STRATEGIC
MANAGEMENT ISSUES
ROLE OF THE E&C INDUSTRY

• Through planning, design, construction, operation, and maintenance activities, the E&C Industry transforms resources of labor, capital (money, materials, & equipment), and knowledge into the physical facilities required to meet a broad range of social and economic needs.
A BASIC PREMISE

• In the economy of the future, the civil engineering profession is ideally positioned to take on an expanded role in the traditional engineering and construction industry; and to conceive and implement innovative business ideas in the future.
SCENARIO PLANNING

• Scenario: Description of plausible future business environment

• Scenario Planning: Testing of the Business Idea against multiple, equally plausible futures (scenarios)
SCENARIO PLANNING

Understanding the Environment (Scenarios)

Understanding the Organization (Business Idea)

Strategy Workshops

Strategic Insights & Options
THE BUSINESS IDEA

• An organization’s mental model of the forces behind its current and future success.

• Success = Establishing value
  – Create surplus for stakeholders
  – Create the expectation of being able to create a surplus and grow in the future
GENERIC BUSINESS IDEA

Understanding Evolving Needs in Society

Entrepreneurial Invention

Resources

Distinctive Competencies

Results

Competitive Advantage
ENTREPRENEURIAL INVENTION

• Discovering new ways of creating value for customers
• Bringing together a combination of competencies which creates this value
• Creating uniqueness in this formula in order to appropriate part of the value created
DISTINCTIVE COMPETENCIES

• Definition: Unique, hard to emulate individual organizational capabilities or combinations of these capabilities

• Categories:
  – Institutional knowledge
  – Embedded processes
  – Reputation & trust
  – Legal protection
  – Activity specific assets
COMPETITIVE
ADVANTAGE

• Differentiated product with premium price

• Low cost commodity product
DIFFERENTIATED PRODUCT

- A differentiated product which cannot be matched by the competition and for which the customer is prepared to pay a superior price
- Differentiation requires deep understanding of what creates value for customers
- Profit potential derives from the premium price
LOW COST PRODUCT

- A unique low-cost way of creating or making available a non-differentiated product (commodity)
- Commodity: Open market has created a standardized and clearly defined product for which there is a continuing market
- Profit potential derives from cost leadership
RESULTS (PROFITS)

• Purpose of Strategy Development
  – To feed expectations of future profits and growth

• Actual Profits
  – Earned by the quality and efficiency of day-to-day operations
GENERIC BUSINESS IDEA

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THE FUTURE BUSINESS ENVIRONMENT

• An Economy in Transition
• Changing Nature of Organizations
• Strategy Options
  – Business as Usual
  – The Master Builder Of the 21st Century
THREE WAVES OF ECONOMIC CHANGE

• Agricultural Wave
• Industrial Wave
• Information Wave
  – Information Age
  – Knowledge Economy
  – Digital Revolution
ECONOMIC PROSPERITY

• Dow at least 21,500 & likely higher
• Sources of economic strengths
  – ability to deliver customized products and services to consumers at increasingly affordable prices and convenience (direct producer-to-consumer)
  – success of Brand name products in the global market place
FEATURES OF THE INFORMATION AGE

• Rapid Technological Change
  – Just-In-Time Supply Systems
  – New Delivery Systems
  – B2B Electronic Market Place
  – Mobile Telephony
INFORMATION AGE

• Global Market
  – Operations, Shopping, Productivity Improvements

• Government Driven Changes
  – Deregulation/Privatization
  – Trading blocs
  – The Decline of Communism
  – China as an Economic Power
INFORMATION AGE

• Changed Face of Competition
  • Industrial Age characterized by planning, control, hierarchy, materials, processing methods, optimization, volume, scale, low cost
  • Processing of Knowledge vrs resources
  • Competitive Advantage characterized by: observation, positioning, flat organizations, missions, teams, cleverness, psychology, adaptation, speed, innovation, service, customization
CHANGING NATURE OF PRODUCTION

Producer Driven   Consumer Driven
- Top down command/control, functional skills focus
- Standardized products/services
- Assembly line methods
- Unskilled workers
- Automation of physical work

- Consumer needs back
- Customized, choice, personalized
- Network methods
- Skilled workers, knowledge workers
- Automation of routine thinking work
INFORMATION AGE

• Changed Patterns of Employment
  – 1970’s: 90% of work force worked for organizations; career-based jobs
  – 1990’s: downsizing, reengineering, etc.
  – 2000+: part-time work, self-employment, independent actors (jobbers, pieceworkers, consultants, facilitators, temps, etc.),
  • Responsible for career development and continuing education
  • Emphasis on contributions and results
INFORMATION AGE

• Knowledge is the Key Economic Resource
  – Embedded in systems and databases
  – Made widely available in an organization
  – Knowledge is being systematically accumulated, shared, and purposely deployed to build distinctive competencies
CHANGING NATURE OF ORGANIZATIONS

- Fast
- Responsive
- Customizing
- Entrepreneurial

- Slow
- Inflexible
- Standardizing
- Highly managed, planned, & coordinated
NETWORKS OF SMALL FIRMS

• The “dinosaur” corporation of the late twentieth century was just a transitional form. In looking back we are most aware that the tiny “mammals”-entertainment production companies, construction project teams, and consultant workgroups-which operated without much public notice back in the 1990’s, were in fact the prototypes of today’s modern organization.
Today (2010), nearly every task is performed by autonomous teams of 1-10 people, set up as independent contractors or small firms, linked by networks, coming together in temporary combinations for various projects, and dissolving once the work is done. When a project needs to be undertaken, requests for proposals are issued or jobs to done are advertised, candidate firms respond, subcontractors are selected, and workers are hired largely on an ad-hoc basis.
THE NETWORK ORGANIZATION

- Consists of leaders, guiding entrepreneurs, and self-managing teams in a chaotic real-time process that is organized around the ever changing needs of individual customers.
THE NETWORK ORGANIZATION

• They are fast, responsive, customizing, and entrepreneurial in contrast to assembly-line organizations which are slow, inflexible, standardizing, and highly planned, managed, and coordinated.
KEY FEATURES

• Leadership at the Center
• Front-Line Browser Teams Organized Around Customers
• Back-Line Servers Teams (Experts & Specialized Products)
• The Radical Elimination of Bureaucracy
• An Internal Free Marketplace
STRATEGY OPTIONS

• Business As Usual
• The Master Builder of the Future
BUSINESS AS USUAL

• Competitive advantage based on cost leadership
• Consolidators as sources of opportunity
  – Buyouts
  – Innovations in engineering and construction processes
  – Access to national and international accounts
BUSINESS AS USUAL (cont’d)

- Distinctive Competencies
  - Global outsourcing of engineering activities
  - Participation in B2B marketplaces to reduce supply chain, logistics, and inventory costs
  - Improved on-site materials and labor management processes
  - Increased use of off-site prefabrication methods
THE MASTER BUILDER OF THE 21st CENTURY

• Competitive advantage based on differentiated services at premium prices
• Outgrowth of design/build processes
• Horizontal integration to combine specialty construction tasks
• Vertical integration to include strategy planning, design, and operations & maintenance management
FACILITY PROJECT LIFE CYCLE*

MARKET DEMANDS OR PERCEIVED NEEDS → CONCEPTUAL PLANNING & FEASIBILITY STUDIES → DESIGN & ENGINEERING → PROCUREMENT & CONSTRUCTION → STARTUP FOR OCCUPANCY → OPERATION & MAINTENANCE → RENOVATION CONVERSION OR DEMOLITION

* Adapted from: “Project Management for Construction”; Chris Hendrickson & Tung Au Prentice Hall; 1989
MASTER BUILDER OF THE 21st CENTURY

• Distinctive Competencies:
  – Entrepreneurship/Technological Knowledge
  – Project management capabilities including schedule and cost control systems, and computer hardware/software for collaboration
  – Prime contracting capabilities
  – Maintenance management systems
  – Systems engineering capabilities
SYSTEMS ENGINEERING/ SYSTEMS INTEGRATION

• 1. Concept Development (the Front-End Process)
• 2. System-Level Design
• 3. Detail Design
• 4. Refinement & Value Engineering
• 5. Post Project Evaluation

– “Product Design and Development”; Ulrich & Eppinger; McGraw-Hill; 1995
FRONT END PROCESS

- Identify Client Needs
- Establish Target Specifications
- Generate Concepts
- Select a Concept
- Economic Analysis
- Project Planning