GRAD

Ray Roldan

Gary Nguyen

Daniela Lopez

MBA 311: Strategic Design – Professor Mary Anne Brady

Artificial Intelligence (AI): Knightscope And The Rise of Security Robots

Section I Introduction

Knightscope, a security robot company that utilizes artificial intelligence (AI) and machine learning (ML) to operate their business was established in 2013 by William Santana Li, our CEO. Knightscope's long-term mission is to make the United States of America the safest country in the world, changing everything for everyone. We focus on business to business (B2B) by providing our Autonomous Security Robot (ASR) technology on a Machine-as-a-Service business model with subscriptions running annual contracts 24/7 at an effective price of $4 to $11 per hour (Knightscope, n.d.). We currently have 8 patents and 4 different vehicles that can be used indoors or outdoors that our customers can choose from. We presently market autonomous robots which are: K1 stationary machine, K3 indoor machine, K5 outdoor machine, and K7 multi-terrain four-wheel version. Our vision is to be the leader in autonomous security capabilities by being able to predict and prevent crime in the $500 billion security industry.

Knightscope is a start-up company that currently raised $70 million from four major corporations and over 16,000 investors. The Company is in the process of raising $25M in growth capital as it considers a potential public listing. Knightscope has reserved its ticker symbol "KSCP" on NASDAQ (Knightscope, n.d.). We would like to investigate if this company is on the path to increase its brand image and grow their business. Our group is interested in researching Knightscope because we wanted to look into an organization that we have not heard of. We believe that artificial intelligence is the future and we would like to understand how will Knightscope have a competitive advantage in the security robot industry. Also, we wanted to challenge each other by looking into a start-up company, in which none of us have any experience. By investigating this company we would like to learn from our mistakes and celebrate our successes.

Our strategic intent is to investigate Knightscope to determine their competitive advantage that will help their growth in revenue and market share. We will look into both internal and external environments to recommend strategies that will suit Knightscope's current situation. The problem that will be solving concerns the marketing strategy, the operations of the

company, and the culture of the company. We believe that investigating these three areas will allow us to give recommendations that will support the increase in Knightscope's revenue and market share.

Our research plan is to utilize Porter's five forces, access recent performances, and access the external environment. In this paper, we will analyze Knightscope by utilizing Porter's five forces: competitive rivalry, supplier power, buyer power, the threat of new entrants, and threats of substitutions. Then we will look into what elements of the industry are favorable and which forces will pose difficulties in our organization. Next, we will access the recent performance of Knightscope by utilizing the Strategic Integration Model that will identify internally both strengths and weaknesses. Then we will access the external environment by looking at the industry landscape and the competitive landscape. Finally, we will analyze all three sections to come up with three recommendations that will support our strategic intent.

Section II Research

1 Porter's Five Forces

To better understand Knightscope's competitiveness in our business environment, and to identify our strategy's potential profitability, we used Porter's 5 forces as a part of our analysis. Porter's 5 forces analysis works by analyzing the strength of five important forces that affect competition: supplier power, buyer power, competitive rivalry, threat of substitution, and threat of new entry. This tool is useful, because, when we understand the forces in our environment or industry that can affect our profitability, we'll be able to adjust our strategy accordingly (Mindtools.com, n.d). Based on our findings, we will have a better understanding of what elements in the industry are favorable, and what forces pose difficulty for our company.

Competitive Rivalry

Companies that compete with KnightScope in security robots include SMP Robotics, Cobalt Robotics, and Singapore-based OTSAW (Thomas, 2019). These companies compete with KnightScope over product variety, technological features, and price for their Robots-as-a-Service programs. SMP Robotics, OTSAW, Cobalt Robotics currently offer 7, 2 and 1 model(s) respectively, while KnightScope offers 4 models. Each model comes with a unique design and set of features, and it is expected that these companies will introduce more models in the foreseeable future. The companies also mildly compete over subscription price. KnightScope is currently the only firm among others that publicly shows their service price (KnightScope, MaaS subscription price), whereas others require online contact forms for customers to learn more about the service price they offer.

Supplier Power

Knightscope's robots are assembled with components from more than 20 suppliers; the top three among those are "Minarik Automation & Control (a division of Kaman Corporation), Velodyne LiDAR and EandM" (Knightscope, 2020, Form 1-SA). As stated on Knightscope's 2018 annual report, Knightscope does not solely depend on one supplier and can find substitutes for their robot's components

from other suppliers (Knightscope, 2018 Form 1-K). Given that the number of Knightscope's competitors ranges from 20 to 25 and is therefore roughly equal to the number of suppliers (owler.com, 2020), suppliers will not have a great power in setting prices for security robot companies. The size of suppliers in the security robot industry are likely to be moderate. This can be deduced from the size of KnightScope's top suppliers. Kaman Automation employs around 500 employees in North America (Kaman Automation, 2020) while its division Minarik Automation & Control employs 146 employees (Minarik Automation & Control, 2020). Velodyne LiDAR also employs around 500 employees as of 2018 (Brooke, 2018). With the number of suppliers being about the same as the number of competitors and with the moderate size of suppliers, the supplier power is regarded as being moderate.

Buyer Power

The buyer power is high because this is a new industry and Knightscope offers a service at an affordable price. In the article, "Robocop meets Minority Report: an Automation & Security Play", the authors state, "With no current direct competitors, Knightscope's products are designed to supplement the work of security professionals instead of replacing them" (Khetan & Joseph, 2017). Thus, "we provide our Autonomous Security Robot(ASR) technology on a Machine-as-a-Service business model with subscriptions running annual contracts 24/7 at an effective price of $4 to $11 per hour" ("Knightscope", n.d). With this low price point, Knightscope will attract new customers, but still needs to win the buy-in from new customers by promoting how effective the service can be. Since we are in the early stages of our business, there are a few savvy customers, which correlates to a higher buying power. Currently, Knightscope has clients of 10 out of Fortune 1000 Corporation and we are looking to increase our customer base.

Threat of New Entry

As an innovative organization that utilizes artificial intelligence, Knightscope's threat of new entry is low. However, robot acceptance and artificial intelligence in commercial applications is on the rise, as a result, growth projections for 2025 have increased by 34% ("Knightscope", n.d.). Thus, the boom of artificial intelligence will continue to evolve and other start-ups will continue to appear. However, Knightscope has four patents that covers Autonomous Data Machines and Systems, and other related technology that allows for competitive advantage. This patent protects Knightscope from our competitors so they cannot copy our products, but it does not stop other companies from coming up with their own technology. Large capital cost is required with heavy emphasis on R&D, branding, marketing, and intellectual properties to become a new player in this market.

Threat of Substitution

Aside from computerized security systems, businesses can find substitutions on the market, such as surveillance devices or hiring police officers and security guards to patrol their property. Possibly the most affordable option for businesses is the use of surveillance security companies, like ADT Business Solutions. These companies help businesses detect intruders, provide video surveillance, install electronic access controls, and allows small business owners to monitor their business from any smart phone or device. For instance, the average cost for a security system is roughly $2,000 in upfront costs, and $60 every month on average ("Ackerman Home Security," n.d). While small to medium size businesses may opt for more affordable security systems, Knightscope security robots can be highly beneficial to large companies and event venues that would require multiple security officers to patrol at any given time. Malls, airports, corporate campuses, hospitals, stadiums, and casinos can all benefit from security robots.

An off duty armed officer, for example, can cost a company on average of $85 per hour, and an unarmed security guard will cost anywhere from $15 to $35 per hour. Coupled with Knightscope's low robot security costs, it runs 24 hours, 7 days a week. In addition, our robots can generate over 90 terabytes of data, equivalent to 1,000 gigabytes, that no human is capable of processing ("Knightscope," n.d.). While Knightscope's robots do not completely replace all human security guards, they improve human capabilities, making them more efficient from an economic standpoint (Vincent, 2019).

Elements That Are Favorable

Artificial Intelligence (AI) is transforming the security industry and improving its capabilities. Our autonomous robots have the ability to see, feel, hear, and smell. They have thermal imaging, facial recognition, can roam around autonomously, and provide 360-degree day/time night-time video. In addition, they can analyze large amounts of collected data. For instance, Knightscope robots can run 300 license plates a minute and identify if there is a felon tied to a particular license plate. They help the security team do their jobs much more effectively by patrolling areas and sending them alerts so they can make a determination on whether they need to take action. Overall, they can provide actionable intelligence for our first responders to do their jobs that much more effectively, and therefore, increasing human capabilities.

Forces That Pose Challenges

Threat of substitution and threat of new entry pose difficulty for Knightscope. While security robots are able to mimic human behavior on specific tasks, they're not capable of thinking or acting like humans. Therefore, Knightscope robots can't completely replace human security guards, however, we do market our robots to replace all humans. Instead, they supplement the security team. For instance, a 3-person security guard team and a Knightscope robot can cover 296 patrol hours per week, in comparison to a 4-person security guard team which can only cover 168 hours a week ("Knightscope," n.d). Taking this into consideration, we will have difficulty selling our products and services to small businesses. In terms of threats of new entries, acquisitions and mergers by any major corporation can pose a direct threat to Knightscope's competitive environment.

2 Assessing Recent Performance

When analyzing Knightscope's recent performance, we utilized the Strategic Integration Model (Fuchs, et al, 2000), a strategic integration approach that is designed to help better understand how the five components of positioning and capability (direction, product/market focus, resources, operational capabilities, and organization/culture) fit together as part of the overall strategic planning process for Knightscope.

Strengths

One of Knightscope's strengths is having a consistent strategic direction. Since the company was founded in 2013, Knightscope has maintained consistency in direction, core values, and long-term vision of making the United States of America the safest country in the world (Knightscope, n.d.). Thus, Knightscope's stakeholders have a clear understanding of the company's mission and direction. As a company, we not only positioned ourselves as a "leader in the development of autonomous security

capabilities, disrupting the $500 billion security industry" (Knightscope, n.d.), but we have proven our value proposition to our clients.

Another strength of Knightscope ties in with our overall resources, but more specifically, our innovative technology, and access to financial resources. Our patented technology and intellectual property combines self-driving data machines, autonomous monitoring security systems, and artificial intelligence; making our products highly marketable. With machine learning, our technology becomes more valuable over time. In addition, given the company's strong growth prospects and attractive pricing strategy, our company is backed by over 10,000 investors, providing us the financial resources we currently need (Knightscope, 2019). To date, Knightscope has raised over $40 million, valuing the company at $310 million. Overall, Knightscope's positive performance is a result of Knightscope's strong strategic direction, their ability to raise capital, and their innovative patented technology.

Weaknesses

Knightscope's organizational culture, organizational structure and main business operations present major challenges for the company (Fuchs, et al, 2000). Based on reviews from Glassdoor.com, Knightscope's leader approval rating is low (30%). Many reviewers claimed the CEO and CIO showed disinterest in employees' growth and development. Additionally, our company has not successfully fostered a collaborative environment as employees complained about busy work weeks and uneven distribution of workload (Glassdoor, n,d). With Knightscope's flat organizational structure, authority and power are concentrated at the top, with few middle managers between staff and leadership. As we plan to hire more people, a flat organizational structure will potentially hinder effective leadership and employees' trust in management (Glassdoor, n,d).

In addition to that, Knightscope's management has not managed to get the company through a series of setbacks encountered in operations since the beginning of 2020. As of June 2020, KnightScope was not generating sufficient revenue from its core business operations (Knightscope, June 2020, form 1-SA, Condensed statement of Cash Flows). The number of robots deployed at the current prices was not high enough to cover all the costs associated with Marketing, R&D and Production. This was reflected through the negative Net Cash of - $5,378,927 from Operations in their Q2 2020 report (Knightscope, June 2020, form 1-SA). The unprofitability from main business operations prompted the company to ramp up on borrowings via financing and investment activities to generate additional cash flows. As a result, Knightscope brought in a positive net cash flow of $6,998,748 from financing activities by the end of June, a 150% increase from December 2019 (Knightscope, June 2020, form 1-SA, Consolidated statement of Cash Flows).

Furthermore, COVID-19 has negatively affected demand and needs for Knightscope's robots. A portion of our clients affected by COVID-19 restrictions terminated service while numerous others delayed their deployment of Knightscope's robots due to closure of their properties during shelter-in-place orders (Knightscope, June 2020, form 1-SA). As a result, Knightscope's spending on Sales & Marketing activities are the highest during the first half of 2020, with a percentage change of 107% from December 2019 to June 2020. In contrast, the 2017-2018 and 2018-2019 one-year periods all witnessed decreases in Sales & Marketing costs, with 7.35% and 73.03% of negative percentage changes respectively. The main driver behind this dramatic increase were the advertising expenditures on Knightscope's fundraising activities.

3 Assessing the External Environment

"Today's smart security robotics can track people and assets, patrol physical areas, record data, and much more. They have the power to pinpoint problems that may be undetectable to humans — plus, they never sleep" (Huntington, 2020). As technology evolves in this fast-changing environment, we are seeing a rise in artificial intelligence, especially in the security robot industry. As we examine the Kngithscope's external environment, it will allow us to better understand Knightscope's external conditions, and thus, help us identify new competitive advantages to position ourselves to become a market leader. First, we will assess the external environment by analyzing the industry landscape by looking at market trends and other external factors. Next, we will take a deeper dive into the competitive landscape by looking at Porter's Five-Forces which consist of competitive rivalry, buyer power, supplier power, threats of substitutes, and threats of new entrants. However, in this portion of the analysis, we will only investigate the competitive rivalry to analyze their competitive advantages of Knightscope's competition.

Industry Landscape

There is an increasing demand for security solutions in America, primarily due to the rise in criminal activity and terrorist attacks. According to MarketsandMarkets, the public safety and security industry, where Knightscope competes, is expected to grow from $277 billion in 2017 to $533 billion in 2022 (Intro-blue, 2020). As more companies try to figure out how to minimize workplace infections of COVID-19, reduce the negative impact that crime has on their businesses, while also keeping operating costs low, the drive to replace humans with machinery is accelerating (Mordor Intelligence, n.d.). Fortunately, forecasts show that the security robot market is expected to reach $3.59 billion by 2025, at a CAGR (compound annual growth rate) of 7.93% (Mordor Intelligence, n.d.), proving that security robotics solutions are a trend that is expected to strengthen in coming years.

Governments and corporations everywhere are seeking to deploy public safety and security solutions, like security robotics; so, there are many directions Knightscope can take. For instance, commercial enterprises and related businesses, which account for a massive portion of the economy, possess huge budgets to spend on enhancing security. So, security robots in this sector offer an appealing and quantifiable value proposition (Mordor Intelligence, n.d.). Alternatively, the National Police Foundation reported that 86% of police departments across the country are experiencing a shortage of officers (Miller, 2020). Since there is not enough force to perform the task efficiently, the adoption of security robots in this sector can compensate for this shortage (Mordor Intelligence, n.d.). While the future of security robotics looks bright, we will need to determine which sector to focus our efforts to enhance Knightscope's hyper-competition business.

Competitive Landscape

Based on our research, the competitive landscape of Knightscope is increasingly competitive because current market research has identified 15 competitors in this fast and growing security robot market. By utilizing Porter's Five Forces, we focused primarily on competitive rivalry and we identified Knightscope's three top competitors to be Cobalt Robotics, SMP Robotics, and OTSAW Robotics

(Mordor Intelligence, n.d.). We compared and contrasted all three of these companies, including Knightscope, by looking into their financial resources and the features of their robots. Regarding their financial resources, we split their financial resources into two categories: annual revenue and funding. We identified OTSAW Robotics had the highest revenue in 2019 with $20.8 million, then Cobalt Robotics with $8.5 million, next is SMP Robotics, with $3.84 million, and finally, Knightscope at $1.6 million. This indicates that Knightscope is behind in the market share, therefore we need to figure out ways to increase revenue to stay competitive. In terms of funding, only two companies were able to raise capital from investors, which are Cobalt Robotic at $101.5 million, and Knightscope at $70 million (owler.com, 2020). This enables each company to position themselves to grow and invest more money into research and development.

All of these companies were able to create indoor and/or outdoor autonomous security robots and install features that set them apart from each other. Knightscope has both indoor and outdoor robots with advanced features, such as 360 degrees HD video streaming, facial recognition, two-way intercom, autonomous charging, and analytics (Knightscope, 2020). Cobalt Robotics has features similar to Knightscope, except they only develop indoor robots that have the ability for facility management (Cobalt Robotics, 2020). While SMP Robotics focuses only on outdoor robots that can move autonomously without GPS, they have facial recognition, and can automatically charge. The unique features of SMP robotics are that customers can customize their robots into having specific features including long-range acoustic devices, radio frequency identification (RFID), sun-tracking solar power systems, or auto-tracking antenna (SMP Robotics, 2020). Finally, OTSAW robotics has a competitive advantage by having automated robots that can deploy drones, have UV-C LED disinfecting autonomous robots, and create a delivery robot (OTSAW, 2020). Each of these companies is fighting for their market share in this new industry since the industry life cycle falls from the introduction phase to the beginning of the growth phase.

Section III Recommended Strategy

As we are establishing our dominance in security robotics industry, we are currently focusing on increasing our revenue and market share. But with high amount of costs mounting in our operations and the current undesirable organizational workplace culture, we are not well-positioned to achieve these strategic objectives. The problem that we will be solving concerns the marketing strategy, the operations of the company, and the culture of the company.

Marketing Strategy

With the shortage of security robots currently faced by police departments and law enforcement agencies (PERF, 2019), Knightscope can offer free trial programs or a 50% discount for robots to departments experiencing a severe shortage. This will allow law enforcement to test Knightscope robots within their departments and will create an incentive for these police departments to deploy more Knightscope robots in the future. The free-trial and discount program can also increase the number of Knightscope robots deployed in the market and thus bring in more revenue. Implementing these strategies can allow Knightscope to stay competitive in robotic technology and meet market demands more rigorously. As other competitors have captured recent trends in technology, Knightscope can maintain an advantage

in patent registration and acquire new technology to compete with competitors. By aiding law enforcement during the current workforce crisis, Knightscope will uphold its mission of "making the United States of America the safest country in the world" (Knightscope, 2020) and increase the value of its robot brands in the security industry.

Operations of Company

We will also focus on improving their operations and cut costs to become a profitable company by creating a new position, such as VP of Operations and/or VP of Marketing and have that person work closely with the newly appointed Financial Officer on cost-cutting measures. As discussed in the "Gross Loss" section of period-ended June 30, 2020 semiannual report, Knightscope had been preparing initiatives to cut operating costs, with heavy emphasis on keeping "fixed costs as low as possible" (Knightscope, June 2020, Form 1-SA). A potential cost-cutting measure we can carry out is implementing an Activity-based cost (ABC) management system at Knightscope. ABC management system will help our company identify and differentiate between value-added and non-value-added activities in the organization (Drury, 2018). With the expertise of our proposed executive structure, we believe these new executive positions will carry out effective cost-cutting measures and lead the organization to increase its revenue.

Improving Company Culture

Finally, by focusing on the people aspect, such as hiring and maintaining the right people will increase their brand awareness and create a positive culture for Knightscope. Therefore, we recommend the company hire a business coach from the outside to observe and ask for feedback from the team. Having an outside perspective will allow the team to build trust with their top executive and build a better culture that will align it with their long-term vision. This person can help mitigate the CEO's approval rating so it can improve, especially from Glassdoor. The top executive should be open to positive and constructive feedback given from their team. By creating a plan, it will set up the company to operate in a better structure that is suited for a larger company.

Section IV Conclusion

In conclusion, Knightscope is on a path towards improving their operations despite the external challenges facing the company and United States. Since their competitive advantage is being an "innovative leadership", their automated security robots will be the future in the security industry. With the aforementioned strategic recommendations on marketing products, cutting costs and fixing organizational culture, we have set up a success path for Knightscope to get onto in the future.

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