

# Cost Engineering Professional Development

# Sean T. Regan, Ph.D. FAACE, CCP, CEP, MRICS

- **Education:**
  - BS Construction Management -- Long Beach State
  - MS Management & Administration – Central Michigan University
  - Ph.D. Engineering Management – Columbus University
- **Employment:**
  - 2010 – Present - Visiting Professor USM School of Construction
  - 2010 – Present – LGM International, President
  - 2013 – Present – Jacobs Engineering, Business Manager
  - 2012 – 2013 – IHI E&C International, Technical Manager Project Controls
  - 2010 – 21012 - Kvaerner, Technical Manager Project Controls
  - 2007 – 2010 IMTC-MEI, Vice President International Operations
  - 2006 - 2007 ConocoPhillips Russia Caspian, Project Services Manager
  - 2006 Parsons Iraq, Project Controls Manager
  - 2005 - 2006: KBR PCO Oil Iraq, EVMS Manager
  - 2004 - 2005: Krump Construction, Project Manager
  - 2002 – 2004: KDG, Project Controls Manager
  - 1990 – 2002: Bechtel International, Project Controls Supervisor
  - 28 Years Experience in Project Controls and Management
- **Professional Certifications:**
  - Certified Cost Professional, Certified Estimating Professional – AACE
  - Chartered Surveyor MRICS – Royal Institute Charter Surveyors

**about me: been photographed in red dress running for orphanage charities in 9 countries!**

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# CHIEF EXECUTIVE

<p><b>Corporate</b></p> <ul style="list-style-type: none"> <li>• Mentoring</li> <li>• Volunteerism</li> </ul>	<p><b>EXECUTIVE MANAGEMENT</b></p> <ul style="list-style-type: none"> <li>• Business Unit Director</li> <li>• Program Manager</li> <li>• Project Director</li> </ul>		<p><b>SPECIALIZATION</b></p> <ul style="list-style-type: none"> <li>• Project Controls/PM</li> <li>• Estimating/Risk/Claims</li> <li>• Planning/Scheduling/VE</li> <li>• Contracts/Procurement</li> </ul>		<p><b>AACE</b></p> <ul style="list-style-type: none"> <li>• Service</li> <li>• Volunteerism</li> </ul>
<p><b>Corporate Board Membership</b></p>					<p><b>AACE Board Membership</b></p>
<p><b>Professional Association Committees</b></p>	<p><b>PROJECT CONTROLS MANAGER</b></p>	<p><b>SCHEDULING MANAGER</b></p>	<p><b>ESTIMATING MANAGER</b></p>	<p><b>PROJECT DIRECTOR</b></p>	<p><b>AACE Committee Membership</b></p>
<p><b>Professional Registration</b></p>	<p><b>SR. COST ENGINEER</b></p>	<p><b>SR. PLANNER-SCHEDULER</b></p>	<p><b>CHIEF ESTIMATOR</b></p>	<p><b>CONST MANAGER</b></p>	<p><b>AACE Certification</b></p>
<p><b>MS/MBA</b></p>	<p><b>COST ENGINEER</b></p>	<p><b>SCHEDULER</b></p>	<p><b>ESTIMATOR</b></p>	<p><b>RESIDENT MANAGER</b></p>	<p><b>AACE S &amp; K Courses</b></p>
<p><b>ENGINEER IN TRAINING (EIT)</b></p>	<p><b>ASSOC. COST ENGINEER</b></p>	<p><b>ASSOC. SCHEDULER</b></p>	<p><b>ASSOC. ESTIMATOR</b></p>	<p><b>FIELD ENGINEER</b></p>	<p><b>AACE DISTANCE LEARNING</b></p>
<p><b>Professional Organizations (Student Membership)</b></p>	<p><b>Bachelor of Science (BS)</b> <b>(Business, Engineering, Construction Technology)</b></p>				<p><b>AACE STUDENT SECTIONS</b></p>

## Career-Path Flow Chart:

Specialization vs. Management Options

Registration vs. Certification Options

# Introduction to Cost Engineering

- **The AACE International Constitution and Bylaws defines cost engineering and total cost management as follows:**

**Section 2.** The Association is dedicated to the tenets of furthering the concepts of total cost management and cost engineering. Total cost management is the effective application of professional and technical expertise to plan and control resources, costs, profitability and risk. Simply stated, it is a systematic approach to managing cost throughout the life cycle of any enterprise, program, facility, project, product, or service. This is accomplished through the application of cost engineering and cost management principles, proven methodologies, and the latest technology in support of the management process.

**Section 3.** Total cost management is that area of engineering practice where engineering judgment and experience are used in the application of scientific principles and techniques to problems of business and program planning; cost estimating; economic and financial analysis; cost engineering; program and project management; planning and scheduling; cost and schedule performance measurement, and change control.

# Roles and Responsibilities

- **Planning and Scheduling**
  - Associate Scheduler up to 3 years Experience
  - Scheduler 3 to 6 Years Experience
  - Planner 5 to 10 Years Experience
- **Cost Engineer**
  - Associate Cost Engineer up to 3 years Experience
  - Planner 5 to 10 Years Experience

# Roles and Responsibilities - Continued

- **Estimating**
  - Associate Estimator up to 3 years Experience
  - Estimator 3 to 6 Years Experience
  - Chief Estimator 10+ Years Experience
- **Other**
  - Risk Manager 5+ years Experience
  - Quantity Surveyor 5 to 10 Years Experience

# Cost Engineering in Project Management

- Cost engineering practitioners tend to be: specialized in function (e.g., cost estimating, planning and scheduling, etc.);
  - focused on either the asset management or project control side of the TCM process; and
  - focused on a particular industry (e.g., engineering and construction, manufacturing, information technology, etc.); or asset type (e.g., chemical process, buildings, software, etc.).
- They may have titles such as cost estimator, quantity surveyor, parametric analyst, strategic planner, planner/scheduler, value engineer, cost/schedule engineer, claims consultant, project manager, or project control lead.

# Certified Cost Professional (CCP™)

The intent is to recognize specialists who meet a demanding set of cost and management criteria by a rigorous examination, experience, education and ethical qualifications.

- 8 Years of Experience in which 4 may be from University
- Register Online and pay Certification fees:
  - US\$500 for AACE Members
  - US\$625 for Non-Members
  - Register Online and pay Certification fees:
- Submit 2,500 Word Technical Paper
- Pass Examination with 70% CBT – 5 Hours

# Certified Estimating Professional (CEP™)

AACE International's Certified Estimating Professional (CEP) certification program is designed to establish credentials for those individuals working in the estimating field. This certification program will give professionals a means to validate their skills and knowledge.

- 8 Years of Experience in which 4 may be from University
- Register Online and pay Certification fees:
  - US\$500 for AACE Members
  - US\$625 for Non-Members
  - Register Online and pay Certification fees:
- Pass Examination with 70% CBT – 5 Hours
- Pass Written CBT Memo, minimum 300 words

# Planning and Scheduling Professional (PSP™)

The intent is to recognize specialists who meet a demanding set of planning and scheduling criteria by a rigorous examination, experience, education and ethical qualifications.

- 8 Years of Experience in which 4 may be from University
- Register Online and pay Certification fees:
  - US\$500 for AACE Members
  - US\$625 for Non-Members
  - Register Online and pay Certification fees:
- Pass Examination with 70% CBT – 5 Hours
- Pass Written CBT Memo, minimum 300 words

# Decision Risk Management Professional (DRMP™)

**Decision and Risk Management Professional (DRMP)** certification program is designed to establish credentials that recognize professional expertise, skills and knowledge in the decision and risk management area of practice within cost engineering. If you desire to be recognized for your strong skills and knowledge in decision and risk management as it relates to their broad business and technical perspectives and senior-level experience in life cycle asset and project management

- 8 Years of Experience in which 4 may be from University
- Register Online and pay Certification fees:
  - US\$500 for AACE Members
  - US\$625 for Non-Members
  - Register Online and pay Certification fees:
- Pass Examination with 70% CBT – 5 Hours
- Pass Written CBT Memo, minimum 300 words

# Earned Value Professional (EVP™)

- The intent is to recognize specialists who meet a demanding set of earned value management criteria by a rigorous examination, experience, education and ethical qualifications. The EVP requirements reflect the sophistication of individuals in today's earned value industry and it fairly measures their knowledge, experience and adherence to best management practices. The Competency Model used to develop the EVP was based on the current version of American National Standards Institute/Electronic Industries Alliance Standard 748, Earned Value Management Systems (ANSI/EIA-748-current version).
- 8 Years of Experience in which 4 may be from University
- Register Online and pay Certification fees:
  - US\$500 for AACE Members
  - US\$625 for Non-Members
  - Register Online and pay Certification fees:
- Pass Examination with 70% CBT – 5 Hours
- Pass Written CBT Memo, minimum 300 words

# Certified Forensic Claims Consultant (CFCC™)

- Certified Forensic Claims Consultant (CFCC) certification program is designed to establish credentials to recognize your professional expertise. This certification program gives professionals a means to validate skills and knowledge in the claims and dispute resolution arena, based upon United States law. CFCC certification will distinguish you as a Certified Forensic Claims Consultant who has the knowledge and skills that impact the bottom line.
- 4 Years of University Experience
- 8 Years of Verifiable Experience in Claims
- 4 Letters of Reference from Industry Professionals
- Written Report or Professional Paper: Electronic submission of an expert report submitted as evidence, a formal claim submittal, or a professional paper accepted for publication, for which authorship by the prospective candidate is verifiable, any of which must have been written within the 24 months prior to applying to sit for the examination.
- Register Online and pay Certification fees:
  - US\$500 for AACE Members
  - US\$625 for Non-Members
- Register Online and pay Certification fees:
- Pass Examination with 70% CBT – 5 Hours
- Pass Essay Assignment, within box provided on screen

# Certified Cost Technician (CCT™)

The Certified Cost Technician program was established to give less experienced professionals the opportunity to advance their cost engineering skills and professional development, and be distinguished as an Certified Cost Technician prior to obtaining the prerequisite 8 years of relevant experience necessary to become certified as a Certified Cost Professional (CCP).

- 4 Years of Experience
- Register Online and pay Certification fees:
  - US\$250 for AACE Members
  - US\$375 for Non-Members
  - Register Online and pay Certification fees:
- Pass Examination with 70% CBT – 5 Hours

# Certified Schedule Technician (CST™)

The Certified Schedule Technician program was established to give less experienced professionals the opportunity to advance their planning and scheduling skills and develop, and be distinguished as an Certified Cost Technician prior to obtaining the prerequisite 8 years of relevant experience necessary to become certified as a Certified Cost Professional (CCP).

- 4 Years of Experience
- Register Online and pay Certification fees:
  - US\$250 for AACE Members
  - US\$375 for Non-Members
  - Register Online and pay Certification fees:
- Pass Examination with 70% CBT – 5 Hours

# Recommended Training Course Structure

- Month 1 to 2
  - Skills and Knowledge Introduction - 2 Days
    - Planning and Scheduling
    - Change Management
    - Earned Value Management
    - Estimating
- Month 6 to 7
  - Skills and Knowledge Advanced - 2 Days
    - Engineering Economics
    - Variance Analysis
    - Probability and Statistics
    - Decision and Risk Management
    - Optimization

# Recommended Certification Structure

- 1 Year
  - Planning and Scheduling Certification - 2 Days
    - Planning and Scheduling
    - Float
    - Earned Value Management
    - Analysis
- 1 Year
  - Certified Estimating Professional- 2 Days
    - Estimate Classification
    - Estimating Processes and Practices
    - Estimating Terminology

# Recommended Certification Structure

- 2 Years
  - Earned Value Professional- 2 Days
    - Organization
    - Planning, Scheduling and Budgeting
    - Accounting
    - Analysis and Management Reports
    - Revisions and Data Management
- 3 Years
  - Decision Risk Management Professional- 2 Days
    - Supporting Skills and Knowledge
    - Risk Management Skills and Knowledge
    - Decision Making Skills and Knowledge
    - Other functional Skills and Knowledge

# Recommended Certification Structure

- 4 Years
  - Certified Cost Professional- 4 Days
    - Introduction of Certification
    - Required Skills and Knowledge
    - Elements of Cost and Costing Versus Pricing
    - Capital Cost Estimating
    - Project Management Productivity
    - Preplanning
    - Planning and Scheduling
    - Engineering Economics
    - Comparing Economics
    - Depreciation
    - Equipment Purchase/Leasing
    - Probability and Statistics
    - Optimization
    - Cost Management

# Key Associations

- Association Advancement Cost Engineering International (AACE) [www.aacei.org](http://www.aacei.org)
- International Cost Engineering Council (ICEC) [www.icoste.org](http://www.icoste.org)
- The Association of Cost Engineers (ACostE) [www.acoste.org](http://www.acoste.org)
- Dutch Association of Cost Engineers (DACE) [www.dace.nl](http://www.dace.nl)

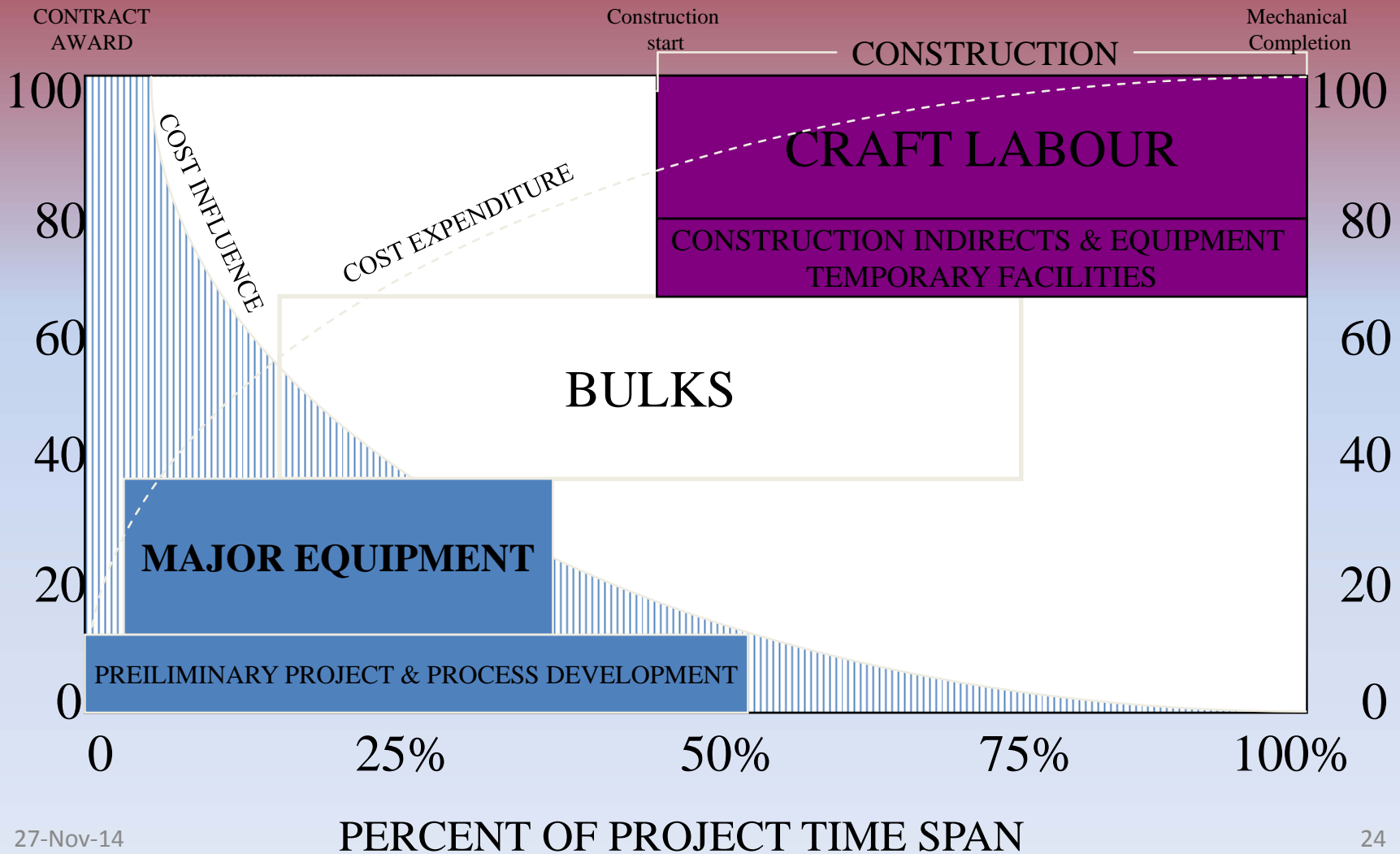
# Key Software

- Oracle P6 – Planning and Scheduling
- MC2 - Estimating
- Prolog – Cost, Change Management and Performance
- Hummingbird and Prolog – Document Control
- Risk Analyzer – Risk Management
- Acumen – Decision and Risk Management

# Software Training Development

- Oracle P6 – Planning and Scheduling – 1 week
- MC2 – Estimating – 4 Days
- Prolog – Cost, Change Management and Performance – 4 Days
- Hummingbird and Prolog – Document Control – 4 Days
- Risk Analyzer – Risk Management – 2 Days
- Acumen – Decision and Risk Management – 4 Days

# Influence on Cost - Curve





# Project Portfolio Management

- **What is the Portfolio Management?**

*The act or practice of making investment decisions in order to make the largest possible return.*

- **What is the Project Portfolio Management?**

*Project Portfolio Management (PPM) is a term used by project managers and project management (PM) organizations to describe methods for analyzing and collectively managing a group of current or proposed projects based on numerous key characteristics*

# Project Portfolio Management

- **The fundamental objective of the PPM process is to determine the optimal mix and sequencing of proposed projects to best achieve the organization's overall goals**
- Basic inputs are:
  - **hard economic measures**
  - **business strategy goals**
  - **constraints** - imposed by management or external real-world factors.
- The key challenge to implementing an effective PPM process is typically securing the mandate to do so.

# Project Portfolio Management



Prioritization is about selecting the **best investments** from many, the ones that will **deliver the most value** and the ones that will **differentiate** us from the rest.

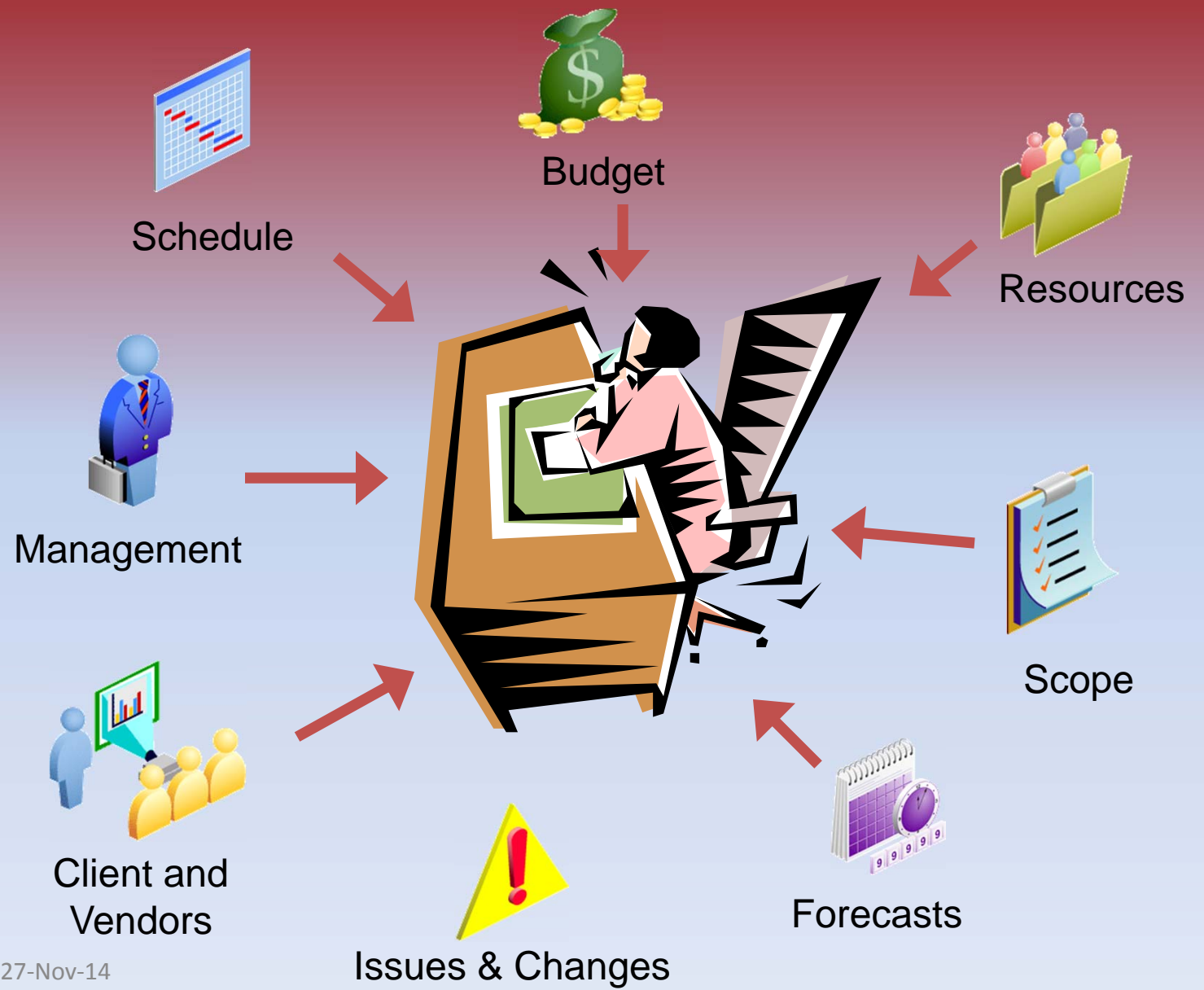
## WHY?

Because we have limited resources mainly the development area (Vendors) and internally as well.

# Project Portfolio Management

①	<b>Alignment with strategies</b>
②	<b>Non - financials criteria</b>
③	<b>Financial criteria</b>
④	<b>Alignment with the CAPEX budget</b>
⑤	<b>Mandatory project requirements</b>
⑥	<b>Risks</b> (PIR history, Complexity, Black scenario, Scope stability)
⑦	<b>Gates passed</b>

# A Project Manager's World



# Business Management Roles and Responsibilities

## Business Manager

- Develops Operating Plans / forecasts for General Manager
- Develop and monitor Overhead for General Manager
- Co-Ordinate and review reporting requirements of Management Information group
- Analysis of items affecting Profitability
- First line of contact for Projects and responsible for effective input of Project Controls on Projects
- Works with Business Development people

## Project Business Manager

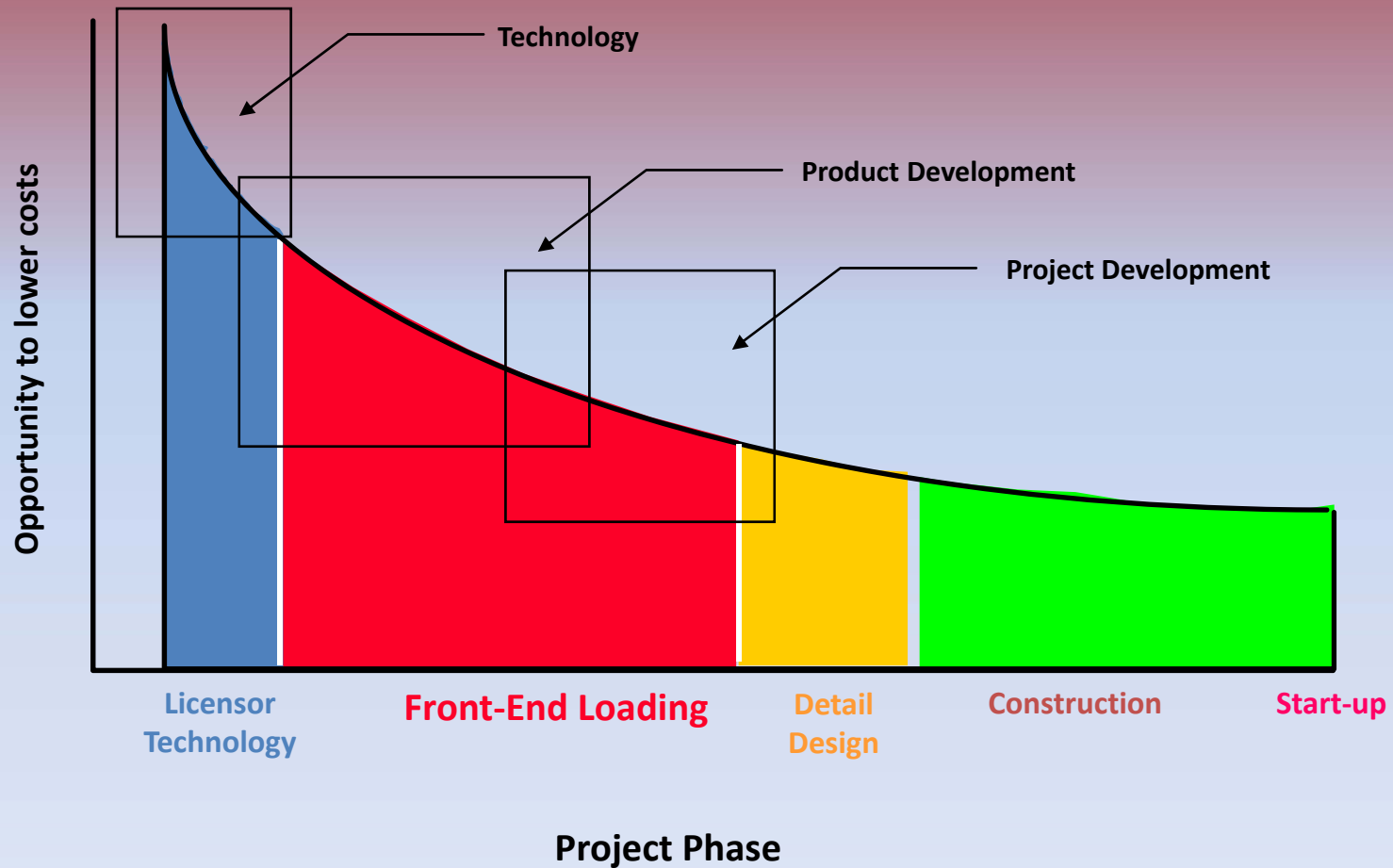
- Responsible for establishing Commercial awareness on the Project via:
  - Cost Engineering
  - Planning and Scheduling
  - Incentives and penalties
  - Prime Contract administration
- Commercial Operational responsibility

# How to Introduce Existing Organization

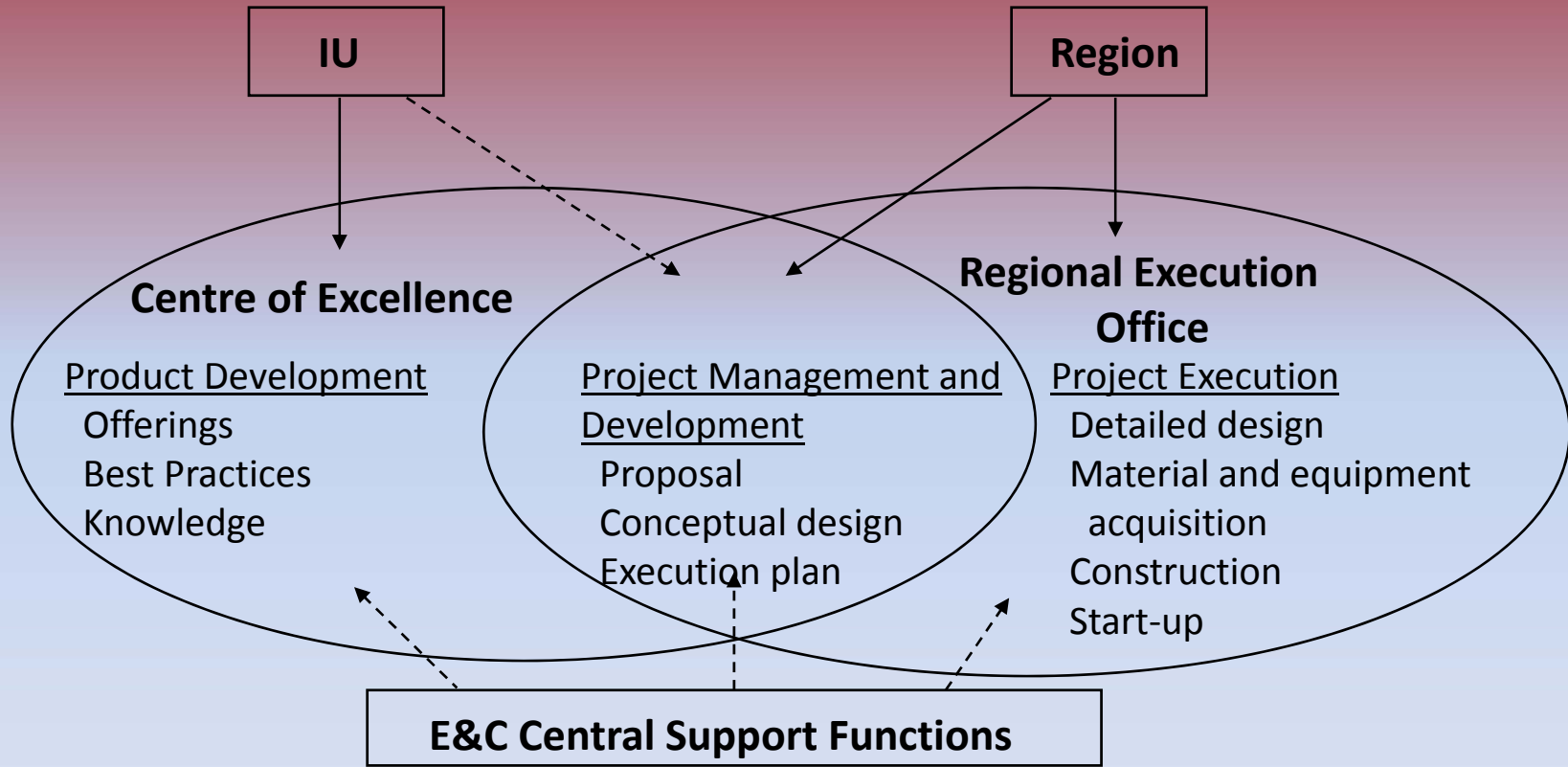
- Audit of existing Positions
- Roles and Responsibilities
- Establish Work Breakdown Structure
- Establish Organizational Breakdown Structure
- Cost and Schedule Breakdown and Coding
- Training
- Procedures
- Implementation Schedule

**MOST IMPORTANT MANAGEMENT OWNERSHIP  
AND AGREEMENT TO THE TEAM.**

# Front End Loading (FEL) Curve

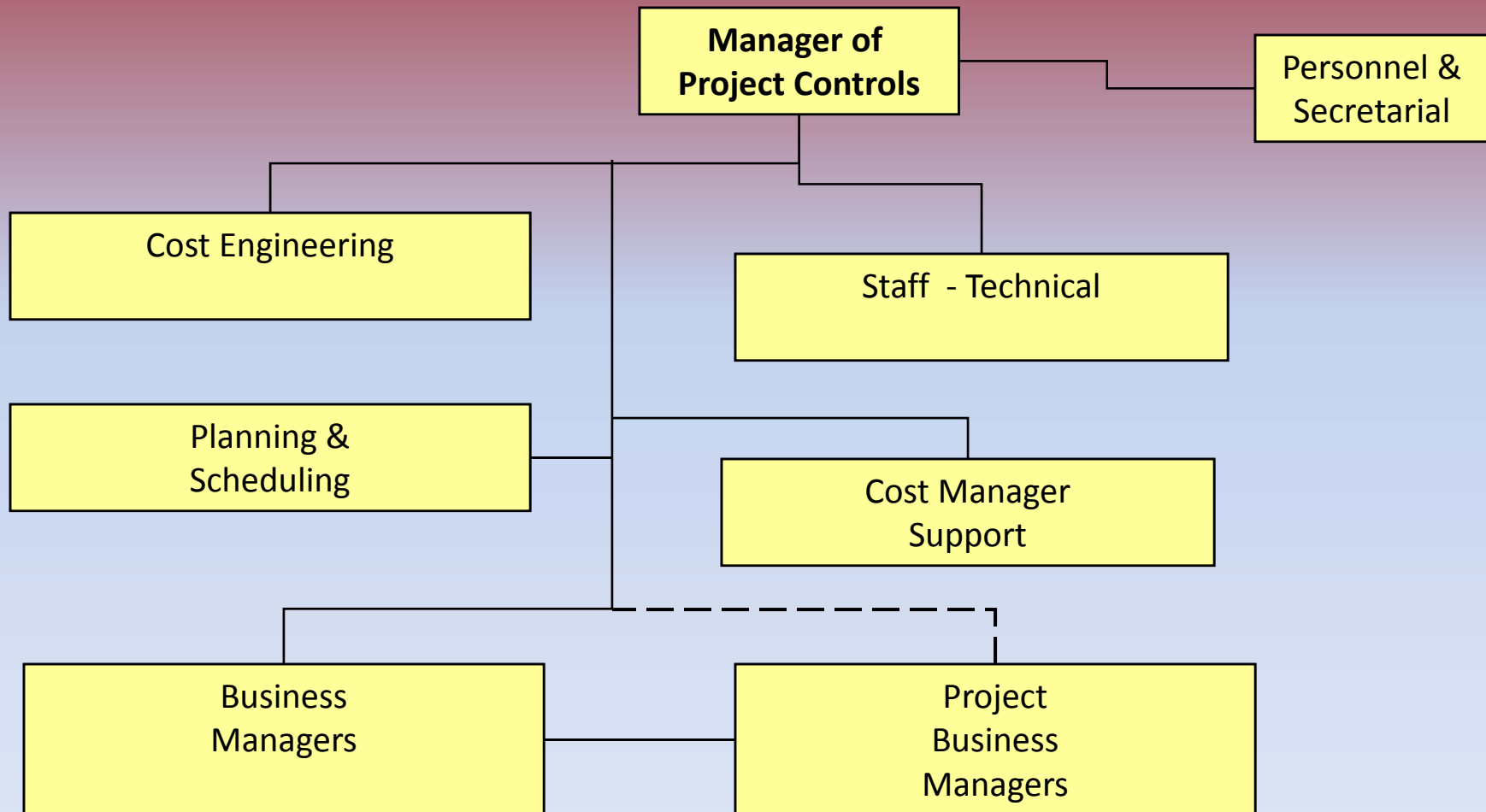


# Division of Responsibility



Tools / Methods / Procedures / Practices / Project Controls  
 Materials Supply Sources  
 Advanced Tools / EPC-PI  
 Manage Shared Support Services  
 World Class EPC Skills

# Project Controls Department



# Implementing a Ethics Programme

- Building Trust
- Good Business



# Implementing Ethics

- Standards of Conduct
- Business Ethics Handbook
- Reporting Systems
- Begin the process yourself
- Recognise that Bad news gets worse with time
- Inform Management of deviations to policy
- Our reputation is in reality a direct result of your conduct