



# Προκλήσεις και Προοπτικές της σύγχρονης επιστήμης του Construction Project Management



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## The presentation storyline...

- **CONSTRUCTION INDUSTRY** *(characteristics that define the market)*
- **CURRENT TRENDS IN CREATING A CPM ORGANIZATIONAL FRAMEWORK ALIGNED WITH FORMALIZED PM METHODOLOGIES**
- **Following a holistic approach – a brief narrative on :**
  - **SYSTEM DYNAMICS IN CONSTRUCTION MANAGEMENT**
  - **NAVIGATING COMPLEXITY IN CONSTRUCTION PROJECTS**
  - **POST GRADUATE CONSTRUCTION MANAGEMENT COURSES – THE VALUE OF COMBINED PROFESSIONAL CERTIFICATIONS**

\* CPM: Construction Project Management

## What are still the Principal Problems of the Construction Industry?

### Continued Inefficiency, Conflict and Waste\* !

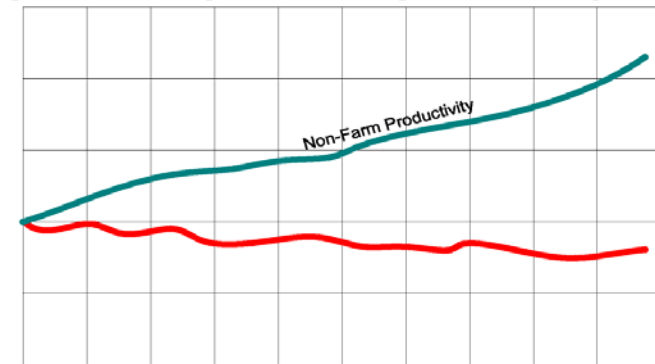
It's a \$ 9 trillion industry, heading towards  
\$ 12 trillion by 2020

\* Waste: Non-utilized resource expenditure

### Construction Industry Characteristics:

- It reacts rapidly to external economic pressures, tight money or national recession.
- No prototypes - very expensive optimization since it has to be performed during the execution of the actual construct.
- Remote site with changing conditions.
- Widely Fragmented - Wide range of activities, methods and manufacture.
- Highly Complex, characterized by ambiguity, emergent issues and risks
- Lack of business and project management ability – Poor management represents 90% of failures
- Lack of capital reserves - Poor cost estimating - Inadequate cost accounting

## Construction Productivity



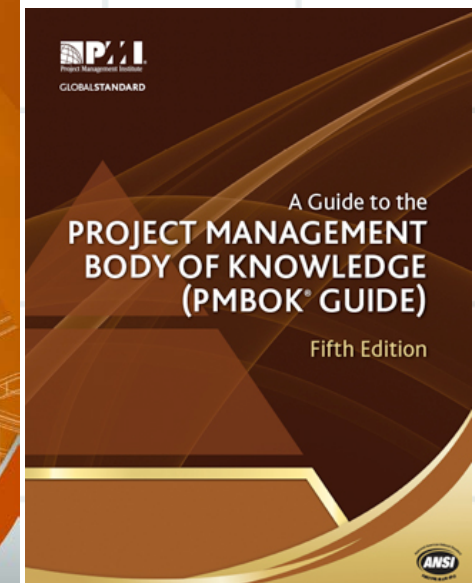
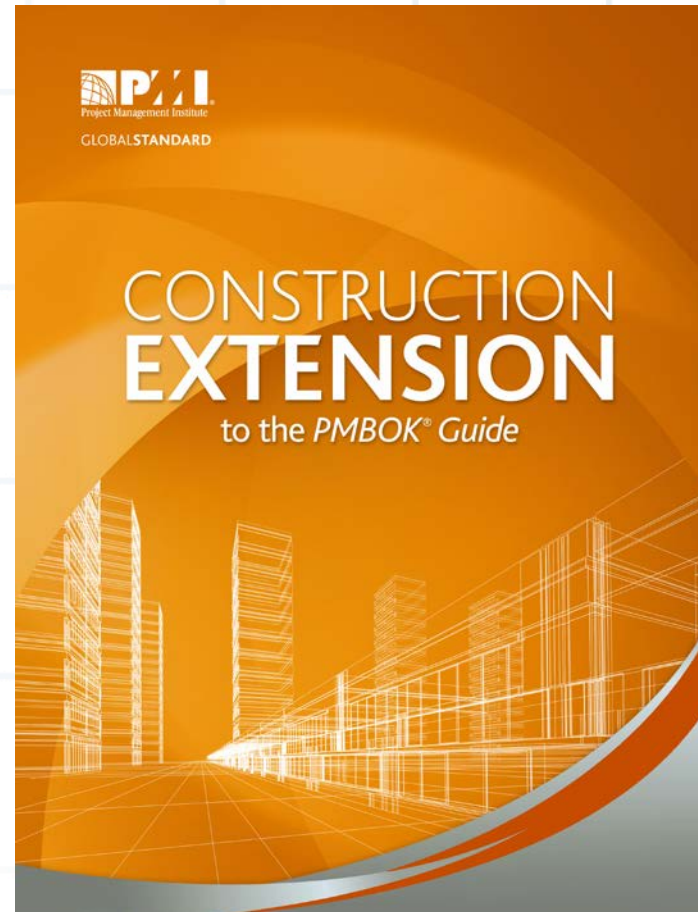
1990 – 2010: 1990=100

Construction at 2010 around 85% versus a mean value of 215%

# Construction Extension to the Project Management Body of Knowledge (PMBOK®)

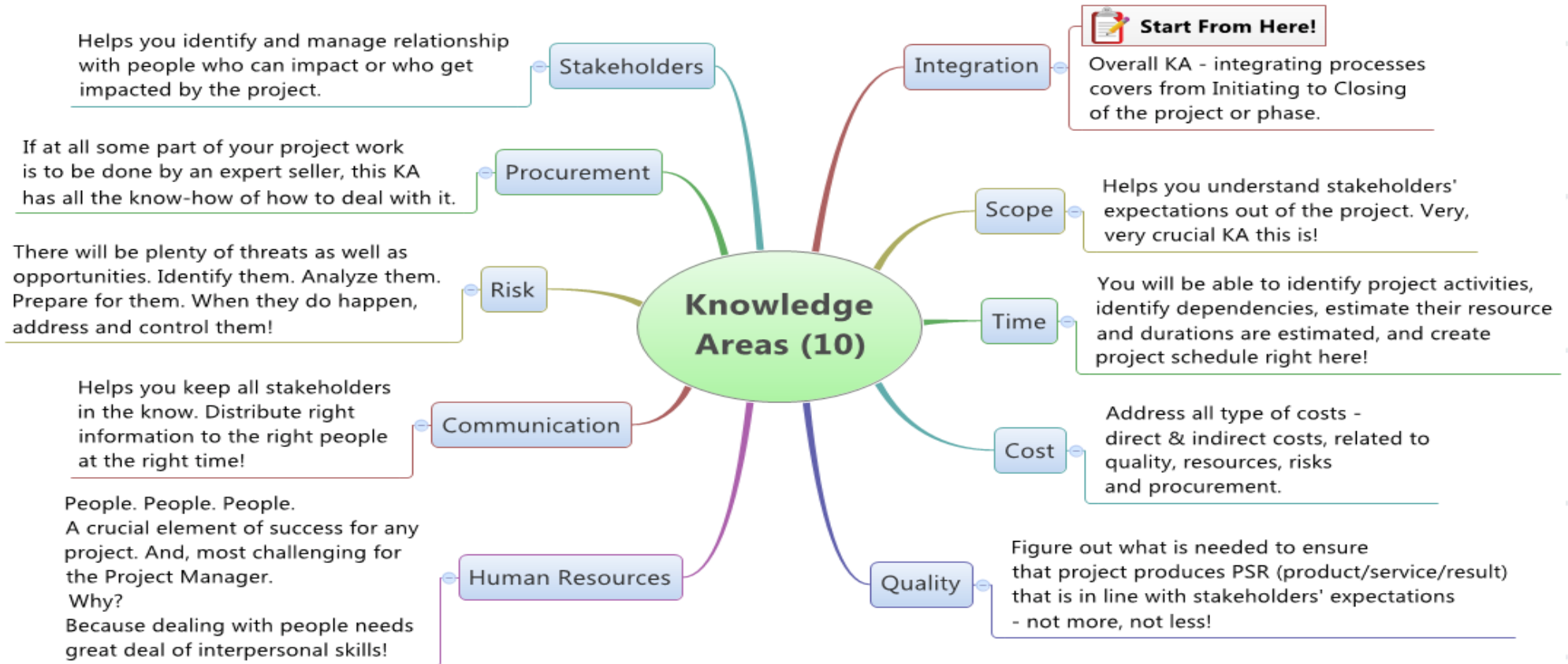
The current Construction Extension was published during the end of 2016.

It is a completely new Standard covering construction specific principles and proven practices for all Project Management knowledge areas. Furthermore, it strives to provide practical guidance to construction specific knowledge areas such as contract administration, project finance, claims management, lean construction, Partnering, Integrated Project Delivery, BIM, etc.



# Project Management Body of Knowledge (PMBOK®)

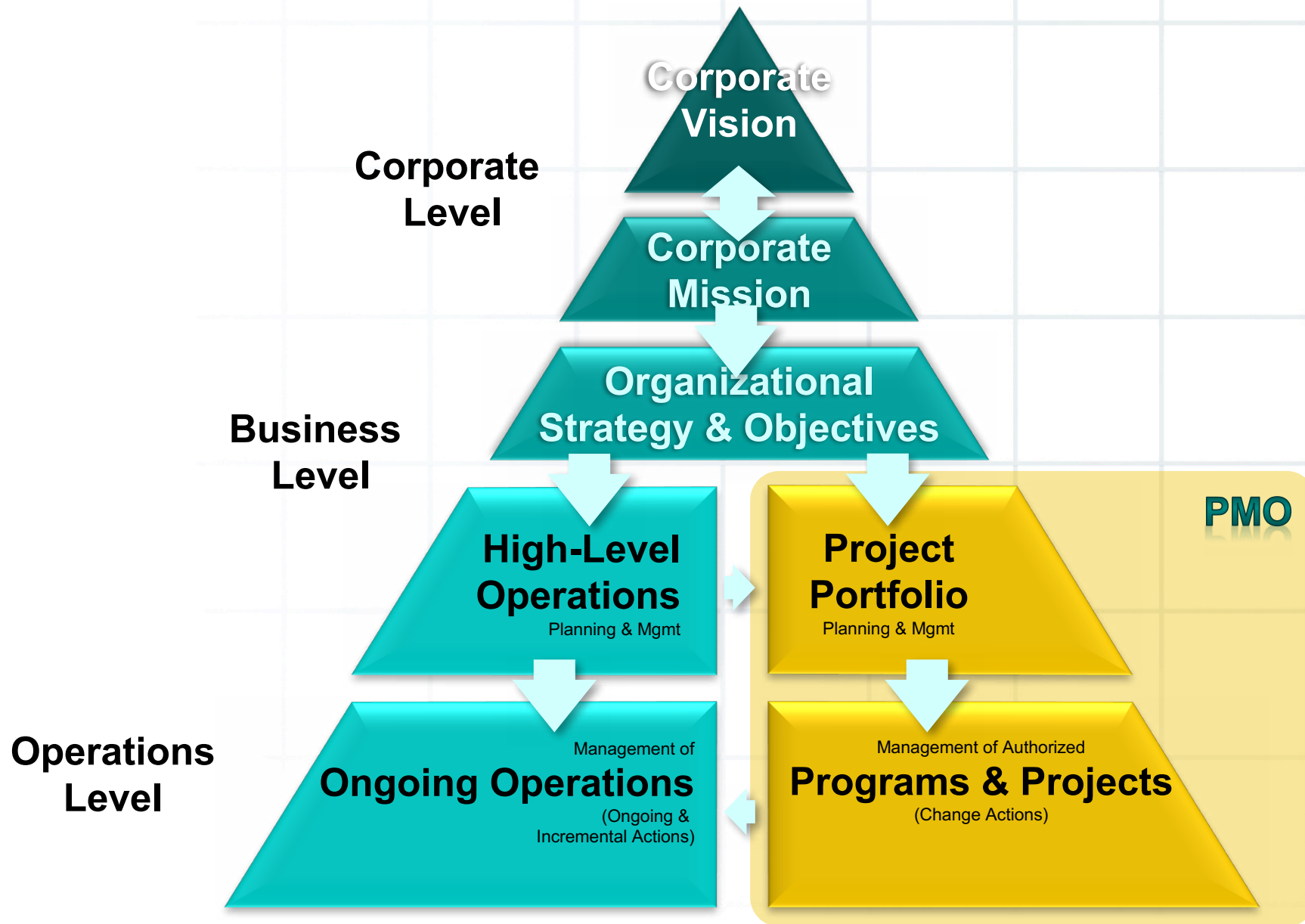
## Knowledge Areas



All PM knowledge areas and processes are fully applicable for Construction Project Management. The **PMBok Construction Extension**, specifies for each knowledge area, CONSTRUCTION INDUSTRY specific policies, principles, procedures, techniques, tools and proven practices.

Additionally, **industry specific**, knowledge areas include: **Project Financial Mgmt - Project Contract Mgmt - Project HSSE Mgmt - Project Claims Mgmt**

# Organizational Model - CONSTRUCTION



## Typical Companies Ideas In

## Portfolio Management Best Practice Companies Ideas In

Percent of ideas that  
make it to **feasibility**

23%

5%

Percent of ideas that  
make it to **development**

12%

2.5%

Resource &  
cost savings

Overall percent of resources  
spent on **project failures**

46%

20%

Percent of **revenue** from  
products introduced in  
the past 5 years

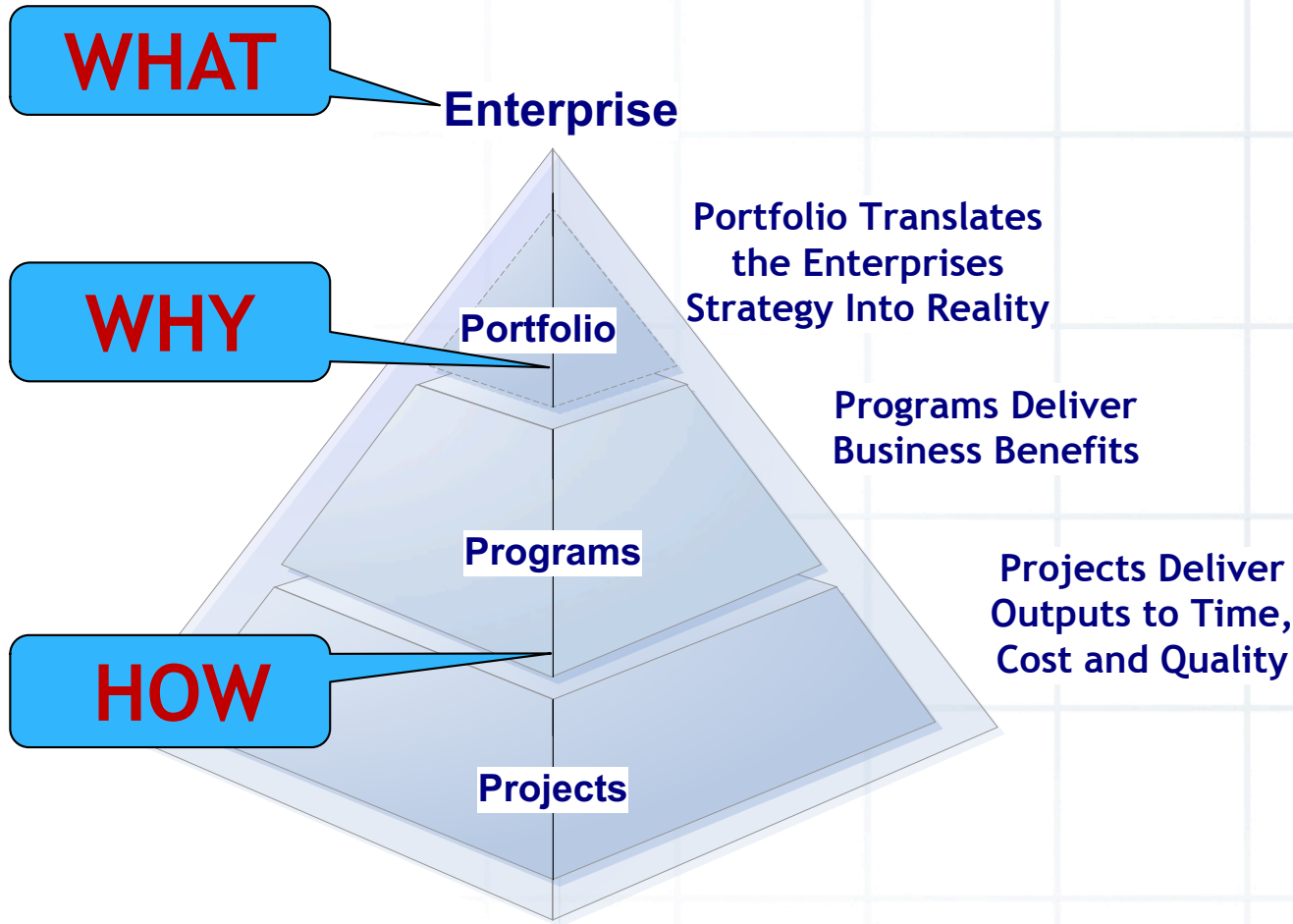
25%

49%

Source: PDMA, PDI, Cap Gemini

Innovation Project Management Help Companies Quickly Eliminate Losing Projects

# Relationships between Project, Programs and Portfolio



If a project fails, you may lose money...

If a programme fails, you may lose a lot of money...

If a portfolio fails, you may lose your company...

PORTFOLIO MEASURES CONTRIBUTION TO STRATEGIC OBJECTIVES



# Project Portfolio Management System

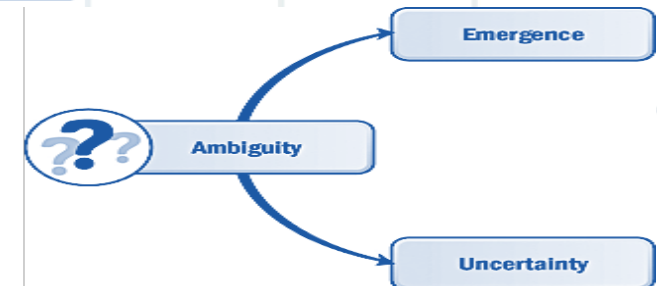
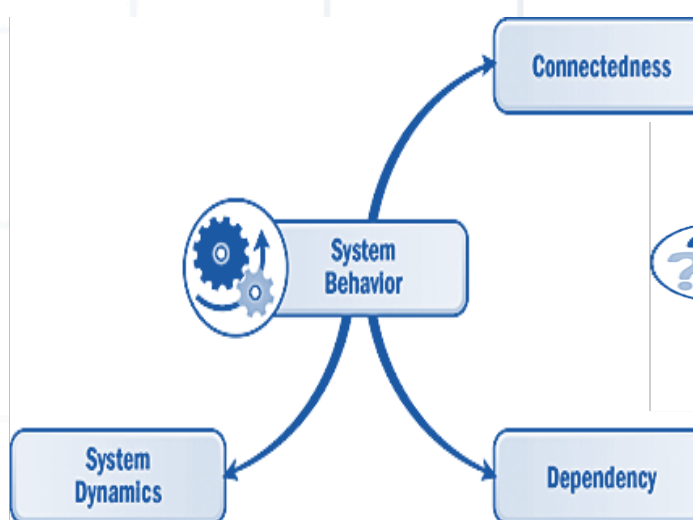
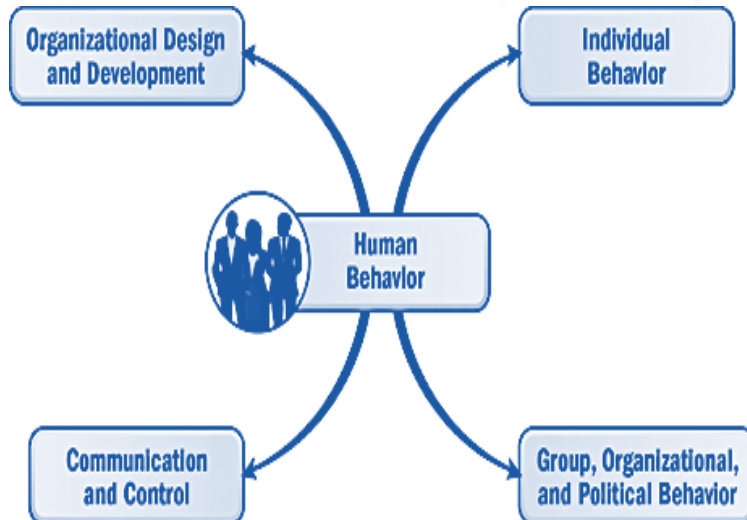
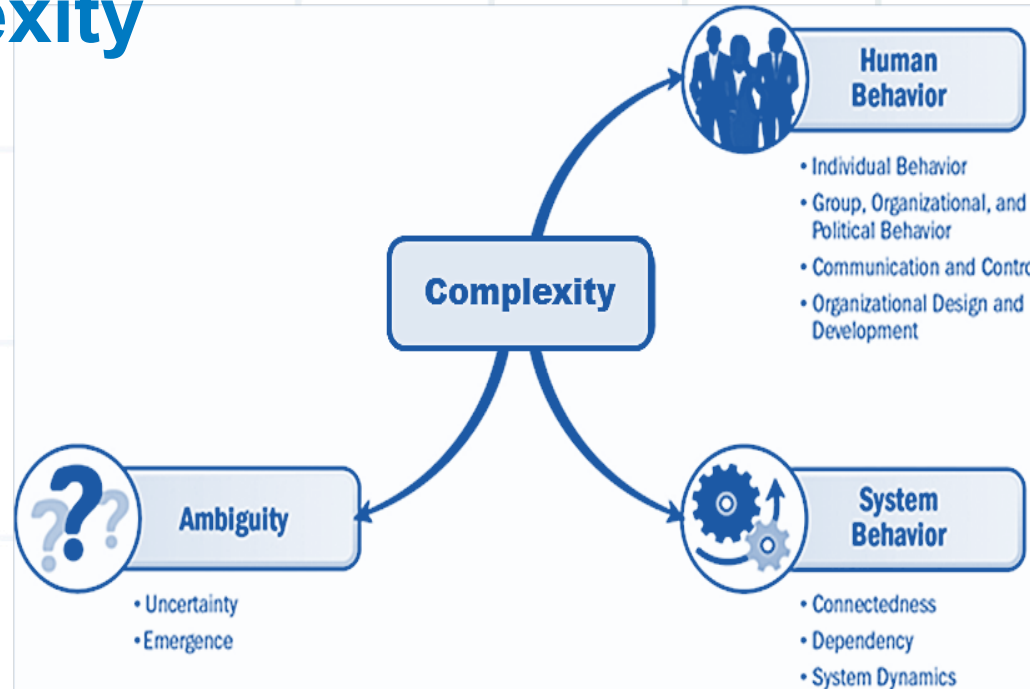
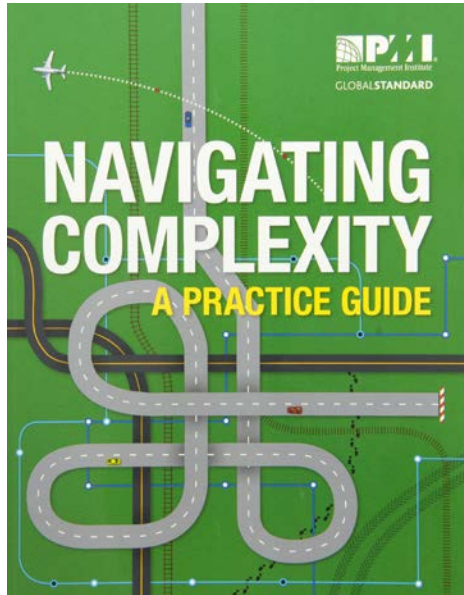
## The implementation of standardized portfolio management provides the construction organization with:

- Effective quality assurance in terms of governance, risk, communications, performance and strategic management.
- Measurement and reporting of value to ensure that the Organization can capitalize on the benefits provided
- Decision support at strategic, tactical and operational levels.
- Enables the establishment of clear, sustainable and agreed governance processes

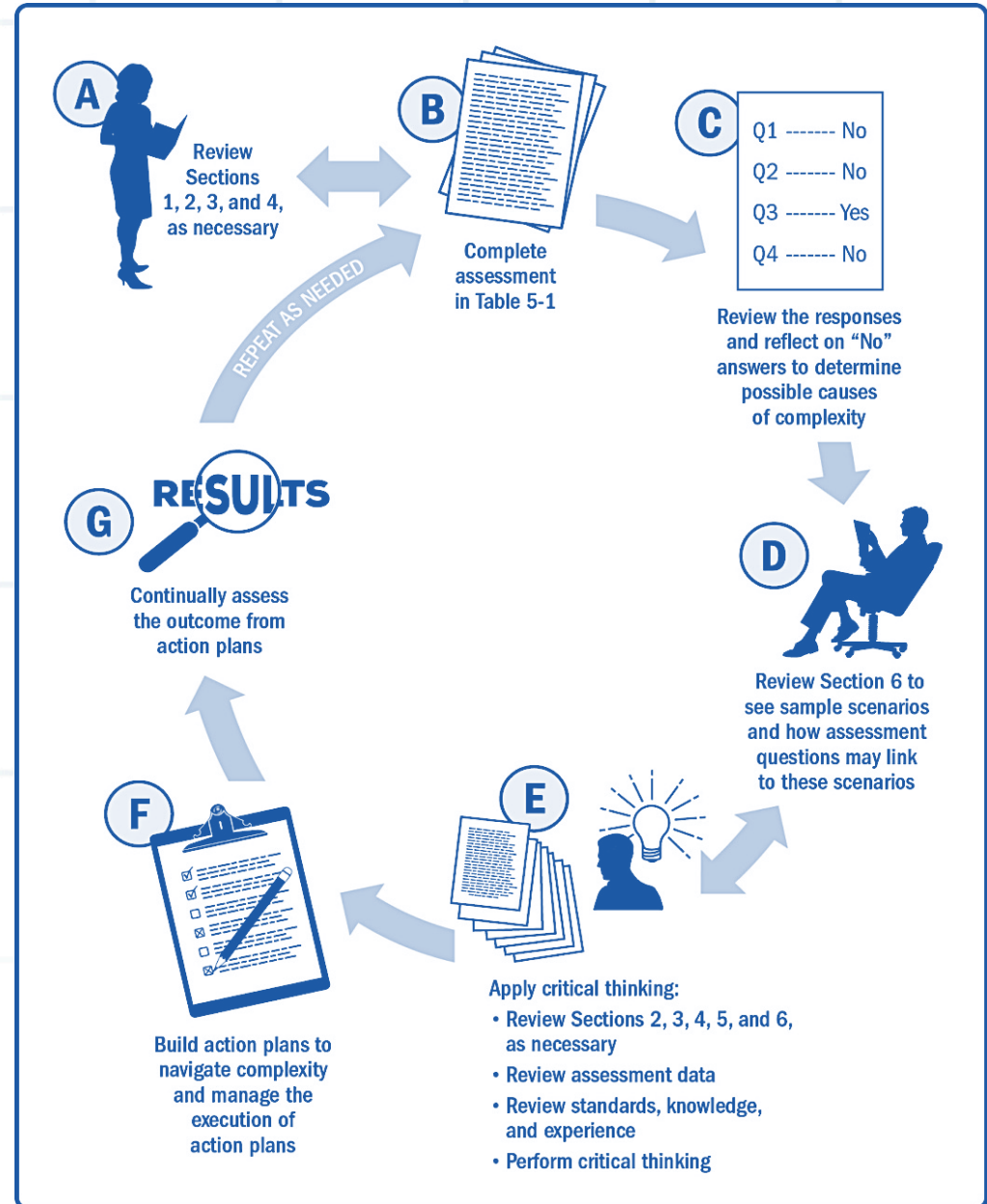
# Construction Project Portfolio Performance Domains

- **Management Control**
- **Benefits Management**
- **Investment Management**
- **Stakeholder Management**
- **Governance**
- **Risk Management**
- **Resource Management**
- **Communications Management**

# Definition of Complexity



# Developing An Action Plan



# Civil Engineering / Construction Management Resources

## Civil Engineering Resource Guide

The work of civil engineers is evident everywhere you look, from roads and bridges to water supply systems and skyscrapers. And as populations grow and new infrastructure is needed, the demand for qualified civil engineers can be expected to increase, as well. Whether you're a student of civil engineering, a teacher or just someone who is interested in the field, this guide is for you. It includes links to 40 high-quality resources, including study resources, teaching resources, news sources, academic journals and more.

### General Civil Engineering General Resources

Check out these general resources to learn about the history of civil engineering, industry group information, helpful forums and the basics of civil engineering.

**American Society of Civil Engineers (ASCE)** – As the oldest engineering society, founded in 1852, ASCE represents over 150,000 members in 177 countries. Member benefits include access to professional conferences and continuing education opportunities. Also, refer to the ASCE as an excellent resource for field-related content and standards and codes that govern the profession.

**Interactive Civil Engineering Timeline** – Enjoy browsing profiles and information about civil engineers starting in 18<sup>th</sup> century. This interactive timeline features civil engineers such as John Bradfield and Peter Rice.

**Engineer Boards** – A useful forum for all those interested in engineering. Forum sections include general, exam and technical discussions. Use this forum if you have questions about the profession or need help studying for your engineering exam.

**Top 10 Civil Engineering Projects** – From ancient times to modern ones, engineers have been constructing masterpieces. Find out which structures made the top 10 on this colorful and detailed infographic, and see if you agree.

**Five Civil Engineering Failures** – Even though the design technology of these civil engineering projects were failures, they led to new design innovations and technologies. Look over this infographic that shows the failures and the effects of the failures.

**Introduction to Civil Engineering** – A concise explanation of the basics of civil engineering for those who are interested in the field but unsure of exactly what it entails.

**Report Card for America's Infrastructure** – Every four years, American civil engineers complete a comprehensive assessment of the nation's infrastructure. This assessment is formatted in the form of a report card that assigns grades to the various major infrastructure categories and makes recommendations for improvements. Learn about the current report card here.

### Civil Engineering Study Resources

To be sure, there's a lack of free, quality materials available for the Civil PE Exam, and prep materials are often costly. However, all is not lost. Browse the list below to find some of the best free study resources for civil engineering that we found on the Web.

**MIT Open Courseware** – The Massachusetts Institute of Technology offers free and open access to civil engineering course content. Use this resource to supplement your studies or to engage in a course of independent learning. Find close to 50 courses in the civil engineering field for downloading.

**Fundamentals of Civil Engineering** – This study guide, reviewed and approved by a professor of engineering at Utah State University, can help you strengthen your knowledge of nine fundamental civil engineering concepts.

**Civil PE Prep** – When Kristin Wood was preparing for her PE exam, she regularly updated her blog with her thoughts of the study process and examples of problems she worked. While that time has passed, the blog is still available for aspiring engineers to gain some insight into what it's like to study for the Civil PE exam.

**Shear and Moment Diagram Formulas** – Thirty-two examples of shear and moment diagrams, complete with formulas, are available with this link. These are helpful for designing beams under different static loading conditions.

**Engineering Licensure Exams Video Reviews** – Sixty-two hours of exam material are covered in these free video reviews located on The Texas A&M University website. The reviews address material on the General FE exam and the Civil Engineering PE exam.

**How to Get Study Materials for the FE Exam** – This link offers good advice for purchasing textbooks for the General FE exam. Learn how to spend your money wisely.

**Civil Engineering Practice Questions** – Take advantage of a trial offer through this link. Take a free sample test containing 50 practice questions in civil engineering. Tests are written and approved by field experts, and each question offers a detailed rationale.

**Civil Engineering Videos** – Use these helpful videos to study for your PE exam. Watch the process as civil engineering problems, similar to ones that will be on the exam, are solved. As an alternative, write down each problem as it's presented, pause the video and solve it before resuming and watching the solution.

## ...some other Sites

<http://www.constructonomics.com>

<https://www.dbia.org>

<http://www.arcom.ac.uk>

<https://aec-business.com>

<http://www.constructionglobal.com>

<http://cmaanet.org>

<http://www.smartscholar.com/civil-engineering-guide/>

# Questions and Answers

