

## *ISBM Nuggets: New Product Development Consortium*

# PORTFOLIO MANAGEMENT

A key points summary from the fourth meeting of the  
ISBM New Product Development Consortium

March 19, 2001  
Philadelphia, Pennsylvania

summary compiled by  
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### **Contents (in order of the conference agenda):**

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- [ISBM Member Practice Insight:](#) Richard Good, Mark Kinkelaar, and Michael Hnatow: Foamex International Inc.— *Foamex New Product Development*.
- [ISBM Member Practice Insight:](#) Edmund M. Ziegler: DuPont Consulting Solutions— *Portfolio Management*.
- [ISBM New Product Development Overview:](#) Ernie Maier, ISBM (formerly Business Development Director of 3M Co.)— *Strategic Product Portfolio Models*.
- [ISBM Featured Research Overview:](#) Dr. Scott J. Edgett: Product Development Institute and McMaster University— *New Product Portfolio Management: Benchmarking Best Practices*.

## **“OPEN MIKE” ON MEMBER ISSUES:**

A summary of comments as member company representatives discuss the status of their new product development (NPD) programs, their opportunities, and their challenges in an open forum introduced and moderated by Ernie Maier, ISBM Director.

### **Comment by a new business group manager within a large industrial manufacturer:**

As we reorganize to be more market- and less product-focused, we're searching for new strategic ideas such as portfolio management. It might also help us evaluate potential M&A partners.

**Comment by a director of a government-sponsored business training program:** Even small manufacturers need to learn how to handle projects in a portfolio manner, and recognize how dynamic their markets really are.

### **Comment by a new business manager at a division of a global chemical company:**

We've practiced stage-gate for six years, and learned that although it's good for getting projects done right, stage-gate doesn't help you do the right projects. So we have adopted the Product Line Planning process of the Product Development Management Association and we have benchmarked portfolio management best practices. I'm here to learn how we can improve.

**Comment by a chemical manufacturing marketing manager:** My question is how to translate customer needs into new product projects, or reposition mature projects.

**Comment by a chemical company information management executive:** We have a vigorous stage-gate process, and we're moving to portfolio management to achieve balance in our planning.

### **Comment by a diversified chemical manufacturer technology development adviser:**

Though our company appears to have greatly decentralized business units, there are substantial synergies among them. How do we design the best portfolios for managing them?

### **Comment by a specialty chemical company new product manager recently promoted to “portfolio manager,” a new title:**

I had been a team leader in stage-gate processes, but now the shoe is on the other foot and I've developed a new respect for what project managers do. I see them bogged down in paperwork and losing sight of stage-gate process goals. We need to balance the needs of efficiency and the accountability of putting things on paper. As portfolio manager, I champion new idea creation, getting projects out of the “fuzzy front end” and into the new product development pipeline.

**Comment by an industrial manufacturer's technical development manager:** A number of our business units use stage-gate, but the process is never fast enough to satisfy our commercialization people. We need a portfolio management process to allocate resources better and support the technical management strategy I am determined to develop for the company. We need to spot game-changing opportunities earlier and then exploit them.

**Comment by a product management director at a technology product and services manufacturer:** We have a stage-gate process. Now we need tools for balancing R&D effort on new product and product upgrade projects. We've also found our new product introduction process weak. Marketing needs to show it can deliver on projects.

**Comment by a planning director at a division of a diversified, global technology products company:** Rather than wait for OEMs to issue specs as our competitors do, we try to anticipate new product platform developments, then decide whether to buy or develop components for that platform. We use voice-of-the-customer research to develop our product specifications, and portfolio management to choose projects to back. Businesses, and groups within businesses, vigorously compete for resources.

**Comment by a market manager at a specialty chemical company:** We've managed to cut the paperwork and improve the process of top-down/bottom-up portfolio management. We have a good process. My job is determining which projects belong in the portfolio and not get bogged down in the detail that can obscure the end result when a product is developed.

**Comment by presenter Scott Edgett of the Product Development Institute:** Some of the major trends we see in our research:

- Rapid new product development process automation.
- A second wave of management demands to cut cycle time an additional 20-30 percent.
- More active senior management involvement in new product development, which is both good and bad:
  - Management support for new product budgets.
  - Management puts on the pressure and demands big hits, which might not be the best approach.
- More formal use of stage-gate processes.
- Globalization of new product development processes.
- More portfolio management to ensure companies back the right projects.
- More emphasis on communicating new product strategies.

**Comment by the planning director of a global services and software firm:** Our challenge is allocating resources across global markets differing by size, sophistication, and capability. We need to improve the integration of R&D into our processes, and we struggle with the question of how far to develop a project in specific markets.

**Comment by a basic chemicals technical services and applications director:** We've got a strong market and customer focus, but need a closer look at the processes we use. Adopting stage-gate helped us bring a commonality to different divisions' new product programs. Now we're adopting our "Idea Tracker" process across functions and customers to refine the new product process. As for portfolio management, each division does its own thing, but we expect to instill commonality through a new Six-Sigma team charged with developing a corporate portfolio management process.

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***ISBM Member Practice Insight:***

## **Foamex New Product Development**

*Adding a structured process to a turnaround company.*

### **Richard Good**

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### **Dr. Mark Kinkelaar**

Director of Business Development

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**Foamex International Inc.**

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### ***Foamex background***

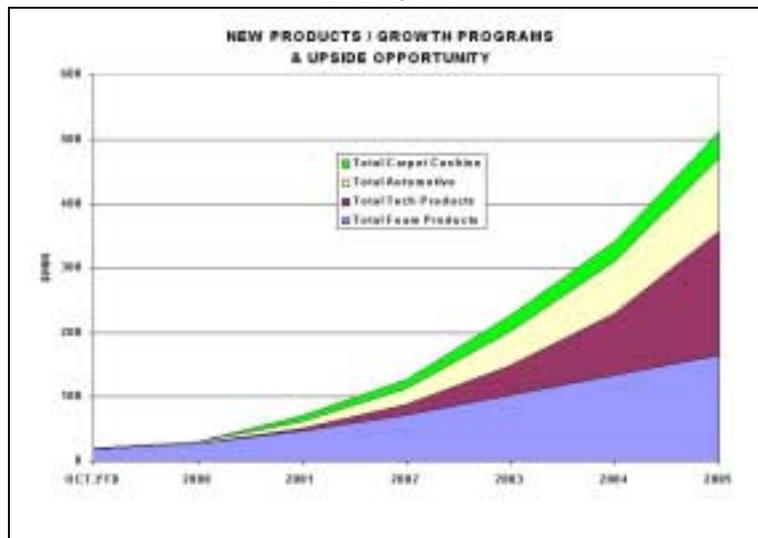
- Diverse applications.
  - #1 Polyurethane foam producer
  - Largest consumer of urethane chemicals
  - #1 Bedding foam supplier
  - #1 Carpet cushion producer
  - #1 Automotive trim foam & acoustics supplier
  - #1 Technical products leadership
- Largest polyurethane manufacturer in North America
  - 2000 sales of 1.3+ billion dollars
  - 56 facilities across the U.S.
  - Facilities in Canada, Mexico and Asia
- Technology leader
  - Manufacturing technologies
  - Dedicated research and development team
- Foamex provides its customers with
  - Outstanding service
  - High quality products
  - Innovative technologies
- Manufacturing sites across the U.S. and Mexico. Because shipping a product that is largely air is expensive, plants are close to major markets.
- Foamex is a turnaround story.

- Spring 1999: nearly bankrupt, overloaded with debt, result of consolidation and acquisitions
- New management team installed
  - Fiscal responsibility
  - New Strategic direction & vision
  - Market focused
  - Growth oriented / new products
- Long drought in new technology in the 1970s and '80s, and a patent expiration, hurt the business, as growth slowed from maturing core technologies.
- New technology bases developed in the 1990s for new growth development.

### ***Foamex “Vision 2005”***

- World's leading polyurethane foam producer:
  - Sales of \$2.5 billion (\$2.0 billion ex-acquisitions)
  - Developing strong brands, differentiated products and businesses
  - Recognized technology leader in polyurethane foam
- Growth in profitability while paying down debt
  - Cost Reduction – Retain only part of savings. Share additional value captured with customers.
  - Market Share Gain through new products. Share gain without new products leads to margin erosion.
  - Geographic Growth – South America, Asia, Europe
  - Acquisitions/Joint Ventures
  - New Product/New Market Development
- New product and market development, if done right:
  - Creates new markets unique to Foamex.
  - Increases margin. Some sales will displace our own existing sales, but at higher margins.
  - Allows growth in market share with reduced/no margin erosion.
  - Can have a pull through effect on commodity products.
  - We expect just 10-15 percent of company growth to be based on existing products (Exhibit 1).

### Exhibit 1



Source: Foamex International

- Technology strength
  - Foamex has the best technology and the most capable technical organization.
  - Recently strengthened Technical/Marketing Organization. Need to do more.
  - Technology has helped us reduce manufacturing chemistry costs in 2000.
  - We are refilling the pipeline with new products.
  - Some significant new ideas and opportunities.

#### *Synergistic growth platforms*

- Inkjet cartridge capillary foams
  - Combines advanced technologies for pore size, reticulation (creating the “skeleton” of the foam product, and felting (thermal setting of the reticulated foam).
- Exploitable opportunities for home furnishings, packaging, automotive, and high technology markets.
  - Variable pressure foaming, a patented new technology.
  - Surface modification technology, a patented foam cutting process.
  - Technical products group with global market opportunities.

#### *Challenges and opportunities*

- Choosing resource and program priorities across divisions.
- Program scale-up to manufacturing
  - Changing the culture
  - Moving from R&D to full production is not a natural thing in our industry.
- Foamex customer credibility
  - programs
  - supplier
  - Lead-time; e.g., just-in-time capability.
- New products and growth programs offer means for major revenue growth for Foamex

- Current restricted resources in research, marketing, and manufacturing
- Path forward:
  - Increased R&D program support
  - Increased marketing resources

### ***Implementing new product processes in technical product groups***

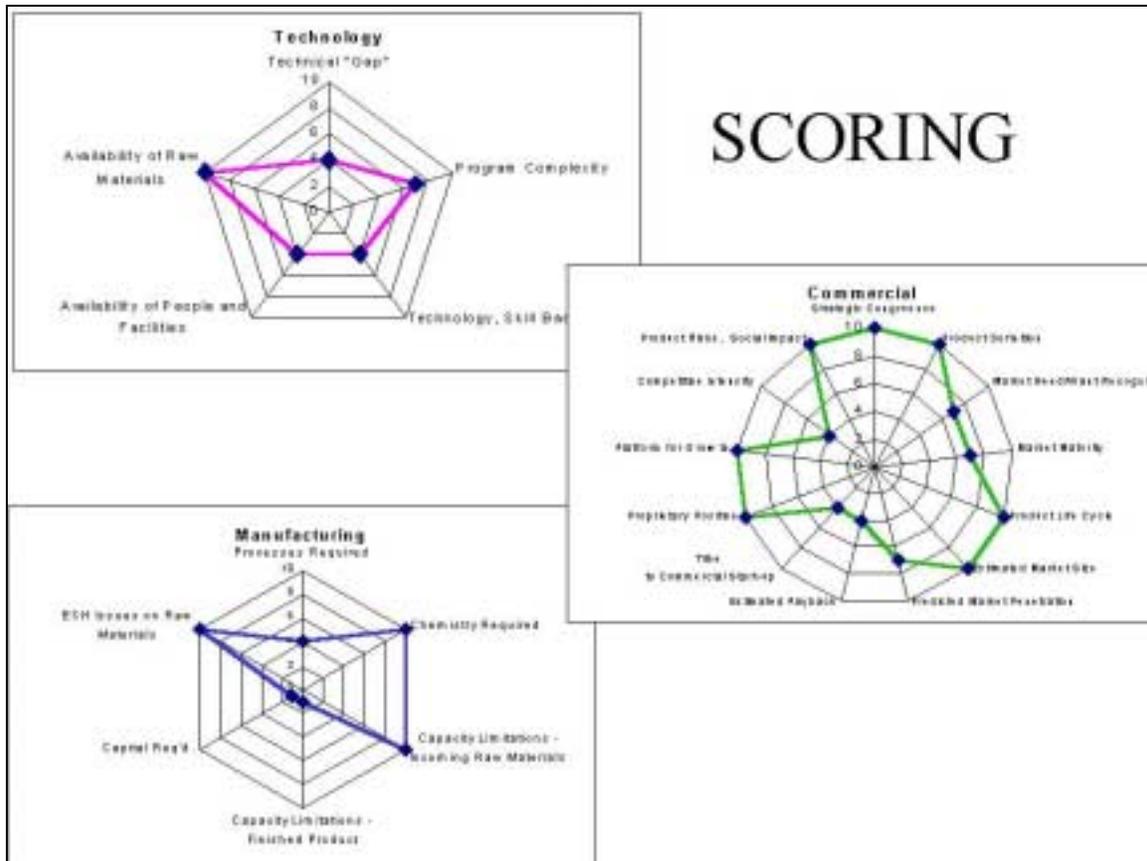
- Initial situation facing the turnaround
  - No “Platforms for Growth” in development
    - Mostly customer-specific projects
      - Based on tweaks of current established technology
      - Limited competitive advantage; a lot of smaller competitors catching up.
    - “Nickel and dime” approach. All projects less than \$1 million in sales potential
  - Limited market focus
    - Strong manufacturing/product focus
    - Limited market knowledge, sales to market data
    - Focused on fabricator more than final market. We don’t always understand the final customer in our core markets.
  - New Product process was limited
    - Focus on the “tweaks”
    - No senior management review process
    - No forced program management (freeform)
    - No scoring, NPV, stage-gate
    - Limited formal justification for development cost, capital
    - Already one false start with stage-gate.
      - One SBU tried it.
      - Process was easy to cut in tough times.
      - Termination bred skepticism for the process.
- First steps
  - Innovation session
    - Facilitated by Bottom Line Innovation and Charles W. Prather ([www.bottomlineinnovation.com](http://www.bottomlineinnovation.com))
      - Includes training and team building
      - Goes beyond “brainstorming”
        - Brainstorming to exhaustion is the first step
          - Most participants ideas to try list dumped here
        - Second phase includes exercises that promote truly new ideas
          - More unique/good ideas from second phase
        - Last phase – develop a plan for some of the best ideas
      - Still no infrastructure to implement ideas
    - But, still no infrastructure developed to implement ideas.
  - Market analysis of current business
    - Limited data available to quantify market exposure. We needed data from users, beyond fabricator purchases.
    - System modification to track products and markets

- Improved budgeting and forecasting of current business
- Improved understanding of value creation
- Improved odds of competing for limited capacity with dieing products
- Tracking for new products and markets

***Infrastructure development—scoring***

- Modeled scoring method after Hoechst method.
  - Questionnaire built into an Excel spreadsheet
  - Forced division in scores (1,4,7,10 only) to ensure relative scores
- Modified to fit Technical Products Group SBU needs
  - Three sections
    - Technology, Commercial and Manufacturing
    - Team of three scoring
  - Starting to apply corporate wide
- Added components
  - Weighting / weighted score report
  - Flagged all “1”s (problem spots)
  - Spider and bar charts
- Use weighted scores for portfolio analysis (Exhibit 2).
- Spreadsheet for analysis available to ISBM members upon request to the presenters at Foamex.

**Exhibit 2**



Source: Foamex International

***Infrastructure development—stage-gate***

- Difficult to overlay on list of *existing* projects
  - Too small to justify effort
  - Lacked market data and rigor
  - Customer opportunity specific. (Customer specific programs have an added risk in that our success is dependent on customer success.)
- Identified several potential programs
  - Innovation session
  - R&D
  - Sales
  - Internal discussions
  - External findings
- Included New Product and Growth programs
  - Growth programs defined as a reinvigoration of current products
- Result: Collection of embryonic programs all at the initial stage

***Infrastructure development—net present value***

- Implemented standard NPV approach.
  - Financial issues are paramount at the company, even though financial measures are frowned upon as the prime portfolio evaluation criteria.
  - Based on early/current NP forecasts
  - Used in Portfolio Management, Stage-Gate
  - Typical issues apply for this approach
- Evaluating Monte Carlo analysis for NPV
  - Crystal Ball® Excel add-in ([www.decisioneering.com/crystal\\_ball/](http://www.decisioneering.com/crystal_ball/))
  - Simulates a 1000 lives to determine probability of outcomes
    - Poorly defined/controversial input variables are defined as probability distribution functions (pdf) not point estimates
    - Calculated results reported as pdf
  - Pros and cons of Monte Carlo simulation
    - Benefits of Monte Carlo approach
      - Easy and quick enough to evaluate as a group
      - Avoid limiting issues of point estimates
      - Calculate odds of a positive NPV based on input
      - Sensitivity analysis can help define the truly critical issues
    - Issues with Monte Carlo approach
      - Still limited to the skill of the team
      - How to apply to current Portfolio Management approaches?
  - Example of NPV Calculation with Crystal Ball (Exhibit 3).

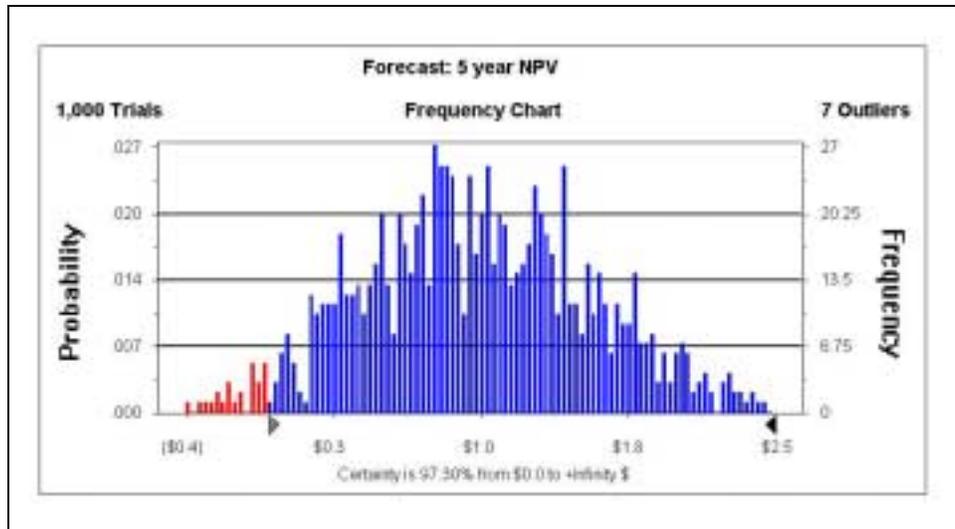
**Exhibit 3**

Hydrophilic Foam NPV					
	2001	2002	2003	2004	2005
Market Size, \$	\$20.0	20.8	21.6	22.5	23.4
Growth Rate	4%	4%	4%	4%	4%
Market Penetration	1%	5%	15%	25%	35%
Total Sales	\$ 0.1	\$ 1.0	\$ 3.2	\$ 5.6	\$ 8.2
Margin	30%	30%	30%	30%	30%
Total Gross Profit	\$ 0.03	\$ 0.31	\$ 0.97	\$ 1.69	\$ 2.46
R&D	(\$0.53)	(\$0.53)	(\$0.31)	(\$0.10)	(\$0.10)
SG&A	\$ (0.20)	\$ (0.20)	\$ (0.20)	\$ (0.20)	\$ (0.20)
Capital	(\$0.50)	\$ -	\$ -	\$ -	\$ -
Net Benefit	\$ (1.20)	\$ (0.42)	\$ 0.47	\$ 1.39	\$ 2.16
Cost of Capital	12%				
NPV (5 Year)	\$1.0	MM			

Source: Foamex International

- Cells show means of calculated probability distributions
  - Green are independent variables.
  - Blue is forecast variable.
- Input variable assumptions
  - Make sure people understand that the decisions going into the model are the most important.
  - Capital, Market Growth and Penetration were defined as uniform distributions
  - Margin was defined as a normal distribution
  - R&D was defined as a normal distribution with a minimum cost threshold
- Resulting NPV forecast as a frequency chart (Exhibit 4).

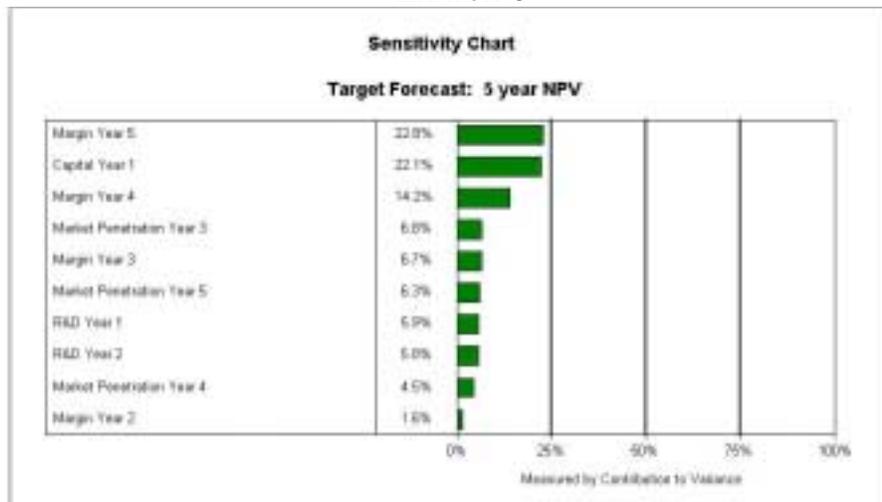
**Exhibit 4**



Source: Foamex International

- Compare exhibit to the standard calculation, which gives an NPV of \$1 million without any insight as to the odds of making money.
- The model will also calculate the certainty of achieving a minimum level designated for the dependent variable.
- Sensitivity analysis reveals most important NPV drivers (Exhibit 5).

### Exhibit 5



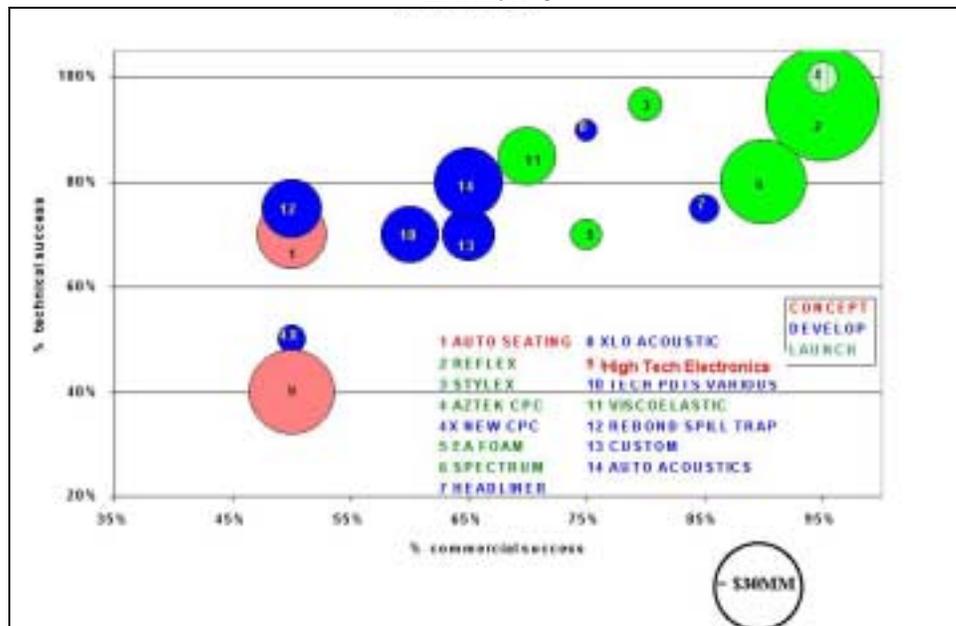
Source: Foamex International

- In Exhibit 5, capital appears as the most important near-term factor.
- R&D apparently is not that big a driver of net present value.

### ***Infrastructure development—portfolio management***

- Bubble charts profile:
  - Growth vs. new products in the technical products group's component of the corporate new product/growth portfolio.
  - Potential platforms for growth, which have the potential to grow beyond expectations because they are not market or customer limited and upside opportunity is poorly defined in NPV analysis.
- Analysis of market and technology risk. Exhibit 6 diagrams corporate-wide new product risks over five years according to NPV, indicating projects to launch now, develop, or continue in concept stage.

Exhibit 6



Source: Foamex International

### *Living with constraints*

- Thus far we've been overlaying a structured NP/Growth process over a lackluster business.
- We have more interesting and potentially profitable ideas than resources to handle them.
  - Embryonic
  - Include new products and growth programs
  - Constrained by capital, capacity and R&D
- Most current portfolio management techniques would have difficulty with the current constraints.
- We chose programs to pursue based on bang/\$ based on the multiple constraints.
- We are confident in the process.
  - Our analyst knows the optimisms and pessimisms of the manager providing input.
  - We've taken some customer-specific projects that don't belong out of the analysis system.

### *A new product example*

- Spectrum™ Protective Packaging.
  - A branded product in the commodity urethane business.
  - Uses patented Chamber Technology of variable pressure foaming providing
    - Higher yields and consistency
    - Environmentally friendly manufacturing
    - Performance innovations
  - Customer benefits
    - Improved cushioning characteristics

- Enhanced drop curve performance
- Lower density / light-weight
- Environmentally friendly manufacturing process
- Consistent performance characteristics
- Significant cost savings
- Customer communications
  - Go right to the Internet with the main message:
    - That Foamex has a new product
    - There are design and economical benefits
    - Global distribution through Foamex network
  - Target internet audience
    - Packaging Engineers / Fabricators
      - Cushioning curve information
      - Material specifications
    - Customers searching for packaging fabricators
      - Large OEM's
      - Small one-shot orders
  - Spectrum Web site includes an interactive design center, a fabricator (i.e., distributor) locator (Exhibit 7), and a competitive cost and specification comparison engine.
    - Customers still ask for faxed information; it's an old industry.
    - Engineers use the tools of the design center to
      - promote new packaging products
      - update technical information
      - set the stage for E-commerce
- Next steps:
  - Promote new packaging products
  - Update technical information
  - Sets the stage for E-commerce

### Exhibit 7



Source: Foamex International

**Richard Good**, Corporate Vice President of Commercial Development at Foamex International, is responsible for new product and growth initiatives. Previously, he was Worldwide Director of Market Development for Arco Chemical prior to Arco's acquisition by Lyondell Petrochemical.

**Mark Kinkelaar** is Director of Business Development for Foamex's Technical Products Group, serving as the group's representative to the corporate commercial development effort. Previously, he was a Business Development Manager and a Research & Development Engineer at Arco Chemical. Dr. Kinkelaar holds a Ph.D. in chemical engineering from Ohio State University.

**Michael Hnatow** is the Market Development Manager for Foamex protective packaging products, responsible for developing and implementing new products for the packaging market. Previously he was an Applications Project Engineer in the R&D Group.

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***ISBM Member Practice Insight:***

## **Portfolio Management**

*Overview, challenges, and practices at DuPont.*

**Edmund M. Ziegler**

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### ***DuPont at a glance***

- Founded in 1802, DuPont is headquartered in Wilmington, Delaware.
- World leader in science and technology spanning high- performance materials, specialty chemicals, pharmaceuticals, and bio- technology.
- Approximately 500 U. S. patents issued each year.
- Number of Trademarks and Brands = 2000+
- Largest Chemical Company in the U. S.
- #42 on Fortune 500
- Number of Employees 94, 000, about 32, 000 employees outside U. S.
- Number of Countries: 65
- Manufacturing Sites: 135
- R& D and Customer Service Labs: >75
- Research and Development: \$1. 8 billion.

### ***1990s—becoming a smaller, more profitable DuPont***

- Comparing 1990 to 2000:
  - Revenue: \$40 Billion to \$28 Billion (primarily due to Conoco sale).
  - Net Income (underlying): \$2. 2 Billion to \$2. 9 Billion
  - Profit Margin: 6% to 10%
  - Capital expenditures: \$5.5 Billion to \$2.0 Billion
  - R&D: \$1.4 Billion to \$1.8 Billion
  - Free Cash Flow (cash flow from operations less capital expenditures: \$0 to \$3.0 Billion.
- Year 2000 sales by end-use industry
  - Agriculture/ Food: 17%
  - Chemical/ Petrochemical: 4%
  - Construction/ Materials: 11%
  - Electrical Appliances: 2%
  - Electrical Machinery: 1%
  - Electronics: 5%
  - Home Furnishings: 4%

- Motor Vehicle: 18%
- Paper: 1%
- Plastics: 5%
- Textile/Apparel: 14%
- Mining: 1%
- Personal Care: 2%
- Health Care: 6%
- Other- Industrial: 5%
- Other- Packaging: 4%
- Aerospace/ Aircraft: 1%
- Portfolio of businesses:
  - Agriculture & Food
    - Crop Protection
    - Nutrition & Health
    - Pioneer
  - Performance Coatings & Polymers
    - Engineering Polymers
    - Performance Coatings
    - DuPont Dow Elastomers
  - Pigments & Chemicals
    - White Pigment
    - Chemical Solutions
    - Fluorochemicals
  - Polyester Enterprise
    - Dacron® Fiber
    - Films, Resins & Intermediates
  - Nylon
  - Specialty Fibers
    - Lycra®
    - Non-Wovens
    - Advanced Fiber Systems
  - Specialty Polymers
    - *i* Technologies
    - Packaging & Industrial Polymers
    - Fluoropolymers
    - Corian®
  - Pharmaceuticals
    - Biomaterials
  - Global Services
    - Safety Resources
    - DuPont Consulting Solutions

### ***DuPont Consulting Solutions***

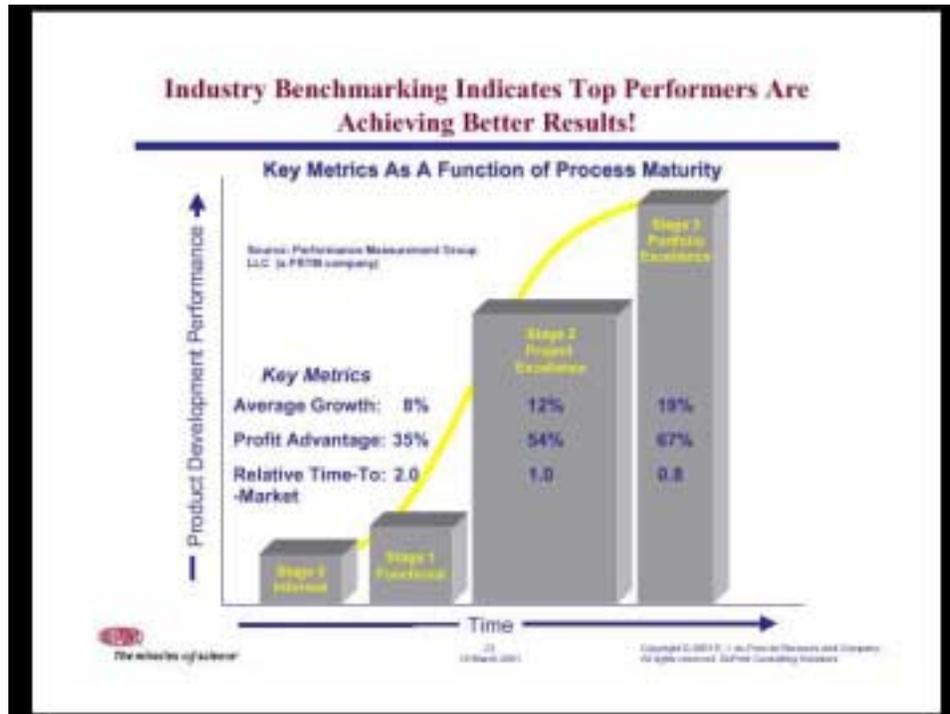
- Services all SBUs and external customers.
  - About six years as an independent profit center.
  - Competes with outside firms for DuPont SBU business.
  - 100 people worldwide
- Consultants are senior professionals with broad experience in DuPont, academia, and external businesses.
- Partners include DuPont's Technology, Engineering, Safety, other practices, and select external consulting services.
- We have growth plans, but we try to avoid doing more work outside than inside.
- Offerings
  - Business strategy and direction
  - Marketing strategy and offering renewal
  - Delivering the current offering
  - Capability and productivity

### ***Portfolio management as we see it***

- Purpose
  - Achieve desired short and long term results by managing the projects supporting the strategy designed to achieve business goals.
  - Achieve results by:
    - maximizing the return on R& D investment
    - deciding project mix and balance to achieve return/ risk
    - profile and assure project throughput
    - aligning with strategic objectives
  - Portfolio management can translate ideas to current products.
  - Portfolio management can also span multiple horizons:
    - Extend and defend core businesses
    - Build emerging business
    - Create viable options
- What is portfolio management?
  - Dynamic process of selecting and prioritizing projects
    - New projects are evaluated, selected, and prioritized
    - Active projects' priorities are constantly updated
    - Existing projects may be accelerated, decelerated, or terminated
  - Process for translating large amounts of project data into effective portfolio and resourcing decisions
    - Portfolio priorities
    - Portfolio character & balance
    - Resource deployment
  - Process for establishing common basis for discussion, discipline, and consistency.
- Portfolio management involves balancing current and anticipated resources across projects.

- Strategic balancing: balancing investment across different investment classes.
- Resource supply/demand balancing: matching resource needs to capacity.
- Throughput management: managing project flow for optimal throughput.
- It makes sense to pay attention to portfolio management (Exhibit 8).

### Exhibit 8



Source: Edmund M. Ziegler

- Portfolio management goals: Optimize overall mix, flow, and direction of multiple projects to best achieve business goals and strategy.
  - Implement strategy in most effective, least risk manner
    - Appropriate allocation of scarce R& D resources (people and \$) to maximize value
    - Desired balance across different plays: markets, technologies, time horizons, regions
    - Validate/ adapt project mix to better reflect strategic objectives and business priorities
    - Seek ways to increase investment leverage
  - Decide whether to add a new development project to the active portfolio
    - What impact will adding a meritorious project have on the portfolio? How will it change the portfolio's characteristics?
    - What, if anything, do we need to stop?
  - Estimate and reconcile total development and functional budgets vs. affordability
  - Match aggregate project requirements to resource availability and capacity, not just to the number of bodies available.
  - Reprioritize projects based upon new business realities

- New market information
- New technical information
- Changes in strategy
- Portfolio management process characteristics
  - Uncertain, dynamic information
  - Fresh opportunities
  - Multiple goals and strategic considerations
  - Project interdependencies
  - Multiple, dispersed decision-makers who seem to be always traveling.
  - Touches several other business and decision processes

### ***Portfolio management process challenges***

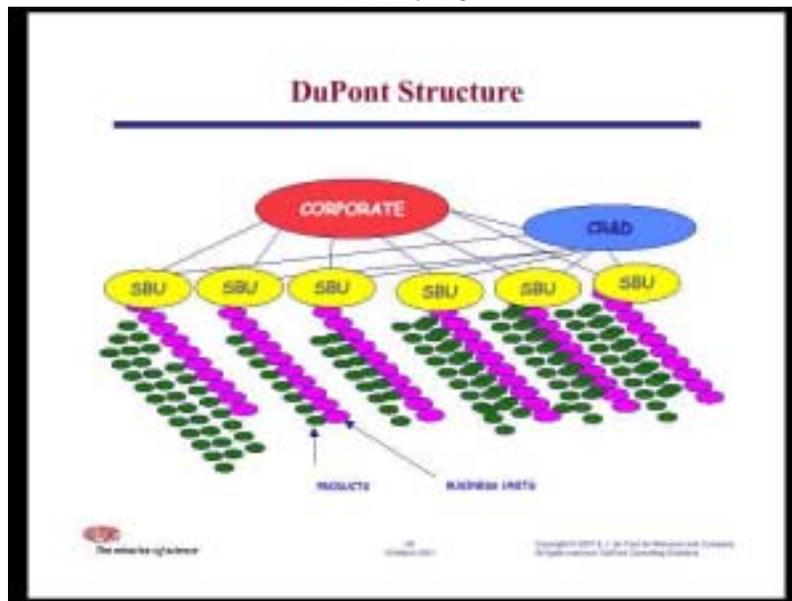
- Project valuation
  - What method should we use?
    - sophisticated NPV
    - real options: the value of platform development, which firms tend to underestimate/
      - revenue (the simple approach)
  - Treatment of different time horizons
  - Uncertainties – timing, cash flow factors
  - Sophisticated calculations
    - unrecognized cross- subsidies (loss leaders)
    - transfer pricing
    - estimating probabilities
    - misallocations of indirect costs and assets
- Portfolio balancing
  - What is the “right” balance?
  - There can be so many “buckets,” we get paralyzed.
    - project types
    - product lines
    - regions
    - market segments
    - strategic vs. non- strategic customers
    - time horizons
    - other parameters
  - Avalanche of charts and data: What are the critical parameters?
  - How much risk do we want/ need to take?
- Resource balancing
  - “Infinite capacity syndrome”
    - too many projects, diluted resources, little slack
  - Over-reliance on key individuals
    - hold critical skills
    - reside in region
    - special customer relationship

- well respected
- Then, how realistic are project schedules and cost projections?
- Fit to Strategy
  - Ratings are very subjective and vulnerable to politics
  - What if the strategy is vague and unclear? Then the projects all fit the “de facto” strategy?
- Scope
  - Including everything can be a daunting task
  - Difficult to capture all projects and activities
    - underground projects avoid the system
    - small, sometimes reactive, projects drain resources
- Interfacing to other business and decision processes
  - Stage-gating, capital budgeting, annual PO process and adjustments, product line planning
- Project interdependencies
  - Cross-business or JV projects
  - Changing one effects the profile of the other
  - Same resources, same time = bottleneck
- Managing processes—the people issues.
  - Discipline to an established method
  - Multiple, dispersed decision-makers
  - Profiling and normalizing projects in a consistent manner
    - resources, timing, attractiveness, risk, project types
  - Avoiding “decision- traps” (e.g., “sunk costs syndrome”)
    - What would we do today, if starting from zero?
  - Dealing with multi- level, iterative processes

***Portfolio management at DuPont***

- DuPont structure (Exhibit 9).

### Exhibit 9



Source: Edmund M. Ziegler

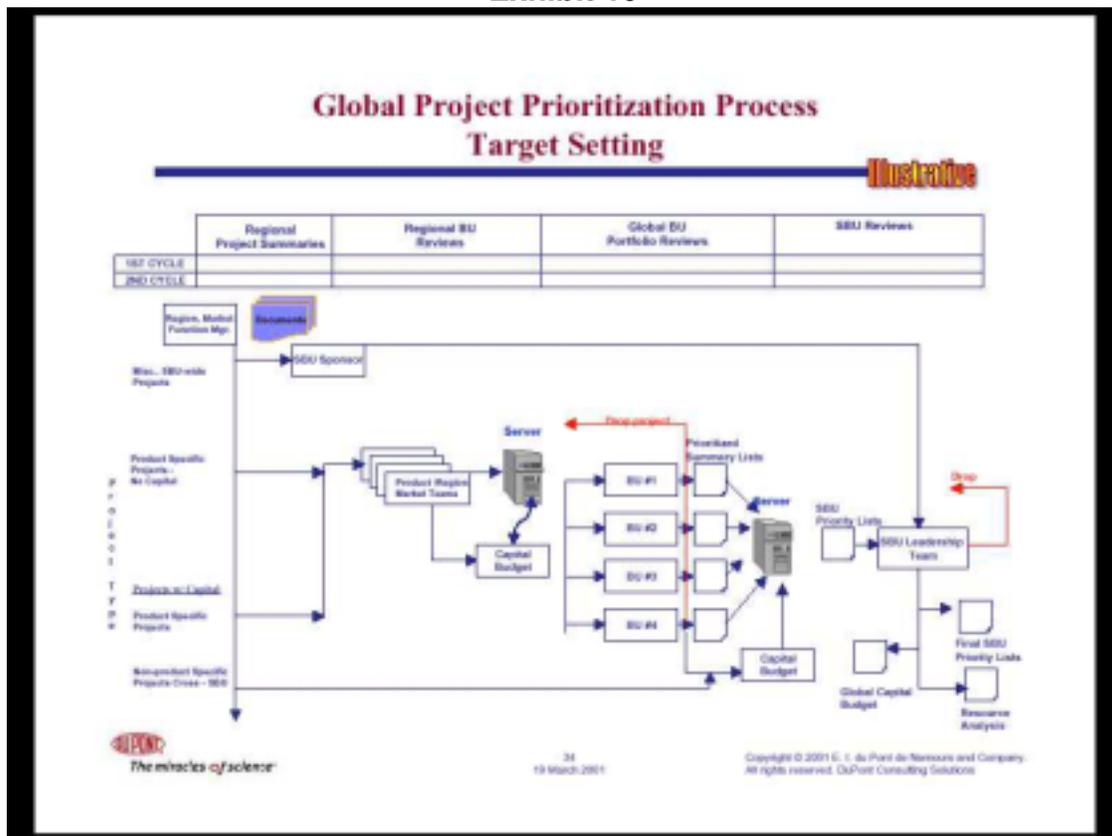
- Each SBU has its own R&D budget for Horizon 1 projects.
- Corporate R&D (CR&D)—with its own budget—supports Horizon 2 and 3 projects that have multiple-SBU implications.
  - SBUs bid for CR&D support, recognizing they'd better do well on Horizon 1 projects before seeking Horizon 2 and 3 support.
  - No one prioritization system guides CR&D project selection.
- Project sources at SBU levels
  - Functions
  - Regional business units
  - Product line teams
  - Market/application teams
- Expressing wants, needs, and desires for the portfolio management process
  - Must be understandable by the users
    - Limited number of displays, based on most important dimensions
    - Common vocabulary—risk, fit to strategy, project type, etc.
  - Clearly identified decision body; e.g., business team
  - Easy to assemble information
  - Timely
  - Must enable consideration of multiple objectives
  - Must recognize the uncertainty level of the information
  - Must be integrated with other business processes

#### *Typical practices at the business unit level*

- Managing process
  - Bottom up, top down prioritization and reconciliation process is used.

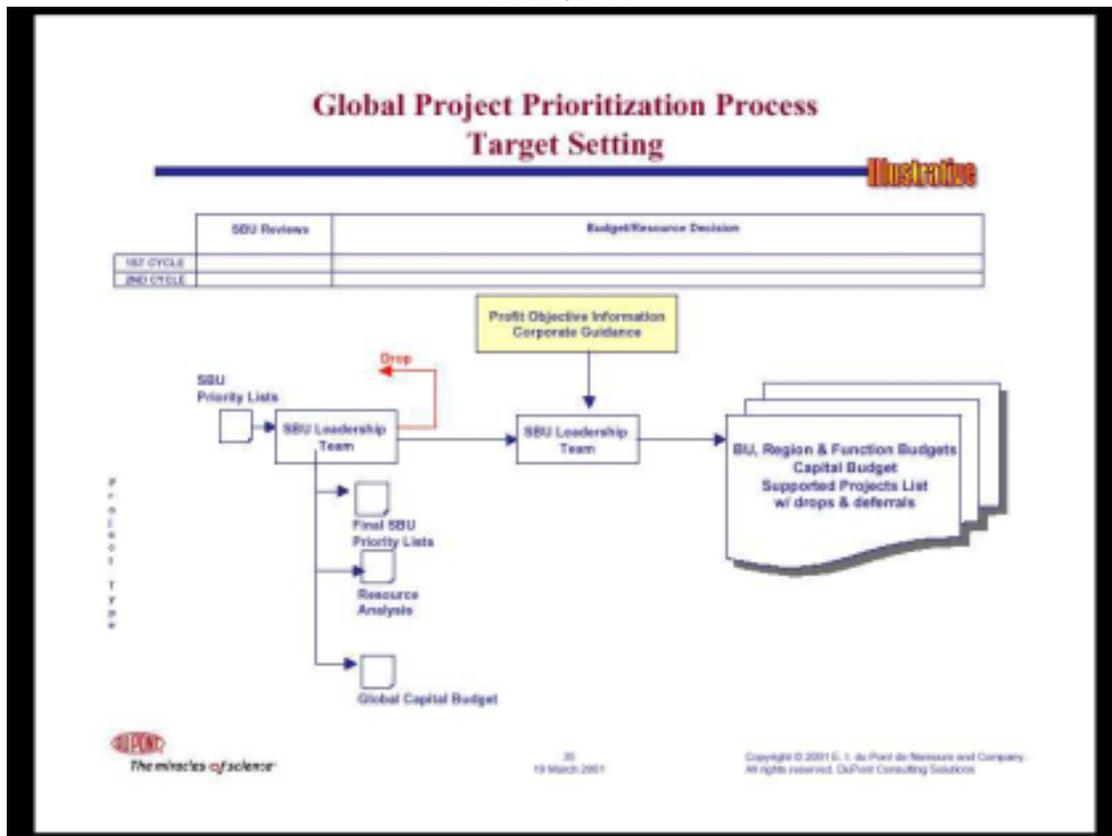
- Prioritized regional and/ or market/ product portfolios are pooled into a global portfolio.
- Global business team is accountable for the global project portfolio and for reconciling priorities and budgets.
  - Regional /functional representation is present.
- Comprehensive reviews range from 1- 4x / year; calendar based.
- Integrated with stage-gating process.
  - Event based.
  - Applied to PID (projects- in- development) and new projects.
- Sample target-setting process in Exhibits 10 and 11.

**Exhibit 10**



Source: Edmund M. Ziegler

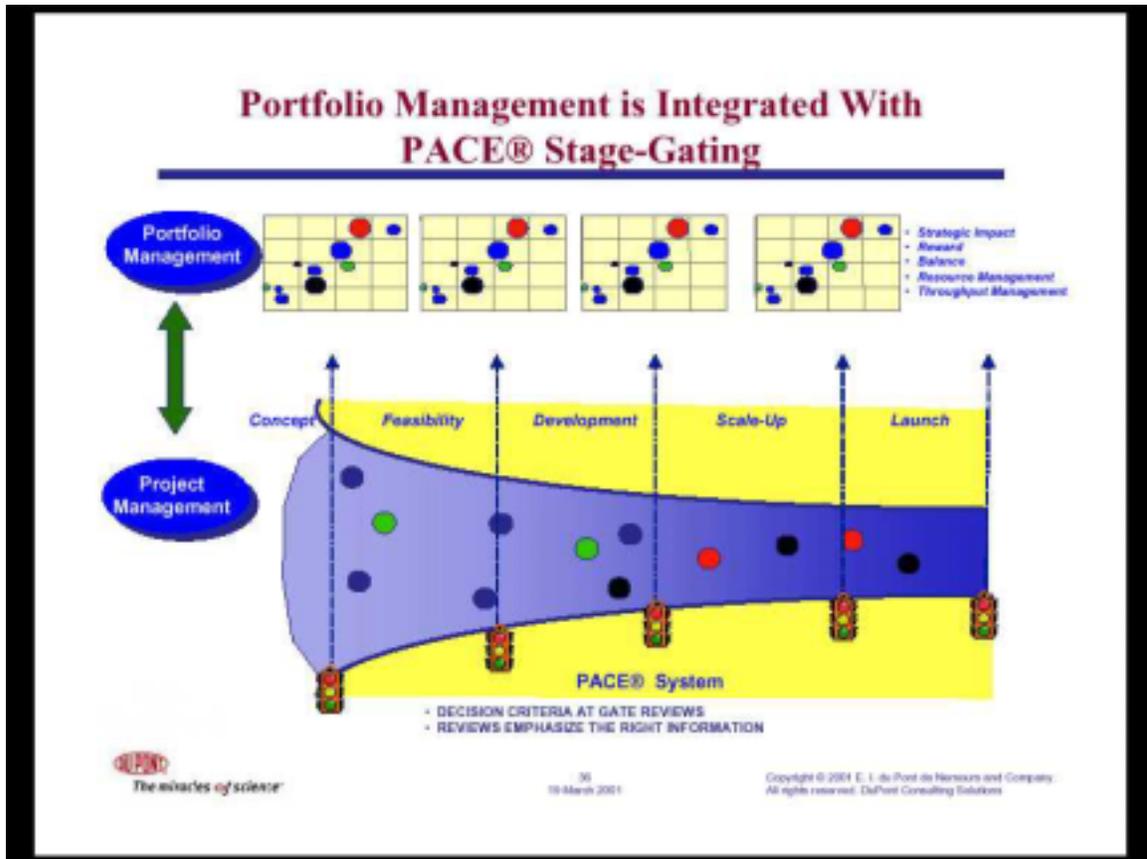
Exhibit 11



Source: Edmund M. Ziegler

- Portfolio management integrated with the PACE<sup>®</sup> (Product and Cycle Time Excellence) framework of consultant PRTM (Pittiglio Rabin Todd & McGrath; [www.prtm.com](http://www.prtm.com)) with whom we've partnered.
- PACE cuts paperwork and bureaucracy in the NPD process.
- Most PACE new product ideas come from marketing and from customers, rather than from the lab.
- The integration (Exhibit 12) is now being revised to incorporate Six-Sigma planning.

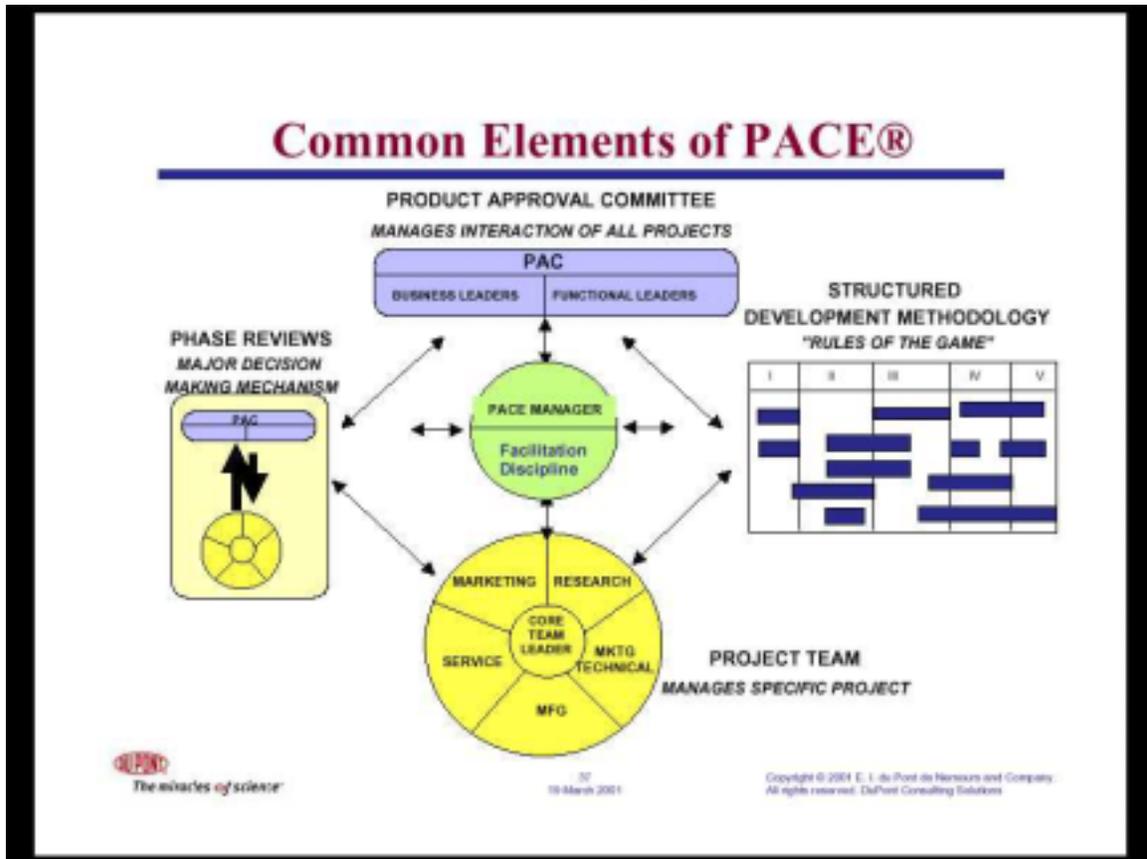
Exhibit 12



Source: Edmund M. Ziegler

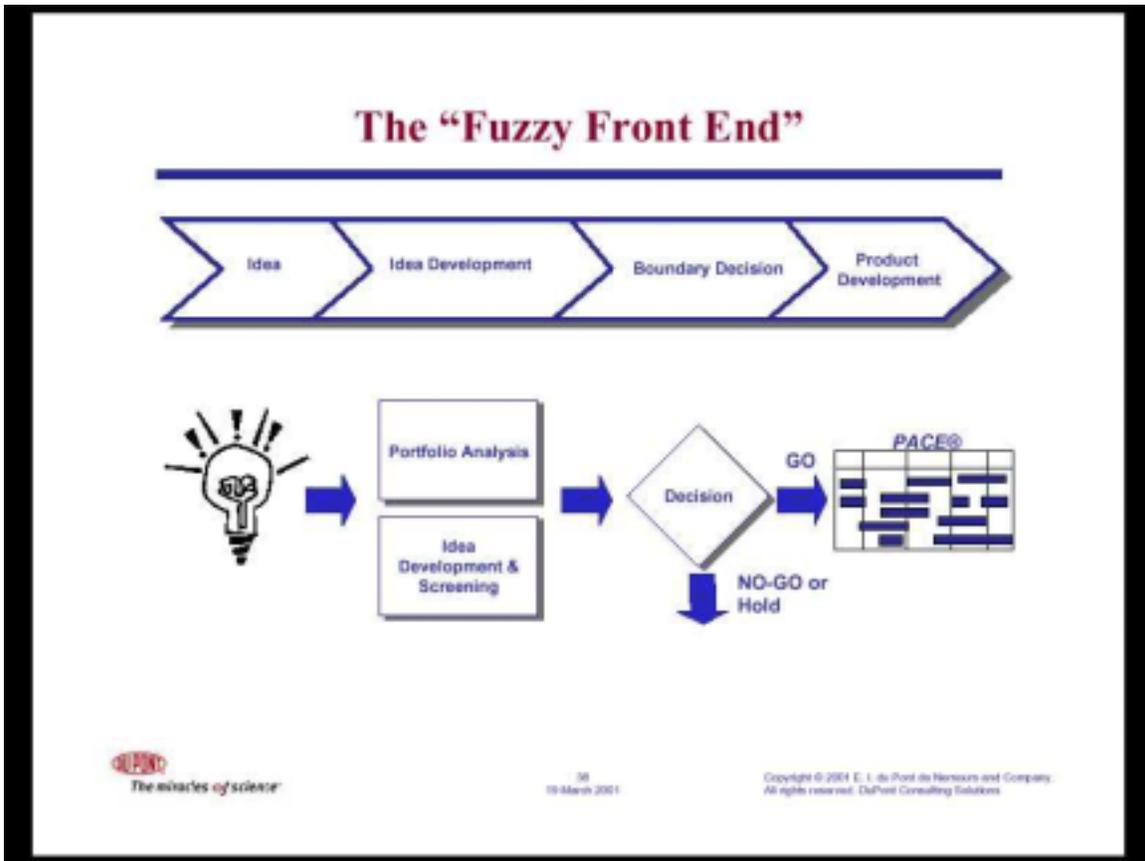
- PACE's role in the process: Exhibits 13, 14 and 15.

Exhibit 13



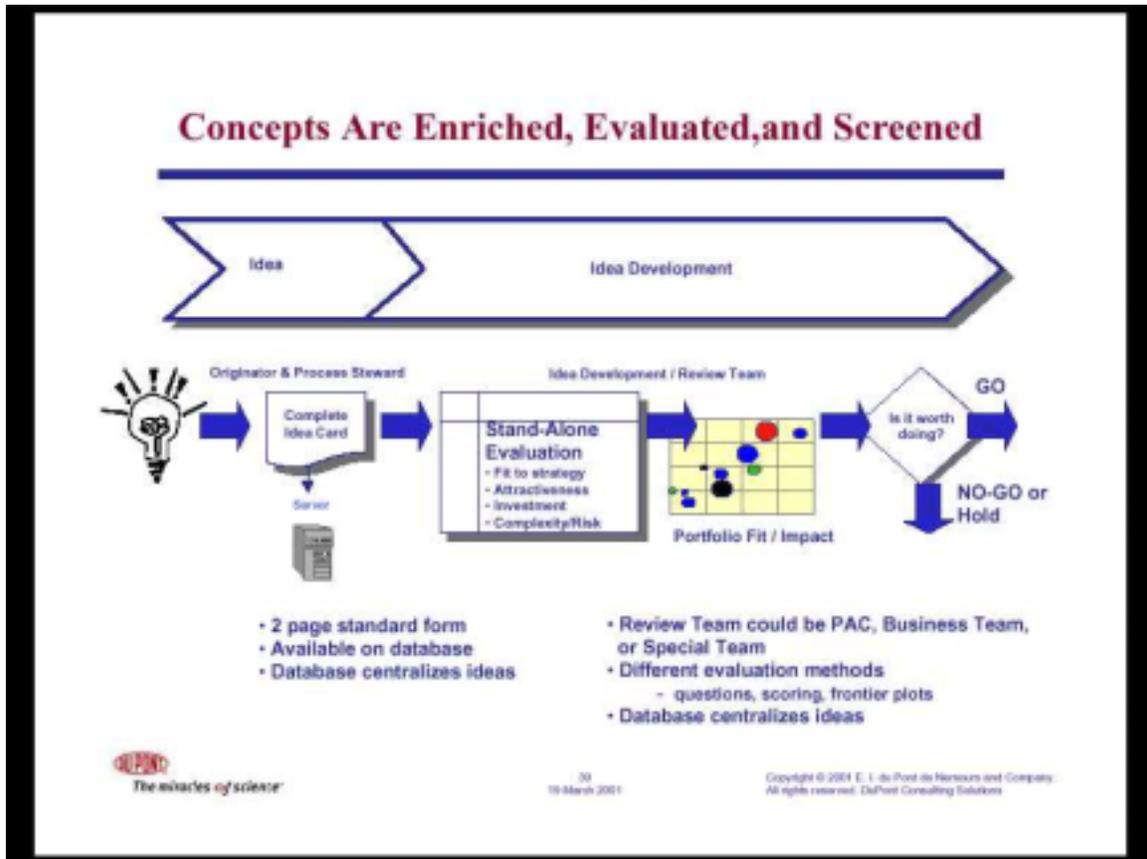
Source: Edmund M. Ziegler

Exhibit 14



Source: Edmund M. Ziegler

### Exhibit 15



Source: Edmund M. Ziegler

- Process design
  - No universal method or vocabulary.
    - There should be. That's the ideal
    - Business decides how it wishes to classify investments and what parameters are used to profile projects.
      - May be consistent with SBU method
      - No corporate edict to use a specific method
  - Some apply portfolio management to most work... others only to specific types of projects:
    - Core Technology
    - Facility Construction
    - New or major product
    - New or Major process
    - Minor product
    - Minor process
    - Regulatory, Safety, Health
  - Key challenge for business units: being more efficient with current products to free resources for new projects.

- Some confusion arises for SBUs organized around assets/products, dealing with new products developed around markets.
- Analysis and decision making
  - DuPont SBU performance parameters:
    - Return on assets
    - Profit
    - Growth
  - At the BU Level, myriad hybrid techniques are used to profile, prioritize, and balance the portfolio.
    - Rank order profitability indexes (some apply to a constraint, e. g. capital)
      - $PI = (\text{value} * \text{probability}) / \text{constrained input}$
    - Scoring models (SBU-level example in Exhibit 16).
    - Graphs (bubble, pie, bar; e.g. Exhibits 17 and 18).
    - Strategic buckets model
      - Bottom- up based on current portfolio
      - Add up and reconcile vs. business strategy

**Exhibit 16**

## Scoring

FACTOR	DATA CALIBRATION			
	1	2	3	4
IRR	<25	<50	<100	>100
NPV	<15	<30	<45	>45
DPB	<3	<6	<9	>9
RISK	<20%	<50%	<75%	>75%
Strategic Leverage	some	minor	broad	new basis for competition
Competitive Impact	Base	Key	Facing	

PROJECT	IRR	NPV	DPB	TOTAL POINTS	FIN	CI	STL	RISK	TOTAL POINT
D	3.0	1.0	4.0	8	8	3.0	4.0	3.0	18
F	4.0	1.0	4.0	8	9	3.0	4.0	1.0	17
D	4.0	1.0	3.0	8	8	3.0	4.0	3.0	17
C	3.0	1.0	3.0	7	7	3.0	4.0	3.0	17
H	3.0	1.0	3.0	7	7	3.0	3.0	4.0	17
T	4.0	1.0	4.0	9	9	3.0	3.0	1.0	16
E	3.0	2.0	3.0	8	8	2.0	4.0	1.0	15
J	3.0	1.0	4.0	8	8	2.0	4.0	1.0	15
L	4.0	1.0	3.0	8	8	1.0	4.0	2.0	15
B	3.0	1.0	4.0	8	8	1.0	4.0	1.0	16
M	3.0	1.0	3.0	7	7	1.0	3.0	3.0	16
A	1.0	1.0	3.0	5	5	3.0	4.0	3.0	16
K	4.0	1.0	3.0	8	8	1.0	2.0	1.0	17



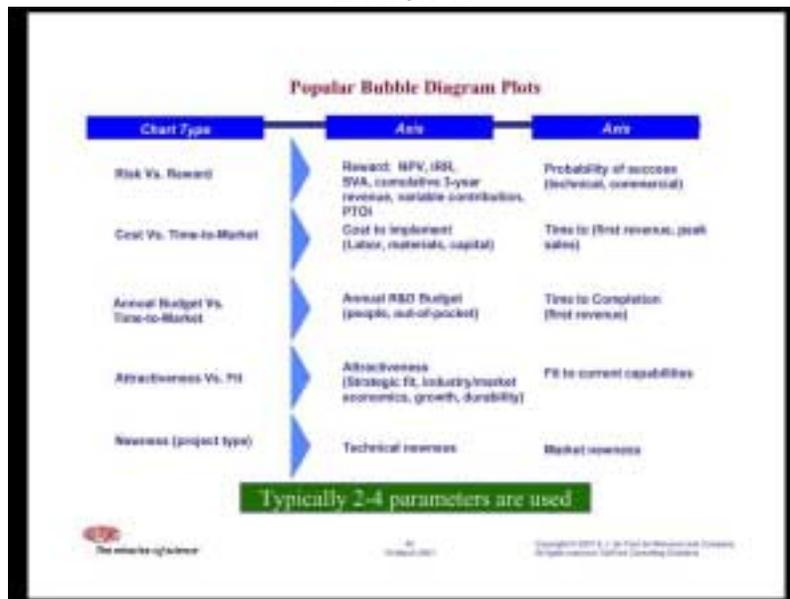
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19 March 2001

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Source: Edmund M. Ziegler

Exhibit 17



Source: Edmund M. Ziegler

Exhibit 18

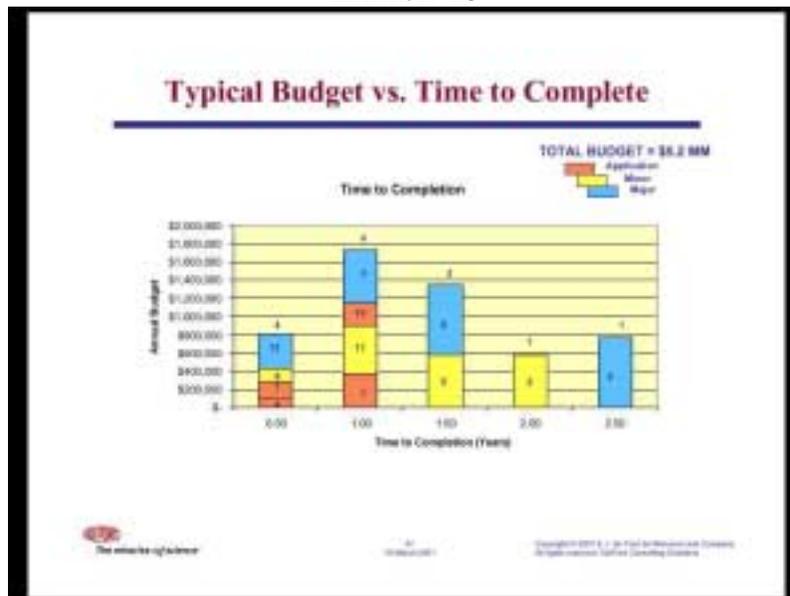


Source: Edmund M. Ziegler

- Methods of project valuation or attractiveness differ by business unit and within a business unit.
  - Depends on preference for sophisticated analyses and rigor
  - Depends on project development phase – front- end vs. later phases
  - Spans SVA, NPV, IRR, gross and variable contribution/ margin, revenue
  - Because of inherent uncertainty, project ranking may apply an anchored Likert scale to permit comparison of projects.
- Significant projects conduct D& RA analysis.

- Project priority criteria
  - 1<sup>st</sup> Screen
    - Fit (business strategy and capabilities)
    - Attractiveness (financial pay off, index, or proxies)
  - 2<sup>nd</sup> Screen
    - Probability of success (technical, commercial)
    - Timing (to- market)
    - Investment (people, OOP, capital)
    - Additional
      - sustainability / durability of competitive position
      - inventive merit or leverage (platform potential)
- Additional examples of graphed output in Exhibits 19, 20, and 21.
  - Exhibit 21, for instance, shows the big picture of an SBU's projects overall.

**Exhibit 19**



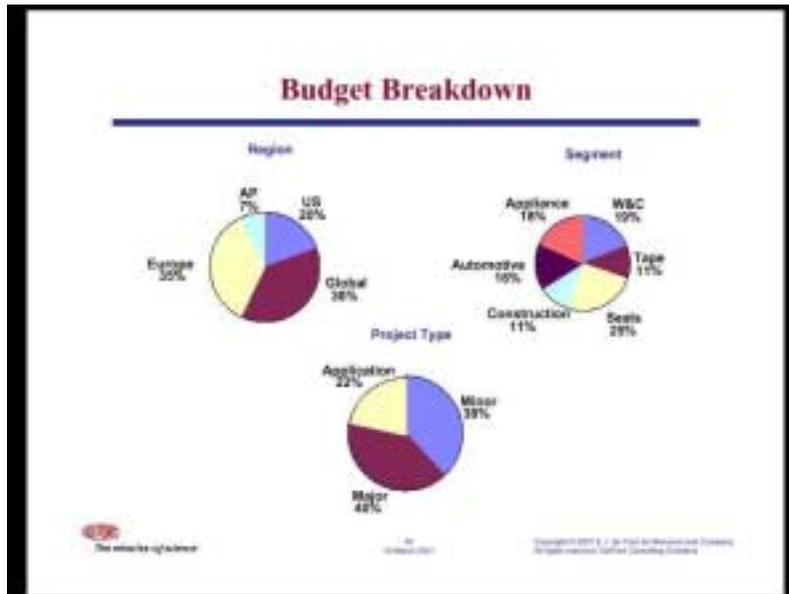
Source: Edmund M. Ziegler

Exhibit 20



Source: Edmund M. Ziegler

Exhibit 21



Source: Edmund M. Ziegler

**Process steps**

- Develop and refine the business strategy and new product strategy.
- Develop consensus on strategic direction and the role of markets, product lines, regions.
- Define the scope and update profiles of existing projects using the chosen criteria.
- Validate and normalize project data & resources.
- Tabulate / map individual projects in the context of each other and the chosen criteria.

- Evaluate, strengthen the baseline portfolio through iterative process.
  - timing changes
  - combining or segmenting projects
- Stop, Redirect or initiate projects via PACE process to fully implement strategy.

### ***Summary***

- There are no magic solutions to the challenges. It takes hard work and good judgment.
- Reams of data and scores of graphs will not make the decision for you.
- There is no one best tool or method to use, but use something!

### ***Q & A***

*Q: How often should you repeat the portfolio review?*

A: It depends on the speed of change in your markets.

*Q: How do you get SBUs to report all their projects, including their “skunk works” activity?*

A: Reduce the threshold size for projects to report to PACE. To really shut off the skunk works stuff, show the SBUs that their high-profile projects leave little resource for undisciplined skunk works.

*Edmund M. Ziegler is a Manager at DuPont Consulting Solutions where he heads the concept development and commercialization practice. His 22 years at DuPont include six years working exclusively on product development performance improvement, as well as assignments in process and product engineering, manufacturing, and quality improvement operations.*

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***ISBM New Product Development Overview:***

## **Strategic Product Portfolio Models**

*Managing unique and not so unique new industrial products and services.*

**Ernie Maier**  
Director, ISBM  
Woodbury, Minnesota  
emaier@eProfitMarketing.net



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### ***Value Commercialization Process (VCP) for unique industrial products***

- The best product doesn't always win.
- “Contrary to conventional wisdom, the strongest determinant of financial performance in high technology markets is not R&D capability, but the interaction of marketing capability and R&D.” — *Success in High Technology Markets*, Dutta, Narasimhan, Rajiv.
- Firms must excel in coming up with innovations constantly, and have the ability to commercialize (offer perceived, superior value) them.
- Instead of developing products then searching for customers, today's revised value-creation chain works with customers and multi-disciplinary technologies to jointly develop products, turning receptive customers into *valuable customers*.
- Discipline of VCP
  - Create markets: groups of customers with common characteristics.
    - Think customers in a value chain, not internally focused.
    - Think superior competitive value, not product.
    - Think differentiation, not improved “widgets.”
    - Think cross-functional process, not function.
  - Value creation and delivery
    - Increase profit share
    - Increase share of target market's business (penetration)
    - Improve relationships

- Develop new business opportunities - services, knowledge
- Pricing optimization, selling confidence
- Focus organization on better profit opportunities
- Reduce negotiation/bidding with customers
- Sophisticated selling tools that win-win
- Deliver value to everyone in the system:
  - Customers
  - Employees'
  - Shareholders
  - Stakeholders: e.g., channel members, society.
- Components of customer value (Exhibit 22).

Exhibit 22



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- Product price has relatively little impact on the value industrial customers receive; 75 percent of the value is in the product's contribution to reducing customer process costs.
- Satisfiers are a customer's laundry list of wants, but they are not that significant in creating perceived value.
- Value creation and value capture
  - Solution development begins with the customer, then the segment, and then the market.
  - Business development, beginning with the market, must eventually put emphasis back on the customer.
  - Map your performance relative to customers, as in Exhibit 23.
    - Look for value delivery that exceeds customer and competitive requirements, and shift resources to more critical areas.



***Beating the commodity magnet—products with undifferentiated performance***

- The positioning map depicts a product's balance of price and cost (Exhibit 25).
  - The market gravitates toward an equity of price commensurate with cost, as with products "B" and "C."
  - "A" has the enviable market power position.
  - "D" has been commoditized and is at a distinct price/cost disadvantage.

**Exhibit 25**



Source: Ernie P. Maier

- A solution for "D": more profit by reducing cost and/or raising price.
  - Market analysis
    - Part 1: activity-based costing of channels and customer service. Recognize that channels should carry the ball selling undifferentiated-performance (commodity) products. Your own salespeople prefer to talk about and sell engineered products.
    - Part 2: analysis of delivered value vs. competition's delivered value.
  - Successful strategy:
    - Unbundling "D" offering to cut cost of standard product.
    - Creating "utility-plus" components to justify higher priced bundles including basic "D."
    - Adding incentives to accelerate sale.
      - for customers, availability and price incentives
      - for channels, information and a "full line encouragement" promotion

***Marketing industrial services through Productivity/Supply Management (P/SM)***

- Customer reality scenario

- Vendor “E,” with moderate share, proposes a “commodity management proposition” (CMP) to manage customers’ commodity supplies.
- Vendor “A,” protecting a major share, promises increased customer savings from the existing offering and service program.
- Vendor “E” prevails with CMP program features such as:
  - “E” will be the single “tier 1” supplier, managing all other major suppliers as tier 2.
  - “Cost per unit manufactured” payment to suppliers, from consigned inventory.
  - All suppliers must look to “E” as their customer / channel, and provide required value-added services.
  - Communicate with/through “E.”
  - All suppliers will meet with “E” as required to develop further cost savings for “CMP” program, actively participating in cost/process teams, as directed by “E.”
  - Lesson for “A”: Services could provide the solution for protecting share from a CMP attack.
- Services evolution
  - 1960s: volume/category contracts promised lower price
  - 1970s-’80s: outsourced purchasing and inventory management—”integrated supply”—cuts customer costs 5-20 percent.
  - 1980s-’90s: deeper outsourcing extends to engineering, facilities and resources, and business functions via programs such as:
    - JIT II
    - In-plant stores, communication, shipping, etc.
- P/SM Relative savings
  - Product management cuts about 2/3 of customer costs on a one-time basis.
  - Productivity management provides a continuous cost reduction via outsourced functions:
    - Process re-engineering
    - Services
    - Supply Chain Optimization
    - Resource / Facility Mgmt.
    - Measurement
- Exemplary P/SM deliverables
  - Eliminate most customer-owned inventory
  - Automatic price monitoring and control without the cost of quotes and invoice checks
  - Service levels of 97% + within the first year of operation
  - Reduced product cost
  - Increased cash flow
  - Reduced purchasing time
  - Supplier rationalization
  - New product / process analysis
  - Supply chain expertise to reduce supply chain costs
  - Value chain productivity expertise

- Reduced management time - supervision and auditing
- Outsourcing of receiving function
- Expediting support
- Reallocation of personnel to more efficient positions
- Tracking of non-stock and stock usage
- Integration of systems to control all inventories and accounting requirements
- Rationalize material and paper flow
- Elimination of debits and credits audit costs
- Process for continuous improvement
- Specific expectations for supply chain and key suppliers, as contracted
- Outsourced storeroom and/or other functions + resources, such as testing.
- Why a service business?
  - Supports Core Competencies
    - “Contracts” (all) business vs. selling one application / plant / product at a time
    - Open access for (new) technology, testing
  - Generates new, profitable revenue stream
    - “Services” often > 5X product
    - Attracting economic profit
  - “Life Cycle” position / information advantage.
    - For example: Manage customer’s life cycle from process / product engineering to aftermarket service / product sales generated by OEM.
  - Differentiation vs. competition
    - “Full line,” global
  - “Account Control”
    - “Manage” value creation + delivery
- Stockroom management value stacks illustrate customer savings due to fewer, but higher-quality stockroom staffers (Exhibit 26).

Exhibit 26



Source: Ernie P. Maier

*Ernie Maier, Director of the Study of Business Markets, augments ISBM's services to current and new members, assisting Ralph Oliva, Executive Director. Mr. Maier's more than 30 years experience at 3M Company spans sales, marketing, and marketing management assignments in the United States and in Europe. He is an active author and speaker on topics such as channel management, new product development, rapid commercialization of technical products, service strategies, profitably marketing commodity products, and strategic planning.*

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***ISBM Featured Research Overview:***

## **New Product Portfolio Management: Benchmarking Best Practices**

*Portfolio management is fundamental to successful product development.*

**Dr. Scott J. Edgett**

Chief Executive Officer

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*Ancaster, Ontario*

Associate Professor of Marketing

McMaster University

*Hamilton, Ontario*

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### ***Portfolio management issues***

- Portfolio Management:
  - Is about resource allocation.
  - Is a check against all projects moving through stage-gate.
  - Which NP projects shall the firm fund from among many opportunities (Go/Kill)?
  - Relative prioritization of these (e.g. accelerated development; Go vs. Hold)
- PM is the *operationalization* of business strategy at multiple levels.
  - The “50,000-foot” view of the portfolio.
  - The “30,000-foot” view.
  - The “10,000-foot” view.
- Portfolio management helps corporate management communicate its strategy.
- Portfolio management is a problem area everybody wrestles with.
  - Portfolio Management is typically poorly handled:
    - management confessed to ...
      - no serious Go/Kill decision points
      - no criteria for making the Go/Kill decision
    - the result: a tunnel, not a funnel
      - also indicated poor project prioritization
    - too many projects for limited resources available
  - Major business challenge
    - many different approaches
    - no easy answers
    - a problem every company is addressing

### ***Portfolio management goals***

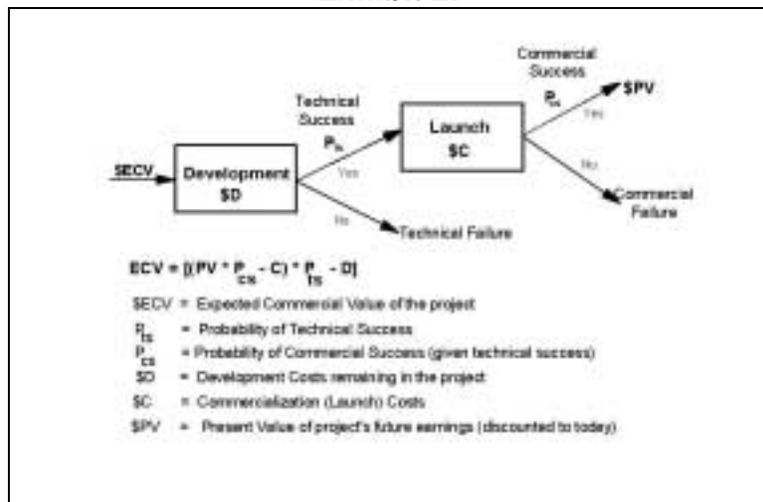
- Different companies emphasize different goals

- Maximizing the Value of the Portfolio
- Balance
- Right number of projects
- Link to the business' strategy
- The challenge is serving all four goals simultaneously.

**Goal 1—Value maximization methods**

- Method 1: Financial
  - Calculate “value” of each project (e.g. NPV, ECV, ROI)
  - Rank order according to economic value
  - Financial models can address both technical and commercial risks (Exhibit 27).

**Exhibit 27**



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- Method 2: Productivity Index
  - Rank order projects according to a financial index
  - Determine the Expected Value of each project; the probability adjusted NPV of cash flows, discounted to present, assuming technical success.
  - Probability adjustment:

$$PI = EV * P_{ts} / R\&D$$

**EV** = Expected value  
**R&D** = costs remaining in project  
 **$P_{ts}$**  = probability of technical success

- R&D, the tightest constraint, is the denominator.
- The company should examine the R&D base each quarter to ensure that current bottlenecks are being addressed.

- Method 3: Dynamic Rank Ordered List
  - Handles a few key criteria
  - Rank order on these; take the “mean ranking”
  - Sometimes the simplest approach is the best.
    - Example: Six Projects & Data for Prioritization (Exhibit 28).

**Exhibit 28**

Project Name	IRR* (%)	NPV (\$ millions)	Strategic Importance**	Prob. Tech Success
Alpha	20%	10.0	5	80%
Beta	15%	2.0	2	70%
Gamma	10%	5.0	3	90%
Delta	17%	12.0	2	85%
Epsilon	12%	20.0	4	90%
Omega	22%	6.0	1	85%

\* The hurdle rate is 10% IRR.  
 \*\* Strategic importance: a 1-5 rating, where 5=critically important.

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- The six projects ranked (Exhibit 29).

**Exhibit 29**

Project Name	IRR*PTS	NPV*PTS	Strategic Importance	Ranking Score*
Alpha	16.0 (2)	8.0 (2)	5 (1)	1.67 (1)
Epsilon	10.8 (4)	18.0 (1)	4 (2)	2.33 (2)
Delta	11.1 (3)	7.8 (3)	2 (4)	3.33 (3)
Omega	18.7 (1)	5.1 (4)	1 (5)	3.87 (4)
Gamma	9.0 (5)	4.5 (5)	3 (3)	4.67 (5)
Beta	10.5 (5)	1.4 (6)	2 (4)	5.00 (6)

Notes: Both IRR & NPV are multiplied by Probability of Technical Success.  
 Projects are then ranked according to the three criteria - numbers in parentheses show the ranking in each column. Projects are ranked ordered until no more resources.  
 \* The final column is the mean across these three rankings. This is the score that the six projects are finally ranked on. Project Alpha is number 1; Project Beta is last.

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- Scoring Model
  - Identify multiple criteria
  - Score projects on these
  - Rank according to project scores
  - Chemical company example (similar to model used by Hoechst)
    - Reward:

- Absolute contribution to profitability (5 year cash flow: cumulative cash flows less all cash costs, before interest & taxes)
- Technological payback: the number of years for the cumulative cash flow to equal all cash costs expended prior to the start-up date
- Time to commercial start-up
- Business Strategy Fit:
  - Congruence: how well the project fits with the strategy (stated or implied) for the product line, Business and/or Company
  - Impact: the financial and strategic impact of the project
- Strategic Leverage:
  - Proprietary position
  - Platform for growth (from “one of a kind” to “opens up new technical & commercial fields”)
  - Durability: the life of the product in the marketplace (years)
  - Synergy with other operations / businesses within the corporation
- Probability of Commercial Success:
  - Existence of a market need
  - Market maturity (from “declining” to “rapid growth”)
  - Competitive intensity: how tough or intense the competition is
  - Existence of commercial applications development skills from “new” to “already in place”)
  - Commercial assumptions (from “low probability” to “highly predictable”)
  - Regulatory/social/political impact (from “negative” to “positive”)
- Probability of Technical Success:
  - Technical gap (from “large gap” to “incremental improvement”)
  - Program complexity
  - Existence of technological skill base (from “new to us” to “widely practiced in company”)
  - Availability of people & facilities (from “must hire/build” to “immediately available”)
- Process steps
  - Each criterion (question) is scored 1- 10; 1, 4, 7 & 10 are “anchored.” (Hoechst puts dollar amounts on scale points to eliminate high-scorer/low-scorer cultural biases in global analyses.)
  - The 5 Factors are calculated via weightings x ratings
  - They are added in a weighted fashion to yield a Project Score
  - Projects are ranked by Project Score until no more resources!

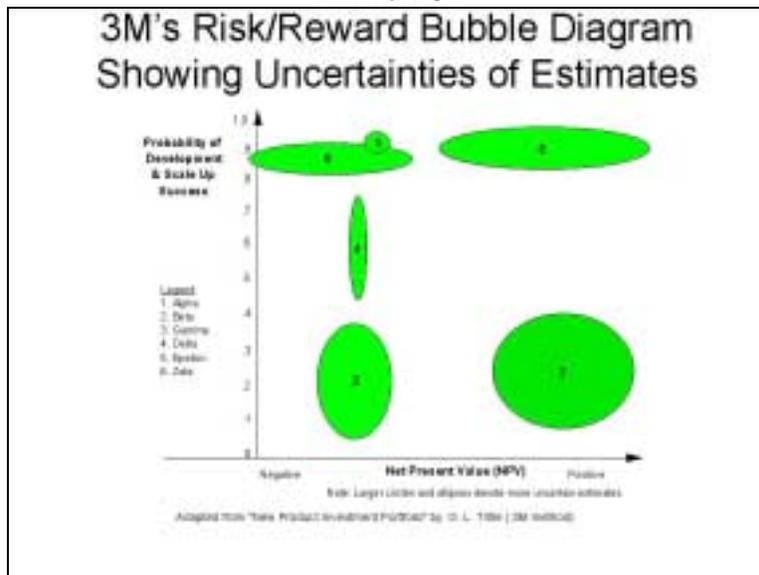
**Goal 2—Balance across projects**

- Methods
  - Mostly visual charts
  - Reveal balance in terms of spending & other key variables
- Types:
  - Bubble diagrams
  - Histograms
  - Pie charts
- Variables or Parameters to plot against each other:
  - Spending level (per year; total project)
  - Return & profitability
  - Risk & probabilities
  - Ease vs. Attractiveness
  - Development type: new products, extensions, modifications
  - Timing (time to market; market launch quarter)
  - Breakdown by markets, product lines, technologies
  - Examples (Exhibits 30-33)
    - Note the probabilistic ranges in the estimates of Exhibit 31.
    - Exhibit 33 cannot do justice to the three-dimensional software plots of the program.

**Exhibit 30**

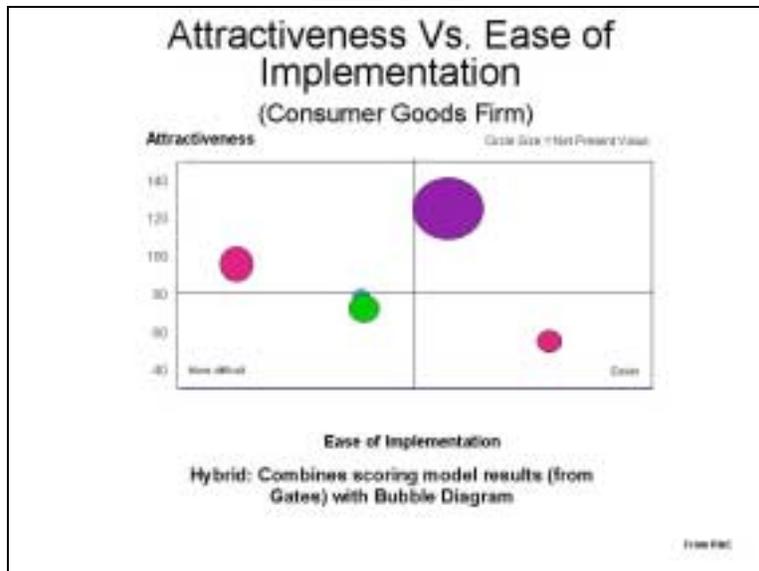


**Exhibit 31**



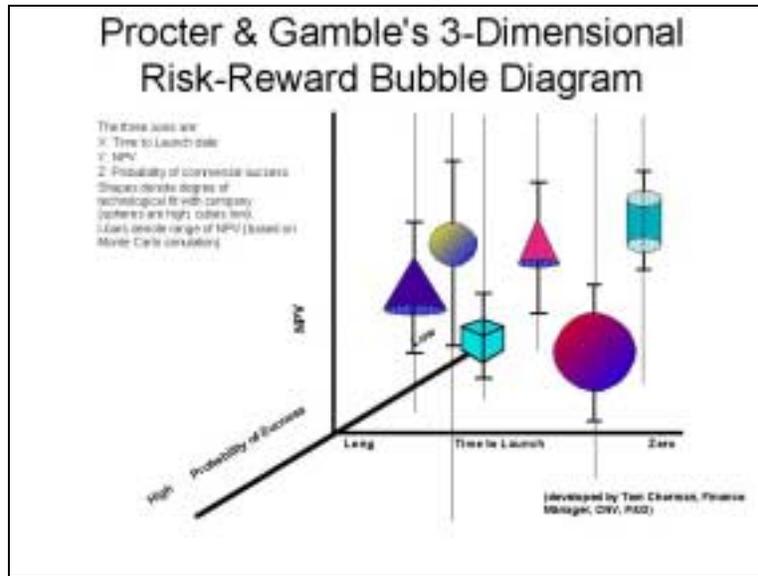
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**Exhibit 32**



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**Exhibit 33**



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- Popular bubble diagram variables (Exhibit 34).

**Exhibit 34**

### Popular Bubble Diagram Plots

Rank	Type of Chart	Axis	Axis	%
1	Risk vs. Reward	Reward: NPV, IRR, benefits after years of launch, market value	Risk: Probability of success (technical, commercial)	44.4
2	Novelty	Technical novelty	Market novelty	11.1
3	Cost Vs. Attractiveness	Technical feasibility	Market attractiveness (growth potential, consumer appeal, gross attractiveness, life cycle)	11.1
4	Strength vs. Attractiveness	Competitive position (strength)	Attractiveness, market growth, technical maturity, years to implementation	11.1
5	Cost Vs. Timing	Cost to implement	Time to impact	8.7
6	Strategic vs. Benefit	Strategic focus of R&D	Business intent, NPV, financial fit, attractiveness	8.8
7	Cost Vs. Benefit	Cumulative reward	Cumulative development costs	5.5

Rank ordered, in descending order of popularity. All 11 charts shown percentage breakdown of bubble diagram usage (at a percent of businesses using bubble diagrams).

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***Goal 3—Linking portfolio to business strategy***

- Three main approaches: Our research finds all three being used.
  - Top-Down: Strategic Buckets model
    - via establishing envelopes of money for different project categories
    - Rule: strategy begins when you start spending money!
    - allocate money to different project “buckets”
    - then prioritize projects within a bucket via maximization approaches
    - results in multiple portfolio lists ... one per bucket
  - Bottom Up: via selecting projects – the projects decide the portfolio
    - use strategic criteria for project selection and ranking ...
      - at gates (e.g., strategic fit; strategic importance), requiring a strong stage-gate process
      - in the portfolio scoring model or rank order approaches
    - results in a single portfolio list of prioritized projects
  - Top Down & Bottom Up: Strategic Check—the most common approach
    - First, top down:
      - develop mission, goals & strategy for each “business”
      - define very tentative split in resources (possible targets)
    - Then, bottom up:
      - prioritize projects
      - first cut Go decisions
      - add up expenditures by business
    - Consistency check between top down & bottom up
      - redo – multiple iterations
      - results in a single portfolio list of prioritized projects
- The Corning approach of allocation to strategic buckets.
  - Strategy categories (Exhibit 35)
    - What counts is not so much the number in the cell, but discussion about the numbers.

**Exhibit 35**

**Familiarity Matrix: Resource Split Across Technology/Market Categories**

		Market Newness		
		Existing	Extension	New
Technology Newness	New	Product Development %	Business Development %	New Business %
	Extension	Product Differentiation %	Product Extension %	Business Diversification %
	Existing	Share Management %	Market Segmentation %	Market Development %

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- Project prioritization within buckets (Exhibit 36).
  - Prioritize projects within each category until the category budget runs out. Compare projects only within the same bucket.
  - Should more projects be developed for “product B new product” bucket, or should excess resources be shifted to other buckets?
  - Business maintenance projects sometimes shortchange what should be long-term spending on new products.

**Exhibit 36**

**Projects Prioritized Within Buckets**

Four of 12 Buckets with Spending Targets in Each Bucket

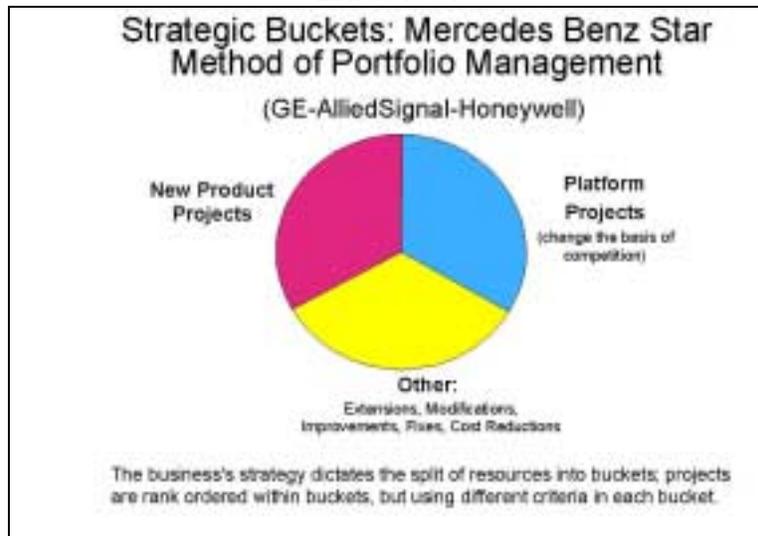
New Products: Product Line A Target Spend: \$9.7M	New Products: Product Line B Target Spend: \$16.6M	Maintenance of Business Product Lines A & B Target Spend: \$10.6M	Cost Reductions: All Products Target Spend: \$7.0M
Project A 4.1	Project B 2.2	Project C 1.2	Project T 1.9
Project C 2.1	Project D 4.5	Project G 6.8	Project M 2.4
Project F 1.7	Project H 2.3	Project H 0.7	Project N 0.7
Project L 0.9	Project T 0.7	Project J 1.5	Project P 1.4
Project R 1.7	<b>Gap = 6.8</b>	Project Q 4.8	Project S 1.9
Project Y 2.8		Project R 1.5	Project U 1.8
Project Z 4.5		Project V 2.5	Project AA 1.2
Project BB 2.8		Project W 2.1	

Projects rank ordered within columns according to Maximilian Method: ECV; a financial criterion such as NPV / Probability of Success; or better yet, a Scoring Model.

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- “Mercedes Benz Star” Method (Exhibit 37).
  - Idea is balancing long- and short-term spending.
  - Used At GE for R&D budgeting.
  - “Platform project” category accounts for more than just a technical definition of a project.
  - This approach generates lots of debate about allocating not only R&D but other resources as well.

**Exhibit 37**

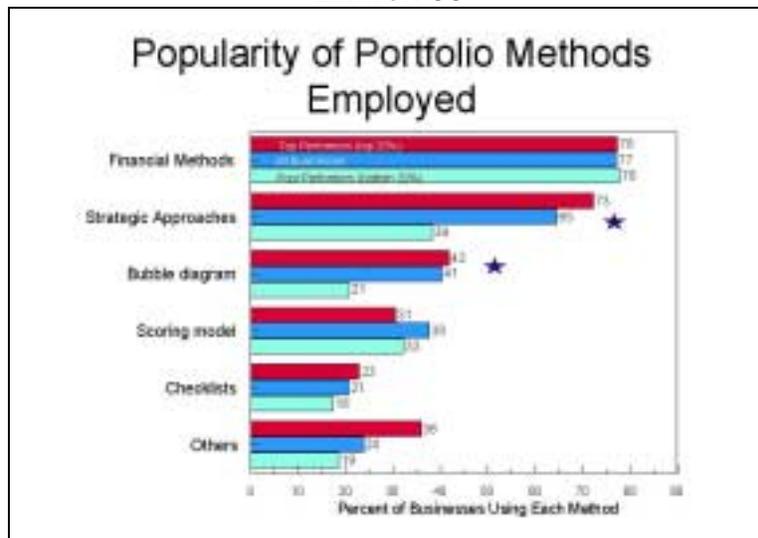


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### ***What's used and what's working?***

- Findings from major benchmarking study of portfolio management practices and performance:
  - 203 businesses, including 28% in chemicals and 18% in high tech.
  - Copies of the study are available on request to the Product Development Institute, [www.prod-dev.com](http://www.prod-dev.com)
- Popularity of methods employed (Exhibit 38).
  - Financial methods lead the pack.
  - Top performers (self-ratings of NPD program success) are more likely to use strategic approaches compared to other firms.

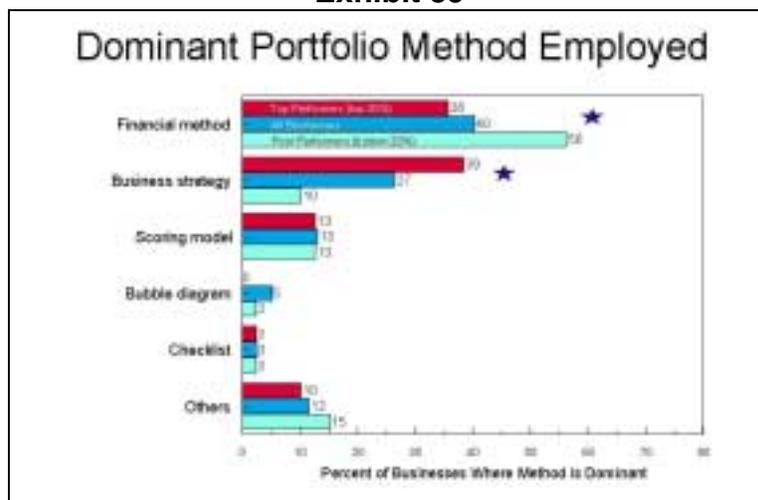
**Exhibit 38**



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- Dominant method employed (Exhibit 39).
  - Poor performers put more faith in financial models than more successful firms.
  - Top performers favor strategic approaches more so than less successful firms.

**Exhibit 39**



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- Though more widely used, financial methods are the least satisfying to respondents (Exhibit 40).
  - Xs indicate weakest methods used.
  - Stars indicate the strongest methods used.

Exhibit 40

# Satisfaction with Project

Performance Metric	Financial Methods	Strategic Methods	Scoring Model	Bubble Diagrams
Method may used to make Go/No decisions	2.87 ✗	2.87 ✗	2.95	3.00 ★
Fits management style	3.52	3.72 ★	3.73 ★	3.40 ✗
Understood by management	2.83 ✗	3.25 ★	3.13	3.00
User friendly way to use	3.10	3.14	3.04 ✗	3.40 ★
Realistic method	3.00 ✗	3.16	3.13	3.30 ★
Perceived as efficient	3.09	3.23	3.47 ★	2.90 ✗
Perceived as effective	3.08 ✗	3.29	3.47 ★	3.70 ★
Method rated as excellent	2.91 ✗	3.06	3.04	3.20 ★
Business would recommend method	2.80 ✗	3.06	2.82	3.50 ★

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## *Portfolio issues yet to be resolved*

- Dynamic nature of decisions:
  - Real time vs. calendar time
  - at gates – make the prioritization ... or
  - annually or semi-annually (budget the resources)
- Need to integrate Portfolio Management with Gate Decisions in Stage-Gate™ process
  - Gates: make sound gate decisions & the portfolio will take care of itself:
    - The gates decide the portfolio
    - A portfolio model serves as a check & minor course correction, or ...
  - Portfolio decisions dominate – gates are just a check
- Other unresolved issues
  - Imaginary precision—measuring a soft banana with a micrometer.
  - Shifting resource commitments (“on again, off again”). When are resources really committed & “firm”?
  - Too many projects on Hold. Troubles: when the list of “Hold” projects is longer than the list of active ones.
  - Why have a prioritized list at all? Just Go or Hold
  - Consider all projects ... not just NP projects. Everything that competes for the same resources should be prioritized against each other.
  - Information display or decision model?
    - Most companies have backed off using decision models.
    - They reason, let managers exercise judgment based on more and better information.

- Too much information portrayed (endless maps).
- Getting good information as input to models.
  - Many require financial data – questionable reliability.
  - Too much data needed.
- Financial models – treatment of ...
  - shared capital equipment
  - cannibalization (Recognize that if you don't obsolete your own product, competition will!)
  - terminal values

### ***Q & A***

*Q: Do people use real options valuation for value maximization decisions?*

A: Some do, such as those with very long-range, high-risk ventures for which forecasts are too risky for traditional innovation estimates. Xerox PARC, for example. More established technology firms typically use traditional valuation methods, however.

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