

# Principles of Effective IT Management

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# Agenda

- The environment in which we operate
- A new framework: 5 fundamentals
- Formal processes: importance and examples
- Organization and staffing
- Recruiting and retention
- Environment and facilities
- Systems, tools, and infrastructure
- IT buy-in and executive management commitment
- Making it all happen

# This Course Is *Not* About:

- How to develop a business strategy
- Why IT is important
- Specific tools, technology, or vendor solutions
- Building a data center
- Troubleshooting networks
- Programming for Network & Systems Management

# What This Course Does Cover:

- The basic elements of an effective IT organization
- How processes, procedures, people, facilities, and tools must dovetail to create sustainable IT performance
- Ideas on developing a framework that's relevant to your organizational environment
- How network and systems management inform your internal operations
- What it takes to gain executive management commitment




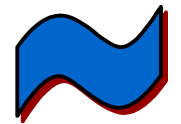
# What is IT?



IT-Specific Disciplines	IT-Intensive Disciplines	IT-Supportive Disciplines
Artificial intelligence Computer science Computer engineering Computational science Database engineering Computer graphics Human-computer interaction Network engineering Operating systems Performance engineering Robotics Scientific computing Software architecture Software engineering System security	Aerospace engineering Bio-informatics Cognitive science Digital library service E-commerce Financial services Genetic engineering Information science Information systems Public policy & privacy Instructional design Knowledge engineering Management information systems Multimedia design Telecommunications Transportation	Computer technician Help desk technician Network technician Professional IT trainer Security specialist System administrator Web services designer Web identity designer Database administrator

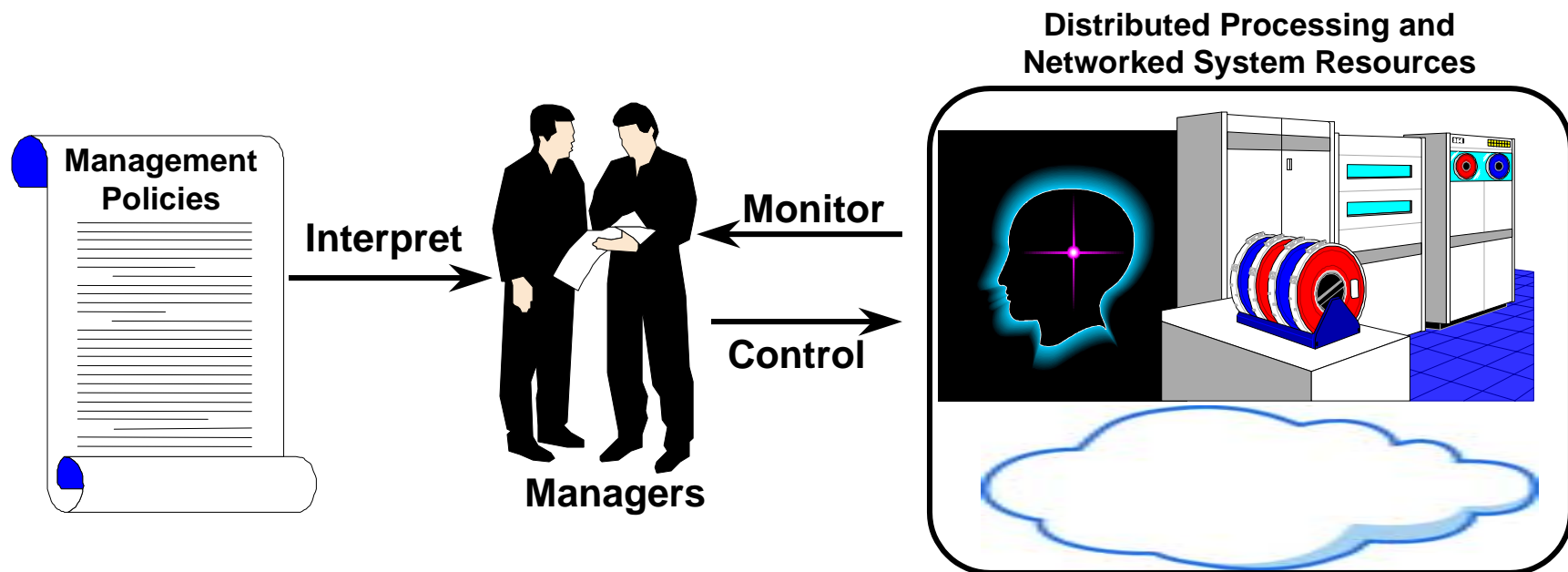
Source: Peter Denning, "Who Are We?", CACM, Feb. 2001

# Discipline or Profession?

- Hallmarks of a profession:
  - a durable domain of human concerns 
  - a codified body of principles (conceptual knowledge) 
  - a codified body of practices (embodied knowledge including competence) 
  - standards for competence, ethics, and practice 

*Source: Peter Denning, "Who Are We?", CACM, Feb. 2001*

# Management & Information Flow

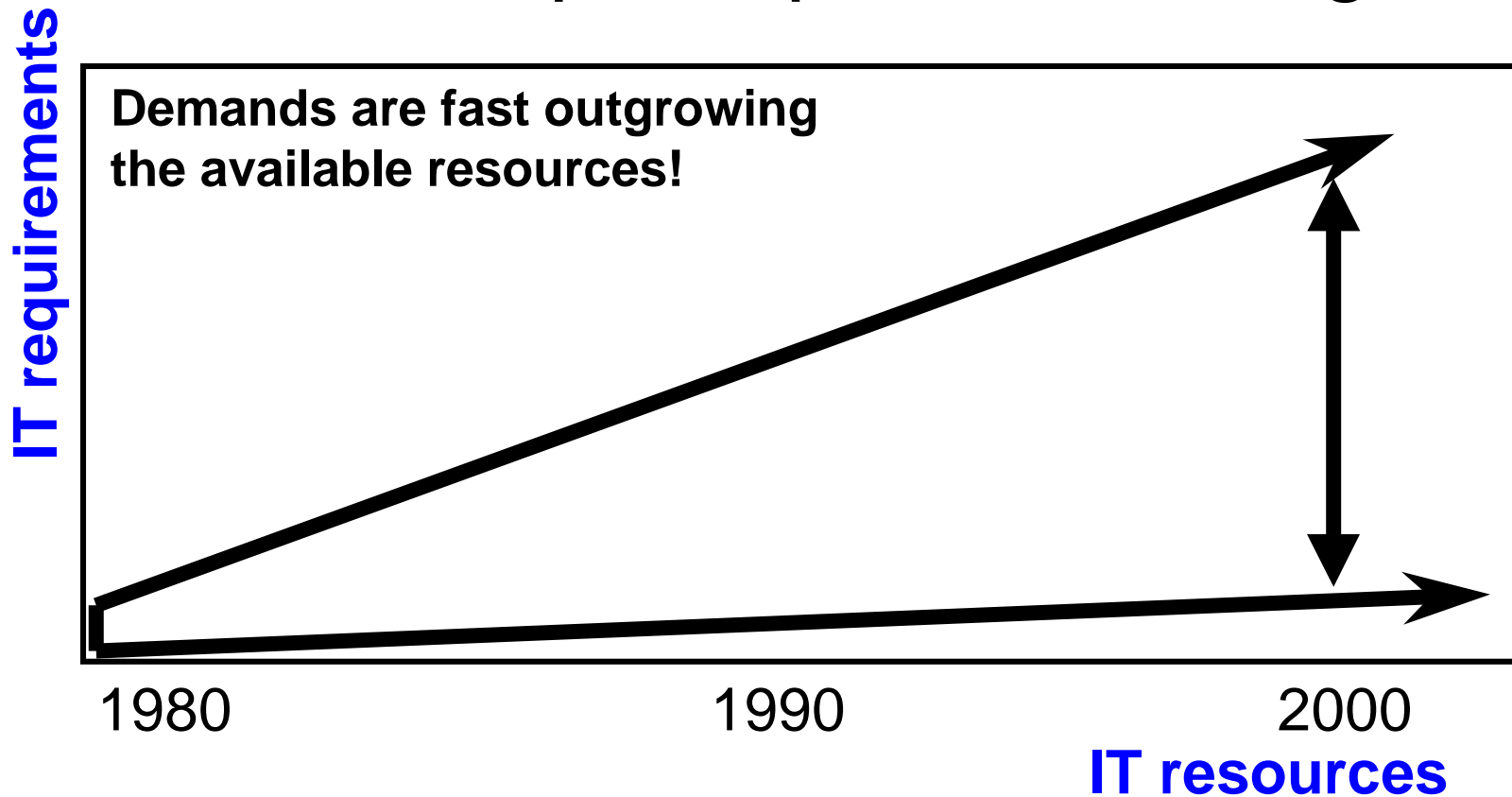


# W hat's D riving U s to C hange?

- Movement to a network computing model
- Expansion of business requirements, based on customer demands (e.g., 24 hour a day banking) and competition
- Increase in the degree of business dependence (24 x 7 uptime requirements)
- New time requirements... what does “Internet time” mean to your business?

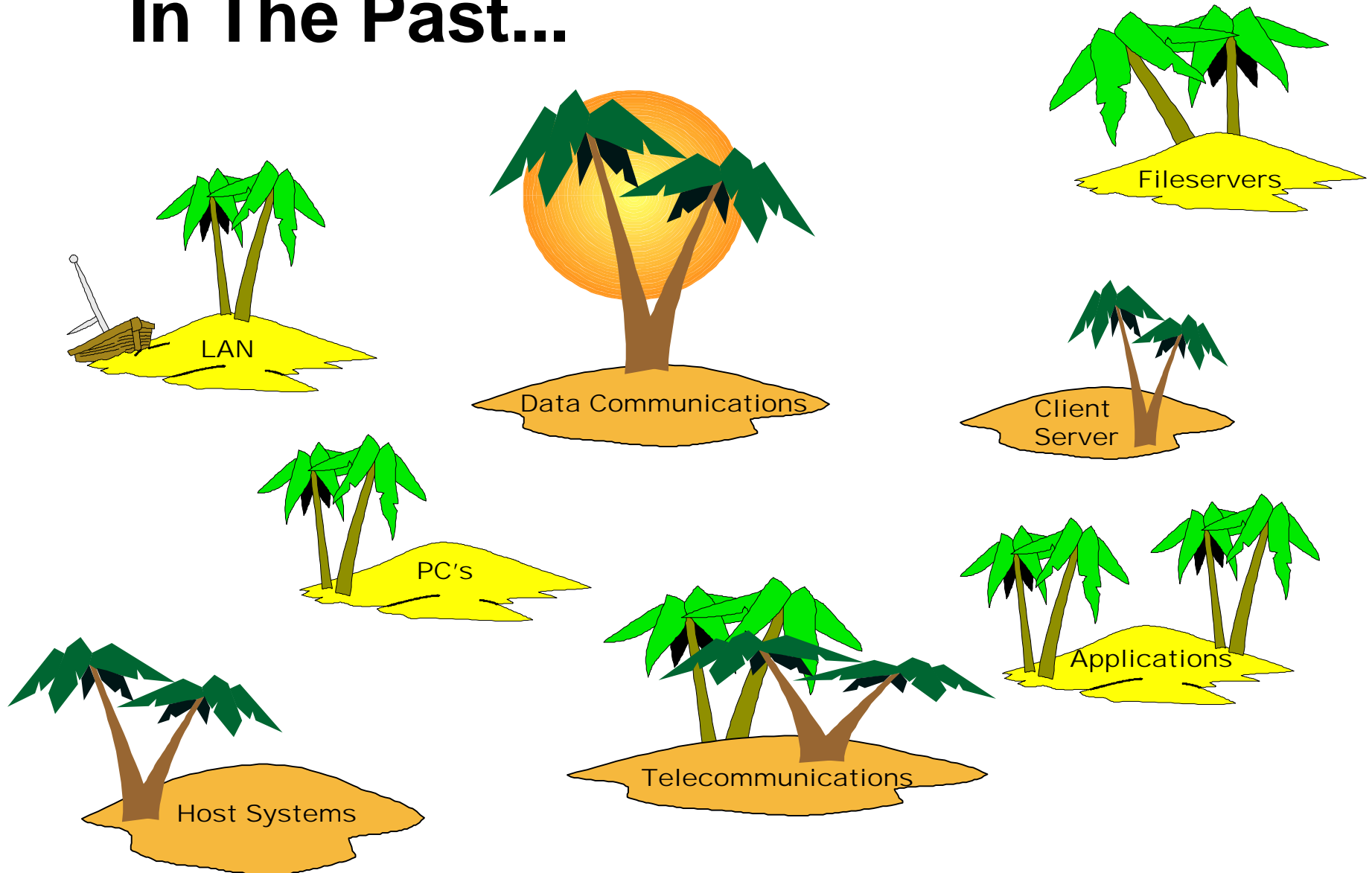


# The Gap Keeps on Growing

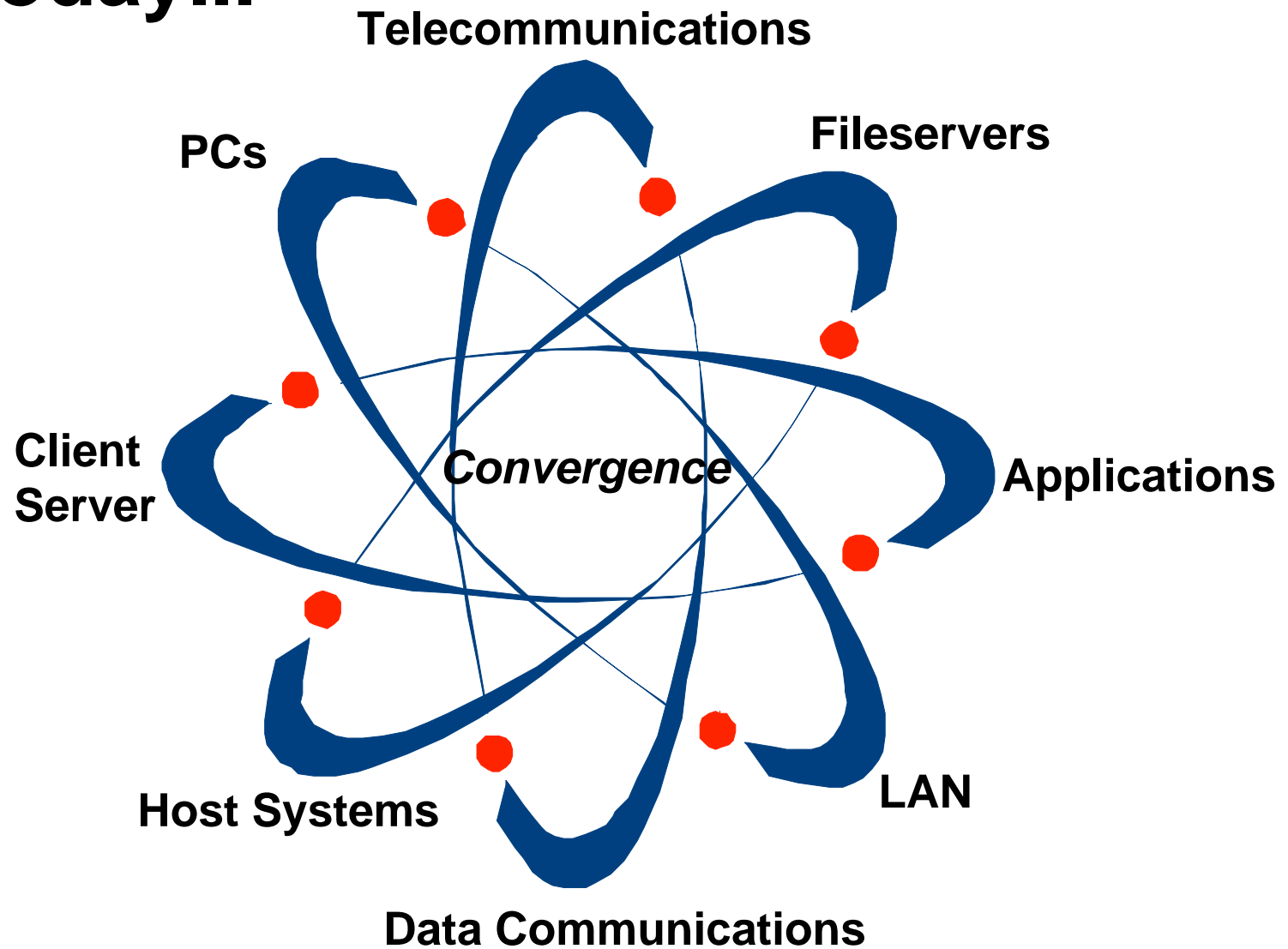


*Numbers and importance of applications, users, systems, devices, etc.  
vs. numbers and capabilities of staff, tools, facilities, etc.*

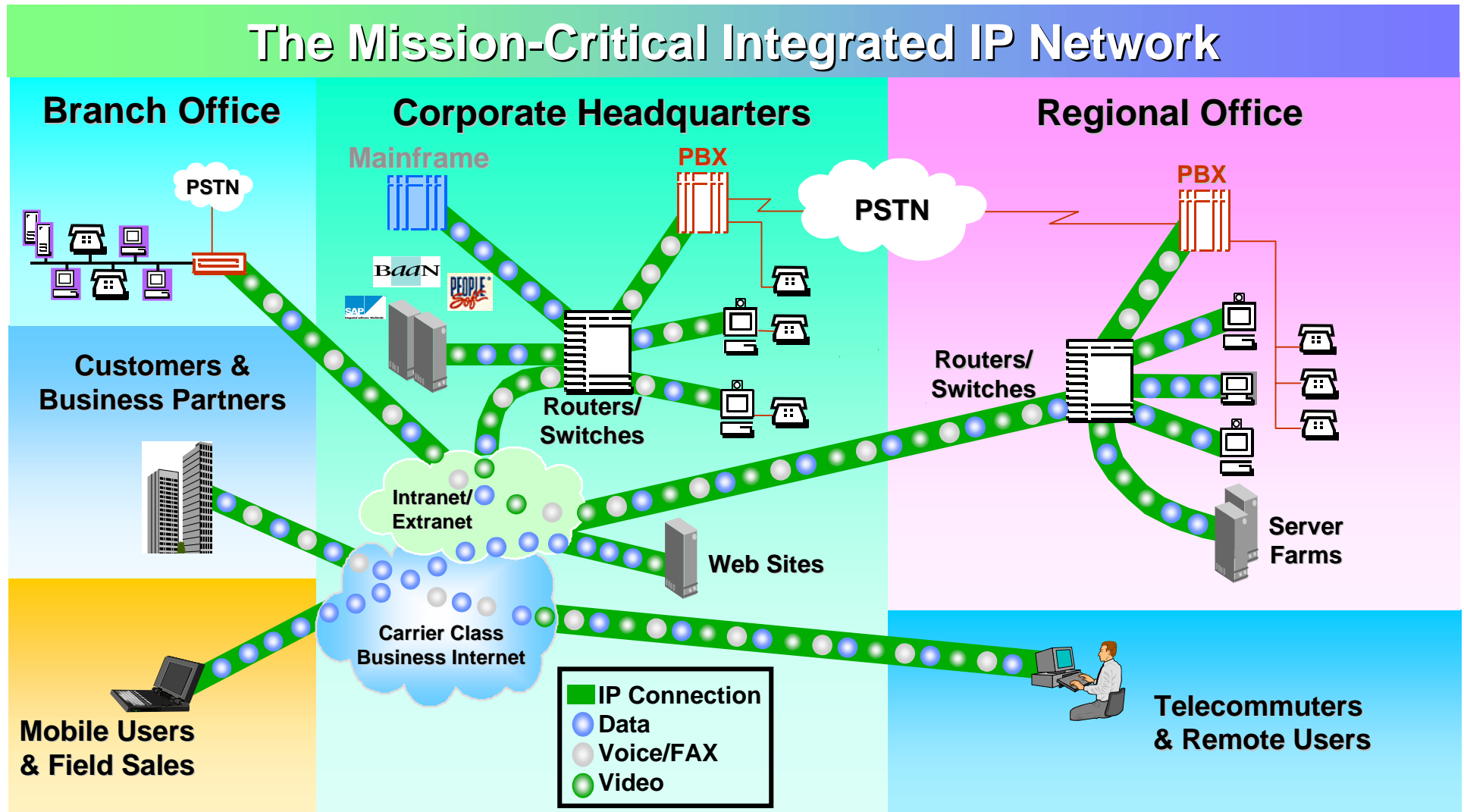
# In The Past...



# Today...



# For example...

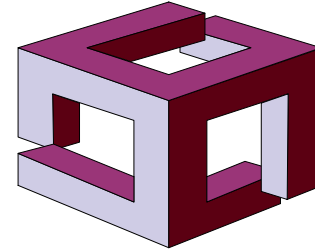


# Agenda

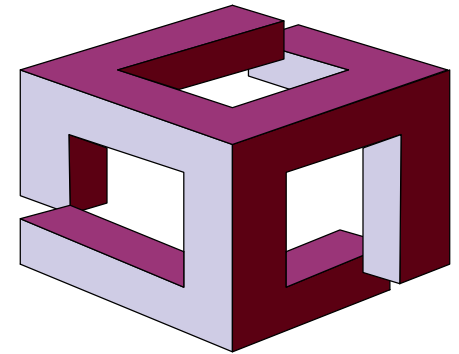
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# Creating a New Framework

- An enterprise approach may involve:
  - solutions from many vendors
  - many internal departments
  - external resources
- Your solution must meet the required business line needs for all of your locations and departments
- So your major questions should include “what’s the right mix of resources to use, for what, when?”
  - IS/IT department
  - people from customer departments
  - outsourcers
  - contractors, consultants
  - vendors



# Framework Characteristics



- It must be flexible enough to change as standards mature and vendors win the wars over market share
- It is most important for you to remember that there is no one solution for all companies
- Successful network & systems management takes commitment to a long-term strategy

# Some Things to Ponder

- $NT + OO = EOO$
- What are:
  - » New Year's
  - » President's Day
  - » Memorial Day
  - » Independence Day
  - » Labor Day
  - » Thanksgiving
  - » Christmas





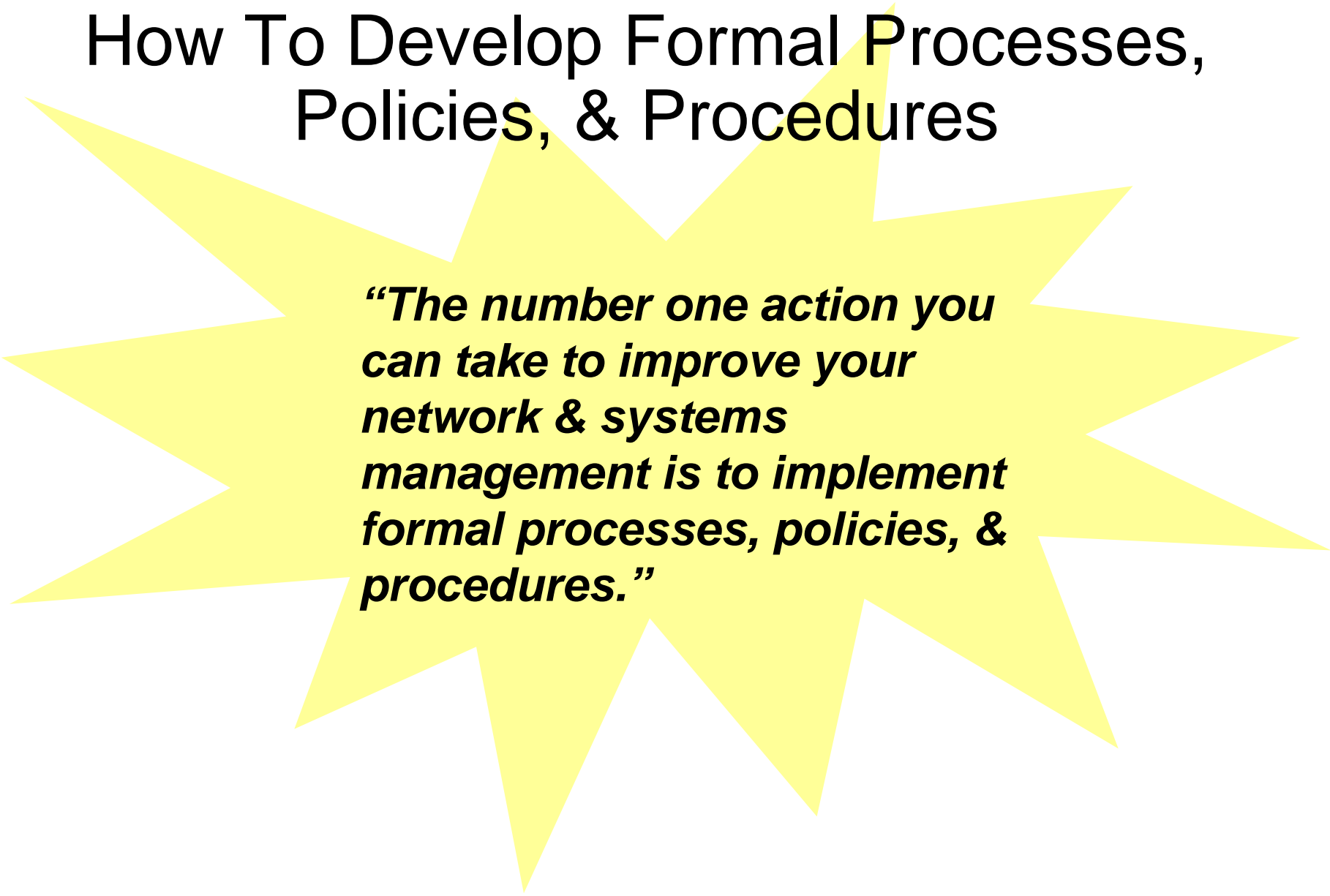
# The Five Fundamentals Of Successful IT Organizations

- Formal processes, policies, & procedures
- Organization and resources
- Functional facilities
- Systems, tools, and infrastructure
- IT buy-in and executive management commitment

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# How To Develop Formal Processes, Policies, & Procedures

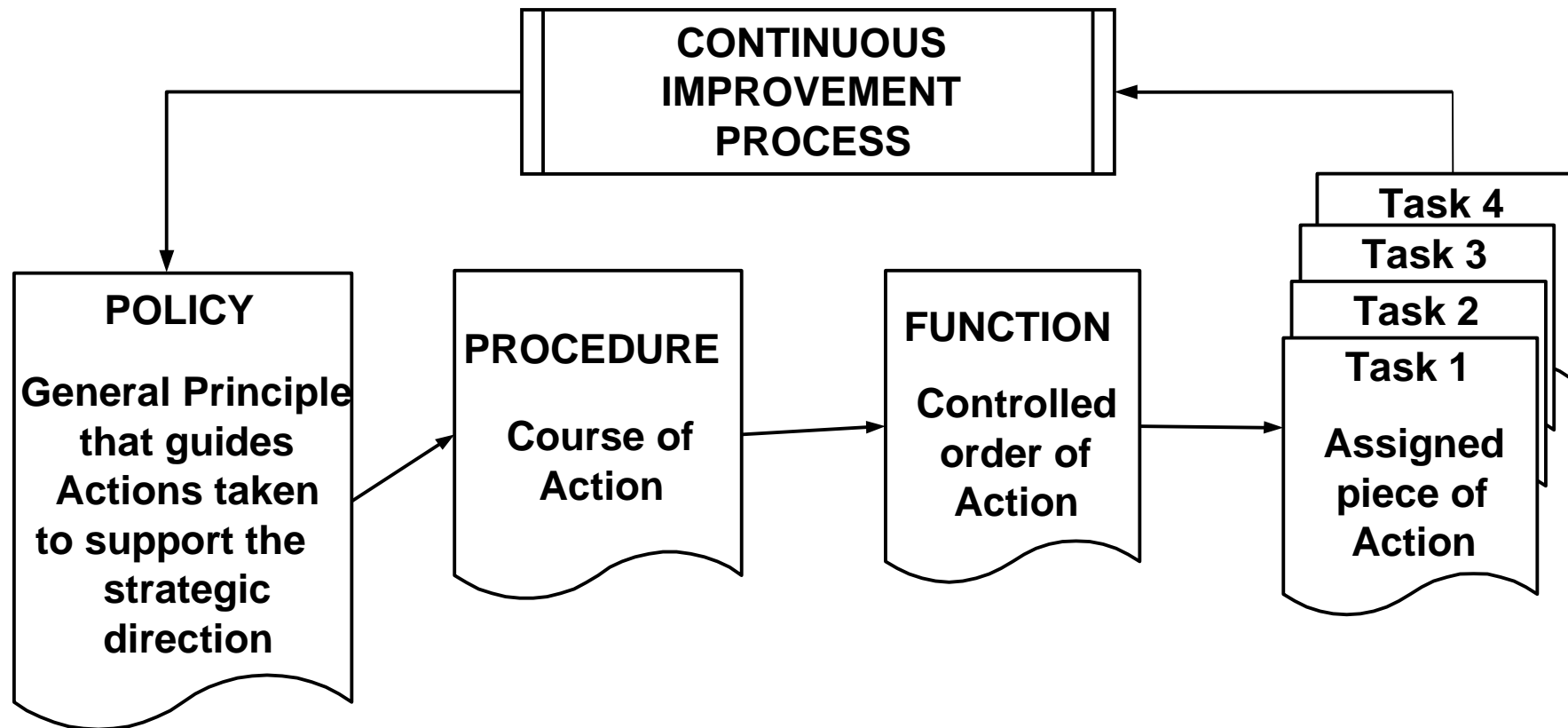


***“The number one action you can take to improve your network & systems management is to implement formal processes, policies, & procedures.”***

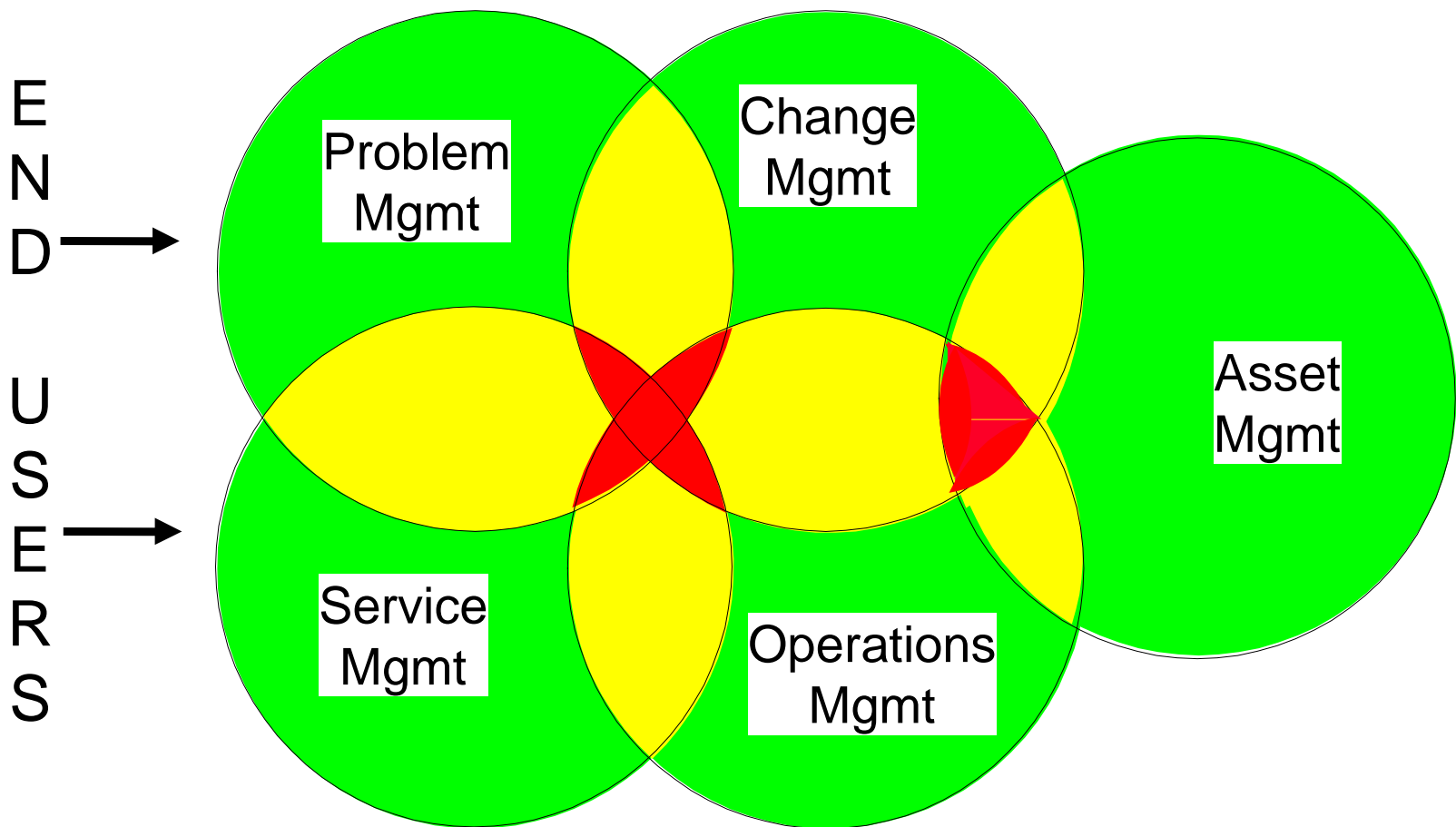
# The Value of Process

- Proactively defines how you will run the business
- Engages stakeholders with process owners and performers
- Creates specifications for staffing and tool requirements

# How the Elements Fit Together



# Example of “Core” Processes



# Problem Management

- Is a global process for IT - everyone gets involved in some aspect
  - reactive: solving problems that have already occurred
  - proactive: using early warning signs to try to prevent problems
  - predictive: gathering and interpreting data for planning purposes
- Help Desk is typically the front-line interface for customers
  - role and details must be defined within the context of global Problem Management





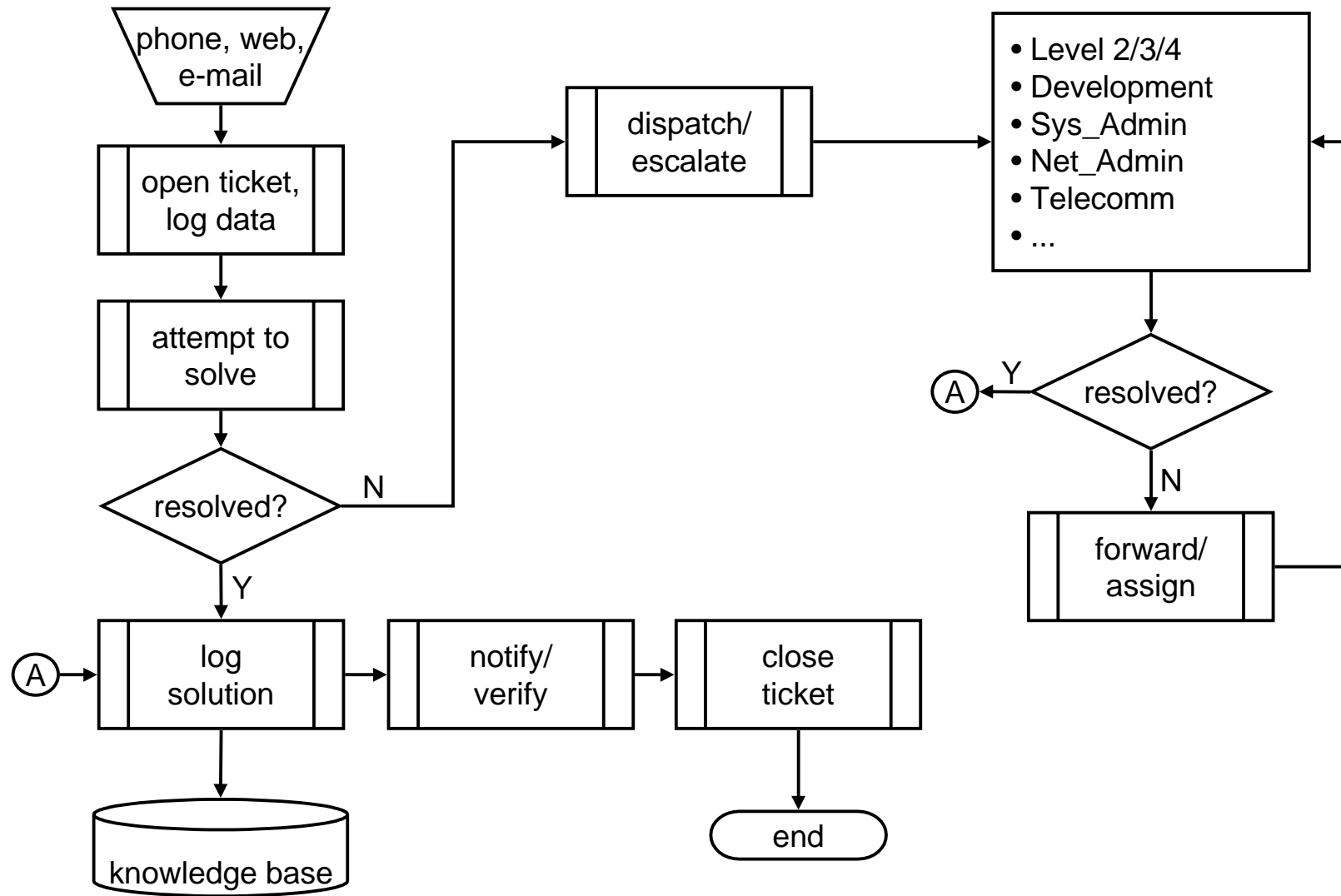
# Keys to Help Desk Success

- Focused on customer care - taking total ownership of problems
- Uses the proper mix of reactive, proactive, and predictive support
- Business-focused rather than technology (understands what's mission critical to the business)
- Has SLAs that commit to what is important to end-user customers, vs. what can or has been measured traditionally





# Sample Call Processing Flow



# What's Important along with the Process Flow

- **OWNERSHIP**
- **TIMELINESS**
- **COMMITMENT**
- **COMMUNICATION**
- **KNOWLEDGE**



# Sample Severity/Priority Levels

	<b><i>DEFINITION</i></b>	<b><i>RESPONSE</i></b>	<b><i>RESOLUTION</i></b>
1 (7x24)	No work-around; business is halted; financial loss	15 min	7x24, try to fix ASAP
2 (7x24)	Work-around can be established in reasonable timeframe	30 min	2 hrs
3 (M-F)	Job functions inconvenienced; normal bus. ops continue	1 bus day	5 bus days
4 (M-F)	Minimal bus. impact; general inquiry; delivery of supported technologies, services	2 bus days	5 bus days

# The Challenge of Collecting Data

- Need to guide the end user / customer on what's relevant
- Need to capture at earliest possible time to prevent repetition that frustrates the customer
- Organization is crucial to a useful knowledge base
- Consistent entry and representation are crucial to a useful knowledge base

# Critical Success Factors

- Service Level Agreements define your commitment to support your customer
- Operating Level Agreements define your working relationship with and expectations of resolution partners
- OLAs and SLAs MUST MATCH!!!!!!
- Stewardship report shows customer how you're doing against goals

# Management Reports

- Stewardship report is your performance report card, internally and for customers
- Map customer business objectives against the 23 key performance indicators
- Choose the metrics that are important to your *customer* - communicate in *their* terminology

# Top Help Desk Metrics

*are they meaningful to your customer?*

<b><i>Business Indicator</i></b>	<b><i>Industry Goals (Avg)</i></b>
Abandoned Rate (dropped calls)	~5-6%
Average Speed of Answer (how quickly incoming call is answered)	80% in 20 sec 100% in 100 sec
Average Handling Time (= avg talk time + after call work)	15 min (10 + 5)
Call Logging	100%
Quality (call monitoring, customer follow-up, ticket auditing)	100-96% - outstanding 95-91% - abv expectn 90-86% - meets 85% -< - below
Cost to Escalate	\$125
Cost Per Call	\$27 (full burden)
First Call Resolution (resolved on immediate contact, no assistance from 2 <sup>nd</sup> support group)	79% (w/ proper tools, skills, training, etc.)
Occupancy (time serving customer = ACD time + available time)	80% (first level)

source = Help Desk Institute

# Some Resources for Additional Information

- Help Desk Institute  
([www.HelpDeskInst.com](http://www.HelpDeskInst.com))
- Project Management Institute  
([www.pmi.org](http://www.pmi.org))
- EXIN provides IT Infrastructure Library (ITIL) exams and certifications  
([www.exin.nl/en/exinanditil.htm](http://www.exin.nl/en/exinanditil.htm))



# To Focus on Problem Prevention

- Measure root cause analysis and trending by creating reports on:
  - Top 5 problems
  - Top 5 Customers
  - All open tickets
  - Missed Problem Management guidelines
  - Tickets assigned by workgroup/individual ID
  - Percent by call type
  - Percent by priority
  - Percent of quick calls

# Pulling the Pieces All Together

ANALYZE - PLAN - ACT - VALIDATE  
with communication, accountability

- for example,
  - weekly managers meeting, led by Help Desk
  - chronics and trends analysis
  - coordinate plans for solution
  - report on progress



# Ways to Gauge Client Satisfaction

- Get regular feedback!
- Choose method that best fits the environment and culture from among:
  - telephone surveys
  - focus group meetings
  - hard-copy surveys
  - Voice Response Unit surveys
  - e-mail surveys



# Why Change Management?

*It is THE most critical process area*

- introduces the concept of control required in today's complex IT environments
  - addresses the root cause of a majority of IT problems! 56% of all problems are “self-inflicted” due to poor change management
- 
- *Must facilitate change, NOT impede it!*

# Change Management

- The considerations:
  - Adherence to defined Architecture and Standards of deployment
  - roles and responsibilities - business and technical
  - Formal processes, policies, and procedures
  - Defined severity levels
  - Process depth equal to business risk tolerance
  - Documentation of change results
  - Defined linkages to Problem Management and Asset Management



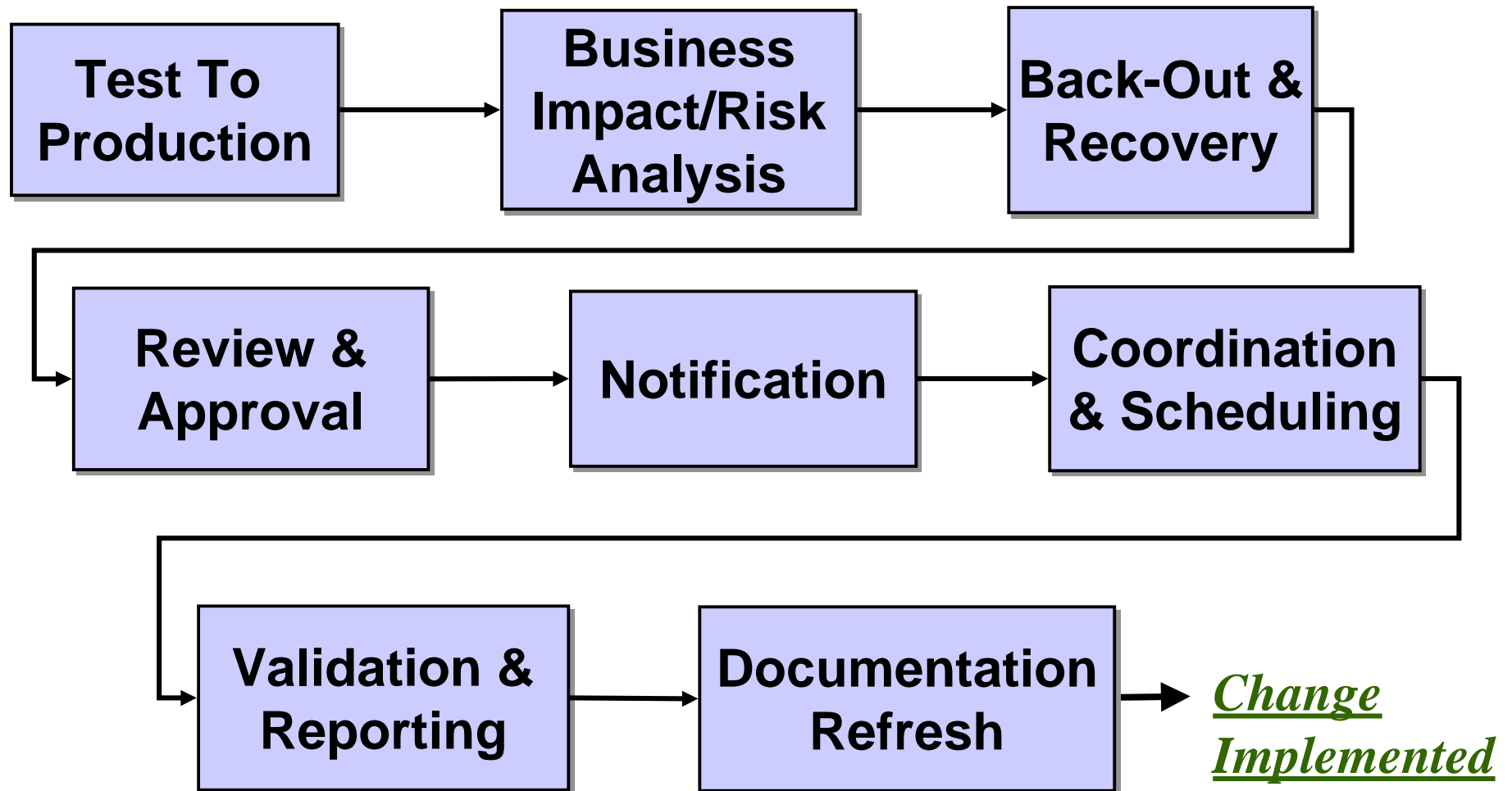
# Change Management Goals

- a controlled order of action (Formal Processes, Policies, Procedures, Functions and Tasks) when implementing changes
- PROTECTION OF THE EXISTING ENVIRONMENT!!!!
- Testing rigor and depth of process match severity level and organization risk tolerance
- Eliminate: Surprise packages altering performance and availability.

# Architecture and Standards

- Define enterprise Architecture
- DOCUMENT DOCUMENT DOCUMENT
- Create and adhere to standards for architecture deployment
- Configuration Management = benchmarked performance and stability specifications
- Each change MUST be reviewed against Architecture and Standards to ensure implementation integrity and assure Operations maintainability

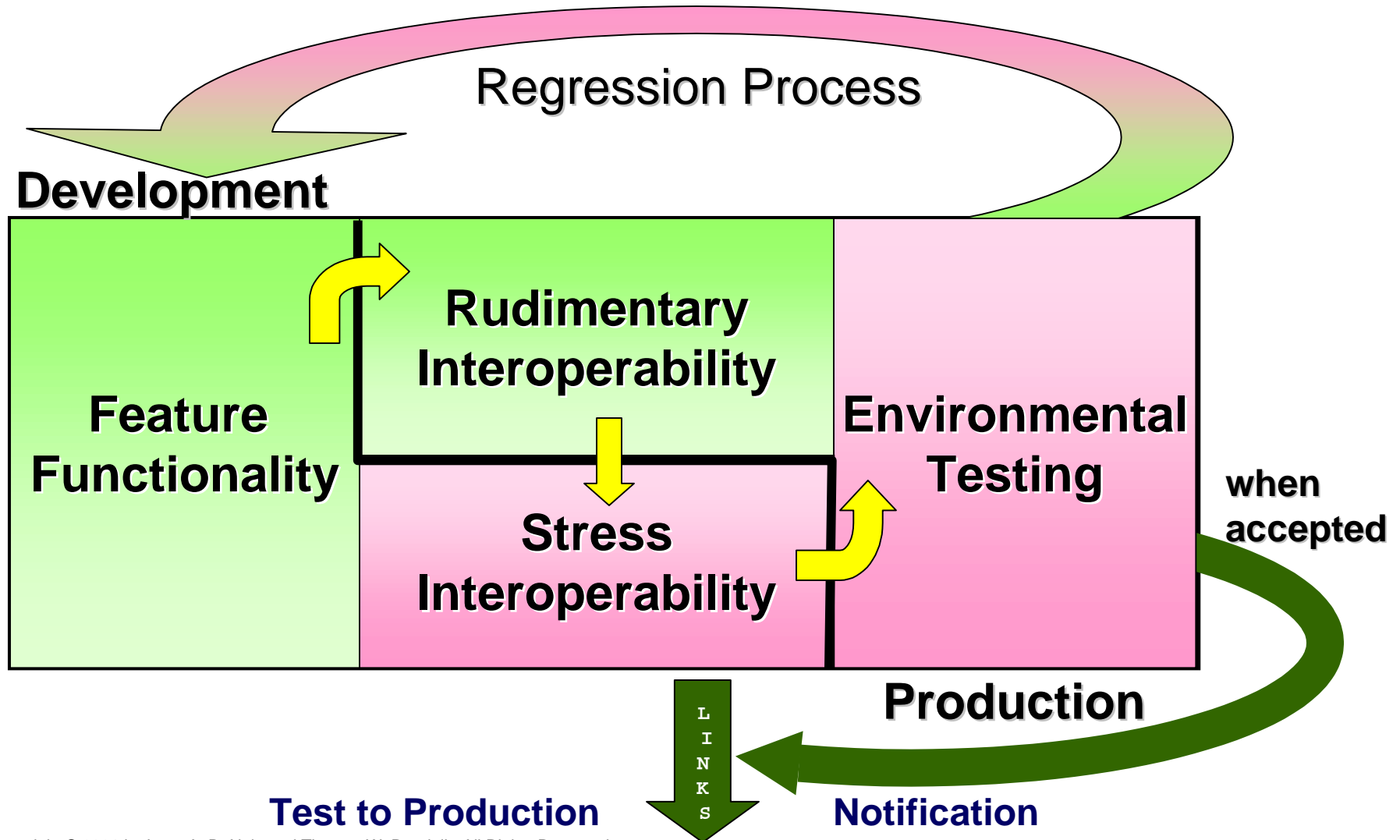
# One Approach to Change Management





# Test to Production

## Process for Migrating into Production



# Business Impact/Risk Analysis

- Mission-Critical Applications
- Underlying Serving Technologies
- Point of Change Risks
  - Defining technical risks
  - Determining points of failure
- Objective scoring vs. subjective decision-making
- Define Corresponding Business Impact



**Business Impact/Risk Analysis**      **Back-Out & Recovery Plan**

# Back-out and Recovery Plan

- Establish window of available time to enact change
- Set major milestones in the change process
  - ◆ success indicators
  - ◆ failure indicators
- Define time frames for execution of recovery plan
- Determine who declares change failure
- Define accountable parties for implementing back-out plan



**Back-Out & Recovery Plan**

**Review & Approval**

# Review and Approval

- Review criteria
- Review Team
- Grants of authority
- Process must have authority and consequences

*“Don’t Allow a Signature to Become  
the Easiest Thing to Get in Your Organization”*



**Review & Approval**

**Coordination & Scheduling**

# Notification

- Stakeholders
- Distribution Methodology
- Feedback Mechanism



# Coordination & Scheduling, 1

- Define severity levels to determine change cycles

<u>Day</u>	<u>Evening</u>	<u>Graveyard</u>
<b>Mission Critical Outage</b>	<b>Software Distribution Basic Reboots Low Impact Changes</b>	<b>Maintenance Windows</b>

- Change opportunities by cycle
- Map competing initiatives
- Schedule & execute

# Coordination & Scheduling, 2

- Managing change events
  - identify pre-requisites
    - » conditions
    - » concurrent vs. serial changes
  - identify relationships
    - » e.g., if change #1 fails, does it affect #4 or #5
    - » also inverses in case back-out is necessary
  - who has timer and clip-board to check progress and decide go-forward vs. back - out



**Coordination & Scheduling**

**Validation & Reporting**

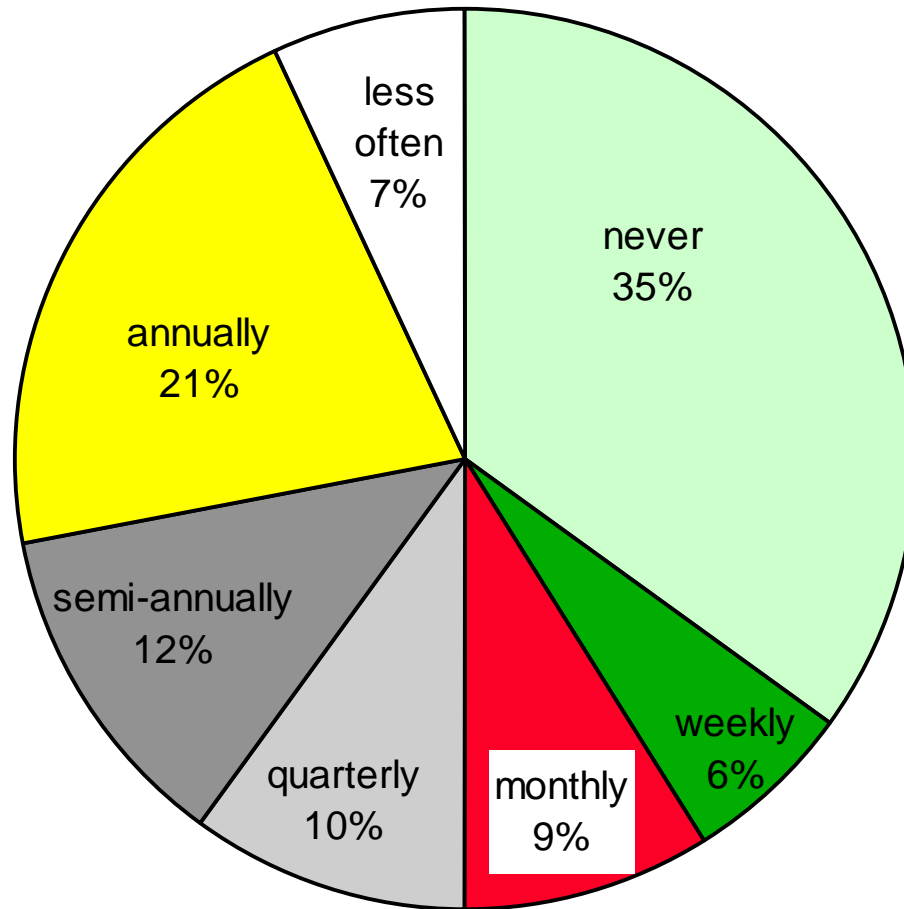
# Validation, Documentation and Reporting

- Actively monitor the change event
  - know your successes
  - know your failures
  - know the actions you need to take for each!
- Duplicate Notification following successful change
- Update and refresh all documentation consistently

*Change Implemented*



# How Often Do You Conduct Asset Inventories?



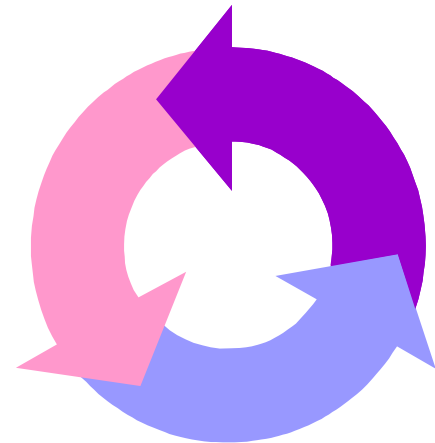
Source = Gowan et al,  
"Avoiding the Pitfalls of  
Installing Systems  
Management Suites", *IT Pro*  
(IEEE), Jan/Feb 2000

# Asset Management Issues

- What data will be captured?
- How/where will data be stored?
- Who will enter data originally?
- How will data be maintained? & Who?
- When assets are retired, how long will data be kept?
- ...

# For Full Value...

- MUST tie problem, change, and asset management processes together!
- Otherwise asset information gets out of date in no time at all



# Operations Management

- Daily checklist (historical from mainframe days)
- Lack of discipline today (typical of client-server)
- Root cause analysis on Help Desk reports
- Which problems are self-inflicted?
- Impose Process/procedures
- Schedule weekly maintenance windows
  - whether used or not... write into SLAs
  - set user expectations & disciplines for change mgmt
- Pull out old IBM mainframe operations manuals!

# Operations Management

- Often more “codified” - usually have procedures manuals
- Elements not often tied together from an over-arching process view
- Policy manuals seldom up to date and pertinent
- How to marry the best of centralized and decentralized perspectives and practices (so don't reinvent the wheel!)

# Typical Operations Responsibilities

- Data retention
- System recovery
- Monitoring
- Install technology
- User set-up and delete
- Back-up
- Restore
- Business continuity
- Disaster recovery

**remember:  
process & policy  
procedures  
functions  
tasks**

# Service Management

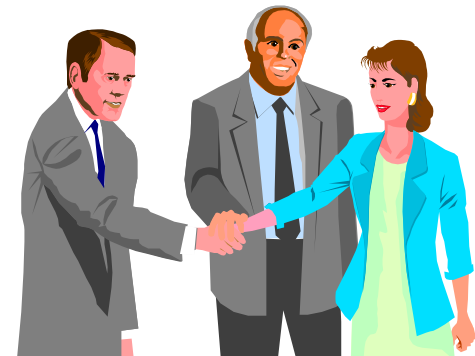
- Originally, IT thought of this as handling service requests rather than problems to be solved - e.g., request for new PC or new network connection

*today, however, it has become*

- Service Level Management... which effectively ties all the core processes back together, in alignment with the business objectives of our customers

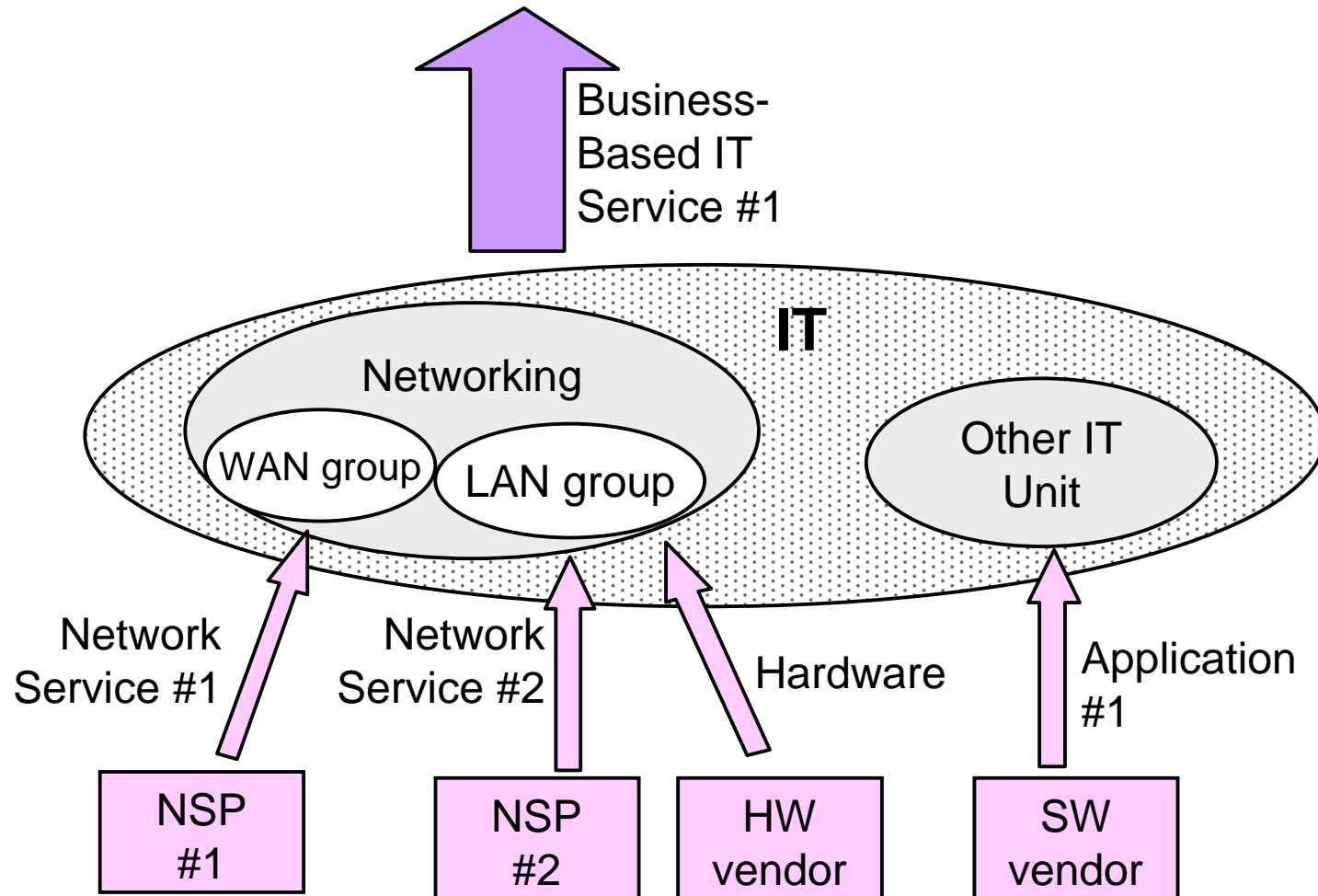
# Service Level Management

- The process through which IT delivers packaged services to its customers and manages that delivery with negotiated Service Level Agreements
- Typically evolves from infrastructure availability and Help Desk problem tracking through request fulfillment and process management, then application availability/response, and on to full service management
- *Business-relevant metrics are crucial to success*

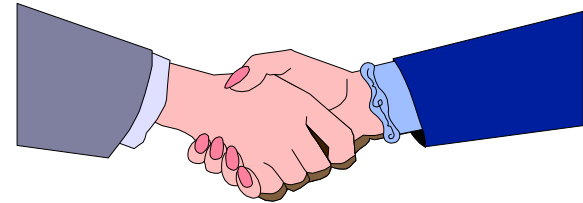




# Tiered Model of Service Delivery



# At the Detailed Level

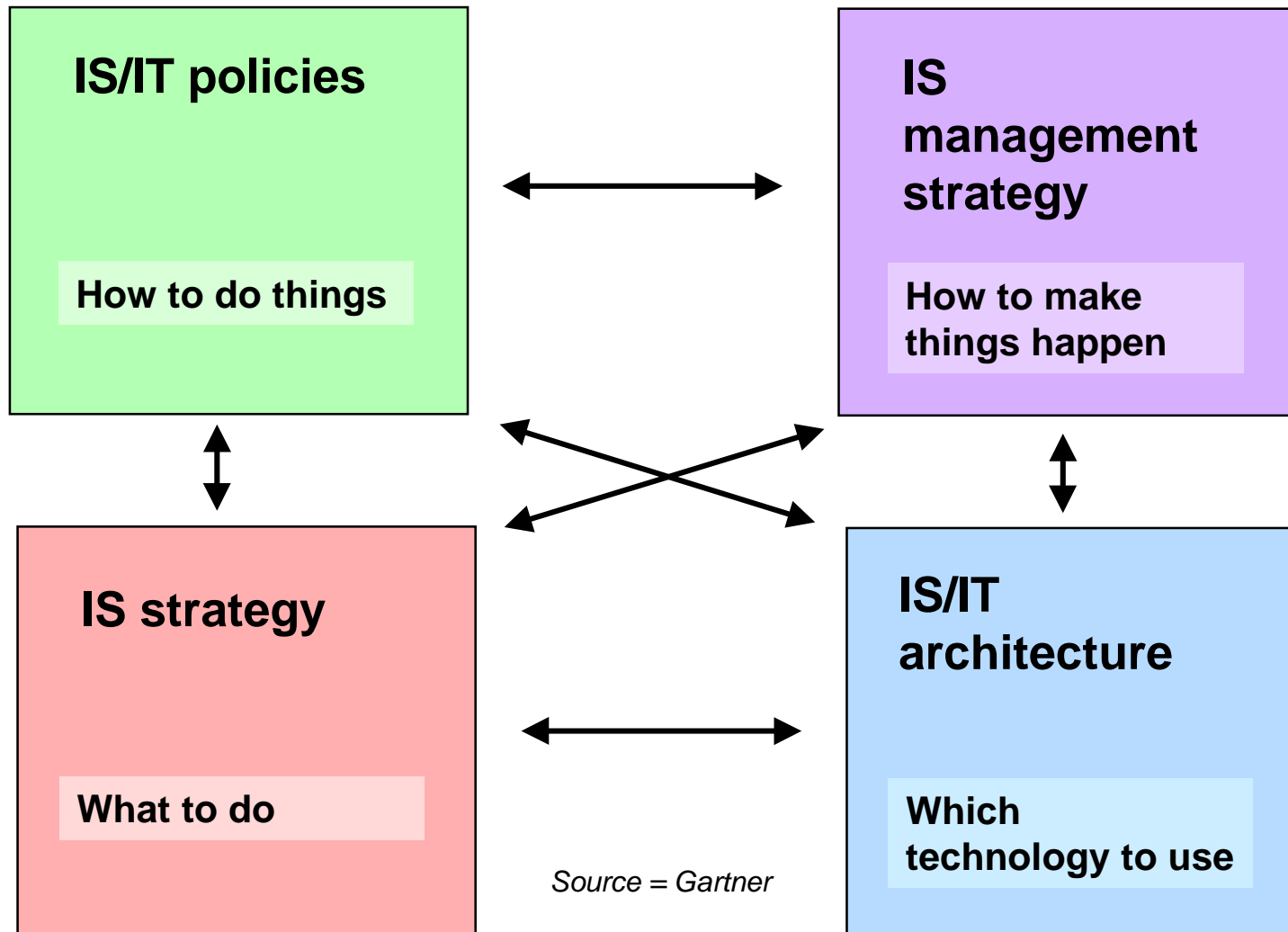


- Service Level Objectives (SLOs)
  - describe how IT will attempt to meet user requirements
  - describe projects and progress, especially for internal customers
- Service Level Agreements (SLAs)
  - serve to define the partnership between customers and IS/IT support groups
- Operational Level Agreements (OLAs)
  - define the agreements among IS/IT departments or groups that enable optimum service delivery to customers
  - hand-offs, timetables, escalation procedures get built into each group's Standard Operating Procedures (SOP)
- Reports and satisfaction surveys designed from the customers' perspective - what is meaningful to them that you can actually measure!

# Service Level Management Learning Community

- On-line at [www.nextslm.org](http://www.nextslm.org)
  - sponsored by BMC Software, Sun Microsystems, and PriceWaterhouseCoopers
- Offers:
  - articles, discussion
  - templates (Customer Satisfaction Survey, SLAs)
  - software vendor directory
  - reference material, links
  - benchmark tool and report

# IS Policies, Strategies, and Architecture are Interrelated

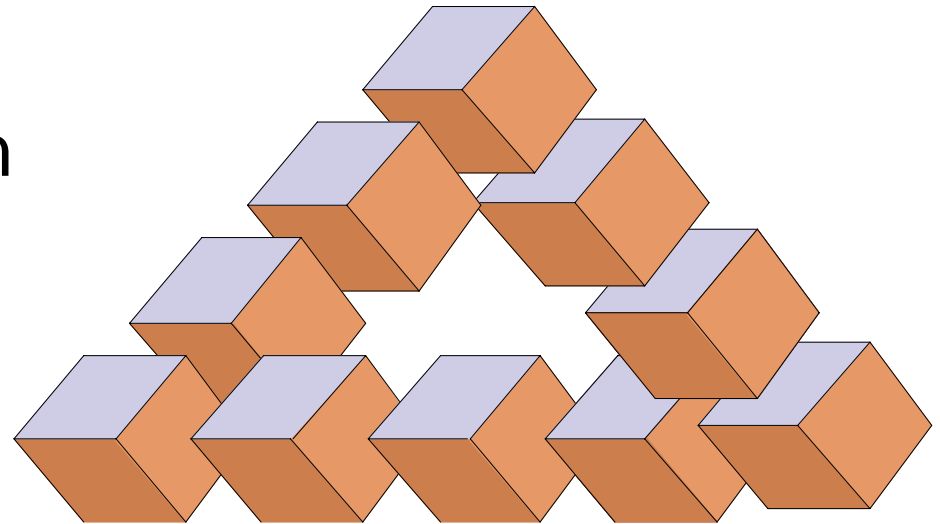


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# Organizational Structures - Options

- Centralized IT
- IT inside business units
- Corporate divisions
- Process orientation

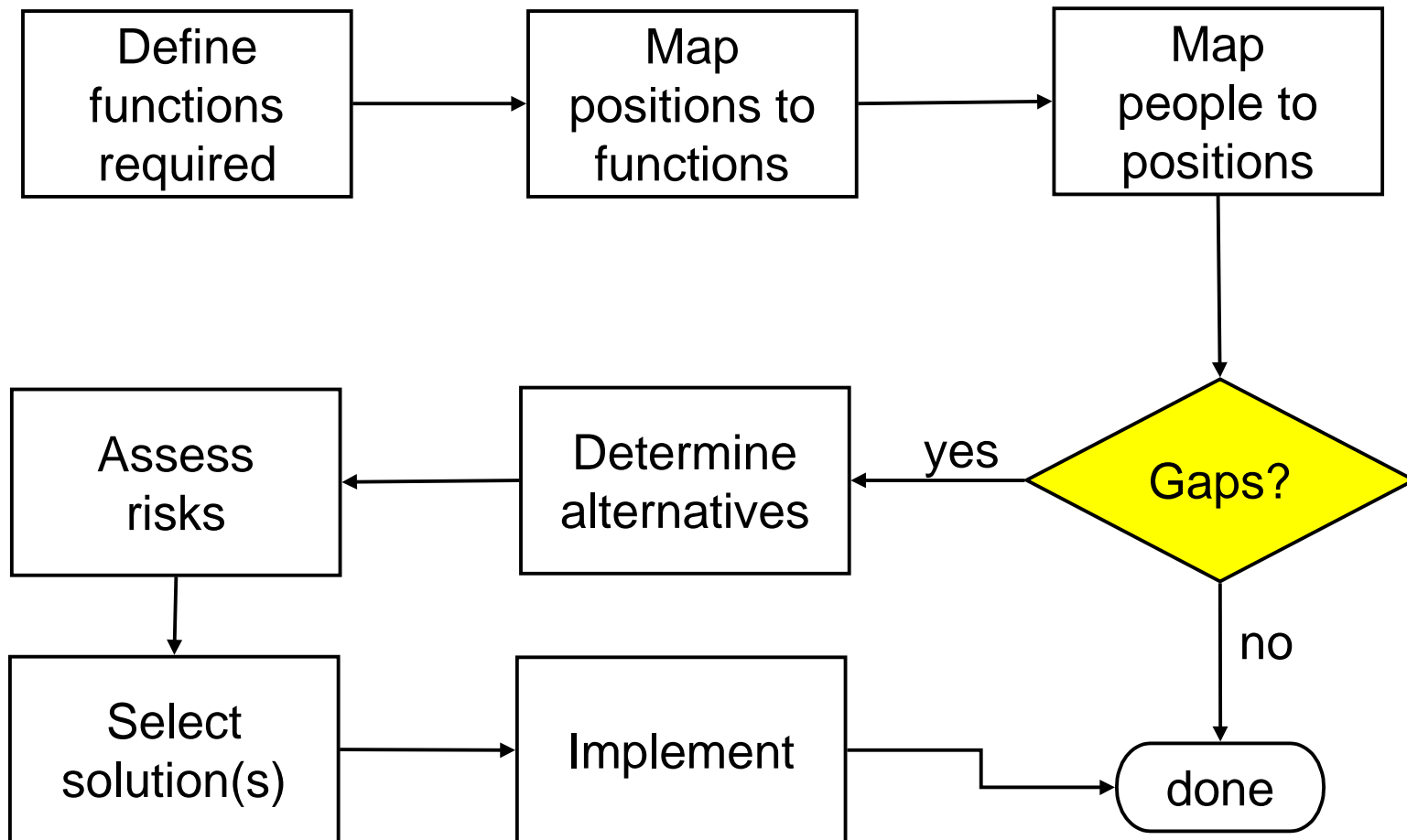


# Resource Shortfalls

- Spot requirements:
  - Technical
  - Strategic
  - Functional
  - Project Oriented

**Define the requirements, the scope of work that needs to be completed, the duration of time it should take and investigate against external options (Contractor, Consulting, ASP, Outsourcing)**

# Organizational Review Process

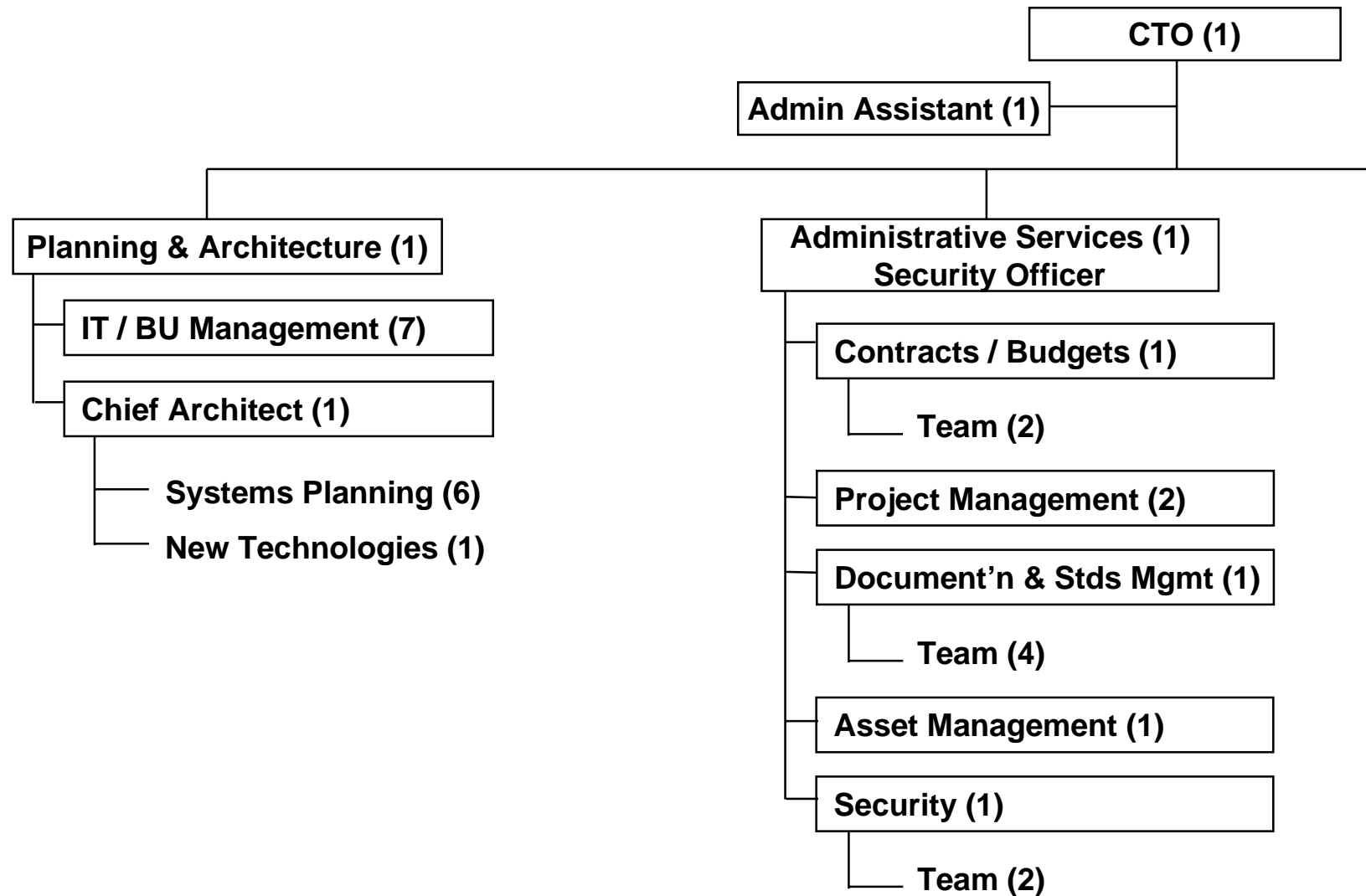




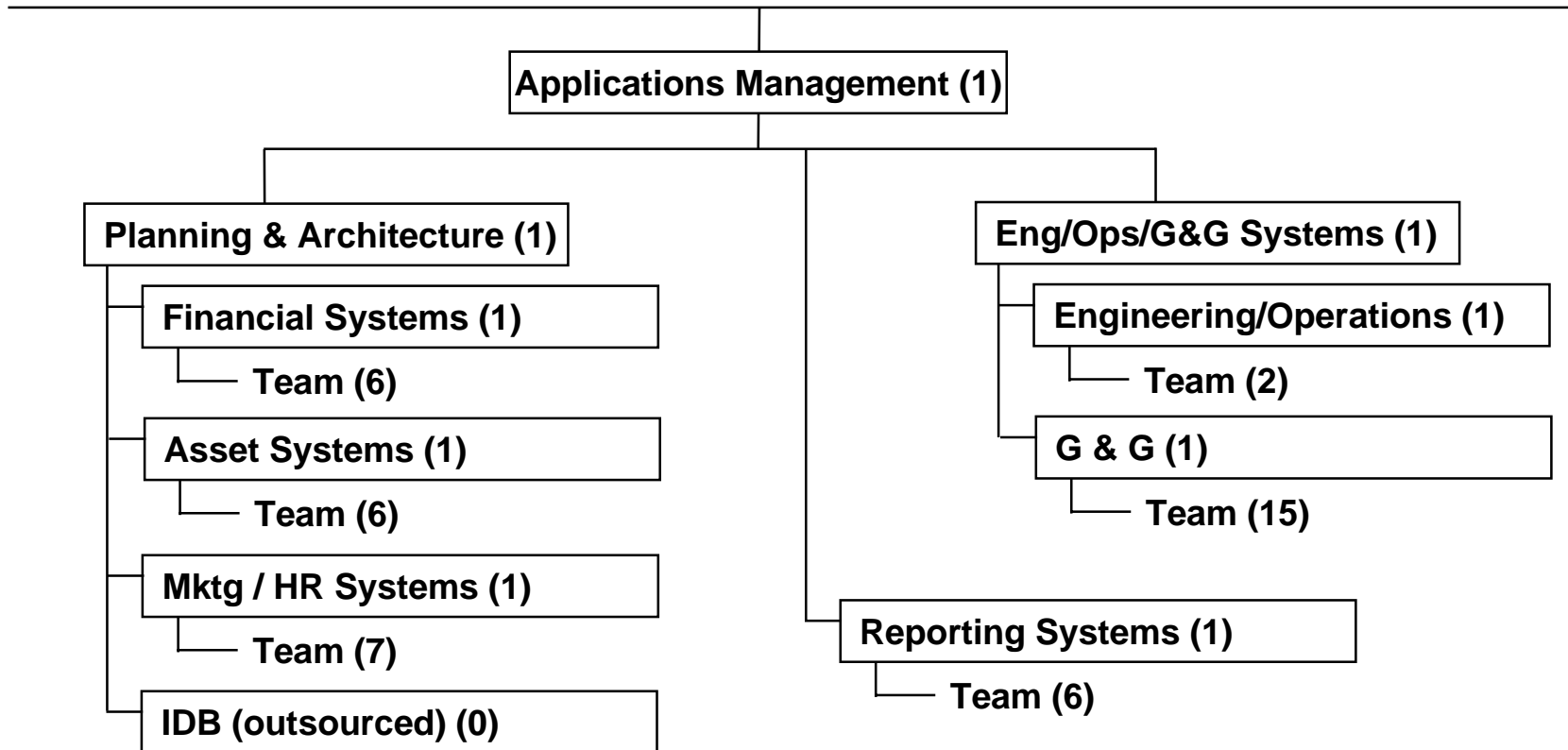
# Major Functional Areas

- Planning & Architecture
  - preparing, discovering, forecasting, and developing methodologies for the successful operation of system
- Application Management
  - designing, developing, and managing applications
  - building of relationships with clients and vendors in support of business solutions
- Production Support
  - administering, supporting, and maintaining the operations of the systems that support the business requirements
- Administrative Services
  - processes that support/control all IS/IT functions

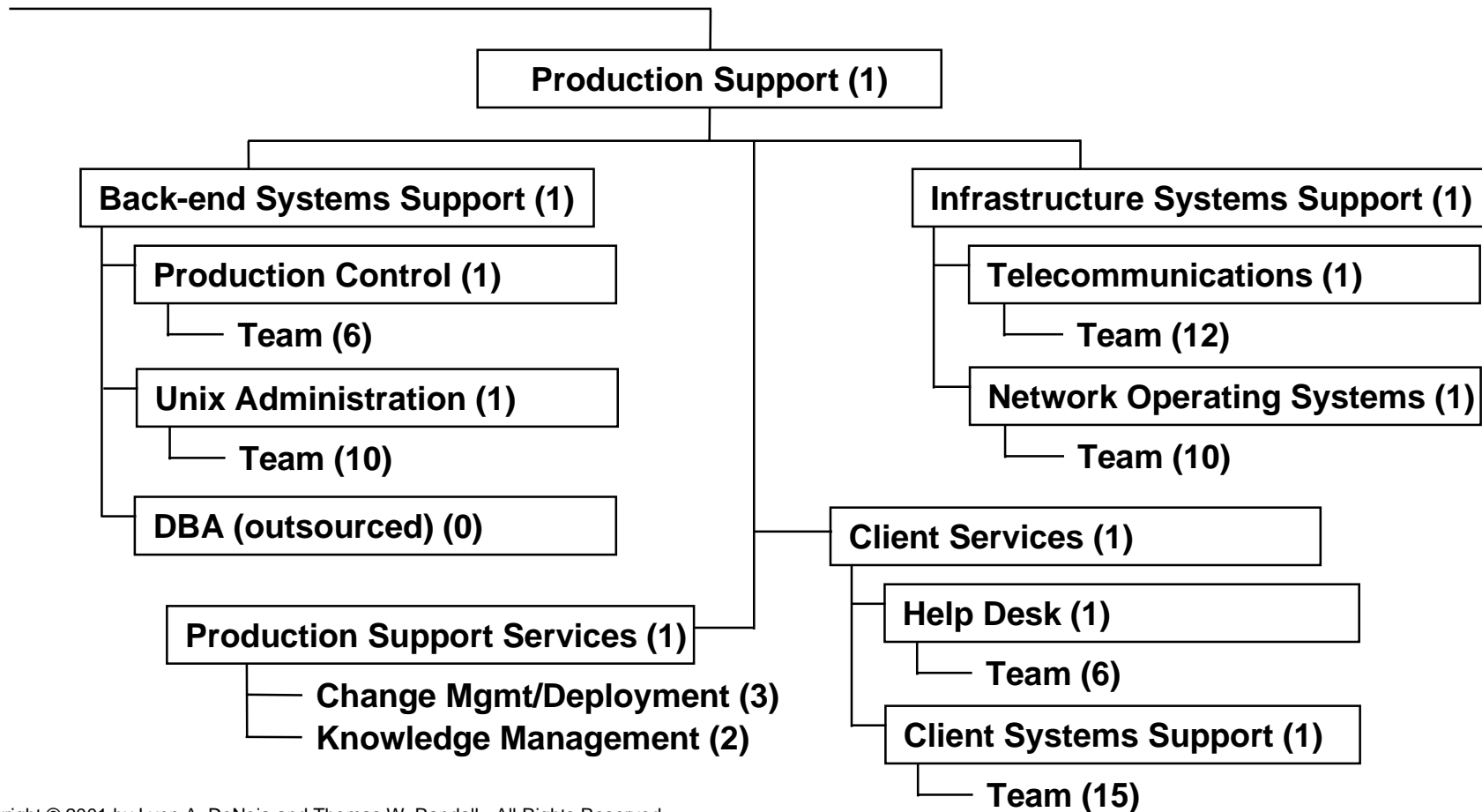
# Example from Client1



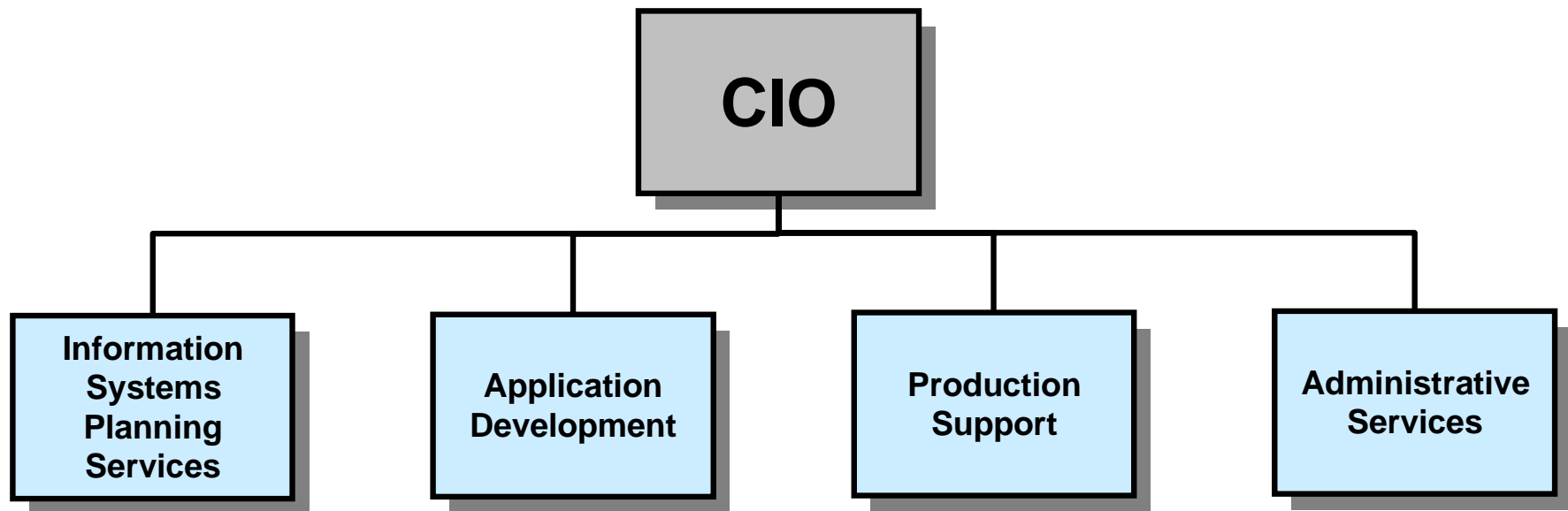
# Client1 (cont'd)



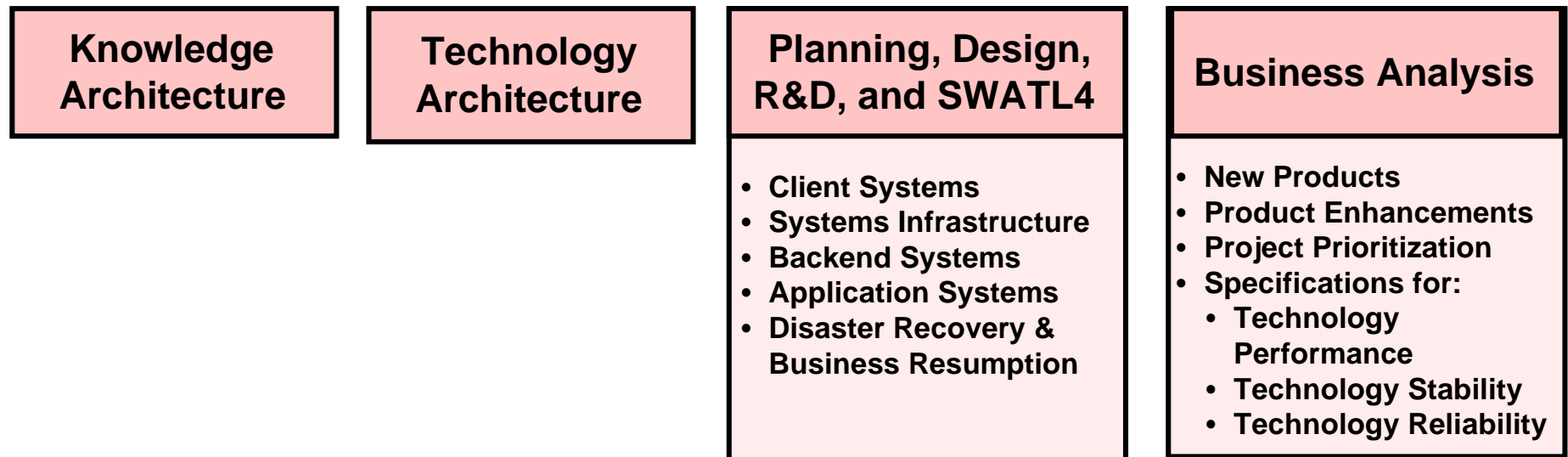
# Client1 (cont'd)



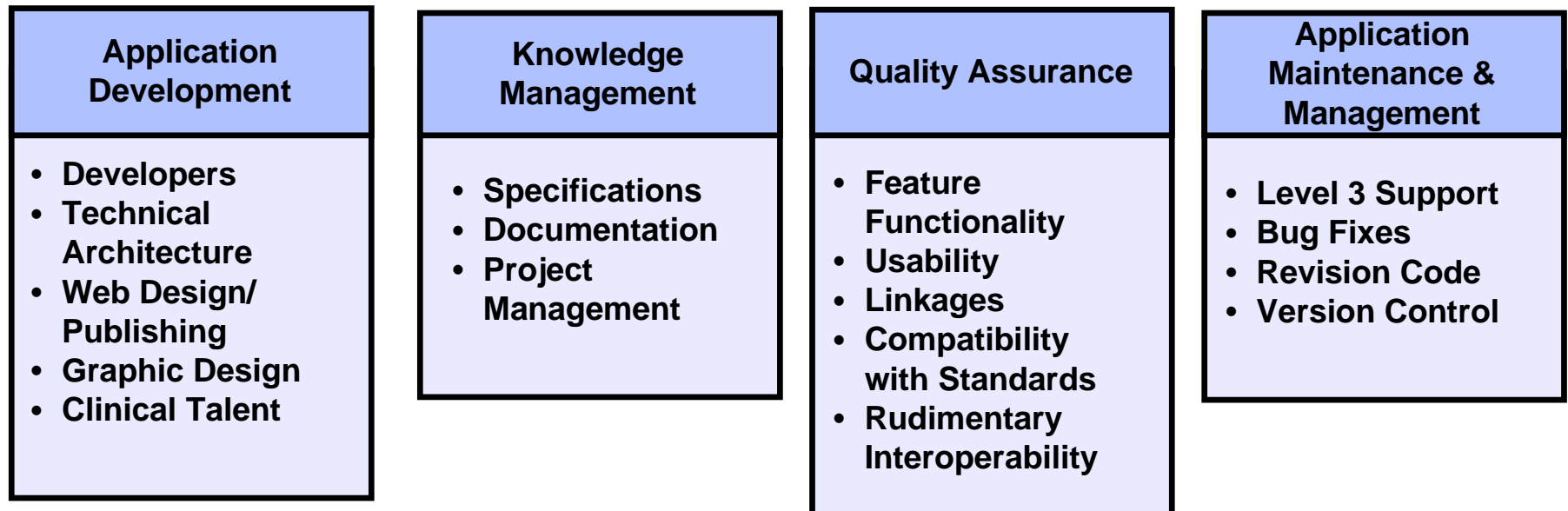
# Another Client Example



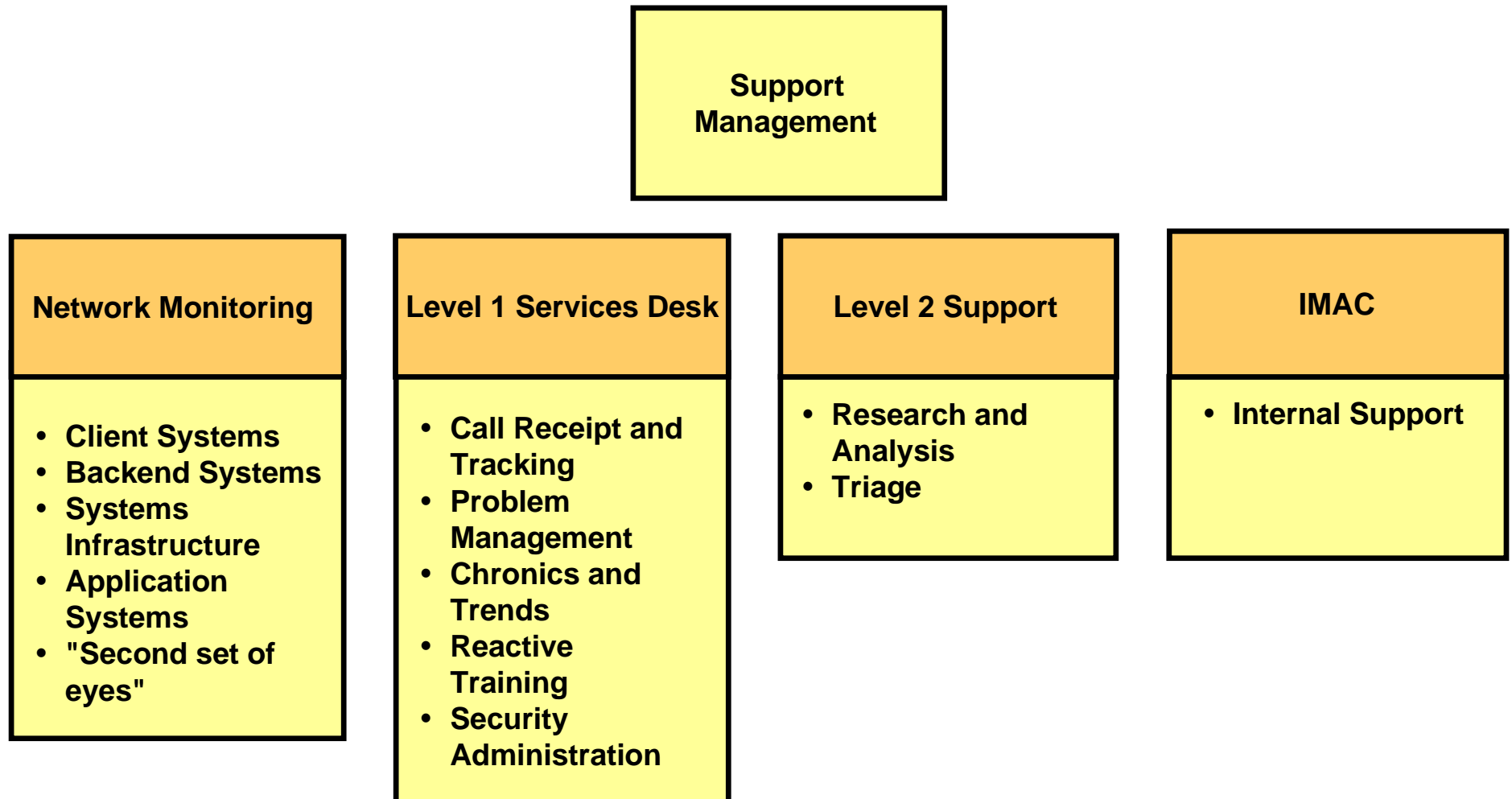
# Information Systems Planning Services



# Application Development

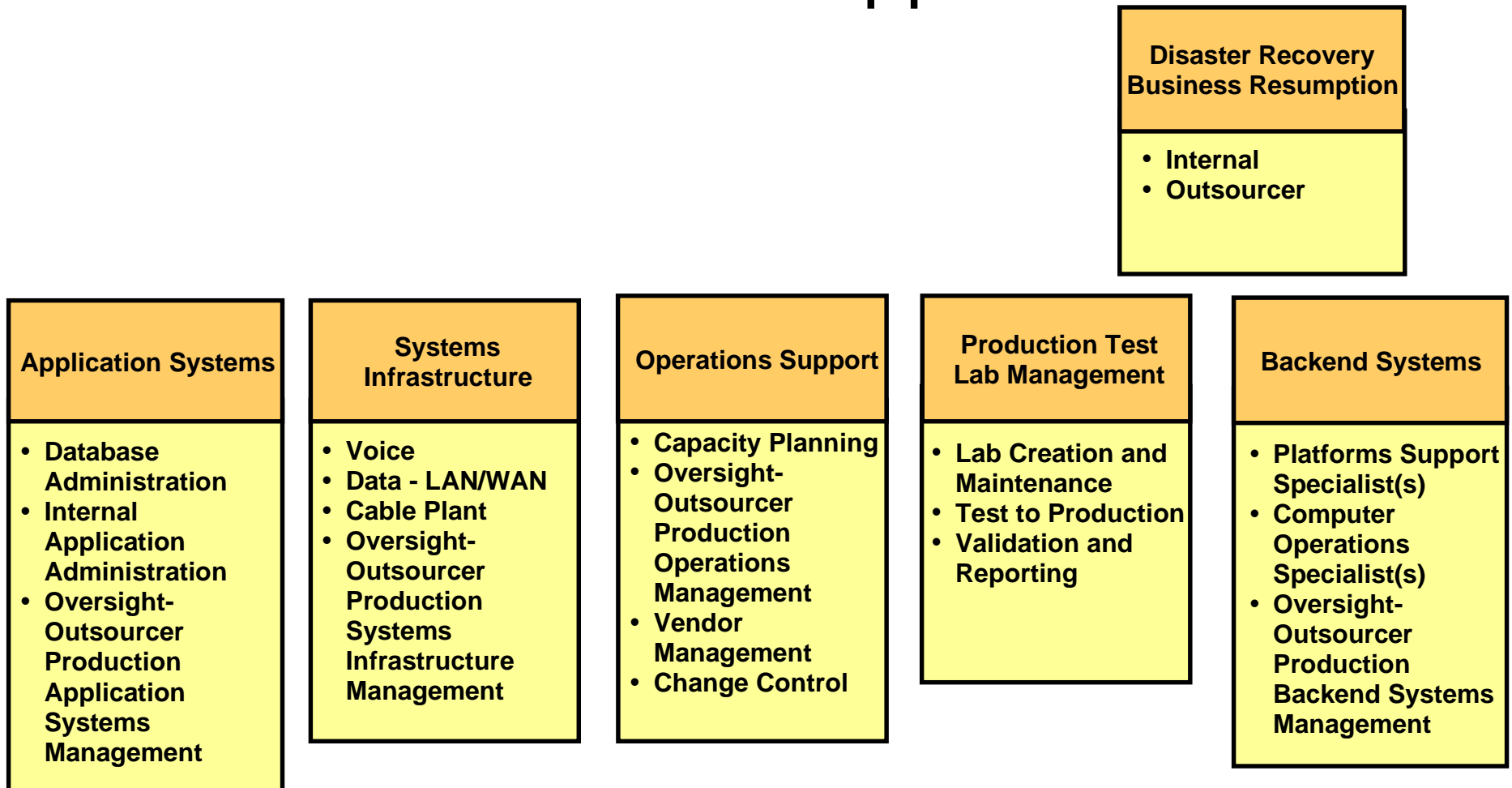


# Production Support

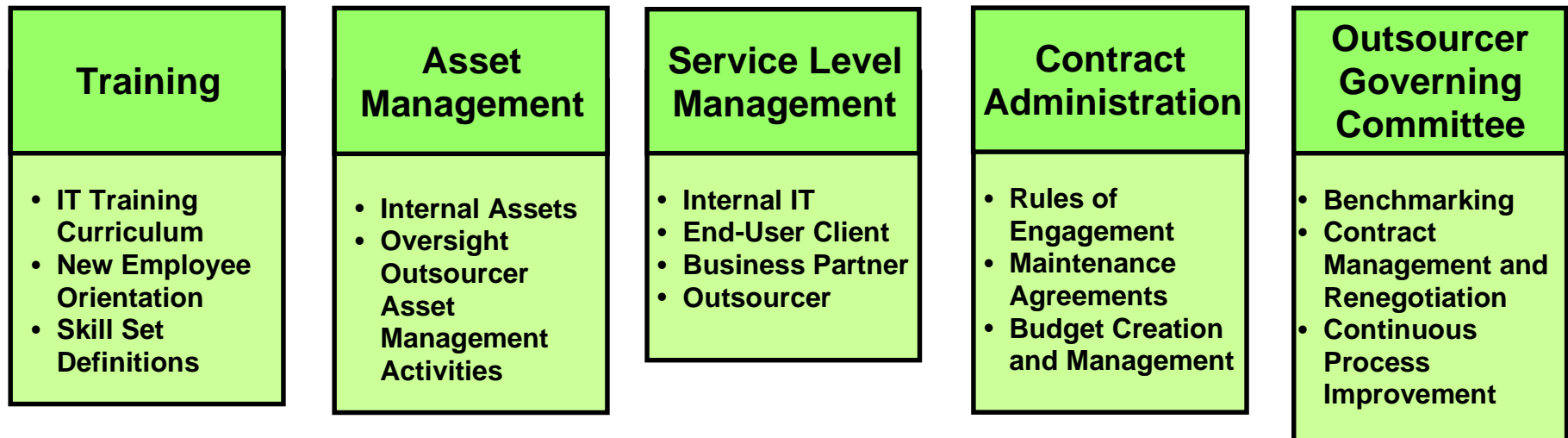




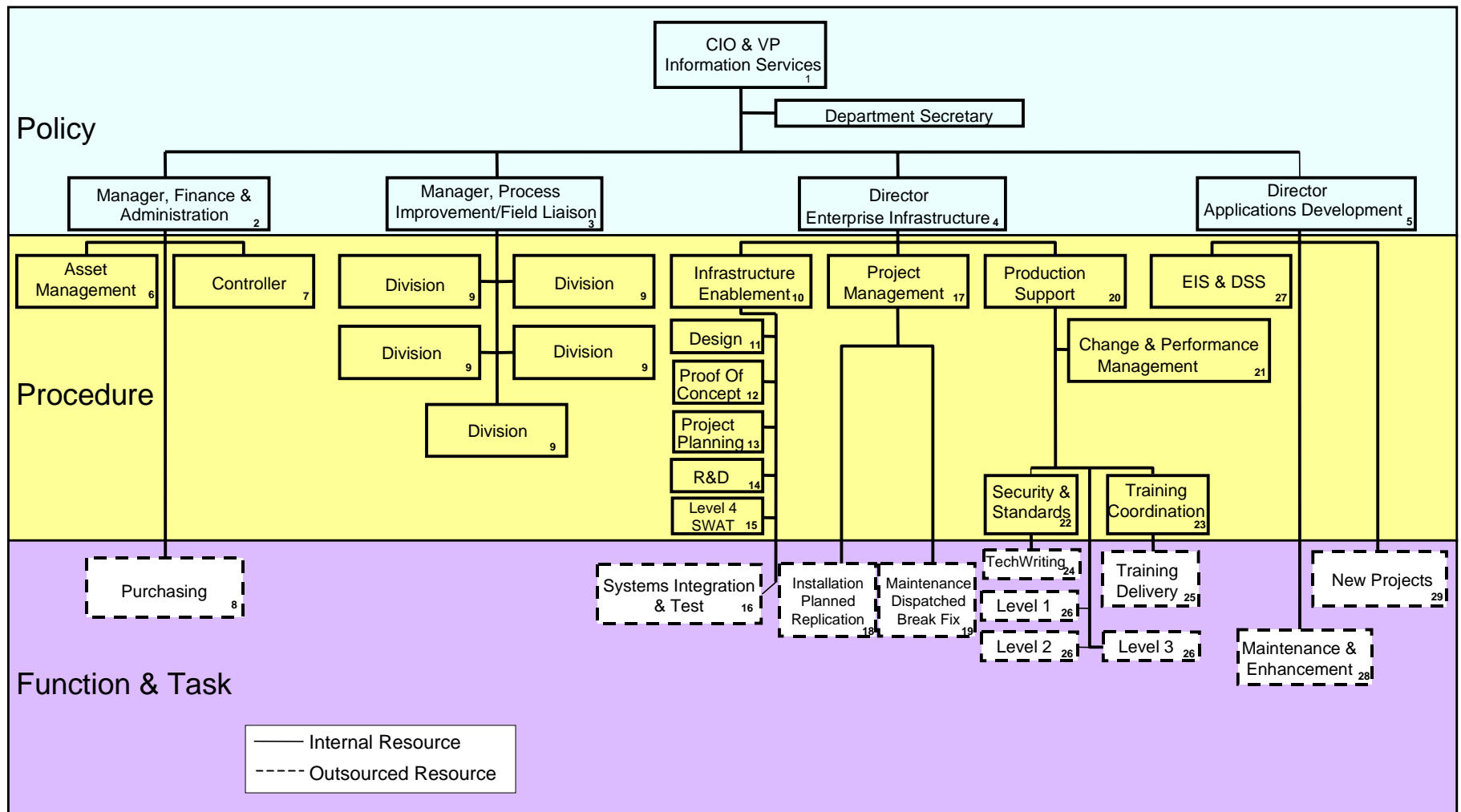
# Production Support



# Administrative Services



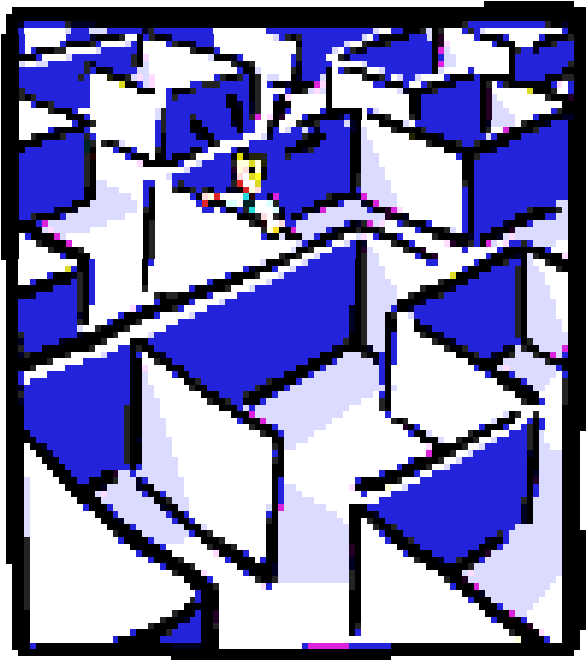
# Alternate Sourcing



# Requirements for Success

- Understand your defined, formal processes
- Create a functional organizational model (FOM) that reflects process performance
- Map existing to the FOM
- Identify any gaps
- Determine the method to fill each gap
  - Internal?
  - Contractor?
  - Outsource?
  - Consultant?
- Example

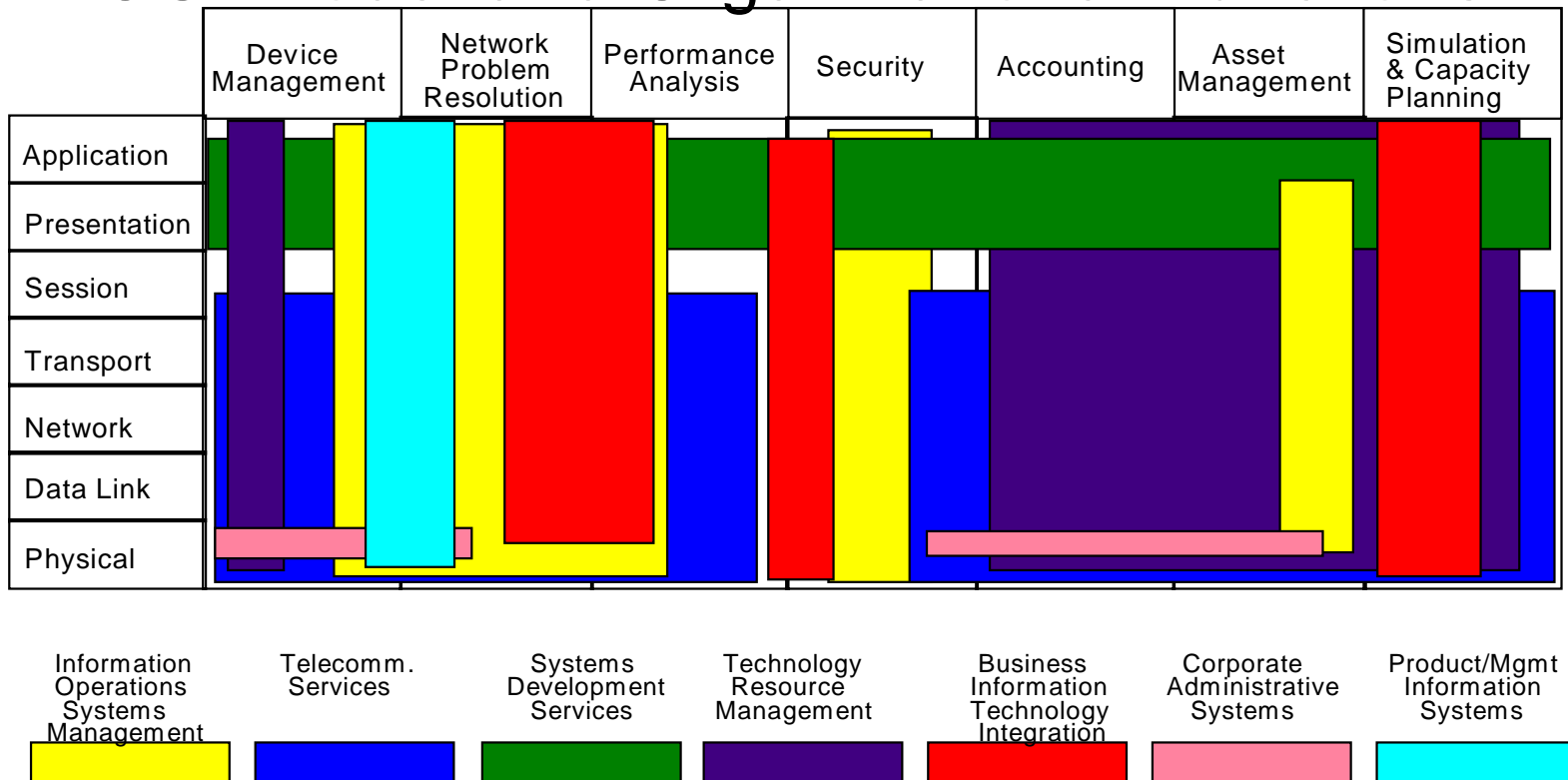
# How To Determine The Organizational Impacts



- ☐ Re-organization
- ☐ New Staffing
- ☐ New Skills Upgrades
- ☐ New Disciplines

# No Matter How Simple You Think It Is...

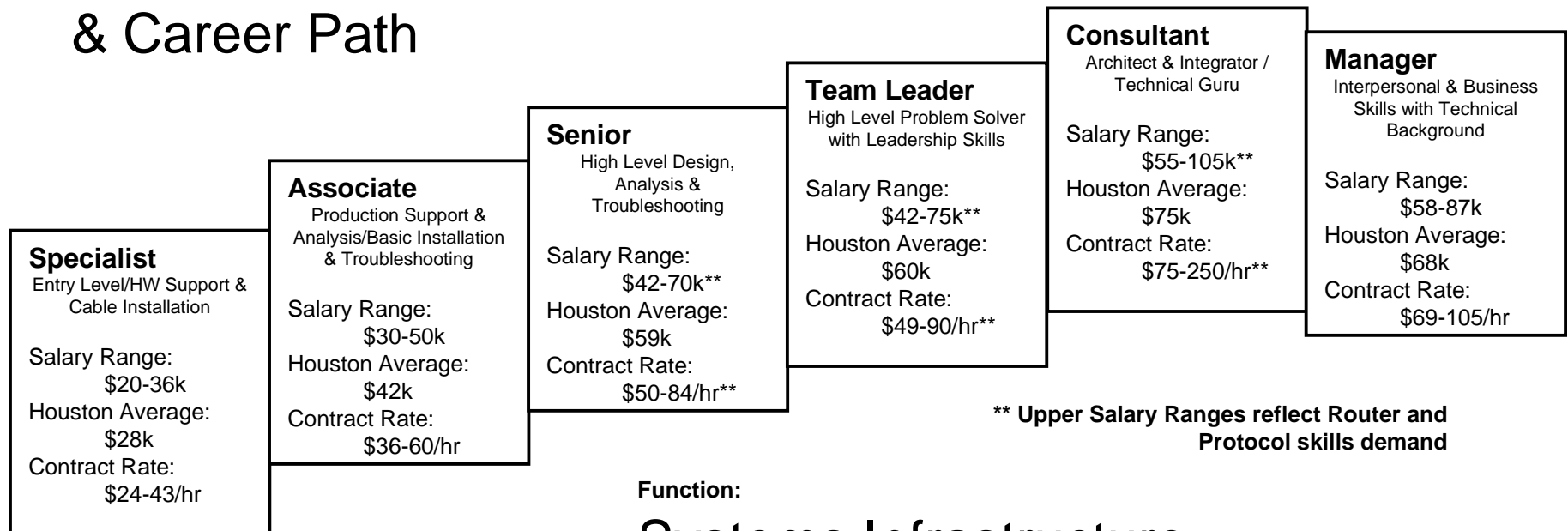
## OSI Model and Organizational Functions



# Map Levels to Functional Responsibilities

## Job Descriptions & Career Path

*(\$ amounts illustrate relationships,  
not current market value)*



**\*\* Upper Salary Ranges reflect Router and Protocol skills demand**

**Function:**

## Systems Infrastructure

**Cable, Hubs & Switches, Routers, WAN, PBX**

### Preferred Skills:

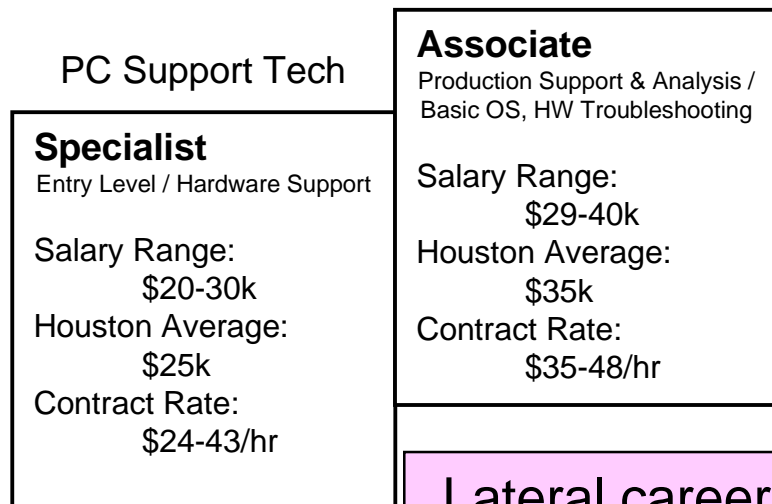
- Experience
- Certifications
- Preferred Education
- Continuing Education
- Career Track

*Notice choice between technical  
and management paths!*

# Create Flexibility for Lateral Career Moves

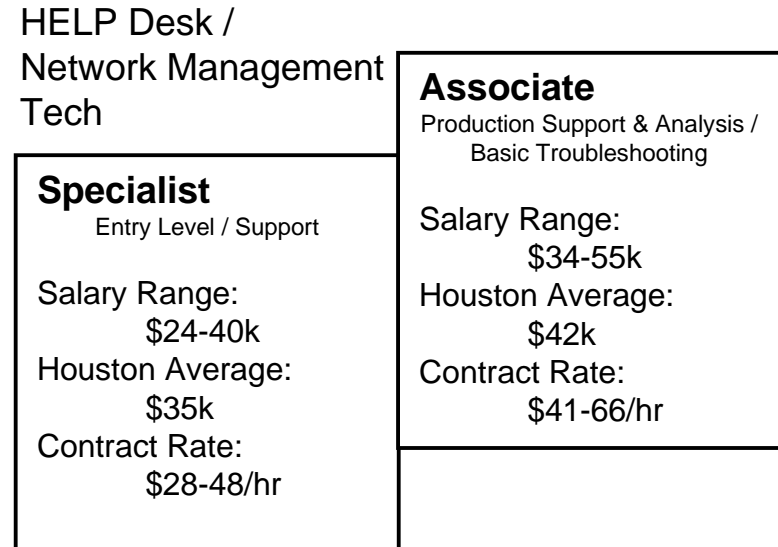
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## Client Systems



Lateral career path

## Enterprise Support Services





# TechRepublic IT Salary Survey

## Regional Medians

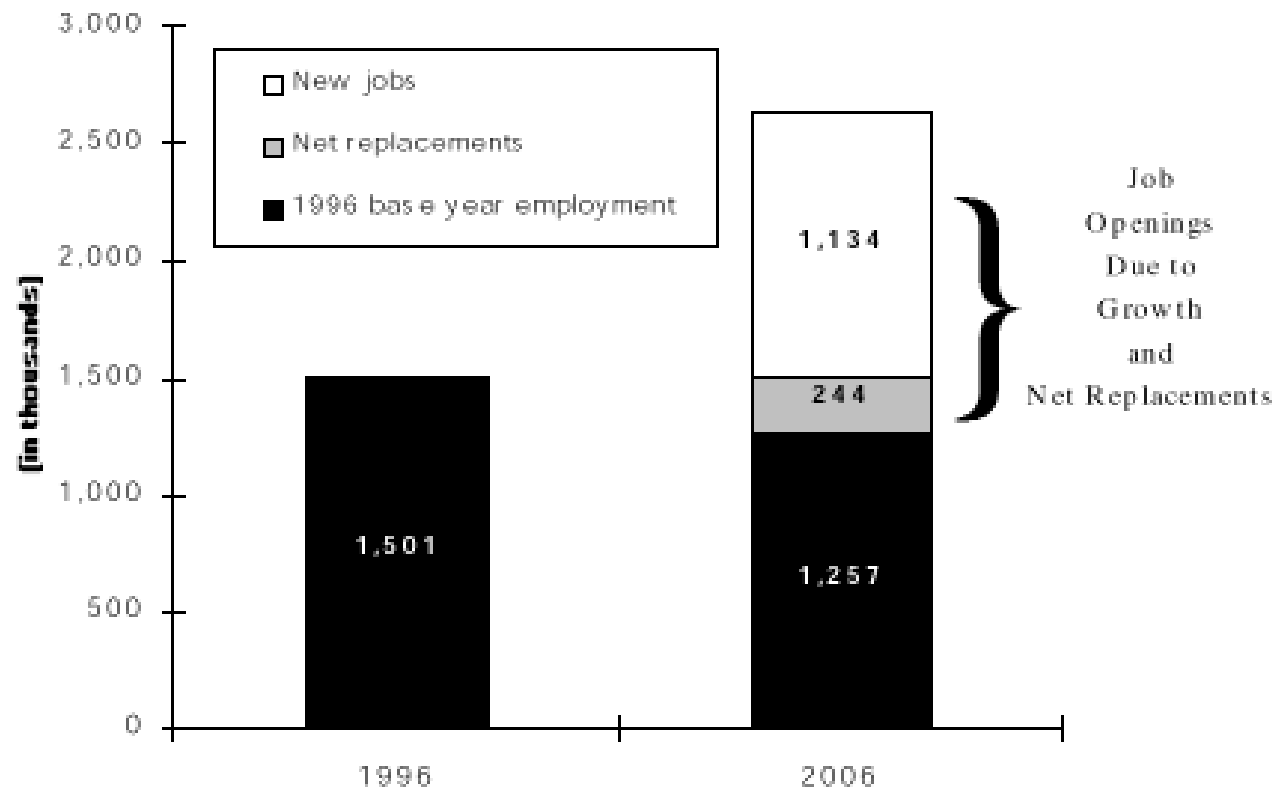
position	West coast	SW	MW	SE	NE
CIO/VP	189k	146k	157k	158k	204k
Network Mgr	88k	76k	85k	92k	92k
Sr. SW Engineer	83k	75k	79k	78k	82k
SW Engineer	72k	58k	65k	69k	71k
Sr. DBA	80k	76k	81k	77k	82k
System A/P	62k	55k	61k	64k	64k
PC Application Specialist	54k	47k	49k	62k	51k
Security Specialist	84k	78k	81k	79k	83k
Web/Internet Developer	82k	70k	71k	68k	83k

*Source: [www.TechRepublic.com](http://www.TechRepublic.com) - Y2k salaries reported by 900 employers, member firms of National Computer Associates, an international network for IT recruiting, 9/00*

# Agenda

- The environment in which we operate
- A new framework: 5 fundamentals
- Formal processes: importance and examples
- Organization and staffing
- Recruiting and retention
- Environment and facilities
- Systems, tools, and infrastructure
- IT buy-in and executive management commitment
- Making it all happen

## High Demand Projected for Information Technology Workers



Source: U.S. Department of Commerce analysis of U.S. Department of Labor Statistics data

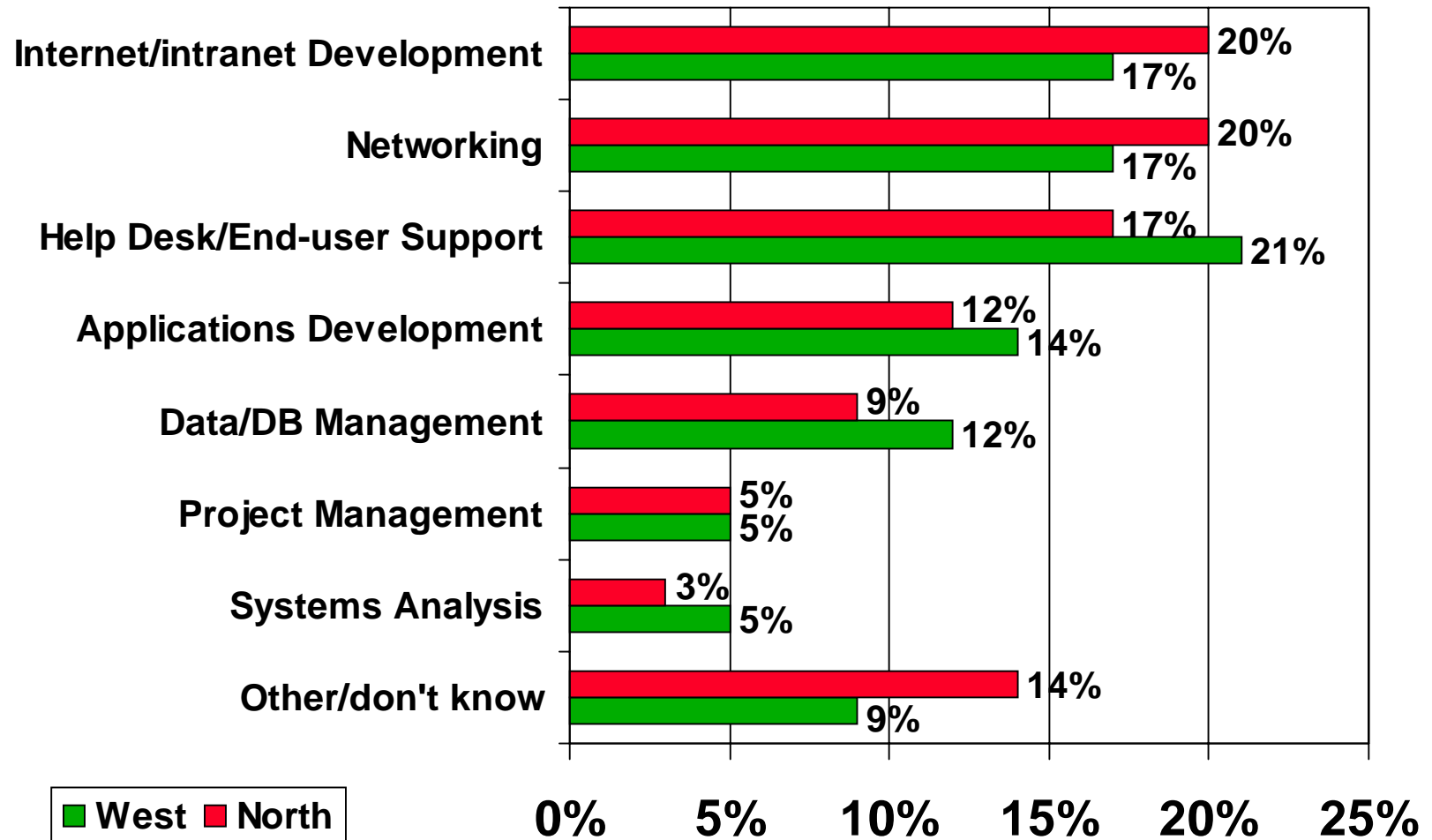
**Figure 1**

# Demand Update, April 2000

- ITAA interviewed 700 companies
  - 200 IT, 500 non-IT
- 10 million US IT workers
  - not including government, not-for-profits, small entrepreneurial firms
- ~1.6 million *new* IT jobs to be filled in 2000
  - about half will go unfilled!
  - small (50-99 people) non-IT firms need 70%
  - IT company needs are critical

*Executive Summary, [www.ita.org](http://www.ita.org)*

# IT's "Hottest" Jobs - 2001

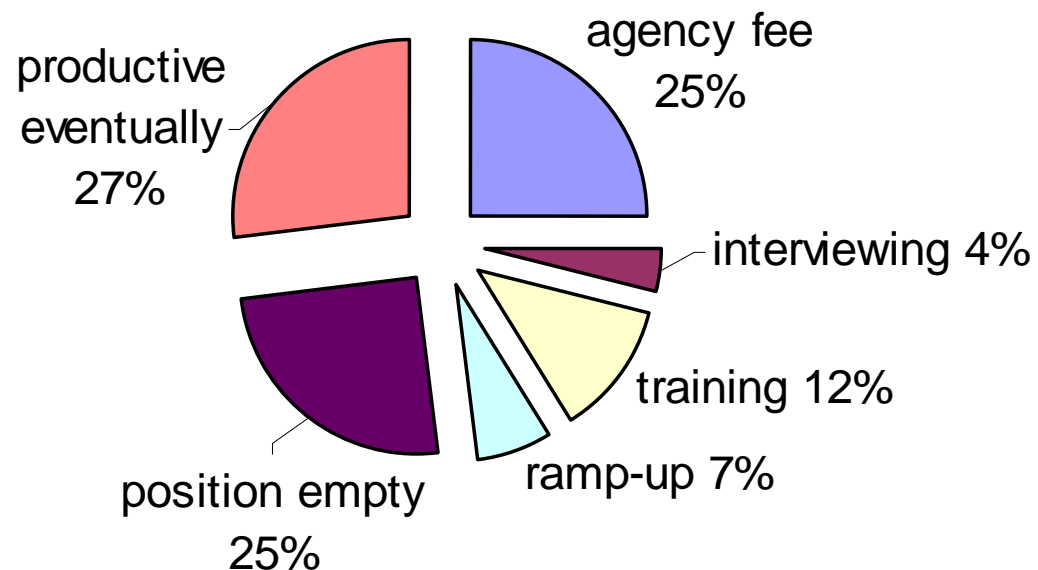


Source: RHI Consulting survey of 1,650 CIOs from U.S. and Canadian companies with more than 100 employees;

presented in RHI Consulting 2001 Salary Guide, [www.rhic.com](http://www.rhic.com)

# A Sample Calculation

## The Costs of Hiring a New Person (by portion of annual base salary)

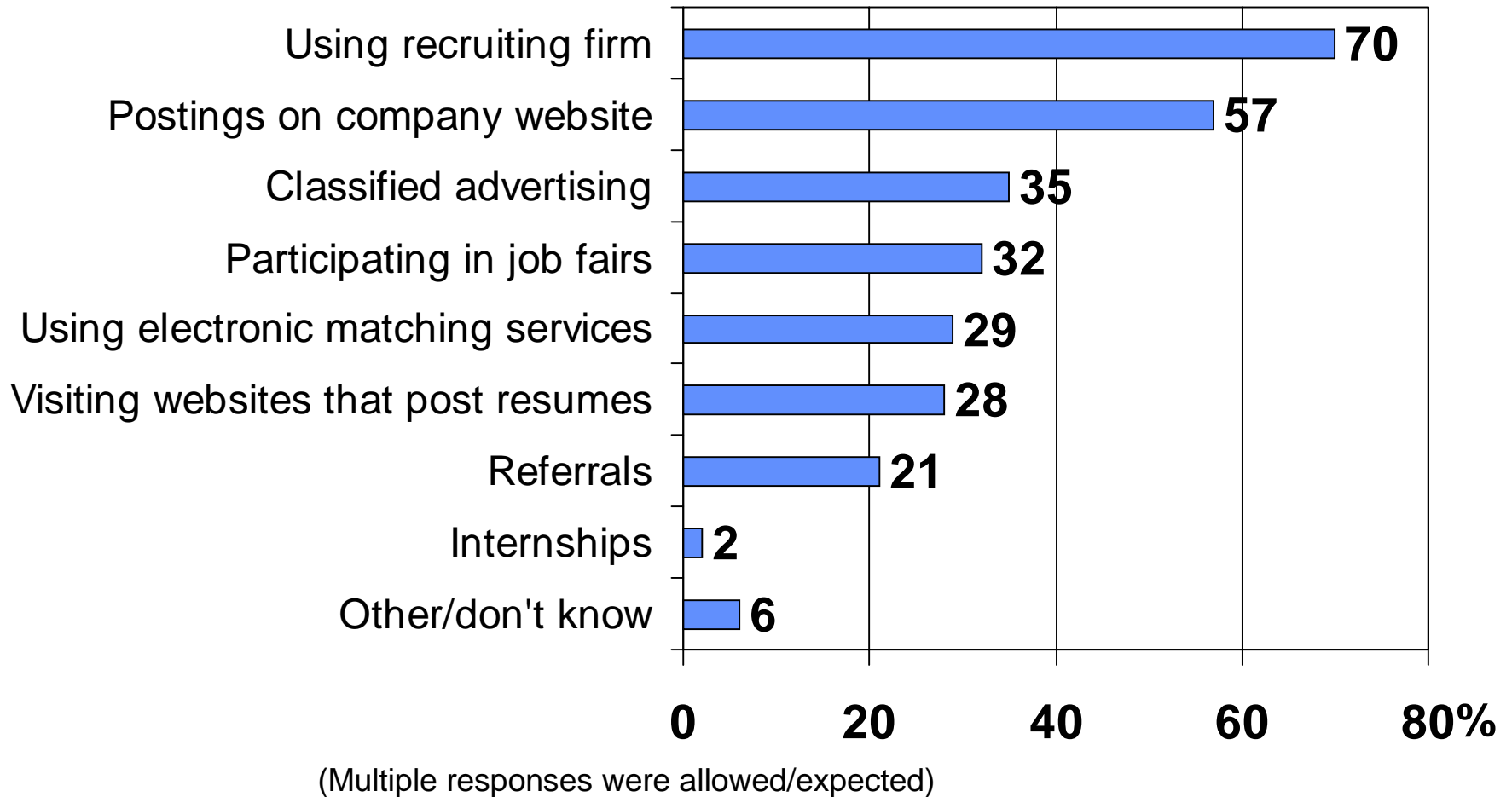


# The Cost of Turnover

- 100-250% of departing person's salary!
  - Pay new employee 15-35% more
  - Recruiter's fee = 20-30% of new salary
  - Interview expenses
  - Learning curve cost of 50% for lower productivity during first 3-6 months
  - Relocation fees
  - Payback of signing bonus and training fees to new person's former employer

*Source: Gartner Group, 2000*

# Recruiting Techniques



Source: RHI survey of 150 executives from Fortune 1000 companies



# Competing For & Retaining Good People

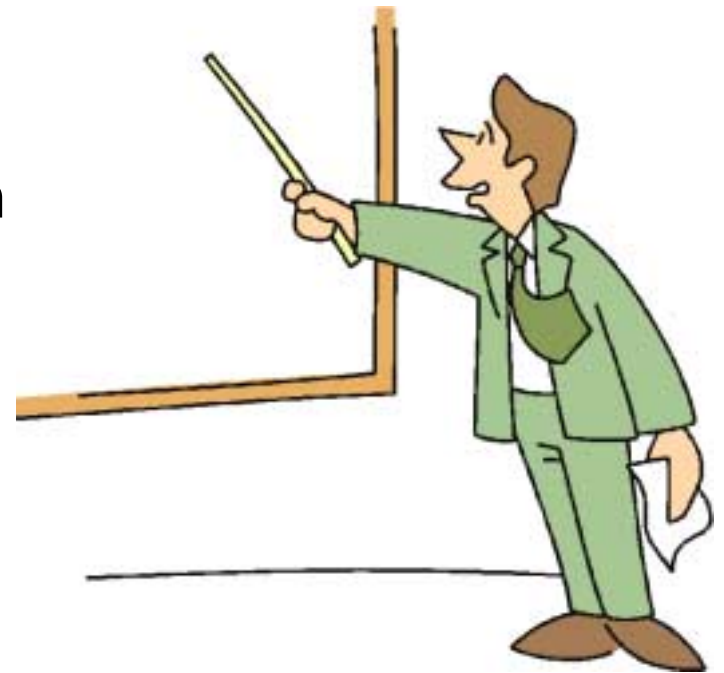
- Common sense rules
- Create and maintain nurturing environment
- This does not mean soft and warm
- Outside in and inside out
- Get creative



# Retention Factors, circa 2000

- Top five:
  - Perceived value of the individual
  - Opportunities for growth
  - Trust
  - Communication
  - Values of the organization
- Bottom two of 12:
  - Compensation
  - Work/life balance

*Source: Linkage Inc.'s High Tech Retention Survey, [www.linkageinc.com/retention](http://www.linkageinc.com/retention)*



# Pay Strategies

Character- istic	Commodity pay	Total pay	Total rewards
Emphasis	Pay to buy specific scarce talent	Integrated solution to address strategic talent needs	Integrated to grow the business
Deal	Let's make a deal	Moving to the better workforce deal	The better workforce deal
Action	Keep current pay design; ratchet up levels	Adapt all elements to capitalize on what works best	Develop in balanced fashion – compelling future, individual growth, positive workplace, and total pay
Target	People identified as scarce talent	Scarce talent broadening to total workforce	Entire workforce with adaptability to address scarce talent
Time frame	Short-term fix through fire-fighting	Short- to longer-term strategy	Middle- to long-term workplace renewal

*Source: Zingheim & Schuster, Pay People Right! Breakthrough Reward Strategies to Create Great Companies, Jossey-Bass, San Francisco, 2000*

# Quick Fixes for the Short Term

- Develop a “buddy” or mentor system
- Keep people through the critical first 3 years
  - “ownership” for the company as early as possible
  - options spread over the first 3-4 years
- Provide the “feel-good” benefits
  - casual dress, flexible hours, work-out clubs, etc.
- Offer project incentives
  - bonuses at project completion (especially if more frequent than annually)
- Recognize increasingly valuable employees as frequently as possible

# Top Motivating Techniques

- According to employees:
  - personal thanks
  - written thanks
  - promotion for performance
  - public praise
  - morale-building meetings

*Audience recommends:  
Ken Blanchard's One  
Minute Manager*

*Source: Linkage Inc.'s High Tech  
Retention Survey,  
[www.linkageinc.com/retention](http://www.linkageinc.com/retention)*



# A “Twenty-something” Perspective

- Top sources of job satisfaction:
  - people, culture, atmosphere, balance
- Other things they like:
  - challenge, learning, leading-edge and diversity, options, freedom, responsibility
- What they don’t like:
  - cafeteria food, long commutes
  - bureaucracy/policy that impedes progress
  - counter-productive policies and procedures
  - waiting for authorization when they could fix it themselves



*Source: “Hanging on to the New Kids  
on the IT Block” - Computerworld,  
2/21/2000*

# Twenty-somethings, cont'd

- To bring out their best:
  - small, informal teams
  - continuous challenges
  - lots of autonomy
  - easy access to resources
  - interesting, important work
- Their advice to managers:
  - keep them growing (it's about training, not money)
  - challenge them and have faith in them
  - give them freedom and responsibility
  - don't promise what you can't deliver
  - pay attention (listen to their ideas)
  - let them loose (freedom to “go wild” with their ideas)



*Source: "Hanging on to the New Kids  
on the IT Block" - Computerworld,  
2/21/2000*

# The Skills Workers Need

- 62% of managers said the most important skill is a good knowledge base in the relevant area
- second most desirable: hands-on experience, but only 47% said this is key
- >1/3 of important skills cited are non-technical
  - good communication, problem-solving, analytical skills
  - flexibility; ability to learn quickly
- largest skills gaps and least availability are for enterprise systems integration and web development positions

*Executive Summary, [www.ita.org](http://www.ita.org)*



# Best Ways to Acquire Skills



- Pre-hire across all positions: 4-yr. colleges and private technical institutes
- By specific position: short courses, seminars, community colleges, informal training
- Preferences by position
  - DB development, SW engineering: 4-yr. colleges
  - web development: seminars, short courses
  - private technical institutes strong for enterprise systems analysis, DB development and administration

*Executive Summary, [www.itaa.org](http://www.itaa.org)*

# Timing and Certification

- 84% rated On-the-Job-Training as effective or very effective vs. 41% for pre-hire training
- Managers strongly preferred OJT when it has structured format and a defined curriculum
- Importance of certification = 3.5 on a scale of 5
- 50% rated certification as important or very important
- 10% of firms hire partially qualified workers and provide training to achieve qualification



# Adequate Internal & External Resources

- Proper level of internal staffing
  - hours of coverage
  - managed objects
  - volume of problems
  - emergency support
- Identify external resources & define roles
  - contractors
  - vendors
  - outsourcers
  - consultants

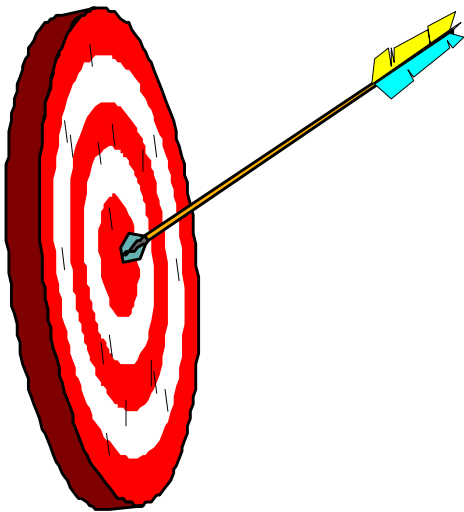


# How to Map Staffing Requirements

	Monday to Friday	7AM	8AM	9AM	10AM	11AM	12PM	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	12AM	1AM	2AM	3AM	4AM	5AM	6AM
1	Problem Coordinator																								
2	Level 1																								
3	Level 1																								
4	Level 2																								
5	Level 2																								
6	Problem Coordinator																								
7	Level 1																								
8	Level 1																								
9	Level 2																								
10	Supervisor																								
11	Manager																								

# Skills Assessment and Development

- ☐ **Do a formal skill-set survey**
- ☐ **Maintain a skill-set database**
- ☐ **Assess skills against willingness to change and grow**
- ☐ **Implement a continuing education plan**



# How to Do a Skill Set Analysis

## Skill Set Documentation

Please fill out the attached Skill Set Document to reflect your current experience with the associated hardware and software. Circle the appropriate number for your experience level for each line item. If a line item isn't circled it is considered to be a "1" (i.e. No Experience). Each page has a category of hardware or software.

Listed below is an example:

Experience Level	Description Of Experience
1	No Experience -
2	No Experience - But I Am Currently Learning
3	Some Experience - Familiar In Theory Little Or No Hands On
4	Little Experience - Occasional Use or Occasionally Used In The Distant Past
5	Moderate Experience - Periodic Use & Can Work With Some Basic Options
6	Solid Experience - Regular Use & Can Work With Most Options
7	Strong Experience - Regular Use And Familiar With Many Advanced Options
8	Very Strong Experience - Have Attended Formal Training & Industry Certified
9	Expert Experience - This Is My Primary Area Of Expertise
10	Certified Instructor - Vendor & Industry Certified Trainer

Experience Level	Operating System/Operating Environment	Comments
1 2 3 4 5 6 7 8 9 10	Windows NT	
1 2 3 4 5 6 7 8 9 10	Netware	
1 2 3 4 5 6 7 8 9 10	Other	

# How People Change on the Job

Questions they ask, in order, include:

- What is it?
- How will the change affect me and my job?
- How will I be evaluated?
- How will this change be conducted?
- What are the benefits?
- What will the overall impact of the change be?
- How can I help others with the change?
- How can we implement improvements?

*Source: Ken Blanchard, author of  
Leadership and the One Minute Manager*

# Organizational Culture



- ☐ Cowboys
- ☐ Communicators
- ☐ Collaborators

- ☐ Communities
- ☐ **You no longer work for  
the company that hired  
you!**

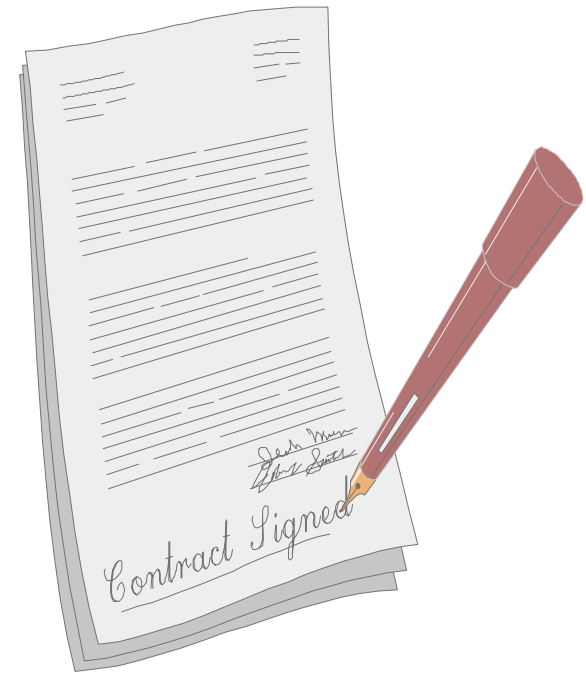


# Employee Contracts

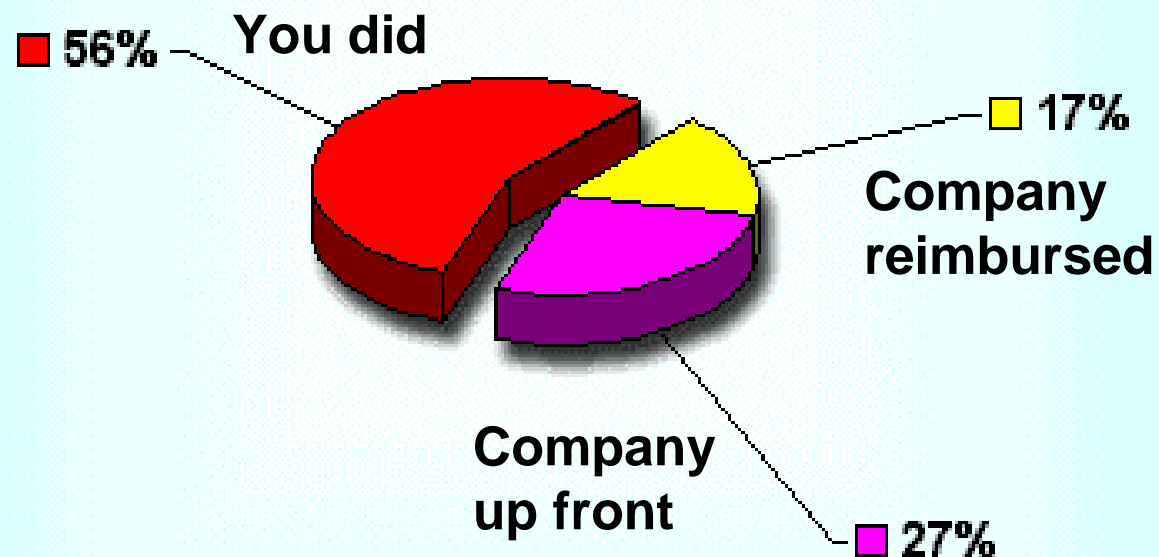
- ☐ Pro's
- ☐ Con's

# Training Contracts

- ☐ Pro's
- ☐ Con's



## Who paid for your last certification?



- You did
- Your company reimbursed you
- Your company paid up front

Source = TechRepublic

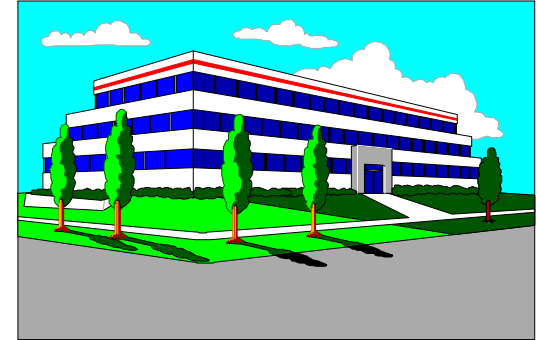
# Additional Resources

- Past attendees recommended:
  - [www.corporateleadershipcouncil.com](http://www.corporateleadershipcouncil.com)
    - » “The Corporate Leadership Council provides best practices research and executive education to human resources executives at leading global corporations. Through the identification and sharing of best practices that increase the quality and effectiveness of both the human resources function and the workforce at large, the Corporate Leadership Council strives to make some modest contribution to the work of its members.”

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# What is A Functional Facility?



## Primary elements:

- high level: environmental
- individual level: ergonomics
- and everything in between!



# Environmentals

- Control center approach and layout
  - feeds from 2 different electric substations
  - telecom entry from 2 separate rights-of-way (need to verify diversity of routing)
  - a plan for alternate power (e.g., generators, batteries) with resources frequently tested over sufficient duration
  - appropriate fire protection & training
  - etc.



# Environmentals, cont'd

- Designed to support 24 X 7 X 365
  - personnel safety
  - meal/food accessibility
  - weather
- Areas for staff during out-of-service time
  - personal locker instead of a desk
- Research library
- Easy access to simulation and problem resolution lab

# Ergonomics

- HVAC, lighting
- Personal keyboard, mouse, headset
- GOOD chairs



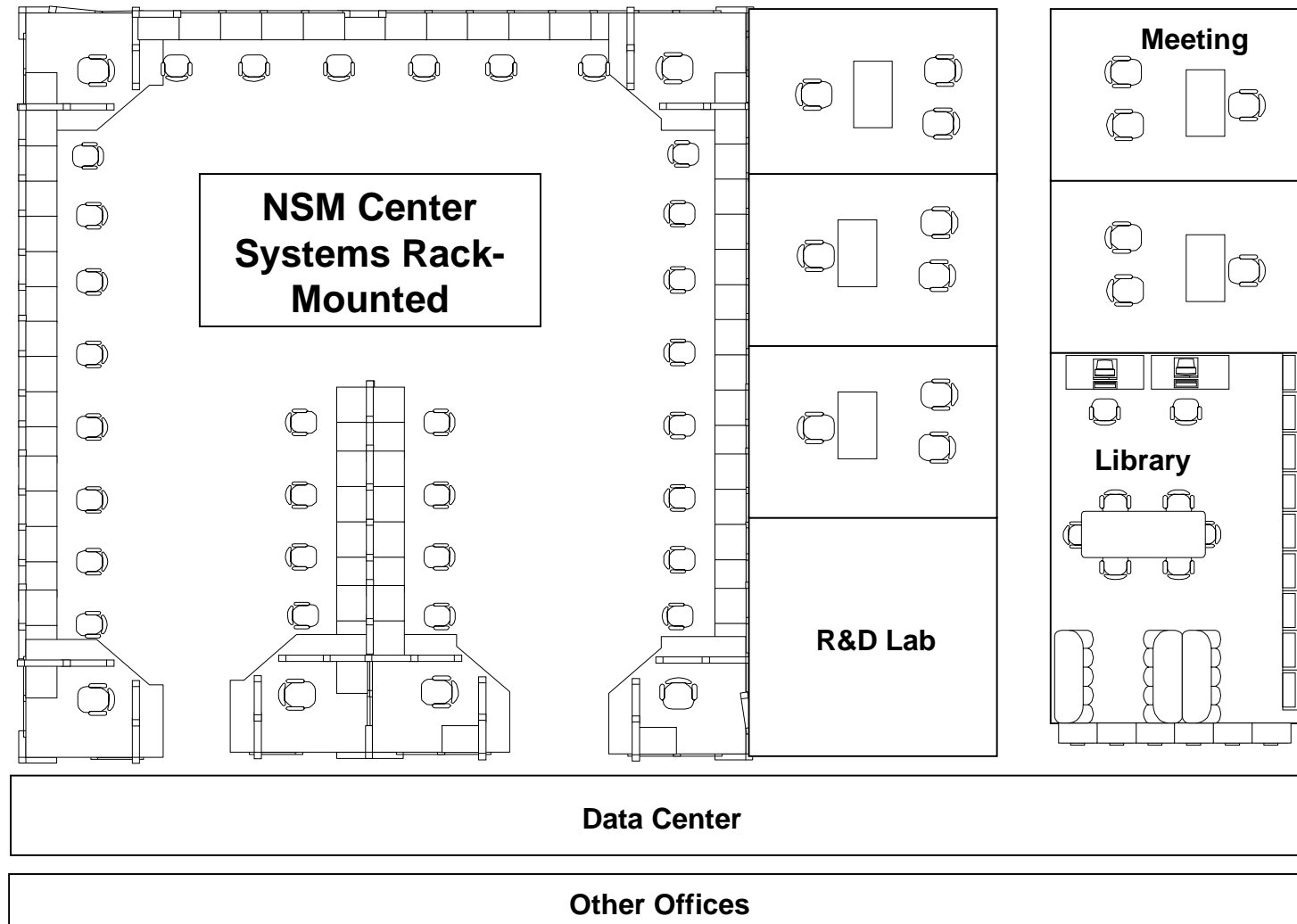
*Keep OSHA in mind*



# In Between...

- Supports and facilitates problem resolution hand-off and team troubleshooting
  - co-locate NOC, Help Desk, Command Center
  - no walls or low partitions so as NOT to block their view of each other's tools and technologies
  - *at minimum, on same network segment!*
- Whiteboards and markers; no sticky notes, paper, pencils or pens
- “Simon” board - ticker-style real-time status headlines on health & well-being of network and systems - in lights!
- Access to all tools without leaving station

# A Sample Layout



# ONE Lab for All



Development - code construction; feature functionality and rudimentary interoperability testing

Production Management - Test to Production (stress interoperability; environmental) with standard test scripts

Architecture and Planning - Integration characteristics and attributes with current technologies

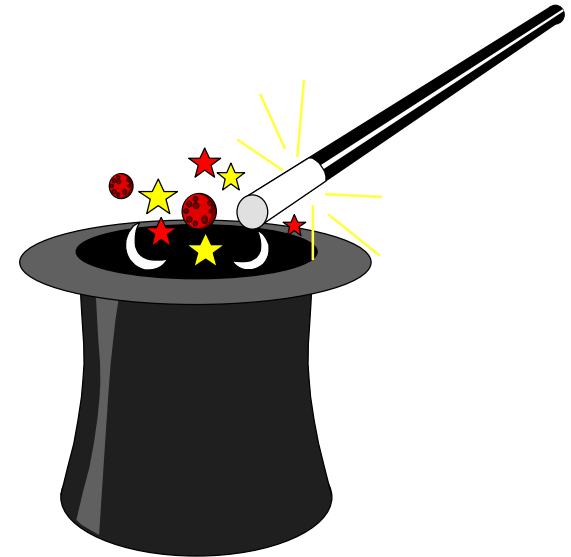
**LOCK STEP WITH PRODUCTION -  
PHYSICAL, LOGICAL, MODELED**

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# The #1 Question

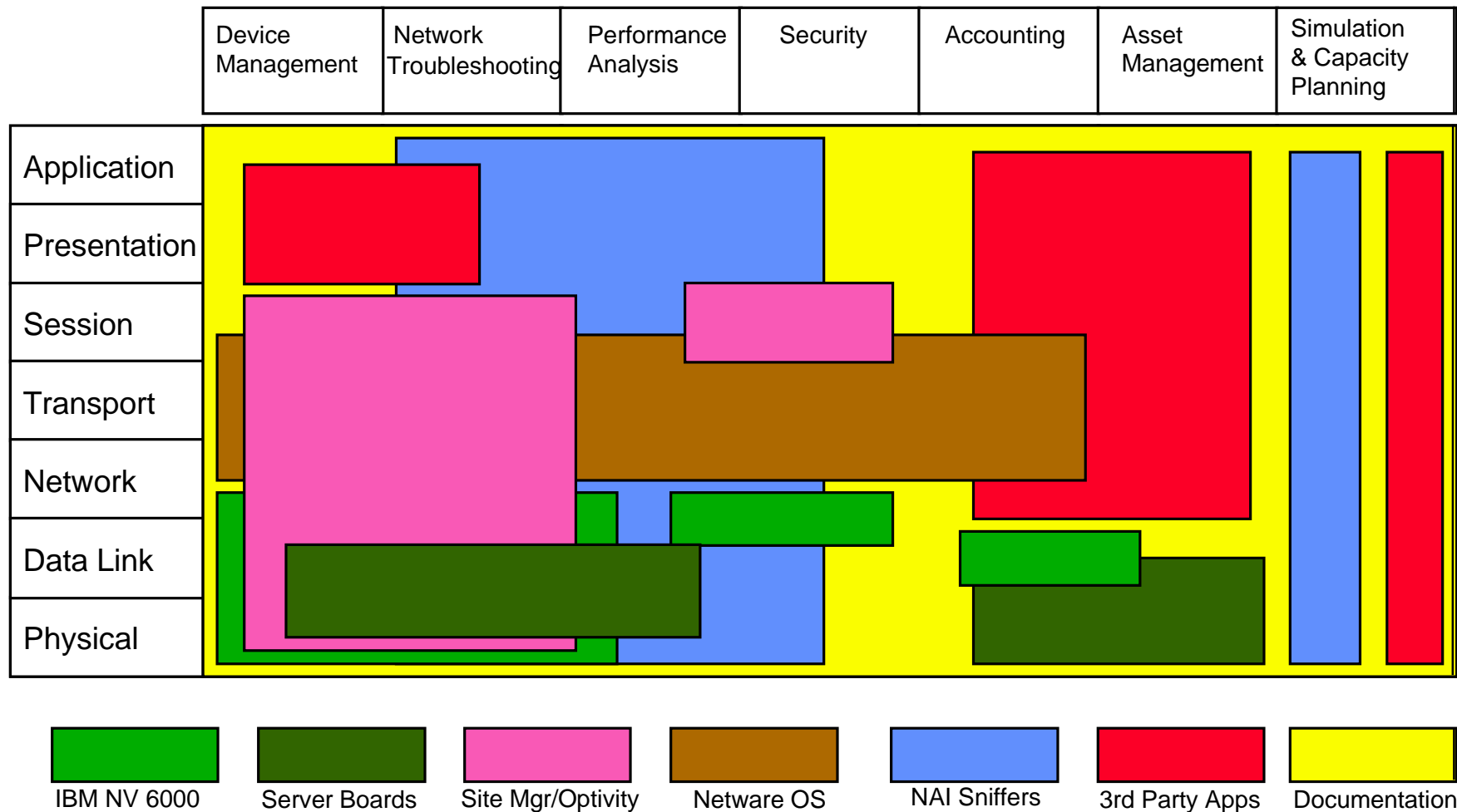
- What is “the system” that runs IS/IT?
  - Network & systems management
  - Will you run it OR will it run you? (I.e., processes MUST come FIRST)
  - Enterprise Management System
- The 3 monitoring challenges:
  - reactive
  - proactive
  - predictive



# OSI Management Perspective

- Configuration management
  - parameter values, consistency/coordination
  - IMACs = installs, moves, adds, changes
- Fault management
  - detection, isolation, diagnosis, work-around /repair/replace
  - prediction, prevention
- Performance management
  - characterization, tuning, modeling
  - capacity planning
- Accounting management
  - asset management, cost models, billing
- Security management

# OSI Reference Model and Network Tool Positioning



# Key Questions for Systems & Tools

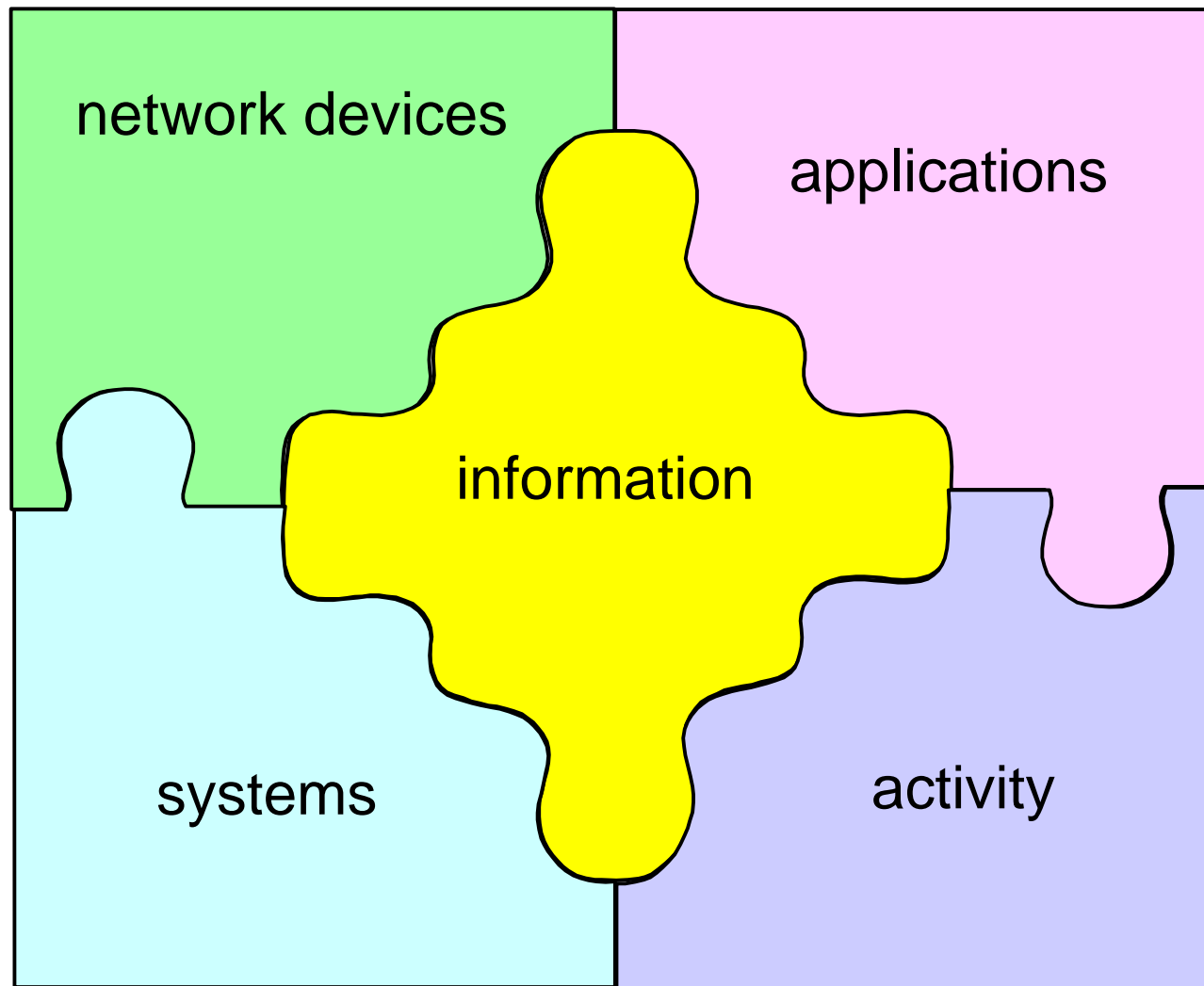
- ☐ **No silver bullet!**
- ☐ **How does it fit the process?**
- ☐ **How does it fit the organization & resources?**
- ☐ **How does it fit the facilities ?**
- ☐ **How does it fit the existing systems & tools ?**
- ☐ **How does it fit the management style?**



***MUST be based on your services and applications!***

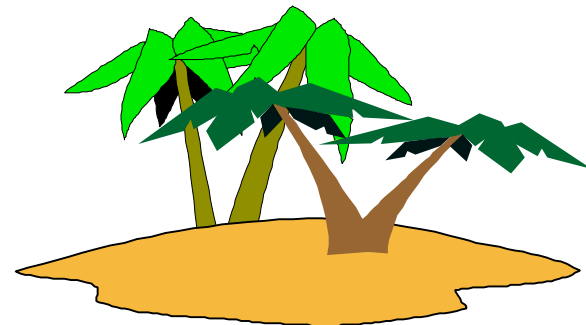
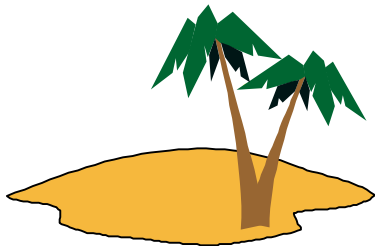
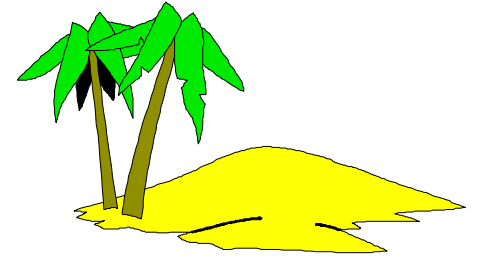


# What Needs Managing?



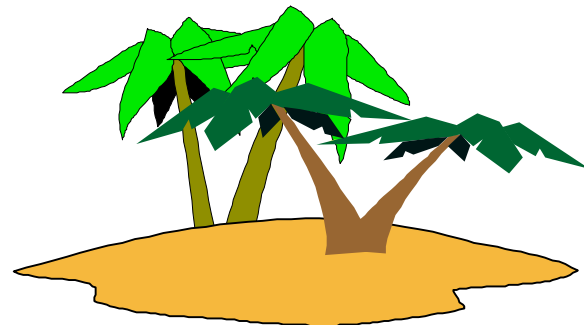
# Typically Autonomous Systems

- Full-function, integrated problem management system
- Automated phone and call management systems
- Device management system
- Change management system
- Software distribution & remote control



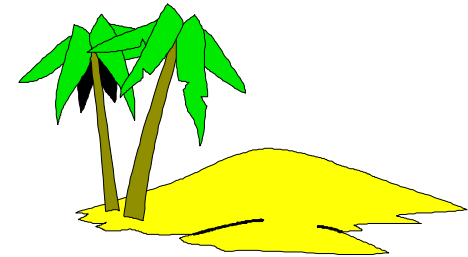
# Systems, cont'd

- Database & application management tools
- Server management
- Mainframe management & gateways
- Operations management
- Asset management system



# Systems, cont'd

- Address management
- Knowledge management system
- Communications management & protocol analysis
- Security
- Capacity Planning
- Enterprise management
  - Service Level Management & QoS
  - Policy-based management

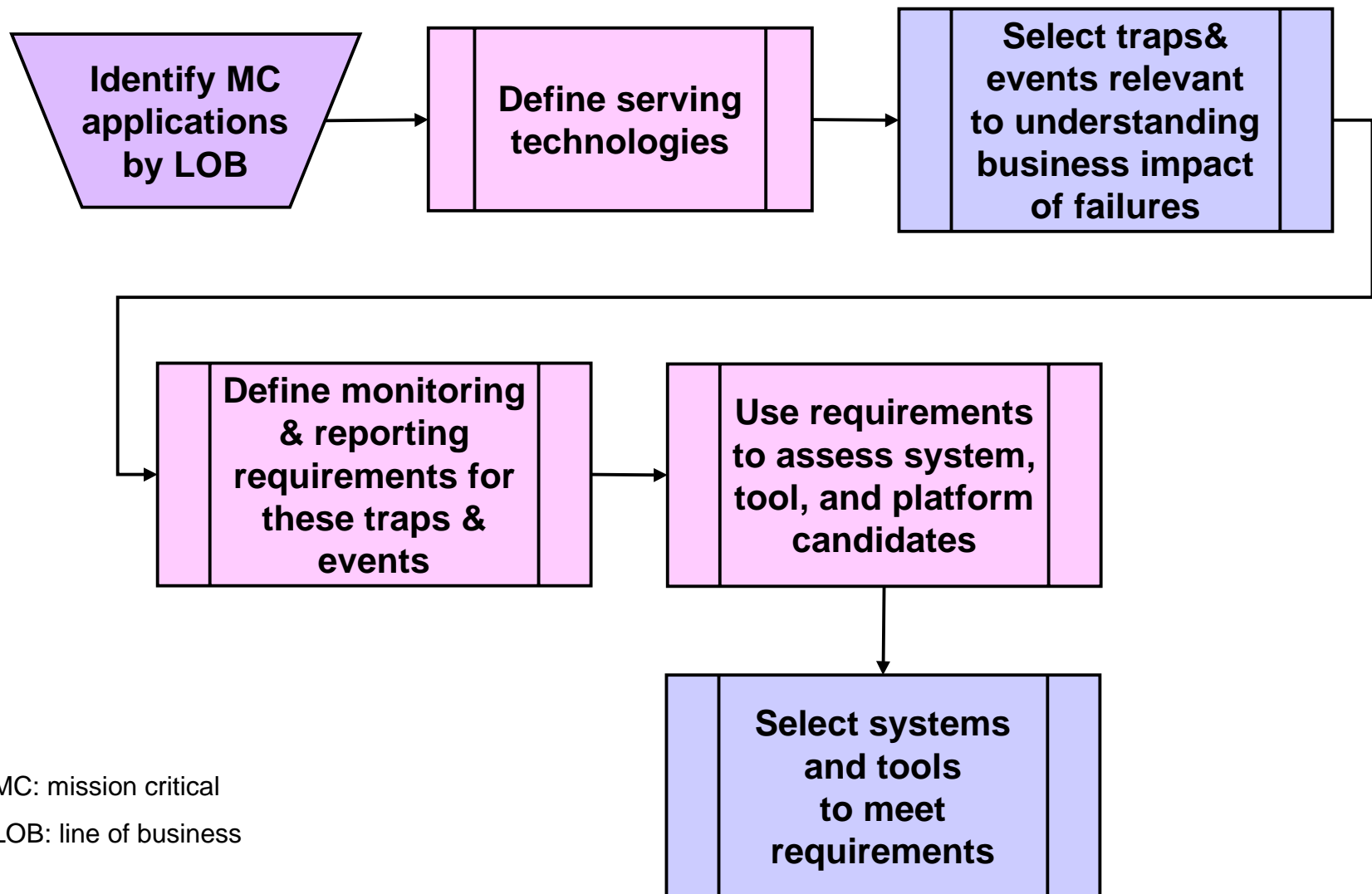


# Context of Suggested “Definitions”

- Platform
  - an environment in which the vendor’s own and 3rd-party tools run
  - e.g., HP OpenView and tools like Nortel’s Optivity
- Framework
  - an environment that ties together a set of tools all from one vendor
  - e.g., CA TNG with Advanced Storage, Asset Mgmt, etc.
- Tool or toolset
  - capability to address a limited scope of function or group of related functions in one management area
  - e.g., Ganymede or Chariot from Pegasus

*this terminology is NOT uniformly used or accepted!*

# A Practical Way to Get Started



MC: mission critical

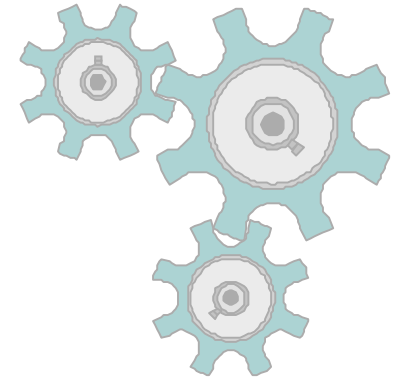
LOB: line of business

# Desirable Characteristics



- ☐ **Modular tools allow choice of best tool at right time**
- ☐ **Support systems & tool maintenance allow steps along an upgrade path**
- ☐ **Choose industry-compliant tools for all key systems (SNMP, SNMPv2, RMON, RMON2, standard MIBs)**
- ☐ **Tools should meet the needs of your existing installed base**

# Keep in Mind...



- Manned vs. unmanned
- Platform selection issues
  - size, operating system, fit in your environment
- Support available for chosen tools
- Vendor selection & negotiations
  - is this really a “good deal”???
- Alternate sources of support (other than vendor)
- Vendor’s long-term strategy
  - development
  - support



# Negotiate for:

- ☐ **Value-added services**
- ☐ **Free installation support**
- ☐ **Free training credits**
- ☐ **1-800 support**
- ☐ **Free software upgrades**
- ☐ **On-site post-sale support**
- ☐ **Performance bonus**
- ☐ **Value-based billings**



# Platform Candidate

- Hewlett-Packard - OpenView - solutions manage: networks, servers, storage, applications
  - Network Node Manager (NNM), Policy Xpert
  - AssetView, Desktop Administrator, ManageX, etc.
  - VantagePoint: operations, performance, etc.
  - OpenView Express: special grouping for mid-tier
  - Service Desk, etc.

# Applications Compatible with HP-OV NNM 6.1

<b><i>Application</i></b>	<i>HP-UX</i> 10.20	<i>Solaris</i> 2.6	<i>NT</i> 4.0
3Com Transcend Enterprise Mgr	5.0	5.0	1.0
Agilent NetMetrix	6.0*	6.0*	
Agilent NetMetrix Performance Center			1.0
Nortel Optivity-NMS	9.0*	9.0	9.0
CiscoWorks 2000 Campus	2.2*	2.2*	2.2*
CiscoWorks 2000 Resource Manager Essentials	2.0*	2.0*	2.0*
CiscoView	4.2	4.2	4.2
HP Customer Views for NNM	1.0	1.0	1.0

# Platform Candidate

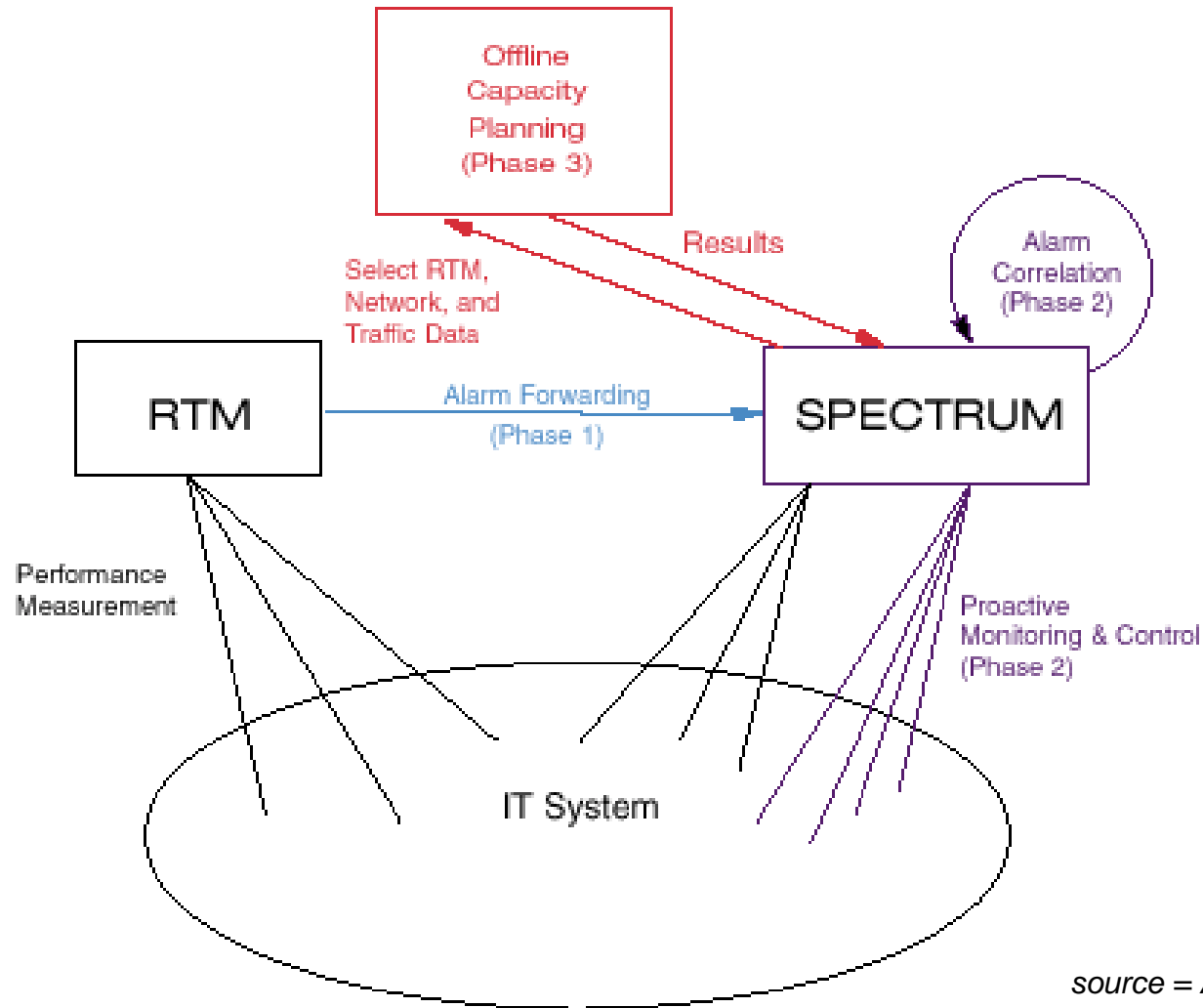
- Aprisma (formerly Cabletron) - Spectrum
  - Enterprise Solutions
  - Service Provider Solutions
  - Broadband Cable Management Solution

# Spectrum 6.0

## Family of Infrastructure Management Solutions

- Branch Office Manager
- Site Manager
  - SpectroServer Knowledge Base (fault mgmt for up to 250 devices)
  - Systems management gateway to Compaq Insight Manager
  - Trouble ticketing gateway to Remedy ARS
  - Enterprise LAN device management
- Enterprise Manager
  - SpectroServer Knowledge Base (unlimited # devices)
  - More client licenses for desktop access
  - Systems management gateway to Compaq Insight Manager
  - Trouble ticketing gateway to Remedy ARS
  - Enterprise LAN device management
- Multi-vendor device support (recent deal with Cisco)

# Integration of Spectrum with Response Time Monitor Tools



source = Aprisma white paper

# Framework Candidates

- Computer Associates - Unicenter TNG/
- Tivoli - NetView TME (now includes NetView, which was originally OEMed from HP-OV - probably only polling is similar today)

# CA Unicenter TNG

- Unicenter TNG Framework = architecture
  - GUI with open APIs
  - data repository and data model (object model is superset of CORBA)
  - communication facility for sharing information across a network
    - » Common Communication Interface
    - » Event Notification Facility
- Many choices for underlying hardware / OS
- Development partners
  - see [http://vip.ca.com/dpp/directory/tng\\_partners.htm](http://vip.ca.com/dpp/directory/tng_partners.htm)



# Unicenter TNG<sup>®</sup>



# Toolsets

- Problem Mgmt + - Remedy,
- Server Mgmt - Compaq Insight Manager, HP “server manager”
- Performance monitoring - Concord’s Network Health, Ganymede’s Pegasus
- BMC Patrol
- Test suites - Netcom’s SmartBITs, Ganymede’s Chariot
- Correlation engines - SMARTS, Avesta’s Trinity
- Application performance: Optimal response time predictor, Ganymede Pegasus, FirstSense
- Lucent e-pro from NetCare (comparable to Concord)

*Think: business impact of failures, degradations, etc.*

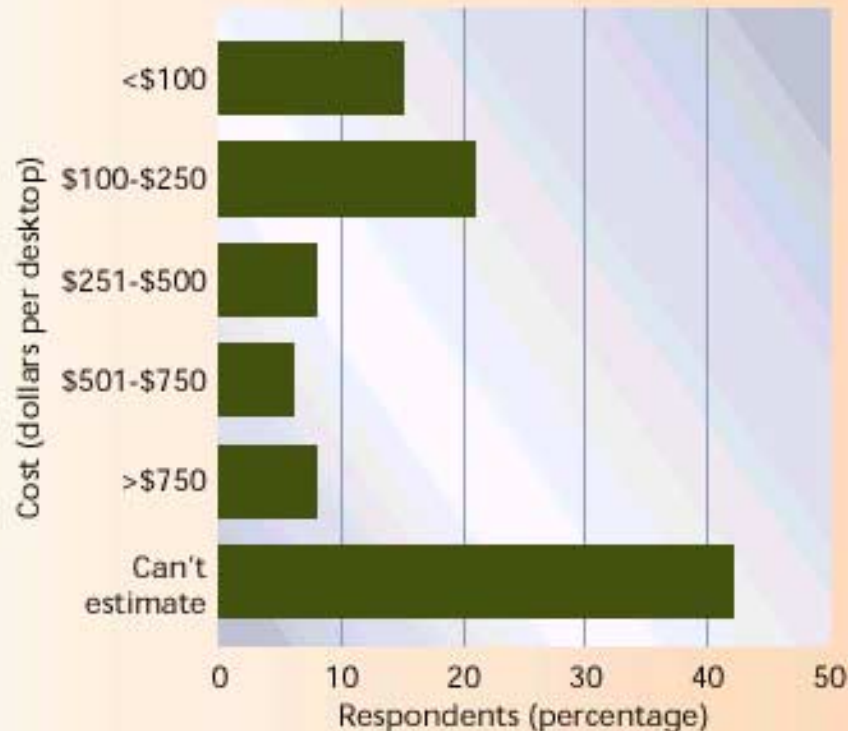
*Think: process-driven, with links among problem, change, & asset management*

# Survey of Fortune 1000 Firms

- 46% committed to multiple point solutions
- 30% committed to combination of point and suite solutions
- 7% undecided
- 17% committed to a single suite solution
- barriers to suite adoption:
  - technology is too complex
  - organizations ill-prepared to deploy such complex technology

*Source = Gowan et al, "Avoiding the Pitfalls of Installing Systems Management Suites", IT Pro (IEEE), Jan/Feb 2000*

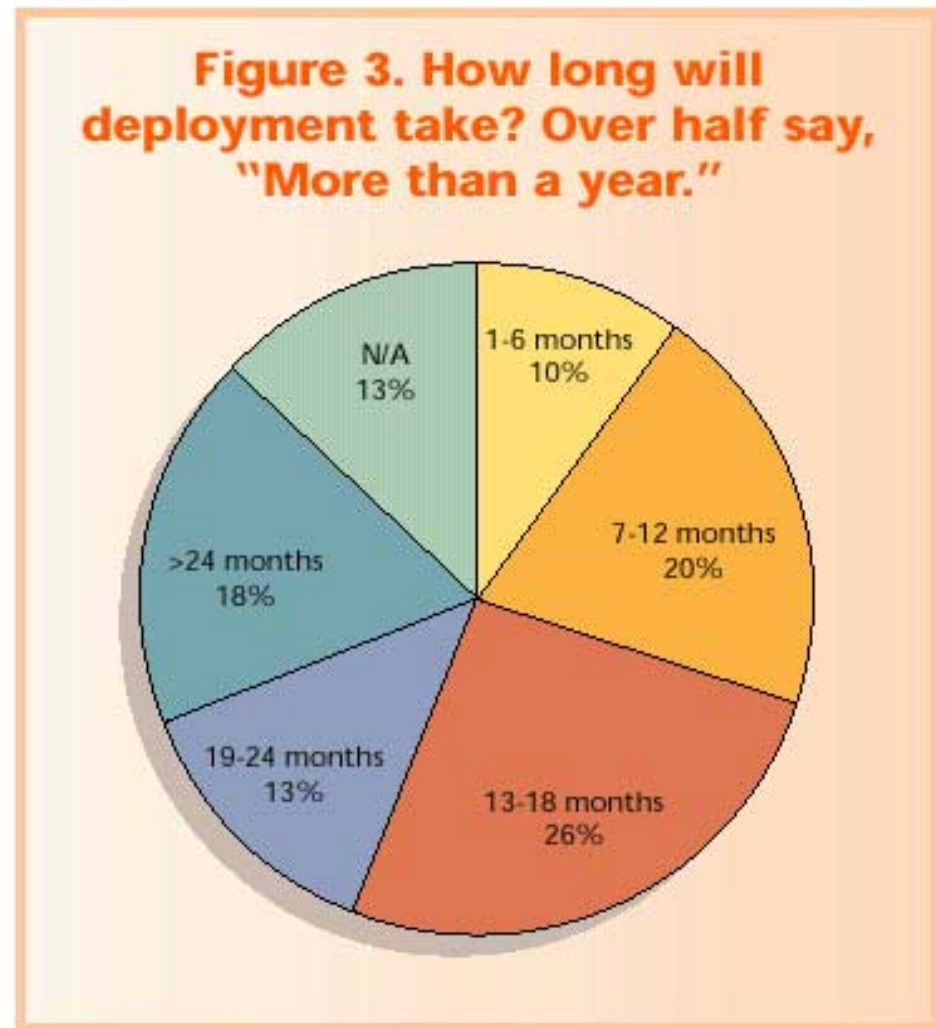
**Figure 2. The cost of systems suites is difficult to pin down.**



- 43 percent of the respondents indicated that their suite solution costs (including implementation) were at least \$100 per desktop;
- 49 percent do not have sufficient information on the desktops in the enterprise to request a fixed-price implementation;
- 56 percent admit that the suite may not or will not be implemented within budget; and
- 42 percent admit they cannot estimate the true cost of suite deployment at this time.

Source = Gowan et al, "Avoiding the Pitfalls of Installing Systems Management Suites", *IT Pro (IEEE)*, Jan/Feb 2000

- 57 percent believe the deployment will take more than a year (see Figure 3);
- 58 percent indicated that the suite technology may not or will not be implemented on time; and
- 41 percent indicated that they are dissatisfied with the implementation process.



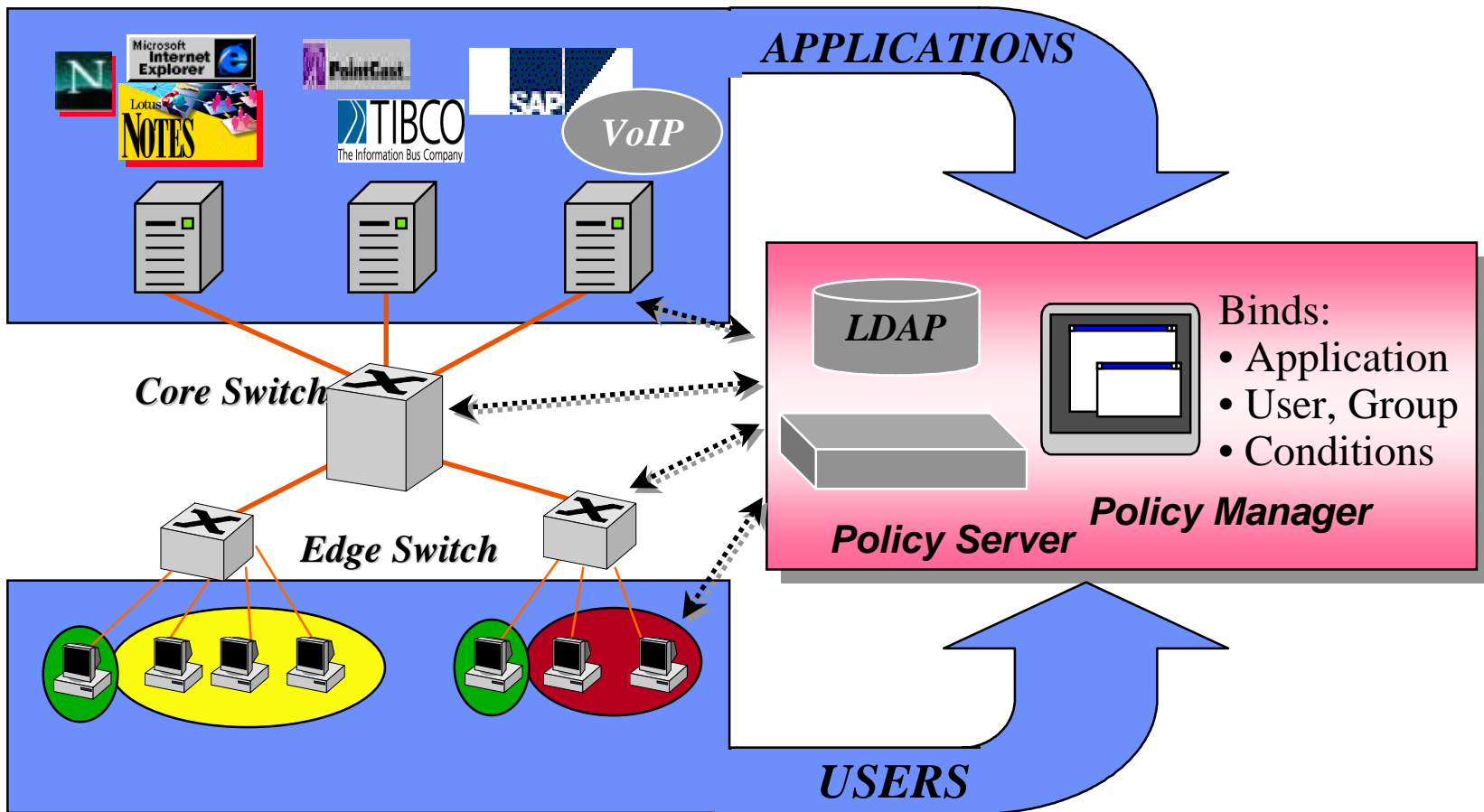
Source = Gowan et al, "Avoiding the Pitfalls of Installing Systems Management Suites", *IT Pro (IEEE)*, Jan/Feb 2000

# Some Advice

- Big, comprehensive platforms take major effort to install, learn, & use
- A small set of carefully selected, compatible tools may be better than a huge platform or suite
- Strive for a common back-end DBMS



# Policy Management Requires an Integrated View



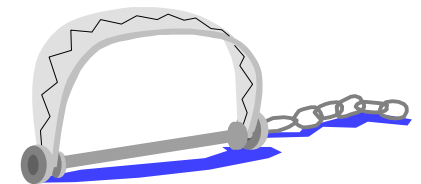
# Policy-based Management

- IT perspective:
  - QoS policy
    - » application: UDP,TCP port #
    - » system or individual: IP host address
    - » group or VLAN: IP subnet address
    - » time: ToD, DoW, WoQ, etc.
  - Security policy
    - » application: access
    - » system or individual: privilege or authentication
    - » group membership: privilege
    - » time: access
- Business perspective:
  - allocating resources in concert with priorities needed to achieve business objectives



# Technologies Supporting Policy-Based Management

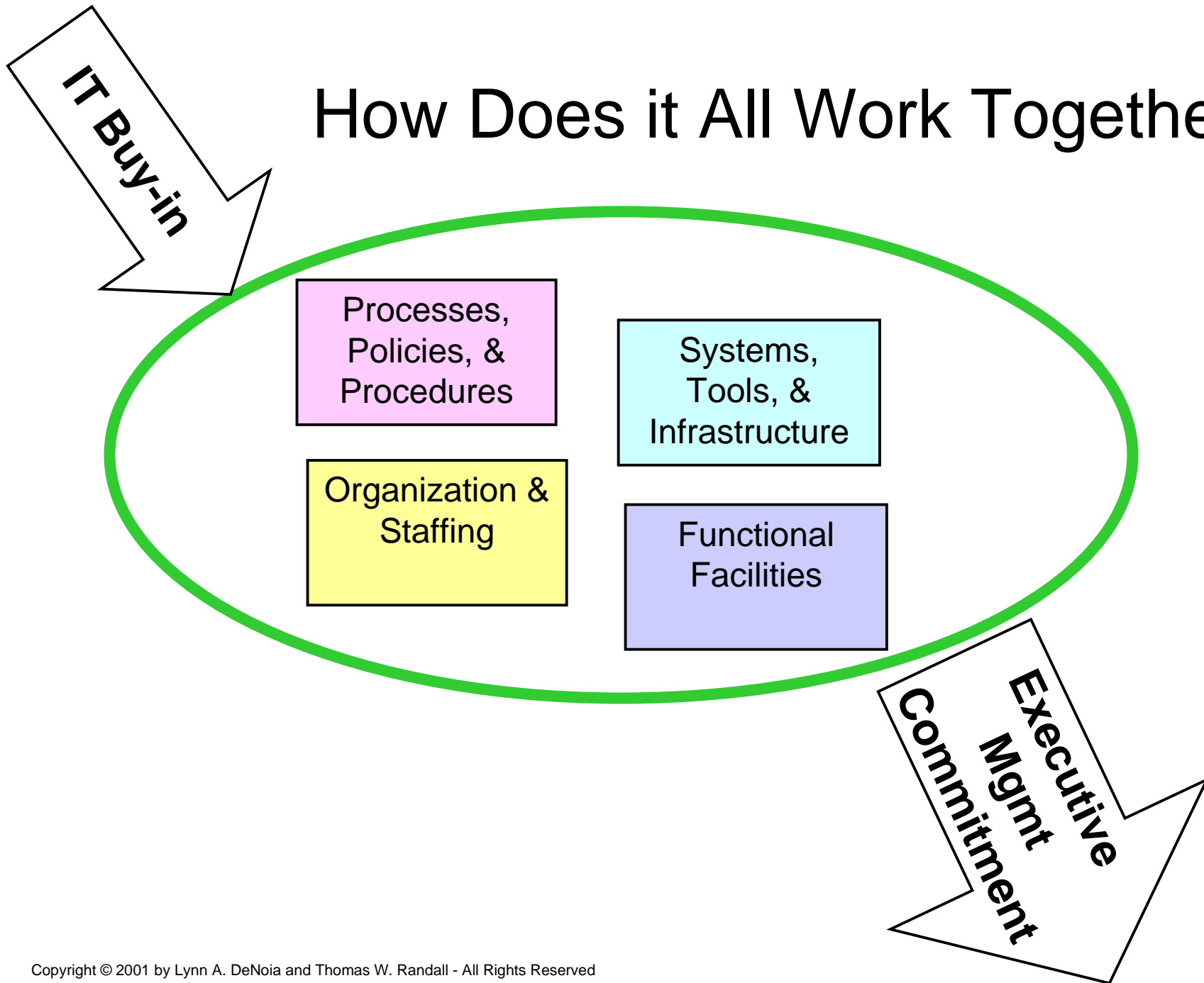
- Policy Transaction Protocols
- User Registration Servers
- Directory Services
- Directory Service Access Protocols
- Network Management Data Interchange and Data Modeling
- Directory Enabled Networks



# Agenda

- The environment in which we operate
- A new framework: 5 fundamentals
- Formal processes: importance and examples
- Organization and staffing
- Recruiting and retention
- Environment and facilities
- Systems, tools, and infrastructure
- IT buy-in and executive management commitment
- Making it all happen

# How Does it All Work Together?



# What Does it Take for IT to Buy In?

- Do they understand the business?
- Do they understand how the technology supports the business?
- Do they understand the impact of technology failures?
- Do they understand their roles in all of this?



# Some Ways to Develop IT Buy-in

- Get IT staff involved in the planning process
- Publish defined service levels & results
- Publish maintenance windows
- Cross-rotate support people & encourage knowledge transfer
- Explain the value of engaging with the support team
- Keep people up to date - share information!



# Developing Executive Management Commitment



- Outline the risks involved
  - risk of doing, risk of not doing
- Understand true costs
- Get them involved in the planning process (need to have CFO as an ally!)
- Define how return on investment will be achieved (e.g., mean time to return to operation & cost of downtime)
- Tangible and intangible benefits

# Map Technology Strategy to Business Objectives

- Identify business objectives and timeframe
- Define required supporting technology (not wish list)
- Perform gap analysis between current and required
- Identify risks
- Design to meet requirements
- Prepare transition/implementation plan

# Work with Total Cost of Ownership

- Too much history of late and over budget
- Too many trips back to the well
- You mean it doesn't last forever?
- Importance of life cycle perspective
- Use industry data carefully





# IT Investment Value

- Usually expressed in terms of:
  - productivity
  - business profitability
  - customer value



# Speaking the CXO's Language

CEO	COO	CFO	CIO
value equation		sales	
	business process	cost	
		customer satisfaction	
		employee satisfaction	IT contribution

*from Society for Information Management working group on  
"Measuring the Value of IT" - [www.simnet.org](http://www.simnet.org)*

# Developing Commitment Takes Time



- ☐ **Explain process, policies, procedures, functions, and tasks**
- ☐ **Discuss value of adherence to disciplines**
- ☐ **Foster involvement and commitment to a strategy not a product**
- ☐ **Assist them to become technology aware**
- ☐ **Assist them to become risk aware**
- ☐ **Show alignment with business objectives**

# Agenda

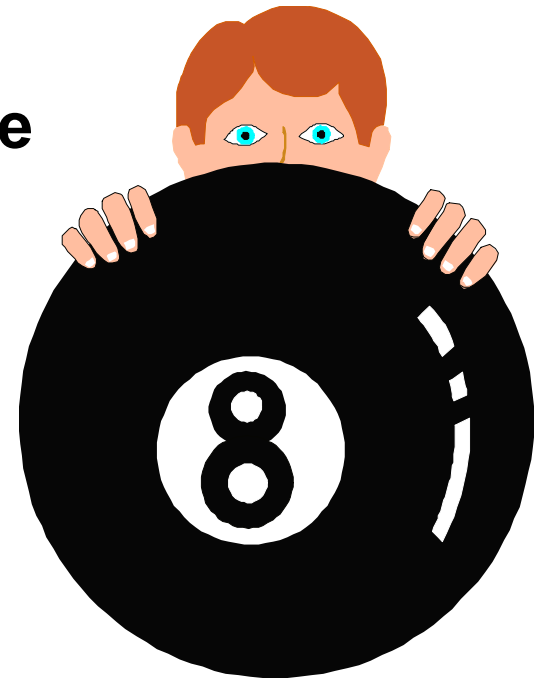
- The environment in which we operate
- A new framework: 5 fundamentals
- Formal processes: importance and examples
- Organization and staffing
- Recruiting and retention
- Environment and facilities
- Systems, tools, and infrastructure
- IT buy-in and executive management commitment
- Making it all happen

# Establish Success Criteria

- ☐ **Define pieces of action**
- ☐ **Define roles & responsibilities**
- ☐ **Define & gain full funding**
- ☐ **Define deliverables**
- ☐ **Define what “complete” means**
- ☐ **Define what “successful” means**

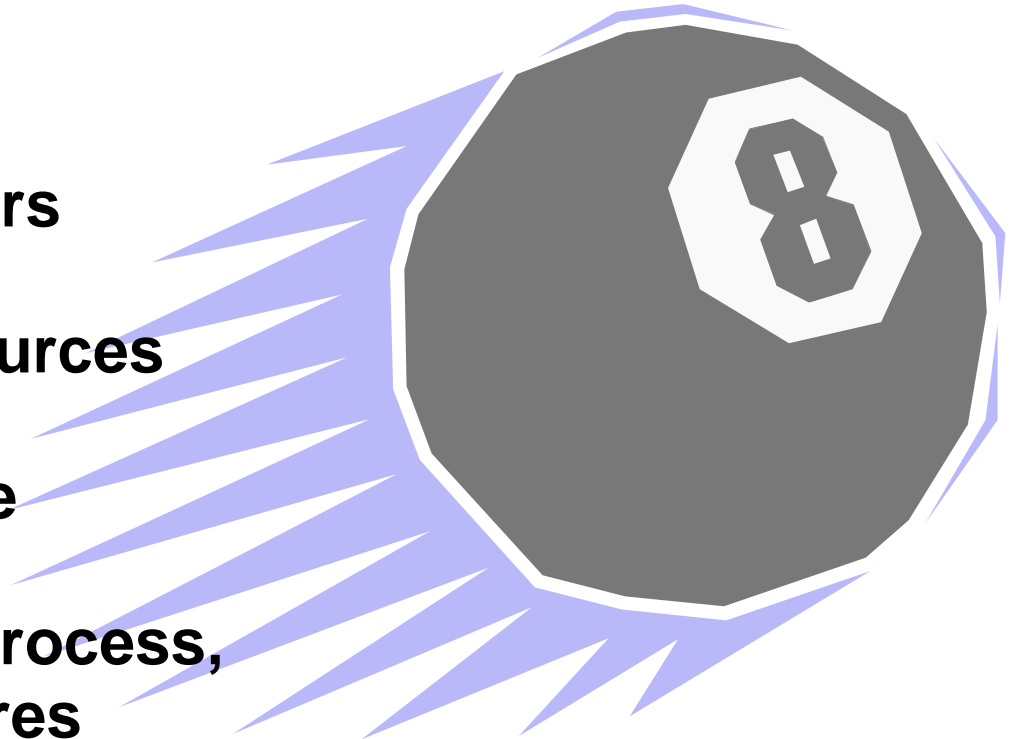
# Common Pitfalls

- ❑ **Failure to take an enterprise approach**
- ❑ **Inaccurate or incomplete documentation**
- ❑ **Failure to plan**
- ❑ **Failure to gain executive management commitment**
- ❑ **Under-funded**



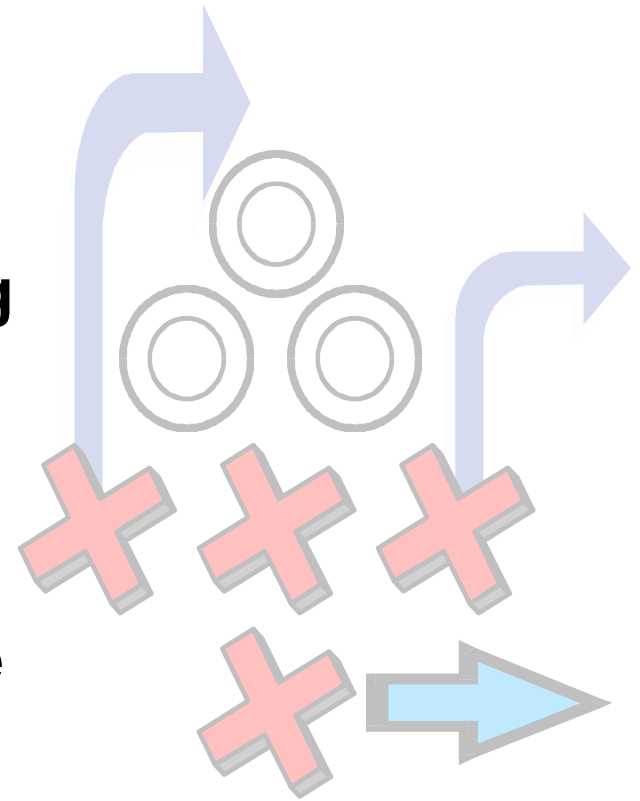
# Pitfalls, cont'd

- ☐ Believing the vendors
- ☐ Non-dedicated resources
- ☐ Getting out of scope
- ☐ Failure to develop process, policies, & procedures
- ☐ Failure to train your staff
- ☐ Unrealistic timeframes or scope or staffing - these are NOT independent variables!



# How to Develop an Implementation Plan

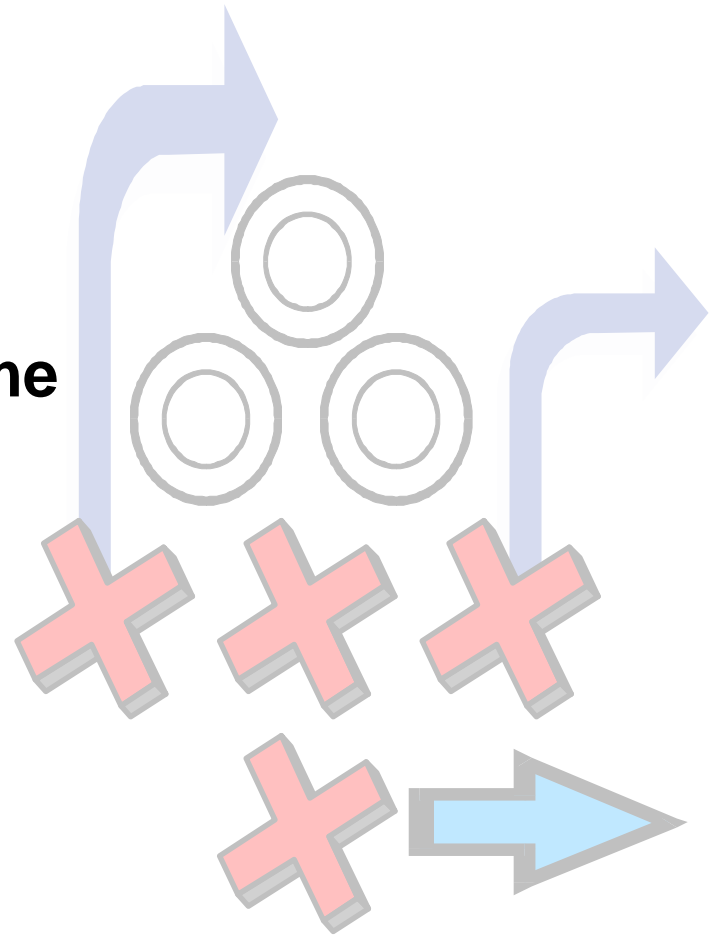
- ❑ **Business unit involvement**
- ❑ **Regular and on-going review of long term plan**
- ❑ **Executive level involvement**
- ❑ **Life-cycles & planned obsolescence**
- ❑ **Formal project planning tools**





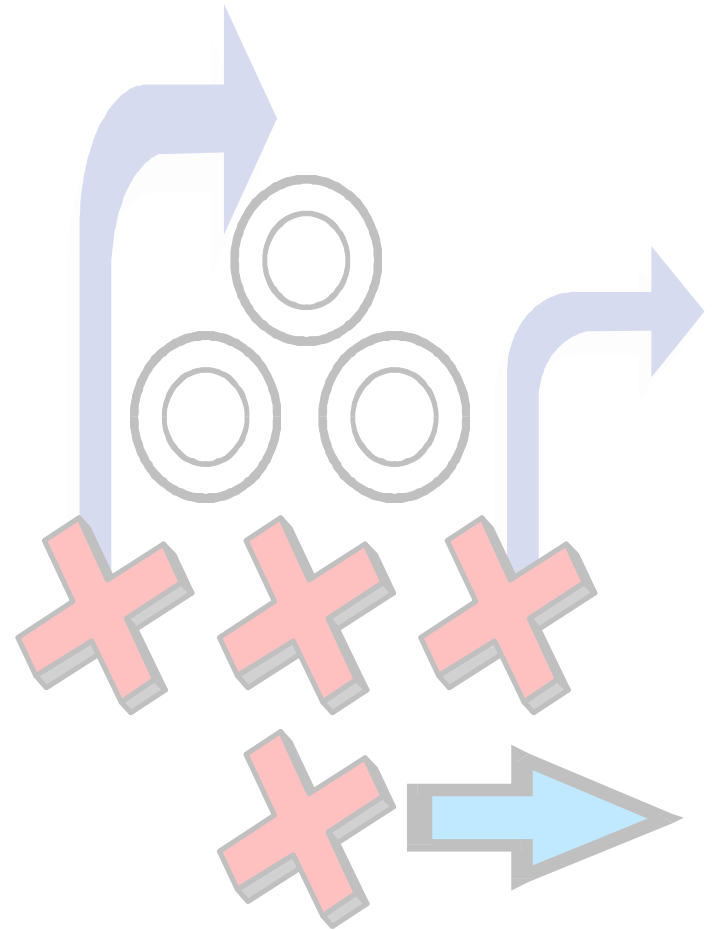
# The Plan Should Include:

- ❑ **Technology standards**
- ❑ **New & enabling technologies**
- ❑ **Risk analysis & cost of downtime**
- ❑ **Resource allocation**
- ❑ **Impacts on production & maintenance windows**



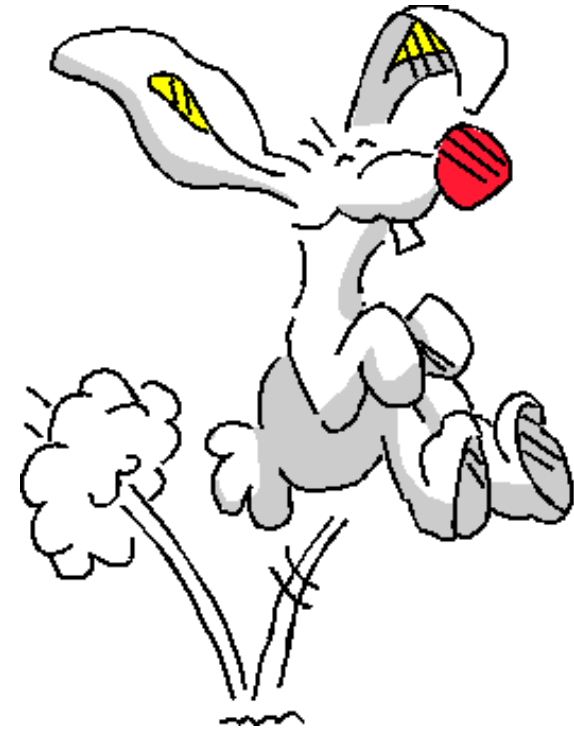
# Plan Contents, cont'd

- ❑ **Systems design & alarm flow**
- ❑ **Proof of concepts**
- ❑ **Defined policies & procedures**
- ❑ **Return on investment**
- ❑ **Success criteria**



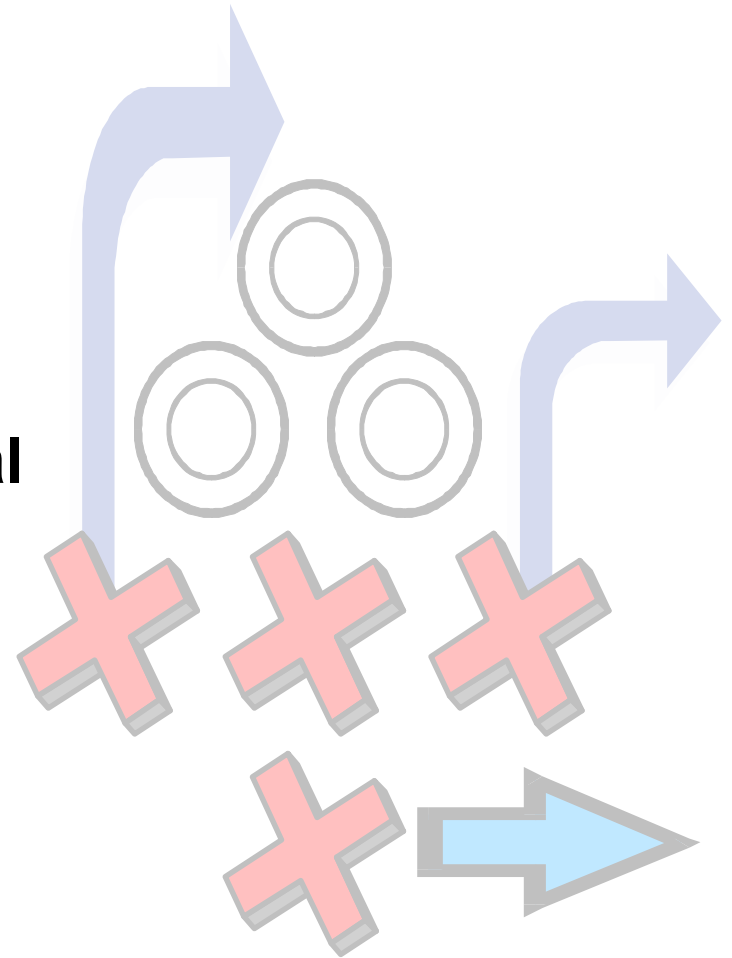
# Success Factors

- ☐ **Establish real timeframes**
- ☐ **Provide fallback pockets**
- ☐ **Review resource allocations carefully**
- ☐ **Evaluate long-term commitment of team members**
- ☐ **Establish milestones**

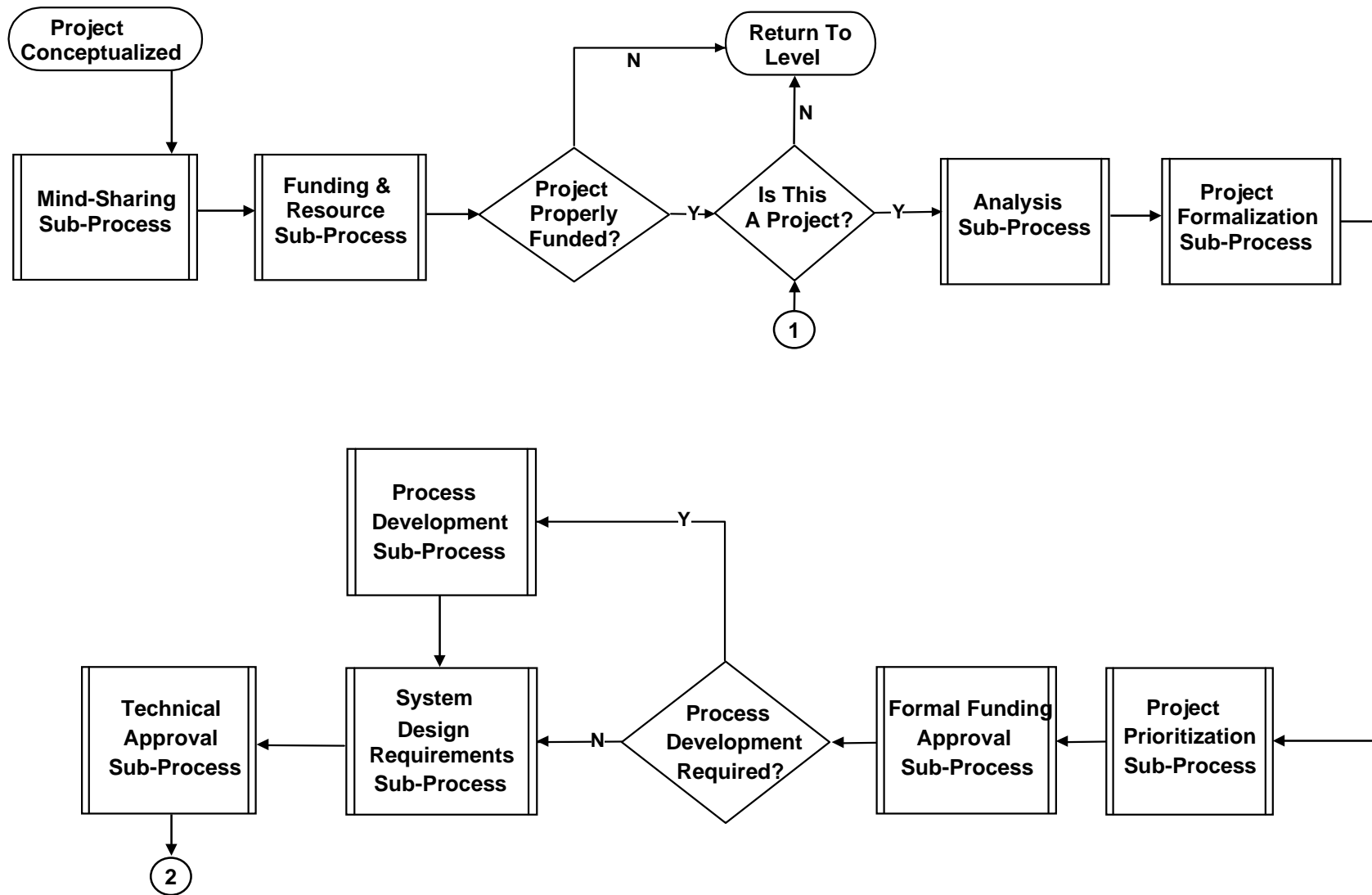


# Success Factors, cont'd

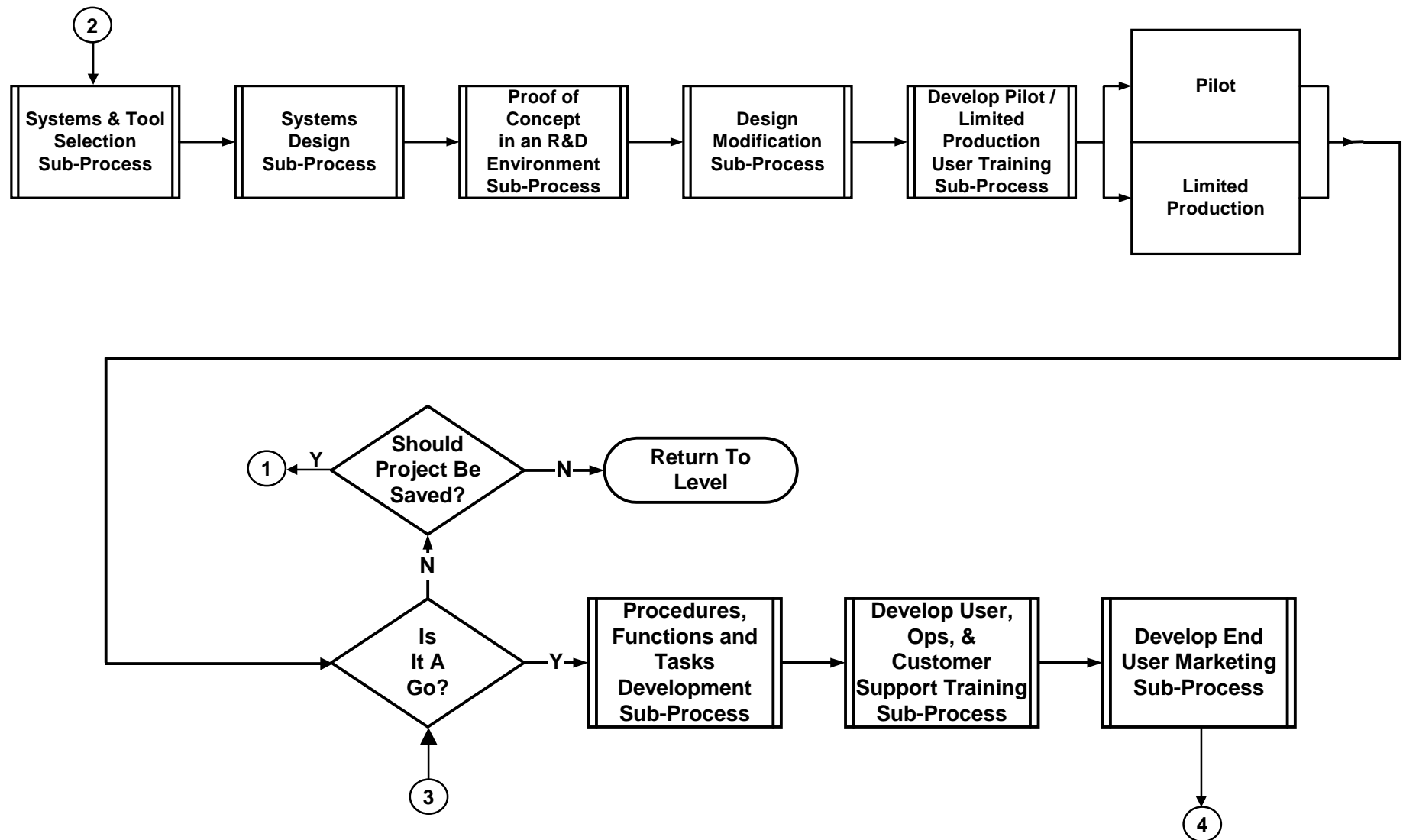
- ❑ **Document changes**
- ❑ **Build detailed implementation plans by task**
- ❑ **Allocate resources by individual**
- ❑ **Publish results**
- ❑ **Plan - Do - Review - Iterate !!!!!**



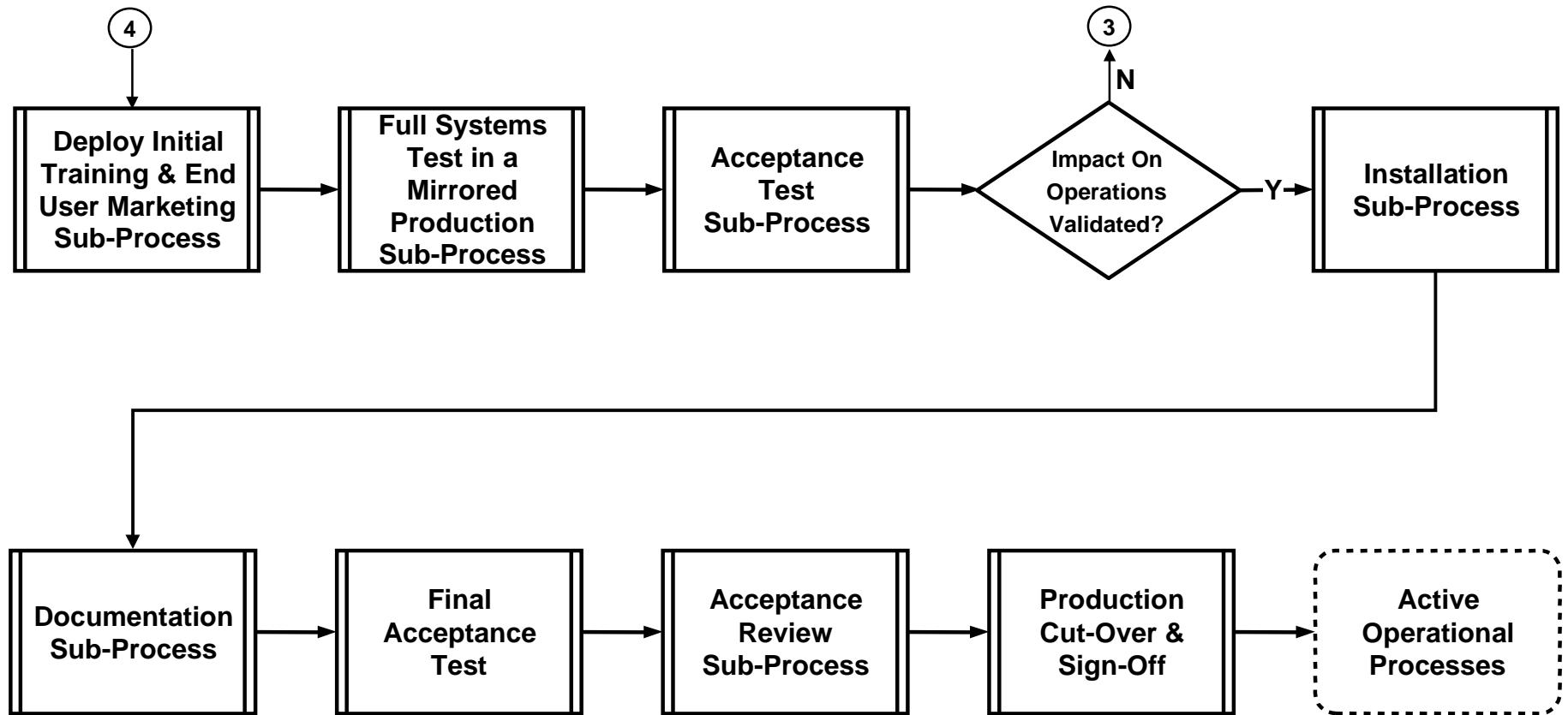
# What Constitutes a Project?



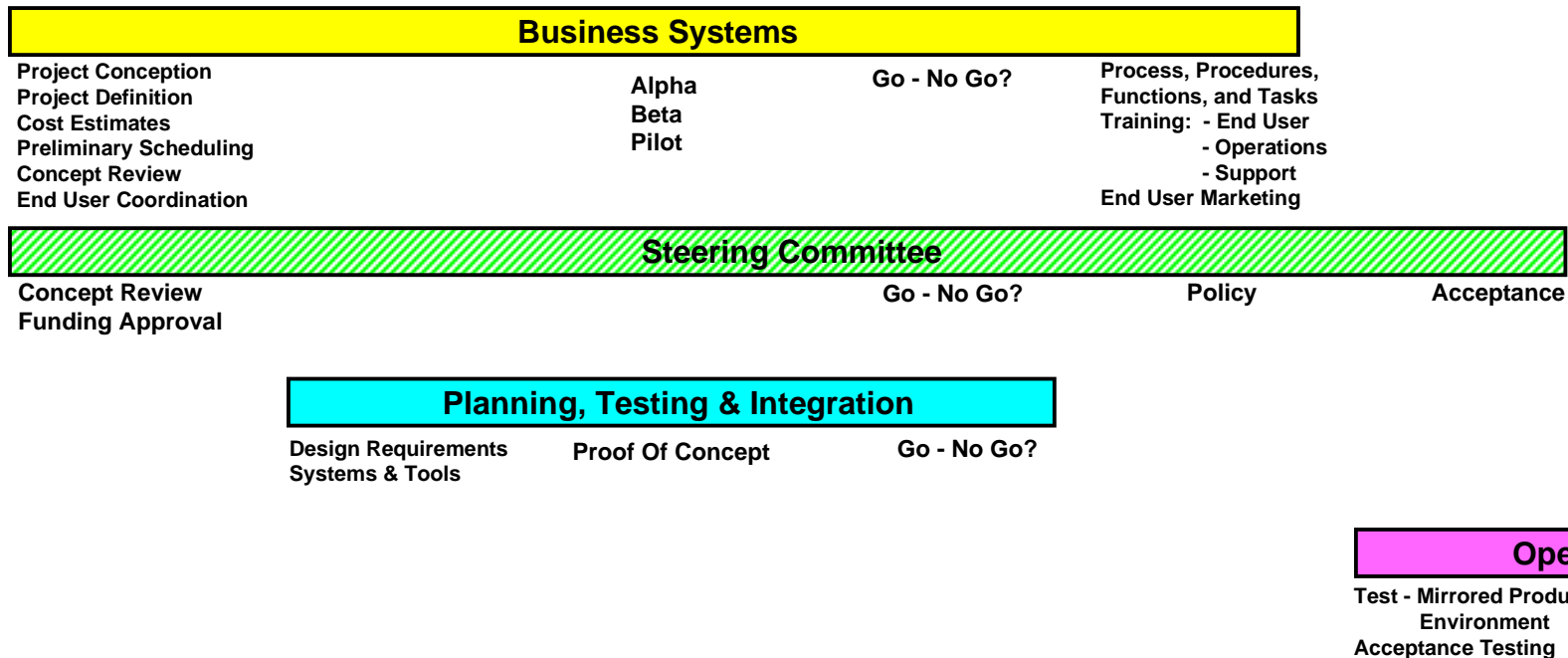
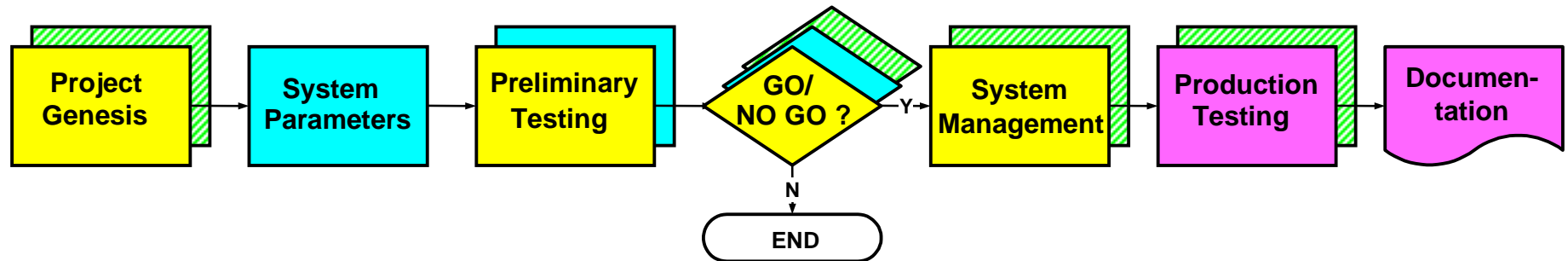
# Project Process, cont'd



# Project Process, cont'd



# Areas of Responsibility





# Sample Participation

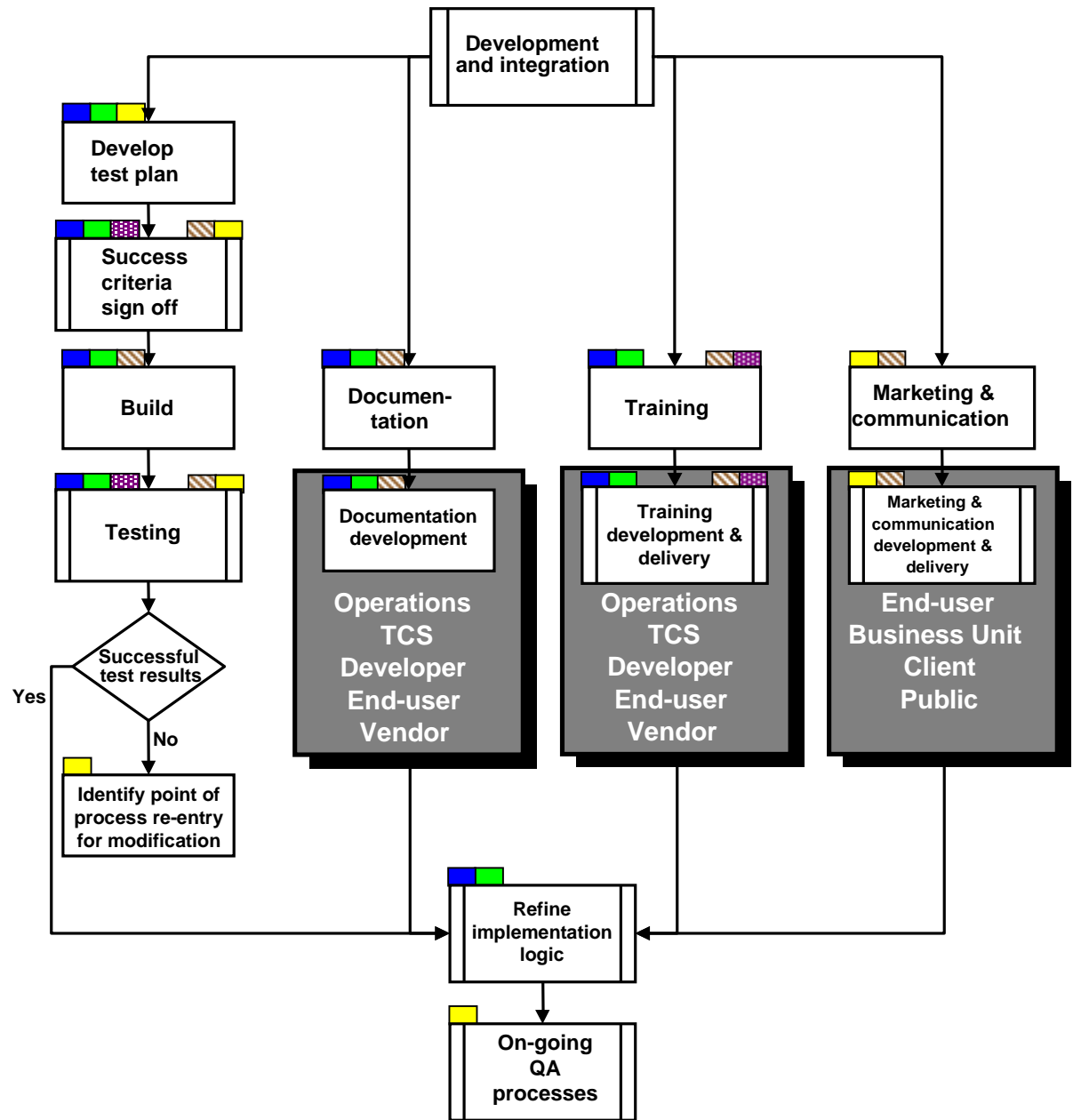
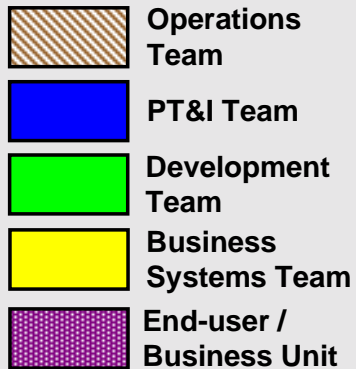
## Development and Integration:

The prerequisite for this phase is successful proof of concept. This phase includes all the requirements for preparing the deliverable for the production environment.

## Testing:

Ensure that the deliverable and all success criteria are defined and met. Includes end-user testing.

### Team Ownership Legend



# Sample Project Phases



- ☐ **Phase 1**    **Review global network & systems management needs**
- ☐ **Phase 2**    **Define existing facilities, resources & tools**
- ☐ **Phase 3**    **Define existing work flow & existing organization**
- ☐ **Phase 4**    **Define existing resources & tools**
- ☐ **Phase 5**    **Develop new process flows, new organization, & new facilities**

## Sample Phases, cont'd

- ☐ **Phase 6**      **Select new systems & tools**
- ☐ **Phase 7**      **Develop new processes, policies, procedures, & standards**
- ☐ **Phase 8**      **Establish budget estimates**
- ☐ **Phase 9**      **Initiate procurement**
- ☐ **Phase 10**      **Create implementation plan**

# Sample Phases, cont'd

☐ **Phase 11**

**Build new facilities**

☐ **Phase 12**

**Set up systems**

☐ **Phase 13**

**Train the team**

☐ **Phase 14**

**Conduct pilot**

☐ **Phase 15**

**Document final procedures**

# Sample Phases, cont'd

- ☐ **Phase 16**                      **Cut over to production**
- ☐ **Phase 17**                      **Review project & sign off**

**Celebrate success!**



# Project Management Institute

- [www.pmi.org](http://www.pmi.org)
- certification program
  - Project Management Professional
  - 4500 hours experience prior to exam
- PMBOK (“pembok”)
  - Project Management Body of Knowledge
  - document available for free download



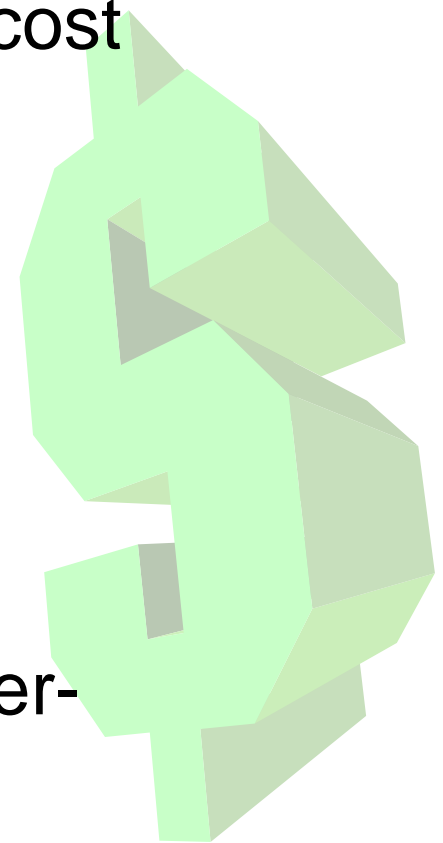
# PMI Knowledge Areas

- project integration management
- project scope management
- project time management
- project cost management
- project quality management
- project human resource management
- project communications management
- project risk management
- project procurement management



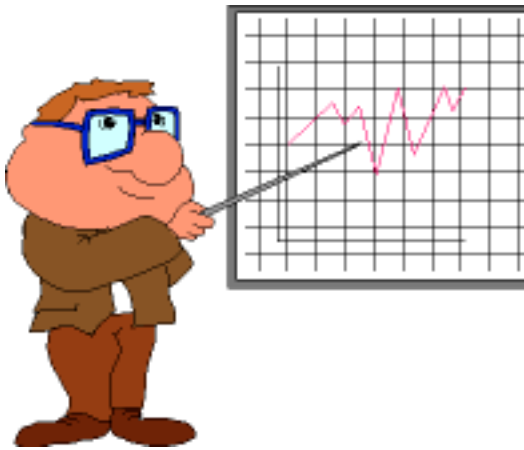
# The Importance of Budgets

- Under-funded technical support can cost twice as much as the proper level of support
- Network & systems management solutions are not inexpensive
- Many organizations are critically under-budgeted





# Remember...

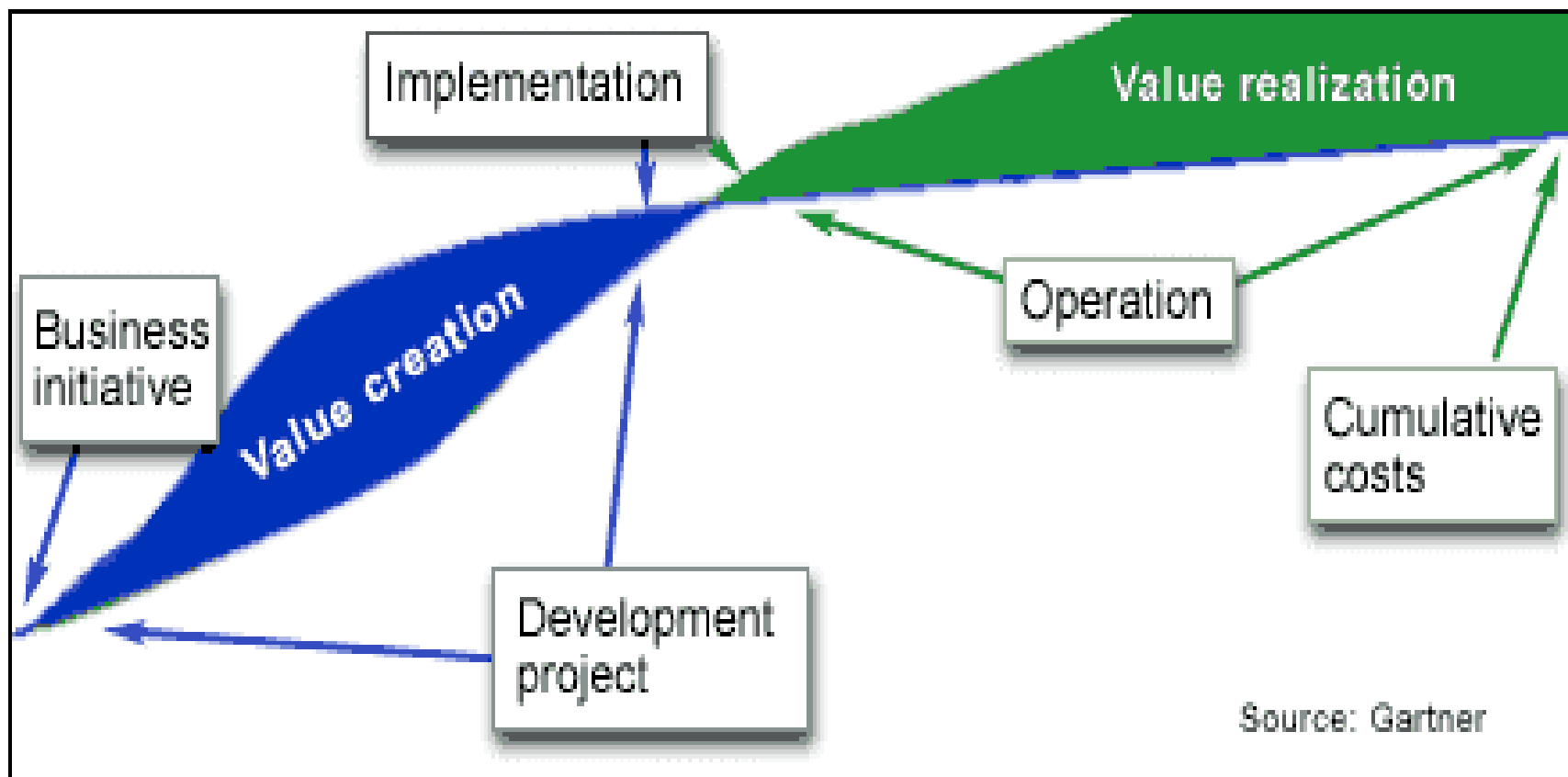


- ❑ **Significant levels of high-end resources may be required to implement & support the proper solution**
- ❑ **“Executive management does not understand why I need to spend the money and does not understand how I get a return on the investment”**

# Some Approaches

- **ROI - Return on Investment**
  - value of all benefits achieved compared with cost of developing, installing, and operating
- **ROM - Return on Management**
  - Paul Strassman
  - different philosophy based on cost of various management activities
- **ROR - Return on Relationship**
  - Nortel Networks Clarify
  - “ability to model, measure, and ultimately maximize a company’s ROR with each individual customer”

# Understanding Where and When IT Value is Created is Crucial to ROI



# Survey Clips (TechRepublic)

- Does your organization have a clear set of metrics for measuring IT effectiveness?  
Yes -- 17%                      No -- 83%
- Which measurement of IT's contribution do you consider most important?  
Efficiency -- 17%                      Effectiveness -- 83%
- Which of the five Gartner "best practices" do you consider most valuable for measuring IT effectiveness?
  - Developing key metrics for correct and regular measurements -- 25%
  - Adapting models to illustrate IT's impact and contribution -- 8%
  - Analyzing data in the models to identify common, significant, or recurring issues -- 0%
  - Enabling rational planning through accurate metrics, reliable data, and useful models -- 25%
  - Implementing "Strategies for Improved Performance" and continuing to measure -- 42%

*Summer, 2000*

# How to Establish Budgets

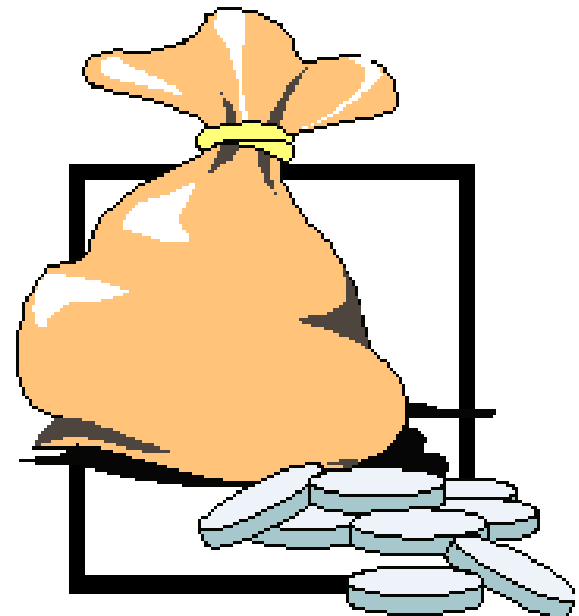
- ❑ **Create a global plan & build the budget**
- ❑ **Establish quarterly outlays**
- ❑ **Define Categories**
  - ❖ **Client Systems**
  - ❖ **Back-end Systems**
  - ❖ **Systems Infrastructure**
  - ❖ **Application Systems**



***Include a “contingency line / fund”***

# Budget Steps, cont'd

- ❑ **Put needs in priority order**
  - ❖ **Must have**
  - ❖ **Should have**
  - ❖ **Nice to have**
  
- ❑ **Include all areas**
  - ❖ **Hardware & software**
  - ❖ **Training**
  - ❖ **Travel costs**
  - ❖ **Internal & external staffing**
  - ❖ **Maintenance**

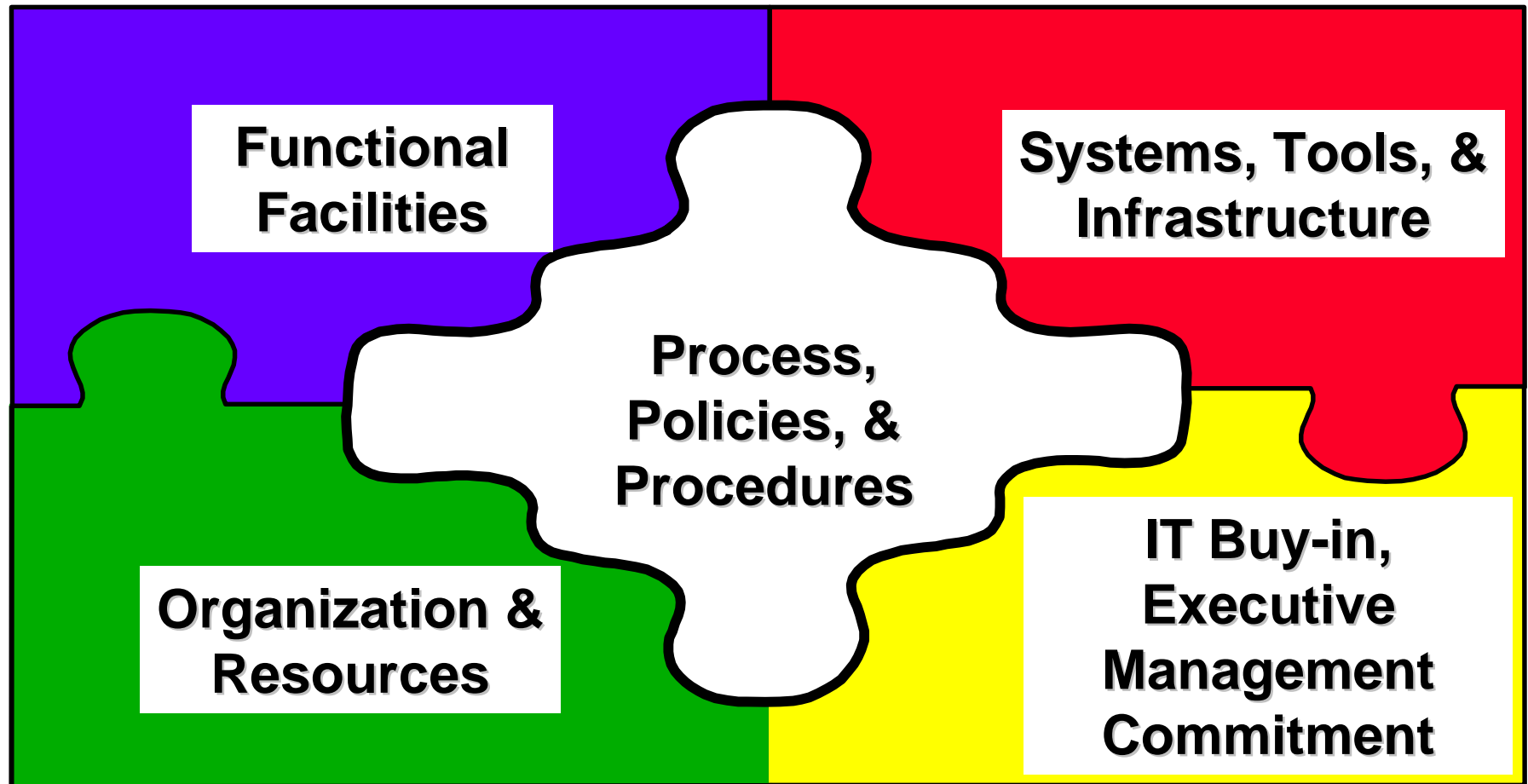


# Success Factors



- ☐ **Gauge your commitment**
- ☐ **Identify ability to be successful**
- ☐ **Plan! Plan! Plan!**
- ☐ **Gain executive management commitment**
- ☐ **Purchase antacid**
- ☐ **Lease straight jackets**
- ☐ **Hang on for the ride**
- ☐ **Enjoy the positive results**

# A Well-balanced IT Organization Needs All 5 Elements





Questions?  
Discussion?



# Thank you!

