

PRODUCT PORTFOLIO MANAGEMENT

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DRM Associates
PD-Trak Solutions**

ABOUT THE WORKSHOP LEADER

Kenneth A. Crow is President of DRM Associates, a consulting and training firm specializing in product development, and is a Principal of PD-Trak Solutions, a provider of NPD project/process management software. He is a recognized expert in the field of new product development with over thirty years of experience consulting with major companies in aerospace, automotive, capital equipment, consumer products, defense, high technology, and medical equipment.

He has worked with management to develop product strategies and plan NPD improvement initiatives. He has assisted product development teams develop their teamwork, plan and manage projects, investigate customer needs (VOC), plan their product strategy, develop a business case, and apply DFM/A, QFD, VA, & Target Costing to optimize their designs. He has helped assess and reengineer clients' product development processes, assisted with the evaluation and implementation of NPD project/process management and PDM systems, and instituted portfolio management and pipeline management processes.

He has written papers, contributed to books, conducted training, and spoken at many conferences on product development and manufacturing. He is the past President and founding member of the Society of Concurrent Product Development and a member of PDMA and Engineering Mgt. Society. He is a Certified New Product Development Professional through PDMA. For further information, contact:

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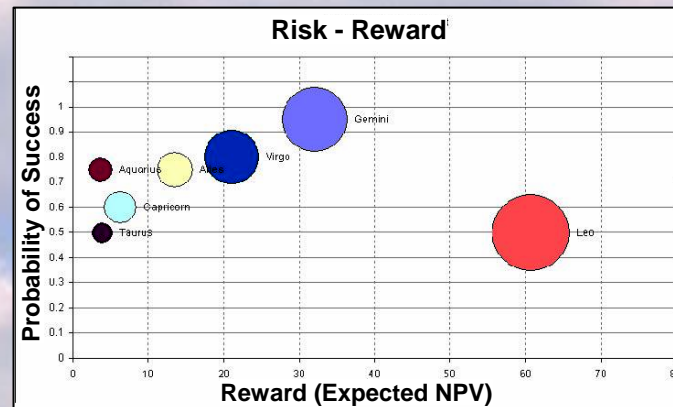
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PRODUCT PORTFOLIO MANAGEMENT

Definition:

The process of managing new product ideas, proposed projects and current projects under development as a portfolio to 1.) maximize the value of the portfolio, 2.) keep it in balance, and 3.) align it with company strategy. By characterizing and reviewing the projects in a company's portfolio as a whole, a big picture is presented and used to prioritize and select projects.



PORTFOLIO MANAGEMENT ELEMENTS

1. **Product strategy** specifies:

- New product goals (e.g., sales from new products)
- Areas of focus (e.g., those markets and product areas that new products will be developed for)
- Relative priorities (e.g., the breakdown of R&D investment by market, product area & project type)

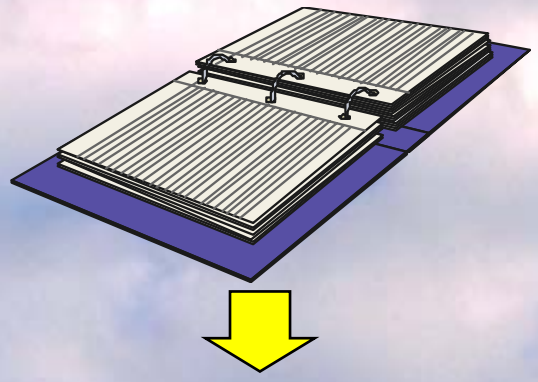
2. **Product development process** has gates where go/kill decisions are made on individual projects and hence resources are allocated

3. **Portfolio Review** where the executive management periodically reviews all projects & determines: Do we have the right projects? Is this really how we want to spend our money?

STARTS WITH STRATEGY & BUSINESS PLAN

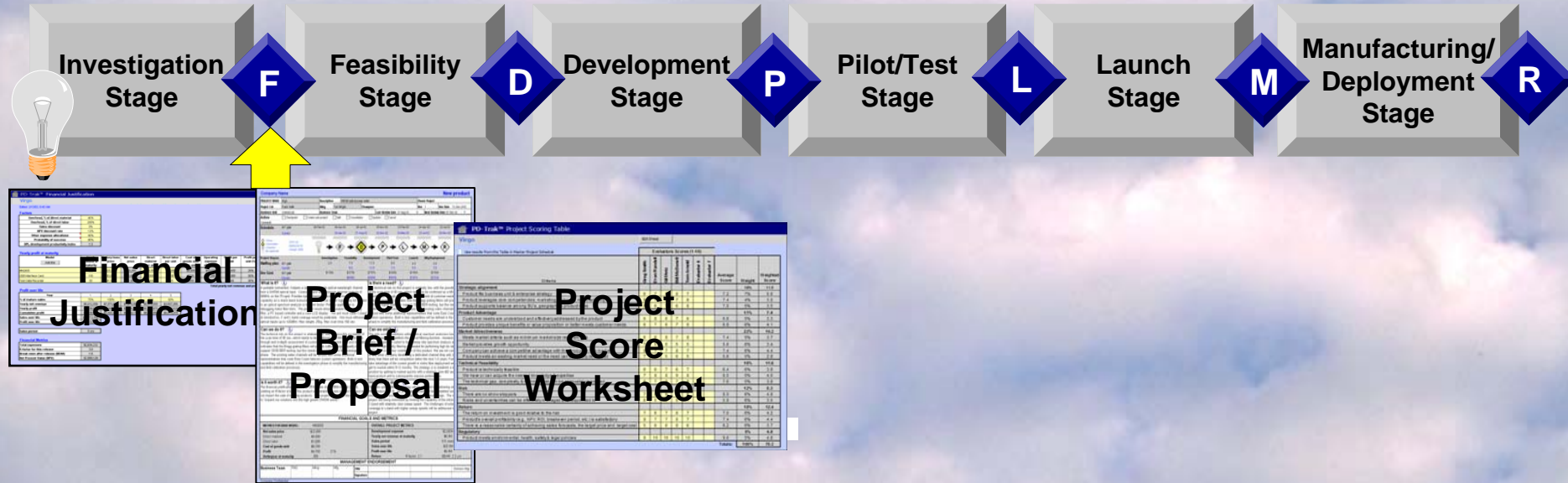
- Strategy defines goals & direction
- Business Plan defines capacity
 - R&D budget
 - R&D headcount
- Dictates how many projects we can undertake in a fiscal period(s)

Business Plan



				PORTFOLIO INFORMATION				
PROJECT NAME	BU/Prod Line	Project mgr	Status	Project cost	Sales over life	NPV	DPI	Score
Description	Process	Marketing lead	Next review	Remaining cost	Profit over life	R-Factor	Prob. Of Success	
Virgo	Technology	Ken Smith	Active	\$2,331k	\$29.5M	\$45.2M	92.6	90.8
DWDM optical power meter	Standard	Harry Brown	7-Nov-03 L Gate	\$391k	\$23.2M	10.0	80%	
Leo	Technology	Ken Smith	Active	\$2,331k	\$58.5M	\$60.8M	35.3	84.2
3GHz signal generator	Standard	Harry Brown	22-Sep-03 P Gate	\$861k	\$30.5M	13.1	50%	
Aries	Industrial	Frank Smith	Closed	\$1,209k	\$13.3M	\$13.5M	1000.0	82.3
High speed compressor	Standard	Tom Wright	26-Jan-03 Review	-\$1k	\$6.9M	5.7	75%	
Capricorn	Industrial	Ken Smith	Proposed	\$2,331k	\$10.5M	\$6.3M	74.5	81.5
High power compressor	Standard	Harry Brown	6-Sep-03 M Gate	\$51k	\$4.0M	1.7	60%	
Cancer	Technology	Ken Smith	Closed	\$2,331k	\$5.9M	\$2.3M	1000.0	80.3
8GHz spectrum analyzer	Standard	Harry Brown	7-Nov-02 L Gate	\$1k	\$2.2M	0.9	80%	
Aquarius	Industrial	Mike Brown	Active	\$903k	\$6.1M	\$3.6M	19.2	77.9
High power compressor	Standard	Tom Wright	27-Sep-03 P Gate	\$143k	\$2.2M	2.4	75%	
Gemini	Industrial	Ken Smith	Active	\$2,331k	\$42.1M	\$32.1M	76.2	66.1
Micro compressor	Standard	Harry Brown	7-Nov-03 L Gate	\$401k	\$16.1M	6.9	95%	
Taurus	Industrial	Mike Brown	Proposed	\$403k	\$4.6M	\$3.9M	4.9	40.1
High efficiency compressor	Standard	Tom Wright	1-Nov-03 Start	\$403k	\$1.8M	4.5	50%	

STAGE / PHASE-GATE REVIEWS



- Stage/phase-gate evaluations are often the source of the information for portfolio evaluation and ranking
- Initial screening of project proposals for adequate business case & fit – rigor prevents expenditure of resources for less desirable projects
- Subsequent gate reviews insure resources are only applied to projects that fit the portfolio criteria and have a high priority

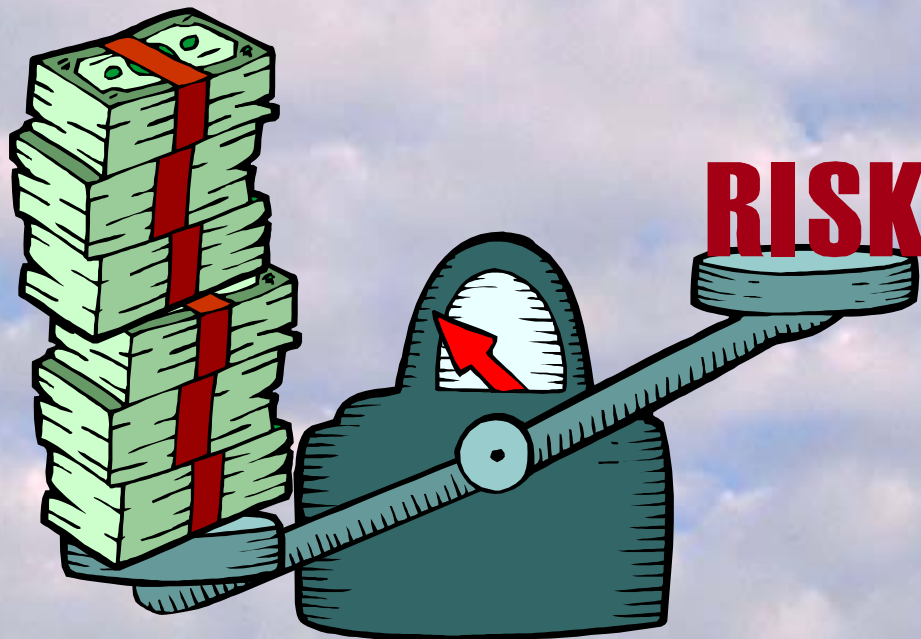
REQUIRES EFFECTIVE GATE PROCESS

Portfolio Management requires an effective gate process to kill bad or marginal projects. This can be a challenge because:

- Management has had a tough time killing projects - “sacred cows” and personal commitment
- Lack of effective gate criteria
- Projects get a life of there own
- Teams tweak the project business case until acceptable

PORTFOLIO MANAGEMENT GOALS

1. Maximize the value of the portfolio
2. Seek balance in the portfolio
3. Keep portfolio projects strategically aligned



PORTFOLIO MANAGEMENT TECHNIQUES

	Financial - NPV & DPI	Project Scoring	Strategic Allocation	Charts & Roadmaps
1. Maximize the value of the portfolio				
2. Seek balance in the portfolio				
3. Keep portfolio projects strategically aligned				

PORTFOLIO MANAGEMENT APPROACH

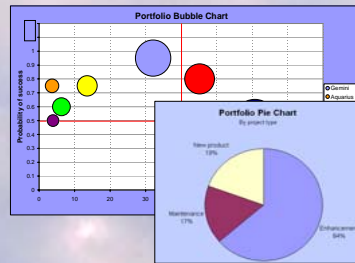
Annual/
5 Year
Business
Plan

R&D Budget
R&D Headcount

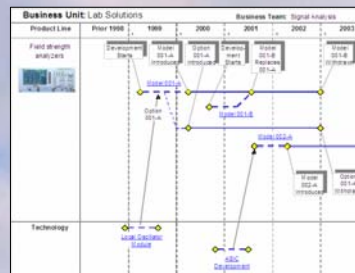
Strategic Allocation
Corporate or BU Level

	Technology Development	New Products	Enhancements & Line Exten.	TOTAL
Business Unit A	7%	24%	4%	35%
Business Unit B	2%	16%	7%	25%
Business Unit C	0%	6%	11%	17%
Business Unit D	2%	14%	6%	22%
TOTAL	11%	60%	28%	99%

Corporate or BU
Portfolio Mgt.



Review to
Ensure Balance



Review to Consider
Roadmap Relationships
(Technology & Platforms)

PROJECT NAME	BU/Prod Line	Project mgr	Status	PORTFOLIO INFORMATION				
				Project cost	Sales over life	NPV	DPI	Score
Description	Process	Marketing lead	Next review	Remaining cost	Profit over life	R-Factor	Prob. Of Success	
Viper	Technology	Ken Smith	Active	\$2,331k	\$29.5M	\$45.2M	92.8	90.8
DWDM optical power meter	Standard	Harry Brown	7-Nov-03 L Gate	\$391k	\$23.2M	10.0	89%	
Leo	Technology	Ken Smith	Active	\$2,331k	\$58.5M	\$60.8M	35.3	84.2
3GHz signal generator	Standard	Harry Brown	22-Sep-03 P Gate	\$861k	\$30.5M	13.1	50%	
Aries	Industrial	Frank Smith	Closed	\$1,209k	\$13.3M	\$13.5M	1000.0	82.3
High speed compressor	Standard	Tom Wright	26-Sep-03 Review	\$1k	\$2.9M	5.7	75%	
Capricorn	Industrial	Ken Smith	Proposed	\$2,331k	\$10.5M	\$6.3M	74.5	81.5
High power compressor	Standard	Harry Brown	8-Sep-03 M Gate	\$51k	\$4.0M	1.7	89%	
Gemini	Technology	Ken Smith	Closed	\$2,331k	\$5.9M	\$2.3M	1000.0	80.3
3GHz spectrum analyzer	Standard	Harry Brown	7-Nov-02 L Gate	\$1k	\$2.2M	0.9	80%	
Avardus	Industrial	Mike Brown	Active	\$903k	\$6.1M	\$3.6M	19.2	77.9
High power compressor	Standard	Tom Wright	27-Sep-03 P Gate	\$143k	\$2.2M	2.4	75%	
Gemini	Industrial	Ken Smith	Active	\$2,331k	\$42.1M	\$32.1M	76.2	66.1
Micro compressor	Standard	Harry Brown	7-Nov-03 L Gate	\$401k	\$16.1M	6.9	95%	
Taurus	Industrial	Mike Brown	Proposed	\$403k	\$4.6M	\$3.2M	4.9	40.1
High efficiency compressor	Standard	Tom Wright	1-Nov-03 L Start	\$403k	\$1.8M	4.5	50%	

Scorecard Method
Development Productivity Index

STRATEGIC ALLOCATION METHOD

- The business strategy dictates the allocation of resources into buckets
- Projects are rank ordered within buckets
- Different criteria are used to rank order projects for each bucket

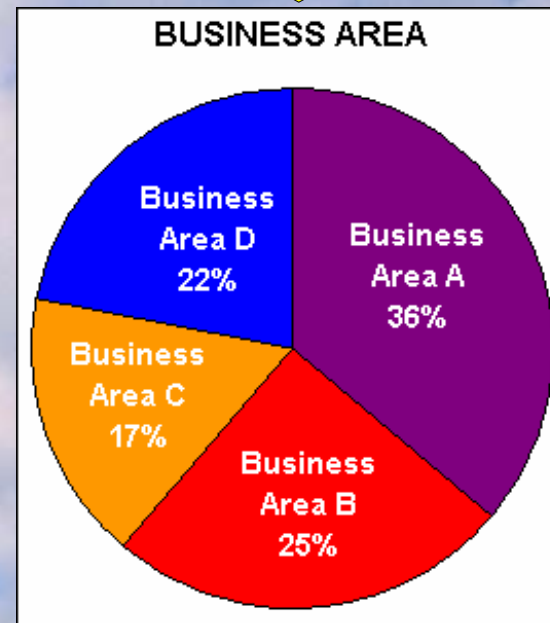
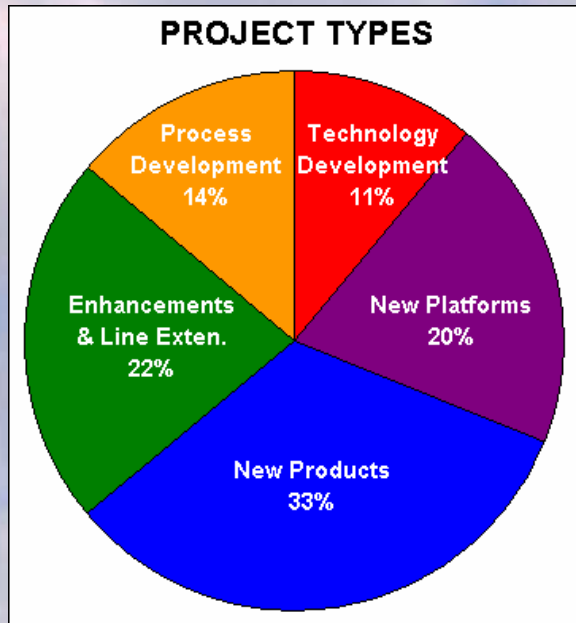


STRATEGIC ALLOCATION BASIS

- **Strategic goals** - defending the base, expanding the base, diversifying, etc.
- **Business unit allocation**
- **Product line allocation**
- **Project type** - new product, upgrade, process improvement, cost reduction, technology development, research, etc.
- **Familiarity** - product technology newness, process newness, market newness, etc.
- **Geography**

STRATEGIC ALLOCATION METHOD

	Technology Development	New Platforms	New Products	Enhancements & Line Exten.	Process Development	TOTAL
Business Area A	7%	12%	10%	4%	3%	36%
Business Area B	2%	6%	10%	5%	2%	25%
Business Area C	0%	0%	4%	9%	4%	17%
Business Area D	2%	2%	9%	4%	5%	22%
TOTAL	11%	20%	33%	22%	14%	100%



PORTFOLIO INFORMATION

Prioritized list of projects with portfolio information

PORTFOLIO INFORMATION					
PROJECT NAME	Project cost	Sales over life	NPV	DPI	Score
Description	Remaining cost	Profit over life	R-Factor	Probability of success	
<u>Aquarius</u>	\$903k	\$6.1M	\$3.6M	17.9	88.7
High power compressor	\$153k	\$2.2M	2.4	75%	
<u>Capricorn</u>	\$2,331k	\$10.5M	\$6.3M	67.8	81.5
High power compressor	\$56k	\$4.0M	1.7	60%	
<u>Leo</u>	\$2,331k	\$58.5M	\$60.8M	34.5	81.3
3GHz signal generator	\$881k	\$30.5M	13.1	50%	
<u>Gemini</u>	\$2,331k	\$42.1M	\$32.1M	72.5	80.4
Micro compressor	\$421k	\$16.1M	6.9	95%	
<u>Virgo</u>	\$2,331k	\$29.5M	\$45.2M	86.0	75.7
DWDM optical power meter	\$421k	\$23.2M	10.0	80%	
<u>Taurus</u>	\$403k	\$4.6M	\$3.9M	4.9	58.9
High efficiency compressor	\$403k	\$1.8M	4.5	50%	

PROJECT SCORING

Criteria	Steve Wright	Bill Sampson	Ralph Porter	Horosi Anaki	Terry Arthur	Average Score	Weight	Weighted Score
Strategic alignment							16%	12.6
Product fits business unit & enterprise strategy	8	7	9	7	8	7.8	7%	5.5
Product leverages core competencies: marketing, technical, manufacturing	7	8	7	8	9	7.8	4%	3.1
Product supports balance among BU's, geography & product lines	8	9	8	7	8	8.0	5%	4.0
Product Advantage							11%	7.7
Customer needs are understood and effectively addressed by the product	7	6	7	6	8	6.8	5%	3.4
Product provides unique benefits or value proposition or better meets customer needs	6	7	8	7	8	7.2	6%	4.3
Market Attractiveness							22%	17.4
Meets market criteria such as minimum market size requirements	8	8	9	8	9	8.4	5%	4.2
Market provides growth opportunity	7	10	9	7	8	8.2	6%	4.9
Company can achieve a competitive advantage with this product in this market	8	8	8	9	8	8.2	6%	4.9
Product meets an existing market need or the need can be readily developed	7	7	7	6	7	6.8	5%	3.4
Technical Feasibility							16%	11.7
Product is technically feasible	6	8	7	6	7	6.8	6%	4.1
We have or can acquire the needed knowledge & expertise	8	8	7	6	8	7.4	5%	3.7
The technical gap, complexity, & technical risk can be adequately managed	9	7	8	8	7	7.8	5%	3.9
Risk							12%	9.7
There are no show stoppers	7	8	9	7	10	8.2	6%	4.9
Risks and uncertainties can be effectively managed and responded to	7	8	8	8	9	8.0	6%	4.8
Return							18%	12.6
The return on investment is good relative to the risk	7	7	6	6	7	6.6	6%	4.0
Product's overall profitability (e.g., NPV, ROI, breakeven period, etc.) is satisfactory	8	7	7	6	6	6.8	6%	4.1
There is a reasonable certainty of achieving sales forecasts, the target price & target cost	8	8	8	7	7	7.6	6%	4.6
Regulatory							5%	4.0
Product meets environmental, health, safety & legal policies	7	8	8	9	8	8.0	5%	4.0
Totals:							100%	75.7

SCORING METHOD

PROJECT NAME	NPV	DPI	Score
Description	R-Factor	Probability of success	
<u>Aquarius</u> High power compressor	\$3.6M 2.4	17.9 75%	88.7
<u>Capricorn</u> High power compressor	\$6.3M 1.7	67.8 60%	81.5
<u>Leo</u> 3GHz signal generator	\$60.8M 13.1	34.5 50%	81.3
<u>Gemini</u> Micro compressor	\$32.1M 6.9	72.5 95%	80.4
<u>Virgo</u> DWDM optical power meter	\$45.2M 10.0	86.0 80%	75.7
<u>Taurus</u> High efficiency compressor	\$3.9M 4.5	4.9 50%	58.9

12 Mo Reqmts	Cumulative Personnel	Action
4.9	4.9	Go
11.5	16.4	Go
5.3	21.7	Go
4.1	25.8	Hold
5.3	31.2	Hold
3.3	34.5	Kill

Rank by Total Score

Average Project Cycle Time = 12 mo.

Sustaining & Administrative Time = 15%

Available staff = 26

Proceed with first 3 projects

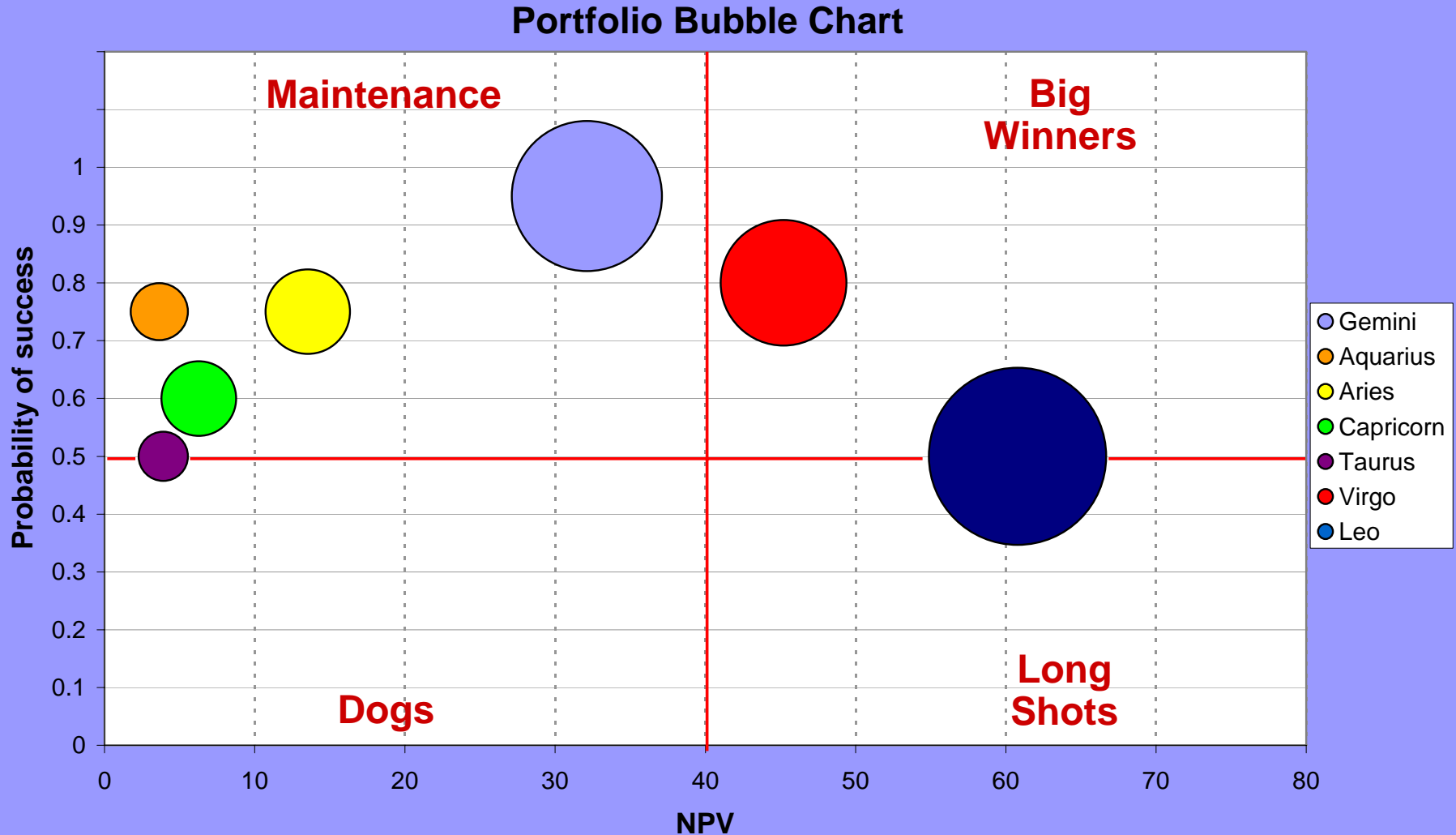
RANKING PROJECTS – DPI & SCORE

<input type="checkbox"/> Active <input type="checkbox"/> Proposed/On hold		PORTFOLIO INFORMATION					12 Mo	Cumulative	
PROJECT NAME	BU/Prod Line	Project	Sales	NPV	DPI	Score	Reqmts	Personnel	Action
Description	Process	Remaining cost	Profit over life	R-Factor	Prob. of Succes				
Capricorn	Technology	\$2,185k	\$16.0M	\$3.1M	1.6	88.3	7.5	7.5	Go
DSP measurement engine	New product	\$1,580k	\$7.1M	3.3	85%				
Aries	Automotive	\$978k	\$15.8M	\$3.5M	12.5	87.4	5.0	12.5	Go
3.8L V8 enhancement	Enhancement	\$253k	\$5.9M	6.0	90%				
Pisces	Automotive	\$242k	\$1.2M	\$0.2M	1.8	84.2	3.5	16.0	Go
Turbo charger life extension	Maintenance	\$92k	\$0.5M	2.1	90%				
Leo	Technology	\$2,446k	\$36.0M	\$7.6M	2.5	80.0	10.0	26.0	Go
Next generation, high capacity	New Product	\$2,446k	\$13.0M	5.3	80%				
Virgo	Technology	\$3,136k	\$50.0M	\$2.0M	1.8	76.5	6.0	32.0	Go
DWDM optical power meter	New product	\$996k	\$7.3M	2.3	90%				
Aquarius	Industrial	\$413k	\$3.2M	\$0.4M	1.1	73.4	3.3	35.3	Kill
High power compressor	Maintenance	\$333k	\$1.0M	2.4	95%				
Gemini	Industrial	\$1,152k	\$14.4M	\$2.3M	2.2	70.2	7.0	42.3	Go
High efficiency compressor	Enhancement	\$842k	\$4.5M	3.9	80%				
Taurus	Industrial	\$1,292k	\$36.0M	\$3.8M	1.8	70.0	4.0	46.3	Hold
Fuel tank leak detection system	New product	\$1,292k	\$7.4M	5.7	60%				

1. Determine personnel resources (38 in example)
2. Consider ranking based on Score or DPI (Development Productivity Index = NPV x Probability of Success/Development Cost Remaining). Evaluate balance, linkages & strategic alignment
3. Make go / kill / hold decisions

REWARD VS. RISK BUBBLE DIAGRAM

Reward vs. Risk is commonly used to assess balance

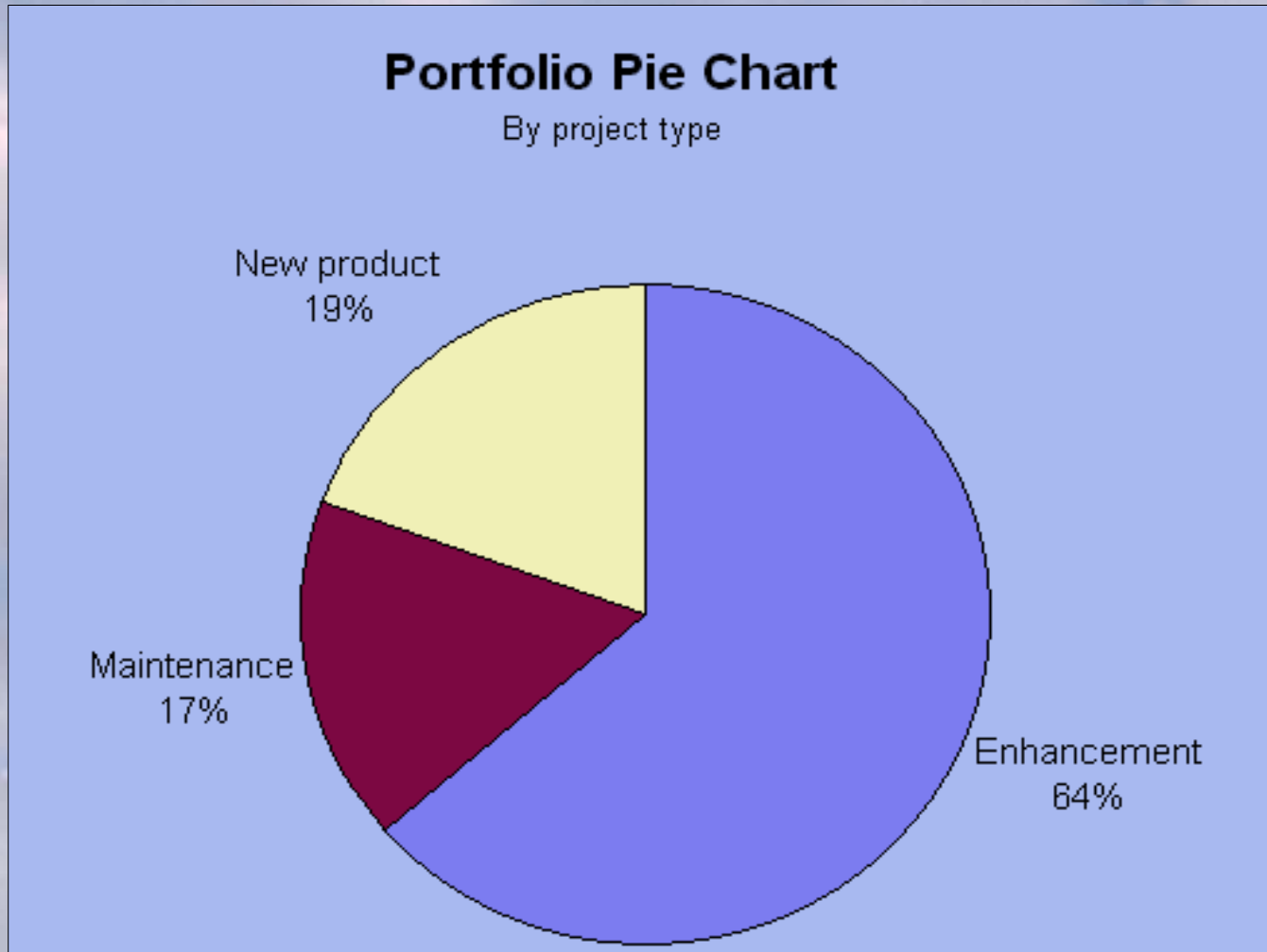


REWARD VS. RISK PROJECT TYPES

- **Big Winners** - high reward & high probability of success; want more of this type of project
- **Long Shots** - high reward & low probability of success projects; a technical breakthrough may lead to a winner
- **Maintenance** - low reward & high probability projects typical of product upgrades & line extensions; common for companies to have too many of these projects
- **Losers** - low reward, low probability (high risk) projects; once approved (perhaps with a different initial assessment), they are difficult to kill

PORTFOLIO MANAGEMENT ALLOCATION

Pie chart used to indicate distribution of project characteristics



STRATEGIC ALLOCATION METHOD

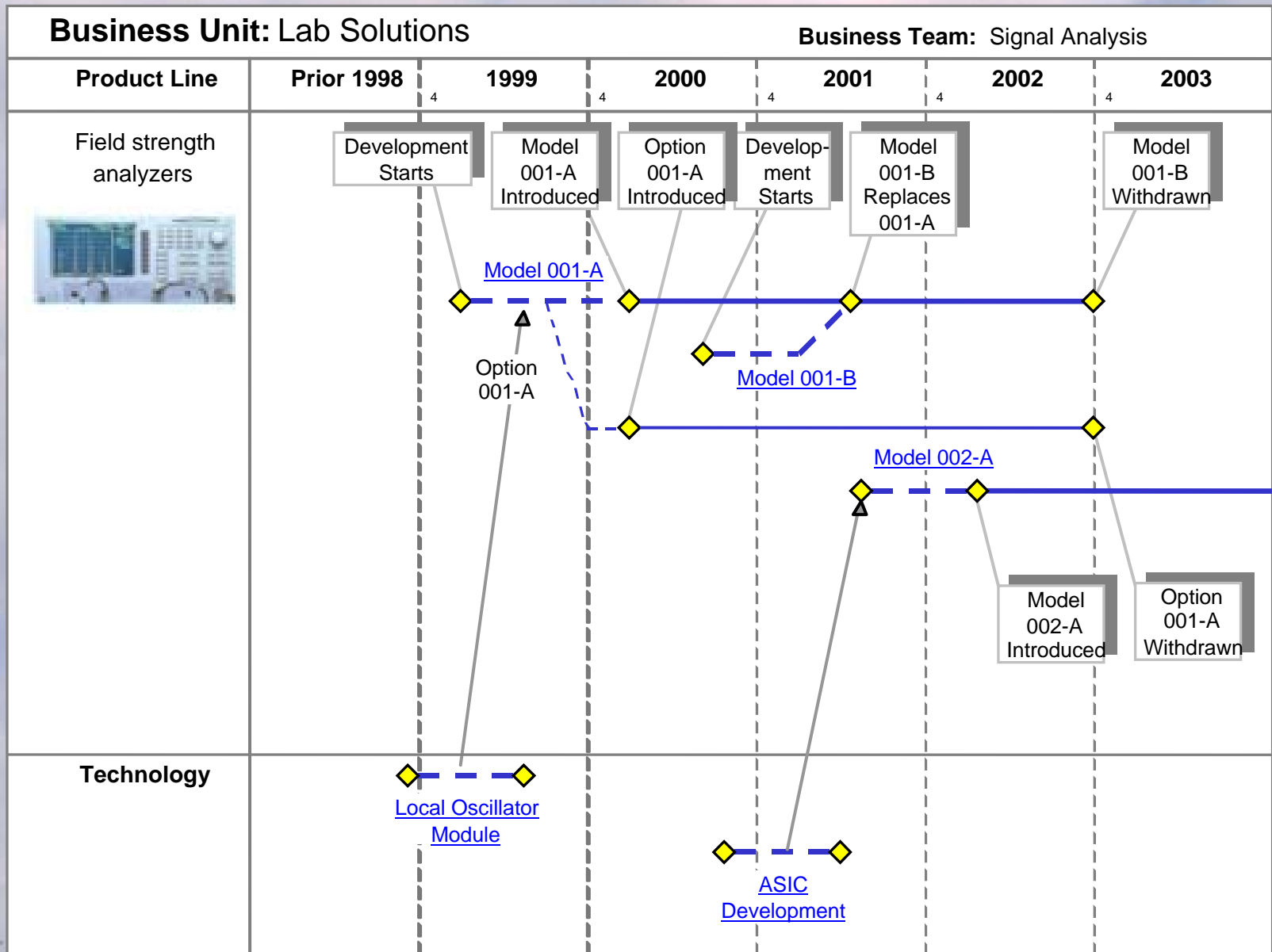
Strategic allocation used with Development Productivity Index

Description	Project Type	Net Present Value	Prob. of Succ.	Develop. Cost	Dev. Prod. Index	New Prod 45%	Upgrade 35%	Tech. 20%
Budget Allocation						\$7,200,000	\$5,600,000	\$3,200,000
Field Strength Analyzer	Upgrade	\$3,415,564	90%	\$1,100,000	2.79		\$1,100,000	
Network Tester	New product	\$3,579,785	80%	\$1,196,000	2.39	\$1,196,000		
Broadband Optical Detector	Upgrade	\$1,561,897	95%	\$694,002	2.14		\$694,002	
Network Driver Software	Upgrade	\$758,040	95%	\$346,894	2.08		\$346,894	
Optical Sensor	New product	\$1,677,893	80%	\$756,611	1.77	\$756,611		
ATM Switch	Upgrade	\$1,093,648	95%	\$742,000	1.40		\$742,000	
DWDM Optical Power Meter	New product	\$4,433,684	80%	\$2,583,000	1.37	\$2,583,000		
Optical Coupling Module	New product	\$321,766	75%	\$187,453	1.29	\$187,453		
10GB Optical Transceiver	New product	\$3,546,755	80%	\$2,322,017	1.22	<u>\$2,322,017</u>		
Optical Demux	Upgrade	\$1,304,088	90%	\$983,671	1.19		\$983,671	
Optical Multiplexer	New product	\$428,408	75%	\$1,200,000	0.27	\$1,200,000		
DSP Measurement Engine	Technology	\$0	70%	\$933,000	0.00			\$933,000
Next Gen Optical Sensor	Technology	\$0	60%	\$2,405,000	0.00			<u>\$2,405,000</u>
1000GB Core Technology	Technology	\$0	60%	\$4,435,000	0.00			<u>\$4,435,000</u>
Total All Projects				\$19,884,648		\$8,245,081	\$3,866,567	\$7,773,000
Total Selected Projects						\$7,045,081	\$3,866,567	\$3,338,000

PRODUCT ROADMAP METHOD

- Business strategy defines goals & strategic arenas
- Determine what major initiatives must be done to win in each arena
- Determine types of platforms and technologies to invest in:
 - Research & development
 - Technology acquisition
- Cluster projects and identify logical development sequence; consider market opportunity, competition, technology development timing, etc.
- Describe via a Product / Technology Roadmap
- Check the roadmap against the portfolio plan to identify prerequisite projects that were killed or placed on hold

PRODUCT ROADMAP EXAMPLE

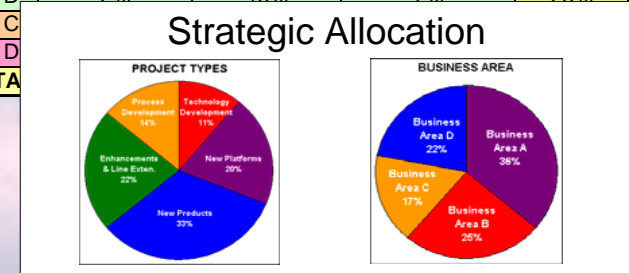


RECOMMENDED APPROACH

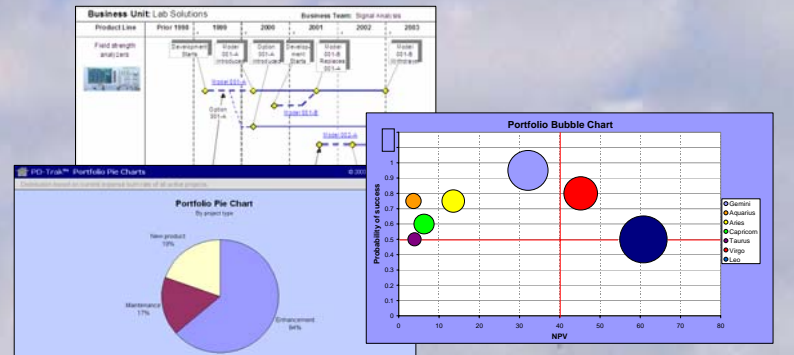
Three-stage process:

1. How should we spend our R&D budget in terms of markets, business units, product lines, & development categories?
2. Which projects should we undertake & what are the priorities?
3. Does this prioritization achieve the desired balance and address technology & platform prerequisites?

	Technology Development	New Products	Enhancements & Line Exten.	TOTAL
Business Unit A	7%	24%	4%	35%
Business Unit B	2%	16%	7%	25%
Business Unit C				
Business Unit D				
TOTAL				



PROJECT NAME	BU/Prod Line	Project mgr	Status	PORTFOLIO INFORMATION					
				Project cost	Sales over life	NPV	DPI	Score	R-Factor
Virgo	Technology	Ken Smith	Active	\$2,331k	\$29.5M	\$45.2M	92.5	90.8	
DWDM optical power meter	Technology	Harry Brown	7-Nov-03 I Gate	\$391k	\$23.2M	10.0	80%		
WRS	Technology	Ken Smith	Active	\$2,331k	\$8.8M	\$69.8M	36.3	84.2	
3GHz signal generator	Standard	Harry Brown	22-Sep-03 I P Gate	\$861k	\$30.5M	13.1	50%		
Amra	Industrial	Frank Smith	Closed	\$1,208k	\$13.2M	\$13.2M	100.0	82.3	
High speed compressor	Standard	Tom Wright	26-Jan-03 Review	\$1k	\$6.9M	3.7	75%		
Cardport	Industrial	Ken Smith	Proposed	\$2,331k	\$10.5M	\$6.3M	74.5	81.5	
High power compressor	Standard	Harry Brown	6-Sep-03 I M Gate	\$51k	\$4.0M	1.7	60%		
Genex	Technology	Ken Smith	Closed	\$7,331k	\$6.9M	\$2.3M	100.0	80.3	
6GHz spectrum analyzer	Standard	Harry Brown	7-Nov-03 I Gate	\$1k	\$2.2M	0.3	50%		
Aquarius	Industrial	Mike Brown	Active	\$603k	\$6.1M	\$3.6M	19.0	77.3	
High power compressor	Standard	Tom Wright	27-Sep-03 I P Gate	\$143k	\$2.2M	2.4	75%		
Genus	Industrial	Ken Smith	Active	\$2,331k	\$42.1M	\$32.1M	78.2	66.1	
Micro compressor	Standard	Harry Brown	7-Nov-03 I L Gate	\$401k	\$16.1M	6.9	95%		
Laurus	Industrial	Mike Brown	Proposed	\$403k	\$4.6M	\$3.9M	4.3	40.1	
High efficiency compressor	Standard	Tom Wright	1-Nov-03 I Start	\$403k	\$1.8M	4.5	50%		



BUSINESS PLANNING INTEGRATION

Annual/
5 Year
Business
Plan

R&D Budget
R&D Headcount
Sales from New Products
Profit from New Products

Project Portfolio
(Master Project Schedule)

Adjust Plan
Adjust Portfolio

PROJECT INFORMATION				PORTFOLIO INFORMATION				
PROJECT NAME	BU/Prod Line	Project mgr	Status	Project cost	Sales over life	NPV	DPI	Score
Description	Process	Marketing lead	Next review	Remaining cost	Profit over life	R-Factor	Prob. Of Success	
Virgo	Technology	Ken Smith	Active	\$2,331k	\$29.5M	\$45.2M	92.6	90.8
DWDM optical power meter	Standard	Harry Brown	7-Nov-03 L Gate	\$391k	\$23.2M	10.0	80%	
Leo	Technology	Ken Smith	Active	\$2,331k	\$58.5M	\$60.8M	35.3	84.2
3GHz signal generator	Standard	Harry Brown	22-Sep-03 P Gate	\$861k	\$30.5M	13.1	50%	
Aries	Industrial	Frank Smith	Closed	\$1,209k	\$13.3M	\$13.5M	1000.0	82.3
High speed compressor	Standard	Tom Wright	26-Jan-03 Review	-\$1k	\$6.9M	5.7	75%	
Capricorn	Industrial	Ken Smith	Proposed	\$2,331k	\$10.5M	\$6.3M	74.5	81.5
High power compressor	Standard	Harry Brown	6-Sep-03 M Gate	\$51k	\$4.0M	1.7	60%	
Cancer	Technology	Ken Smith	Closed	\$2,331k	\$5.9M	\$2.3M	1000.0	80.3
8GHz spectrum analyzer	Standard	Harry Brown	7-Nov-02 L Gate	\$1k	\$2.2M	0.9	80%	
Aquarius	Industrial	Mike Brown	Active	\$903k	\$6.1M	\$3.6M	19.2	77.9
High power compressor	Standard	Tom Wright	27-Sep-03 P Gate	\$143k	\$2.2M	2.4	75%	
Gemini	Industrial	Ken Smith	Active	\$2,331k	\$42.1M	\$32.1M	76.2	66.1
Micro compressor	Standard	Harry Brown	7-Nov-03 L Gate	\$401k	\$16.1M	6.9	95%	
Taurus	Industrial	Mike Brown	Proposed	\$403k	\$4.6M	\$3.9M	4.9	40.1
High efficiency compressor	Standard	Tom Wright	1-Nov-03 Start	\$403k	\$1.8M	4.5	50%	

Portfolio Business Summary

	2004	2005	2006	2007	2008
New Product Sales	\$15.4M	\$28.5M	\$36.8M	\$37.2M	\$31.2M
New Product Profit	\$4.1M	\$7.1M	\$8.8M	\$9.0M	\$7.6M
Dev. Expense-Committed	\$12.6M	\$12.7M	\$6.5M	\$0.0M	\$0.0M
Dev. Expense-Planned			\$6.3M	\$13.4M	\$13.7M
Development Headcount	72	72	74	74	76

Meet Plan?
No
Yes
Stop

PORTFOLIO MANAGEMENT & GATES

Two approaches:

1. Gate-Focused

- For larger, more mature firm with a relatively stable product portfolio & environment
- Strong stage-gate process
- The project under gate review must pass gate criteria and then resources are allocated based on how it stacks up relative to all other projects
- Portfolio management reviews held twice a year primarily to oversee gate process and make course corrections

PORTFOLIO MANAGEMENT & GATES

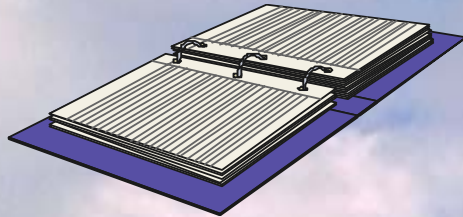
Two approaches:

2. Portfolio Management-Focused

- For fast-paced companies in fluid markets and a dynamic environment
- Reprioritization of projects essential because of the changes in the market
- Portfolio management reviews held at least quarterly
- All projects reviewed and then killed or reprioritized

A TOTAL MANAGEMENT SYSTEM

Business Plan



1. Decision on the overall level of investment in R&D and our general product development strategy



2. A solid business case and product strategy for each proposed development project

3. A Phase/Stage-Gate process to rigorously evaluate projects at critical points and approve or kill projects



QUESTIONS? COMMENTS?

Thank you for your attention and participation

Feel free to contact me with questions or for further help at kcrow@aol.com or (310) 377-5569