Understanding the Front End: A Common Language and Structured Picture

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An Co-Sponsored Best Practice Event
Agenda

What is the Front End?

NCD Model
What it is?

Most Effective Practices
Most important part of Front End – macro perspective
Elements of Best Projects
What is the “Front End of Innovation?”

“Front End of Innovation” is defined by:
Activities that come before the “formal and well structured” New Product Development (NPD) Portion

FEI activities are less structured and less predictable

Structured with a formalized and prescribed set of activities and questions

New product development portion includes BOTH new product and process

We prefer NOT use the term “Fuzzy Front End” since it implies that the FEI is mysterious, uncontrollable and cannot be managed.
What is the “Front End of Innovation?”

Highly Innovative and Profitable Platform Strategies Leveraging Core Competencies/Capabilities

Platform Strategies Leveraging Existing Customer Value Chain

Size of Bubble is related to Profit Potential

Front End of Innovation

New Product Development Stage

Commercialization

Traditional Stage Gate

Idea Selection Process for Incremental Products
Breakthrough products* (i.e. new to the company or new the world) offer a 5-10 times or greater improvement in performance combined with a 30-50% or greater reduction in costs

Platform

Definition

Platform products* establish a basic architecture for a next generation product or process and are substantially larger in scope and resources than incremental projects.

Why Focus on the Front End?

**Differences**

<table>
<thead>
<tr>
<th>Work</th>
<th>Front End Innovation</th>
<th>New Product Development Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercialization Date</td>
<td>Experimental, often chaotic. “Eureka” moments. Can schedule work – but not invention</td>
<td>Disciplined and goal oriented with a project plan</td>
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<tr>
<td>Funding</td>
<td>Unpredictable</td>
<td>High degree of certainty</td>
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<tr>
<td>Revenue Expectation</td>
<td>Often uncertain with a great deal of speculation</td>
<td>Believable with increasing certainty as the release date gets closer</td>
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<tr>
<td>Activity</td>
<td>Individual or team emphasis in areas to minimize risk</td>
<td>Multi-function product/process development team</td>
</tr>
<tr>
<td>Measure of Progress</td>
<td>Strengthened Concept</td>
<td>Milestone Achievement</td>
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Budgeted

Depends. In the beginning stages many projects may be “bootlegged”
Agenda

✓ What is the Front End?

NCD Model
What it is?

Most Effective Practices
Most important part of Front End – macro perspective
Elements of Best Projects
New Concept Development Model (NCD)

Provides a common language and terminology necessary to optimize the “Front End of Innovation”

Core Front End “Activity” Elements

Engine “Controllable”

Influencing Factors “Uncontrollable”


Definitions

Opportunity
A business or technical need that the company or individual realizes by design or default they might want to pursue to capture competitive advantage, respond to a threat or solve a problem.

Idea
Most embryonic form of a new product, service or envisioned solution.

Concept
Has a defined form (i.e. written and visual) with features and customer benefits combined with a broad understanding of the technology needed.
Agenda

✓ What is the Front End?

✓ NCD Model
  ✓ What it is?

Most Effective Practices

Most important part of Front End – macro perspective
Elements of Best Projects
Quiz

What elements of the NCD Model are highly innovative (i.e. lots of new products every year) companies very proficient in?

Yesterday’s class
1st Front End of Innovation Conference
Agenda

✓ What is the Front End?

✓ NCD Model
   ✓ What it is?

Most Effective Practices

Most important part of Front End – macro perspective

Elements of Best Projects
Elements of Effective Projects

Early senior management involvement and commitment

Front End Maturity Model
Adopted from PRTM’s model for the entire innovation process

The prime imperative for breakthrough projects in the Front End is NOT picking the winners, but killing the losers early.
Elements of Effective Projects

Early involvement of business executive champion
Collaborative culture which encourages knowledge creation
  Communities of Practice
  IT Tools which enable people-to-people contacts
  Collaborative Work Space

Constancy of purpose
Aggressive Goals
Elements of Effective Projects

Collaborative Environment

What is a collaborative culture?

Mutual Trust
- Trust in the individual that you share tacit knowledge with

Active Empathy
- To be able to share pain and frailties

Access to help
- Experts in the organization are willing to provide help

Lenience in Judgment
- Harsh judgment, laughter and criticism will prevent the sharing of one's own true beliefs

Courage
- Individuals should not be afraid of exposing their concepts to fierce judgment
Elements of Effective Practices

Communities of Practice

- Creates new knowledge within the community
- Connects, acquires, exchanges and builds new knowledge
- New science occurs through the process of building upon internal and external knowledge communities

"Breakthrough Knowledge Usually Occurs at the Boundaries of the Old" McDermott, 1999
Communities of Practice - an example

Production and Reservoir Engineering Community at Schlumberger

Goal is to better optimize the value of each well
Consists of 536 members around the world
Focused on Schlumberger’s core competence in production and reservoir engineering
Developed a series of web based case histories
Catalog industry practices into “good idea,” “Local Best Practice” and “Schlumberger Best Practice”

Community creates a support network for Schlumberger’s technical experts
Elements of Effective Practices

Communities of Practice

Best Practices:

Focus of on the core competencies of the corporation
Leader should be well respected member of the community and be able to commit at least 25% time
Experts need not apply
Initially the thought leaders need to be part of the community
Community of Practice should NOT become another project
Create passion and real dialogue since the COP is voluntary
Make connections between community members seamless


Elements of Effective Projects

Projects get started based on:
- Customer Trend Analysis (Clear Opportunity)
- Technology Trend Analysis
- Technology Road Mapping
- Competitive Intelligence Analysis
- Scenario Planning

These efforts create many triggers
Need to envision the future
Market Attack Team

A process for rapidly developing actionable plans for large market opportunities

Effort ideally includes 3 -5 full time people
Why Attack Team?

Attack Team approach enables World Class Innovation - Wisdom of the “Sages”

Business-Technology Interspersing
Based on Market and Technology Trend Analysis
  Where the future opportunities come from
Science Based Core Competencies
Aggressive Goals
(External) Scientific Peer Review
Focusing (in contrast to spreading too thin)
  Constancy of Purpose
Process Optimization which include:
  Complete Business Case, Management Oversight and involvement and fact based fast kills and metrics
Full time project team populated with members with demonstrated track record and company credibility
Elements of Effective Projects

Customer
- Ethnography approaches
- Lead User Methodology
- Early involvement of customer champion
- Discovering the Archetype of your customer

Business-Technology Interspersing
- Increasing linkages both internal and external (Technology Flow)
- Partnering

Diversity of cognitive styles on idea enrichment team
Elements of Effective Projects

Portfolio methodologies based on multiple factors of:
- Technical Success Probability
- Commercial Success Probability
- Reward
- Strategic Fit
- Strategic Leverage

*Using Anchored Scales*

NOT just financial justification

Use of “Options Theory” to evaluate projects

Screening methodologies are not used on “breakthrough” projects
- “Holy Grail”
- Obvious

RIGOROUS use of the Technology Stage Gate for high risk projects
Technology Stage Gate

Technology Stage Gate is an effective technology development process with management overview, business and scientific rigor which creates an environment of fast failures.

Traditional Project Management

Assumes that there is little uncertainty associated with the technologies

Starting product development before technology is known

Results in canceled or delayed projects, and wasted product development effort

Where it fits

Front End of Innovation

New Product Development Stage

Commercialization

Technology Stage Gate

Traditional Project Management
Traditional Project Management

**Repeatable Process**
- 85% repeatable
- Leverage from past experiences

**Predictable procedures**
- Detailed project plan of what to do and when
- Can estimate cycle time

**Structure and discipline are critical**
- Creativity is less important

**Project management skills are required**
Technology Stage Gate

Difficult to capture and leverage past experiences for future efforts
  Cycle time difficult to estimate
Range of experimental outcomes is vast
  Detailed overall project plan is impractical
Do not know how many gates
  Can’t schedule invention
Too much structure can inhibit creativity
Project leaders need ability to manage uncertainty while focusing on project goals
Technology Feasibility Point

Usually MULTIPLE technologies are involved

Need to concentrate on the “problem child”

Some may be difficult to move
Some may even FALL back!
Conclusions

Front End of Innovation can be studied, evaluated and managed – BUT only if there exists a common language

Is NOT “Fuzzy”
Should be thought of in a holistic manner
Different for incremental, platform and breakthrough

NCD Model Created
Engine
Five Front End Elements
Influencing Factors
Conclusions

Greatest weakness of FEI
- Engine
- Opportunity Identification
- Technology Stage Gate

“Effective” Practices for FEI are being better understood
- Technology and Market Trend Analysis
- Providing a collaborative environment for enhancing Knowledge Creation
- Really understanding unmet customer needs
- Managing high risk projects
Conclusions

Breakthrough Projects
Require senior management involvement, commitment and stomach
Expect only 20-25% to be winners
   The key issue is NOT picking the winners – but killing the losers early
Discuss option cost to the next risk reduction milestone – rather than total valuation
Expect that the project will morph into something else

Disruptive Businesses
Sustaining Businesses need to embrace the disruptive Business Model
Set up as a separate business unit
Aggressively look for acquisition targets that are potentially disruptive