Top Quartile Practices in the Front End

Research Objective

To determine the key Front End of Innovation (FEI) skills and activities that a company needs to be proficient in order to achieve robust growth and sustained profitability through an evidence based approach.

The Paradox

US Companies spend over $60 billion in training and another $45 billion on consultants.
40,000 management books in print with 3500 new ones published each year

BUT all of these efforts fail to produce ANY real improvements in performance


Why??
Why do large companies, despite all of the books and consultants, fail to produce real innovation growth?

1. Not innovative
2. Only good at sustaining
3. Practice management principles based on gut rather than evidence
4. Too early in the morning to answer a serious question

Innovation management decisions in our companies are based on:
- What others seem to be doing
- What senior leaders have done and believe has worked in the past
- Closely held ideologies
- Learning practices from ONLY high performing companies

...we base our innovation management decisions on a lot of things - **BUT NOT** facts!

The Paradox

Do you remember

- Published in 1982
- Studied practices in excellent companies
  - Avon
  - Boeing
  - DuPont
  - HP
  - IBM
  - Johnson & Johnson
  - Levi Strauss
  - Maytag
  - 3M
  - Revlon
  - Texas Instruments
  - Wang Industries

Comparison of Peters and Water’s companies financial performance in 1985 vs. Fortune 1000 found NO significant performance differences!


The Paradox

Medicine in the mid 1990’s has begun to embrace Evidence Based Management

Evidence Based

Is this our innovation management practices today?

Agenda

- Definitions
  - What is the Front End
  - NCD Model
  - Terminology
- Latest Practices, Tools and Techniques
  - Survey
  - Engine (Leadership, resources and climate)
  - Engine (Knowledge sharing and teams)
  - Incremental projects
  - Breakthrough projects
- Conclusions
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

New Concept Development Model (NCD)

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

Terminology

- **Opportunity**
  - Food company identifies the need to develop low fat products due to rising consumer interest in low fat
  - Company performs detail analysis on trends

- **Idea**
  - Several methods are identified for delivering nonfat potato chips
  - Candidate molecules are envisioned which provide the same flavor, but would not be absorbed by the body

- **Concept**
  - Scientific program started and funded to develop specific types of nonfat molecules

- **Product**
  - Olestra – a non fat substitute

Which is the most important to a VC?

1. Opportunity
2. Idea
3. Concept
Incremental vs. Breakthrough

Disproportionate wealth creation from breakthrough opportunities

Based on a study of 150 companies in 30 different industries. (Kim and Mauborgne. “Blue Ocean Strategy,” HBR, October 2004.)

Agenda

7 Definitions
7 What is the Front End
7 NCD Model
7 Terminology

7 Latest Practices, Tools and Techniques
  Survey
  Engine (Leadership, resources and climate)
  Engine (Knowledge sharing and teams)
  Incremental projects
  Breakthrough projects
7 Conclusions

Survey

Surveyed 350 business units from 141 companies including GE, P&G and Intel

Developed by world-class academic and industry team consisting of 17 companies and institutions

Funded by National Science Foundation, Consortium for Corporate Entrepreneurship at Stevens Institute of Technology and supported by the Industrial Research Institute

An evidenced based management approach to understanding best practices in the front end.

Major Conclusions

7 Senior Management commitment (vision, strategy, resources and culture) to the front end is the single most important variable

7 Effective networked teams and their leaders are more important than any tools and techniques

7 Incremental and breakthrough projects require fundamentally different innovation management practices
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**Engine**

- Consists of:
  - Management Involvement
  - Vision
  - Strategy
  - Resources
  - Culture

**Which is the most important?**

For this question you have two votes

1. Management Involvement
2. Vision
3. Strategy
4. Resources
5. Culture

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**Engine**

- Consists of:
  - Management Involvement
  - Vision
  - Strategy
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  - Culture

% of outcome explained relative importance of factors
Engine

What does it look like?

Corporate Vision → Innovation Strategy → Innovation Score Card → Portfolio

Core Competencies and Capabilities

Grand Challenges and New Platforms → Core Competencies and Capabilities

Innovation Development and Interdepartment

Product Road Map → Portfolio

Stage Gate

Financial Scoring

Strategic Bubble

Portfolio

Best Practices

- Best in class companies consider portfolio management to be critical

Apple

Core of the team that revitalized Apple were all at Apple BEFORE Jobs returned

Sept 1997 Jobs becomes CEO

Engine

- Consists of:
  - Effective Teams
  - Team Leadership
  - Communities of Practice

25% of outcome explained

Which is the most important?

1. Effective Teams
2. Team Leadership
3. Communities of Practice

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

- **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


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Engine

- **Consists of:**
  - Effective Teams
  - Team Leadership
  - Communities of Practice

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Teams

![Teams Image](image)


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Teams

![Teams Image](image)

Typical loading on major projects?

1. 1 project/person
2. 2 projects/person
3. 3 projects/person
4. 4 projects/person
5. 5 projects/person
6. > 5

Creativity Under Time Pressure

Individual creativity occurs when:
- People are on a mission
- Can focus on one activity for a significant part of their day
- Are challenged and involved in their work

Individual creativity does NOT occur when:
- People feel they are on a treadmill
- Experience a highly fragmented day
- Have more group discussions rather than individual meetings
- Have lots of last minute changes in their plans and schedules
- After effects continue onto the 2nd and 3rd day

Cognitive Neuroscience
**Creativity Experiment**

Professional Jazz Musicians \[\rightarrow\] Improvise

Non-Musicians

**Hypothesis:** Professional musicians would have more activation in the core generative network

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Activity in the core network was identical between professional musicians and non-musicians

**One single difference:** Deactivation in goal-driven behavior or "top down" attention in professional musicians

**Savants**
Creativity Experiment: Implication

- Creativity requires filtering out of task-irrelevant stimuli
- Expertise in creativity requires training, the ability to modulate goal-directed attention and FOCUS


Collaboration
Linear Thinking: Trapped by our embedded schemas
1st Steam Ship

The brain: neural darwinianism
The brain: neural darwinianism

= 40W

the brain evolved thru resource competition and adaption to process information at the lowest possible energy state .... Gerald Edelman

Laptop computer: power consumption

38 to 40 watts

Apple Mac 24 inch: power consumption

146 to 154 watts

IBM Watson
"You don't see what you are looking at, you see what you are looking for."

"consciousness = 300 milliseconds"
Schemas

Count the x’s

Count these: r, x, v, s, w

12

22
Count these: a, e, i, o, u

Schemas are an inevitable consequence of evolution

Breaking out of schemas: How to?

The best solutions come from better networked teams

Teams produce bigger wins than individuals
The 21st century leader manages their people’s network

Managing director of Excel Venture Management (life sciences VC) and Biotechonomy LLC. Founded several successful start-ups. Bestselling researcher, author, and teacher on the economic and political impacts of life sciences as well as the rise and fall of countries. Was founding director of the Harvard Business School Life Sciences Project, ran Mexico City’s Urban Development Corporation. Member of Sorcerer II Expedition, a global circumnavigation, with Craig Venter, which doubled known genes from all species. Wrote “As the Future Catches You” and “The Untied States of America.” Co-authored “H. evolutis: Please Meet the Next Human Species.” Published various academic articles and case studies including “Transforming Life Transforming Business the Life Science Revolution,” “Global Life Science Data Flows and the IT industry,” “SARS, Smallpox, and Business Unusual,” and “Technology, Gene Research, and National Competitiveness.” Co-author of the first map of global nucleotide data flow (selected by Rhem Koolhaas and Wired as one of the iconic examples of 21st century design). Has been on various boards including Cabot Corp., Cabot Micro, Synthetic Genomics, Activate Networks, Harvard Medical School Genetics Advisory Council, Americas Society, Harvard’s David Rockefeller Center, Harvard’s KASPAC, WGBH, Jules Institute for Global Leadership, Center for Excellence in Education, and the Boston Science Museum.

Juan Enriquez

Diversity
People prefer working with people like themselves

Diverse Groups are More Creative

Team Performance

- Heterogeneous teams produce better results
  - All stages are focused on by heterogeneous teams
  - Homogeneous teams neglect stages that are not their most comfortable stage
- Homogeneous teams are more satisfied with their teammates and their teamwork
  - “We like people who think like us”
  - Heterogeneous team members often feel they have to ‘fight’ for time in their respective process stages


Creative Problem Solving Profile Stages

- Generators
- Conceptualizers
- Implementers
- Optimizers
- Creators
- Strong Conceptualizer
- Strong Generator
Which 2 personality styles will have the highest innovation performance?
(vote two times)

1. Creators
2. Optimizers
3. Implementers


Innovation Performance

Creative  Optimizers  Implementers

High
Moderate
Lowest

Incremental

Do you understand your unmet customer?
Asking your customer does NOT work

“You can’t just ask customers what they want and then try to give that to them. By the time you get it built, they’ll want something new.”

“If I had asked people what they wanted, they would have said faster horses.”
—Henry Ford
Asking your customer does NOT work
Not that easy

Look for “compensatory” actions
Tide Pods

- Biggest innovation in Tide in 3 decades
- Current sales: $0.5 Billion