PORTFOLIO SUMMIT

Chairman:
David Matheson, Ph.D.
President and CEO, SmartOrg
David Matheson—Session Chairman

**Dr. David Matheson** has helped senior management of firms in the United States and Europe improve their results from portfolio management, product development, innovation, R&D, capital investment and strategy, and is an expert on measuring value and managing uncertainty.

His practical experience covers a wide variety of industries, including printing, software development, biotechnology, telecommunications, chemicals, pharmaceuticals, medical devices, manufacturing, electric power and entertainment.

He is co-author of the best selling book, *The Smart Organization: Creating Value through Strategic R&D* (Harvard Business School Press) and has authored numerous articles on innovation, portfolio management and decision making.

In addition to SmartOrg, his executive roles include: currently member of the board at Photozini, Inc. and prior to founding SmartOrg in 2000, a principal at Strategic Decisions Group.

His Ph.D. is from Stanford University, where he currently teaches on Strategic Portfolio Management and other topics at the Stanford Center for Professional Development.
SmartOrg software and services helps companies find the most profitable projects

<table>
<thead>
<tr>
<th>Life science</th>
<th>Aerospace</th>
<th>Technology</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bayer</td>
<td>Aena</td>
<td>Sprint</td>
<td>Eaton</td>
</tr>
<tr>
<td>Zimmer</td>
<td>Eurocontrol</td>
<td>hp</td>
<td>Chevron</td>
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<td>Catalent</td>
<td>EADS</td>
<td>National Semiconductor</td>
<td>Weyerhaeuser</td>
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<td>Alcatel-Lucent</td>
<td>Sara Lee</td>
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<td>Medtronic</td>
<td>Cisco</td>
<td>Andersen</td>
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<td></td>
<td>Inspire</td>
<td>Sandisk</td>
<td>Ford</td>
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<td></td>
<td>Dow AgroSciences</td>
<td>Trak Microwave</td>
<td>Scholle</td>
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</tbody>
</table>
Software and services to help you build your capability.

**Portfolio Navigator Software**

- Evaluate and track sources of value, risk and upside.
- Focus stakeholders on critical issues.
- Aggregate and compare projects and portfolios.

**Services**

- Training & Coaching
- Management Consulting
- Pilots & Implementation Projects
- Customization

![Portraits of the Team]

- Peter McNamee, Ph.D. Solutions & Software
- Somik Raha, Ph.D. Consultant
- Jim Matheson, Ph.D. Chairman
- Nadine Oeser, European Consultant
- Grant Steinfeld, Software
- Greg Lorch, Consultant
What is the status of your portfolio?

<table>
<thead>
<tr>
<th>Number of good projects</th>
<th>Innovative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Too few</td>
<td>Too many</td>
</tr>
<tr>
<td>Nearsighted</td>
<td>Glut</td>
</tr>
<tr>
<td>Starving</td>
<td>Futurist</td>
</tr>
</tbody>
</table>

Too few
Too many
What is the status of your portfolio?

Number of good projects

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Innovative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nearsighted</td>
<td>too few</td>
<td>58%</td>
</tr>
<tr>
<td>Starving</td>
<td>too few</td>
<td>2%</td>
</tr>
<tr>
<td>Futurist</td>
<td>too many</td>
<td>10%</td>
</tr>
<tr>
<td>Glut</td>
<td>too many</td>
<td>32%</td>
</tr>
</tbody>
</table>

Results from survey of 50 companies
Improving the Odds of Winning: Creating High Value from Innovation

David Matheson, Ph.D.
President and CEO
Our image of innovation
The reality
Asking executives what worked and what didn’t:

• What have you tried in the last ten years or so?
• What worked really well and should become (or remain in) the innovation canon?
• What did not work well, was significantly oversold or under delivered, and should fade from memory?
The five must-do’s of innovation management:

1. Use iterative, learning-based processes.
2. Make uncertainty and ambiguity your allies.
3. Allow innovation to challenge strategy.
4. Experience your customers.
5. Find and support committed innovators.

Go to [www.smartorg.com](http://www.smartorg.com) and search for “assessing the state of innovation” to download a whitepaper and view a webinar.

PDMA Visions
Innovation model summary.

1. Ideate
   - Committed Innovators
2. Formulate
   - Aligned Learning Plan
3. Incubate
4. Accelerate
   - Proven Opportunity
5. Reformulate
   - Scalable Business
Ideation: finding the committed innovator with unique insight.
Niccolò Machiavelli on Innovation:

“It ought to be remembered that there is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things. Because the innovator has for enemies all those who have done well under the old conditions, and lukewarm defenders in those who may do well under the new.”
A common misconception:

“People think ideas are the input to the process. This is wrong. Ideas are the byproduct of the committed innovator.”

Alberto Savoia
Serial Entrepreneur
Currently at Google
In every field, HHMI grants generated the most important and innovative research.

Funds projects based on rating proposals on multiple criteria.

Funds researchers and encourages them to explore interesting topics.

Source: Jonah Lehrer, author of *How We Decide*, from his blog “The Necessity of Funding Failure.”
Your innovator needs actionable insight.

Market
Customer
Technology
Trend
Etc.
Formulation: aligning on a learning plan.
Success Factors

Internal
1. Shelter the project from internal metrics and processes
2. Banish supplier / procurement thinking
3. Have the tough conversations up front
4. Negotiate based on principles
5. Never over estimate your knowledge of your partner
6. Every decision needs to improve risk adjusted value
7. Communicate your vision (prepare the market, build your brand)
8. Market disruptions are often driven by technology innovation
9. New businesses fail for commercial reasons
10. The more outrageous the vision, the more resilient the program

Partner

Value Creation

Market Disruption

Security/Access
Infrastructure health
Real-time traffic conditions
Climate monitoring
Home automation
Home security
Water/Gas
Aspirations are low

What is your potential for co-innovation?

<table>
<thead>
<tr>
<th>Revenue</th>
<th>% Respondents</th>
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<tbody>
<tr>
<td>$5M</td>
<td></td>
</tr>
<tr>
<td>$10M</td>
<td>35%</td>
</tr>
<tr>
<td>$50M</td>
<td></td>
</tr>
<tr>
<td>$100M</td>
<td></td>
</tr>
<tr>
<td>$500M</td>
<td></td>
</tr>
<tr>
<td>$1B</td>
<td></td>
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</tbody>
</table>
Can we distribute motor oil in a cardboard box?
Frost & Sullivan wrote up a best practice guidebook for the Formulation Phase.

Best Practice Guidebook

Strategic and Economic Value Analysis of Innovative New Business Ideas

GUIDEBOOK SUMMARY

Firm: Hewlett-Packard Company
Industry: Information Technology, Computer Products and Services
Headquarters: Palo Alto, California, United States
Geographic Footprint: Global
Ownership: Public
Revenue (2009): $114.6 billion USD

Problem:
HP needs a rigorous process for developing, evaluating, and launching new businesses based on strategic and economic value.

Solution:
HP establishes a strategic and economic value-based process to develop ideas for new businesses. The process employs a two-day workshop that involves:
- Identifying appropriate commercialization strategies
- Structuring the commercialization strategies to minimize risk
- Identifying uncertainties around the key economic factors that most influence estimates of the new business’ commercial value

Business Results:
- More than 30 new businesses have been evaluated using the process
- 15 new businesses were launched; 70% involved disruptive innovation

Resources Required:
- A cross-functional team prepared to support the new business idea and participate in the workshop
- A trained process facilitator to prepare and run a two-day workshop

Applicability of Best Practice to Executive Functions:

<table>
<thead>
<tr>
<th>Function</th>
<th>Applicability</th>
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</thead>
<tbody>
<tr>
<td>R&amp;D/Innovation</td>
<td></td>
</tr>
<tr>
<td>Corporate Development</td>
<td></td>
</tr>
<tr>
<td>Corporate Strategy</td>
<td></td>
</tr>
</tbody>
</table>

See a webinar or download at: www.smartorg.com/hpguidebook
How to develop a DVD burner that writes its own label? (circa 2002)

A feature in our computers
Multiple strategies – need to learn which is best.

- A feature in our computers
- License out
- A consortium-based inside brand
Which uncertainties matter?

**Future disc usage?**

- Strong growth supported by multiple third-party experts.
- Team not concerned.

**Bill of Materials Cost?**

- Detailed engineering estimates and contracts show BOM within 5%.
- Team very worried estimates might be 10% off.
The team was focusing on the wrong factors.

If mp3 players take off, then business is small.

If copyright favors disc distribution, then business is great.

BOM uncertainty has limited impact on business.
Incubation: delivering on the proof points.
WORK VS. PROOF: HP’S IDEA FOR THE “ATM OF PHOTO PRINTING.”

- What is the biggest source of risk?

- Supply Chain
  - Very difficult to set up, very complex
  - Large source of schedule and budget variance.
WORK VS. PROOF: HP’S IDEA FOR THE “ATM OF PHOTO PRINTING.”

- What is the biggest source of risk?

- Supply Chain = needs work
  - Very difficult to set up, very complex
  - Large source of schedule and budget variance.
  - HP is world class at this!

- Behavior change = needs proof
  - Will someone encountering a station on the street pull out their camera card and print?
  - To get evidence, saturate an area with prototypes.
“Dry” Photofinishing lab
Semi-Attended Environments
Low Volume Stores

“Can I get the printer part of the kiosk”

“Just chop the head off, add an Ethernet, and I’ll write you a check!”
Acceleration: growing up.
What is the best first major account for your new business?

You have launched a business.

• Customers are enthusiastic about the product.
• You are making money (gross margin), but still require investment to grow.
• The product is in version 1.0.
• Manufacturing is ramping up.
Adolescent businesses need adult challenges in a safe environment.

Need P&L discipline without crushing pressure.
Require the flexibility to adjust.
Have lots of awkward issues that need to be worked through.
Metrics that transition to full P&L accountability.
Innovation model summary.

Ideate
- Committed Innovators

Formulate
- Aligned Learning Plan

Incubate
- Proven Opportunity

Accelerate
- Scalable Business

Reformulate
Wireless million channel system

The case for Wireless:
• No cables
• Flexible survey design
• Light weight / low volume
• Deployment flexibility
• … but batteries required

Requirements:
• Light weight
• Low power consumption
• Low noise
• Wide frequency response
• Rugged
HP’s journey has been one of Incubation and Reformulation.

Nov 2009:
HP announced a new inertial sensing technology that delivers an entirely new combination of performance, low power consumption, and low cost.

Feb 2010:
HP and Shell announced a collaboration to develop a wireless sensing system to acquire extremely high-resolution seismic data on land.

Mar 2011:
HP and Shell announced test results that prove ability to acquire considerably more lower-noise data.

Launched Seismic Co-Innovation Program with Shell

Sensing Business Launched
Sensing Business Workshop
HP CeNSE HBR Article
Discovered Inertial Sensor
Canceled Atomic Resolution Storage
Which step most needs improvement in your company?

- Ideate
- Formulate
- Incubate
- Accelerate

- Committed
- Innovators
- Aligned
- Learning
- Plan
- Proven
- Opportunity
- Scalable
- Business
Formulation Example: The Solar Kettle

- Ideate
- Formulate
- Incubate
- Accelerate
- Reformulate

Committed Innovators
Aligned Learning Plan
Proven Opportunity
Scalable Business
Ideation: The Solar Kettle

- Boils in seconds
- Uses no electric power
- Elegant design
- Has strong appeal to Green Movement

Solar Stuff Corp. + Tea Wares, Inc.
The first clash

Elegant Design VS Boiling Efficiency
Formulation: The strategy table shows business visions in conflict.
Ranges of uncertainty in inputs exposes excessive optimism.

**Market Size: Solar Enthusiasts Who Like Tea**

- **High**
  - Solar Enthusiasts Everywhere
  - Greens like Tea

- **Base**

- **Low**
  - Solar Enthusiasts Like Coffee
  - If their tea-drinking friends get excited

200 M
Ranges of uncertainty in inputs tempers pessimism.

**Market Size: Solar Enthusiasts Who Like Tea**

- **High**
  - Solar Enthusiasts Everywhere
  - Greens like Tea

- **Base**

- **Low**
  - Only committed Solar Tea lovers
  - Nuclear Coffee Pot takes off

- **Low**
  - Solar Enthusiasts Like Coffee
  - If their tea-drinking friends get excited 200 M

- **Low**
  - Strong core of tea lovers among greens 85 M
Ranges of uncertainty in inputs helps achieve alignment.

**Market Size: Solar Enthusiasts Who Like Tea**

- **High**
  - Solar Enthusiasts Everywhere
  - Greens like Tea
  - Solar Enthusiasts Like Coffee
  - If their tea-drinking friends get excited
  - Only committed Solar Tea lovers
  - Nuclear Coffee Pot takes off

- **Base**

- **Low**
  - Strong core of tea lovers among greens

- **Numbers**
  - 200 M
  - 100 M
  - 85 M
Analyze all factors in business case.
Base case financial analysis.
Focus on uncertainties that drive value.

Accessing the Solar Enthusiast’s friends really drives the upside!
Comparing the two strategies.

Where to sell to get higher margins?
Solar is the second best project in the portfolio, beating many incremental projects.
Collaborative Incubation activities:

What users care about time to boil? How many?

Where can we reach the largest group? What are price expectations in these channels?

Can we find a technical approach to faster boil times with small solar arrays?
Findings:

What users care about time to boil? How many?
Under five minute boils are required for a viable product.

Where can we reach the largest group? What are price expectations in these channels?
The most valuable customers are at traditional luxury retail.

Can we find a technical approach to faster boil times with small solar arrays?
If we store energy in the teapot, then we can charge it in the sun and boil quickly.
Reformulate into the Tea Charger strategy

<table>
<thead>
<tr>
<th>Define</th>
<th>Target Customer</th>
<th>Channel</th>
<th>Features Priority</th>
<th>Price Point</th>
<th>Use Method</th>
<th>Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tea afficionado</td>
<td>High-end tea shops</td>
<td>Elegant design</td>
<td>Premium</td>
<td>Enjoy the lengthy boiling experience</td>
<td>Small solar elements integrated into pot</td>
</tr>
<tr>
<td></td>
<td>Solar Enthusiast</td>
<td>Whole Earth Catalog 2.0</td>
<td>Fast boiling</td>
<td>Parity</td>
<td>Set in sun to boil quickly</td>
<td>Big solar array</td>
</tr>
<tr>
<td>Tea Charger</td>
<td>Busy tea drinker</td>
<td>Luxury Retail</td>
<td>Utilitarian Design</td>
<td>Premium</td>
<td>Leave in sun until needed, then quick boil</td>
<td>Small solar elements + battery</td>
</tr>
</tbody>
</table>

Finish strategy (Official Version)

Finish [Official Version] - Save As  | Delete  | Make Official Version  | Import
Celebrate learning and develop next proof points!