Decision Analysis Applied to Business Strategy Development Exxon Mobil Chemical

Discussion Topics

Introduction

Strategy Process Overview

Organizational approach

Example Discussion

Implementation

Introduction

- ExxonMobil Chemical (EMCC) has been using DA since 1996
- Initial emphasis was on capital projects to select the best project
- Since 1998, DA has been applied extensively beyond capital projects
  - Technology Program Assessments
  - Technology R&D Portfolio Decisions
  - Technology Licensing Strategy
  - Selected Business Strategy Decisions
  - Functional Groups Decisions
- In late 1998, Senior Management decided to revisit all EMCC Business Unit strategies, and DA was selected as Best Practice
- Most EMCC BU's completed business strategy reviews in 1999
- Some merger impacted BU's deferred effort until 1Q00
- DA has gained broad acceptance in EMCC as the Best Practice in dealing with complex decisions

Strategy Process Overview

DEFINE THE OPPORTUNITY AND POTENTIAL SOLUTIONS

- Clearly understand boundaries
- Define strategic issues.
- Develop initial Frame
- Define potential new strategies to consider
- Agree on decision criteria (NPV, ROCE, earnings growth, etc)
- Engage Decision Makers & Stakeholders to achieve alignment on alternatives to evaluate

ALTERNATE SCENARIO DEVELOPMENT

- Potential scenarios that can impact strategy selection
  - Industry events, Technology, Product displacement, competitor actions,etc.
- How new events can change the rules
- Identify key uncertainties that will drive the strategy
- Understand regional and worldwide supply/demand scenarios

EVALUATE ALTERNATE STRATEGIES

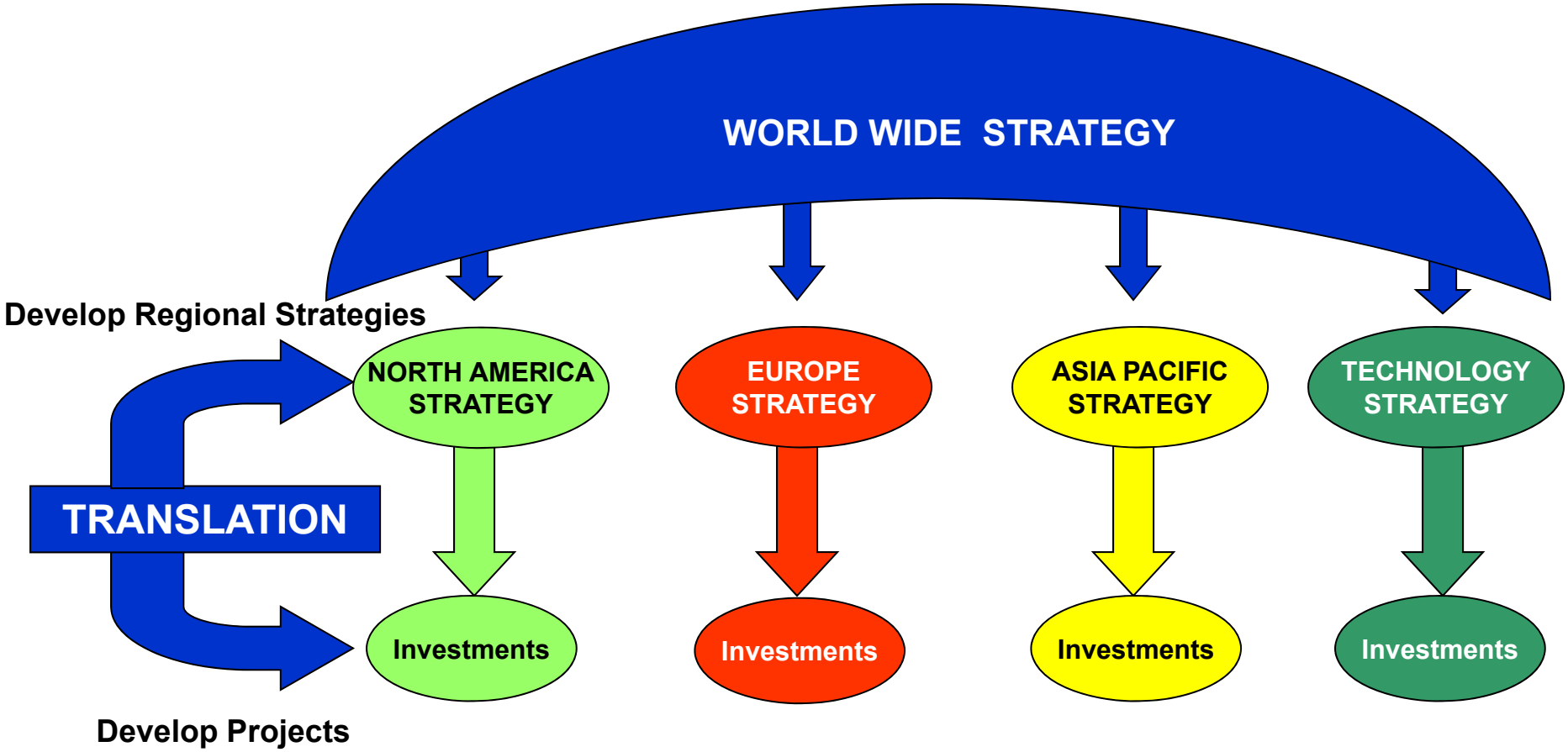
- Finalize alternatives to evaluate. Test for hybrid strategies
- Develop Financial model
- Establish ranges of uncertainty for identified drivers for 10/90/50 scenarios
  - Internal expert assessments
  - External consultant perspective
- Sensitivity analysis identifies the sources of risk for each alternative
- Probability analysis establishes level of risk for each alternative

RECOMMEND BEST STRATEGY

- Select the highest value alternative, based on:
  - Established criteria
  - Most acceptable risk
- Test robustness of chosen strategy against key scenarios
- Develop risk mitigating strategies for chosen alternative
- Identify "No Regret" Decisions

Recycle as appropriate

Strategy Translation and Implementation

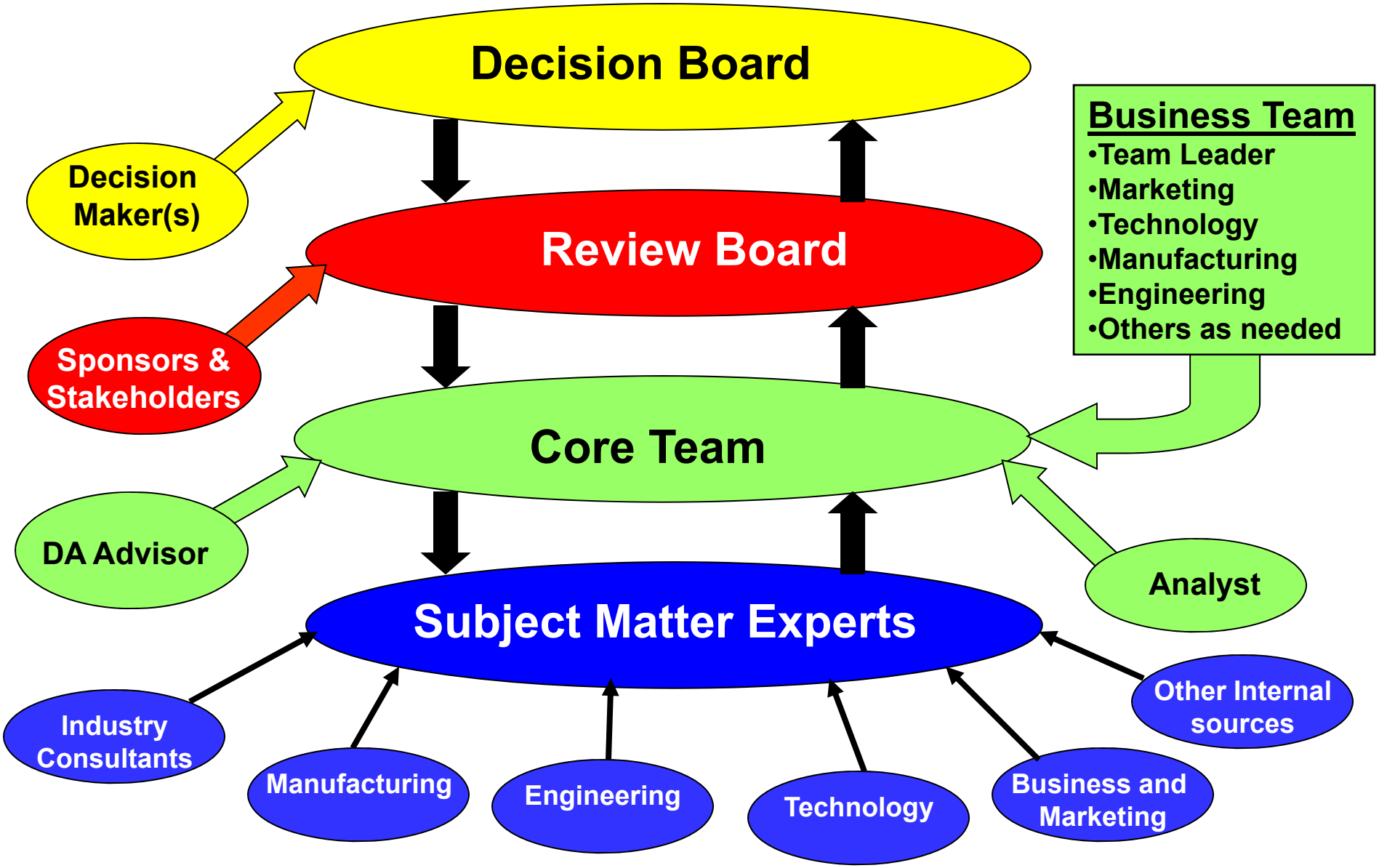


IMPLEMENTATION — **EXECUTE PROJECTS.**

Organizational Approach

- A layered organizational approach is very effective
  - Decision Board
  - Review Board
  - Core Team
  - Subject Matter Experts
- Typical Core Team members
  - Team Leader
  - Business Teams
    - Representatives from Marketing,Technology, Engineering, Manufacturing
  - Analysis Leader
  - DA Process Advisor
  - Others as needed driven by the specific decision

Organizational Approach



Example Discussion

Background and Case for Action

- Exxon has mostly used single vendor's process control systems since 1978, and for new plants built between 1978 and 1986, the then state-of-the-art control system was installed
- Post 1986, all new projects were based on the vendor's next generation process control systems
- Some early control systems have been replaced with next generation systems as part of routine capacity projects
- End of hardware life and adequate support skill set are in sight. However, over 20 plants are still using the original 70'-80's vintage technology
- New process control technology may be developed over the next decade
- Action is required to minimize the business risk of continuing to operate with current technology set to:
  - Avoid increasing potential of failures of key components leading to plant shutdowns
  - Deal with limited availability of replacement components no longer in production
  - Maintain capability for ongoing technical support in light of decreasing technical resources
  - Maintain capability of process control applications credits
  - Position to capitalize on new process control applications developments
- Key decision is to select the best strategy that offers system reliability, integrity and functionality that maximizes business value for EMCC

Strategy Alternatives

Get on with it

- Replacement of all systems as soon as practical ('04) using currently available technology.
- This option minimizes risk from system unreliability
- Effective project execution a challenge because of limited resource availability
- Reduces ability to include new technology developments

Moderate System Life Extension

- Take steps necessary to extend system life and then replace all systems by '07.
- Next generation technology will be used when available
- Early replacement systems will be based on post 1986 vintage technology

Wait for New Technology

- Take maximum steps to extend current system life and then replace all systems by '10.
- Replacement systems will all be based on next generation technology
- No current technology installations will be made

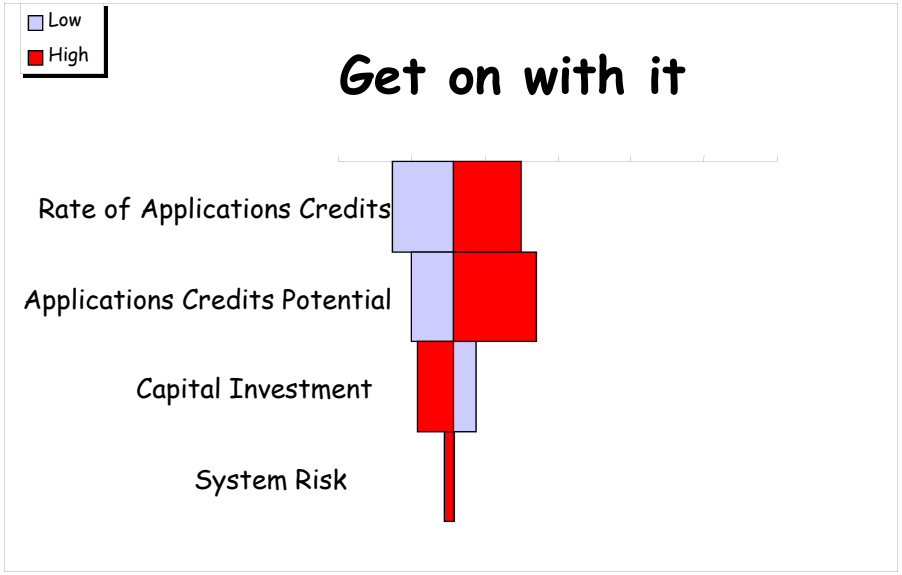
Paced Replacement

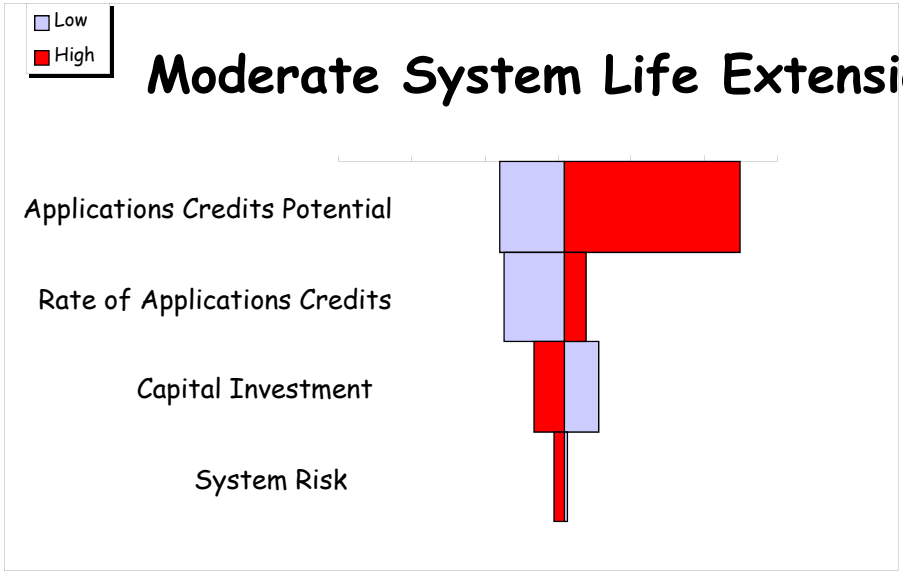
- Manage the conversion projects limited by available resources
- Take maximum steps to extend system life and replace all them at a constant rate before '10.
- Replacement technology will be chosen at time of each migration

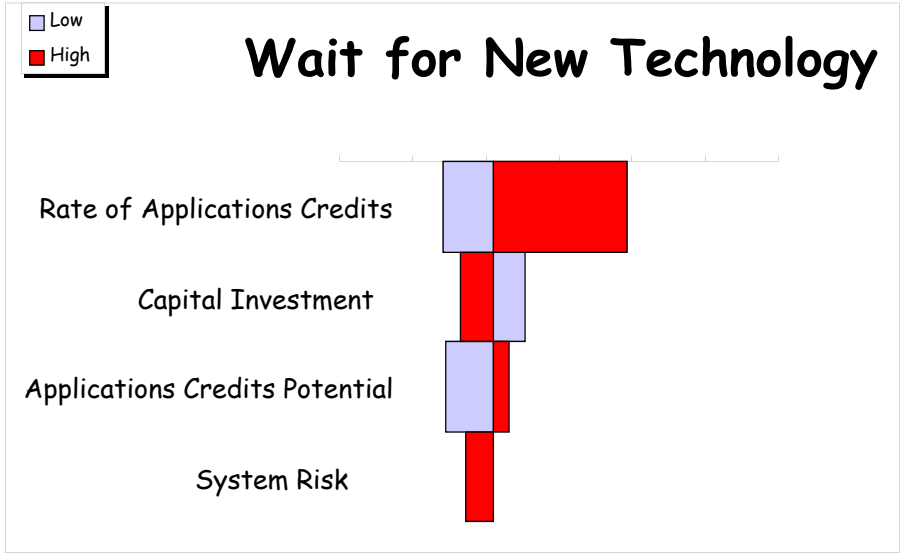
Key Drivers

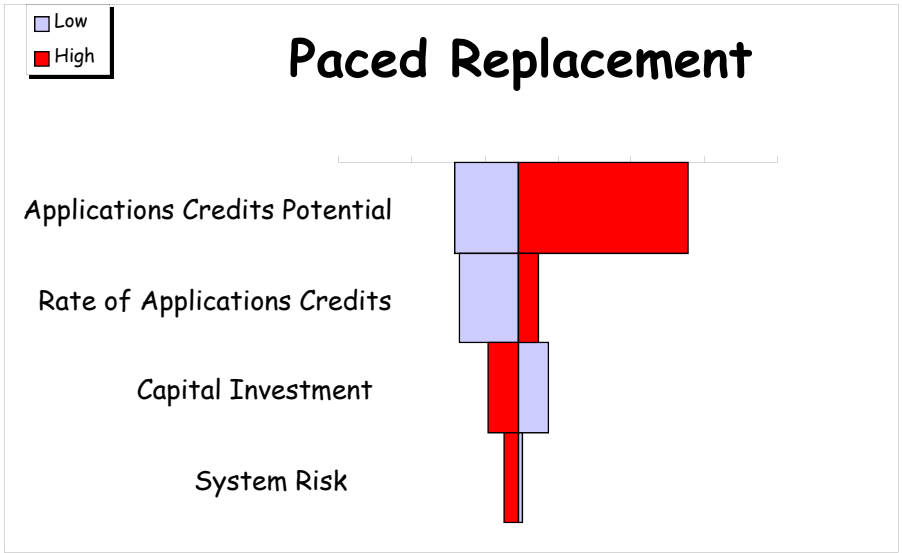
- Applications Credits Potential
  - To what extent could new process control developments be achieved?
- Rate of Applications Credits
  - How fast could these credits be realized?
- Capital Investment
  - What is the investment cost of the replacement systems?
- System Risk
  - What is the rate of component reliability deterioration?
- Support Risk
  - What will be the availability of ongoing technical support?
- Technology Timing
  - When will the new technology be commercial?

Sensitivity Analysis

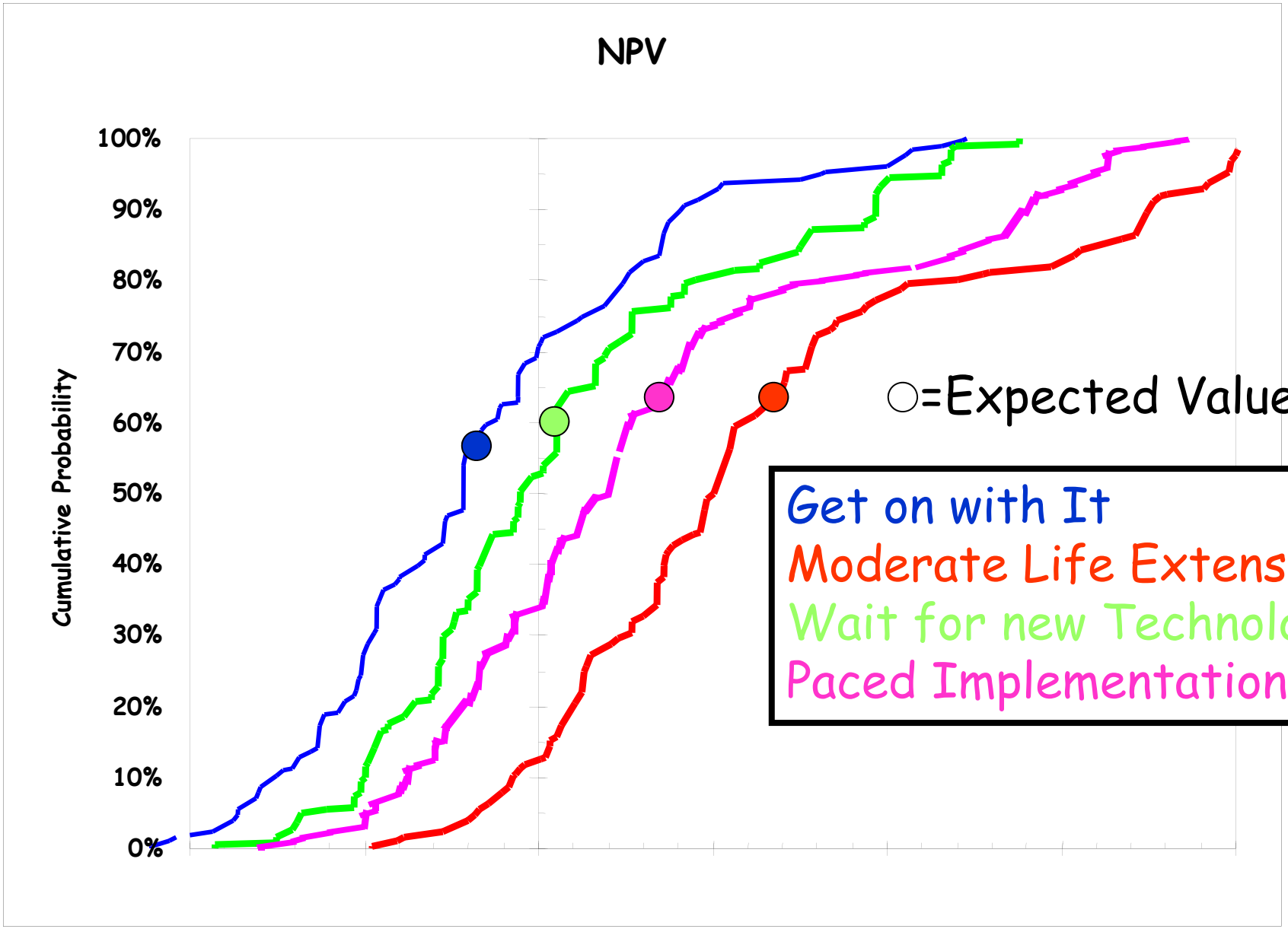








Probability Curves



Moderate Life Extension Strategy is Selected

FINANCIAL BENEFITS

- ➔ Significantly higher EV NPV than next best strategy.
- ➔ The probability of not returning at least the cost of capital is less than 10%
- ➔ Minimizes the risk of system reliability and potential production losses

OTHER CONSIDERATIONS

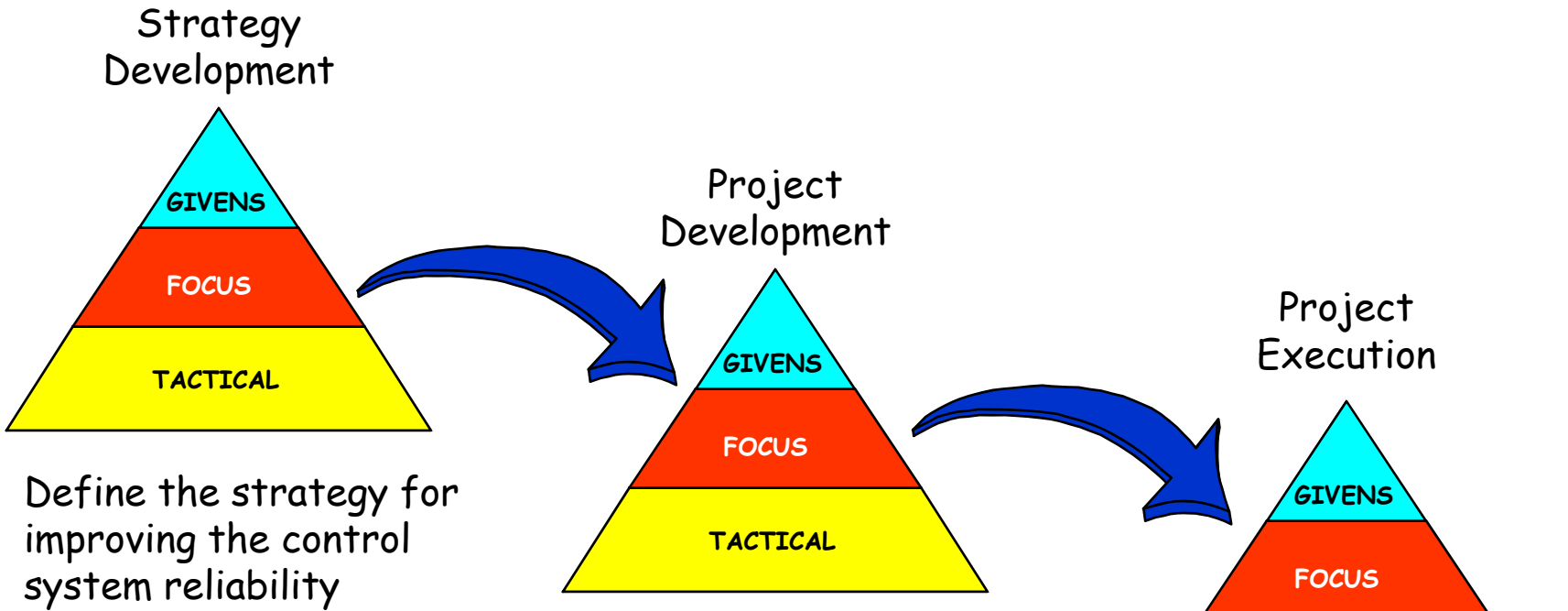
- ➔ Represents a good balance of system life extension vs replacements
- ➔ Represents the best Capital Investment deployment requirements
- ➔ Makes efficient use of limited technical resources

NEXT STEPS

- ➔ Develop project(s) implementation Plan

Project Implementation

➔ DA process used for strategy development is re-deployed at the project development and project execution phases



Project Execution
Capital Investment Management (CIM)

CIM is a process of series of stages and gates, with increasing level of definition