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Special thanks to Liam Esmailzadeh, MSE for his work on portions of the content.
Genesis of this presentation

Organisation for Economic Co-operation and Development (OECD)

*Project governance* includes the processes, systems, and regulations that the financing party must have in place to ensure that projects are successful.

- Volden and Samset (2017)
Extensive review of U.S. literature concerning the term “project governance” was not fruitful. However,

- project management,
- systems,
- administration requirements and
- regulations

are all relevant words that are widely used.

<table>
<thead>
<tr>
<th>Information/Agency</th>
<th>GSA</th>
<th>FHWA</th>
<th>DOE</th>
<th>USACE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of projects</td>
<td>Construction and operations of U.S. governmental buildings</td>
<td>Maintenance and construction of highways</td>
<td>Large science, energy, nuclear, and environmental cleanup</td>
<td>Dams, waterways, infrastructure construction and operations</td>
</tr>
<tr>
<td>Presidential Budget (2019)</td>
<td>$10.7 billion</td>
<td>$46 billion</td>
<td>$30.6 billion</td>
<td>$4.9 billion</td>
</tr>
</tbody>
</table>

GSA-General Services Administration  
FHWA-Federal Highway Administration  
USACE-US Army Corp of Engineers  
DOE-US Department of Energy

Project budget appraisal under various OECD schemes (Volden and Samset 2017)
The image contains a diagram illustrating the U.S. Federal Budget Process/Project Appraisal (Simplified). The process begins with the Office of Management and Budget (OMB) providing guidelines to agencies, followed by Federal Agencies drafting their initial budget. OMB compiles a formal budget, and the President submits a budget request to Congress. The House Budget Committee reviews the request, and the Senate Budget Committee does the same. The House Appropriations subcommittee hears and markup bills, followed by the Senate Appropriations subcommittee. The House and Senate committees then report to their respective bodies, which vote on final reviews. The House of Representatives finalizes the budget, and the Senate Committee on Appropriations reviews and approves it. The process continues with the House Committee on Appropriations reviews and approves the budget.

The diagram is titled "U.S. Federal Budget Process/Project Appraisal (Simplified)."

PMP-Project Management Plan

Department of Energy (DOE) Order 413.3B process map (DOE O.413.3B 2022)

CD-Critical Decision
EIR-External Independent Review
PED-Project Engineering and Design
PARS-Project Assessment and Report System

NOTES:
1. Operating Funds may be used prior to CD-4 for transition, startup, and training costs.
2. PED funds can be used after CD-3 for design.
Comparison of Markets

<table>
<thead>
<tr>
<th></th>
<th>United States</th>
<th>United Kingdom</th>
<th>Norway</th>
<th>Sweden</th>
<th>Denmark</th>
<th>Netherlands</th>
<th>Quebec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Market Size (2019 USD)</td>
<td>1.3 Trillion</td>
<td>160 Billion</td>
<td>22 Billion</td>
<td>30 Billion</td>
<td>13 Billion</td>
<td>35 Billion</td>
<td>15 Billion</td>
</tr>
<tr>
<td>Private versus Public share</td>
<td>70%-30%</td>
<td>80%-20%</td>
<td>20%-80%</td>
<td>50%-50%</td>
<td>35%-65%</td>
<td>40%-60%</td>
<td>80%-20% (Canada)</td>
</tr>
</tbody>
</table>


GAO-General Accounting Office
CQM-Construction Quality Management
GSA-General Services Administration
FHWA-Federal Highway Administration
USACE-US Army Corp of Engineers
DOE-US Department of Energy
Gibson and Esmailzadeh (2022)

GSA: General Services Administration
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- Volden and Samset (2017)
it starts with excellent front end planning

Front End Planning Process

front end planning gated process

0 Feasibility 1 Concept 2 Detailed Scope 3 Design and Construction

Generally 30% Design Effort Complete

-CII 2011
Front End Planning Process

front end planning gated process

0 Feasibility 1 Concept 2 Detailed Scope 3 Design and Construction

Generally 30% Design Effort Complete

To be successful, an organization must marry its approval process with an integrated project/program management system and excellent front end planning

-CII 2011

What happens at a Gate/Phase check?

Stop, project either shelved or canceled
Project failed to meet governance criteria

Another option?

Go, governance requirements met; move on to next phase

Project is not approved to proceed to the next stage; further investigation is required or gaps in governance deliverables must be addressed
Self-governance refers to the capacity of a contractor to govern autonomously. When a contractor instills integrated project/program management principles using the Earned Value Management Systems (EVMS) in a way that benefits all levels of the organization, with results guiding management decisions, leading to improved project/program execution, and optimizing performance of the project/program team.

-Gibson et al. 2022

Typical Large and Complex Projects/Programs

- Industrial
- Energy
- Defense
- Aerospace
- Manufacturing
- Infrastructure
- etc.
Definitions

**Earned Value Management (EVM):** The use of performance management information, produced from the EVMS, to plan, direct, control, and forecast the execution and accomplishment of contract/project cost, schedule, and technical performance objectives versus the plan.

**Earned Value Management System (EVMS):** An organization’s management system for project/program management that integrates a defined set of associated work scopes, schedules and budgets for effective planning, performance, and management control. It integrates these functions with other business systems such as accounting and human resources, among others.

**Maturity:** The degree to which an implemented system, associated processes, and deliverables serve as the basis for an effective and compliant EVMS.

**Environment:** The conditions (i.e., people, culture, practices, and resources) that enable or limit the ability to manage the project/program using the EVMS, serving as a basis for timely and effective decision-making.
Integrated Project/Program Management (IP2M), Maturity and Environment Total Risk Rating (METRR) using EVMS

**IP2M METRR**

10 sub-processes

A. Organizing
B. Planning and Scheduling
C. Budgeting and Work Authorization
D. Accounting Considerations
E. Analysis and Management Reporting
F. Change Control
G. Material Management
H. Subcontract Management
I. Risk Management

**Maturity Assessment**

**Environment Assessment**

Four categories

1. Culture
2. People
3. Practices
4. Resources

Current version available at: https://www.energy.gov/projectmanagement/articles/ip2m-metrr-asu-evms-study
Final Results: 35 sample projects/programs

- The collected data came from 28 projects and 7 programs, with
- ~$21.8 Billion USD in installed cost
- Located in 17 U.S. states and territories:
  - Alabama
  - California
  - Florida
  - Idaho
  - Illinois
  - Indiana
  - Louisiana
  - Missouri
  - New Mexico
  - New York
  - Pennsylvania
  - South Carolina
  - Tennessee
  - Texas
  - Virginia
  - Washington
  - Washington DC

- The types of projects/programs they represent, and the maturity and environment scores are shown on the next slide.
### Large and Complex Projects/Programs (N=35)

<table>
<thead>
<tr>
<th>Type of projects/programs</th>
<th># of projects/programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>12</td>
</tr>
<tr>
<td>Defense</td>
<td>9</td>
</tr>
<tr>
<td>Environmental</td>
<td>6</td>
</tr>
<tr>
<td>Software</td>
<td>3</td>
</tr>
<tr>
<td>Aerospace</td>
<td>3</td>
</tr>
<tr>
<td>Science</td>
<td>2</td>
</tr>
</tbody>
</table>

![Environment and Maturity Matrix – 34 Completed Projects](image)

**HMPE (N=20):**
- Mean + 45.9% cost growth
- Mean + 23.5% schedule growth

**LMGE (N=6):**
- Mean + 125.6% cost growth
- Mean + 18.2% schedule growth

**HMGE (N=6):**
- Mean - 2.6% cost growth
- Mean - 1.8% schedule growth
Note: Cost and schedule growth is measured versus the PMB at 20% project completion. The sample is reduced by removing one project with no performance information and one outlier.

**Performance Across the Heat Map (N=33)**

<table>
<thead>
<tr>
<th>Environment Heat Map (N=33)</th>
<th>Green (&gt;800)</th>
<th>Yellow (700-799)</th>
<th>Orange (500-699)</th>
<th>Red (&lt;500)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>5</td>
<td>7</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>Mean Cost Growth</td>
<td>-0.3%</td>
<td>+13.7%</td>
<td>+48.2%</td>
<td>+92.3%</td>
</tr>
<tr>
<td>Mean Schedule Growth</td>
<td>-6.9%</td>
<td>+3.8%</td>
<td>+26.9%</td>
<td>+24.3%</td>
</tr>
</tbody>
</table>
Software development

Software development
Systems Maturity is Important but 
Environment (Social Context) Matters a lot

\[ M = f(E) \]

- Requires:
  - Leadership values, priorities, focus, and commitments
  - Weekly/monthly management meetings
  - Training
  - Self-governance
  - Teamwork and team alignment
  - Business practices
  - Resources

Conclusions (1)

- Governance is not a typical word used for capital programs in the U.S. governments
- Governance in the U.S. is similar to Europe OECD’s studied except larger programs and more distributed
- Governance schemes of US Federal Agencies vs six OECD
  - Many similarities in terms of transparency, budget allocation, accountability framework, and organizational flexibility
- Keys:
  - Oversight, effective gated process decisions
  - ICE, EIR
  - OMB/GAO for accountability
  - Checks and balances
  - Standards and processes
Conclusions (2)

• Governance schemes are highly complex, techo-social systems
  • Organizations must address both areas to be successful
• Environment (social) and maturity (technical/process) are positively correlated
• M+E is statistically related to better project/program performance
• IP2M METRR works

Further information

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Questions for me?

References:


Department of Energy (DOE) Order 413.3b, Program and Project Management for the Acquisition of Capital Assets; https://science.osti.gov/-/media/opa/pdf/processes-and-procedures/doe/DOE_Order_413-3B.pdf


