Market Assessment for SBIR Firms

SBIR · STTR
America’s Seed Fund

htdc
HIGH TECHNOLOGY DEVELOPMENT CORPORATION

RTI INTERNATIONAL

Steve McManus
July 23, 2021
RTI Innovation Advisors

• Over 50 years of experience
• Thousands of projects
  ▪ Market intelligence, Strategy
  ▪ Technology Scouting, Forecasting
  ▪ Ideation
  ▪ Training & Building Capabilities
• Clients include
  ▪ all sizes of companies
  ▪ government agencies
  ▪ universities
  ▪ foundations
RTI at a Glance

$\$963\text{M}\$
FY2019 Revenue

1,259
FY2019 Clients

4,184
FY2019 Projects

90 Languages
250 Degree Fields
100 Nationalities

Practice Areas

- Energy Research
- Environmental Sciences
- International Development
- Food Security and Agriculture
- Health
- Social Policy
- Education & Workforce Development
RTI provides market and technology scouting services to MEP clients.
Clients report great impacts from these services.

Clients who engaged MEP Centers to conduct a Market or Technology Scouting project reported an average total impact of:

- $848,572 in new or retained sales;
- $75,108 in total cost savings;
- $382,586 in new investment; and
- 5.3 added or retained jobs.

“GENEDGE was a force multiplier for TAG and enabled us to broaden our perspective on markets both commercially and in the federal government. Their findings validated commercial opportunities that we would not have had the resources to do on our own and may not have considered.” —John Borden, COO, TAG

“Possibly the most beneficial result was the confirmation that several areas we believed to be opportunities were not applicable after all. We would have spent resources trying to roll out there to no avail.” - John Gregor, Vice President/General Manager, Packaging Horizons
A Challenge for SBIR Firms

• Delivering on the technical commitment to the funding agency, while developing the business plan:
  • to maximize the firm’s growth opportunities
  • to meet increasing SBIR program requirements to develop a commercialization strategy
  • to attract investment
    • Additional SBIR funding (phase 2/3)
    • Additional Federal funding (DoE, DoD, NIH)
    • Private investment
How an Assessment Helps

The Preliminary Assessment is a service designed to help firms applying for SBIR grants to:

• Articulate your value proposition

• Identify potential “dual-use” markets to investigate

• Assess 1-2 selected markets

• Test and refine your initial value proposition

• Provide strategic insights
Approach

• The Value Proposition Canvas exercise is a component of the well-known Business Model Canvas™ method developed by Strategyzer, and is used to complete the Value Propositions and Customer Segments sections of the Business Model Canvas.

• RTI uses the Value Proposition Canvas method to develop and communicate the technology firm’s hypothetical value proposition.

• The hypothetical value proposition is tested with market research, which will validate or identify flaws.
The Business Model Canvas is a popular method of developing business strategy.

### The Business Model Canvas

<table>
<thead>
<tr>
<th>Key Partners</th>
<th>Key Activities</th>
<th>Value Propositions</th>
<th>Customer Relationships</th>
<th>Customer Segments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leading Microscope OEMS</td>
<td>R &amp; D Manufacturing</td>
<td>Confocal microscope With: • Superior resolution • Automation • UV excitation • Ruggedness • Portability</td>
<td></td>
<td>Universities</td>
</tr>
<tr>
<td>Smaller OEMs</td>
<td></td>
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<td></td>
<td>Manufacturing</td>
</tr>
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<thead>
<tr>
<th>Key Resources</th>
<th>Channels</th>
<th>Revenue Streams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical expertise</td>
<td>OEM partners</td>
<td>Contract Manufacturing</td>
</tr>
<tr>
<td>Sales</td>
<td>Distributors</td>
<td>Product Development NRE</td>
</tr>
<tr>
<td>Distribution</td>
<td></td>
<td>Consulting</td>
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<tr>
<td>O &amp; M Support</td>
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<table>
<thead>
<tr>
<th>Cost Structure</th>
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<tbody>
<tr>
<td>Technical Expertise</td>
<td></td>
<td></td>
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<tr>
<td>Precision Manufacturing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R &amp; D Labs</td>
<td></td>
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**RTI**

The Business Model Canvas is designed to help companies visualize and develop their business strategies.
Market research strengthens the Business Model Canvas.

The Business Model Canvas

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</thead>
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<tr>
<td>Leading Microscope OEMs</td>
<td>R &amp; D Manufacturing</td>
<td>Confocal microscope With: • Superior resolution • Automation • UV-IR spectrum capability • Ruggedness • Portability</td>
<td>Application support Custom solutions Accessories</td>
<td>Universities Federal labs Research Institutions Military Manufacturing</td>
</tr>
<tr>
<td>Smaller OEMs</td>
<td>Technical expertise Sales Distribution O &amp; M Support</td>
<td></td>
<td></td>
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<table>
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<tr>
<th>Channels</th>
<th>Revenue Streams</th>
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<tr>
<td>OEM partners Distributor:</td>
<td>Contract Manufacturing Product Development NRE Consulting</td>
</tr>
</tbody>
</table>

Cost Structure

- Technical Expertise
- Precision Manufacturing
- R & D Labs

Strategic Sourcing

SBIR Market Assessment
The Value Proposition Canvas feeds the Business Model Canvas.

-By defining, testing and refining the value proposition in target customer (market) segments

Value proposition, in terms of how it will help the Customer do their Job more effectively

Customer, jobs to be done, pains, potential gains
The Value Proposition Canvas process connects product features to customer needs.
Example: Uber (App-driven transportation service)
Example: Uber
The Value Proposition Canvas process is designed to help the firm articulate its value proposition.

Our ____________________________
Product or service

help(s) ____________________________
Customer/End user

who want(s) to ____________________________
Customer/End user jobs to be done

by ____________________________ a customer/end user pain
Verb (e.g. reducing, avoiding)

and ____________________________ a customer/end user gain
Verb (e.g. increasing, enabling)

(unklike ____________________________).
Current situation or solution
The Value Proposition Canvas process is designed to help the firm articulate its value proposition.

- **Our** _______________________________  
  Product or service

- **help(s)** _______________________________  
  Customer/End user

- **who want(s) to** _______________________________  
  book a taxi

- **by** _______________________________  
  Verb (e.g. reducing, avoiding)  
  a customer/end user pain

- **and** _______________________________  
  Verb (e.g. increasing, enabling)  
  a customer/end user gain

- **(unlike** _______________________________  
  Current situation or solution

  - **Taxi Smartphone App**
  - **Taxi passengers**
  - **minimizing** waiting time
  - **enjoying** affordable prices
  - **calling taxi services by phone**
Process Overview

1. RTI and SBIR firm conduct a kickoff Zoom meeting to understand company & technology, and develop a hypothetical value proposition using the Value Proposition Canvas method

2. RTI conducts research

3. RTI conducts 1 interim Zoom review to share findings, get feedback to inform the remainder of the research

4. RTI delivers final report via Zoom

Elapsed time: 6-8 weeks
Technology Summary and Initial Value Proposition

devlopment tool

SBIR Phase 1 Awardee
Market Assessment: Technology Summary and Hypothetical Value Proposition

Describe the asset (idea, product, or capability).

What is the asset (material, component, system, capability, etc.)?

Describe the intended use or function.

Who would use it? [Customer segments]

How would they use it?

What Customer Tasks or “Jobs to be done” does this address?

What are the product features the Customer would use to perform these tasks?
Technology Summary and Initial Value Proposition

development tool

SBIR Phase 1 Awardee
Market Assessment: Technology Summary and Hypothetical Value Proposition

Why would they use it?

What pain would it alleviate?

What gains would it enable?

Describe developmental maturity.
What is the current stage of development? (TRL level? MRL level?)
What are the next steps for development?

Describe known or anticipated limitations.
Are there any known technical parameters, complexities, or issues that could impact market acceptance or technical viability?
Technology Summary and Initial Value Proposition
development tool

SBIR Phase 1 Awardee
Market Assessment: Technology Summary and Hypothetical Value Proposition

SUMMARIZE THE ASSET IN TERMS OF BENEFITS
Building on the asset description (previous box), broaden the description to offer the benefits of the asset (use numbers and link to applications and markets when possible). The description should tell what the asset does, not how it does it. The description must protect the enabling/essential aspects of the asset.

Example:

Our (product/service)

helps (customer segment/end user)

who does/wants to (customer/end user job(s) to be done)

by (verb, e.g., reducing/avoiding) (a customer pain point)

and by (verb, e.g., increasing/enabling) (a customer/end user gain)

unlike (the current situation/solution).
Initial (Hypothetical) Value Proposition
(developed by SBIR firm with Innovate HI’s assistance)

Example: Microscope
Example Market Assessment Deliverable
Technology & Value Proposition Summary

Technology Summary:
- Confocal microscope with novel all-reflective optics
- Highest sensitivity from UV to IR
- Highest NA (resolution) possible for air objective
- Captures spectroscopic data and images

Hypothetical Value Proposition:
Our confocal microscope technology helps University Scientists and Corporate Researchers who want to extract more information by observing smaller features and observing the UV spectrum. And reduce sample prep time by avoiding using cover slips. Unlike current microscope technologies.
### Market Opportunities Summary

<table>
<thead>
<tr>
<th>Potential market/application</th>
<th>Entry market potential</th>
<th>Long-term market potential</th>
<th>Key Insights</th>
</tr>
</thead>
</table>
| Materials Characterization   | High                    | Med                       | • Advantages in niche applications (crystal growth) could be entry opportunities  
                              |                         |              | • Small niche size: $50 million global market |
| Drug Discovery               | Med                     | High                      | • Need for reduced noise, increased resolution  
                              |                         |              | • Eliminating immersion removes bottleneck  
                              |                         |              | • Large industrial market |
| Forensics                    | Low                     | Low                       | • No need for enhanced resolution-standard microscopes meet 99% of needs  
                              |                         |              | • Conservative market |

- 1-2 Slide Summary of high-level market research summarizing the potential markets and applications identified.

- RTI then selects a subset for further investigation, with input from Innovate Hawaii and the SBIR firm. Factors considered may include initial impressions of:
  - Potential for rapid penetration as an entry market
  - Synergy with current SBIR work
  - Overall market size, growth, health
  - Key partners
  - Initial customers
  - R&D assets
  - Investors with domain expertise
# Market Snapshots (for 1-2 selected markets)

## Microscopy Market Snapshot

<table>
<thead>
<tr>
<th>Category</th>
<th>Values/findings</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market size</td>
<td>Overall: Large, growing ($10 billion; 4.5% CAGR)</td>
<td>1, 4</td>
</tr>
<tr>
<td></td>
<td>Key Segments:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Life Science: $1 billion; 6% CAGR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Materials: $500 million; 4% CAGR</td>
<td></td>
</tr>
<tr>
<td>Largest geographic markets</td>
<td>(NA 35%, EU 35%, Asia 25%); Asia is fastest-growing</td>
<td>2, 7, 8</td>
</tr>
<tr>
<td>Key customer segments</td>
<td>• Universities</td>
<td>5, 6</td>
</tr>
<tr>
<td></td>
<td>• Federal labs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Research Institutions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Military</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Manufacturing</td>
<td></td>
</tr>
<tr>
<td>Key partners</td>
<td>• Leading Microscope OEMs (Leica, Zeiss, Olympus)</td>
<td>2, 3, 9</td>
</tr>
<tr>
<td></td>
<td>• Smaller OEMs (Craic)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Distributors (Storr)</td>
<td></td>
</tr>
<tr>
<td>Key competitors</td>
<td>OEMs (large and small)</td>
<td>1, 7</td>
</tr>
<tr>
<td>Key trends &amp; insights</td>
<td>• Mature industry</td>
<td>6, 9</td>
</tr>
<tr>
<td></td>
<td>• OEM capabilities are strong</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• OEM value proposition includes O&amp;M contracts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Many small customers requires distribution strategy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• High-content screening cannot be done with liquid immersion</td>
<td></td>
</tr>
</tbody>
</table>
Value Proposition Assessment (for selected markets)
## Value Proposition Assessment-Rationale

<table>
<thead>
<tr>
<th>Pain Reliever</th>
<th>Markets</th>
<th>Rating</th>
<th>Rationale/comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greatly reduces sample prep time/effort</td>
<td>Drug Discovery, Forensics</td>
<td>Validated</td>
<td>• Essential for use in high content/throughput screening(^1,^4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Also an issue in lab work generally (^7)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gain Creator</th>
<th>Markets</th>
<th>Rating</th>
<th>Rationale/comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observe UV spectra</td>
<td>Forensics</td>
<td>Fatal Flaw</td>
<td>Very few relevant targets fluorescence in UV(^2)</td>
</tr>
<tr>
<td>Preserves live specimens</td>
<td>Drug Discovery</td>
<td>Issue/Concern</td>
<td>In most cases, aqueous immersion keeps specimens alive long enough(^5)</td>
</tr>
</tbody>
</table>
## Key Observations and Suggested Actions

### Observations
- Partnering with an incumbent may be the best strategy:
  - Entering the market as an OEM requires extensive marketing, sales, distribution, and support – a tall order for a small company.
  - Customers with the need for the advanced capability of microscope are geographically distributed.
  - Microscope needs are highly application-specific and likely consists of numerous small niches.
  - Industrial applications are limited; most customers will be universities and government labs. High content/high throughput screening for drug development is an exception.

### Suggested Actions:
- Further explore Drug Discovery applications
  - Strong evidence of need for microscope’s value proposition
  - Large market
  - Path to market identified through key OEMs
- Next steps:
  - Create comparative case studies with images and results in relevant applications
    - Engage leading researchers to help with this effort
    - Explore partnering opportunities with researchers to pursue research funding including purchase of equipment
  - Engage OEM product and business development managers to explore their interest in evaluating the technology for targeted applications
  - Consider attending in the following events/trade shows/conferences:
    - Forensics Society Conference
    - Drug Discovery Expo
# Key Findings and References (in Appendix)

<table>
<thead>
<tr>
<th>Ref. #</th>
<th>Source</th>
<th>Summary</th>
</tr>
</thead>
</table>
| 1      | High on High Content: A guide to some new and improved high-content screening systems (The Scientist, December 2012, accessed 1/1/2018) | • Sample prep time must be minimized  
• Leading HC/HTS system OEMs Perkin Elmer and Molecular Diagnostics) use spinning-disk confocal microscopy  
• Liquid immersion objectives are not feasible |
| 2      | Interview with John Doe, Lead Fluorescence Microscopy Scientist, NIH, 2/24/18 | • Very few molecular targets used in drug discovery fluoresce in response to UV stimulation |
Market Assessment Goals

- Help the SBIR firm articulate its value proposition in specific applications beyond the SBIR funding agency applications
- Increase awareness of commercial opportunities
- Strengthen value proposition, company valuation
- Sharpen strategic focus
- Provide a foundation for business strategy that the firm can build upon over time to refine strategy and raise funds (e.g. through SBIR/STTR, other govt. sources, or private equity)
Case Study

Nalu Scientific specializes in advanced mixed signal integrated circuits with applications in particle tracking and time of flight measurements.

RTI conducted a market assessment for Nalu in 2018, recommending pursuit of light detection & ranging (LIDAR) applications.

Nalu received a $120,000, six-month Phase I Small SBIR award to design and build a single-photon-sensitive waveform enhanced and lightweight LIDAR system (SWELL).
Contact:

Steve McManus
Innovation Advisor
smcmanus@rti.org