Overlooked—The First Step of Innovation

Presented by Ben Graham and Kevin Li
The Problem Lab
The Problem Lab’s sole mandate is to find and understand important problems.
If I had an hour to solve a problem
I'd spend 55 minutes thinking about the problem and 5 minutes thinking about solutions.

— Albert Einstein —
EXHIBIT 2 | The Four Types of Diversity That Bolster Innovation—And Two That Don’t

<table>
<thead>
<tr>
<th>DIVERSITY DIMENSION</th>
<th>RELATIONSHIP TO INNOVATION</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Direction of relationship</td>
</tr>
<tr>
<td>Industry background</td>
<td>↑</td>
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<tr>
<td>Country of origin</td>
<td>↑</td>
</tr>
<tr>
<td>Career path</td>
<td>↑</td>
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<tr>
<td>Gender</td>
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<tr>
<td>Academic background</td>
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<tr>
<td>Age</td>
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Source: 2016 survey of German, Swiss, and Austrian companies by BCG and Technical University of Munich.

Note: Innovation = the percentage of revenue from new products or services in the most recent three-year period. Very high statistical significance = a p value <0.01. High statistical significance = a p value <0.05.

“Up to 41% of big companies’ variation in innovation can be explained by the diversity of industry backgrounds or career paths of their managers.”

Defence Procurement

Four procurement options:

- Develop innovative products domestically
- Adapt existing products
- Develop products with international partnerships
- Acquire new products from international firms

Four procurement options:

1. Develop innovative product domestically
2. Adapt existing products
3. Develop products with international partnerships
4. Acquire new products from international firms

Defence Procurement

Adapt existing products

Represents significant amount of combat vehicle spending
Defence Procurement
The challenge ahead

Current and Future Vulnerabilities to US Military Installations

<table>
<thead>
<tr>
<th>Service</th>
<th># Installations</th>
<th>Recurrent Flooding</th>
<th>Drought</th>
<th>Desertification</th>
<th>Wildfires</th>
<th>Thawing Permafrost</th>
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<td>Air Force</td>
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<td>25</td>
<td>20</td>
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<td>Army</td>
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<td>53</td>
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</tbody>
</table>

“The N-Word”

Non-lethal Force Technologies

Environment
- Military, police and civilians

Weapon Characteristics
- Controllable, precision capabilities
- Wide-spread

Legal Framework
- Force is proportionate to the objective and target
- Bystanders are unaffected
Non-lethal Force Technologies
Active Denial System

Source: Wired

U.S. Marine Corps photo by Lance Cpl. Andrew M. Huff
Non-lethal Force Technologies
Active Denial System

- Deployed in Afghanistan in 2008
- Inflexible and withdrawn in 2010

Environments reduce energy power levels

Researchers “found a wide safety margin between the desired repel response and injuries.”

Common Problem-Solving Pitfalls

- Flawed Problem Definition
- Solution Confirmation
- Wrong Framework
- Narrow Problem Framing
- Miscommunication

Q&A

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https://uwaterloo.ca/problem-lab/