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PROJECT SIGNATURE PAGE

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PROJECT TITLE: Ares Security Business Proposal

AUTHORS: Kim Alexis Deleon Ballantyne, Maria Guzman, John Fortune, Inna Yuhko

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Name of Project Advisor

DAVID GROOMS 12/5/18

PROJECT ADVISOR SIGNATURE DATE
David Grooms

SOHEILA JORJANI 12/5/18

PROJECT SECOND READER SIGNATURE DATE
Soheila Jorjani

Ares Security Business Proposal Executive Summary

Alexis Deleon Ballantyne
Maria Guzman
Johnnie L. Fortune Jr
Inna Yuhko
CSUSM FEMBA Class 2017

Company

Located in the small town of Vienna Virginia, Ares Security began their mission in 1999, when a group of like- minded individuals with the help of the US Department of Defense started developing solutions to provide safeguard for clients' critical assets. After ten years of work, on October 1, 2012 Ares Security Corporation became officially incorporated. This allowed the company to expand and essentially acquire majority ownership interest in the Mariner Group. The Mariner Group, was founded in 2001. They were acknowledged at the time for their work in situational awareness principles. They designed and developed the Command Bridge platform which provides clients with a highly organized solutions to situations and incident responses.

In 2016, the technology was essentially acquired, when Ares fully acquired The Mariner Group. First and foremost, ARES is a software company concentrated around physical security. Physical security represents an emerging frontier, where artificial intelligence, machine learning, autonomous technologies and other advances could give any organization including military an edge. Their mission is to provide solutions against a wide range of risks that jeopardize people, revenue, and operations. Ares portfolio's main assets consist of AVERT and ComandBridge. The AVERT software has become ARES main product as it contributes the largest segment of the company's revenue stream. AVERT software enables customers to optimize their facilities through detailed risk assessments. The software operates in a two-step process, it evaluates existing security through simulations and helps designing modifications to the cite in order to make the facility as secure as possible. The first step is derived from the software's user interface which creates 3D replicas of the customer's interior and exterior grounds. Once that has been completed, AVERT will use Monte Carlo simulations to defeat the customers current security systems.

After the simulations have been completed, AVERT will expose any vulnerabilities the customers facility may have. The findings are held reliable as they are supported by the accredited algorithms in AVERT. A significant advantage of the software is that it quantifies an enormous amount of data received from simulations in a very rigorous way, which is an impossible task for any individual human subject matter expert. In addition to exposing security system vulnerabilities, the software also helps customers reduce operating expenses for the customer. For most customers, operating expenses are the second largest expense on any profit and loss statement.

The AVERT software is setting the new industry standard for performing quantitative risk assessments. IT is the only completely-off-the self-vulnerability assessment software in North America that is certified by the SAFETY Act and DHS and is accredited by the DoD and DoE.

Problem Statement

ARES Security Corporation has been in the business of physical security for over ten years and its management realizes that in order for the company to continue its progress, they have to look for ways to enter new markets and continuously update its product line to satisfy changing consumer demands. The company leadership identified that the current Artificial Intelligence

market is enormous and has unfulfilled demand, especially in the field of AI-based physical security product. The CEO of ARES, Ben Eazzetta, recognizes that the U.S. government is a key customer with strong financial ability and if the right product is offered to the federal agencies, it will create an inevitable success and support long-term revenue growth. As the demand for AI-enabled technology continues to grow in the federal government, the opportunities must be evaluated to determine how ARES will fit into this market. However, at this point our client is struggling with finding a clear vision on customer needs and preferences.

Objectives

With regards to helping company leadership with its future business strategy, our team identified the following key objectives:

1. Research the field of Artificial Intelligence and various markets associated with it.
2. Understand the demand for Artificial Intelligence in the military and security markets.
3. Develop a business strategy for the company in the field of Deep Learning and Artificial Intelligence concentrating on the military as a primary customer base.

A major downfall of the existing product line is that ARES software does not support any AI abilities and no intelligent advanced decisions that simulate human behavior are being made. A critical path for ARES is to develop an unsupervised learning system that would be able to quickly provide data that's current and predictive. In order to bring a high-quality product that will separate the company from its rivals, ARES has to identify the key elements that are in demand and invest into the development of the next level software product. An additional issue is that the company does not have available cash flow to address all the questions regarding developing a new product. To address this problem, we will focus on government funded opportunities and present business ideas that would allow for a new business strategy without significant out-of-pocket expenses.

Research Methods

There are many factors to take into account and evaluate when selecting among different research approaches. The most effective research method for our project objectives is secondary research through the Internet with a search of relevant and reliable sources. With extensive analysis of government websites such as DARPA.MIL and FBO.GOV, we were able to understand the existing demand for AI technology and analyze future opportunities. Our team agreed that the best approach to develop a business strategy for ARES is to identify current needs of the federal government. We utilized posted government solicitations as a primary source for identifying the unfulfilled technological demand in the military and other federal agencies. The solicitations were found through various government websites discussed above. After careful consideration, we narrowed down the number of relevant solicitations to twenty. The second step of this process was to review twenty solicitations and pick the final six documents that would go into our project. To identify the six solicitations, we used key factors such as financial threshold, the scope of the solicitation, and mission relevancy to recognize opportunities for ARES. Additionally, we limited our research to solicitations with funding of less than two million dollars due to ARES Corporation being a fairly small company and as such, we did not want to propose a contract where the company would not have the resources available to fulfill

the obligations.

Our team did not get a chance to meet face to face with company representatives due to the main office being located on the east coast; however, we had an opportunity to participate in the web-based demo of the company's current product - AVERT. Moreover, to gain additional understanding of the entity and its current market, we interviewed Susan Alderson, a subject matter expert in the technological field of the military. We did not conduct an online survey or questionnaire since those methods were not useful to our project's main objective. Finally, our team researched the company's closest competitors to provide a comparative analysis and pointed out ARES's potential areas of improvement. In our paper, we also take into consideration ethical complexities and public response as it relates to AI-enabled technology for military purposes.

Summary of Findings

For the purpose of developing a business strategy for ARES, we identified the current needs of the federal government through the posted government solicitations. Based on the extensive research of current demand for AI and physical security within the federal agencies, our team has determined that the following six solicitations hold the greatest business opportunities for ARES:

1. DARPA: Disruptive Capabilities for Future Warfare

Solicitation Number: HR001118S0028

For over fifty years, the Defense Advanced Research Projects Agency (DARPA) has abided by their mission to "make pivotal investments in breakthrough technologies for national security". In fiscal year 2018, DARPA, in conjunction with Tactical Technology Office (TTO), announced that they were accepting proposals for applied research, advance technology development, and platform demonstrations that are directed towards new warfighting constructs.

In an ever-evolving world, militaristic strategies change and therefore the U.S. military must adapt and transition from their current strategy of applying overwhelming force to one of agility and precision. DARPA and TTO are seeking solicitations that will incorporate artificial intelligence that will change the way the DoD deals with conflict and engages threats. The purpose of this technology is to reduce the risk and enhance the safety of men and women in the armed forces by using situational awareness in combat operations. Additionally, this technology will also provide the U.S. Military the upper-hand on foreign soil. DARPA and TTO have not indicated the number of recipients or the amount each recipient can/will be awarded.

2. DARPA: Defense Sciences Office

Solicitation Number: HR001118S0045

DARPA has pioneered groundbreaking research and development in AI for more than five decades. They continue to lead innovation in AI research though large R&D programs aimed to shape the future of AI technology were machines may serve as trusted and collaborative partners in solving important problems to national security. DAPRA is seeking innovative basic or applied research concepts to address the technical domain of Complex Social Systems.

Understanding social behavior and complex social networks is very important for many military operations in regards to counter-terrorism, training, and mission planning. Topics of interest

include capabilities to improve understanding in complex social systems, tools that enable improved human-machine symbiotic decision-making and new concepts in war gaming and conflict simulation. Ares' AVERT Advanced Behaviors allows the use to define complex interactions between agents and events, change guard response and additional rules of engagement for security forces. This technology could further be developed with AI research to help understand complex social systems.

3. National Science Foundation

Solicitation Number: NSF 19-504

The National Science Foundation (NSF), in collaboration with the National Geospatial Intelligence Agency (NGA), has created an Algorithm for Threat Detection (ATD) program. The purpose of the program is to help sponsor and launch projects to develop the next generation of algorithms that can analyze databases that have integrated quantitative models of human dynamics. With the accessibility of data, organizations now have the opportunity to document and recognize patterns with in communities that may be cues of possible threats.

The Algorithm for Threat Detection (ATD) program will be issuing annually 10 to 20 awards totaling 3,000,000 starting in fiscal year 2019. The objective is to develop mathematical and statistical algorithms that can analyze in near real-time large geospatial datasets. The real-time data would be able to identify events and forecast threats. The developed model should equate a degree of confidence level. These models can use mathematical research areas including, but not limited to, point processes, time series, dynamical systems, partial differential equations, and optimal control.

The purpose of Ares AVERT software is to address a wide range of risks that threaten an organization's most critical assets. The ADT program is looking for applicants such as ARES Security who are interested in threat detection. AVERT currently uses accredited algorithms to quantify large amounts of data received from simulations but lacks the ability to quantify that data in real-time. By working in conjunction with the ADT program, ARES could use the established groundwork from AVERT to produce a real-time product which can propel them into a wealth of success

4. Fundamental Research to Counter Weapons of Mass Destruction

Solicitation Number: HDTRA1-14-24-FRCWMD-BAA

The Defense Threat Reduction Agency is currently researching fundamental science for protection, which involves advancing knowledge in physical, biological, and engineering sciences to protect personnel, sensitive electronic systems, and structural infrastructure from the effects of weapons of mass destruction. Protection includes both, passive and active defense against threats. Approaches include hardening of infrastructure and facilities to protect against blast, nuclear events, or other CBRNE effects; protection of personnel, including physical defenses as well as advanced biological and chemical countermeasures or filtering; fundamental research to improve understanding defenses to non-traditional agents and threats; novel and significant active defense against weapons of mass destruction (WMD), including science to support innovative robotics for countering WMD; detecting, identifying and characterizing the origin and spread of CBRNE agents or threats; methods to measure and assess the effects of WMD; new approaches to understand uncertainty and reduce risk; new principles for decontamination of personnel or equipment and facilities, and shielding of systems or networks.

Additionally, the goal of this proposal is to discover revolutionary means to secure components, materials, and weapons, including sciences for more robust nuclear security practices; science to enhance monitoring, compliance, and verification technologies in support of existing, emerging, and new treaties; explore the principles to improve nuclear test detection and analysis; investigate fundamental and novel techniques and emerging science areas that support new approaches to developing a strategy for countering WMD development, deployment, or use.

As discussed above, this solicitation goes along with ARES's primary business objectives to protect the critical assets of the company. Nuclear attack is a real scenario in our day and age. By expanding their software into predictable modeling and simulation of in-theater scenarios for minimizing collateral effects when engaging WMD, the company would be able to utilize its software in order to save critical infrastructure and reduce potential threat to a minimum.

5. The Air Force Life Cycle Management Center TENCAP Program

Solicitation Number: AFLCMC-AFTENCAP-BAA-17-02

Situational awareness is an important idea in the context of both safety and security and is especially relevant where there is a possible risk or threat to the security of assets or the safety of people. The Air Force Life Cycle Management Center is seeking innovative methods of correlating and de-confliction Joint Blue Force Situational Awareness (JBFSA) information using the latest technologies in AI to enhance situational awareness (SA). Persistent SA provides "the means to find fix and finish combat operations against new and elusive does, collateral damage control and security access issues". The purpose of Tactical Exploitation of National Capabilities Program (TENCAP) is to exploit current and future tactical potential of national space systems. TENCAP is looking for innovative ideas that leverage leading-edge technologies, to provide substantial enhancements to Persistent SA. The specific areas of interest include detection, location and identification of targets employing advanced camouflage and deception tactics with latest AI technologies. TENCAP is looking for new ideas on indications and warnings of imminent or potential threats and activities of interest. This solicitation will generally be limited to $1 million per concept or $2 million over 2 years.

ARES' current product CommandBridge provides solution to situational awareness by integrating an intuitive Common Operational Picture (COP). This feature helps gain situational awareness by cutting through data clutter and adding context. CommandBridge simplifies operations by increasing awareness and response capabilities. CommandBridge currently detects any activity identified as important and fires alerts to enable the user to execute the appropriate response. TENCAP is seeking enhancements with AI for detection, characterization and geolocation of the source of attacks against their space assets. With this current technology and investment of AI capacities, ARES can develop CommandBridge to meet the needs of TENCAP.

6. DARPA: Serial Interactions in Imperfect Information Games Applied to Complex Military Decision-Making

Solicitation Number: DARPA-SN-18-80

DARPA Defense Sciences Office (DSO) is issuing a Disruption Opportunity Special Notice inviting submissions of innovative basic or applied research concepts in the technical domain of artificial intelligence and game theory. In particular, DARPA is interested in understanding the

feasibility of applying recent developments in these areas to complex military decision making in changing multi-agent environments with imperfect information. The goal of Serial Interactions in Imperfect Information Games Applied to Complex Military Decision-Making (SI3-CMD) is to demonstrate the feasibility of applying techniques from artificial intelligence, game theory, and decision sciences to complex military decision making. In particular, Phase 1 is intended to produce a detailed feasibility analysis and Phase 2 an initial pilot demonstration on a real or realistic problem that includes most if not all of the characteristics described in the Introduction.

DARPA envisions that current AI and game theoretic techniques will initially be evaluated, augmented, and applied to competition between two agents; however, they are also interested in extensions to situations where more than two agents are interacting. These multi-agent situations may involve homogeneous or heterogeneous agents, may allow agents to observe others' actions even when the observer is not part of an interaction, may present opportunities for alliances and other forms of cooperative behavior, and may admit emergent effects where the intentional or unintentional behaviors of some agents may have unintended effects on the outcomes of other agents.

The main objective of this solicitation aligns perfectly with ARES's business strategy of artificial intelligence and expansion into the military markets. Military conflicts involving multiple parties with distinct motivations and shifting alliances is an example of a situation where company's software could be applied to determine possible outcomes. As such, we believe that taking advantage of this specific solicitation will be extremely beneficial for the entity.

Conclusion

Through our research, we concluded the U.S. government is actively seeking proposals to enhance their physical security. Furthermore, we established the Pentagon is planning to invest $2 billion in AI technologies. AI is not a concept of our future, but rather our present; therefore, the U.S. government is continuously increasing the number of solicitations being posted.

Our group has presented six feasible solicitations which fit the needs of ARES. Based on our research, ARES is highly likely to be awarded the funds to launch their research. ARES already has the competitive advantage as they have already established an accredited algorithm that can simulate and expose threats. If ARES was to succeed and develop an algorithm that could analyze real-time data and be able to identify events and forecast threats, it would revolutionize the AI industry. Given the current market conditions, this is the most opportune time for ARES to take advantage and take a stake in the AI market share. Ultimately, if ARES were to secure a contract through one of the proposals offered above, they would position themselves among the defense contractor giants such as Lockheed Martin, Raytheon, and Northrop Grumman. ARES has the necessary foundation and essentially opportunity to evolve into one of the leading contractors for the U.S. government.

Recommendations

Based on our analysis of the overall security market and the needs of the U.S. government, we strongly believe that ARES Security has the opportunity to take a stronghold of the AI market. After reviewing the details of the various solicitations referenced in our paper, we believe ARES

should primarily focus on the following two solicitations - HR001118S0028 and NSF 19-504. Specifically, both solicitations play to ARES strengths and are in line with their mission and current state.

If ARES was awarded solicitation NSF 19-504, they would have the means to integrate AI into their current algorithm model. Currently, ARES holds the accreditation of AVERT's algorithms, and by integrating AI into their algorithms, they will be able to accomplish something many other companies are racing to solve. Furthermore, solicitation number HR001118S0028 embodies ARES mission to provide solutions against a wide range of risks that jeopardize physical assets, people, revenue, and operations. DARPA and TTO are seeking the agility to protect their main assets, which are soldiers' lives. If ARES was able to augment their current technology with AI, they would change the entire dynamic of current modern warfare. ARES would not only hold the key to becoming the U.S. government's leading contractor, but also hold the honor of knowing that lives are being saved with their technology.

In conclusion, we believe ARES holds the key to unlocking something great, something revolutionary, and above all, save human lives.