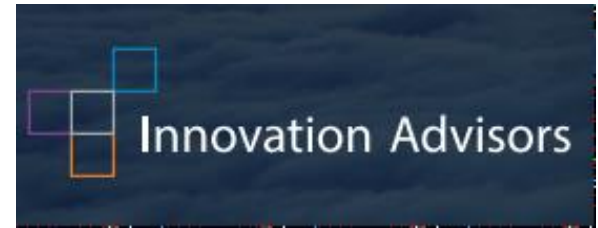


Market Assessment for SBIR Firms



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



\$963M
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

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:

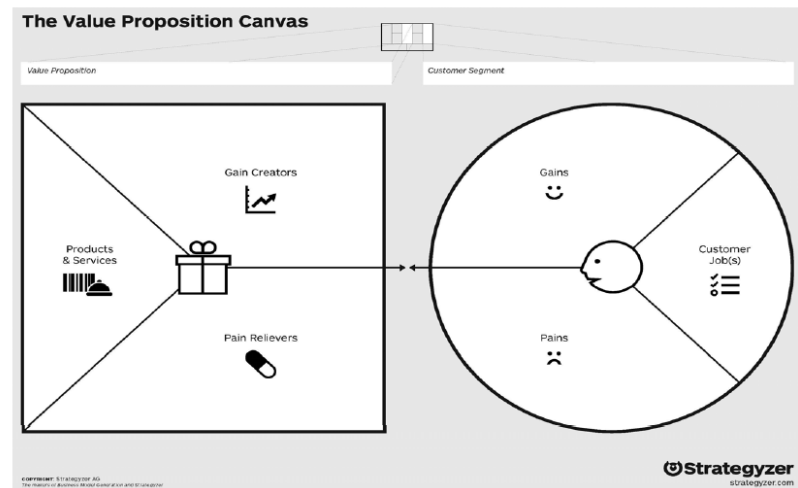
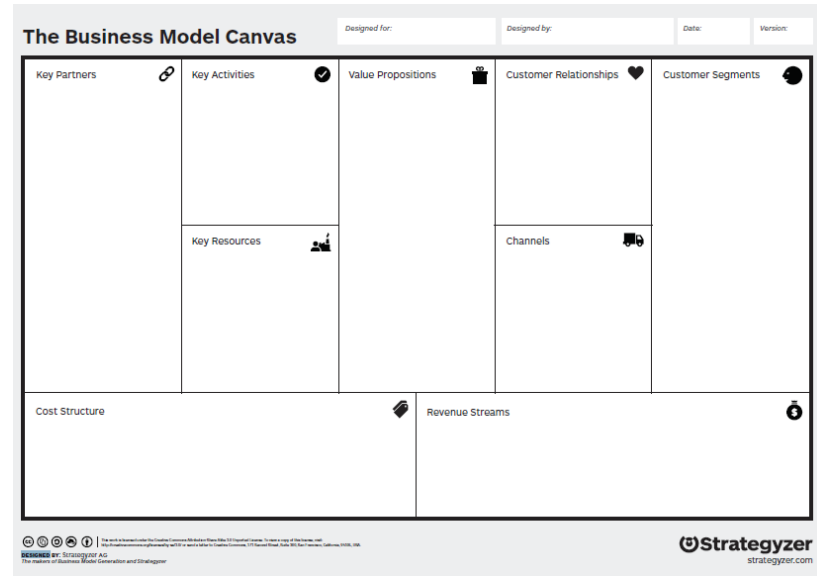
- Articulate your value proposition
- Identify potential “dual-use” markets to investigate
- Assess 1-2 selected markets
- Test and refine your initial value proposition
- Provide strategic insights



Market Intelligence provides strategic direction and market validation

Approach

- The Value Proposition Canvas exercise is a component of the well-known [Business Model Canvas](#)TM 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

Designed for: _____ Designed by: **RTI** Date: _____ Version: _____

<p>Key Partners </p> <p>Leading Microscope OEMs</p> <p>Smaller OEMs</p>	<p>Key Activities </p> <p>R & D</p> <p>Manufacturing</p>	<p>Value Propositions </p> <p>Confocal microscope</p> <p>With:</p> <ul style="list-style-type: none"> Superior resolution Automation UV excitation Ruggedness Portability 	<p>Customer Relationships </p>	<p>Customer Segments </p> <p>Universities</p> <p>Federal labs</p> <p>Research Institutions</p> <p>Military</p> <p>Manufacturing</p>
<p>Key Resources </p> <p>Technical expertise</p> <p>Sales</p> <p>Distribution</p> <p>O & M Support</p>		<p>Channels </p> <p>OEM partners</p> <p>Distributors</p>		
<p>Cost Structure </p> <p>Technical Expertise</p> <p>Precision Manufacturing</p> <p>R& D Labs</p>			<p>Revenue Streams </p> <p>Contract Manufacturing</p> <p>Product Development NRE</p> <p>Consulting</p>	

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 The makers of Business Model Generation and Strategyzer

Strategyzer
 strategyzer.com



Market research strengthens the Business Model Canvas.

The Business Model Canvas Designed for: Designed by: **RTI** Date: Version:

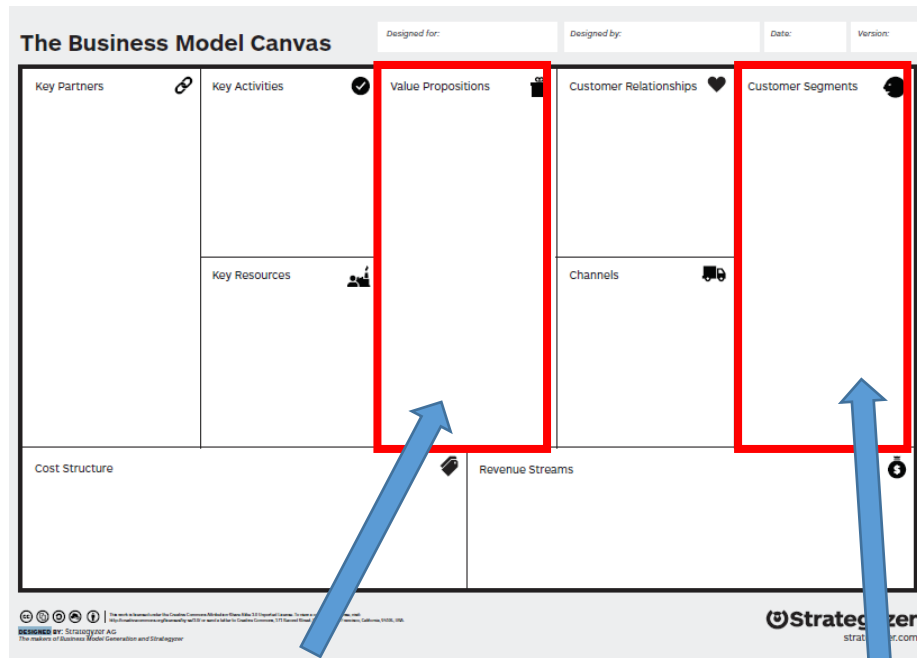
<p>Key Partners </p> <p>Leading Microscope OEMS</p> <p>Smaller OEMs</p>	<p>Key Activities </p> <p>R & D</p> <p>Manufacturing</p>	<p>Value Propositions </p> <p>Confocal microscope With:</p> <ul style="list-style-type: none"> • Superior resolution • Automation • UV-IR spectrum capability • Ruggedness • Portability 	<p>Customer Relationships </p> <p>Application support Custom solutions Accessories</p>	<p>Customer Segments </p> <p>Universities</p> <p>Federal labs</p> <p>Research Institutions</p> <p>Military</p> <p>Manufacturing</p>
<p>Key Resources </p> <p>Technical expertise</p> <p>Sales</p> <p>Distribution</p> <p>O & M Support</p>		<p>Channels </p> <p>OEM partners</p> <p>Distributor:</p>		
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The makers of Business Model Generation and Strategyzer

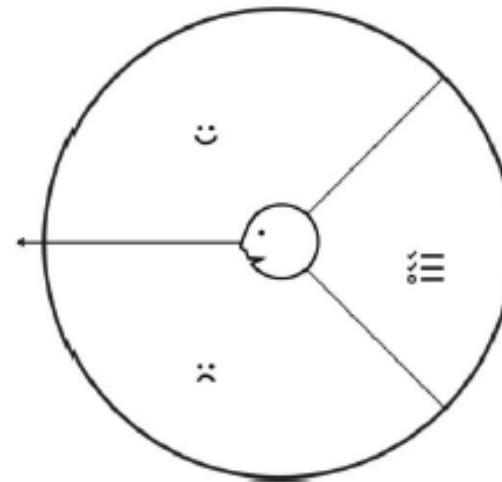
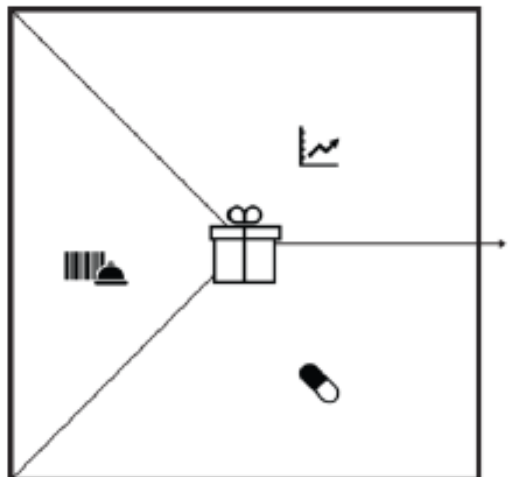
Strategyzer
strategyzer.com

The Value Proposition Canvas feeds the Business Model Canvas.



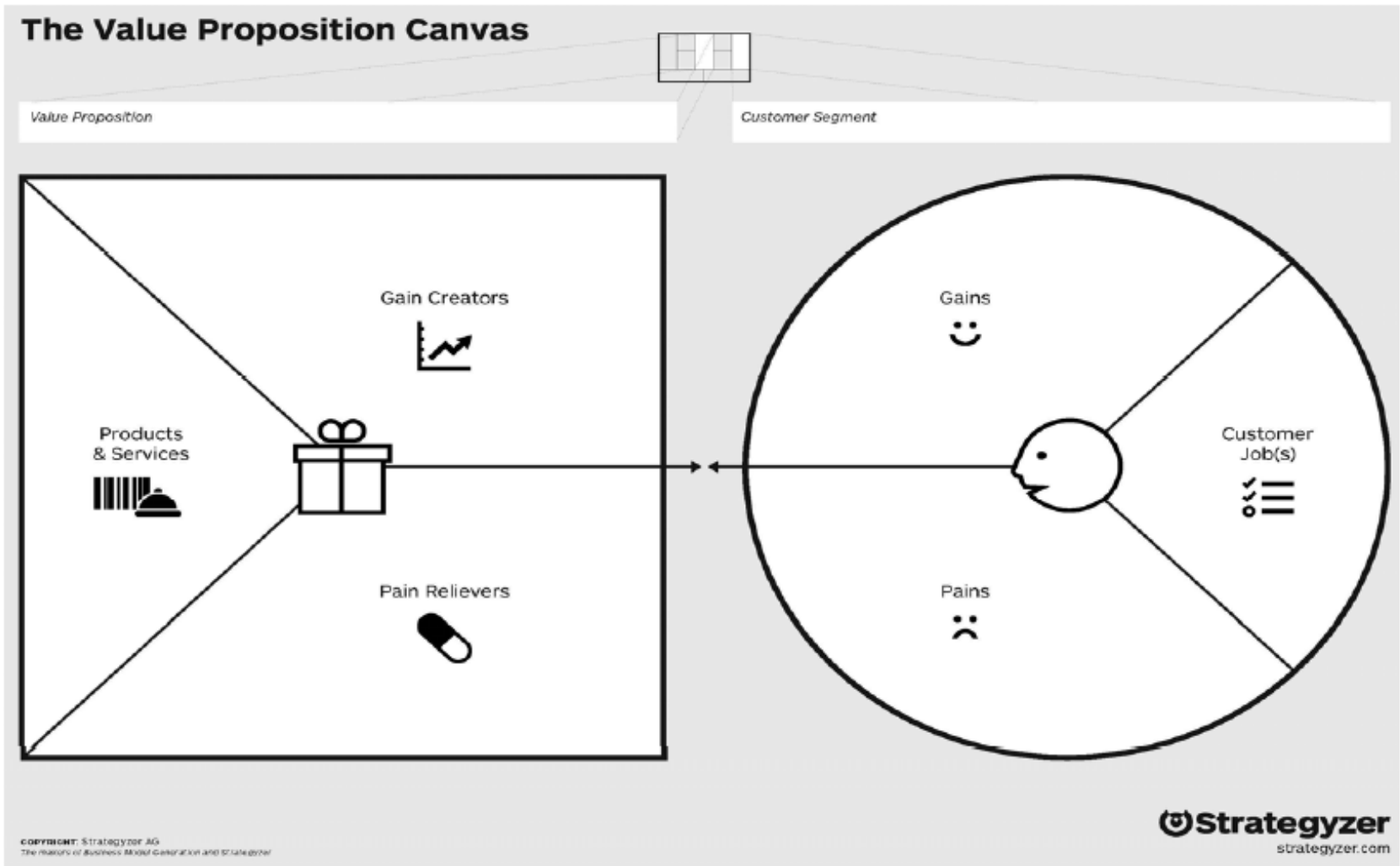
-By defining, testing and refining the value proposition in target customer (market) segments

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)

Customer Profile

The set of customer **characteristics** that you **assume, observe** and **verify** in the market



Example: Uber

Value Map

The set of value proposition **benefits** that you **design** to attract customers



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)

(unlike _____).

Current situation or solution

The Value Proposition Canvas process is designed to help the firm articulate its value proposition.

Our Taxi Smartphone App
Product or service

help(s) Taxi passengers
Customer/End user

who want(s) to book a taxi
Customer/End user jobs to be done

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

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

(unlike calling taxi services by phone).
Current situation or solution

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 development tool



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



Form Prepared By:	<input type="text"/>	Date:	<input type="text"/>
Company/Institution:	SBIR Phase I awardee	Website:	<input type="text"/>
Business Contact Name:	<input type="text"/>	Title:	<input type="text"/>
Technical Contact Name:	<input type="text"/>	Phone:	<input type="text"/>
		E-mail:	<input type="text"/>

For each SECTION, capture as much information as possible. After the interview, review the information with the project team (client) to consider accuracy and completeness.

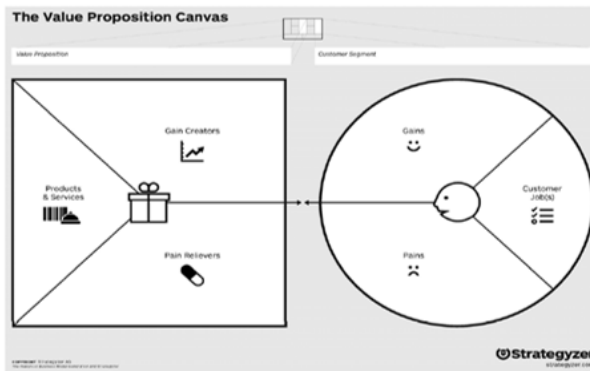
The purpose of this Assessment is to understand the client's technology asset, identify potential applications, and develop initial value propositions that RTI will test as part of its market research. RTI uses the highly regarded and commonly used Business Model Canvas approach developed by Strategyzer, which includes a Value Proposition Canvas. RTI's Market Assessment Report uses the Business Model Canvas framework and terminology, which the SBIR firm can leverage and refine as the company matures and pursues new investment.

Before the assessment, the SBIR firm should review the Youtube videos below from Strategyzer:

Business Model Canvas Explained <https://www.youtube.com/watch?v=QoAOzMTLP5s&t=17s>

Strategyzer's Value Proposition Canvas Explained <https://www.youtube.com/watch?v=ReMIUqmVFP0>

The Value Proposition Canvas:



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)



Customer/End-user jobs: The things your customers/end users are trying to get done in their work or in their life. A job could be the core:

- tasks they are trying to perform and complete,
- problems they are trying to solve, or
- needs they are trying to satisfy.

Questions to stimulate ideas for jobs:


- What tasks are your customers/end users trying to perform in their work or personal life?
- What are the core, functional problems your customer/end users encounter?
- How does the customer/end user want to be perceived by others? What can they do to be perceived this way?

How would they use it?

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


What are the products/services 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 Pains would it alleviate?




Customer/End-user pains: Describes anything that annoys your customers/end users before, during, and after trying to get a job done, or simply prevents them from getting a job done.

Questions to stimulate ideas for pains:

- What makes your customers feel bad? What are their frustrations, annoyances, or things that give them a headache?
- How are current value propositions under performing for your customers? Which features are they missing? Are there performance issues that annoy them or malfunctions they cite?

What Gains would it enable?



Customer/End-user gains: The outcomes and benefits your customers/end users want. Some gains are required, expected, or desired, and some would surprise them.

Example gains:

- Functional utility
- Social gains
- Positive Emotions
- Cost savings

Example questions to stimulate ideas for gains:

- Which savings in terms of time, frustration, money, and effort would make your customer/end user happy?
- How do customers/end users measure success and failure?
- How do they gauge performance or cost?

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?

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SBIR Phase 1 Awardee

Market Assessment: Technology Summary and Hypothetical Value Proposition



Describe competing products/capabilities in the markets/applications.

What are the competition's main advantages or disadvantages?

Who is offering them?

Describe any supporting information.

What data, prototypes, visuals, and/or other information can be shared about the asset to help the project team understand the asset?

Describe the intellectual property status.

Is it patented, patent pending, protected by TM, copyright, or trade-secret?

Does the client have rights to make, use, or sell via other licenses?

Describe known experts and resources.

What resources, experts have you used?

What sources are known, but have not been investigated?

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Technology Summary and Initial Value Proposition development tool



SBIR Phase 1 Awardee

Market Assessment: Technology Summary and Hypothetical Value Proposition



Describe any aspects of the asset or company/business that should be kept confidential.

Describe resource constraints (e.g., investment funding, existing investment in capital equipment, manpower).

List companies that should be avoided. (e.g., competitors, suppliers).

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/sensitive 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)

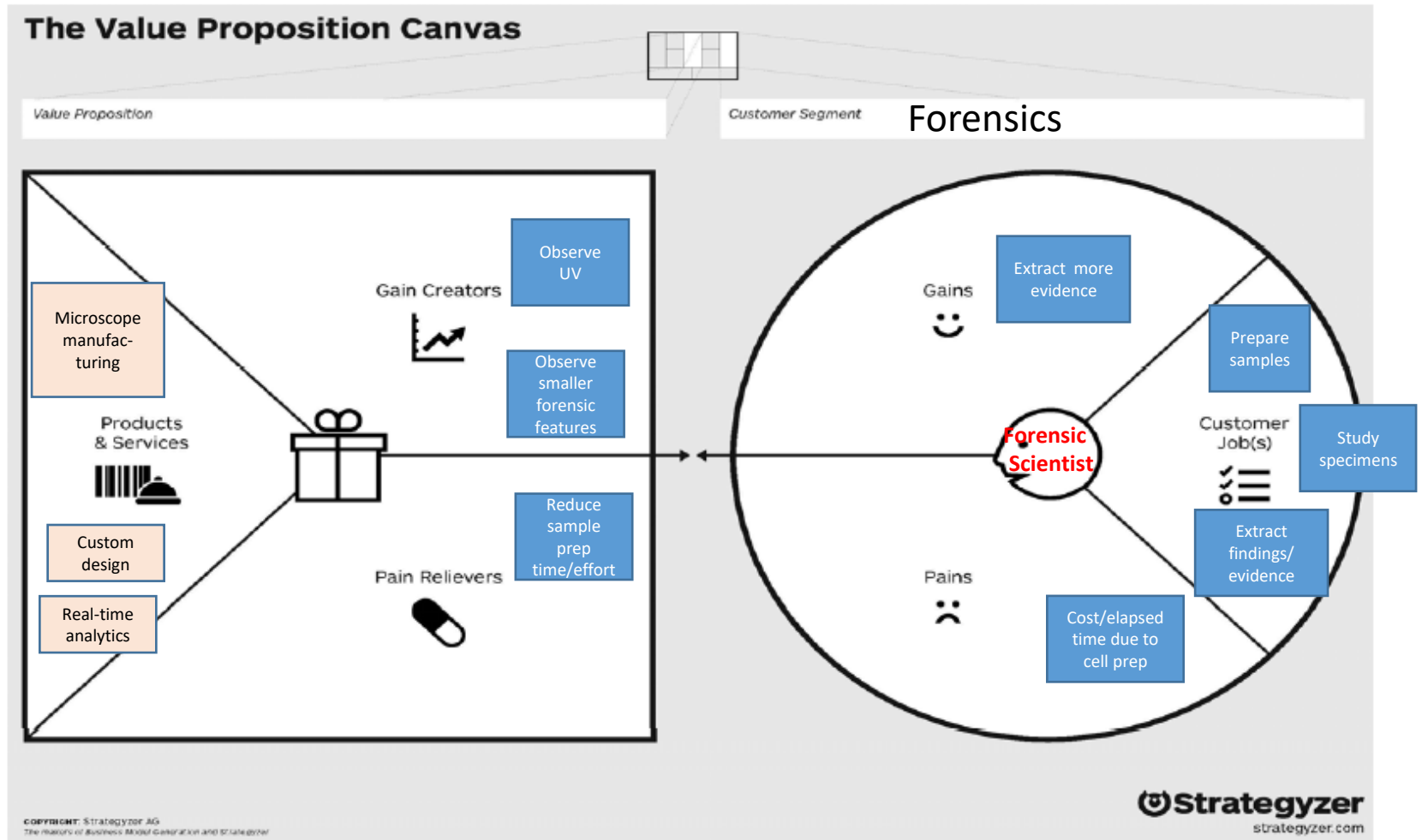
and by (verb, e.g., increasing, enabling) (a customer/end user gain)

unlike (the current situation/solution).

HYPOTHETICAL, NON-DISCLOSING
VALUE PROPOSITION

Initial (Hypothetical) Value Proposition (developed by SBIR firm with Innovate HI's assistance)

Example: Microscope



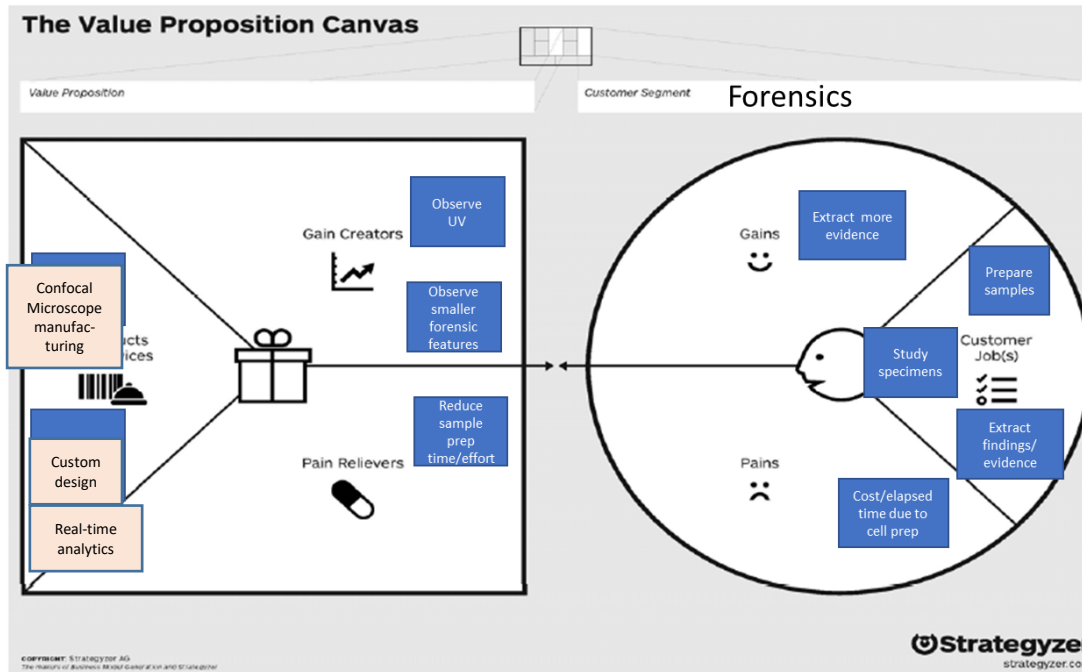
Example Market Assessment Deliverable

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

Summary slide with key information from TSIVP form



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

Potential market/application	Entry market potential	Long-term market potential	Key Insights
✓ Materials Characterization	High	Med	<ul style="list-style-type: none"> • Advantages in niche applications (crystal growth) could be entry opportunities • Small niche size: \$50 million global market
✓ Drug Discovery	Med	High	<ul style="list-style-type: none"> • Need for reduced noise, increased resolution • Eliminating immersion removes bottleneck • Large industrial market
✗ Forensics	Low	Low	<ul style="list-style-type: none"> • 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

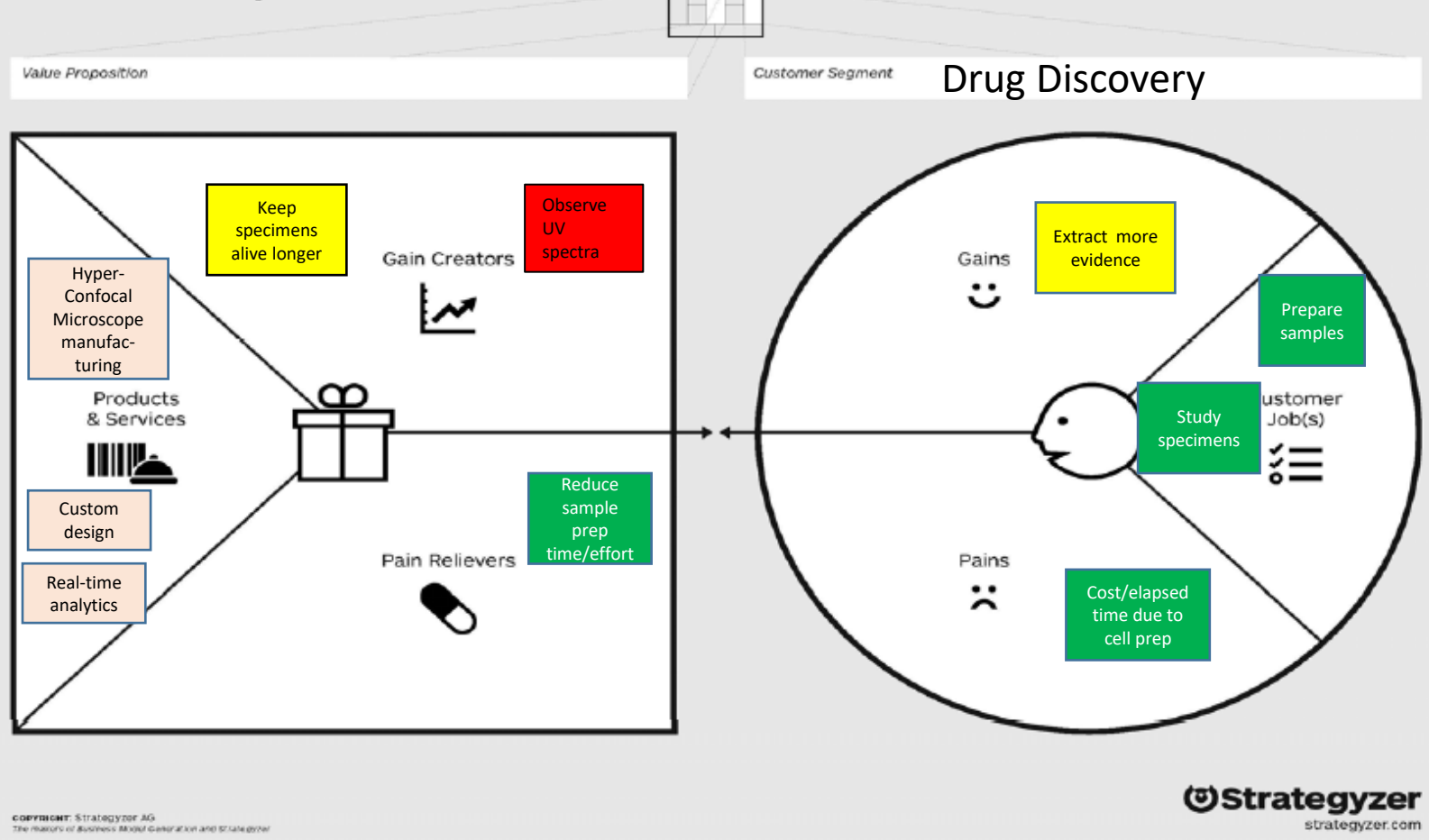
Category	Values/findings	Sources
Market size	Overall: Large, growing (\$10 billion; 4.5% CAGR) Key Segments: Life Science: \$ 1billion; 6% CAGR Materials: \$500 million; 4% CAGR	1, 4
Largest geographic markets	(NA 35%, EU 35%, Asia 25%); Asia is fastest-growing	2, 7, 8
Key customer segments	<ul style="list-style-type: none"> • Universities • Federal labs • Research Institutions • Military • Manufacturing 	5, 6
Key partners	<ul style="list-style-type: none"> • Leading Microscope OEMs (Leica, Zeiss, Olympus) • Smaller OEMs (Craic) • Distributors (Storr) 	2, 3, 9
Key competitors	OEMs (large and small)	1, 7
Key trends & insights	<ul style="list-style-type: none"> • Mature industry • OEM capabilities are strong • OEM value proposition includes O&M contracts • Many small customers-requires distribution strategy • High-content screening cannot be done with liquid immersion 	6, 9

Value Proposition Assessment (for selected markets)

- ✓ Validated
- ! Issues/concerns
- ✗ Fatal Flaw
- ? Unclear



The Value Proposition Canvas



Value Proposition Assessment-Rationale

Pain Reliever	Markets	Rating	Rationale/comments
Greatly reduces sample prep time/effort	Drug Discovery, Forensics	Validated	<ul style="list-style-type: none"> • Essential for use in high content/throughput screening^{1,4} • Also an issue in lab work generally ⁷

Gain Creator	Markets	Rating	Rationale/comments
Observe UV spectra	Forensics	Fatal Flaw	Very few relevant targets fluorescence in UV ²
Preserves live specimens	Drug Discovery	Issue/ Concern	In most cases, aqueous immersion keeps specimens alive long enough ⁵

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)

Ref. #	Source	Summary
1	High on High Content: A guide to some new and improved high-content screening systems (The Scientist, December 2012, accessed 1/1/2018)	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• 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).

A dark blue rectangular box containing the text "PACIFIC BUSINESS NEWS" in white, bold, sans-serif font.

TECHNOLOGY

Nalu Scientific receives NASA grant for innovative tech



Contact:

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Innovation Advisor

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