**March 1, 2002**

**Kazuo J. Ezawa**
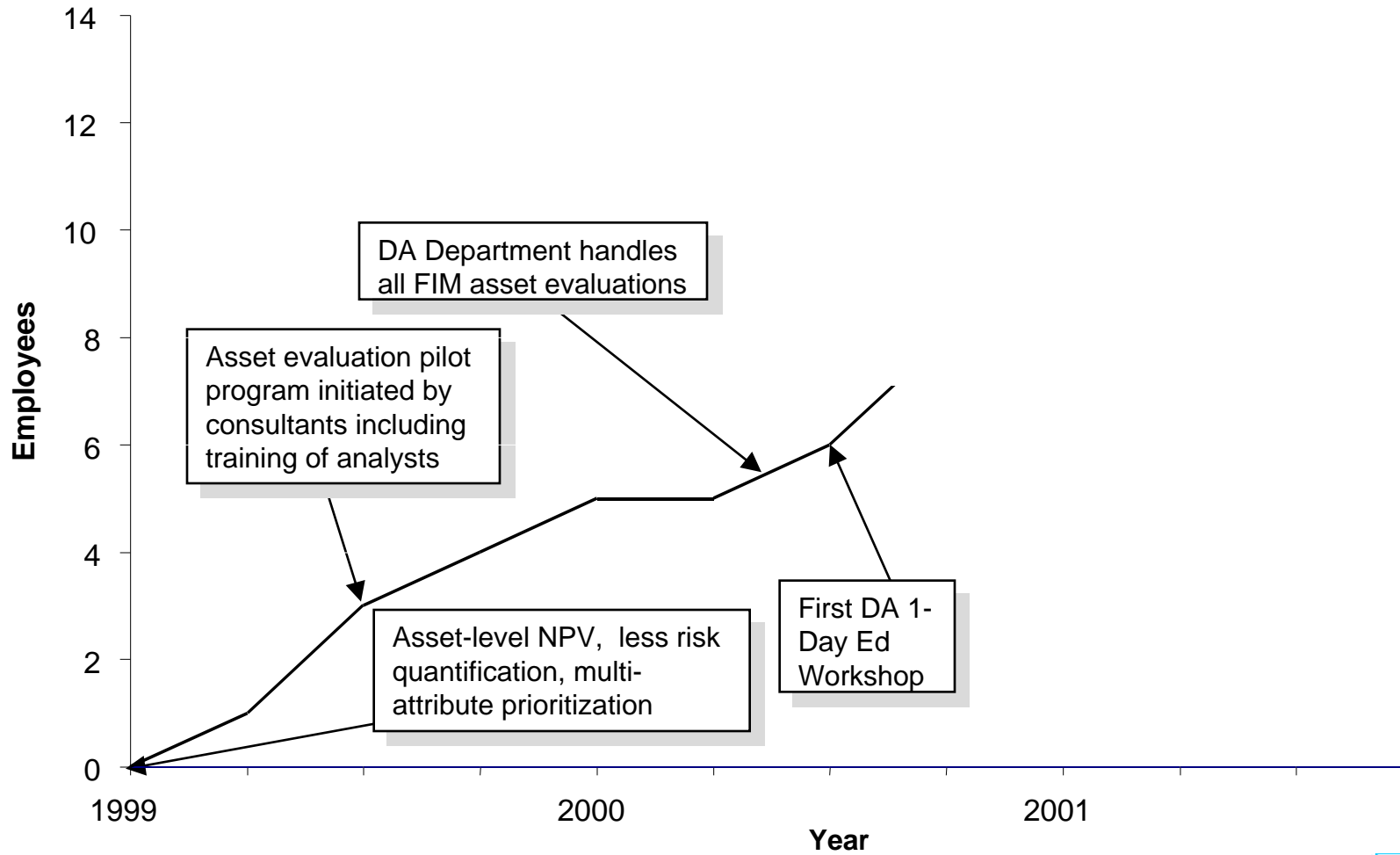
**Bristol-Myers Squibb**

# Bristol-Myers Squibb (BMS) Decision Analysis and Portfolio Planning and Management Group(1)

- **Started in 1999**
  - ➤ Rick Bayney joined BMS to start a group
  - ➤ Objective: provide decision analysis and portfolio management of pipeline assets
  - ➤ Sponsor: the president of Pharmaceutical Research Institute of BMS
  - ➤ Reported to: the senior vice president of the pharmaceutical development, along side with project management
  - ➤ Initiation:
    - – started with recruitment of 3 members
    - – contracted a consulting company for the education/training of the DA members and executives, run pilot decision analysis sessions, and development of initial DA and portfolio management tool
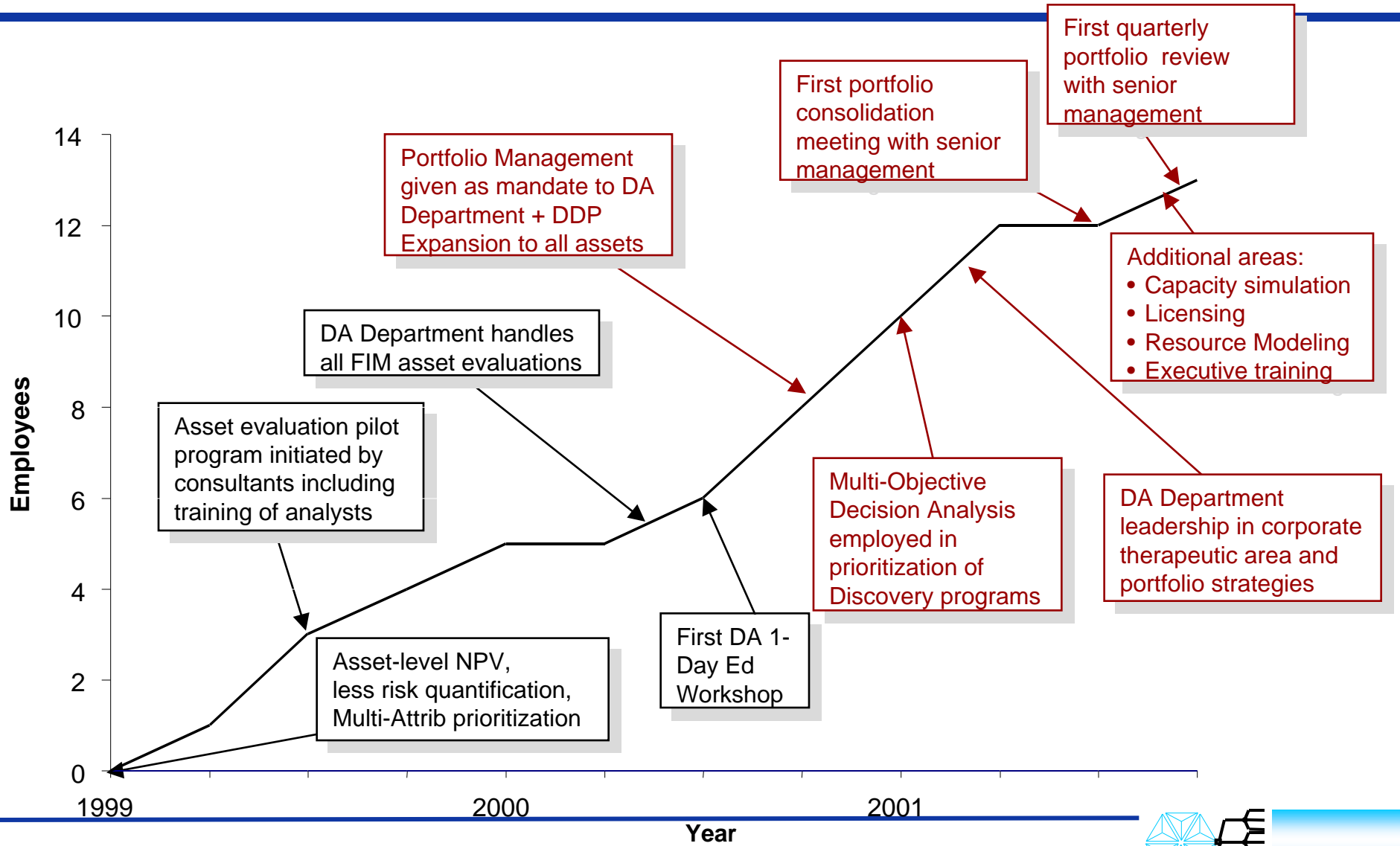
# Bristol-Myers Squibb Decision Analysis and Portfolio Planning and Management Group(2)

- **Growing pain 2000 - 2001**
  - ➤ Members grew from 5 to 14 members overall (including a secretary)
  - ➤ Delivered first annual portfolio consolidation session in 2001, participated by the president of BMS World Wide Medicine (WWM), and the president of Pharmaceutical Research Institute (PRI), & others included key senior vice presidents and vice presidents from both institutions
  - ➤ On-line portfolio management tool became available to senior executives
  - ➤ Intensive pipeline asset decision analyses were conducted through out the year

# Bristol-Myers Squibb Decision Analysis and Portfolio Planning and Management Group(3)

- **Re-organization in 2002**
  - Change in reporting structure, became a unit under the chief marketing officer
  - Move from PRI to WWM

- **Challenges**
  - Re-education of DA to the line of command
  - Re-establishment of DA value proposition
  - Member turnovers
  - Resource constraints
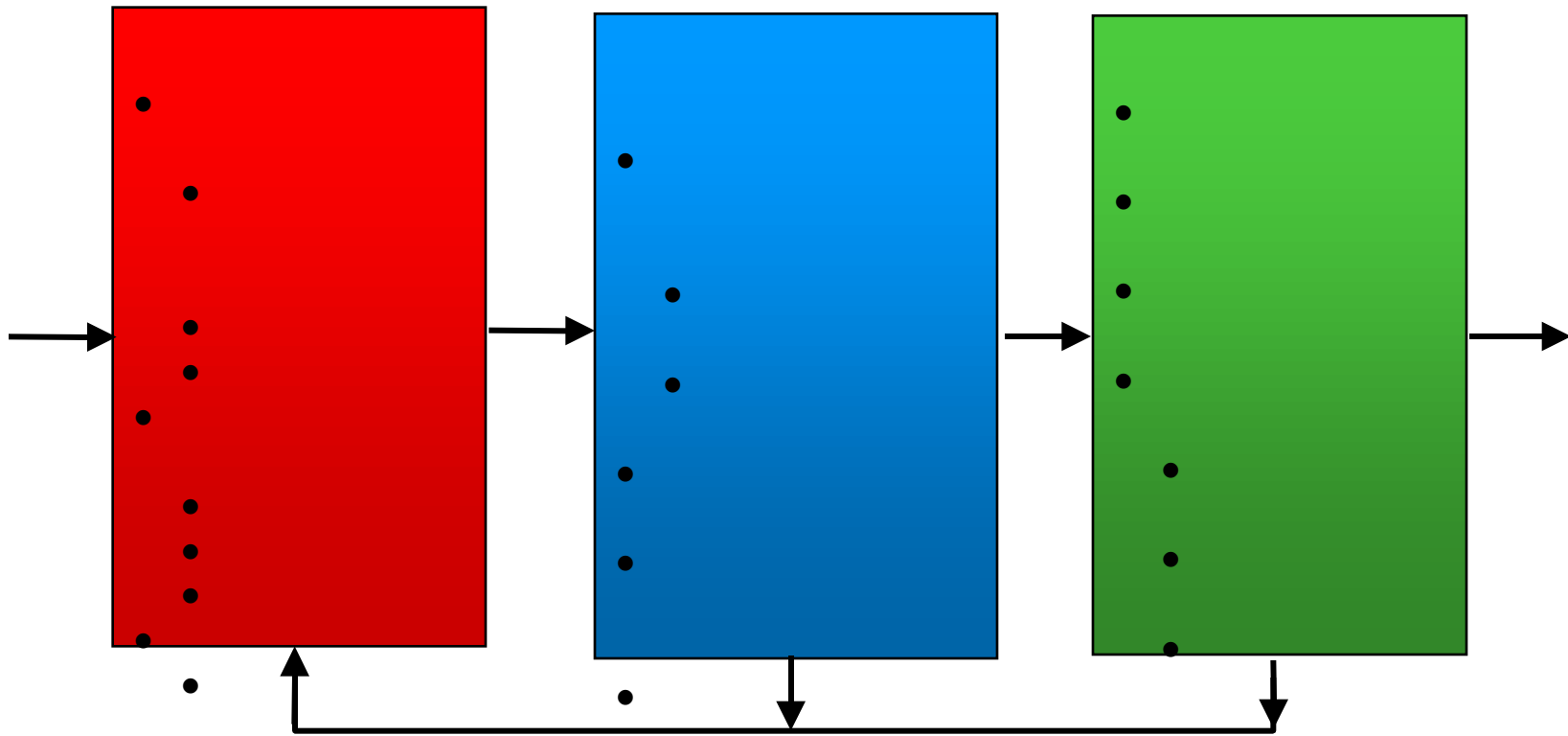  - Expanding work requests

# Outline

- Personal Decision Analysis Chronicle and Decision Analysis at a Pharmaceutical Company

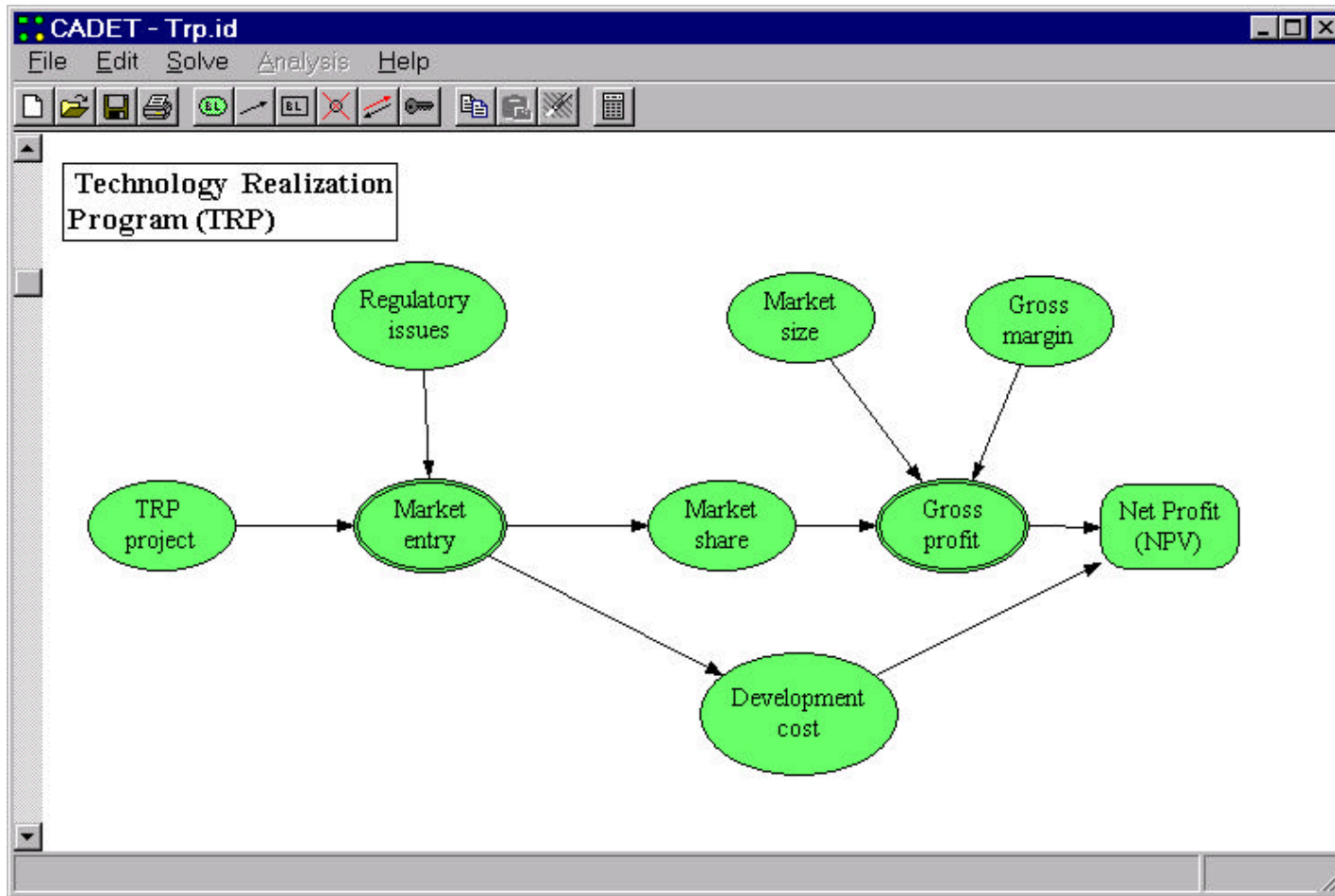- Challenges for a new DA Group at a Major Pharmaceutical Company

# Personal Chronicle in DA

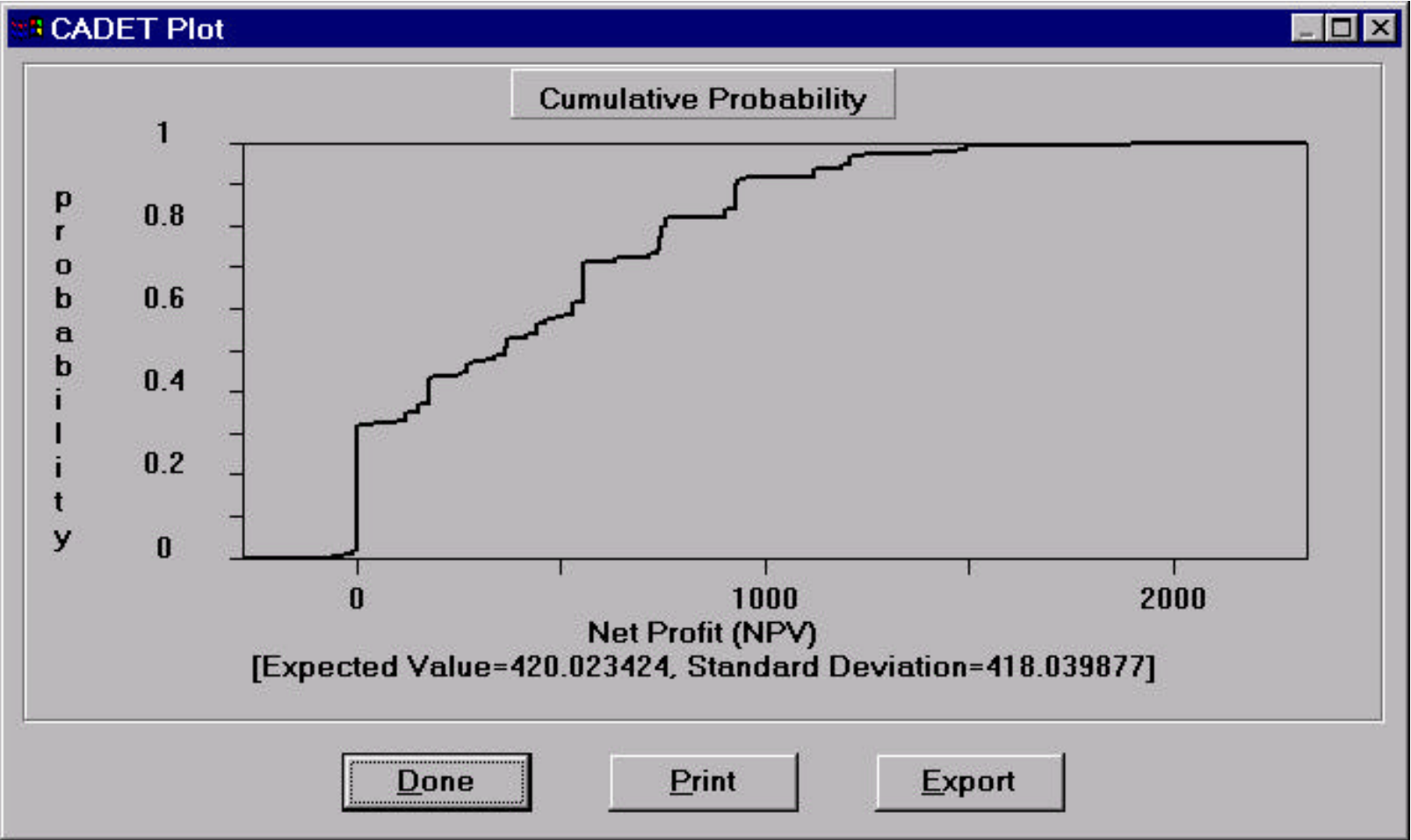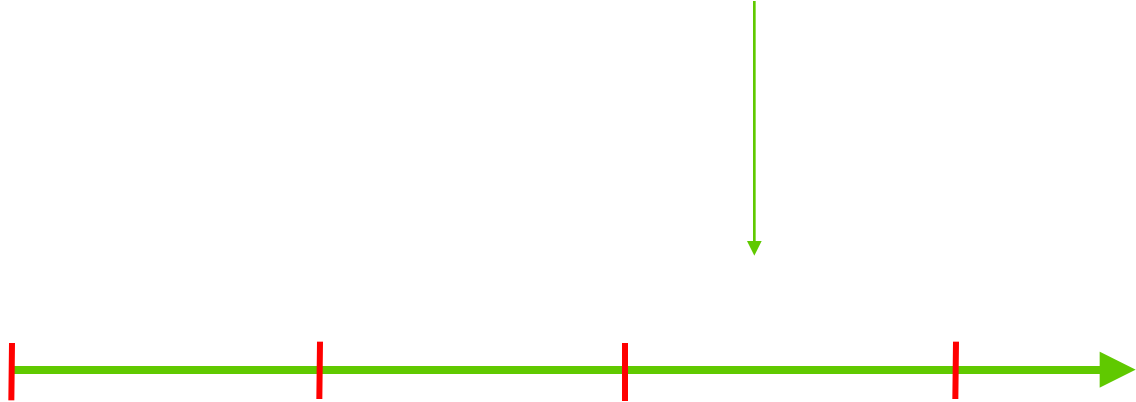# Telecommunications R&D



**Influence Diagram for R&D Project Evaluation**

**CADET Plot**

**Cumulative Probability**

Net Profit (NPV)
[Expected Value=420.023424, Standard Deviation=418.039877]

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# Personal Chronicle in DA

Ch
Ol

## Strategic Alternative Generation

## ETP/Asset Valuation

**Process Steps**

| Situation Assessment | Alternative Development |
|---|---|

| Technical and Cost Analysis | Commercial Analysis | Final Valuation |
|---|---|---|
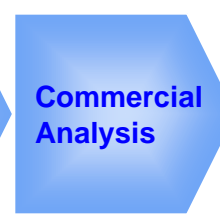
**Supporting Tasks**

- Define/confirm current plan
- Define project scope

- Brainstorm options for each decision
- Define strategic alternatives for evaluation
- Create a rationale for each strategic alternative
- Develop Expected Target Profiles (ETPs)

- Define success criteria and assess probabilities
- Assess time to market
- Define development program assumptions
- Estimate development costs

- Assess market size, share and price
- Assess competitor dynamics
- Assess commercial costs
- Identify key commercial value drivers

- Calculate expected value and productivity for each alternative
- Develop analysis insights
- Draft recommendations for Steering Committee review

# Pharmaceutical R & D
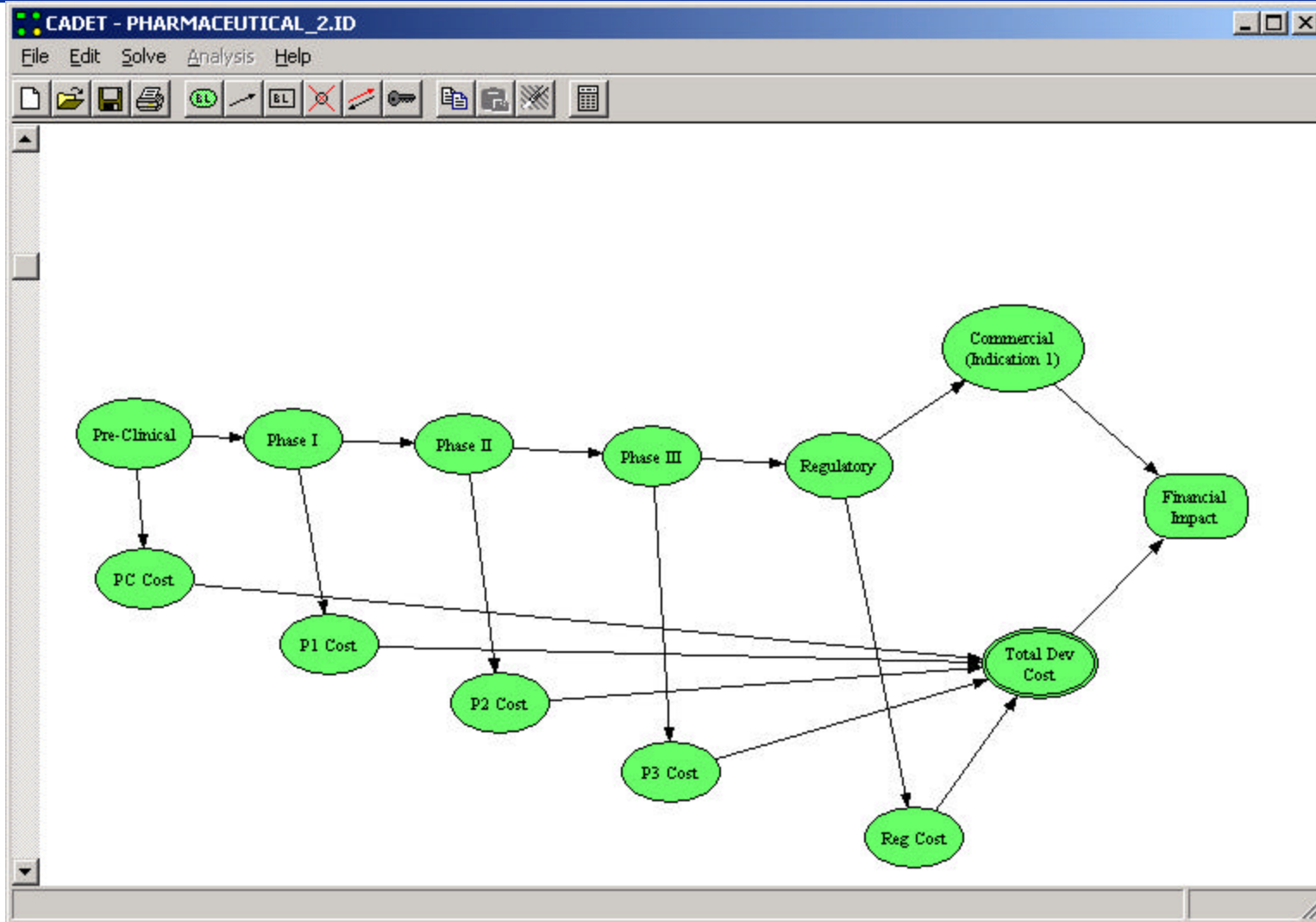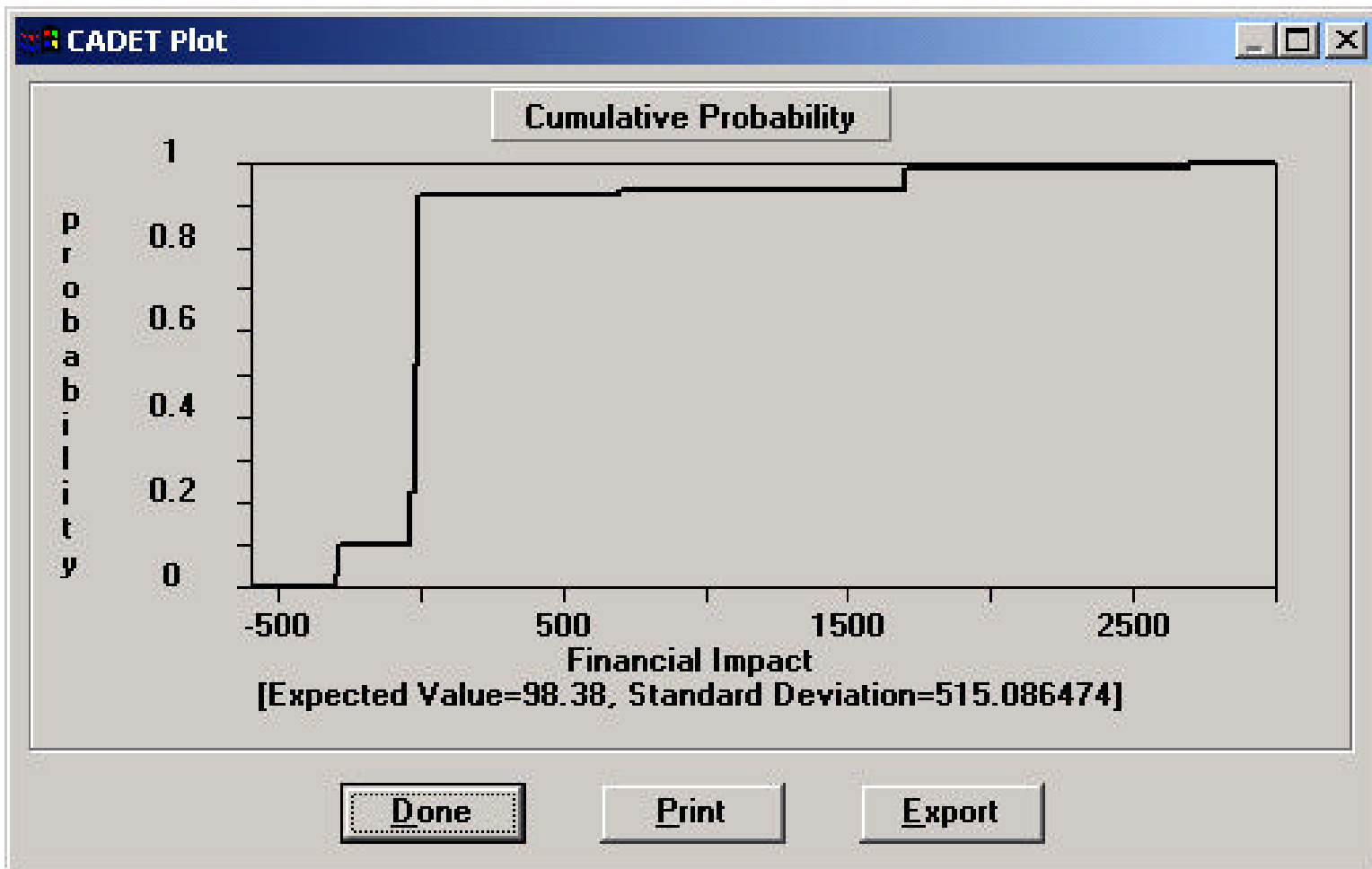
# Outline

- Personal Decision Analysis Chronicle  and Decision Analysis at a Pharmaceutical Company

- Challenges for a new DA Group at a Major Pharmaceutical Company

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  - ➤ Resource constraints
  - ➤ Expanding work requests

# Actions: Continuous Marketing & Networking

- Senior executive support (champion) for DA is critical

- Keep networking and recruit executives to DA camps
  - Turnovers and reorganization are often, and must continue to recruit executives in every possible occasions
  - Service First -- offer DA support for their key/important issues, and demonstrate the value that DA brings to their executive decision making

- Continue to provide DA education opportunities to executives & key managers

- Become members of key R&D and Executive committees

# Internal Challenges -- Change in Mindset

- Focus on "Framing", away from "number generation"!
  - Alternative Generation (Potential Indications)
  - Expected Target Profiles
  - Clinical Plan
  - Potential Launch Timing

- Input Assessment itself adds a significant value
  - "Probability of Technical and Regulatory Success"
  - These detailed assessment themselves are extremely valuable for the operating committees (final decision making body)

- Provide insights about the assets!

# Internal Challenges -- Reality Check

- **Company needs as many compounds as possible**
  - ➤ Will find a way to fund the compounds
  - ➤ May limit the indications to go after
  - ➤ Suspending the development of compounds due to budgetary reasons results in loss of "value" of assets
    - – lost competitive position (lost time to market)
    - – reduced market value of the compounds

- **Trade-off of assets in the portfolio rarely happens other than irrational management decisions**

# New Venue

- Engage in Corporate/Discovery Strategy Development

- Development of Corporate/Discovery Strategy Evaluation Simulator

- Make DA an integrated part of "Corporate Strategy Evaluation and Validation" in addition to Pipeline Asset Portfolio Management

- **Corporate/Discovery Strategy**
  - ➤ **Qualitative Vision of the Future**
  - ➤ **Analytical methods**
    - − **Scenario Planning**
    - − **Brain Storming**
    - − **Multi–Attribute Scoring**
      - ■ **Semi–Quantitative Analysis**

- **Simulation –– "Putting it together!"**
  - ➤ **Quantitative Evaluation of Corporate/Discovery Strategy**

# Qualitative Statement / Declaration

- Corporate/Discovery Strategy is qualitative, and has no "quantitative" measurement

# Very High Price Tag

- Major pharmaceutical companies spend $ 2 – 6 billion a year for Drug Development
- Discovery's share is about 10% => $200 – 600 million a year

# Very Long Lead Time

- ~10 years from discovery to the market
- After the change of corporate/discovery strategy, Pharma will spend $ 2 – 6 billion to see the first compound in the market in discovery alone, and $20 – 60 billion for the overall R&D

# Solution

- Develop Corporate/Discovery Strategy Simulator to validate / quantify the benefits of the new corporate/discovery strategy

# Goal:

➤ **Simulate drug development process on an individual program/asset level as well as a integrated portfolio level**

➤ **Run different corporate/discovery strategies**

➤ **Test various constraints in resource allocation and R&D capabilities**

➤ **Identify adverse events and generate contingency plans**

# Benefits:

➤ **Various corporate/discovery strategies are rigorously tested against currently imaginable future events and R&D capabilities**

➤ **Impacts of corporate/discovery strategies are quantified**

➤ **Contingency plans are prepared**

Corporate/Discovery
Strategy

Corporate/Discovery
Simulation

Integrated
Portfolio
Management
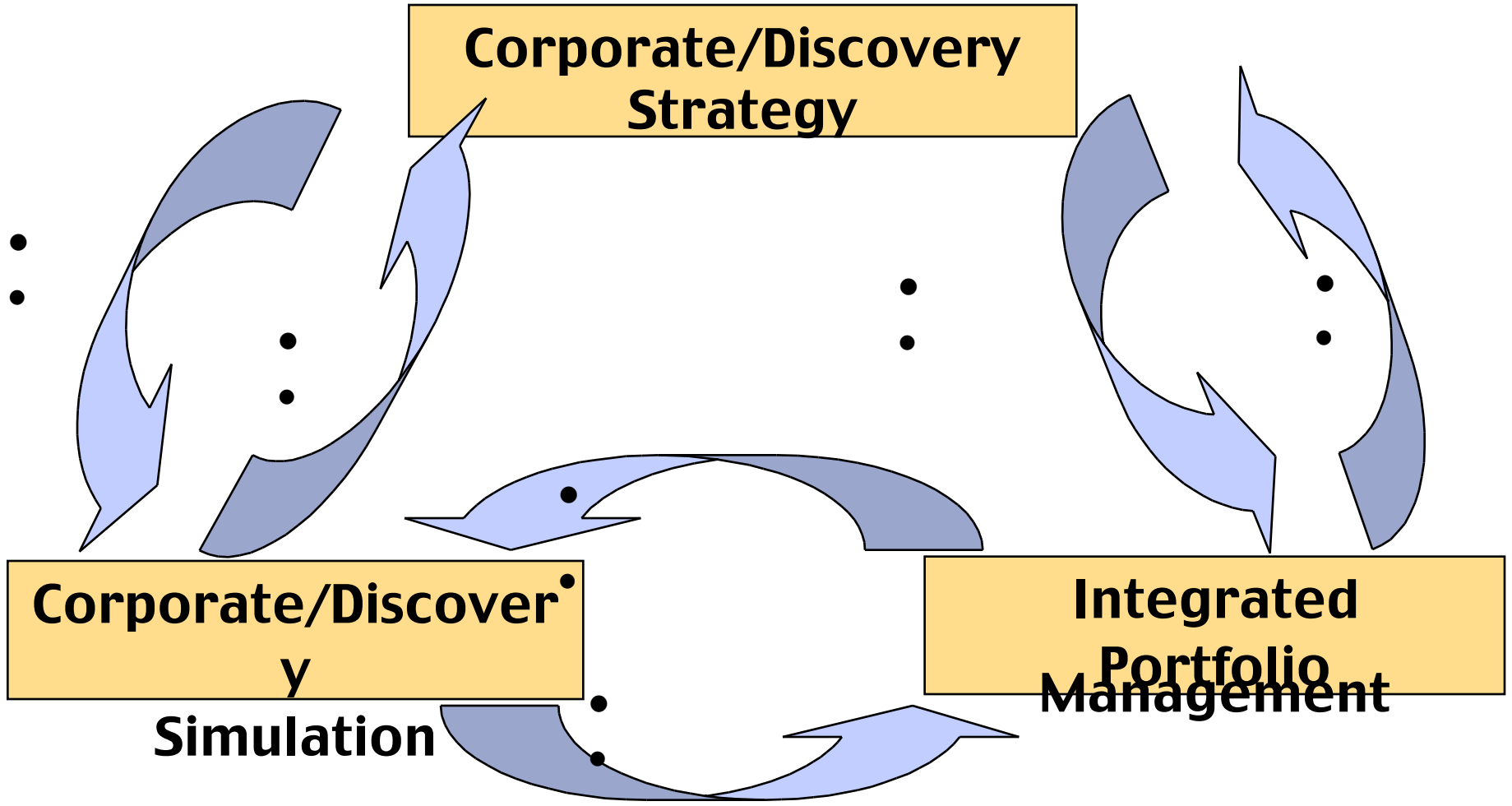
# Decision Analysis Challenges in General

- Framing is the most critical task and demanding, and most value added
  - Strategy generations / indication strategies have profound impact on the clinical plans and the future value of the compound

- Seeking Insight v.s. Accuracy of Prediction
  - Don't assume the positive of a "number crunchier" but business insight provider

- Data / Information can be found
  - Lack of marketing research and out-research should not prevent the initiation of decision analysis
  - Common sense often provide sufficient information and deliver robust results

- Computation
  - Computation power is not an issue

# Decision Analysis in Corporate Environment

- **Needs for Decision Making Support**
  - Immense needs for "framing of decision problems"
    - Especially, decision alternative generations
  - Evaluation/Quantification of the decision problems are nice, but secondary

- **In Practice**
  - In the telecommunication and financial industries, an application of decision analysis is an exception rather than a rule
  - In the pharmaceutical industry, decision analysis is relatively popular in the analysis of pipeline assets and portfolio management
    - Due to aggressive DA consulting company effort?
  - Many good decision problems and opportunity exist

- **Lesson Learned**
  - Decision analysis is for a selected few!
  - If applied properly, it would have a significant impact to the corporation

# Summary

- Decision Analysis can play a critical role in pharmaceutical industry

- To be successful as an organization, it needs constant marketing and recruitment of senior executives to the DA camp

# Decision Analysis at a Pharmaceutical Company

- Decision analysis is widely used at the majority of pharmaceutical companies at the various intensity and mutation

- Primary application --  Asset Evaluation and Portfolio Management
  - Very High Price Tag
    - Major pharmaceutical companies spends $ 2 - 5 billion a year for Drug Development
    - 2 - 3 new drugs a year, i.e., $1 - $2 billion per new drug!
  - Very Long Lead Time
    - ~10 years from discovery to the market
  - Probability of technical success is low
    - from discovery to market, 1 in million
    - from early drug candidate to market, less than 10 percent