



Using Analytics and Technology Accelerators to Help First Responders

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- Some Background
- The Program
- Project Selection Methodology
- Testing Approach & Results
- Next Steps



Background



- There is an omnipresent desire to improve First Responder capabilities whenever and where ever possible.
- The DHS S&T First Responders' Group(FRG) leads this effort for the Federal Government
- Continually emerging IoT information technologies were identified by the FRG as having high potential to contribute to First Responder Safety
- IoT technologies a rapidly growing set of technologies and multibillion dollar market
- The IoT marketplace is different from the traditional sources of improvement to first responder safety. E.g.:
 - Insurance Industry
 - Building / Construction Industry

Solution: Look for Technology Innovators

Traditional SBIR / STTR efforts were not achieving First Responder market penetration



The Sciti (pronounced "City") Program



- Smart City IoT Innovation (Sciti) Program
 - Sponsored by DHS S&T- First Responders' Group
 - Executed by the Virginia Center for Innovative Technology
 - Supported by:
 - TechNexus

Technology Accelerators

- Smart City Works
 KaDSci, LLC
 Analytics Col
- KaDSci, LLC Analytics Company
 The goal of the program is to seek out, develop, and bring innovative lot technologies that improve first responder.
- innovative IoT technologies that improve first responder capability to market.
- By:
 - Working with First Responders
 - Aligning with larger market opportunities
 - Seeking out Innovators
 - Planting & fertilizing seeds

Technology innovators are usually found in small startups





Project Selection



- The challenge How to select the winners Knowing:
 - Most Startups fail
 - Success depends on much more than the "idea"
 - Improving First Responder Capability will require technologies to interoperate once deployed.
- The solution:
 - Cast a very broad net
 - Use a proven, disciplined selection method
 - Require interoperability from the very beginning
 - Make the performers demonstrate interoperability early and often



Casting a Broad Net



- Widely Publicized (https://www.cit.org/SCITI/)
 - Technology Accelerator Circles
 - Universities
 - Relevant Professional Societies
- Easy Application Process
 - One Page
 - One Phone Call Screening
- Received over 130 applications in four weeks
- Down selected applications to approximately 40 for detailed review (March 2018)

Web Based Application

1 If you need help, contact info@exoger	nius.com		
SCITI Labs is looking for capabilities www.cit.org/SCITI www.cit.org/SCITI/RFI	to support First Responders. Please see	the following links for more infor	mation.
Company Information			
Company Name	Date Formed	Webs	site
Company Description			1
City	0	Country	
Founding Team Primary Contact First Name	Primary Contact Last Name	Primary Contact E-mail	Primary Contact Phone
4	<u>۵</u>		
Additional Founders		Employee Summary	
	5.5		



Disciplined Process



- Created three pools of complimentary technology types
 - Navigation and sensors (mobile emphasizing indoor navigation)
 - Indoor sensors (static innovative applications of emerging IoT for Smart Cities)
 - Smart Hub (Infrastructure to facilitate interoperability)
- Required a standard submission packet, tailored to technology
- Applied a decision analytic model (Influence Diagram) designed for technology startup investment analysis.
 - Looked across three dimensions (Value Proposition, Business Execution, Exit Potential)
 - Twenty self evaluation questions for proposers
 - Twenty three evaluation questions for evaluators ("investors")
- Ranked Proposals in each Pool based on the evaluations
- Selected 13 Phase One Projects (April 2018)

Executed using a Commercial Platform Called "EXOGENiUS"

Projects Compare Evaluations				
Navigation and Sensors Compare Evaluations				
Proposal Name	Average Overall Score	Average Value Proposition Measure	Average Business Execution Measure	Average Exit Potential Measure
	π	92	er 🔥	67
	60	57 J	66	52
	50 A A	61	66	41
	58	58	65	42
	57	64	59	40
	55	53	64	42
	52	47	70	25
	50	50	69	12
	45	54	38	40
	43	53	43	24
	40	48	33	36
	32	43	33	9



KaDSci Assessment Data Collection Tool



-	4 88				💻 English (US) 🛛 💄 Nina Ar	aujo ~
*	Home	^	Proposals > Casper Drones	e-score 58	QUESTIONS ANSWERED INVESTO 100%	OR VIEWS
Q	Search Proposals	⊕				
Ø	Screening Proposals	Ð	About	Proposal Details	Entrepreneur Score	- 2
 Home Screening Proposals Screening Proposals Yiew All Create Proposal Evaluator Name Overall Score Value Proposal Evaluation Five categories of questions Offering Market Team Capital Company Infrastructure Overall Impressions What is your overall impression of the most likely exit the applicant(s) will achieve for the prop 	Objectives					
	View All		Evaluator Name Overall Score Value Proposition Measure	Business Execution Mea	Sure Exit Potential Measure	
	Create		58 66	56	48	
 Home Search Proposals Screening Proposals Proposal Pools View All Create Proposal Evaluator Nation of Control of the sector of Control o	(Entrepreneur) 63 63 88	34	71			
			Proposal Evaluation Five categories of que	stions –	•	- 2
			Offering Market Team Capital Company Infras		Impress & Prev Next -	
			Overall Impressions			
			Proposals > caper brones • Proposals > caper brones • Excore • Out • Proposal Details • Entrepreneur • About • Proposal Details • Entrepreneur • Additive Utility Function • Three Objectiv • Evaluator Name • Overall Score • Business Execution Measure Exit Potent • Evaluator Name • Overall Score • Value Proposition Measure Business Execution Measure Exit Potent • Evaluator • Ss • G • Ss • Ss			
			What is your overall impression of the most likely exit the ap business?	plicant(s) will ach	lieve for the proposed	
			Exit size is estimated as a multiple of the overall investment made in the venture. Returns va	ry both in size and time re	quired between investment and	
				Balch		
			No Exit			



Evaluation Questions Background & Structure



	Export Proposal Details
Collaborators	Funding Request
	\$0
Value Proposition	
As the pioneer in intelligent build building navigation, providing su	ng information collection and 3D visualization of IoT data, EcoDomus is planning to enhance its capabilities by integrating BIM with beacons for in- port for 3D visualization of positioning body-worn sensors and applying other IoT use cases.
Attached Files	Company Details / Pitch
Company Information	
Date Formed	Website

- Questions and underlying model developed over 5 years
- Sources include
 - Industry data
 - Expert Judgment

Nhat is the expected market size for the proposed Offering (idea / innovation / technology / product / service)?

Assess the target market. Does the analysis point to a large, accessible market with a rapid growth rate? Is there a real opportunity for a dominant market position? Is there an opportunity to realize large-scale production and/or delivery economies?

Entrepreneur Selected Answer	
Very large market	

Entrepreneur Supporting Evidence

All capital structures: buildings, factories, airports, rail stations, oil refineries, etc. need to be digitized and have intelligent information models. That's the market EcoDomus is after. EcoDomus has assembled a unique group of the best-in-industry clients and partners and scaling up to move from early adopters into the mainstream.

	- Igor Starkov	Analysis points to a market with	
0	Very large market	extremely big buying power now, in excess of \$1B or a market with the	
•	Large market	potential to grow to a size in excess of \$1B within five years.	
\bigcirc	Mid size market		
\bigcirc	Small Market		
\bigcirc	Very small market		
\bigcirc	I do not have the info	rmation necessary to evaluate this question	

I do not have the expertise necessary to evaluate this question

Well structured questions Designed to pass a clarity test (as much as possible)

Example Contractions Sciences The Underlying Assessment Model







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Apply OR "Soft Skills"



Overview	Questions					
					Export Evaluations	
Evaluator N	Name	Overall Score	Value Proposition Measure	Business Execution Measure	Exit Potential Measure	See Differences in Overall Score
-	_	56	53	61	54	
-	_	69	88	63	43	
		31	4	56	32	
		24	24	30	40	

How many founders own and are actively involved in the company? Entrepreneur selected: Two

Selected Answer		Evaluator
⊘ Two E	Evaluators Agree	David Ihrie: Marco Rubin: Nina Araujo:
Not Answered		Daniel Maxwell:

Is the management structure of the company consistent with the size and maturity of the organization? Entrepreneur selected: Consistent

Selected Answer	Evaluator
Some Inconsistencies	David Ihrie:
Consistent	Marco Rubin:
	Nina Araujo:

Collaborate and reconcile differences



Model Effectiveness (V&V)



0.05 FailedReal Exits
 High Real Exits
 Medium Real Exit 0.04 0.03 Density Density 0.02 0.01 0.00 -20 20 40 60 80 0 N = 36 Bandwidth = 6.888

Density of Overall Scores in Experiment

Density of Exit Scores in Experiment



Clinical Trial Results 82% accuracy in identifying <u>failed</u> <u>start-ups</u> 77% accuracy in identifying a "medium" exit **41%** accuracy in identifying "large" exits



Multi-Vendor Demo.... Often Measure Results Coordinate with Standards Organizations



Companies Selected



- Smarthub
 - Zello
 - Coolfire
 - Excession
 - Command Wear

- UAV / Navigation
 - Airgility
 - Third Insight
 - U. Cincinatti (SUAVE)
 - Ecodomus

- Indoor Sensors (IoT)
 - Known Quantity Sensors
 - Wireless System Solutions
 - University of Dayton



Testing Approach



- Multi-Stage
 - Developmental Test & Evaluation (DTE): October 2018 (Complete)
 - Operational Test & Evaluation (OTE): Late Spring 2019
 - Field Testing: Winter 2019/2020
- Designed to become more challenging over time
 - Reduced set up time
 - Increased scenario / vignette complexity
 - Increased requirement for "automated" interoperability



DTE Venue





Texas A&M Engineering Extension's "Disaster City"

Two Buildings

- 1. Partially destroyed Movie Theater
- 2. Office / Classroom Building

Key Personnel

- 1. First Responders
- 2. S&T Expertise from Teex
- 3. DHS S&T Staff
- 4. Sciti Core Team



Product Introduction

Brief Field

Training

Introduce

Product To

Responders

DTE Event Overview

Evaluation





Testing

Performance

Test

Baseline Test

(No Smart

Hub)

Eight Vignette's

Increasing complexity

Standard Process for each Vignette



The Follow On Decision





DTE Evaluation Criteria

The following rubric will be used to evaluate performers for continuation in Phase II of the program.

Metric	<u>Weight</u>	<u>Score (0-5)</u>	<u>Weighteo</u> <u>Score</u>
SCITI Assessment Suite (<u>ExoGenius</u> , Industry input, Baseline value prop)	0.2		0
Architecture + SWAMP	0.1		0
API, Open Standards, Standards Checklist	0.1		0
TEEX Test Results	0.3		0
Demonstration at TEEX	0.1		0
			0
Business Capacity/Maturity	0.05		0
Performance to date	0.05		0
Market traction	0.1		0
		TOTAL SCORE	0
	Date:		
	Metric SCITI Assessment Suite (ExoGenius, Industry input, Baseline value prop) Architecture + SWAMP API, Open Standards, Standards Checklist TEEX Test Results Demonstration at TEEX Business Capacity/Maturity Performance to date Market traction	MetricWeightSCITI Assessment Suite (ExoGenius, Industry input, Baseline value prop)0.2Architecture + SWAMP0.1API, Open Standards, Standards Checklist0.1TEEX Test Results0.3Demonstration at TEEX0.1Business Capacity/Maturity Market traction0.05 0.05Market traction0.1	Metric Weight Score (0-5) SCITI Assessment Suite (ExoGenius, Industry input, Baseline value prop) 0.2 Architecture + SWAMP 0.1 API, Open Standards, Standards Checklist 0.1 TEEX Test Results 0.3 Demonstration at TEEX 0.1 Business Capacity/Maturity 0.05 Performance to date 0.05 Market traction 0.1 TOTAL Date:



Next Steps



- Award Phase II Contracts to high performing Companies
- Prepare for Operational Testing
- Assist Companies:
 - In correcting weaknesses ID'd in EXOGENIUS evaluation
 - Getting Market awareness / traction as they are ready





Questions? Comments!



References



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- Pine, J. (2007) Technology in Emergency Management, John Wiley & Sons, New York.



Example in the classical sciences Technologies – Some Pictures

























