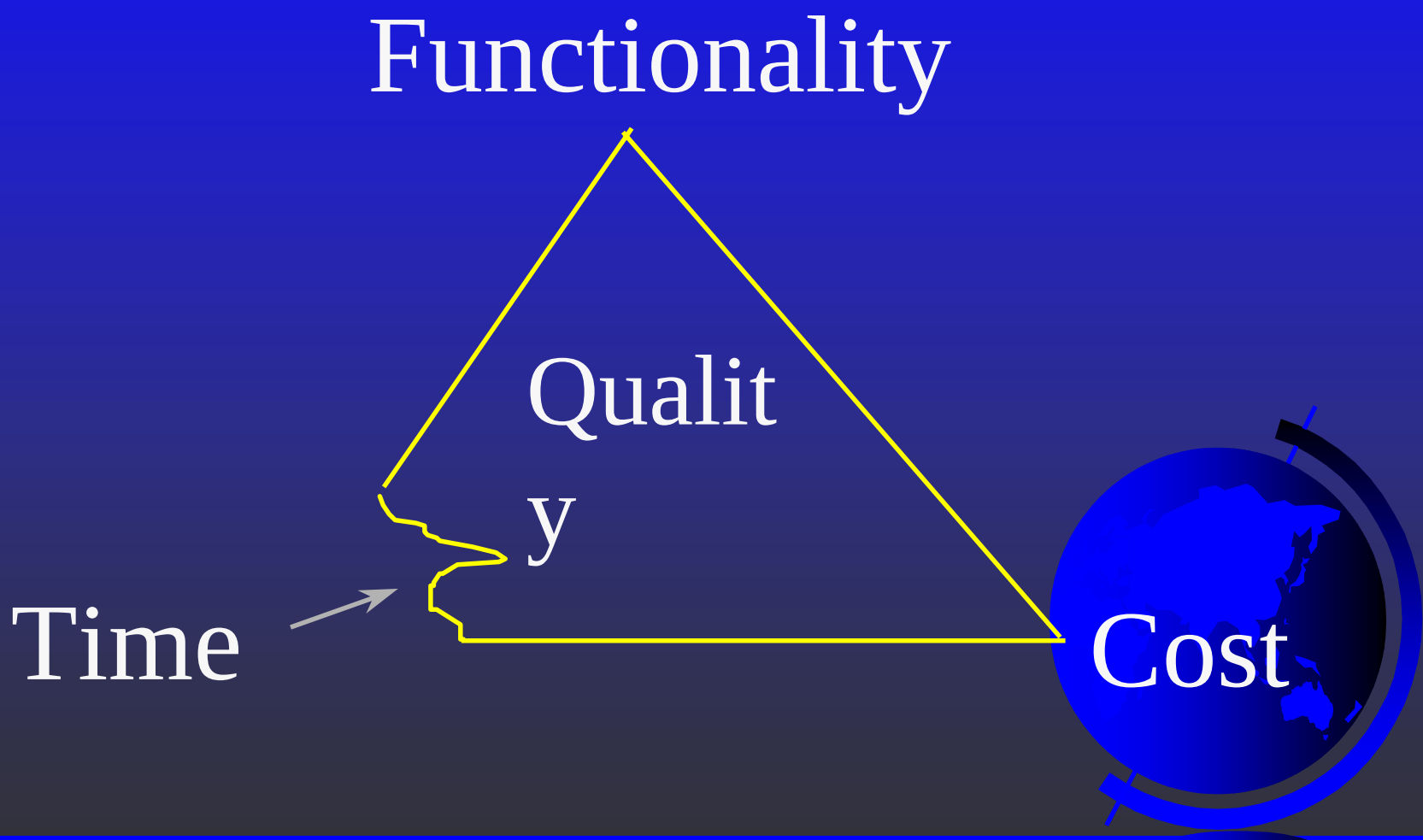
Impact of Reduced Time



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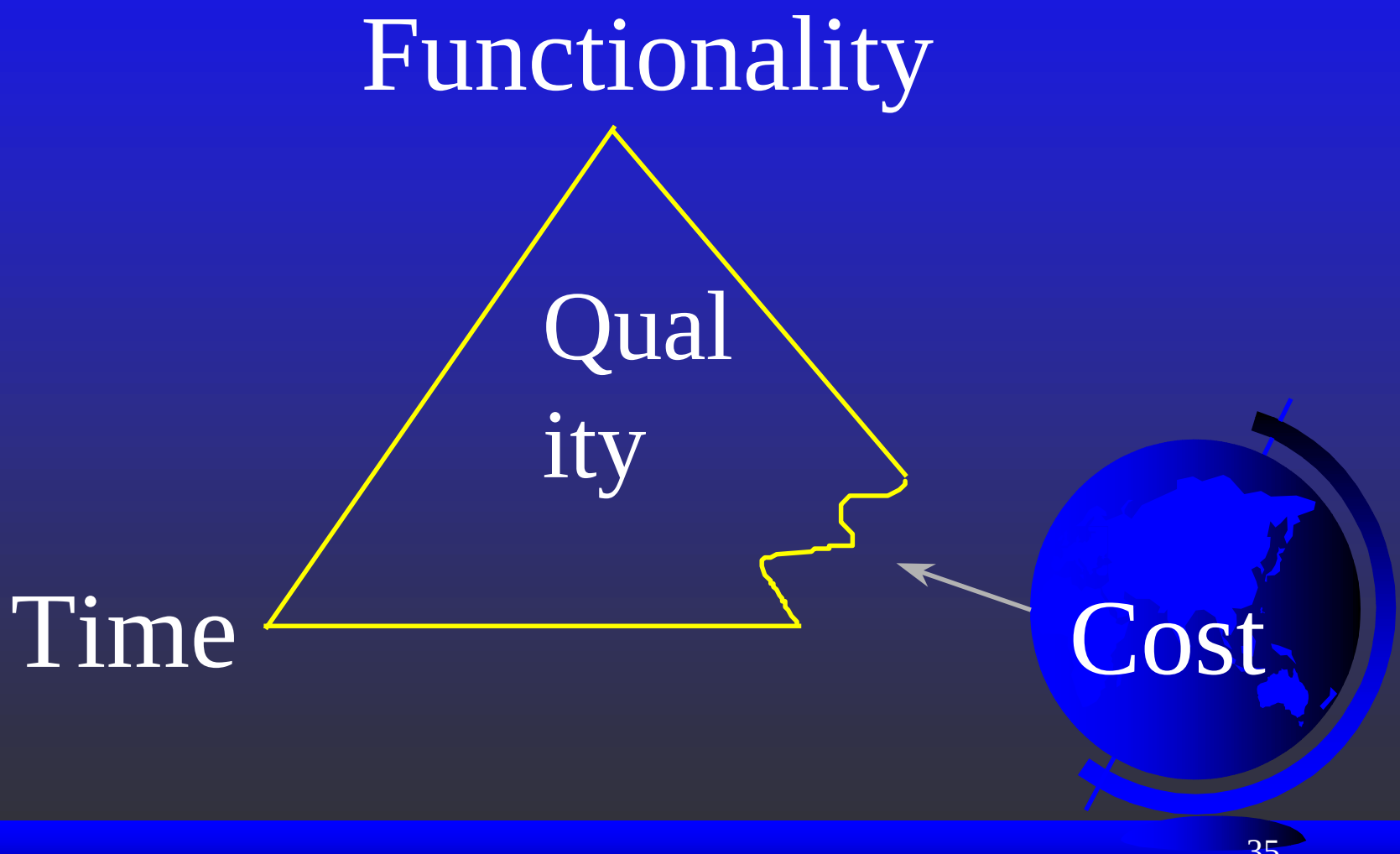
Impact of Reduced Cost



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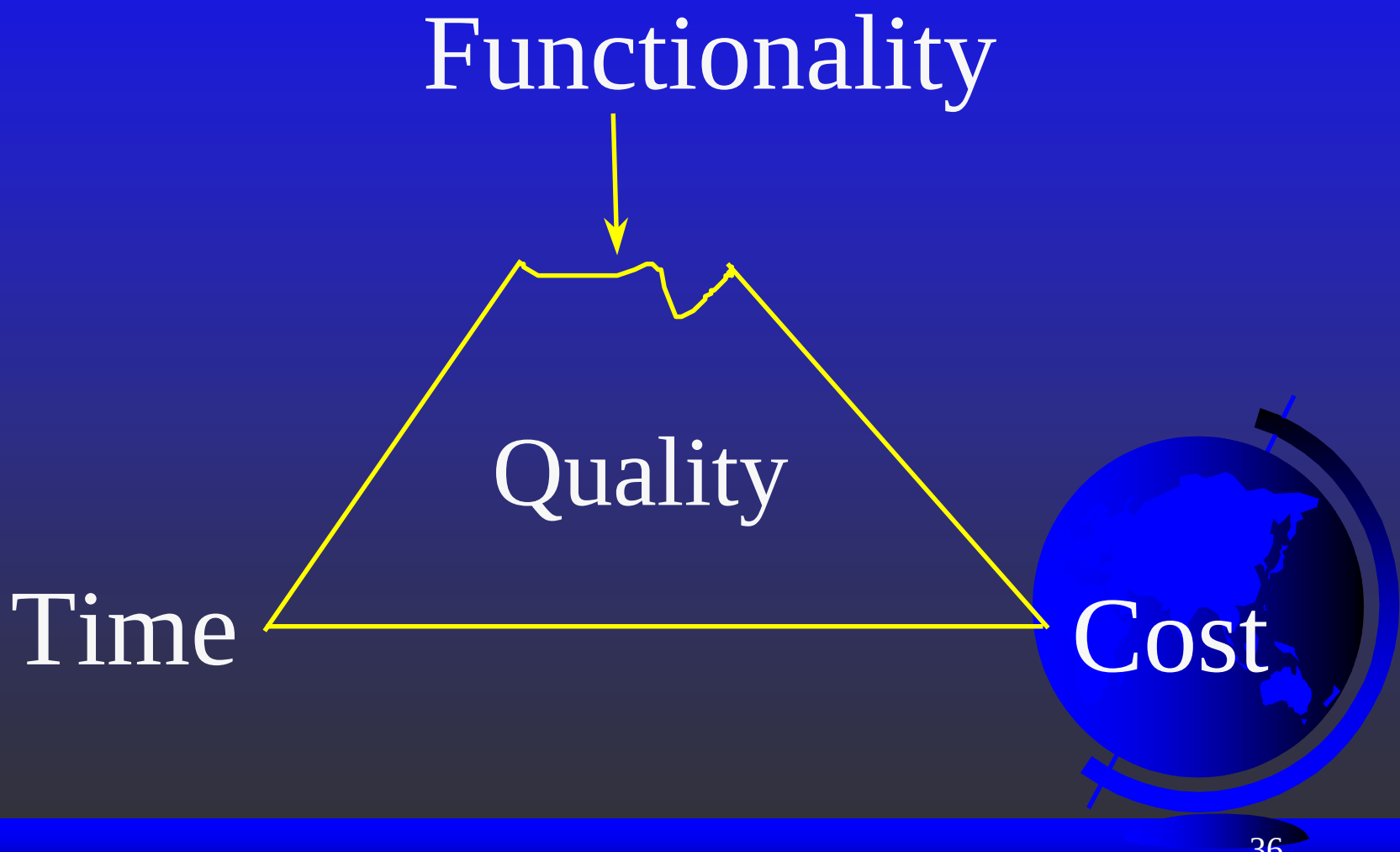
Impact of Changed Functionality



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Lesson Two

A development tool is just that: a tool, not a solution

A tool should only be used within the context of a technique, within the context of a method

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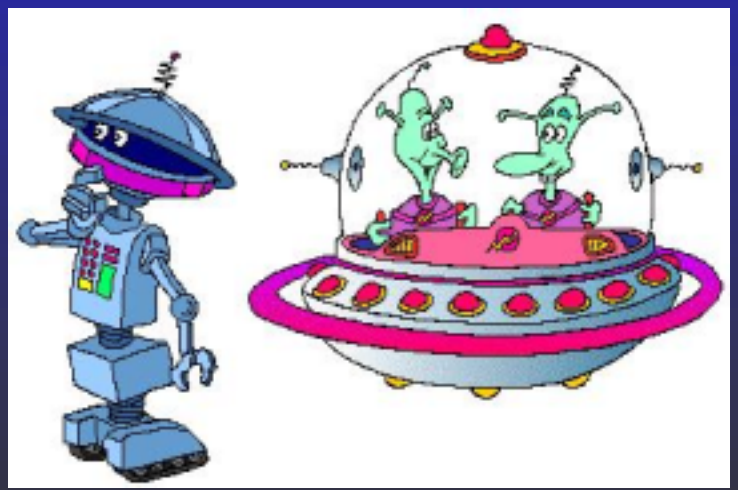
The Crunch

When should we stop designing and start building it?



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Lesson Three

Don't just automate a task: question the need for it and seek to eliminate it.

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Perfect System Behaviour

- The Holy Grail of both systems staff and user management
- It requires the existence of a mechanism that consistently ensures the company is:
  - running the correct software
  - using the correct master files
  - processing data correctly
  - using the correct operating procedures
  - using the correct clerical procedures

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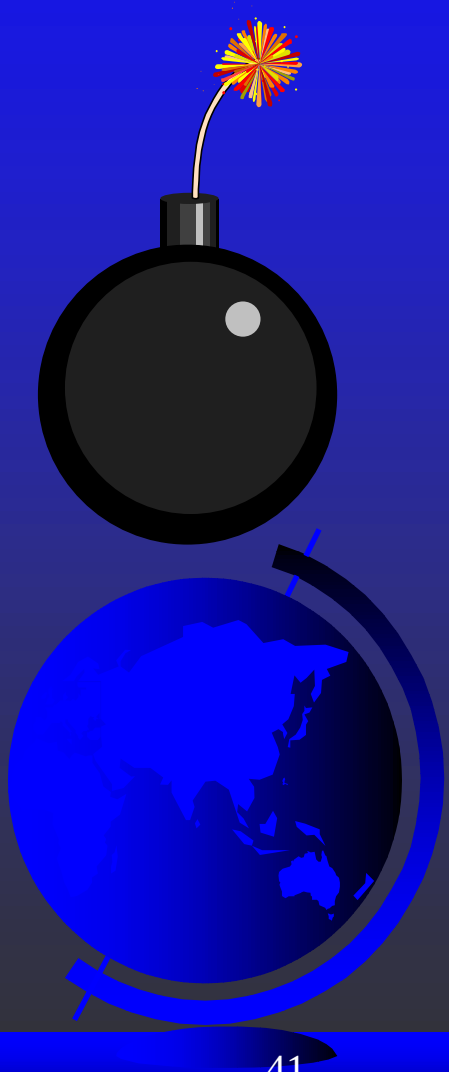
Lesson Four

- Package implementation is no different from developing an in-house system
- It is even more important to have a clear definition of requirements as subsequent change may be difficult and expensive



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Project Management Underpinning

- ISO 17799 (Information Security Standard)
- Control Objectives for IT (CobiT)
- TickIT (BS5750 Part 13)

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Project Development Using CobiT

IT GOVERNANCE PROGRAMME

Planning & Organisation	Acquisition & Impl.	Delivery & Support	Monitoring
- Strategic Planning - Information Architecture - Technological Direction - IT Organisation & Relationships - Manage the IT Investment - Communicate Aims & Direction - Manage human resources - Ensure Compliance - Assess Risks - Manage Projects - Manage Quality	- Identify Solutions - Acquire & Maintain Application Software - Acquire & Maintain Technology Architecture - Develop & Maintain IT Procedures - Install & Accredit systems - Manage Changes	- Define Service Levels - Manage third-party services - Manage performance and capacity - Ensure continuous service - Ensure systems security - Identify and attribute costs - Educate and train users - Assist & advise IT customers - Manage the configuration - Manage problems & incidents - Manage data - Manage facilities - Manage operations	- Monitor the processes - Assess internal control adequacy - Obtain independent assurance - Provide for independent audit

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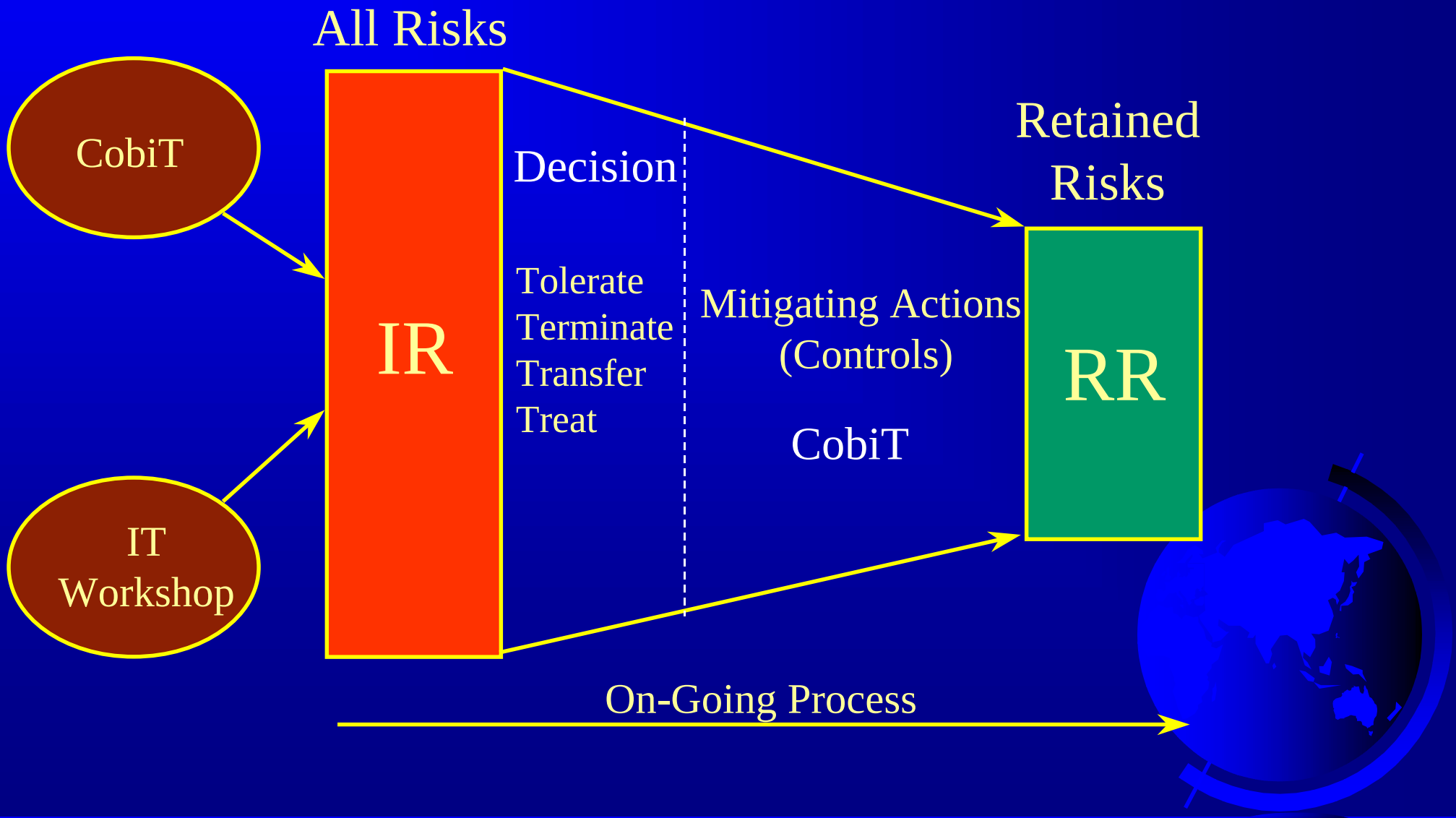
Project Risk Management



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Project Risk Register

- Identify all risks that will impact on:
  - system delivery
  - operation of the system once it goes live
  - quality of the data at take-on and subsequent operation
- Decide on what you intend to do about each one:
  - Tolerate
  - Terminate
  - Transfer
  - Treat
- Do it!

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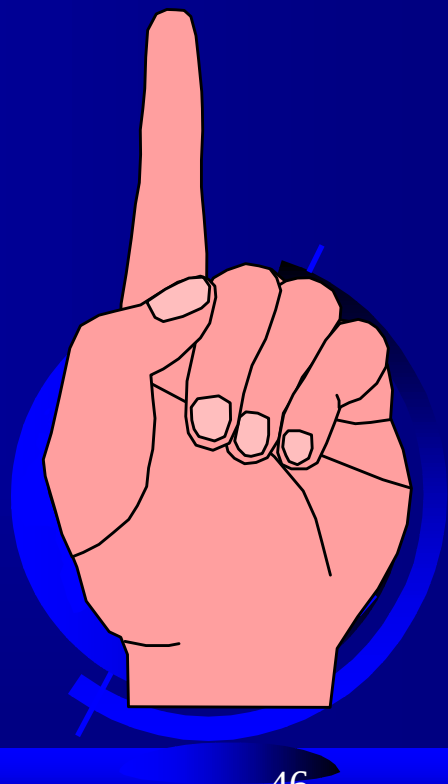
Consider Operational Control During Development

- Requirements specification
  - Make control an explicit requirement
  - Include the control requirements of all secondary and third-party users
- Detailed design
  - Infrastructure
  - Application
  - User procedures



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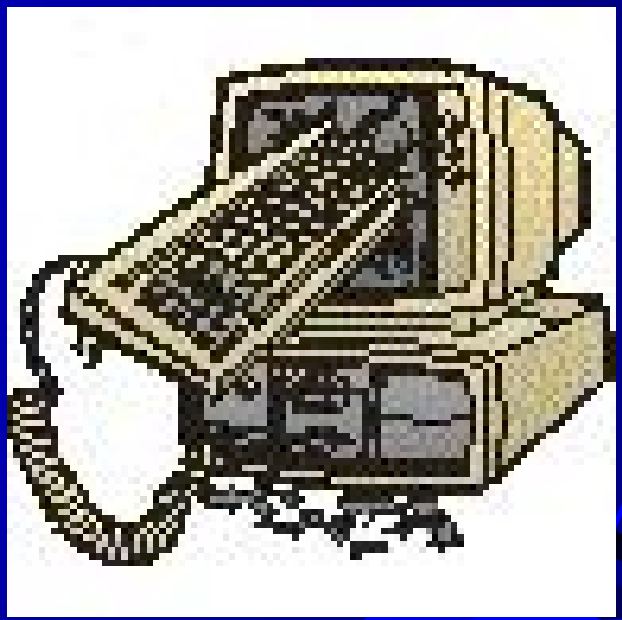
System Integrity Threats

- Mistakes caused by:
  - people
  - software
  - hardware
- Deliberate attacks for:
  - nuisance
  - compromise
  - fraud



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Holistic Control

- Confidentiality
  - Data, information and services are only available to those who should have then
- Integrity
  - Data and processing is complete, accurate and reliable
- Availability
  - Data, information and services are available at the time of need to those who should have them

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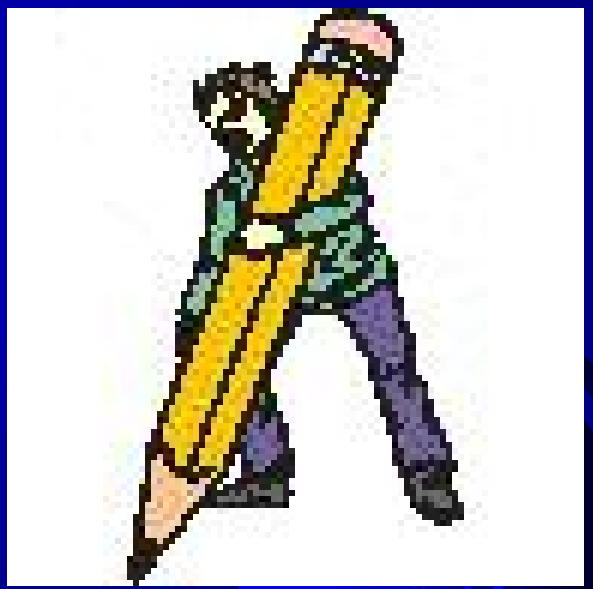
Documentation Risks and Controls

- Control documentation should be produced as part of the detailed system design
- It should include details of:
  - identified risks
  - all data items & quality rules
  - processing control
  - output control
  - access privileges & restrictions
  - contingency plans
  - management trail



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The Cost of Correcting Software Errors

Project Stage	**Cost**
Requirements	X 1
Design	X 3
Coding	X 5
Testing	X 14
Acceptance Testing	X 33
Live	X 100

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Change During Development

- It will happen
- Must be controlled
- Use the risk register to do so

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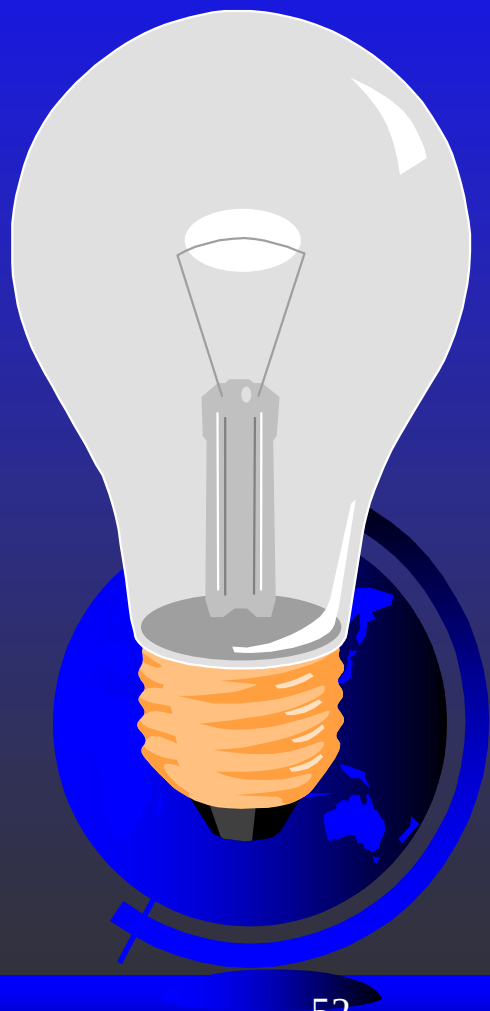
Things To Think About (Success Model)

- Leadership is when you can't say "let's forget the whole thing"
- During change, people are more important than things
- Nobody really listens



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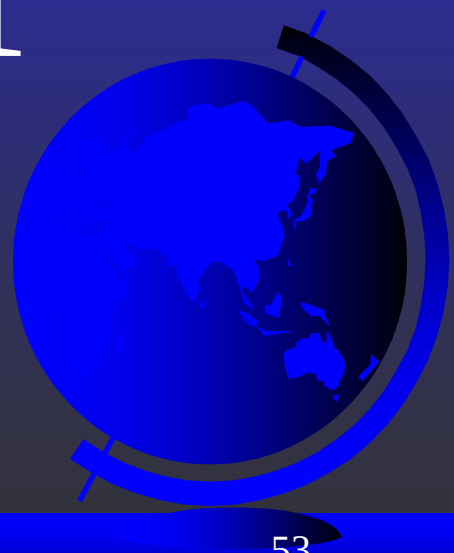
Things To Think About (Success Model)

DATA IS VERY IMPORTANT



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The Importance of Data

- The reason for the system in the first place
- Data quality rules should be specified as part of the design to avoid subsequent garbage in, garbage out (GIGO) problems

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Data Integrity Requirements

- The mechanism for ensuring data integrity must be explicitly defined at the design stage
- The data quality rules should form a separate section of the design documentation

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Some Things to Ponder

- The end game is the operational system - it will be around for a long time
- Data integrity and reliability of output are the prime requirements
- Control & security must be designed in - not added on later
- External processes are as important as internal design and should be designed at the same time

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Often Forgotten

- Configuration management (capacity planning)
- Disaster recovery must be available from day one
- Second and third party user requirements
- Integration with other systems
- External user processes
- Testing - design the testing strategy during the design phase
- Training (user, help desk, technical support)
- Maintenance

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The Two Big Questions

- If things go wrong
  - ⇨ Where was Internal Audit?
- If things go right
  - ⇨ What contribution did it make?

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Audit Reporting

AUDIT ISSUE FORM

System:

Issue No:

To:

AUDIT ISSUE

MANAGEMENT RESPONSE

FURTHER AUDIT COMMENT

Date: Signature:

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Audit Do's

- Educate the developers and users in control methodology
- Write a section in the development manual (if there is one) on control techniques
- Make sure that Audit involvement is shown in the development plan
- Carefully check the performance assumptions

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Audit Do's

- Make sure that you fully understand any formulae, or other calculations
- Check any calculations for the correct result
- Check the interfaces
- Raise audit issues as they occur
- Be a constructive nuisance

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Audit Do's

- Put it in writing
- Get it minuted
- Go and talk to people
- Act as a facilitator
- Respond quickly
- Get involved
- Admit mistakes

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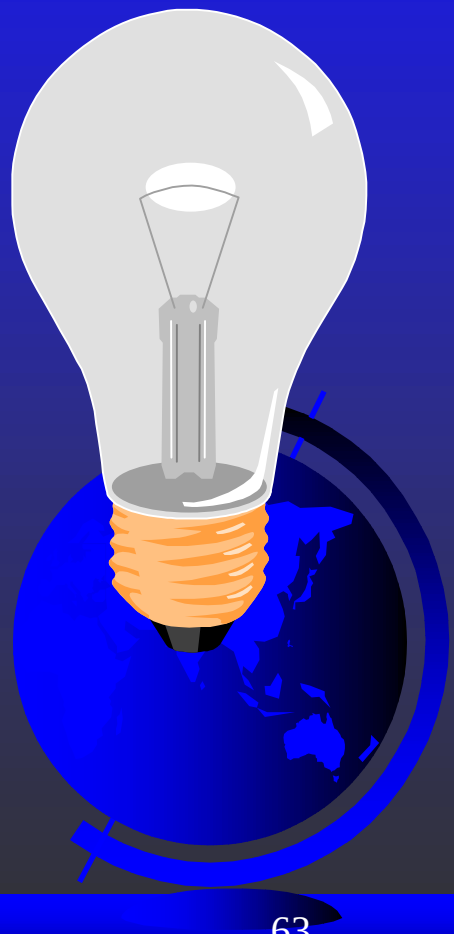
Things To Think About

- Past performance is a sure guide to the future
- You are the control expert
- They are the computer experts
- Don't forget the basics



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More Things To Think About

- Involvement does not mean lying down with your legs in the air
- Optimism is an expensive luxury
- Always borrow money from a pessimist

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Conclusions

- Development failures are as much a result of social failings as technical inadequacies
- Over optimism by all sides is the worst culprit
- Every project board should contain an ‘eeyore’

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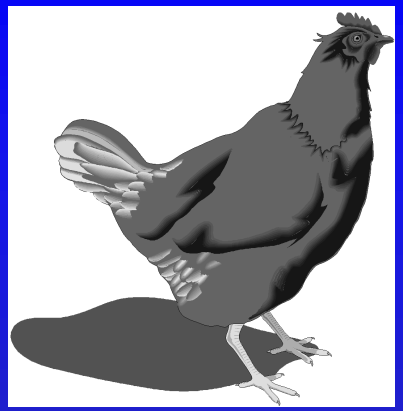
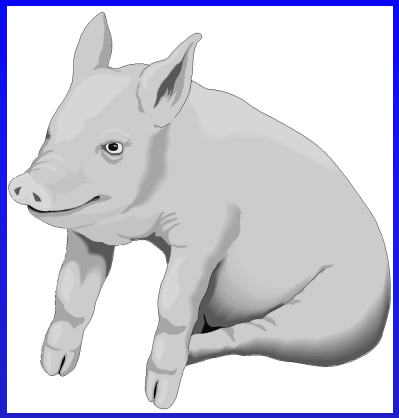
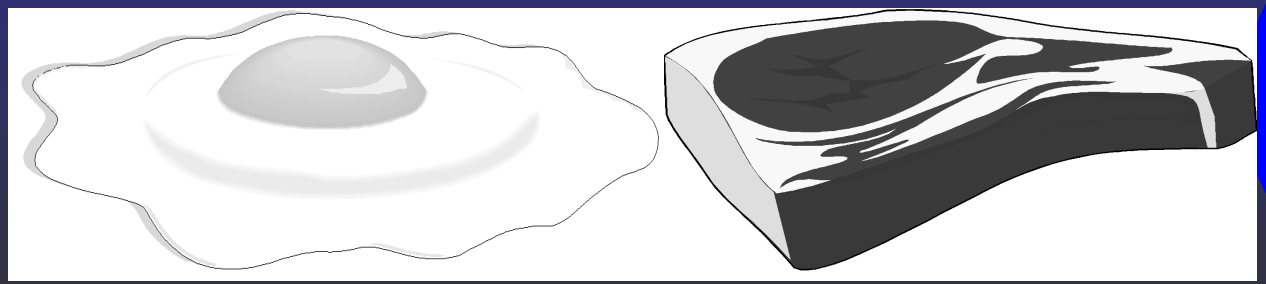
A Final Thing To Think About







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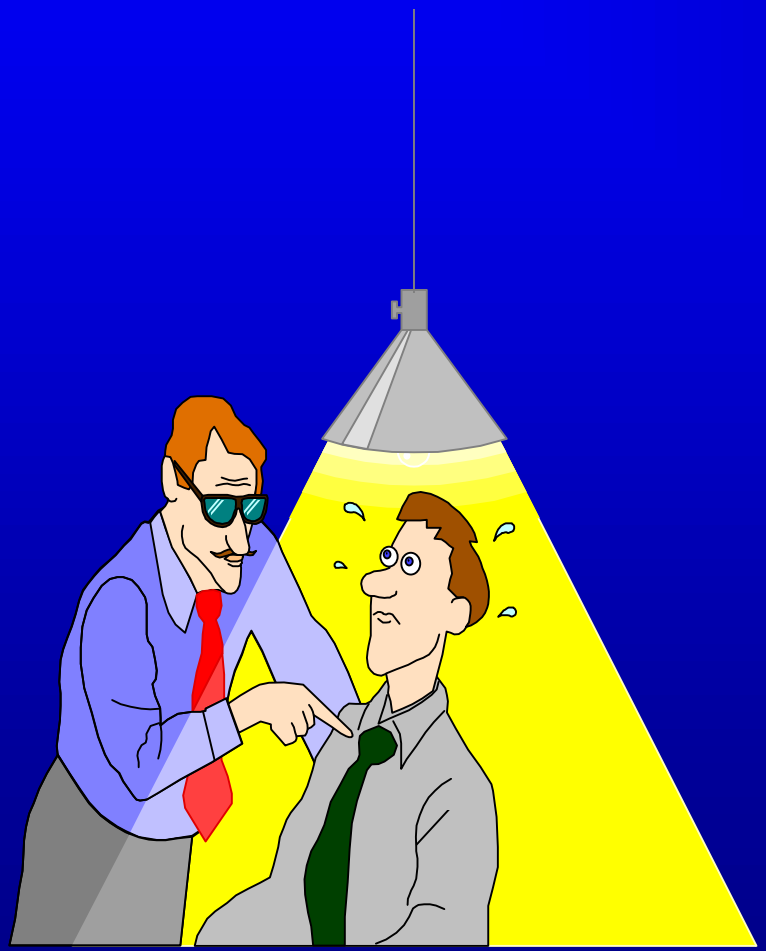
Questions?



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