Planeamento de Sistemas de Informação

Motivações, Problemas e Estratégias

Today's Lecture

- **Introduction**
  - Why is planning so difficult?
- **The Changing World of Planning**
  - Traditional Strategy-Making
  - Today's Sense-and-Respond Approach
- **Planning techniques**

Definition / Levels of IS Planning

- **What is IS planning?**
  - The process of developing a view of the future that guides decision making today
  - Stating the direction we want to go and how we intend to get there

FIGURE 4-1 Three Types of Planning

Target Horizon	Focus	Issues	Primary Responsibility
3–5 years	Strategic	Strategic planning, business process	Senior management CIO
1–2 years	Tactical	Resource allocation, project selection	Middle managers IS line partners Steering committee
6 months–1 year	Operational	Project management, meeting time, and budget targets	IS professionals Line managers Partners

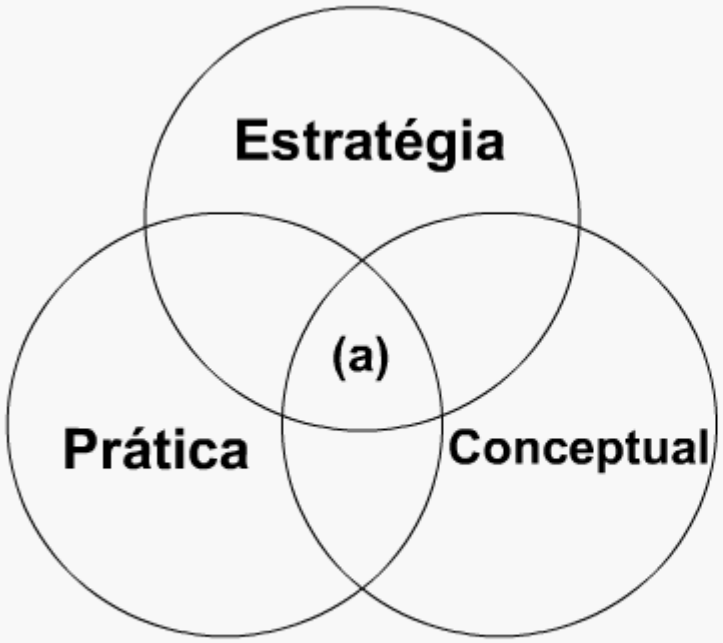
Introduction

- **Why do we need IS planning?**
  - We need IT in our modern organizations but yet we “throw our hands up” because IT changes so fast!
  - Can we keep up? Is it worth it?
- **How to resolve this apparent paradox?**

Introduction cont'd

- **We need a plan!**
  - **Stating the direction in which you want to go and how you intend to get there**
  - **Develop a view of the future that guides your decision-making today**

Motivation for IS Planning



Natureza das motivações do PSI
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Conceptual:
Exercício normal da actividade de gestão.

Prática:
Reconhecimento de problemas no SI.

Estratégico:
Procura oportunidades pela utilização das TI/SI

Why Planning Is So Difficult

- **Alignment of strategic business goals and systems plans**
  - CIO not in inner circle
  - Attitudes have changed
- **Technologies are rapidly changing**
  - Is strategic planning even relevant?
    - > Continuous planning (monitoring, adjustments)
    - > "Built to Change" (Lawler III & Worley, 2006)

Why Planning Is So Difficult

- **Companies need IT portfolios rather than projects**
  - Portfolio planning is sophisticated
    - > Projects must be evaluated beyond individual merits
    - > Fit with other projects is crucial
- **Infrastructure development is difficult to fund**
  - IT investments grossly expensive
  - Indirect effects:
    - > "Customer Information Engine"
  - Constant pressure to keep up with industry?

Why Planning Is So Difficult

- **Responsibility needs to be joint**
  - Commitment from multiple stakeholders
    - > Consensus?
    - > Involvement of external stakeholders?
- **Other planning issues**
  - Organizational culture
    - > Top-down versus bottom-up
  - Continuous vs. disruptive changes

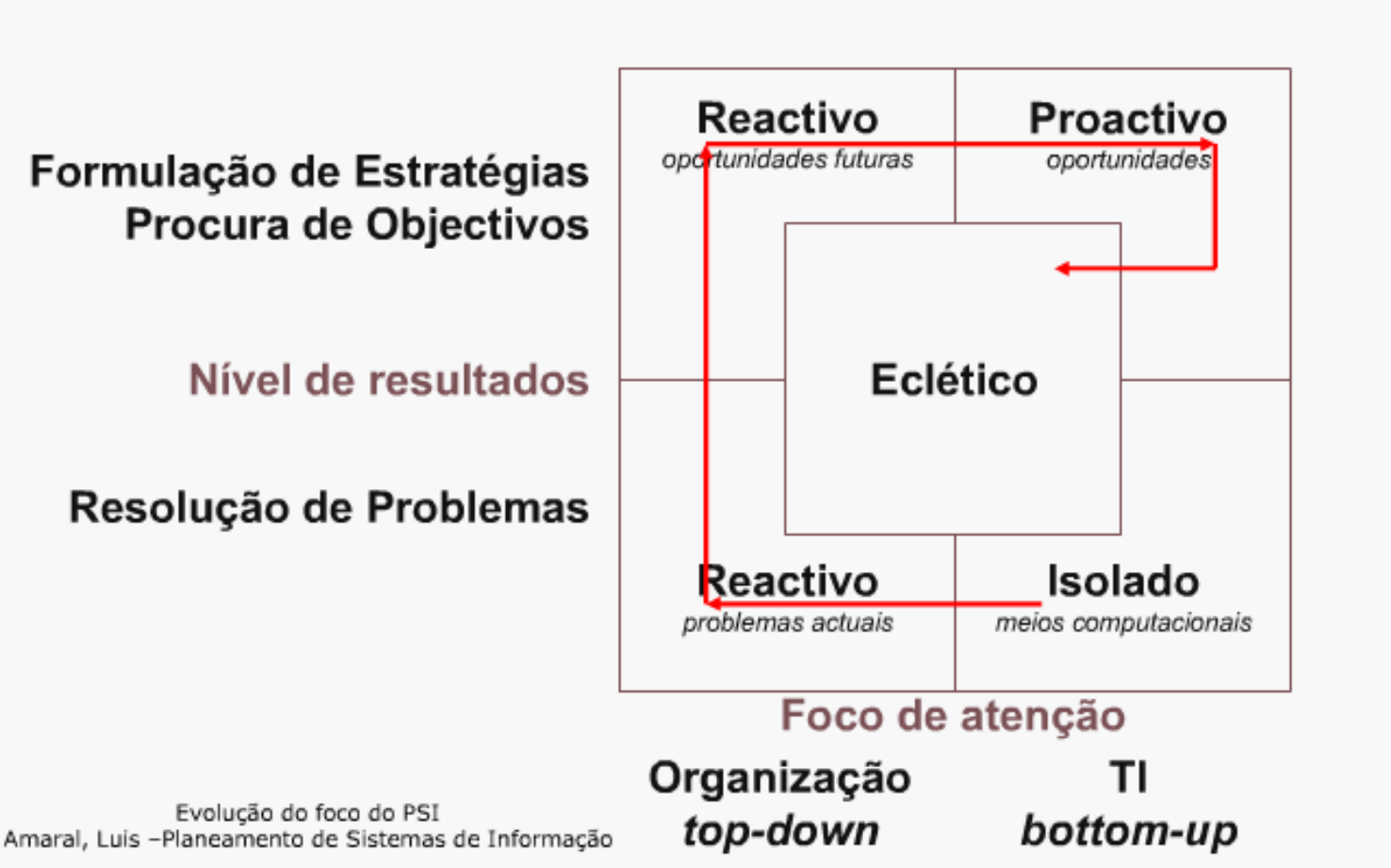
The Changing World of Planning

- Evolution of strategic IS planning along with rapid change of Internet-driven technologies.
- Traditional style of planning no longer viable
  - Command and control
  - IS as a support function
  - "Lifecycle" (static environment)
- Still need long-range vision but with flexibility and creativity

The Changing World of Planning

- **Internet etc. = 'introduced' speed into the business environment and transformed how people think about time, how much time they have to plan, react to competitors etc.**
- **Traditional Strategy-Making:**
  1. **Business executives created a strategic business plan = where the business wanted to go**
  2. **IS executives created an IS strategic plan = how IT would support the business plan**
  3. **IT implementation plan created = describe exactly how the IS strategic plan would be implemented**
- **Assumptions:**
  - **The future can be predicted**
  - **Time is available to do these 3 parts**
  - **IS supports and follows the business**
  - **Top management knows best (broadest view of firm)**
  - **Company = like an 'Army'**

IS Plan Evolution



Evolução do foco do PSI
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Traditional IS Planning

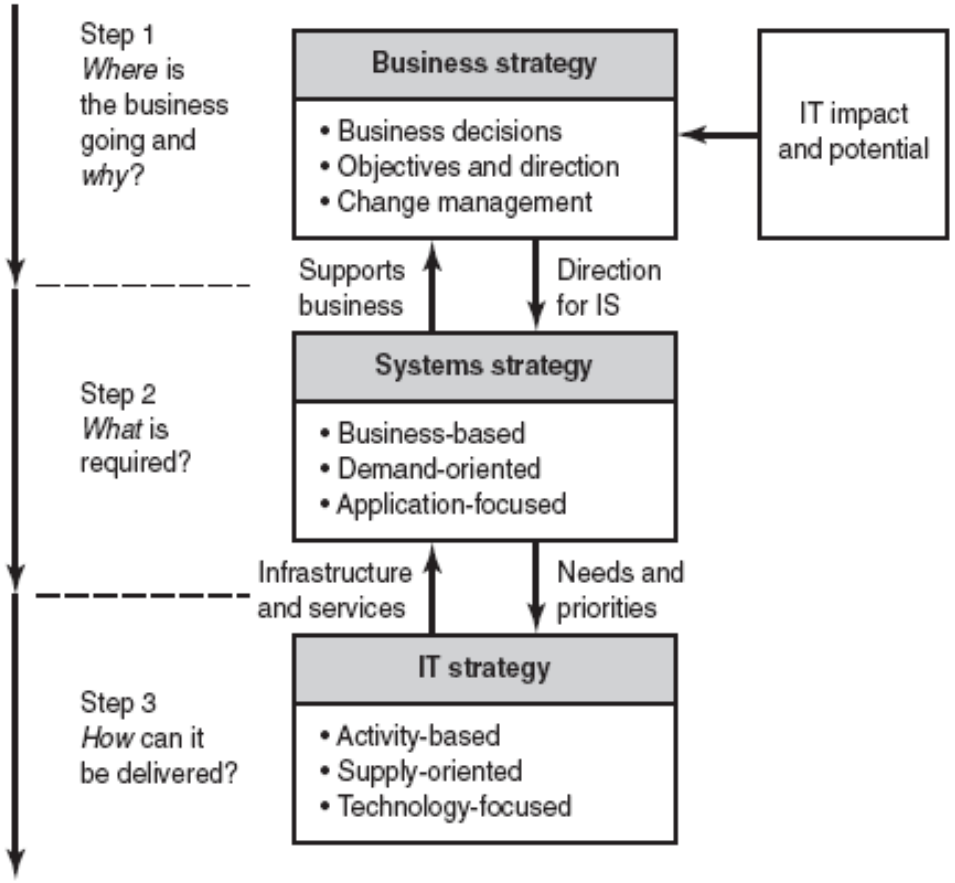


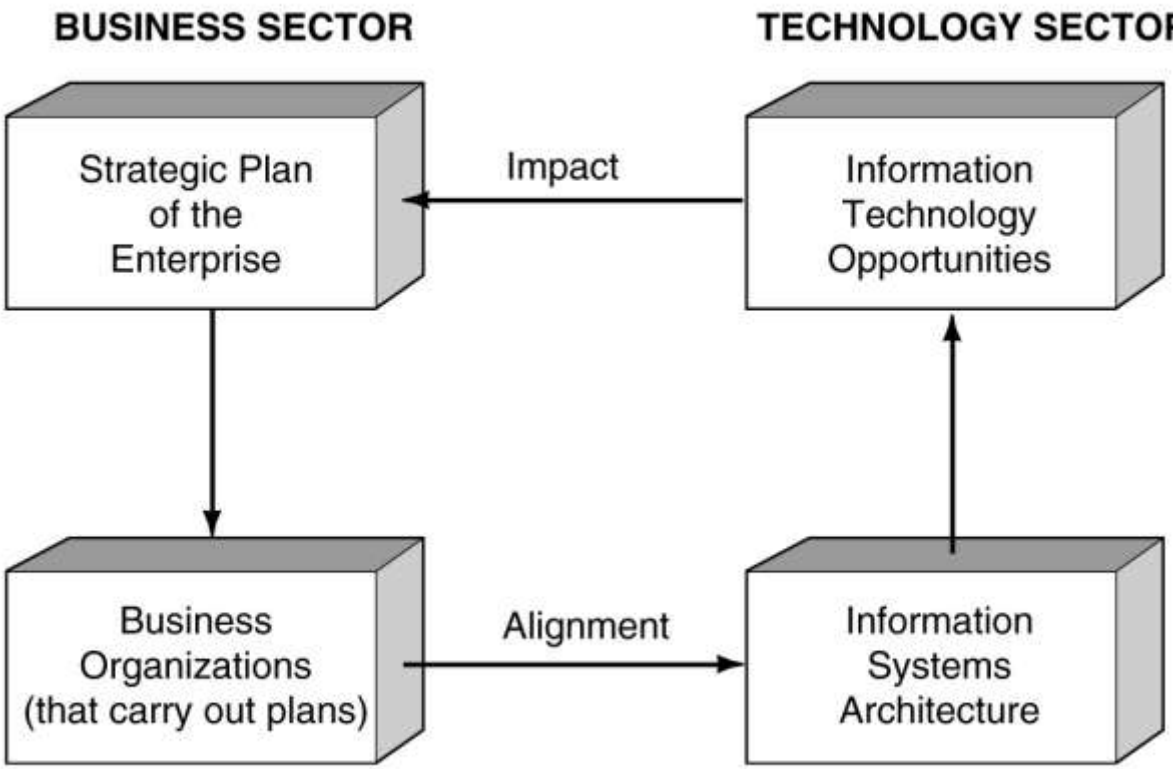
FIGURE 4-2 Traditional Strategy Making

Source: Adapted from and reprinted with permission from Roger Woolfe, Barbara McNurlin, and Phil Taylor, *Tactical Strategy*, Wentworth Research Program (now part of Gartner EXP, 56 Top Gallant, Stamford, CT 06904), November 1999.

Traditional IS Planning - issues

- The future is less predictable
  - Disruptive Internet-driven innovations (e.g. Amazon.com)
- Time is running out
  - Speed is of the essence
- IS does not just support the business anymore
  - How can IT influence new ways of working?
- Top management may not know best
- A business organization is not like an army

FIGURE 2-8 The Enterprisewide Information Management Model



Source: Marilyn Parker and Robert Benson with Ed Trainor, *Information Economics: Linking Information Technology and Business Performance* (Upper Saddle River, NJ: Prentice Hall, 1988).

Mistakes: Strategic Planning Don'ts (and Dos)

All

- **Why is it critical to do effective IT planning?**
- **What are some characteristics of an effective IT strategic planning process? Please cite examples from the article.**

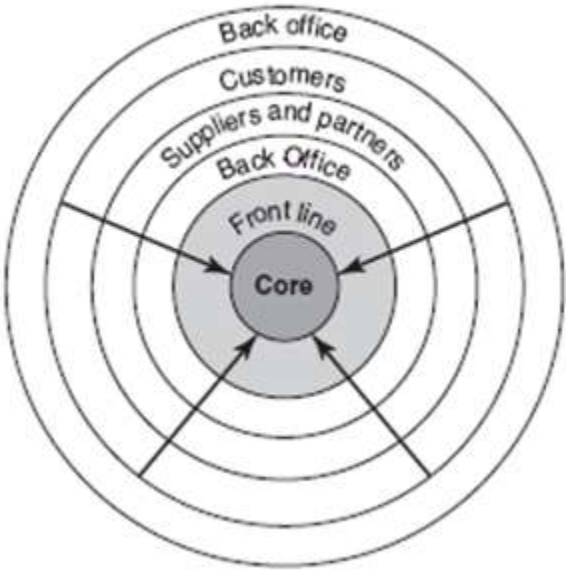
Methods for IS Planning

- **Just some examples (more than 50 methods…)**

BIAIT	Business Information Analysis and Integration Technique	Carlson 1979
BICS	Busines Information Characterization Study	Kerner 1979
BSP	Business Systems Planning	IBM 1984
CRLC	Custumer Resource Life Cycle	Ives e Learmonth 1984
CSF	Critical Success Factors	Rockart 1979
E/M A	Ends-Means Analysis	Wetherbe e Davis 1982
EAP	Enterprise Architecture Planning	Spewak e Hill 1993
HSPA	Hierarchical Systems Planning Approach	McLean e Soden 1977
IQA	Information Quality Analysis	Vacca 1984
ISP/IE	Information Strategy Plnning/Information Engeneering	Martin 1986b

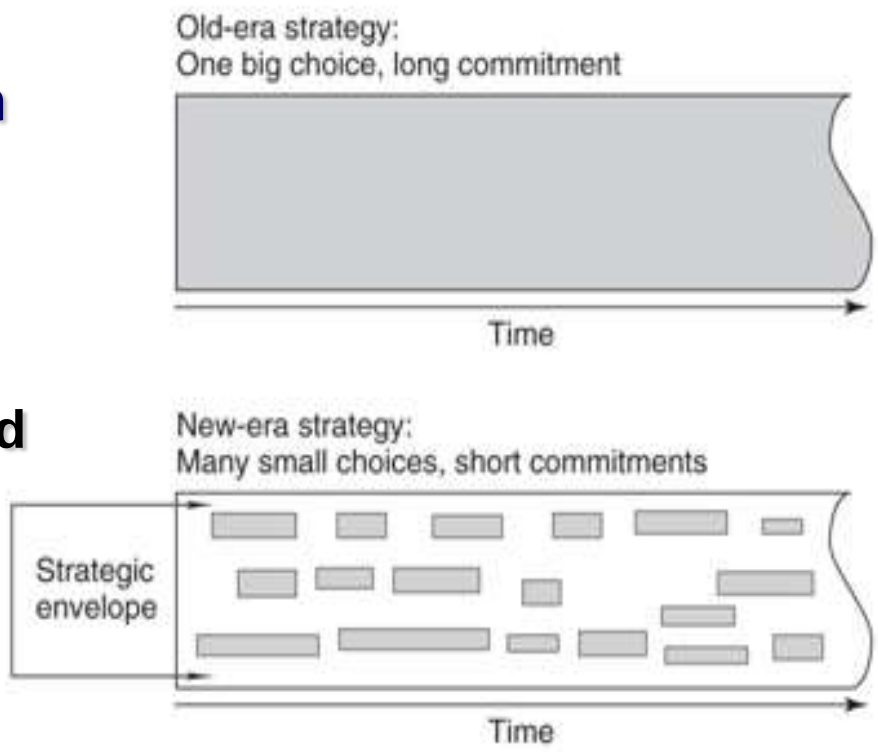
A better way – outside in

- Need a shift in planning approach from “inside-out” to “outside-in”
- Strategic development should start from the “organizational edges” (front line)
  - Start with the customers and front-line employees



A better way – sense and respond

- Sense-and-respond approach
- Let strategies unfold rather than plan them long in advance
- Guide strategy making with a "strategic envelope"
  - Myriad of strategic options and opinions (especially with outside-in approach)
  - Need central guidelines from top management to prevent anarchy
    - > Set parameters
    - > Open and regular communication



Microsoft

Case example: Sense-and-Respond

- **Diversification and expansion strategy**
  - Relentlessly explore different software technologies and business opportunities
  - Always an eye on the competitive environment
  - Windows and PC, MSN portal, mobile devices and apps, Xbox, business solutions etc.
  - Latest challenge (February 2008): Bid $44.6 billion for Yahoo! to compete with Google

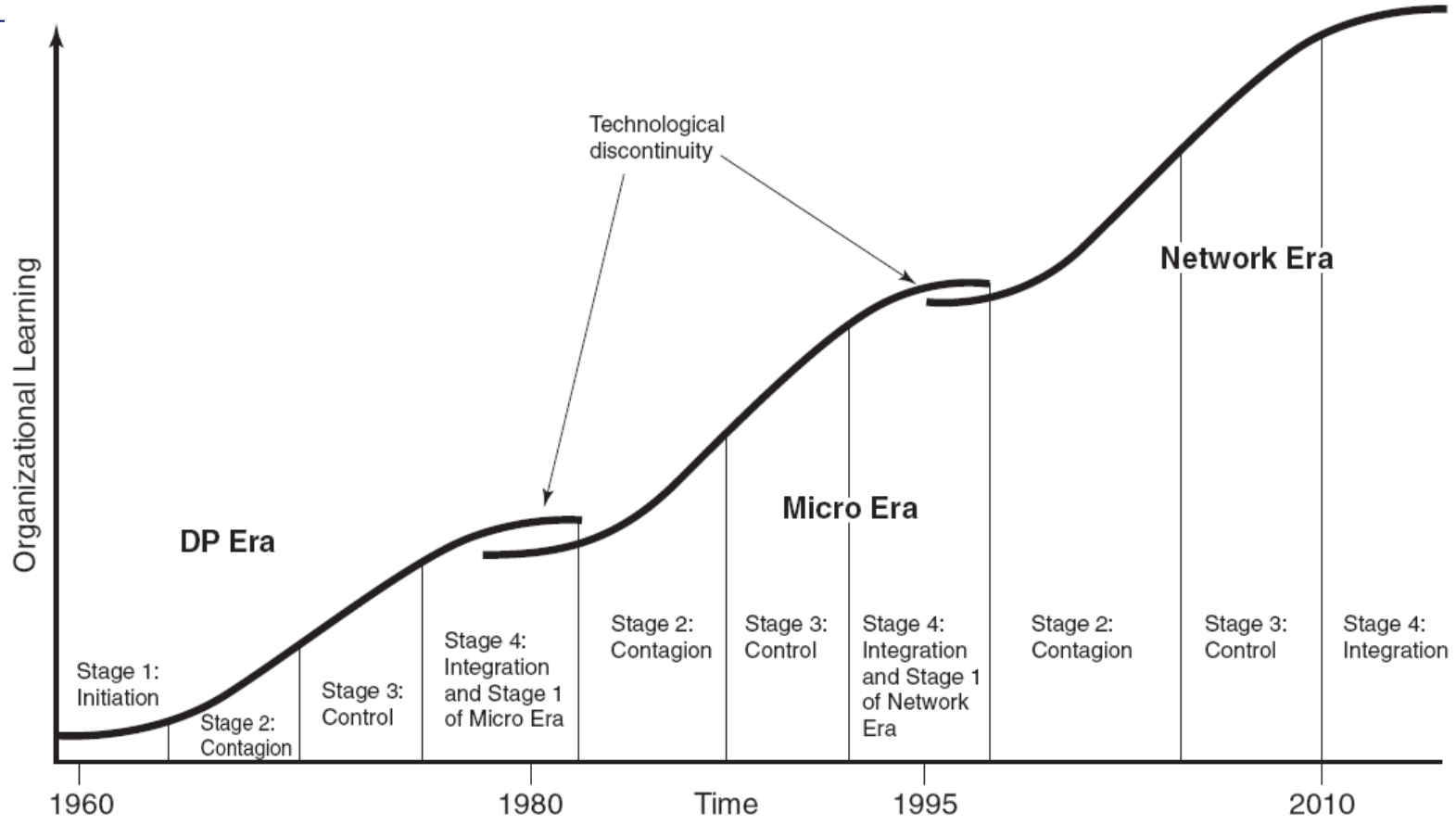
Eight Planning Techniques

- Useful to have a framework or methodology to help in the complexities of IS planning
- Eight different techniques have been proposed over the years
- These techniques are not mutually exclusive. Think of them as part of a 'planning toolkit'.

1. Stages of growth
2. Critical Success Factors
3. Porter's Competitive Forces Model
4. Downes' Three Emerging Forces Model
5. Value Chain Analysis
6. E-business Value Matrix
7. Linkage Analysis Planning
8. Scenario Planning

Stages of Growth

FIGURE 4-5 Stages of Growth



Source: Reprinted with permission from R. L. Nolan, "Information Technology Management from 1960–2000," in *A Nation Transformed by Information*, Alfred D. Chandler and James W. Cortad (eds.), Oxford, 2000.

1. Stages of Growth

- **Stage 1:** *Early successes* **(adoption)**
  - **Success in initial use of new technology leads to increased interest and experimentation**
- **Stage 2:** *Contagion*
  - **Proliferation of technology stage of "learning" for the field—what worked, what did not etc. (feedback)**
- **Stage 3:** *Control*
  - **Efforts toward standardization after proliferation**
- **Stage 4:** *Integration* **(mature phase)**
  - **Pattern is repeated for newer technologies**

2. Critical Success Factors

- What are the few key areas of the job where things must go right for the organization to thrive?
- What's going on right now in the organization that needs to be addressed or may pose a serious threat in the future?
- How can we align IT to ensure CSFs are met?
- Examples – University
  - Recruit top students
  - Recruit and retain top professors
  - Obtain funding for research
  - Build and maintain strong relationships with alumni

2. Critical Success Factors

- **Four sources for CSFs**
  - Industry business is in (specific)
  - Company itself and situation within industry
  - Environment (e.g. consumer trends)
  - Temporal organizational factors

3. Porter's Five Forces

- **Porter's Five Forces (to determine suitability of industry)**
  - Threat of new entrants
  - Bargaining power of customers
  - Bargaining power of suppliers
  - Substitutes
  - Competition (intensity)

3. Porter's Five Forces

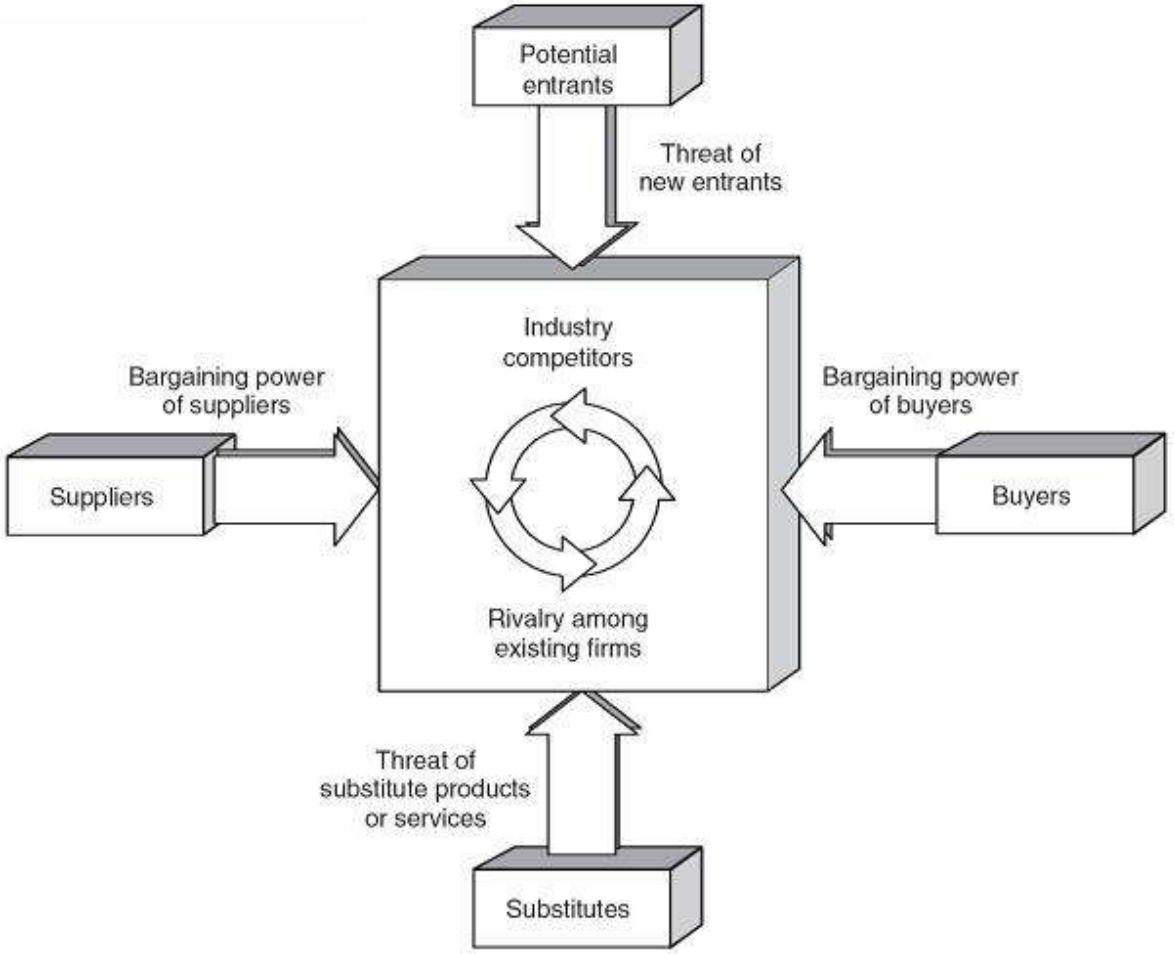


FIGURE 4-6 Michael Porter's Competitive Analysis Model

Source: Michael E. Porter, "The Five Competitive Forces That Shape Strategy," *Harvard Business Review*, January 2008.

3. Competitive Forces Model

- **Three strategies for dealing with these competitive forces**
  - **Product differentiation**
  - **Price leadership (lowest cost)**
  - **Niche market (could be geographical or segment)**

3. Competitive Forces Model - Framework Example

- Internet tends to reduce firms' profitability
- Five Forces analysis of the Internet (impact)
  - Increases buyer power (lower search costs)
  - Decreases barriers to entry
  - Increases bargaining power of suppliers
  - Increases the threat of substitute products
  - Intensifies rivalry among competitors (how?)
- Internet Strategy: Focus on maintaining profitability (not growth and market share)
- Discuss with regard to Amazon.com ("Get Big Fast")

4. Downes' Three Emerging Forces

- **Porter's Five Forces model is rooted in industrial organization, which reflects an era of rather predictable developments**
- **Three "new" forces:**
  - **Digitization (new business models)**
  - **Globalization (telecommunications, transportation)**
  - **Deregulation (many industries)**

5. Porter's Value Chain Analysis

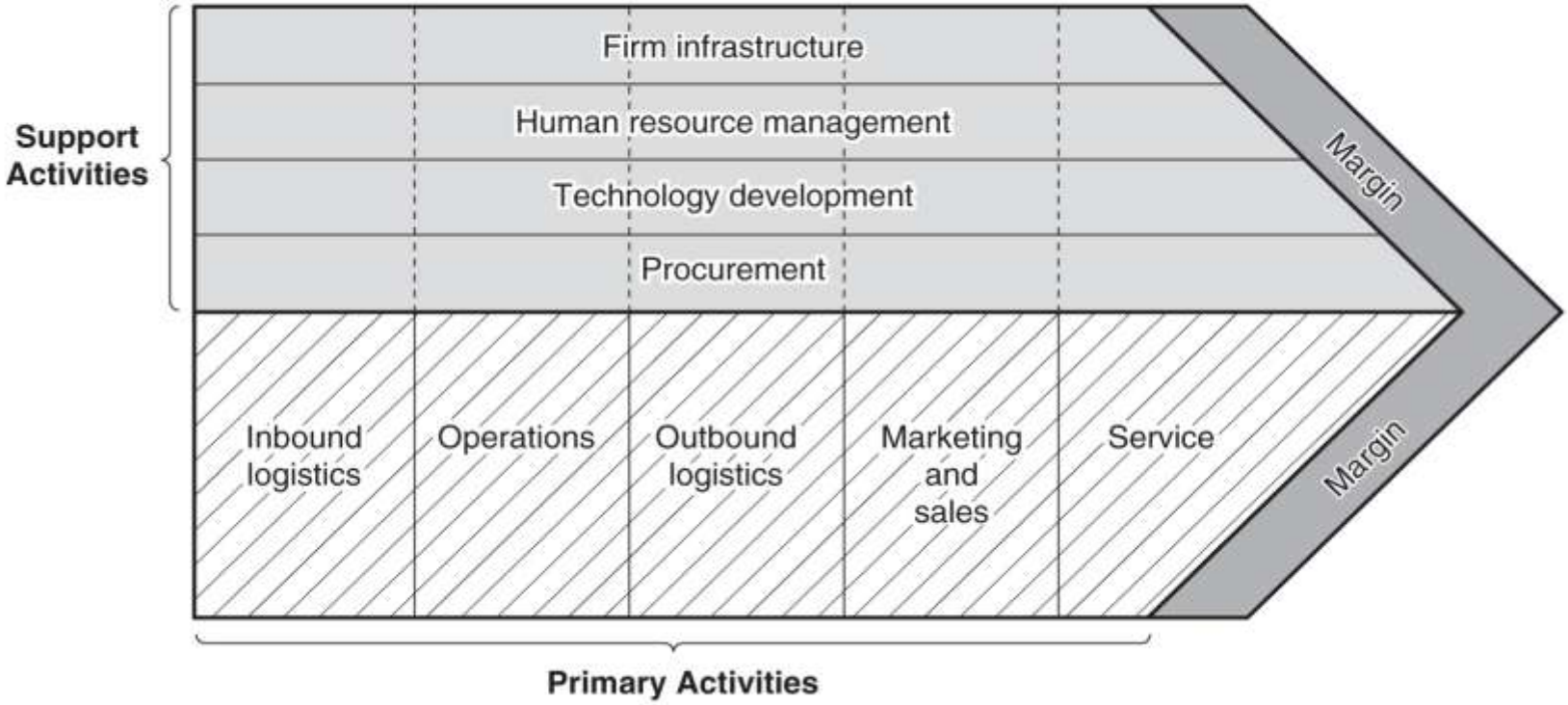
- **Five primary activities that form the sequence of the value chain:**
  1. **Inbound logistics**
  2. **Operations**
  3. **Outbound logistics**
  4. **Marketing and sales**
  5. **Service**

5. Porter's Value Chain Analysis cont'd

- **Four supporting activities that underlie the entire value chain:**
  1. **Organizational infrastructure**
  2. **Human resources management**
  3. **Technology development**
  4. **Procurement**

5. Porter's Value Chain Analysis cont'd

FIGURE 4-7 The Value Chain



Source: Michael E. Porter, *Competitive Advantage* (New York: The Free Press, 1985).

5. Porter's Virtual Value Chain Extended

- How can companies create value in the Internet marketplace (e-commerce)?
- Information as a source of value itself, rather than a support element. Five ways:
  - Gather
  - Organize
  - Select
  - Synthesize
  - Distribute

5. Porter's Virtual Value Chain Extended Example: An Automobile Manufacturer

Case Example: Virtual Value Chain

- Rental car subsidiary auction off good used cars to dealers online via satellite dish networks
- Dealers view cars and place bids during online auctions.
- Faster sales; time and effort saved
- Which way(s) was information used to create business value?

6. E-Business Value Matrix

- Tool used at Cisco Systems to develop a well-rounded portfolio of IT projects.
- Every IT project is placed into one of four categories to assess its business value:
  1. New fundamentals
  2. Operational excellence
  3. Rational experimentation
  4. Breakthrough strategy

6. E-Business Value Matrix

FIGURE 4-8 E-Business Value Matrix

	Criticality to Business	*Newness of Idea*
New fundamentals	Low	Low
Operational excellence	High	Low
Rational experimentation	Low	High
Breakthrough strategy	High	High

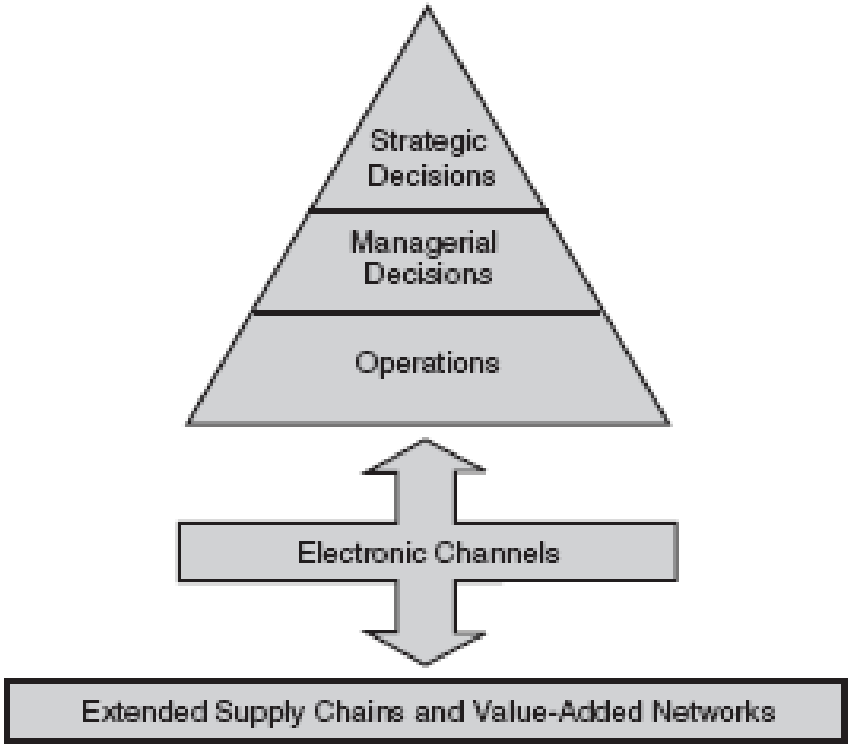
Source: Adapted from a speech by Peter Alexander and *Net Ready: Strategies for Success in the E-conomy* by Amir Hartman, John Sifonis, and John Kador (New York: McGraw-Hill, 2000).

7. Linkage Analysis Planning

- Examines the links between organizations in order to create a strategy for utilizing electronic channels
- Methodology involves three steps
  1. Define power relationships among stakeholders
  2. Map out the extended enterprise (suppliers, buyers, strategic partners)
  3. Plan electronic channels to deliver information component of products and services

7. Linkage Analysis Planning cont'd

FIGURE 4-9 The Extended Enterprise



Source: Adapted from K. I. Primozic, E. A. Primozic, and J. F. Leben, *Strategic Choices: Supremacy, Survival, or Sayonara* (New York: McGraw-Hill, 1991).

8. Scenario Planning

- Goal is to 1) explore the forces that could cause different “scenarios” of the future to happen; and 2) take proactive actions against those scenarios
- Departs from traditional long-range planning based on hindsight
- Four steps involved
  1. Define a decision problem and time frame to bound the analysis
  2. Identify the major known trends that will affect the decision problem
  3. Identify just a few driving uncertainties
  4. Construct the scenarios

Scenarios on the Future of IS Management

Case Example: Scenario Planning

- **Firewall Scenario**
  - Information security and control main concerns
  - IS staff become general contractors and enforcement agencies
- **Worknet Enterprise Scenario**
  - IT-enabled value networks
  - Self-managing virtual IS departments
  - IS staff as change agents of information brokers

Sustaining a Strategic Information System (SIS)

Strategic information systems **are designed to establish a profitable and sustainable position against the competitive forces in an industry. Due to advances in systems development it has become increasingly difficult to sustain an advantage for an extended period. Experience also indicates that information systems, by themselves, can rarely provide a sustainable competitive advantage. Therefore, the major problem that companies now face is how to sustain their competitive advantage.**

One popular approach is to use *inward systems* that are not visible to competitors. These proprietary systems allow the company to perform the activities on their value chain differently than their competitors.

Strategic Resources And Capabilities

TABLE 12.2 Key Resource Attributes That Create Competitive Advantage

Resource Attributes	Description
Value	The degree to which a resource can help a firm improve efficiency or effectiveness.
Rarity	The degree to which a resource is nonheterogeneously distributed across firms in an industry.
Appropriability	The degree to which a firm can make use of a resource without incurring an expense that exceeds the value of the resource.
Imitability	The degree to which a resource can be readily emulated.
Mobility	The degree to which a resource is easy to transport.
Substitutability	The degree to which another resource can be used in lieu of the original resource to achieve value.

Strategic Resources And Capabilities

TABLE 12.3 IS Resources and Capabilities

IS Resource/Capability	Description	Relationship to Resource Attributes
Technology resources	Includes infrastructure, proprietary technology, hardware, and software.	Not necessarily rare or valuable, but difficult to appropriate and imitate. Low mobility but a fair degree of substitutability.
IT skills	Includes technical knowledge, development knowledge, and operational skills.	Highly mobile, but less imitable or substitutable. Not necessarily rare but highly valuable.
Managerial IT resources	Includes vendor and outsourcer relationship skills, market responsiveness, IS-business partnerships, IS planning and management skills.	Somewhat more rare than the technology and IT skill resources. Also of higher value. High mobility given the short tenure of CIOs. Nonsubstitutable.

IT Planning – Critical

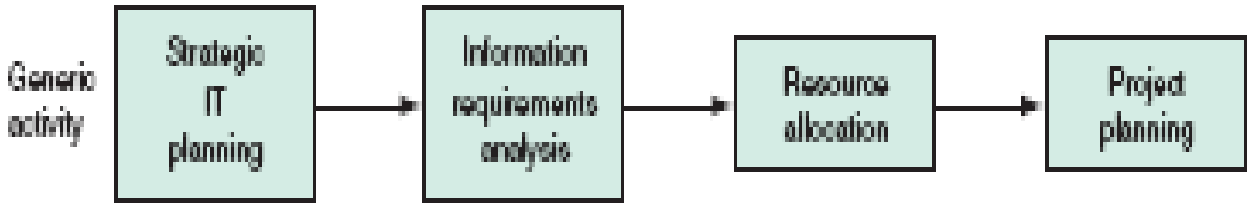


FIGURE 12.3 Basic four-stage model of IS planning.

IT Planning — A Critical Issue for Organizations

IT planning is the organized planning of the IT infrastructure and applications portfolios for all levels of the organization.
Corporate IT planning determines the IT infrastructure which in turn determines what applications end users can deploy. Aligning the goals of the organization and the ability of IT to contribute to those goals can deliver great gains in productivity to the organization.

- **IT PLANNING APPROACHES**
  - **Business-led approach:** The IT investment plan is defined on the basis of the current business strategy.
  - **Method-driven approach:** The IS needs are identified with the use of techniques and tools.
  - **Technological approach:** Analytical modeling and other tools are used to execute the IT plans.
  - **Administrative approach:** The IT plan is established by a steering committee.
  - **Organizational approach:** The IT investment plan is derived from a business-consensus view of all stakeholders in the organization

IT Planning — A Critical Issue for Organizations Continued

A four-stage model of IT planning that consists of four major activities.

- **Strategic IT planning:** Establishes the relationship between the overall organizational plan and the IT plan.
- **Information requirements analysis:** Identifies broad, organizational information requirements to establish a strategic information architecture that can be used to direct specific application development.
- **Resource allocation:** Allocates both IT application development resources and operational resources.
- **Project planning:** Develops a plan that outlines schedules and resource requirements for specific IS projects.

The four-stage planning model is the foundation for the development of a portfolio of applications that is highly aligned with the corporate goals and has the ability to create an advantage over competitors.

IT Planning — A Critical Issue for Organizations Continued

An applications portfolio is the mix of computer applications that the information system department has installed or is the process of developing on behalf of the company.

The applications portfolio categorizes existing, planned, and potential information systems based on their business contributions.

STRATEGIC	HIGH POTENTIAL
Applications that *are critical to* sustaining future business strategy	Applications that *may be important* in achieving future success
Applications on which the organization *currently depends* for success	Applications that are *valuable but not critical to* success
KEY OPERATIONAL	SUPPORT

Strategic Information Technology Planning - Stage 1

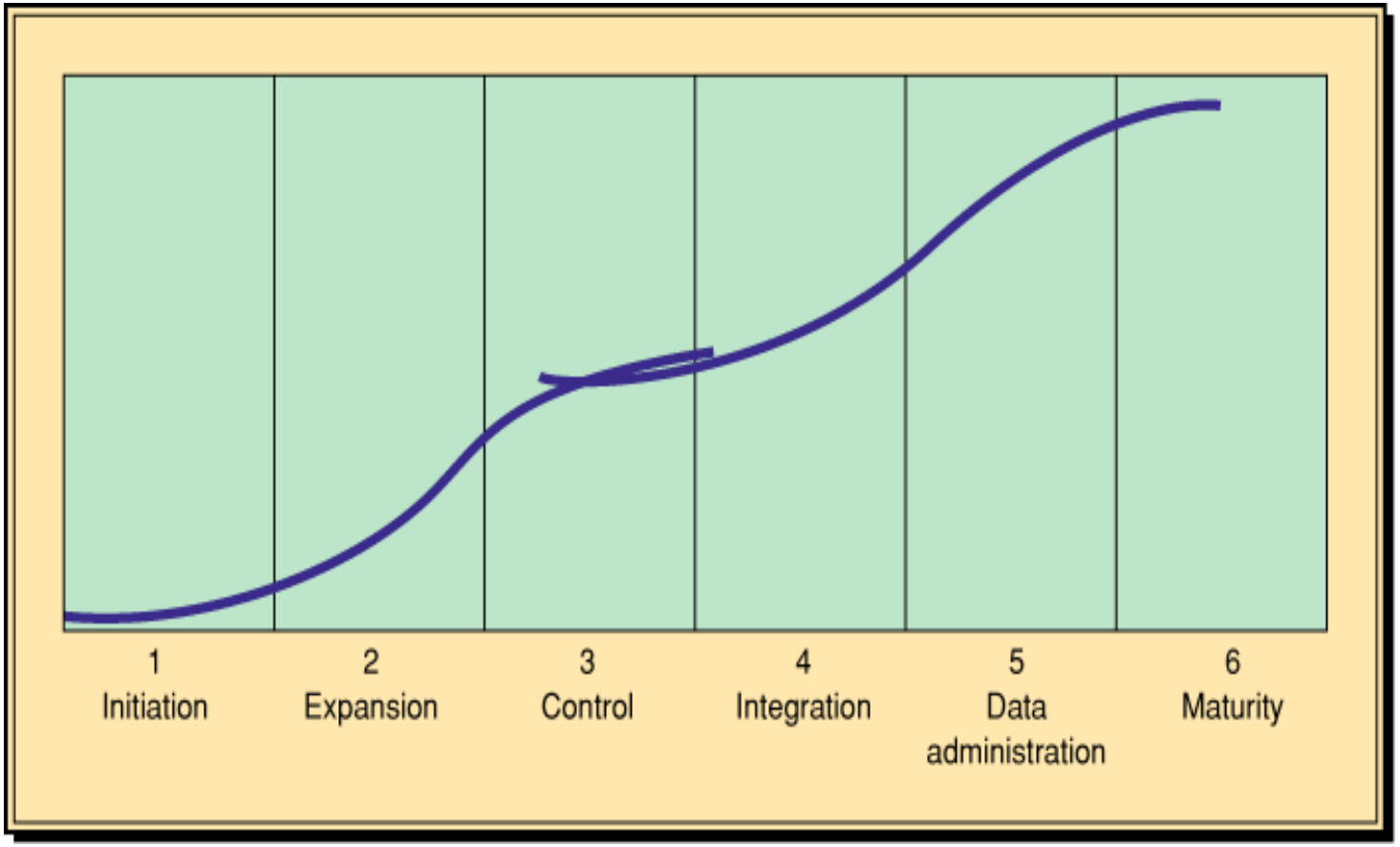
The first stage of the IT planning model identifies the *applications portfolio* through which an organization will conduct its business. This stage can also be expanded to include the process of searching for *strategic information systems (SIS)* that enable a firm to develop a competitive advantage. This involves assessing the current business environment and the future objectives and strategies.

- **IT Alignment with Organizational Plans: The primary task of IT planning is to identify information systems applications that fit the objectives and priorities established by the organization.**
- **Analyze the external environment *(industry, supply chain, competition)* and the internal environment *(competencies, value chain, organizational structure)* then relate them to technology (*alignment*).**
- **Alignment is a complex management activity whose complexity increases in accordance with the complexity of organization.**

Strategic Information Technology Planning – Methodologies

- **The business systems planning (BSP) model, developed by IBM deals with two main building blocks which become the basis of an information architecture.**
  - **Business processes**
  - **Data classes**
- **Stages Of It Growth Model, indicates that organizations go through six stages of IT growth**
  - **Initiation. When computers are initially introduced.**
  - **Expansion (Contagion). Centralized growth takes place as users demand more applications.**
  - **Control. In response to management concern about cost versus benefits, systems projects are expected to show a return.**
  - **Integration. Expenditures on integrating (via telecommunications and databases) existing systems**
  - **Data administration. Information requirements rather than processing drive the applications portfolio.**
  - **Maturity. The planning and development of IT are closely coordinated with business development**

Strategic Information Technology Planning – Methodologies Continued

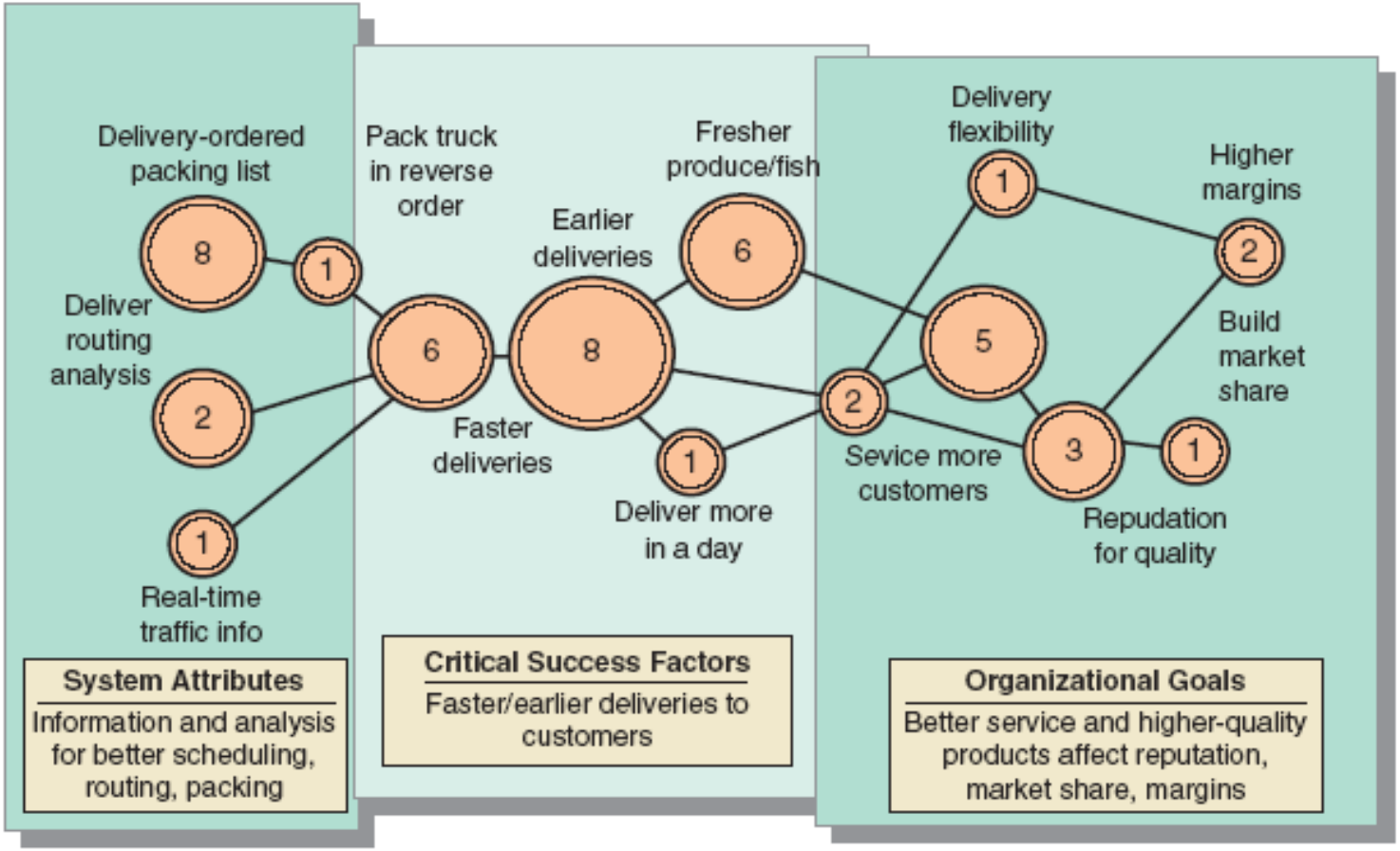


Strategic Information Technology Planning – Methodologies Continued

- **Critical success factors (CSFs)** are those few things that must go right in order to ensure the organization's survival and success. Critical success factors vary by industry categories—manufacturing, service, or government—and by specific industries within these categories. Sample questions asked in the CSF approach are:
  - What objectives are central to your organization?
  - What are the critical factors that are essential to meeting these objectives?
  - What decisions or actions are key to these critical factors?
  - What variables underlie these decisions, and how are they measured?
  - What information systems can supply these measures?
- **Scenario planning** is a methodology in which planners first create several scenarios, then a team compiles as many as possible future events that may influence the outcome of each scenario.

Strategic Information Technology Planning – Methodologies Continued

Critical success factors (CSFs)



Strategic Information Technology Planning - Stage 2

Information Requirements Analysis

The second stage of the model is the information requirements analysis, which is an analysis of the information needs of users and how that information relates to their work. The goal of this second stage is to ensure that the various information systems, databases, and networks can be integrated to support the requirements identified in stage 1.

- **Information requirements analysis in stage 2 is a more comprehensive level of analysis. It encompasses infrastructures such as the data needs (e.g., in a data warehouse or a data center), requirements for the intranet, extranet, and corporate partners are established.**
- **Identifies high payoffs IT projects which will produce the highest organizational payoff.**
- **Provides an architecture that leads to a cohesive, integrated systems that offers the most benefit**

Strategic Information Technology Planning - Stage 3 Resource Allocation

Resource allocation, the third stage of the IT planning model, consists of developing the hardware, software, data networks and communications, facilities, personnel, and financial plans needed to execute the master development plan as defined in the requirements analysis phase.

Allocation is a difficult and in many cases a political process.

- **Difficult since opportunities and requests for spending far exceed the available funds.**
- **Difficult since some projects and infrastructures are *necessary* in order for the organization to stay in business.**
- **Another major factor in resource allocation is employing *outsourcing strategy.***

Strategic Information Technology Planning -
Stage 4 Project Planning

The fourth and final stage of the model for IT planning is project planning. It provides an overall framework within which specific applications can be planned, scheduled, and controlled. Additional emphasis is placed on vendor management and control it the organization will outsources some of the requirements.

We have to understand what we are going to do
We need to know the start and end dates
We need to know the resources
We need to know the tasks

Various tools exist for planning and control:

- ***PERT & CPM***
- ***Gantt Charts***

IT Planning — Information Technology Architectures

Information technology architecture refers to the overall structure of all information systems in an organization.

- This structure consists of applications for various management levels
  - operational control
  - management planning and control
  - strategic planning
- Applications oriented to various functional-operational activities
  - Marketing
  - R&D
  - Production
  - Distribution
- It also includes infrastructure
  - Databases
  - Supporting software
  - Networks

IT Planning — Information Technology Architectures Continued

Different organizations have different IT infrastructure requirements. Two general factors that influence infrastructure levels are information intensity *(the extent to which products or processes incorporate information)* and strategic focus *(the level of emphasis on strategy and planning)*. Firms with higher levels of these two factors use more IT infrastructure services,

- *Industry*. Manufacturing firms use fewer IT infrastructure services than retail or financial firms.
- *Market volatility.* Firms that need to change products quickly use more IT infrastructure services.
- *Business unit synergy*. Firms that emphasize synergies (e.g., cross-selling) use more IT infrastructure services.
- *Strategy and planning*. Firms that integrate IT and organizational planning, and track or monitor the achievement of strategic goals, use more IT infrastructure services.

IT Planning — Information Technology Architectures Continued

Each organization has its own particular needs and preferences for information. Therefore, today's IT architecture is designed around *business processes* rather than traditional departmental hierarchy.

- **Architectural choices are:**
  - **Centralized computing: puts all processing and control authority within one computer to which all other computing devices respond.**
  - **Distributed computing: gives users direct control over their own computing by providing a decentralized environment**
  - **Blended computing: a blend of the two models**
- **End-user configurations (*workstations*):**
  - **Centralized computing with the PC functioning as "dumb terminals" or "not smart" thin PCs.**
  - **A single-user PC that is not connected to any other device.**
  - **A single-user PC that is connected to other PCs or systems, using a telecommunications connections.**
  - **Workgroup PCs connected to each other in a small *P2P network*.**
  - **Distributed computing with many PCs fully connected by LANs via wireline or Wi-FI.**

IT Planning — Planning Challenges

Information technology planning gets more complicated when several organizations are involved, as well as when we deal with multinational corporations.

- **Planning for Interorganizational Systems** (IOS) involving several organizations may be complex. Those involved with hundreds or even thousands of business partners is extremely difficult. IT planners in those cases should focus on groups of customers, suppliers, and partners
- **IT Planning for Multinational Corporations** face a complex legal, political, and social environment, which complicates corporate IT planning. Therefore, many multinational companies prefer to decentralize their IT planning and operations. Thus evolving into local systems.
- **Other Problems for IT Planning**
  - Cost, ROI justification
  - Time-consuming process
  - Obsolete methodologies
  - Lack of qualified personnel
  - Poor communication flow
  - Minimal top management support

Global Competition

Many companies are operating in a *global environment*. Doing business in this environment is becoming more challenging as the political environment improves and as telecommunications and the Internet open the door to a large number of buyers, sellers, and competitors worldwide. This increased competition is forcing companies to look for better ways to compete globally.

- **Global dimensions along which management can globalize**
  - **Product**
  - **Markets & Placement**
  - **Promotion**
- **Where value is added to the product**
- **Competitive strategy**
- **Use of non-home-country personnel - labor**

Multidomestic Strategy: **Zero standardization along the global dimensions.** ***Global Strategy:*** **Complete standardization along the seven global dimensions.**

IT Planning — Web-based Systems

Strategic planning for Web-based systems can be viewed as a subset of IT strategic planning. However, in many cases it is done independently of IT planning. E-planning mostly deals with the EC infrastructure uncovering business opportunities and deciding on an applications portfolio that will exploit those opportunities.

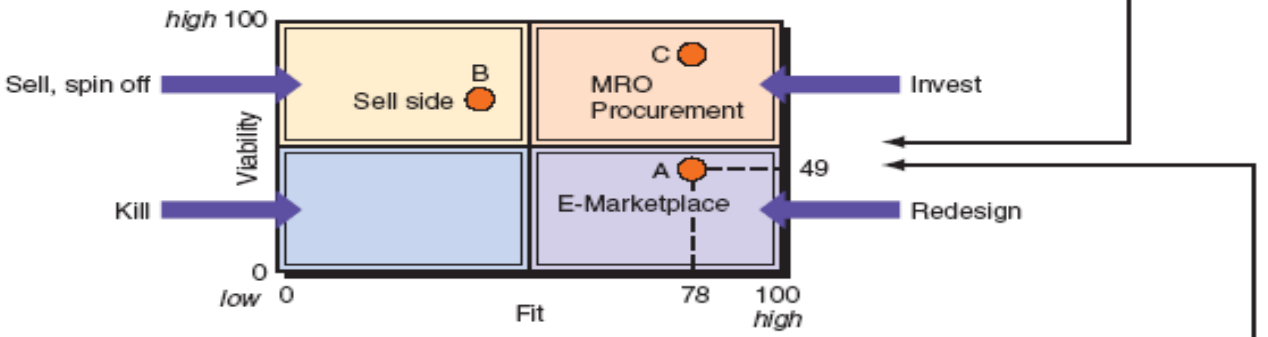
- E-planning is usually less formal
- E-planning must be more flexible
- In e-planning more attention is given to:
  - applications portfolio
  - risk analysis, the degree of risk in Web-based systems can be high
  - strategic planning issues such as the use of metrics (industry standards)
  - strategic planning must integrate, e-business and knowledge management
- The Web environment is very turbulent

IT Planning — Web-based Systems

Continued

EC Application	Market-Value Potential	Time to Positive Cash Flow	Personnel Requirement	Funding Requirement	Average
e-Marketplace	85	70	20	20	49
Sell-side	70	70	60	50	63
MRO Procurement	80	60	80	90	80

Viability Metric (on 1–100 scale)



EC Application	Alignment with Core Capabilities	Alignment with Other Company's Initiatives	Fit with Organizational Structure	Fit with Company's Culture and Values	Ease of Technical Implement-ation	Average, Overall Fit
e-Marketplace	90	60	90	70	80	78
Sell-side	10	30	30	40	60	35
MRO Procurement	90	60	90	80	80	84

Fit Metric (on 1–100 scale)