



Riaforce

Drone & Mining Case Studies

Riaforce is an artificial intelligence and data science consulting firm based in the USA.

Riaforce specializes in creating innovative digital products and strategies for their clients.

This document details some of Riaforce's past client work related to computer vision, mining, and drone technology.

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2019

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Client: BLACK AND VEATCH

Product: Corrosion Detection Drones

Problem:

Corrosion damage to large industrial structures and infrastructure has huge monetary impacts. These costs are not only due to corrosion repair processes, but also in the routine inspection of the structures.

Total Corrosion Costs in the United States are Nearly 3% of GDP (276 Billion)

Riaforce Solution:

Riaforce proposed and designed a drone-based sensor package that would equip aerial or UAV (underwater autonomous vehicle) drones with eddy current and ultrasonic testing probes.

This would enable drones to scan joints and bolts on structures and ships for corrosion damage. The results would be sent back to a human operator for analysis.

The result of this proposal is lower cost to corrosion inspections, less time for corrosion sweeps, as well as improvements to worker safety.



Client: GOLDCORP

Product: Rapid Ore Counter (Computer Vision for Mining)

Problem:

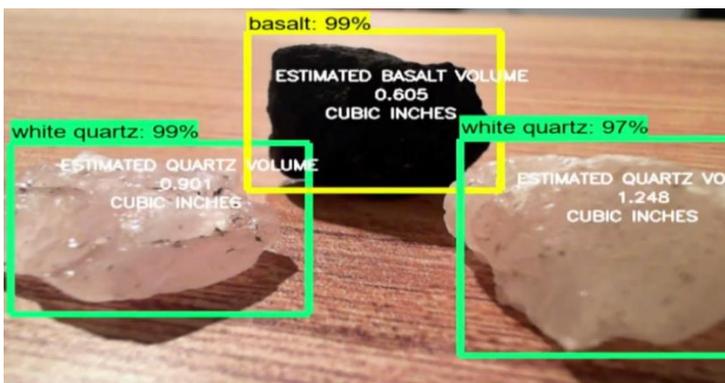
There are currently no real time ore grade assessment computer vision technologies. Gold ore grades are expected to significantly decrease in the coming years due to low junior resource exploration. Technology must be used to rapidly assess the lower grade ores to efficiently plan mining operations.

The decrease in gold prices in 2013 caused a decrease of 39% in 2013 and 29% in 2014 in junior resource exploration.

Riaforce Solution:

Riaforce has developed a computer vision product called Rapid Ore Counter (ROC). ROC allows for the real time estimation of gold bearing ore during the culmination process.

Additionally, ROC allows for the reduction in costs of junior exploration as it can be trained to identify various rocks in real time. This enables junior exploration to be done by an untrained employee rather than a geologist. Furthermore, junior exploration using ROC could even be conducted via drone-based camera platforms.





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AI and Automation Reports

Riaforce is an artificial intelligence and data science consulting firm based in the USA. Riaforce specializes in creating innovative digital products, research reports, and strategies for their clients.

This document contains an abridged version of a research report similar to those that Riaforce creates for clients in the investment and merger and acquisition industries.

Riaforce has no affiliation with any companies included in this report.

To learn more or to have a private research report created for a specific company contact us at: joseph@riaforce.com

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Company: Snap-on (Ticker: SNA)

Industry: Industrials, Manufacturing, and Diagnostics

Cut to the Chase:

Snap-on's traditional manufacturing and tool production segments will face headwinds due to steel price increases, economic downturn, and the cyclical nature of new car and light truck sales. Snap-on's existing integration into repair facilities will benefit from the growing population of aging vehicles. Snap-on's sale of new diagnostic devices will benefit from the increasing number of sensors in new vehicles. Snap-on has an immense structured database of repair and diagnostic data, making it an attractive candidate for machine learning and artificial intelligence products.

Data Value Thesis:

Snap-on has ~1 billion repair and service records.

Snap-on Data Value:

The value of company data is difficult to quantify. Riaforce traditionally uses the MIT Sloan method of data valuation. The following criteria are used and applied to Snap-on:

- **Asset Value of Data:** In our expert opinion the ~1 billion records of Snap-on diagnostic and repair data is very valuable. The reason for this is the fact that Snap-on's diagnostic devices export data in a structured format. This would allow data scientists to more easily extract insights from the data. Enterprise and industrial businesses frequently have difficulty in dealing with highly unstructured data, due to the fact it requires teams of experts who are in high demand in other industries such as technology. Additionally, since Snap-on designs the diagnostic devices in house, they can choose to extract data that is important to their stakeholders.

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- **Value of Data in Use:** Snap-on has made headway in deploying the recorded diagnostic and repair data to improve their business. Snap-on seems to have realized this in the 2018 annual report where growth of traditional tools was negative, but losses were offset by growth in the diagnostic tools and information services product lines. In the report they state: *“We believe growth in sales of diagnostics and repair information products demonstrates the greater need in repair shops for data and insight to address increasing vehicle complexity and constantly changing technologies”*.¹ Additionally, 63% of US auto technicians prefer Snap-on diagnostic devices (next competitor 12% preference)² showing that Snap-on is using their data to already provide value to their existing customers.
 - **Expected Future Value of Data:** Snap-on’s data should be viewed as a potential catalyst of growth, but not as a sure bet. We have analyzed many companies that have extensive datasets, but either fail to implement the data in a meaningful way or fail to gain customers for new data driven products. For instance, GE Digital had a data diagnostic platform for turbines under GE Power, but it lacked adoption due to the fact it could not prove it provided any value to customers. In Snap-on’s situation we believe they have proven they can provide value to their existing customers (automotive technicians and repair centers). There is little information that shows Snap-on can expand into new product lines based on their data and analytic capabilities. Snap-on has shown that they are investigating and pursuing data and information service based products by their company statements and the creation of their Innovation Works facility. However, to accomplish a digital transformation there must be proper staffing and leadership. Riaforce will discuss Snap-on’s likelihood of effective digital execution in the following sections.

¹ [Snap-on 2018 Annual Report]

² [Frost & Sullivan – 2018 United States Automotive Technicians’ Choice: Opportunities in the Automotive Tools Market].

Snap-on Current Data Initiatives:

Snap-on partnered with Predii, an artificial intelligence firm, in 2013 to produce Predii Repair Intelligence. This is a preemptive maintenance and guided repair solution. Predii reports 1 billion total repairs processed using their software, however they most likely are referring to Snap-on's ~1 billion repair record database rather than their own customers. It would appear from researching Snap-on and Predii employees that Snap-on has outsourced their AI development to Predii.

In 2018 Snap-on launched the Apollo D8 diagnostic station which provides technicians with access to the Snap-on data platform called Intelligent Diagnostics which uses previous technician data to suggest repair procedures.

Snap-on Data Leaders:

June Lemerand – Chief Information Officer Snap-on

Riaforce found very limited information about June Lemerand. There are no news articles or professional articles describing June's methodology or goals for Snap-on's digital initiatives. June has zero scientific publications. June's degree is in arts from Oakland University. Riaforce would place low confidence in June's digital transformation leadership abilities.

Ben Brenton – Chief Innovation Officer Snap-on

Riaforce found that Ben Brenton had served in innovation roles at Kraft Foods, Kraft Heinz, and Pepsi Co. News articles regarding Ben's work at Kraft indicate that he led innovation projects focused on reducing childhood obesity. News articles related to Ben's tenure at Snap-on are mostly related to the field innovation of hand tools and safety devices. Ben Brenton has a PhD in food science and nutrition from University of Massachusetts Amherst. Riaforce would place high confidence in Ben Brenton's innovation leadership, but low confidence in Ben Brenton's digital transformation and data related competencies.

Despite Snap-on's statements on digital transformation, the general staff of Snap-on is significantly lacking in data scientists and software engineers. There are no existing job

listings for data scientists or artificial intelligence roles at Snap-on. Both are negative signs when it comes to effectively executing a digital growth initiative.

Final Thoughts:

Bull: Snap-on has an extremely large set of existing structured data. Snap-on's data has proven value to their customer base. Snap-on has stated they are looking to expand their digital and software products. Snap-on has previous partnerships that were able to effectively use their data for artificial intelligence. More sensors in cars will continually increase Snap-on's datasets. Increases in the number of aging cars will increase the need for maintenance and repair services. Snap-on's yield of ~2.5%, D/E of 0.35, and comparatively low P/E of ~12 indicates relatively low risk.

Bear: Snap-on is not staffed to effectively execute a digital transformation plan. Snap-on's senior information leadership team does not appear to have the experience or expertise to execute the stated software and data product expansion goal. Snap-on will face headwinds to their tradition business lines from steel price increases, economic downturn, and the cyclical nature of new car and light truck sales.

About Us:

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