

CAPITAL PROJECTS EXCELLENCE

Playbook



Navigating for Success

Optimizing Capital Projects

Embarking on **capital projects** involves long-term, **substantial investments** to expand, enhance, or fortify capital assets. These initiatives stand out due to their **extensive scale and significant costs**.

Critical for **spurring growth** within businesses or governments, capital investments, such as erecting new facilities, infrastructures, or systems, play a pivotal role.

Managing these capital projects demands careful attention as they require considerable **resources and time**. Each project involves a calculated risk, expecting the resulting capital asset to yield **substantial returns**.

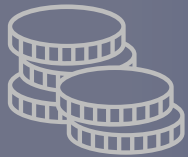
Effectively steering and **mitigating risk** is integral to successfully developing and delivering capital projects.

Capital Projects Challenges



QUALITY CONTROL

Maintaining and assuring the desired standards and specifications throughout the project lifecycle to deliver a high-quality outcome.



BUDGET CONTROL

Ensuring effective financial management to stay within allocated budgets, avoiding cost overruns, and guaranteeing optimal resource utilization.



TIME MANAGEMENT

Efficiently planning, scheduling, and monitoring project timelines to meet deadlines and prevent delays in project completion.



RESOURCE ALLOCATION

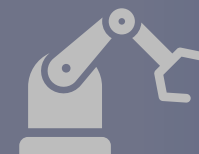
Optimizing the allocation of human, financial, and material resources to enhance productivity and prevent resource shortages.



RISK MANAGEMENT

Identifying, assessing, and mitigating potential risks that could impact the project's success, encompassing financial, operational, and external factors.

Capital Projects Challenges



TECHNOLOGY AND INNOVATION

Integrating new technologies and innovative solutions while ensuring compatibility, reliability, and stakeholder acceptance.



COMPLEXITY

Managing the intricacies and interdependencies within a project, ensuring effective coordination and collaboration among various stakeholders.



REGULATORY COMPLIANCE

Adhering to legal and regulatory requirements to avoid legal issues, fines, and delays in project implementation.



SCOPE CREEP

Preventing uncontrolled changes to project scope can avoid increased costs and delays.



SUSTAINABILITY IMPACT

With a growing emphasis on sustainability, managing the environmental impact of large projects has become more critical. Compliance with environmental regulations, minimizing ecological footprint, and implementing sustainable practices are essential challenges.

The Roadmap to Excellence in Capital Projects

PHASE 1

Initiation

Initiate each project with a **detailed business rationale** to establish the **purpose and feasibility**

PHASE 2

Concept & Feasibility

Establish stakeholder alignment on strategy, translating it into **clear concepts** before commencing the design phase while assessing the **technical capacity required** for successful project delivery

PHASE 3

Definition / Preliminary Design

Develop a **preliminary design** and **funding request** by evaluating project risks, objectives, requirements, and scope, ensuring a solid foundation for project advancement

PHASE 4

Detailed Design & Engineering

Present a fully **documented design and specifications** to secure stakeholder alignment before entering the procurement phase, ensuring clarity and agreement on project elements

PHASE 5

Procurement, Implementation & Capability Building

Prepare for smooth procurement, **build team capabilities**, and ready operations for implementation to achieve a successful **Vertical Start-up**

PHASE 6

Commissioning

Execute **structured Commissioning**, Qualification, and Verification activities, ensuring a methodical approach for a successful **Vertical Start-up** and guaranteeing **sustained performance**

PHASE 7

Post-launch & Reapplication

Enhance **future project effectiveness** by analyzing project processes and results and continuously strengthening standards and specifications for **improved methodologies**

Improve Capital Project Management and Implementation with KAIZEN™

PHASE 1
Initiation

PHASE 2
Concept &
Feasibility

PHASE 3
Definition /
Preliminary
Design

PHASE 4
Detailed Design
& Engineering

PHASE 5
Procurement,
Implementation
& Capability
Building

PHASE 6
Commissioning

PHASE 7
Post-launch &
Reapplication

PROJECT MANAGEMENT

1. PHASE GATE DESIGN
2. PROJECT CHARTER
3. PHASE SCHEDULING
4. CRITICAL CHAIN PLANNING
5. OBEYA CONTROL

IMPROVEMENT WORKSHOPS (some examples)

1. IDEA
EVALUATION

1. SUPPLY CHAIN
IMPACT STUDY
2. CONCEPTUAL
STUDY
3. CONCEPT FMEA

1. PRELIMINARY
ENGINEERING
DESIGN
2. DFC
3. DFQ
4. DFM

1. COMMISSIONING
PREPARATION
2. PROCUREMENT
STRATEGY
3. SUPPLIERS
INTEGRATION

1. FAT STANDARD
WORK
2. LAST PLANNER
3. SAT STANDARD
WORK

1. COMMISSIONING
STANDARD
WORK

1. LESSONS
LEARNED

COMMON PROBLEMS

- Lack of a well-defined project plan;
- Inadequate Communication;
- Scope Changes;
- Resource Constraints;
- Unclear Roles and Responsibilities;
- Budget Overruns.

IMPACT

- **Timely Delivery;**
- **Budget Compliance;**
- **Cost Efficiency;**
- **Effective Risk Mitigation;**
- **Optimized Resource Utilization.**

IMPROVEMENT APPROACH

- **Phase Gate Design:** Establish a robust project structure using the phase-gate model, laying the groundwork for effective project management. This ensures a well-organized project, optimizing resource utilization and managing timelines efficiently.
- **Project Charter:** Initiate successful project execution by clearly defining goals, requirements, and scope. The project charter fosters effective communication, aligns stakeholders, provides a clear project vision, and minimizes misunderstandings.
- **Phase Scheduling:** Plan and delegate tasks to control work processes, identify potential issues early on, and manage risks in the schedule effectively. This approach enhances control, aids in resource allocation, and minimizes delays.
- **Critical Chain Planning:** Identify and manage project bottlenecks, optimize timelines, save time and costs, and reduce overall project risk. This strategy focuses resources where they are most needed, streamlines decision-making, and minimizes delays.
- **Obeya Control:** Implement visual management and decision-making techniques to improve lead time, control project quality, and enhance collaboration. This approach boosts communication, collaboration, and overall project visibility.



Project Management

COMMON PROBLEMS

- Lack of alignment between projects and business priorities;
- Insufficient information about the project's impact on the supply chain;
- Uncertainty and changes during the feasibility phase;
- Budget challenges in the feasibility phase;
- Failure to address potential failure modes during the concept phase.

IMPACT

- **Well-informed Investment Choices;**
- **Minimized Disruptions in the Supply Chain;**
- **Informed Decision-making;**
- **Improved Future Performance, Quality, Reliability, and Safety.**

IMPROVEMENT APPROACH

- **Idea Evaluation:** Assess project ideas for alignment with business priorities, cost considerations, and resource requirements to guide funding decisions. This process enables well-informed investment choices, optimizing the utilization of available resources.
- **Supply Chain Impact Analysis:** Investigate how project implementation influences the supply chain, anticipating and addressing potential issues. This ensures alignment with supply chain needs, minimizes disruptions, and bolsters overall project success.
- **Conceptual Study:** Generate and assess project options based on designs and costs, establishing a foundation for informed decision-making and resource planning.
- **Concept FMEA (Failure Mode and Effects Analysis):** Identify potential failure points in a project concept and devise countermeasures. Proactively addressing potential issues enhances performance, quality, reliability, and safety.



**Initiation,
Concept &
Feasibility Phase**

COMMON PROBLEMS

- Inaccurate cost estimates and insufficient design foundation;
- Project cost inefficiencies;
- Insufficient integration of quality considerations, leading to rework and dissatisfaction in the following stages;
- Poor maintainability and vertical start-up issues in the future.

IMPACT

- **Detailed Design Foundation;**
- **Cost Estimation Precision;**
- **Optimized Current & Future Costs;**
- **Higher-quality Equipment / System;**
- **Improved Future Maintainability;**
- **Future Vertical Start-up.**

IMPROVEMENT APPROACH

- **Preliminary Engineering Design:** Create an initial design with a confidence level supporting a cost estimate accuracy within $\pm 10\%$. This sets the foundation for detailed design work and precise cost estimation.
- **Design For Cost:** Conduct a workshop to reduce project costs without compromising functionality. This approach maximizes project value by optimizing both current and future expenses.
- **Design For Quality:** Integrate quality considerations into the equipment's development process to ensure a higher-quality final product. This practice reduces rework and enhances customer satisfaction.
- **Design For Maintenance:** Identify and propose solutions for improved maintainability and vertical start-up, minimizing issues during start-up and enhancing long-term maintenance efficiency.



Definition & Preliminary Design Phase

COMMON PROBLEMS


- Unorganized commissioning stages leading to a risk of operational issues;
- Unplanned procurement leading to delays, increased costs, and resource inefficiencies;
- Lack of communication and collaboration with suppliers, leading to potential issues and increased costs.

IMPACT

- **Controlled and Organized Commissioning;**
- **Quality, Timely, and Cost-effective; Resource Acquisition;**
- **Reduced Supplier-Related Risks.**

IMPROVEMENT APPROACH

- **Commissioning Preparation:** Prepare for commissioning stages in a controlled and organized manner. This involves good preparation to ensure that all systems and components are designed, installed, operated, and maintained according to the established plan requirements.
- **Procurement Strategy:** Strategically plan procurement by considering vendor capabilities, quality, value, and agreed lead times. This approach guarantees the timely and cost-effective acquisition of necessary resources, aligning with project objectives.
- **Suppliers Integration:** Actively gather input and insights from suppliers to preemptively address potential issues and costs. This practice fosters collaboration and minimizes risks associated with supplier-related problems, contributing to overall project success.



**Detailed Design
& Engineering
Phase**

COMMON PROBLEMS

- Uncertainty about equipment readiness, compliance, and functionality;
- Poor planning, predictability, and communication in project delivery, especially with suppliers;
- Issues in on-site equipment/system performance and adherence to requirements.

IMPACT

- **Risk Mitigation;**
- **Seamless Transition during Installation and Operation;**
- **Efficient Project Execution;**
- **Future Vertical start-up.**

IMPROVEMENT APPROACH

- **Factory Acceptance Tests Standard Work:** Strategically plan tests at the supplier's location to verify equipment readiness, compliance with standards, and effective operation. This approach mitigates risks and ensures a seamless transition during the installation and operation phases.
- **Last Planner:** Enhance planning, predictability, and communication in project delivery, particularly with suppliers. This methodology improves relationship management and commitment, addressing uncertainties and complexities for more efficient project execution.
- **Site Acceptance Tests Standard Work:** Systematically plan tests to guarantee that equipment/system meets specified requirements and functions effectively on-site. This process allows for site-specific adjustments, ensuring a successful deployment.



**Procurement,
Implementation
& Capability
Building Phase**

COMMON PROBLEMS

- Inconsistency, compromised quality, and unreliable systems or facilities during commissioning;
- Repeated mistakes from previous projects;
- Lack of continuous improvement, knowledge sharing, and proactive risk management.

IMPACT

- **Vertical Start-up;**
- **Enhanced Operational Efficiency;**
- **Continuous Improvement Culture;**
- **Effective Knowledge Sharing.**

IMPROVEMENT APPROACH

- **Commissioning Standard Work:** Uphold consistency, quality, and reliability in delivering systems or facilities. This standard work guides the commissioning team, ensuring all requirements are met for the successful completion of the final product.
- **Lessons Learned:** Facilitate continuous improvement, knowledge sharing, and risk management for future projects. This practice enhances overall project effectiveness and efficiency by extracting valuable insights from past experiences.



**Commissioning,
Post-launch
& Reapplication
Phase**

BY INTEGRATING THESE METHODOLOGIES
INTO THEIR **CAPITAL PROJECTS**,
COMPANIES CAN ACHIEVE SUBSTANTIAL
IMPACT, **MAXIMIZING RETURNS**
ON THEIR INVESTMENTS



THANK YOU!