

Best Practice Guidebook



Innovation Portfolio Management: Balancing Value and Risk

Beta Inc.*

INDUSTRY

Information and Communication Technology

REVENUE (2011)

\$3–5 billion USD

Applicability to Executive Functions



Challenge

Beta seeks to generate better returns from its product portfolio (both existing products and those still in development). However, the company struggles to evaluate and compare the value and risk of all projects, which hampers funding and decision-making.

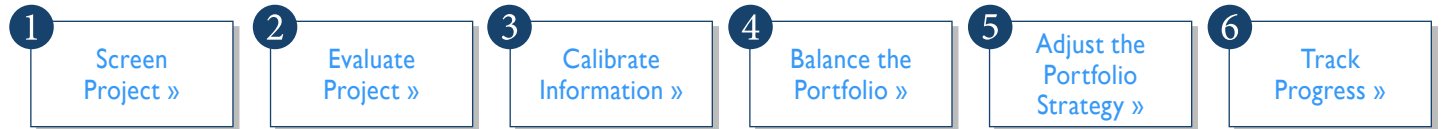


Solution

Beta implements a six-step portfolio management process to focus on the most valuable opportunities.



Solution Components



Beta's Key Lessons Learned

- There is no perfect portfolio management process. Instead focus on agility and the business impact of your portfolio. Then iterate at each portfolio cycle, always improving and increasing project and portfolio value.
- Successfully combining portfolio and project management requires the right balance of people, process, and systems. Over- or under-resourcing any of these areas may undermine the success of the other two. Too much attention to systems can lead to excessive documentation, and a disproportionate focus on processes can result in automating obsolete approaches. Finally, too much attention on people can lead to an ad hoc system and slow down the process.

[READ MORE »](#)

 Contents

- Overview Page 3
- Screen Project 4
- Evaluate Project 5
- Calibrate Information. 9
- Balance the Portfolio 10
- Adjust the Portfolio Strategy. 12
- Track Progress 13
- Business Results 14
- Key Lessons Learned 15
- Supporting Tools & Resources 16
 - Glossary of Terms 16
 - Investment Criteria by Life Cycle Stage 17
 - How to Build a Tornado Diagram 18
 - SmartOrg 19



HEADQUARTERS United States
 GEOGRAPHIC FOOTPRINT Global
 OWNERSHIP Public
 EMPLOYEES (2011) 10,000–15,000

 Business Results

- 100% increase in products successfully launched
- 30% increase in the portfolio’s return on investment (ROI)

 Resources Required

- Process owner and small process team—portfolio management and quality assurance
- Portfolio Management Software—portfolio evaluation and tracking

 Contact the Growth Team Membership™ (GTM)

 GTMresearch@frost.com

 www.gtm.frost.com

 twitter.com/Frost_GTM

Beta's portfolio management process evaluates projects individually and as part of the innovation portfolio

Innovation Portfolio Management Process and System

Process Owner

COMPOSITION
Senior product development manager and a staff of two experienced engineers

ROLE
Facilitates and maintains the portfolio management process and system

Executive Team

COMPOSITION
CEO and senior management in R&D, Marketing, Manufacturing, and Finance

ROLE
Sets the company's innovation strategy and manages the innovation portfolio

Project Teams

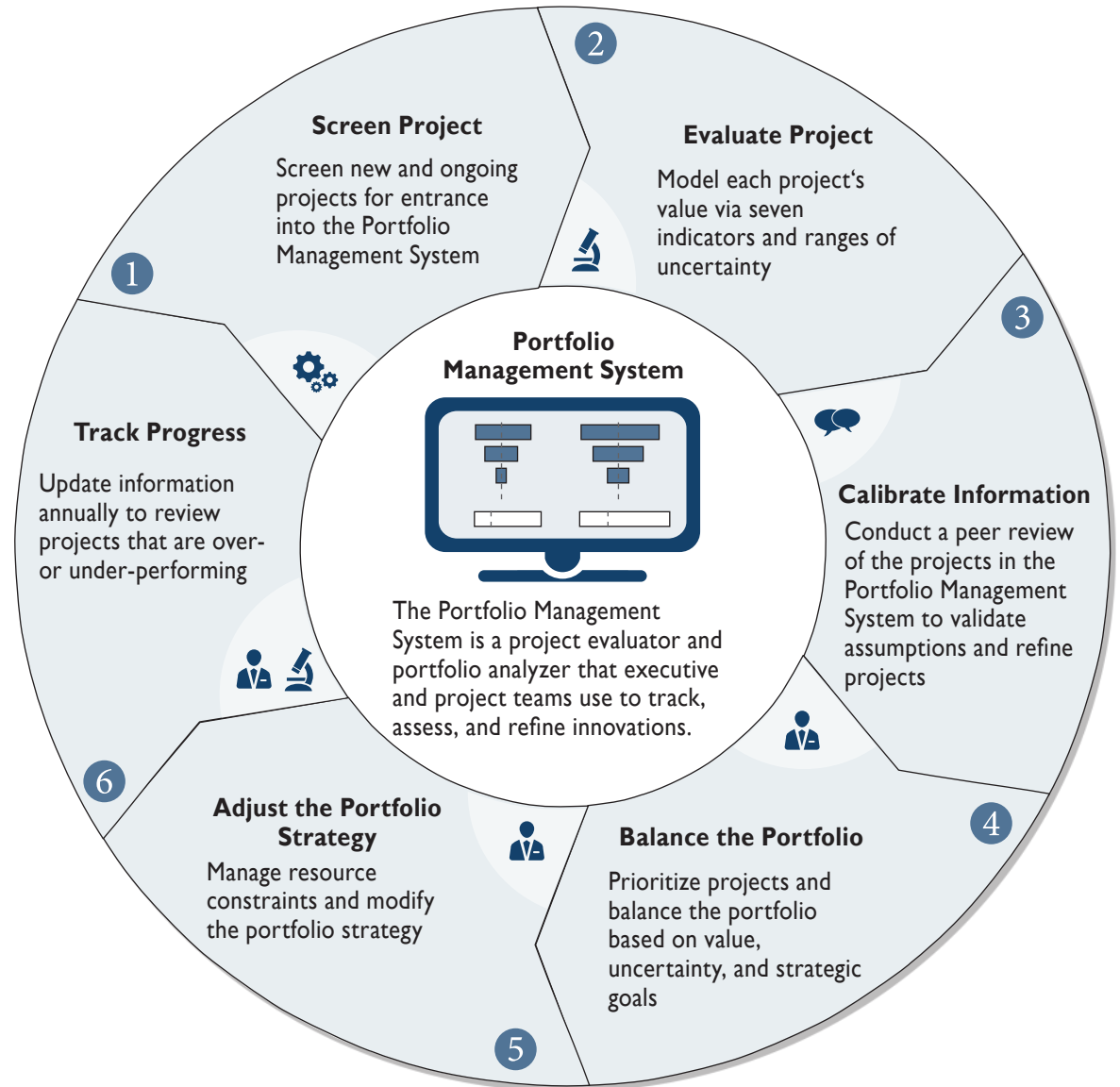
COMPOSITION
Representatives from R&D, Product Launch, Marketing, Sales, and Finance; each team is led by a Project Leader who reports directly to the Executive Team

ROLE
Develops the project and tracks its metrics in the Portfolio Management System

Calibration Committee

COMPOSITION
Project Leaders; select technical, market or topical experts; and the Executive Team

ROLE
Conducts a peer review of all the projects in the Portfolio Management System before portfolio prioritization and funding decisions are made



1 **Screen Project** 

KEY TAKEAWAY: Limit entry into the portfolio management process

The process owner determines which projects enter the portfolio based on their strategic fit, likelihood of success, and commercial potential

Portfolio Screening Criteria



Case-In-Point: Mark

Background: Beta is one of the top three firms in the statistical analysis software industry that use large repositories of data to produce actionable insights. An engineer at Beta has proposed a new product, Mark, which analyzes marketing campaign effectiveness via the social media activities associated with a specific product/service.

- ✓ **Market need:** The market needs software that can provide insight and compile data from multiple social media networks.
- ✓ **Market saturation:** The market is a new and poorly served sub-sector within the larger statistical analysis software market.
- ✓ **Market growth:** The sub-sector is growing by more than 15% each year and is expected to be a \$3 billion market within five years.

- ✓ **Strategic alignment:** The potential to grow Beta’s presence in this fast-growing market segment makes this a strategically relevant project.
- ✓ **Core competency:** This product would capitalize on Beta’s statistical analysis competencies.
- ✓ **Market share:** Beta controls 30% of the market for statistical analysis products and 5% of the social media data analysis sub-sector.

Mark qualifies as an EMERGE project; based on its potential market, it should meet the investment hurdles for this stage.

APPROVED

The process owner screens Mark against the criteria and approves it to enter the portfolio.

* See the [Tools & Resources section](#) for more information on the Product Life Cycle Stages.

2 Evaluate Project 

KEY TAKEAWAY: Establish proof points to assess the chance of success at each product development phase

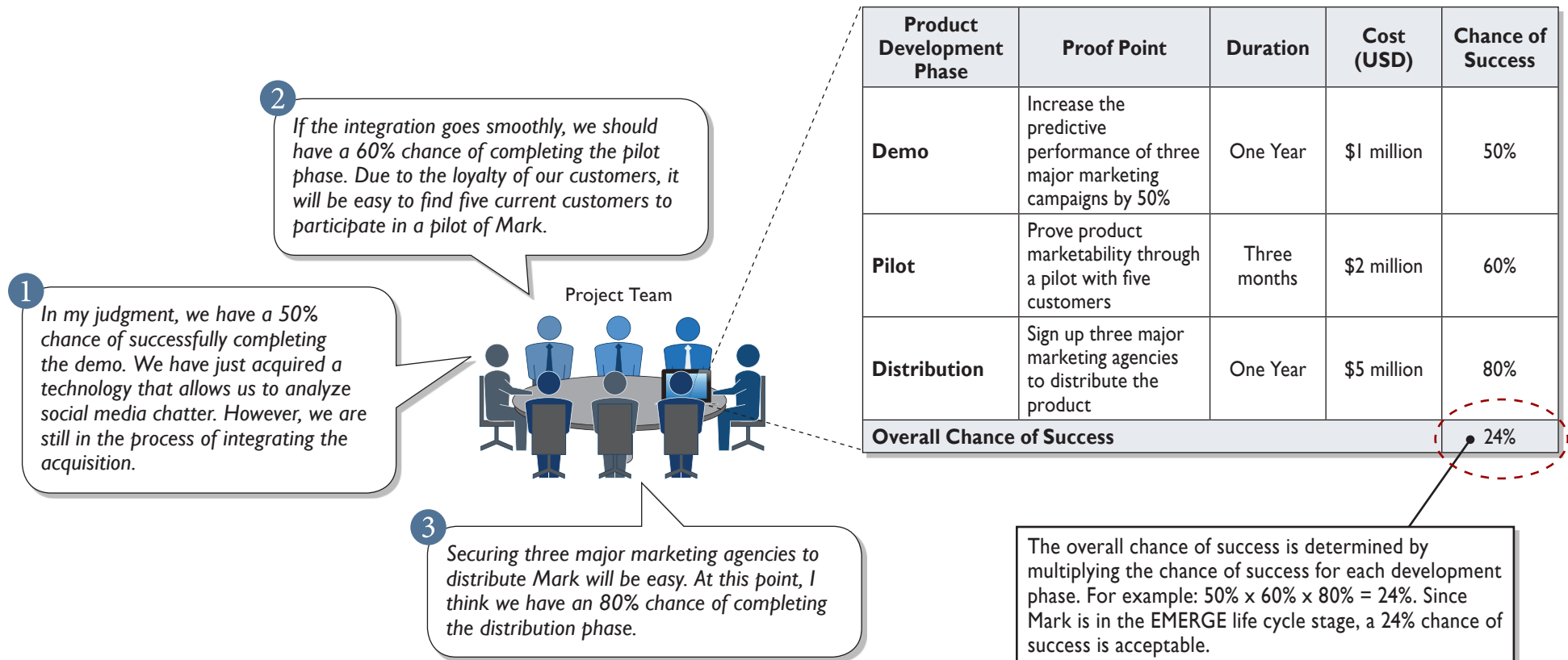
Instead of focusing on work-based project milestones, the Project Team uses proof points to estimate projects' chances of success and to ensure that awareness of risk guides the development process

Proof Point Development

Case in Point: Mark

PROOF POINTS

Proof Points allow the Project Team to determine project viability and anticipate difficult development phases. The Project Team uses the following question as a prompt to identify proof points: **What would you want to know before mortgaging your house to fund the product?**



2 Evaluate Project 

KEY TAKEAWAY: Estimate the project’s commercial value using a concise, fixed set of indicators

*The Project Team forecasts the project’s commercial value by estimating high, base, and low values for seven commercial indicators, which makes the level of **uncertainty** explicit and simple to understand*

Forecasting Commercial Value Workshop

The project leader facilitates a two-hour discussion with the Project Team to build a model of the project’s value. To avoid false precision and reflect the innate ambiguity of forecasts (and to save time), the project’s model is based on existing research and the team’s expertise.

Discuss

The Project Team discusses the available evidence (existing research, data, the team’s experience) on the project.

Estimate

The Project Team estimates **high**, **base**, and **low** values for each of the seven indicators. Values reflect the range of uncertainty and risk around each indicator.

Document

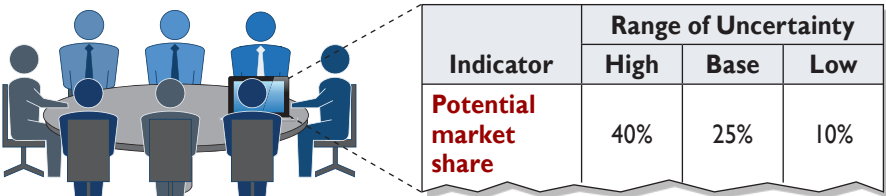
The Project Team documents the rationale for the range of uncertainty. The available research and indicator values are revisited annually or when information changes.

IDENTIFYING THE INDICATORS OF COMMERCIAL VALUE

Beta evaluated 20 years of financial data to reduce the 100+ data points used in innovation business cases to the 7 listed below. By consolidating the indicators, Beta avoids false precision, models each project’s value and risk with less effort, and compares projects objectively.

Seven Indicators of Commercial Value:

1. Total available market
2. Market penetration
3. Potential market share
4. Market duration
5. Unit price
6. Fixed annual cost
7. Sales and marketing costs



Indicator	Range of Uncertainty		
	High	Base	Low
Potential market share	40%	25%	10%

Project Team

Our market share could be as low as 10% if competitors get to market before we do.

However, since there is little competition in this space, our market share could be as high as 40%. We seem most likely to garner approximately 25%.

PORTFOLIO MANAGEMENT SYSTEM

All project teams must enter and update the range of uncertainty for each value indicator in the Portfolio Management System as projects go through the product development process. This enables the executive and project teams to:

- Assess viability, uncertainty, and potential value
- Refine the indicators through additional research
- Conduct side-by-side comparisons of projects’ value and risk
- Refine the project mix in the portfolio
- Track projects’ value and role in the portfolio over time
- Coordinate geographically disperse teams

2 Evaluate Project

KEY TAKEAWAY: Pinpoint the indicators with the greatest impact on a project’s net present value (NPV)

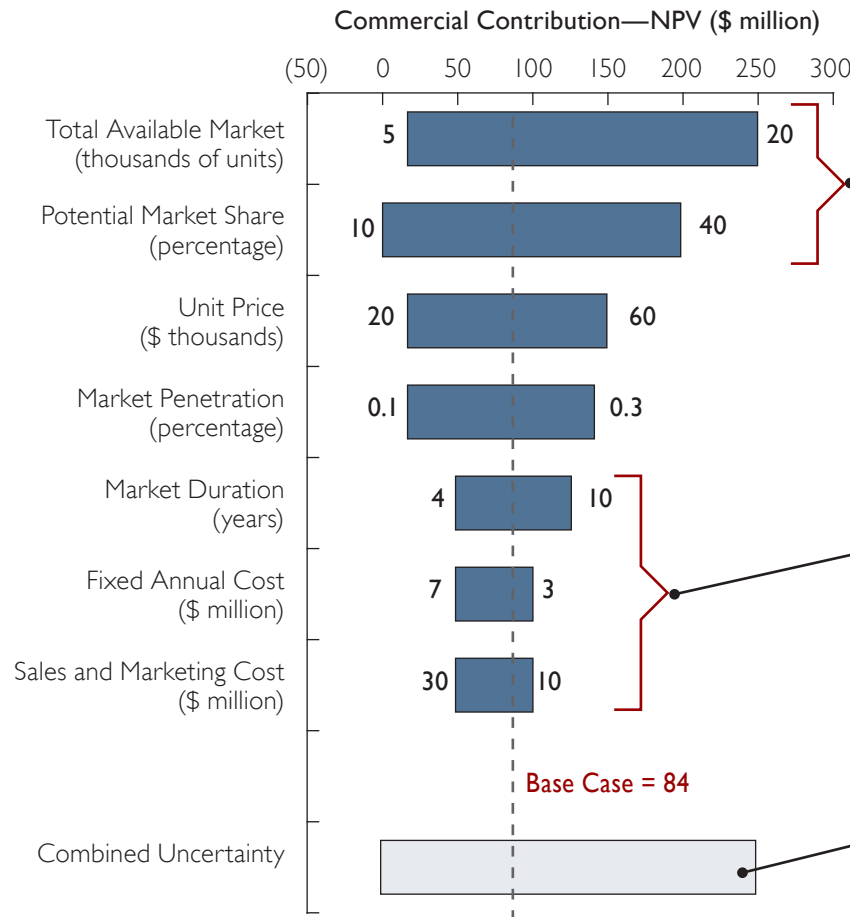
The Project Team uses a tornado diagram to model the indicators of *commercial contribution* for the project and depict each indicator’s impact on NPV

Tornado Diagram
Case in Point: Mark

BUILDING A TORNADO DIAGRAM

Tornado diagrams are created by:

- Calculating the Base Case NPV using the base input for all seven indicators of commercial value
- Determining the impact of the range of uncertainty on value by calculating the NPV for the low and high values of each indicator (keeping all other factors constant at the *base case*); the length of each bar illustrates the uncertainty associated with each indicator
- Computing the “Combined Uncertainty,” which depicts the range of commercial contribution for the project by combining all of the indicators’ high, base, and low values



The longer bars signify factors with high levels of uncertainty and impact on the project’s Base Case NPV. **This tornado diagram** reveals that the Project Team lacks sufficient information on Mark’s total available market.

The smaller bars signify factors with less uncertainty and a lower impact on the NPV. **This tornado diagram** indicates the *project costs* (fixed annual and sales and marketing) do not require further investigation.

The width of the combined uncertainty bar indicates the overall uncertainty of the project’s commercial value: *downside risk* and *upside potential*.

* See the [Tools & Resources](#) section for more information on how to build a tornado diagram.

2 Evaluate Project

KEY TAKEAWAY: Improve project value and reduce risk by addressing the areas of greatest uncertainty

The Project Team identifies the indicators with the highest range of uncertainty...

...conducts additional research to increase its understanding...

...and refines the indicators' values, thereby reducing project risk and increasing NPV

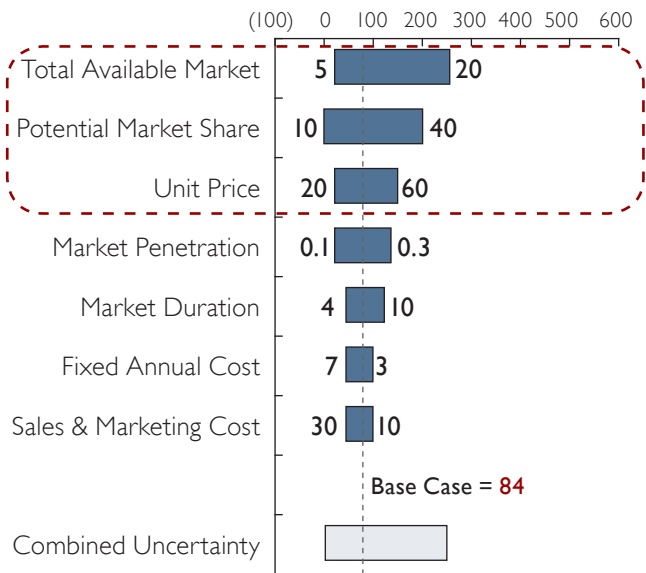
Project Refinement

Case in Point: Mark

Initial Evaluation

The total available market, potential market share, and unit price have the highest ranges of uncertainty and are the greatest sources of risk. The Project Team needs to conduct additional research to reduce its uncertainty around these indicators.

Commercial Contribution—NPV (\$ million)



Clarification

To refine its assumptions, the Project Team:

Organizes a conference on social media data analysis

Insight: Social media platforms and activities are increasing. The market's growth rate is therefore larger than the previous assessment of 15%, increasing the **total available market** by 5%.

Surveys 1,000 social media professionals on their data analysis needs and product use

Insight: Few social media analysis providers can match Beta Inc.'s reputation in the statistical analysis software market. Beta's **potential market share** is therefore larger than initially expected.

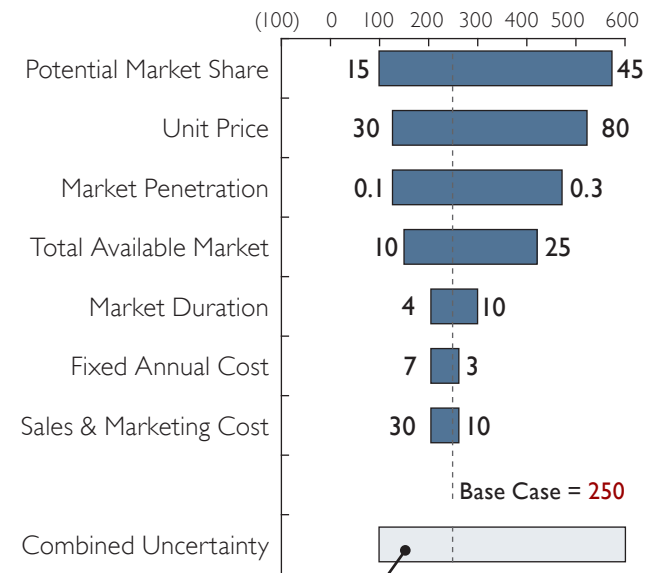
Conducts in-depth interviews with 20% of the survey respondents

Insight: Social media professionals use multiple products to measure their campaigns. Mark's **unit price** can be increased, because, it will consolidate the functionality of several of these products.

Adjusted Evaluation

By adjusting the total available market, unit price, and potential market share values, the downside risk is reduced and the Base Case NPV of the project is increased.

Commercial Contribution—NPV (\$ million)



Though the combined uncertainty range has increased, the downside risk has improved from a negative value to more than \$100 million. Additionally, the upside potential has increased from approximately \$300 million to \$600 million.

Note: In many cases, project refinement takes place between product development cycles.

3 Calibrate Information

KEY TAKEAWAY: Use peer reviews to ensure project team assumptions are credible and comparable

The Calibration Committee compares the Base Case NPV and indicators of commercial value for all projects in the portfolio, identifying inconsistencies and refining project expectations accordingly

CALIBRATION GOALS

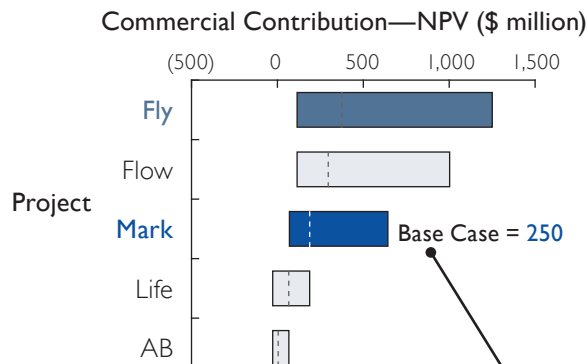
Portfolio management necessitates go/no-go decisions that require high standards for project comparison. The calibration committee enables this comparison by:

1. Checking the validity of the project teams' inputs and assumptions
2. Standardizing assumptions for similar projects
3. Refining projects' expectations based on recalibration efforts

Calibration Committee Review

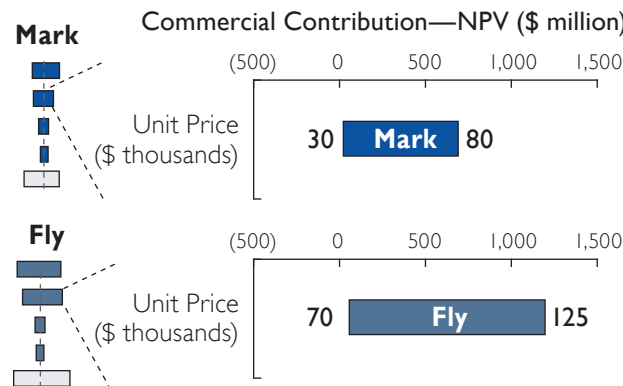
Case in Point: Mark versus Fly

Compare Mark to the Portfolio at Large



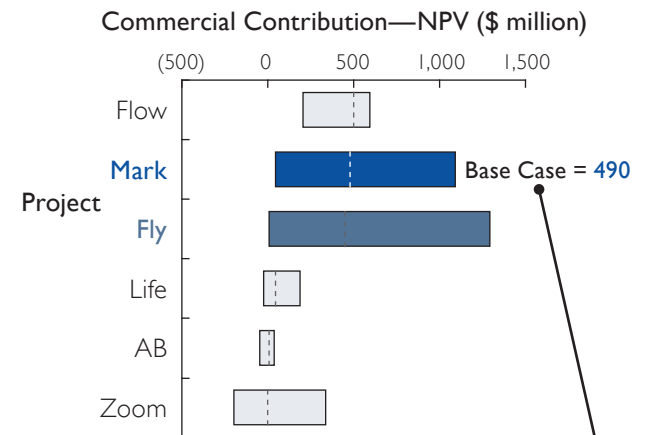
While the Project Team believes **Mark** has significant commercial potential, its Base Case NPV (represented on the combined uncertainty bar) is low compared to the other projects in the portfolio.

Compare Mark and Fly's Indicators



Fly and Mark are targeting the same industry, but their assumptions about the unit price vary widely.

Refine Mark's Assumptions and Expectations



Adjusting the unit price to match Fly's increases **Mark's** overall NPV and almost doubles its Base Case NPV.

According to the Portfolio Management System, the **Fly** Project Team researched pricing models for this industry. Therefore, we trust the **Fly** team's assumptions about the unit price, and we should use its pricing model for **Mark**. We should use this pricing model for future projects in this industry as well.

Why does **Fly** have a better upside potential than **Mark**?



4 Balance the Portfolio 

KEY TAKEAWAY: Prioritize all projects for funding in the portfolio based on their comparative value, cost, and uncertainty

The Executive Team uses a CFO Chart to compare projects in the portfolio based on their investment productivity (project value to cost ratio)...

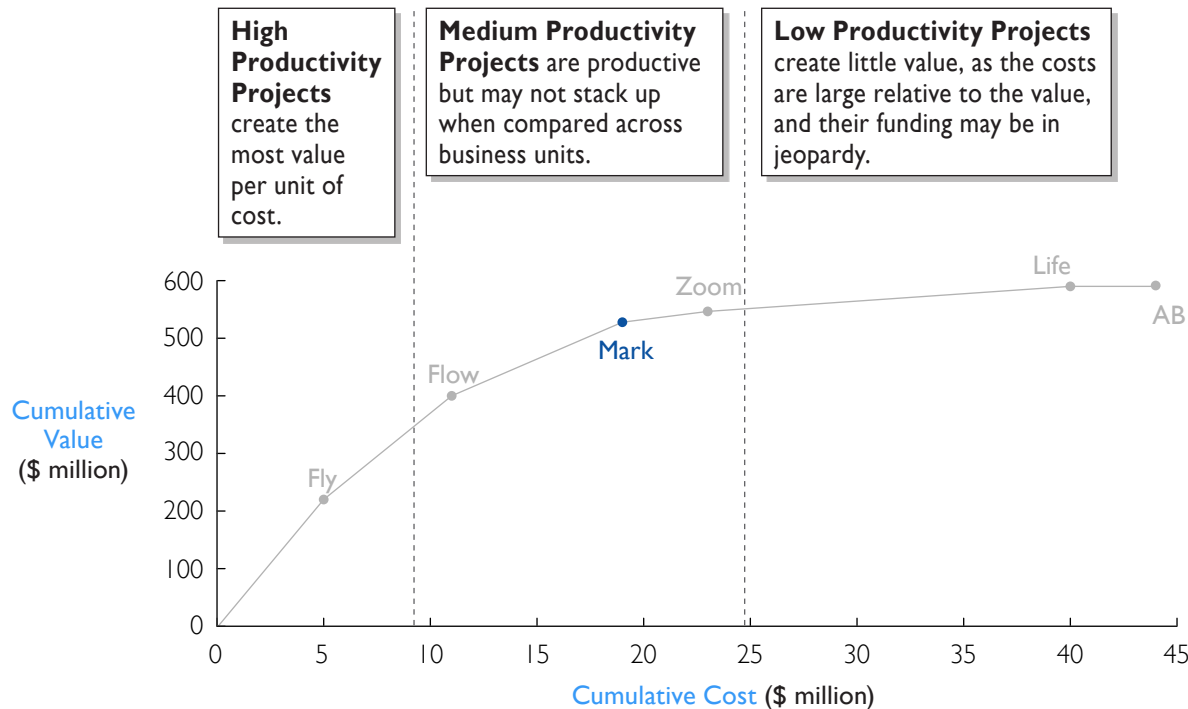
...and the Commercial Contribution Chart contrasts their potential value and combined uncertainty (risk)

CFO Chart:
Measures Investment Productivity

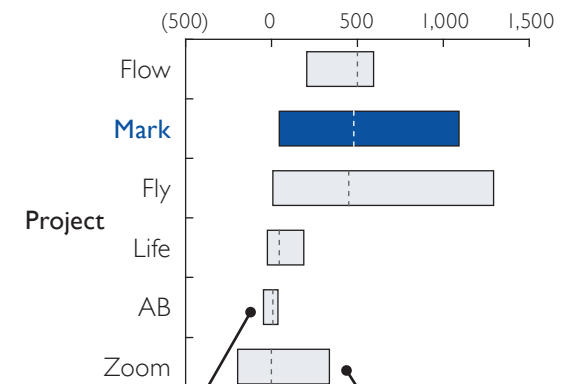
Commercial Contribution Chart:
Compares Combined Uncertainty

The CFO Chart permits apples-to-apples comparisons by classifying each project as high, medium, or low investment productivity and plotting them in descending order of productivity.

The Executive Team takes risk into account when finalizing project funding by examining the Commercial Contribution Chart. The chart ranks projects' combined uncertainty bars, by their Base Case NPV, to underline risk and potential value.



Commercial Contribution—NPV (\$ million)



AB will not be funded because of its low productivity, negligible Base Case NPV, and minimal upside potential.

Zoom's productivity ratio exceeds that of Life and AB. However, Zoom's combined uncertainty bar is asymmetrical: very low Base Case NPV, small downside risk, but significant upside potential, comparable to Mark's. The Executive Team concludes that the uncertainty is too high and will only fund the Project Team to conduct research that reduces the downside risk.

4 Balance the Portfolio

KEY TAKEAWAY: Assess the portfolio's ability to meet strategic and business line goals

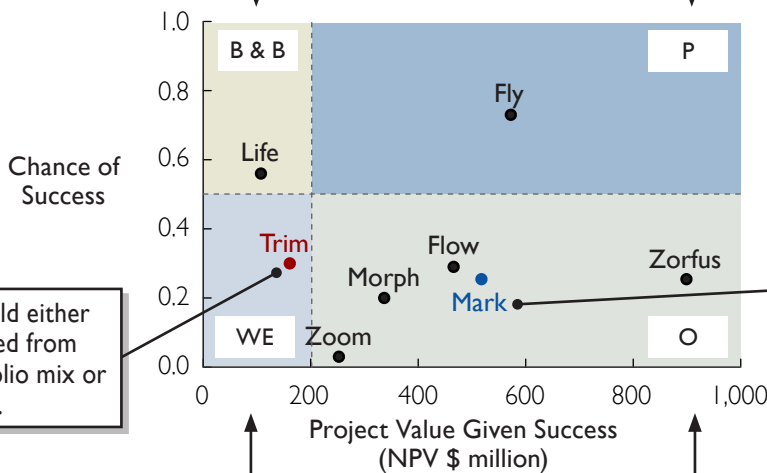
The Executive Team balances the mix of short- and long-term projects within the portfolio to meet strategic priorities...

Managing Portfolio Mix

The Executive Team assesses the portfolio mix (balancing risk and return) using the following classification scheme: Bread & Butter, Oysters, Pearls, and White Elephants.

Bread & Butter (B & B) are line extensions, cost reductions, or incremental improvements. They deliver moderate innovation with high odds of technical success but low commercialization value. The portfolio relies on these projects for continuous revenue.

Pearls (P) are easy to accomplish and promise substantial commercial value. In many cases, Pearls are mature Oysters.



Trim should either be removed from the portfolio mix or revamped.

Mark has the potential to be a game-changing product, so it needs to secure its proof points.

White Elephants (WE) are often failed Oysters, address a narrow interest, or are mapped to the wrong need. They are difficult to accomplish, have limited value, and should either be terminated or adjusted to increase their value.

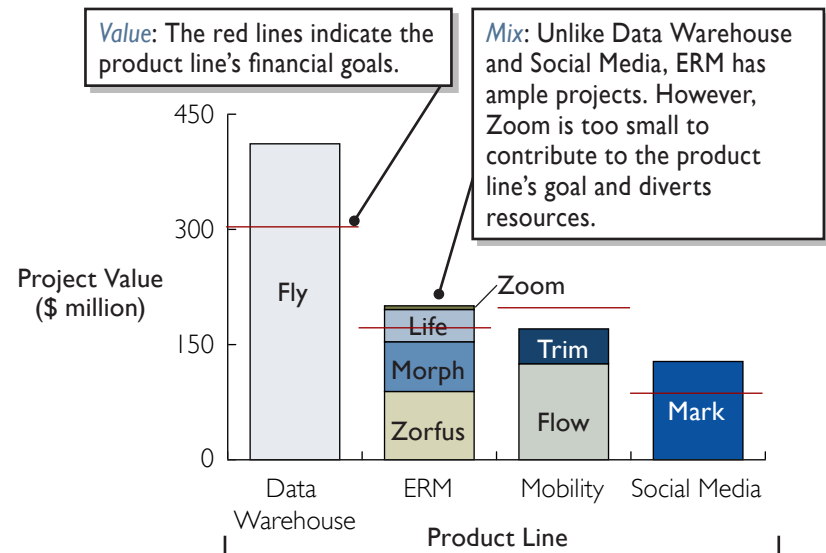
Oysters (O) are new to market or breakthrough technologies. They are technically challenging but have commercial promise as future Pearls. To support long-term growth, the portfolio needs multiple Oysters.

...and compares projects by product line to ensure all product lines attain their financial goals

Project Value by Product Line

The Executive Team conducts a side-by-side comparison of the projects in each product line to assess potential value, product mix, and gaps.

<p>Value</p> <p>Do the products' cumulative value meet the product line's revenue goals?</p>	<p>Mix</p> <p>Will the product line's project mix meet expectations?</p>	<p>Gaps</p> <p>What product lines are over- or under-represented in the portfolio?</p>
---	---	---



Value: The red lines indicate the product line's financial goals.

Mix: Unlike Data Warehouse and Social Media, ERM has ample projects. However, Zoom is too small to contribute to the product line's goal and diverts resources.

Gaps: Mobility does not have enough projects to meet its goal. Data Warehouse and Social Media's portfolios rely on a single project, which undermine their ability to meet their financial goals. They need to reduce risk and diversify by adding more Bread & Butter projects.

5 Adjust the Portfolio Strategy

KEY TAKEAWAY: Adjust financial goals and resource constraints to optimize the portfolio

The Executive Team rolls up the risk-adjusted financial values for all the projects to ensure Beta can attain its financial goals and identifies any necessary resource adjustments

Portfolio Strategy and Long-Term Financial Goals

1 Will we meet our revenue goal?

The Executive Team assesses the portfolio's ability to meet the company's financial goals.

Our goal is to generate \$500 million in revenue from innovation by 2015. However, the expected value of our portfolio's revenue for 2015 is only \$250 million. We need to identify ways to improve the portfolio's value.



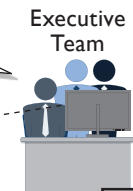
	2012	2013	2014	2015
Revenue	0	6	54	250
Cost	0	5	47	202
Profit	0	1	7	48

2 What can we do to meet our goals?

The Executive Team can use several options to improve the portfolio's value:

- ✓ Adjust the portfolio strategy:
 - Acquire a company for its portfolio or capabilities
 - Reduce the revenue goal
- ✓ Improve risk-adjusted value:
 - Augment the portfolio with additional projects
 - Improve the Chance of Success for the projects in the portfolio:
 - Review the portfolio mix and assumptions
 - Pinpoint and adjust resource restraints

If we hire an external marketing team to assist with Fly, Mark, and Life, we will have the resources we need to support these projects, ensure they meet their proof points, and achieve our goals.



		Portfolio Projects			
		Zorfus	Fly	Mark	Life
Productivity		94.63	71.18	15.25	2.3
Cumulative Resources	R&D FTE	3.6	4.8	8.4	12
	Marketing FTE	2.7	4	6.7	9.4
	Non-staff Cost	\$5.9	\$10.9	\$16.8	\$22.7
	Total Cost	\$6.5	\$11.5	\$18.1	\$24.6

Red values indicate resource restraints.

6 Track Progress 

KEY TAKEAWAY: Revisit assumptions and refine projects based on their commercial value and impact on the portfolio mix

The Executive Team revisits assumptions from the project business cases via year-on-year performance reviews—comparing forecasted and current performance, adjusting over- or under-performing projects...

...and assessing the effect on the portfolio mix as a whole

Annual Value-Tracking Assessment

Case in Point: Mark

The Executive Team conducts annual in-depth project reviews for projects with a +/- 10% difference in value.

Track Portfolio Mix

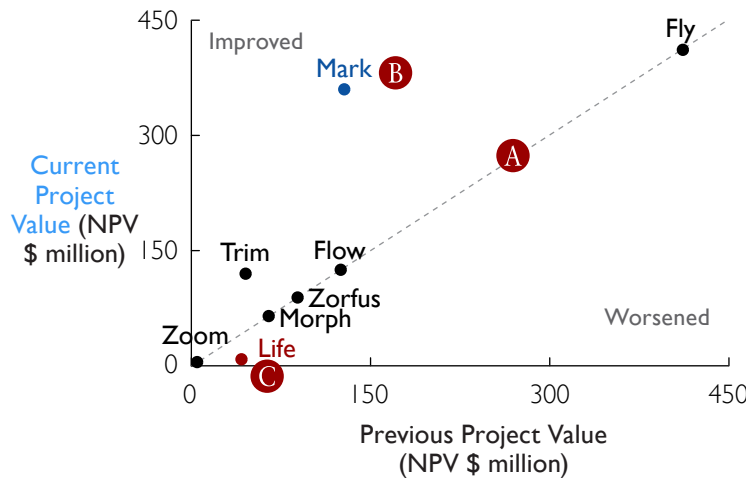
Case in Point: Mark

The Executive Team assesses how each project's role in the portfolio shifts and adjusts the portfolio strategy accordingly.

A **Baseline:** The business case for each project establishes the baseline for that project's value.

B **Mark** has performed well above its previous baseline value, as the technical challenges were not as difficult as the Project Team expected. The Executive Team will increase **Mark's** resources for expansion to additional markets.

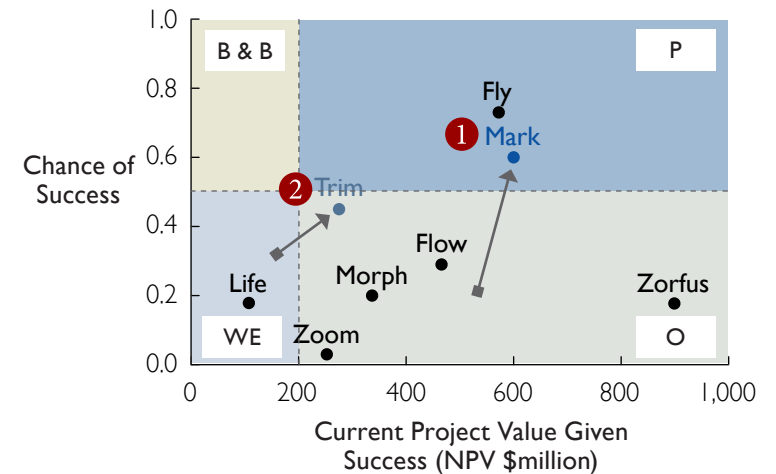
C **Life** is underperforming due to changes in the market, so it will be terminated and its resources reallocated to **Mark**.



NEXT STEPS

The Executive Team prescribes next steps to address the root cause of the change, from increasing funding for high-performing projects to risk mitigation or project termination for underperforming projects.

1 **Mark** achieved Pearl status quickly and therefore will be launched in other markets.



2 The Project Team overcame the barriers to **Trim's** market potential. This ultimately increases its Chance of Success and makes it an Oyster.

Business Results

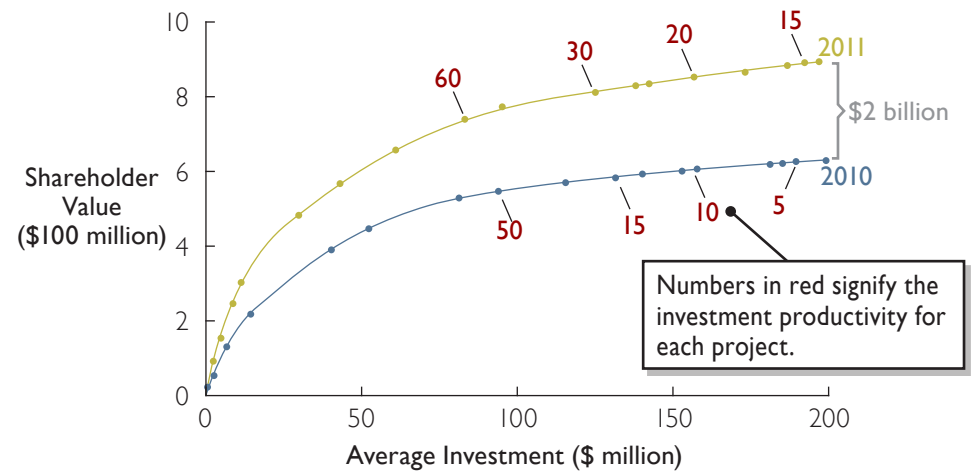
Beta has improved the performance of the portfolio...

Portfolio Performance Metrics

	2010	2011	Improvement
Ideas screened	20	35	60%
Projects approved for development	10	15	50%
Projects launched	3	6	100%
Projects terminated	4	8	100%

...increased average investment productivity by 30% ...

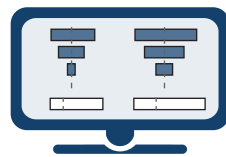
Portfolio Return



...and increased the objectivity and effectiveness of project evaluations

Project Management Improvement

Portfolio Management System



The portfolio management process has helped Beta:

- Reduce the amount of time it takes a project to move through the innovation process
- Improved efficiency by removing four man years of overhead effort from the annual portfolio cycle
- Conduct consistent project evaluations, including comparison of different types of projects for funding decisions
- Weed out underperforming projects quickly
- Facilitate cross-regional projects

Key Lessons Learned

Profiled Company Perspective

- There is no perfect portfolio management process. Instead focus on agility and the business impact of your portfolio. Then iterate at each portfolio cycle, always improving and increasing project and portfolio value.
- Successfully combining portfolio and project management requires the right balance of people, process, and systems. Over- or under-resourcing any of these areas may undermine the success of the other two. Too much attention to systems can lead to excessive documentation, and a disproportionate focus on processes can result in automating obsolete approaches. Finally, too much attention on people can lead to an ad hoc system and slow down the process.
- Data modeling is an effective way to reduce effort and save time without sacrificing information. Less can be more when you don't focus on a single, "perfect" number.
 - Allowing users to reflect uncertainty in their inputs generates realistic values and data ownership. The inputs also show project teams where to reduce project uncertainty and improve project value.
- A system that is transparent to all stakeholders will help you:
 - *Receive immediate feedback*—clear project metrics and investment guidelines provide teams with a frame of reference for the difference between marginal and acceptable projects.
 - *Build trust in the funding process*—a straightforward project approval process and clear prioritization criteria build trust for the process among stakeholders. Consensus on which projects should be funded, rejected, or discontinued is much easier to achieve when everyone is referencing the same information.
- Not all portfolio management technology solutions are created equal. Finding the right software designed for the task is important. Beta was looking for portfolio and project management tools that could help track project value, identify uncertainties, and present alternatives through quantitative modeling. Beta ultimately chose Portfolio Navigator by SmartOrg.

Supporting Tools & Resources

Glossary of Terms

Base Case: When all the indicators are held at their base values, the resulting scenario is referred to as the base case. In business situations, the base case metric may be the NPV of commercial contribution.

[GO BACK »](#)

Baseline: This is the project's value computed initially and marked for comparison over time.

[GO BACK »](#)

Chance of Success: This is a number between 0% and 100% that is obtained by quantifying the team's uncertainty about the success of a phase of the project. Typically, high-quality assessments will be facilitated through calibrations and a discussion of the evidence at hand.

[GO BACK »](#)

Commercial Contribution: This is a probability distribution on value that answers the question, "So what if we are successful with this project?" and quantifies the impact of success. It is obtained by mapping out indicators of value, how they combine, their uncertainty, and the impact of that uncertainty.

[GO BACK »](#)

Cumulative Value: The y-axis value of a project on a CFO chart is the cumulative value of a project, which is calculated as the sum of the previous cumulative value and this project's value.

[GO BACK »](#)

Cumulative Cost: The x-axis value of a project on a CFO chart is the cumulative cost of this project, which is calculated as the sum of the previous cumulative cost and this project's cost

[GO BACK »](#)

Current Project Value: When information about a project changes, its value is recalculated and referred to as the current value. This is usually compared with the baseline value to see how the project has moved over time.

[GO BACK »](#)

Downside Risk: The possibility of an outcome that falls below expectations and the low end of a range of uncertainty.

[GO BACK »](#)

Expected Value: A common term used to refer to the sum of all of the probability-weighted NPVs. Also called "average," "mean," "probability-weighted average," or "risk-adjusted value" (see [Project Value](#)).

[GO BACK »](#)

High Value: This is the assessment of the high end of an indicator. Technically, the assessor would place a 10% probability of the indicator exceeding this value.

[GO BACK »](#)

Low Value: This is the assessment of the low end of an indicator. Technically, the assessor would place a 10% probability of the indicator being below this value.

[GO BACK »](#)

Net Present Value (NPV): The sum of the discounted present value of a time series of cash flows.

[GO BACK »](#)

Project Cost: This may be assessed as a deterministic number. It could also be assessed as a range, in which case the project cost will be summarized as a probability-weighted sum of that range.

[GO BACK »](#)

Project Value: This is calculated as the probability-weighted sum of NPV (Base Case NPV times the chance of success). It is usually lower than the mean of commercial contribution, because it accounts for the probability of failure.

[GO BACK »](#)

Risk : The range of uncertainty around the commercial value of the project.

[GO BACK »](#)

Uncertainty: A lack of information, knowledge of an outcome, or the possibility of different outcomes, for example: success or failure in projects, or a range of commercial results.

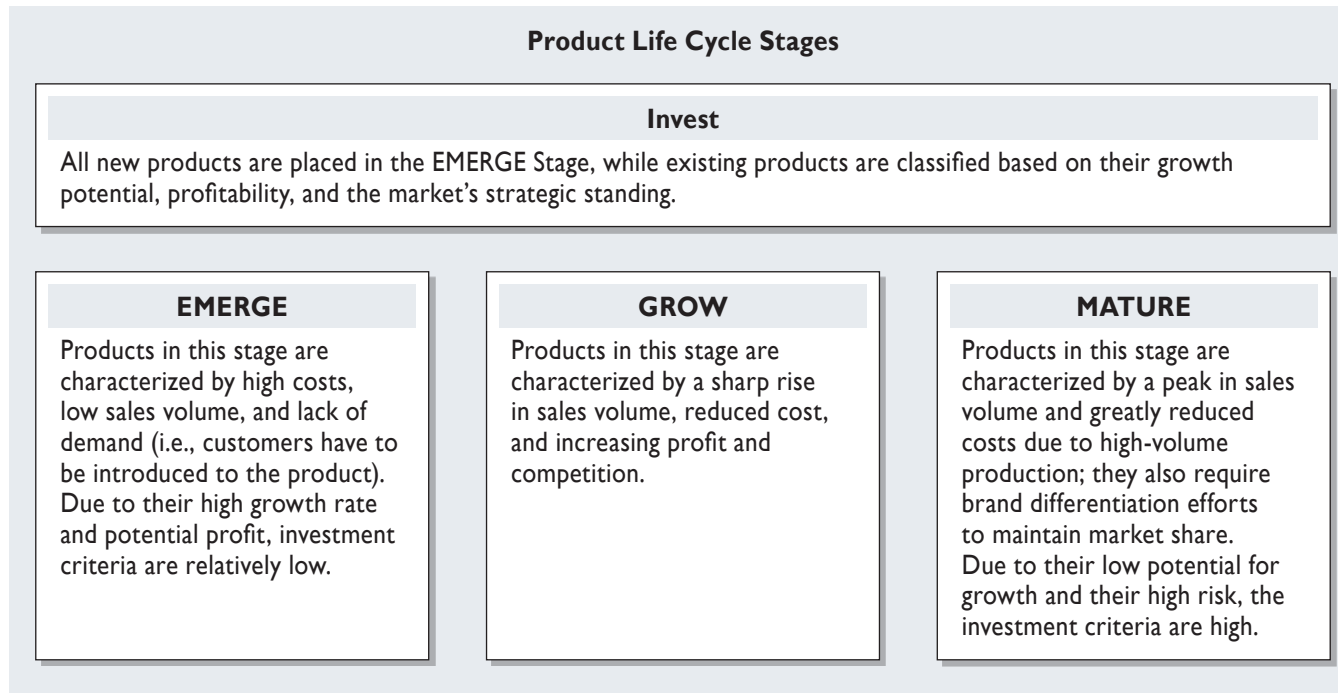
[GO BACK »](#)

Upside Potential: The possibility of an outcome that exceeds expectations and the high end of a range of uncertainty.

[GO BACK »](#)

Supporting Tools & Resources

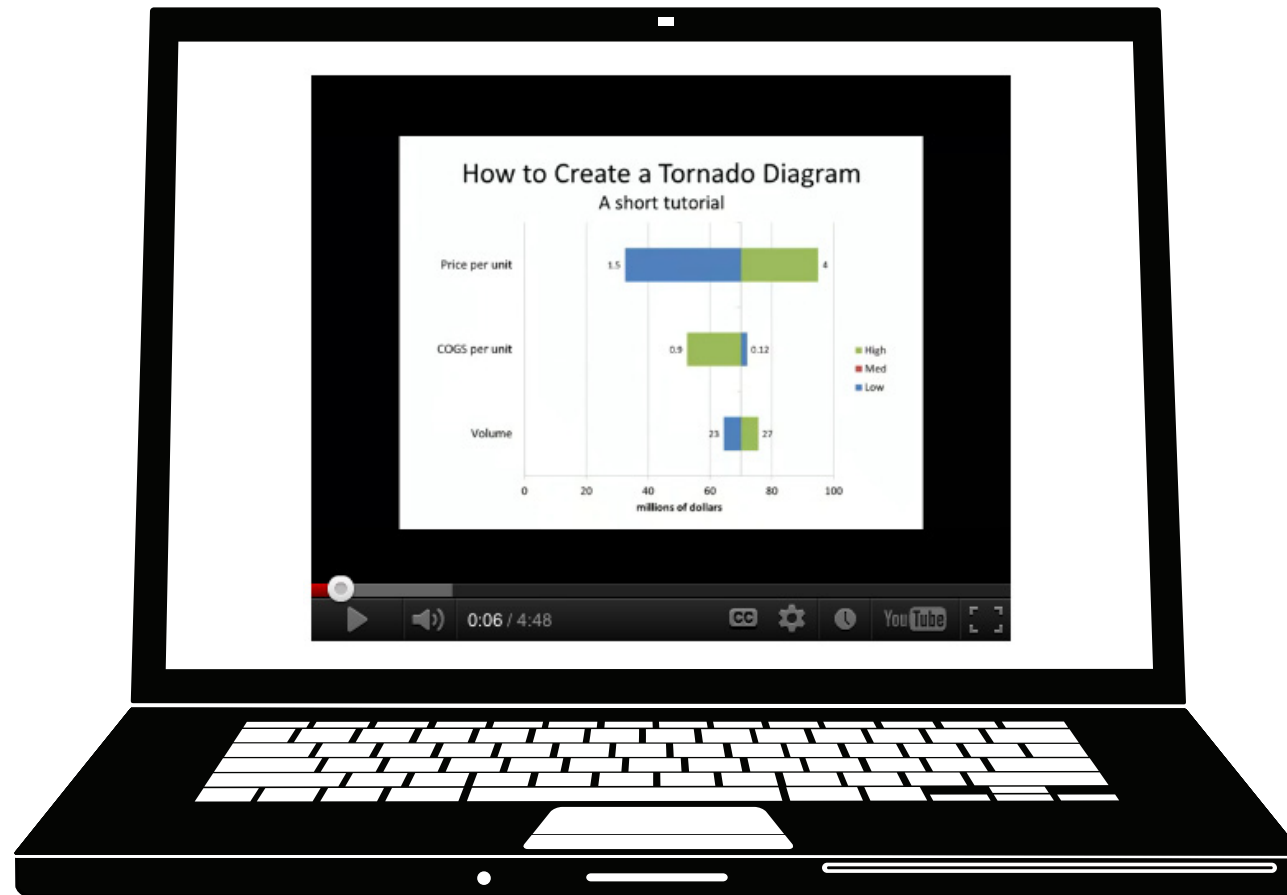
Investment Criteria by Life Cycle Stage



Supporting Tools & Resources

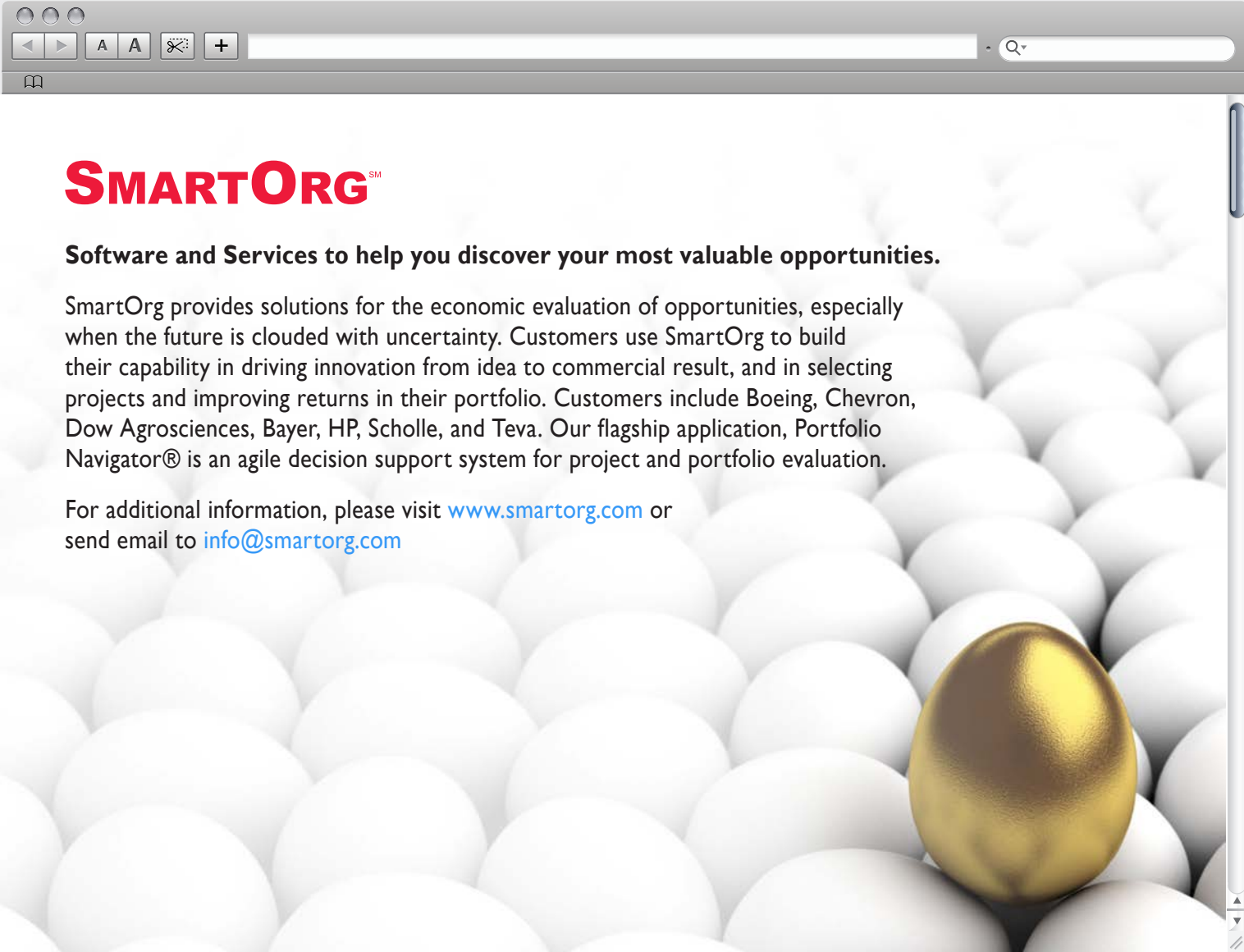
How to Build a Tornado Diagram

[Access the Video](#)



Supporting Tools & Resources

SmartOrg



SMARTORGSM

Software and Services to help you discover your most valuable opportunities.

SmartOrg provides solutions for the economic evaluation of opportunities, especially when the future is clouded with uncertainty. Customers use SmartOrg to build their capability in driving innovation from idea to commercial result, and in selecting projects and improving returns in their portfolio. Customers include Boeing, Chevron, Dow Agrosiences, Bayer, HP, Scholle, and Teva. Our flagship application, Portfolio Navigator® is an agile decision support system for project and portfolio evaluation.

For additional information, please visit www.smartorg.com or send email to info@smartorg.com

The image shows a screenshot of a web browser window. The browser's address bar is empty. The main content area features the SmartOrg logo in red and black. Below the logo is a headline in bold black text, followed by a paragraph of text describing the company's services and customers. At the bottom of the text is a call to action with two links. The background of the webpage is a 3D-rendered scene of many white eggs, with one egg in the foreground being a shiny, golden color.