



## PPIM - Machine Learning and Data Science Adoption Slow but Interest Booming

Last week, we attended the [Pipeline Pigging and Integrity Management Conference and Exhibition](#) (“PPIM”), the pipeline industry’s only forum devoted exclusively to maintenance, inspection, and integrity evaluation. We wanted to see the extent to which the industry was embracing machine learning to manage and protect its most valuable assets – pipelines. In this report we detail our findings, but before we dive in below is a brief summary of our last report.

In our report [ESG Investment for the Petroleum and Gas Pipeline Industry](#), we detailed that:

1. Sophic Capital client [OneSoft Solutions](#) (OSS:TSXV, OSSIF:OTC) is an Environmental, Social and Governance (“ESG”) firm making the fossil fuel pipeline industry safer for workers, communities and the environment;
2. U.S. pipeline failures may be occurring, in part, because legacy data analysis techniques depend upon Microsoft Excel, which only typically analyze 5 to 10% of total pipeline data collected;
3. [OneSoft](#) has a machine learning, predictive analytics solution that analyzes 100% of the pipeline data -- faster, more accurately, and at a lower cost;
4. Six Fortune 100/500 companies, including Phillips 66 ([PSX:NYSE](#)) and an unnamed industry Supermajor, have licensed [OneSoft](#)’s solution following extensive validation efforts;
5. [OneSoft](#)’s current clients operate about 7% of the U.S. piggable pipeline market, and [OneSoft](#) has almost half of the addressable U.S. piggable market in its sales funnel;
6. [OneSoft](#) has: several opportunities to capture the remaining addressable U.S. piggable market; a plan to target the non-piggable market (developing new software modules for direct assessment); options to add new revenue generating functionality to its solution; and potential to expand beyond its current target market, and;
7. [OneSoft](#) has a sizable competitive moat, making it difficult for new entrants (of which there currently are none that have developed and commercialized a machine learning and advanced data science platform to aggregate and analyze data across the industry) to catch up and compete.



*A BIG pipeline inspection gauge (“PIG”) used to inspect the inside of pipelines.*

## Digital Transformation in the Pipeline Industry Has Been Slow but is Happening

Although the pipeline industry understands that machine learning can predict failures faster and more accurately at significantly lower costs, adoption has been slow. Pipeline operators are certainly becoming more aware of machine learning. We saw several<sup>1</sup> at OneSoft's booth, engaged in discussions and/or watching a video of OneSoft's machine learning pipeline integrity management solution.

Pipeline inspection gauge ("PIG") tool vendors also recognize that machine learning is the industry's future. We spoke with three large, industry-leading tool vendors (two of whom we also spotted at OneSoft's booth), and all of them told us that they had either had or were in the process of developing machine learning solutions for their own tools. What differentiates OneSoft is that its machine learning solution is tool-agnostic, meaning it can ingest and process data that any PIG collects. This is highly advantageous because OneSoft's platform has by now aggregated tens of thousands of miles of pipeline data from numerous tool vendors and has learnings from more than 50 million features – something that no single PIG vendor could accomplish. We also met some services companies that process PIG data. These firms were becoming aware of machine learning but seemed attached to their own legacy processes, for now.



The benefits of machine learning have yet to reach pipeline workers. We spoke with several professionals who dig up and repair pipelines. In our discussions, industry messaging about improving safety and eliminating all pipeline incidents had certainly reached these front-line workers. However, the industry has not communicated with them the benefits of machine learning and how it can help achieve the zero-failure objective. When we described the technology, these folks quickly grasped machine learning's value proposition.

## Machine Learning Courses and Presentations at PPIM 2020

Machine learning's prominence at PPIM 2020 was highlighted in the forum's educational sessions. A *Practical Application of Machine Learning to Pipeline Integrity* was a two-day course that we attended. This is the first time that we've seen a formal instruction dedicated to machine learning for pipeline integrity management. And for anyone who believes that the pipeline industry is for Luddites, these folks could easily ace all three CFA exams<sup>2</sup> with the amount of linear algebra, calculus, and statistics covered. After spending a morning looking at bell curves, vectors, and integral signs, we couldn't understand why these intelligent engineers have been slow to adopt machine learning. So we asked them:

<sup>1</sup> We do not know if these pipeline operators were customers, prospects, or part of OneSoft's 300,000 pipeline miles of sales funnel.

<sup>2</sup> Machine learning maths included: hypothesis testing, confidence intervals, correlation, 6-types of regression, and Bayes theory.

***“We’ve actually been trying to do machine learning for 12 years to help manage our network. We need it because the environment where we operate is unique in the world and very corrosive to our pipes.”*** I approached this person to ask why they developed their system in-house. He replied that no machine learning solution existed when they first initiated their internal program, so they attempted to build their own. When asked if it met their needs, he replied “no” and said that was why he and two colleagues were taking the PPIM course.



Source: [Pipelines International](#)

***“We need to do some background work to learn more.”*** This engineer said his firm had a small pipeline network that was expensive to maintain. They had too many false digs (he guessed around 30 to 40% but didn’t know for sure), meaning their work crews would dig up a site but couldn’t identify the issue they expected to find. His team understood the concepts about data science and wanted to see how they applied to pipeline integrity management. Oddly enough, this team was also considering developing their own system in-house rather than seek a third-party solution. Why? They don’t want to share their data with tool vendors and get locked into a solution dependent upon a vendor’s PIGs. As mentioned before, **OneSoft’s** machine learning solution is tool-agnostic, and many in the industry (including 6 Fortune 100/500 customer) view **OneSoft** as a neutral third-party.

***“Machine learning is the future for this industry.”*** This person was interested in machine learning for non-piggable pipeline, which comprises about 2.1 million of the USA’s 2.7 million miles of pipeline. Interestingly, this person had tried to contact C3.ai for information about its machine learning platform but said the company was not forthcoming with any information and speculated that perhaps they still had none. He had never heard of **OneSoft Solutions**, so I gave him the booth number. He said he’d have a look. We asked if software development was core to his company. His response: “It will be.”

## Regulatory Environment Will Likely Help Drive Machine Learning Adoption

**[Over 59% of America’s gas transmission pipelines were installed before 1970.](#)** Age isn’t that critical, however, if pipelines are regularly inspected and well maintained. Given that: a) incumbent, Excel-based analysis techniques only examine 5 to 10% of PIG data AND b) PPIM continues to grow year-over-year as the key forum to share information about new pigging tool technologies and integrity management processes, we suspect that pipeline integrity methodologies are still in great need for improvement.

**New PHMSA (the government agency that regulates America’s pipeline industry) rules could expand OneSoft’s U.S. market by 20%.** The rules now include gathering pipelines, (i.e., those pipes that transport crude and natural gas from the wellhead to a transmission mainline or storage facility). Based upon our discussions with industry experts at PPIM 2020, this new rule could increase the total number of regulated U.S. pipelines by 20%. Services companies told us that pipeline companies were preparing for these regulation changes and looking for ways to be more proactive, rather than reactive.

*Through this required program...an operator must evaluate all defects and... develop a schedule that prioritizes the defects for evaluation and repair.*

PHMSA Rule: Pipeline Integrity Management in High Consequence Areas

Source: [PHMSA](#)

**PHMSA's changes will affect the integrity management plans of pipeline operators.** The most significant changes call for: a) increased management of high consequence areas (like freeways and bridges) that would suffer severe consequences in the event of an incident; b) preventative measures to minimize the chance of an incident, and; c) prescriptive data gathering and assessment. Operators will need to collect, store and analyze more high-fidelity data. There are numerous tool vendors, survey firms and services companies that are more than qualified to do this. However, PHMSA plans to mandate new requirements for risk assessment validation and the ability to identify the likelihood of threats and implied consequences across each pipeline segment. This requires integrating and processing big and disparate data sets, exactly what **OneSoft Solutions** excels at.

## Proprietary Machine Learning Solutions Exist, BUT...

... **proprietary machine learning solutions have limited markets.** Pipeline operators tend to avoid single sourcing tool vendors because they want to retain price competitive advantages. Perhaps more important is that they don't want to hand over data or control over their pipeline assets to any third party. Pipeline operators therefore multisource pigging services and do not share their data with alternate PIG vendors.

**This bodes well for OneSoft Solutions because it is not a tool vendor.** OneSoft's ingestion algorithms work with any PIG data set provided from a pipeline operator, with some data sets dating back as far as 30 years. While OneSoft keeps the learnings from all these data sets (which it can then share based on data-anonymous basis with all users of its solution) pipeline operators maintain control over all their data.

**And here is the biggest "BUT": Although the large tool vendors we spoke with are developing proprietary machine learning solutions, they knew about OneSoft.** One representative told us that OneSoft had the "most complete machine learning solution". He was impressed with OneSoft's current client base (he named Phillips 66) and said it was "a pure big data company". When we asked if he knew anyone else competing with OneSoft, he said there were some firms trying to replicate OneSoft's success (he couldn't recall their names) but OneSoft was "miles ahead".

## What It All Means

**Although the pipeline industry is lagging when it comes to adopting machine learning / predictive analytics, the operators understand how this new technology will help achieve the industry's goal of safeguarding the environment, protecting communities, and eliminating worker injuries and deaths.** For years, the industry has been exploring how to improve its integrity management processes but has only recently began to consider machine learning as the catalyst for such change. Based upon the PPIM courses that we attended and informal chats we had with industry professionals, we're confident that machine learning will be the technology that eliminates pipeline incidents not only in the United States but across the world.



## What It All Means to You

**OneSoft Solutions** is a pureplay machine learning firm working to eliminate pipeline failures in the oil and gas industry through better detection of potential threats. **OneSoft** is targeting the U.S. first since it is the largest and most regulated pipeline market. Recent new regulatory rules in the U.S. could spur increased demand for **OneSoft**'s solutions, even though machine learning adoption in the industry is still in its infancy. **OneSoft** has no direct competitors yet, and the tool vendors we spoke with that are developing proprietary machine learning solutions spoke favourably about **OneSoft**. The Company's balance sheet is strong, and management has a large vested interest (about 34% ownership) to make **OneSoft** succeed. **OneSoft** has an impressive customer list, a sales pipeline that is tracking almost half of the current addressable U.S. piggable market, a plan to pursue the non-piggable market, and other catalysts that could drive adoption of **OneSoft**'s solutions. We believe that 2020 could be the year for **OneSoft** to scale rapidly.

**OneSoft Solutions** was the only pureplay machine learning company that we saw at PPIM 2020, thus reinforcing its competitive moat. Although three large tool vendors we spoke with have or are working on their own solutions, they are disadvantaged because pipeline operators don't single source a vendor or share their data. This limits the data they have access to, which severely limits the usefulness of their proprietary machine learning solutions. This also applies to the large pipeline operators whose strategies are to develop their own in-house solutions. **OneSoft Solutions**, on the other hand, has designed its system as a neutral service provider that can ingest and analyze vendor-agnostic data and share learnings with clients without sharing any data, a concept that is highly embraced by most pipeline operators and PHMSA.

**Regulatory, social, and financial pressures are driving the oil and gas pipeline industry to seek new solutions to protect communities, workers, and the environment.** **OneSoft**'s customers have validated the Company's machine learning solution and now use it as their fundamental integrity management technology to better mitigate risks associated with pipeline failures.

**OneSoft** (OSS:TSXV, OSSIF:OTC) nicely dovetails into the Environmental, Social, and Governance ("ESG") investment theme that is globally trending and growing. **OneSoft** has a solid balance sheet to execute its current business plan and grow into the ESG theme by addressing the regulatory, social, and financial issues that the U.S. oil and gas pipeline industry is contending with.

For more information about **OneSoft Solutions** visit [www.OneSoft.ca](http://www.OneSoft.ca).



*EIA forecasts indicate petroleum and natural gas will provide over 50% of America's energies at least until 2050. Renewables will grow through the period but will provide only about 15%. Given this, pipeline infrastructure is crucial. Like Marcel, we should all want to Make Pipelines Great Again.*

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