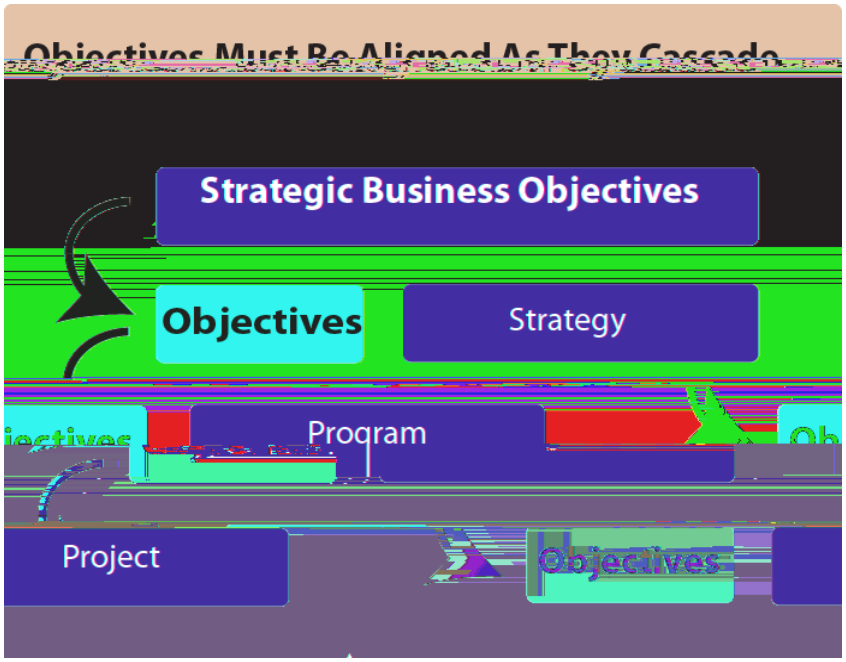

MCX
CMAA
Constru



Selection of Projects

The selection of the portfolio of projects that will comprise the program must:

- Optimize multiple strategic business objectives
- Address sequencing required for optimization
- Address interdependencies between projects
- Reflect real-world resource constraints
- Enhance program (and organizational) flexibility and resiliency

Programs which experience weak project selection may have failed to:

- Maintain focus on strategic business objectives
- Prevent biases from entering the process
- Establish a sufficiently strong methodology for project portfolio evaluation, often only considering one primary SBO without attention to other such objectives
- Appropriately cascade metrics to the assessment of project portfolio performance and ultimately individual project performance.
- Inadequately reflect uncertainty and risks in portfolio evaluation

Weak project selection will result in low-value capture and, to the extent to which project selection appears to be driven by biases or other non-objective factors, undermine organizational honesty and openness.

d Z •] • (} Œ s se%o Œ } must be constantly monitored, in addition to monitoring project performance under program management. This is an area that requires increased focus in the engineering and construction industry. Changes in market conditions, resource constraints, risk levels, or execution performance may drive a re-evaluation of the portfolio or the project after it is underway, which shows that redeployment of resources is in the best interest of achieving the program's strategic business objectives even when sunk costs and commitments are fully considered.

Termination of a previously selected project may be a simpler matter if it is performing below expectations (schedule delays, cost overruns, etc.) but when driven by a reduction in the benefits that will accrue or value derived, it is a much harder matter. Who wants to be the program manager who terminates a strong performing project (ahead of schedule, under budget)?

Best Performing Not Necessarily the Best Investment
On one large mining program, several megaprojects were underway at the same time. Overall, the program was struggling to maintain budget and schedule, and market conditions

Optimize Multiple Strategic Business Objectives

A key attribute of project selection in major engineering and construction programs is the need to simultaneously optimize multiple strategic business objectives.

- Political risks
- Technology risks
- Intellectual property risks
- Business model risks
- Projectexecution risks

Weak project evaluation methodologies that seek to reduce all benefits to a singular related value, such as NPV, must be avoided in recognition that:

- Uncertainty in estimates is compounded
- Structured multi-variate risk analysis would produce a better assessment of risk
- Benefits of later phase projects are not fully appreciated
- Changes in risk profile over time are not recognized

Meet the Objectives t All the Objectives
On one giga program, the owner faced a broad array of stakeholders with often competing objectives. He attempted to satisfy these needs by developing a broad, compelling vision that would serve to satisfy all stakeholder groups in one grand sweep. He failed, however, to ensure that this grand vision met his other strategic business objectives with respect to cost and schedule. The immediate effect of this grand vision was to raise the bar for each and À Œ Ç • š l Z } o Œ [• Æ ‰ š š] } v • X d Z } Á v Œ } v š] v µ through a series of further concessions until cost and schedule forecasts could no longer be ignored. By then it was too late.
Strategic Program Management is built on defining a set of true, strategic business objectives and then developing a strategy to achieve each and every strategic business objective. ^ š Œ š P] W Œ } P Œ u D v P u v š] • µ] o š } v š Z Á } Œ ^ v objectives. Strategic Program Management is not about placing primacy on one of the strategic objectives. To be successful, giga programs require careful attention and selection of the over-arching strategic business objectives. These objectives cannot be a set of wishes or wants, but rather must be those things required for program success.

Avoiding Bias in Project Selection

Objective assessment rests on well-defined objectives, constraints, and evaluation metrics that can be mapped to well-defined evaluation criteria.

Contradictory evidence avoidance	Contradctory evidence avoidance t Ignoring facts that do not fit with your belief set or existing hypothesis. Often when you deepest convictions are challenged by contradictory evidenc your beliefs get stronger.
Biased argument framing	Biased argument framing t occurs when people react differently to something depending on whether it is presented as positive or negative. In other words, a decision is influenced by how the information is presented rather than what is being said.
Anchoring	Anchoring t a cognitive bias whereby an individual's decisions are influenced by a particular reference point or anchor. Both numeric and non-numeric anchoring can occur. In numeric anchoring, once the value of the anchor is set, subsequent arguments or estimates made by an individual may change fro what they would have otherwise been without the anchor.

Reasoning by analogy	Reasoning by analogy is a cognitive process where one uses a comparison between two things to understand or solve a problem. It involves identifying the underlying relationships and mapping them from one domain to another. Reasoning by analogy is a type of inductive argument, which means it can be valid or invalid depending on the strength of the similarity and the relevance of the differences.

Linear programming, also called linear opiomi
maximum profit or lowest cost) in a mathematical
reltion/ships. Linear programming is a special cas
mathemtiocal opiomiztionn.

variables. If the number of variables is large, or if
opiomal, then do
solve such a problem may be too large.

Where b

The abnve capital allncaion/ model is cn/strained
ptrtfolio does not exceed some maximum capital

This simple capital allnctioo/ model can be extende

x

x

- Future costs associated with implementation of a project (maintenance and operating costs, consumables)
- Costs associated with not doing a project
- Mutually exclusive projects or project alternatives
- Project precedence
- Partial project benefit interdependency
- Cost, schedule other benefit synergies
- Multi-period cost constraints
- Sensitivity to delay

d Z ^ (( ]] v š & Œ } v š] Œ _

Solving the capital allocation model does not result in a singular solution but rather an extensive solution set that may be considered by looking at:

- Risk adjusted benefits versus total costs (project portfolio management)
- Portfolio returns at various risk levels (portfolio theory)

These potential portfolio solutions may be plotted to create a view of the "efficient frontier."

Identifying and understanding the efficient frontier allows us to identify the best project portfolios at a given budget level and to assess the lost benefits or added costs associated with other than optimal portfolio selection.

As cost constraints are relaxed, additional or larger projects typically provide lower incremental returns. This is reflected in the flattening observ] v š Z (( ]] v š (Œ } v š] Œ v o } • o Ç u] Œ Œ } Œ rule, where 80 percent of all value available from all projects may be achieved from doing just 20 percent of the projects. This provides the program manager with a convenient tool for managem em prioritization and the development of critical controls for the program.

Characteristics of Successful Project Portfolios

Successful project portfolios:

- • • µ Œ ‰ Œ } i š • Œ o] P v Á] š Z v } Œ P v] Ì š] } v [• • š Œ š P]] Œ š]
- Are based on a sound portfolio decision process
- Comprise projects that are resilient to the effects of uncertainties embedded in the project selection process
- Recognize the shift in constraints as one moves from a project to program context

Constraints Shift Under Program Management	
Project	Program
Scope	Alignment with strategic business objectives
Schedule	Required resources
Cost	Benefits

Successful project portfolios recognize the critical aspect of the project selection process is represented by the quality of the decisions made.

Conclusion

Objectivedriven, biasfree project portfolio analysis and selection provide the owner and program manager with another tool to:

- Build organizational alignment.
- Understand program sensitivities to changes in acceptable risk levels and profile.
- Understand the influence of budget and other constraints on benefit maximization
- Identify project priorities, sequencing, and effects of interdependencies and synergies
- Establish an appropriate set of critical controls

For Further Reading: Executive Insights

The Importance of Strategic Business Objectives
Trust
Know What You Are Trying to Accomplish: The Primacy of the Scope Baseline

References

Markowitz, H.M., "Portfolio Selection" The Journal of Finance 7 (1): 77–91. doi:10.2307/2975974. http://jstor.org/stable/2975974. March 1952
Strategic Program Management; published by the Construction Management Association of America (CMAA); ISBN 978-0-9815612-1-9; July 24, 2008
Topics in Strategic Program Management; ISBN 0-9557-52887-5; July 2010
Project Selection in Large Engineering Construction Programs; PM World Today, Vol. XIII, Issue V; May 2011

About the Author

Bob Prieto was elected to the National Academy of Construction in 2011. He is a senior executive who is effective in shaping and executing business strategy and a recognized leader within the infrastructure, engineering, and construction industries.