HMH: A data-driven approach to drilling optimization with Spotfire and Precise Prediction

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The oil and gas industry faces a major hurdle: a vast amount of collected data remains untapped. The consequences are significant, as valuable insights remain hidden, leading to suboptimal productivity levels and missed opportunities for operational efficiency.

HMH, one of the world's largest drilling equipment OEMs and an industry-leading provider of digital solutions for drilling operations, tackles this challenge head-on with its innovative offering, the DRILLPerform™ service. This solution, powered by the visual data science capabilities of Spotfire, aims to bridge the data gap and maximize drilling efficiency around the world.

Eivind Esaiassen, VP of Services at HMH, explains HMH's current market: "We have a large portfolio of drilling equipment and services that are installed and delivered in hundreds of drilling rigs around the world. We utilize Spotfire for several use cases within HMH, but it is particularly instrumental in enabling our DRILLPerform™ solution. This service is dedicated to optimizing the operational performance of drilling rigs, and we achieve this by thoroughly analyzing the hundreds of data points that are generated by equipment on a rig and working with our customers to take the appropriate follow-up actions. We're also evolving into wind, deep sea mining, robotics, and cyber security, leveraging digital tools to become more data-driven than ever."

Challenge

Data utilization can hold the oil and gas industry back due to several factors: complicated IT infrastructure, remote offshore monitoring hurdles, and sheer volumes of data. There are massive amounts of data collected via sensors or manually from remote rigs, with only a fraction of it available for decision-making. Companies can find it difficult to pinpoint improvement areas or predict future maintenance requirements without observing and interpreting the right data at the right time.

The HMH team wanted to overcome these common challenges in the industry by using an advanced analytics and visualization tool that could create predictive models and insightful visualizations that would enable them to maximize the uptime of its drilling equipment and predict future maintenance for its machinery, leading to lowered operational costs and better asset utilization.

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Precise Prediction

Solution

HMH's DRILLPerform™ service, leveraging the power of Spotfire, revolutionizes drilling operations by transforming underutilized data into a source of continuous improvement. This data-driven approach empowers HMH and its customers to optimize drilling equipment and smart module usage, benchmark crew performance, enhance collaboration, and achieve new levels of drilling efficiency, safety, and profitability.

While other solutions were initially considered to further develop this service, HMH ultimately chose Spotfire to support the development of its DRILLPerform™ offering, due to its superior capabilities in handling high data volumes, customization requirements, server scalability, governance features, and integration with Python for data modeling and transformations. Working alongside Spotfire partner Precise Prediction, the company onboarded quickly, receiving customized training for their specific industry and regional needs. As a key partner in Norway, Precise Prediction offered the right levels of service that matched HMH's unique use cases.

Rikard Bohm, CTO and Senior Spotfire Lead at Precise Prediction, adds, "It has been a great experience working with a professional team at HMH over the past years, seeing how the solution has evolved to become a very powerful tool using all available data to optimize performance for their drilling equipment. The experience gained from this project could also be deployed in other industries using advanced technical equipment.

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DRILLPerform™: Unlocking insights with Spotfire

With Spotfire at its core, HMH's DRILLPerform™ service uses data from various sources, including rig loggers, equipment sensors, and HMH's proprietary smart modules, to create dashboards and reports that easily communicate key information across organizations in a way that's relevant for HMH and its customers. The advanced algorithms and visualization capabilities from Spotfire that are leveraged within these reports enable HMH to:

- **Identify performance bottlenecks:** Reports pinpoint abnormalities in its customers' rig operations, allowing for timely interventions that optimize performance.
- **Provide real-time operational visibility:** Interactive visualizations and reports offer a clear and comprehensive view of ongoing operations, empowering data-driven decision-making.
- **Ensure optimal utilization of smart modules:** By tracking module usage patterns, HMH can identify any underutilization and provide targeted support to ensure customers maximize their investment.
- **Drive continuous improvement:** Data insights inform the implementation as well as the development and optimization of smart module software, ensuring it meets evolving customer needs and remains at the forefront of drilling technology.
- **Benchmark rig crew performance:** Crew data analyses enable the HMH team to establish performance benchmarks, identify best practices, and highlight areas for improvement.
- **Facilitate targeted coaching:** By comparing crew performance against benchmarks, HMH can provide tailored coaching and training programs, leading to enhanced efficiency and safety.

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—Tommy Gordon Haaheim, HMH

The reports gathered within the DRILLPerform™ web portal are jointly reviewed daily by HMH's analysts with more than 60 external customers globally. With data-driven insights being made available faster and regularly, customers subscribing to the DRILLPerform™ service can better utilize their resources, enabling them to increase the productivity of their rigs, optimizing operational processes, reducing costs, and enhancing safety.

In addition to lowering costs while increasing productivity at a rig level, the DRILLPerform™ service allows subscribers to enhance safety and performance across multiple sites by leveraging rig-specific insights widely across their fleet of rigs.

HMH is a premier drilling solutions provider, which was formed as an independent company in October 2021 through the merger of Baker Hughes' (NYSE: BKR) Subsea Drilling Systems business and Akastor ASA's wholly owned subsidiary, MHWirth AS.

HMH combines integrated delivery capabilities, capital, and renowned industry expertise and delivers the full range of offshore drilling equipment products and packages at scale. HMH aims to support the industry's transition toward more energy-efficient solutions, as well as deploy technologies and service solutions to make the sector more competitive through increased drilling efficiency.

Moreover, the company's service and technology portfolio will be utilized as a springboard for future growth, both within drilling services and when pursuing opportunities in adjacentindustries such as renewables and mining.

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Benefits

Customer satisfaction has increased with a more collaborative approach to data. With access to the DRILLPerform™'s portal, HMH customers can access performance and insights. Complex data is transformed into easy-to-understand visualizations, enabling a wider audience to grasp the impact of optimization efforts. This collaborative approach, coupled with transparent data sharing, builds trust and ensures alignment between HMH and its customers, driving continuous improvement in drilling operations.

Crew performance benchmarking as delivered within the DRILLPerform™ services is a key contribution to an overall safer work environment, notes Tommy Gordon Haaheim, Front End Developer and Lead at HMH. "To get insights on how customers are operating, we monitor and break down operational data by crew. We can determine what kind of crew is performing optimally. So if crew A is performing better than B and C, we can investigate those potential reasons for future training possibilities. We use a data function to benchmark the activities within the portal on demand." Additionally, rig crews can directly report abnormalities to the global operation support center, ensuring swift issue resolution.

The DRILLPerform™ service has also been instrumental in ensuring the successful deployment of new drilling automation technologies on rigs around the globe. "Our smart modules can display how much customers use our technologies to automate their drilling operations. Our analyst team follows up daily on usage, such as how customers can use the technology better to improve operations," explains Haaheim. He also notes, "With regards to pattern recognition, we have set up an event system that processes current occurrences on the rigs. Our event log goes into great detail about what is happening within each rig activity. We're working with Precise Prediction on implementing a Spotfire Mod, the network chart, that can be customized with the event timestamp with elevated insights".

Looking ahead, HMH is committed to continually pushing the boundaries of what is possible in drilling performance optimization. As Eivind Esaiassen affirms, "We look forward to continuing our work with Spotfire to further develop the DRILLPerform™ Service. By expanding the scope of support we offer, we can empower our customers in their ambition to leverage data-driven analyses as a key enabler for optimizing drilling performance." Together, HMH and Spotfire are dedicated to delivering innovative solutions that drive measurable value for the industry and support our customers in achieving their operational goals.

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