In the Oil Field Services world, there is an undeniable culture that places precedence on getting the work done. The high-tech tools deployed in the field represent this focus and have evolved over time and experience to help ensure the work gets done better, safer and faster. In stark contrast to the use of pioneering technologies which help quickly, safely and more effectively establish the well and extract the product, the tools used to manage field resource qualifications, assign equipment and track work, as well as seamlessly update backend human resource and billing systems are generations behind the current technologies. These backend systems have been, at best, an afterthought, often relying on ‘gut’ instinct, hard work and the absolute need to just get it done with the tools at hand. These ‘tools’ are often standalone systems taking the form of white boards, elaborate excel worksheets, or intricately developed legacy applications that become an unsustainable code stream.

The purpose of this white paper is to address some of the pains and lost opportunities resulting from maintaining a legacy approach to field resource management. More specifically, we will look at how the introduction of mobile field resource management technologies to an oil and gas field services operation can reduce administrative workloads while improving visibility, quality and efficiency. In short, how using the right tool for the job can improve operational awareness, enhance field resource effectiveness and streamline the entire process of taking in, assigning and closing out work.

Key benefits of adopting these new tools include:

- Increased operational awareness (visibility of what is planned, is happening and has gone on in the field)
- Improve use of available resources (increased revenue per resource)
- Ensure the right resources are used in the right place at the right time (improved commitment compliance)
- Align use of resources to business priorities (improve operational impact)
- Increase accuracy and confidence in data collected from the field (improved logistics & reduced bill contention)
- Provide a holistic approach to the process of taking in work, assigning work, completing work, and getting paid for the work (streamlined Order/Quote-to-Cash process and reduced Days Sales Outstanding (DSO))
Inevitable need to improve field resource management

The oil industry is highly complex. The upstream arena of Energy and Petroleum has more service providers than any other part of the industry. Competitiveness is not just a matter of pride, but a necessity to ensure your reputation is maintained and improved in an industry where you may be considered only as good as your last job.

If permits aren’t in place, a well can’t be spudded, if the rig isn’t booked in advance, the resultant delay puts a dent in standby cost margins and potential profitability. Once drilling is under way, if the personnel, equipment and materials are not available or aren’t in the right place at the right time, the day rates add up and the headaches begin. As industry regulations increase, the problem gets even more complex as a need for greater awareness and precision to ensure compliance with resource qualifications, certifications and exposure time forces a more thorough assessment of the scheduling problem while not giving up on responsiveness.

No organization can afford hold ups to drilling or production resulting from its failure to schedule equipment or resources on time. It is bad for the client, bad for your reputation - and inevitably bad for the bottom line.

One of the most effective ways to improve operational performance is through improved awareness and access to available and fully capable field resource. Knowing what you have available and when you can provide it is essential to effectively leveraging your resources to produce work at the lowest operational costs. Balancing the use of available resources to ensure adherence to the defined business policies helps keep the business aligned to its goals and provides consistent, predictable access to services.

Mobile field resource management systems are focused on these problems, inherently delivering absolute, dynamic visibility of all field resources along with their specific qualifications, availability and capabilities including connectivity to field resources to support quick access as well as current location and disposition (human and equipment resources). The increased visibility of and accessibility to fully equipped, available field resources(considering all the details of each individual resource) ups the level of precision available to operations while reducing the effort and time required to align the right resources to the job. Thus placing a valuable tool in the hands of oilfield services organizations to easily consider the atomic level requirements of the job against the atomic level details of all field resources, to quickly assign work consistent to the business rules, objectives, and cost/revenue considerations.

To recap, the combined pressures outlined above, namely:

- A competitive atmosphere to ensure properly skilled and equipped resources deliver timely service
- The inevitability of increased regulations that will enforce more precise evaluation and collection of data as part of the job
- The ever present need to make the best use of available resources to minimize costs and maximize revenues

Contribute to the need for an upgrade to the inadequate tools currently used for others that improve mobile field resource management.

So, with some of the challenges outlined, let’s take a closer look at three key ways in which mobile field resource management solutions can lead to quantifiable business benefits:

1. Take a consolidated approach to Field Services

A consolidated approach to managing field services can ensure consistency, streamline processes across the organization and give a complete, 360 degree view of workforce activity. By deploying this streamlined approach, the Quote/Order-to-Cash process is
streamlined providing significant reductions in Lapsed Days/DSO among other benefits.

An end-to-end solution allows for seamless interaction between the various operational systems (for example Work Order, Service Order, Billing & Human Capital Management systems) and delivers this information to a single system that can consolidate the details and ease production of the resource schedule, while also being able to accommodate variability across many very different operational units.

This schedule, along with relevant details such as location information, then needs delivering to the field, addressing the varied needs of user and of work types on a wide range of mobile devices. These mobile devices must, in turn, be able to collect details (on or offline) and propagate them back to base.

This capability, provides organizations with a paradigm shift in ability to get a complete view of workforce activity across the entire enterprise, and critically, this allows the business to collect the necessary level of detail electronically as the work is being done and deliver it back to the host system to trigger the billing cycle upon job closeout.

This means service organizations can support a process of ‘Bill-ready at the job site’ and thus streamline the process of getting a bill in the hands of the customer many days sooner, benefiting an organization millions of dollars.

2. Streamline your Business Processes

The challenge of manually scheduling resources is getting the right individuals, crews and equipment to the right place at the right time requires tremendous coordination and is fraught with potential misses. Get it slightly wrong and costs can soar, either with untapped manpower sitting around or, worse, production falling because of the lack of appropriate available manpower and equipment.

As previously discussed, the tools commonly in use today (white boards, excel spreadsheets, paper workpackets, and disconnected custom developed applications) are by nature inefficient and void of the level of detail and speed necessary to make accurate and consistent decisions.

In contrast, the tools available today enable seamless connection with backoffice systems to ensure information is up to date and as importantly, accessible. Thus - supporting proper and rapid decision making, with consideration of all available data and awareness of the desired business policies, While at the same time delivering work to the field and accommodating the complexities of many varied users, covering a range of shifts and ensuring proper adherence to the defined field policies relevant to the work at hand. Data collected in the field (offline or not) must be accurately and quickly delivered back to other users and systems to ensure they can continue to get their jobs done.

Equally, the system must be easy to use. Operators should not be expected to take weeks or even months to be effective, so the tool must be intuitive and properly address the particulars of the business problem, while supporting varied uses, so ensuring one centralized toolset will address the entire range of operational and user needs.

Tremendous effort is expended throughout the industry using the tools that simply do not support a streamlined approach to field resource management. To reduce the administrative hops, hasten the dissemination of critical business data (e.g. materials needs, job completion, on hold issues), while ensuring consistent compliance with operational policies a different toolset is required.

3. Improve Operational Awareness

It is widely accepted that business runs in cycles. Depending on the price of oil and gas, field service providers can go from being very busy to quickly grinding to a halt. With this in mind, understanding the current state of your operation, what has transpired in the past, as well as what is on the plate for the future is essential to effective, efficient management of field service operations. An equally critical contributor is access and visibility of available and capable resources (personnel, equipment and crews) to quickly and firmly commit to customer needs while ensuring minimal operational costs.

To obtain reliable information on what is happening now and disseminate it through the operation, field resources must be connected. Providing details on the current stage, what resources are involved and easily updating the current status of the job from the field, provides sight back to logistics and management to ensure smoother operations as well as better decision making (e.g. commitments to upcoming customers). Tools in use today don’t support ease of distribution or collection of field resource and job data. What equipment was or is on a job at any given time, which personnel showed up for their shift and when, as well as what their particular contribution to a job was all contribute to reduced billing contention. Likewise, the visibility and accessibility to shift idle resources across the business help make the
most effective use of available personnel, tools and equipment.

Today, these and other key data elements are all too often lost, opening the door for billing disputes and lost revenue.

When an owner/operator wants to know what is going on at the job site (who and what is present), records established from the currently used tools are often out of date and/or unreliable. Mobility tools to enable the field personnel to quickly and easily identify what needs to be done and distribute what is happening while in difficult environments, are fundamental to improving operational awareness.

Being able to establish a future schedule of jobs that can readily adapt to reflect the reality of changing circumstances is fundamental to achieving a complete understanding of the operation. Today, many field service operations avoid establishing a future schedule, knowing that by their nature, many services are interdependent on others and so very reactive. For example, commencement of Cementing operations are dependent on when the driller will get to total depth, resulting in minimal notice to prepare, spot bins and set up.

This is where automated field resource management comes into its own, supporting dynamic adjustments to the entire schedule as real-time updates occur. Likewise, decision support tools aid the user in identifying fully equipped and available resources to meet the job needs while also getting notifications of when a job or process is not being fully addressed. This level of automation and ease of adjusting the existing and future schedule, helps provide insight into capacity as well as understanding what particular resource deficiencies need to be addressed, to accommodate changing service demands.

Similarly, collection of the historic schedule, down to the individual resource, job, and customer specific details (while working through each job), ensures visibility of past activities to support greater awareness of business trends. With field resource management facilities, each individual activity is captured, along with insights of planned and actual details. As the business uses these tools, a wealth of data is captured and exposes the trends by allowing managers to configure their own reports if and when desired. These tools help operations target key shortcomings, as well as providing visibility of customer and industry/territory specific trends. This ability to look back at historical data, to support a more educated look forward results in greater operational awareness and fact based decision making.

Operational awareness is critical to ensuring that resources are utilized as effectively and productively as possible, while the capability to adjust to trends and adapt to capture the services that are in demand enables operations to run lean, while still meeting the needs of the business. Centralizing the schedule provides a clearing house for all resource data, which when viewed alongside customer requirements, helps operations visualize what needs to change to support the demands on the business, examples being; ‘do I need to train more personnel?’ or ‘is a lack of horsepower keeping us from taking on more work?’.

To attain true operational awareness, the business must have the necessary tools to see what is happening now, in the past, as well as in the future.

The challenges of coordinating demand forecasting, workforce planning, shift rostering, job scheduling, and mobility solutions can easily be met using an integrated business process.

**Decision Support Tools**

Combining all the essential activities and resources into one schedule is the most complicated element of creating an optimal schedule. What is the driving force of the task? Is it that a particular piece of equipment needed to do a particular job? Where is that equipment now, and when will it be free to be used elsewhere? Who is qualified to run that equipment, and what is their availability? Is there a “Plan B” in place in case any of the normal solutions don’t work, or aren’t available?

Transitioning from one job to the next or from one resource/crew to another is a facet that must be factored into planning the schedule. Transition periods can be costly, but if managed correctly, these costs in time and
money can be mitigated or eliminated altogether. An automated schedule will find the optimal job sequencing and transitions in order to keep costs to a minimum.

**Connecting the Field**

In order to get the jobs done, the workforce has to be mobile. A mobile solution creates a fluid work environment that is better able to react to clients’ needs without disrupting the workflow of other functions. A well-run schedule will be defined at headquarters and dispatched in real time to the field crews.

Cell phones and work packages are useful, but these rarely provide the greater visibility and access needed when dealing with a mobile workforce. As a result of this, many companies are shifting to tablet or hand-held devices that provide data access capabilities in real time.

Field crews can easily upload needed information into their mobile devices and digitally report back to the home office. This keeps the work schedule current and provides critical information on job progress, material needs, and potential impacts to other work. The accuracy of the information captured can be more easily verified and integrated, which shortens the time and energy necessary to produce and deliver a bill for service.

**Resource and Job Planning**

Once jobs are prioritized, assigning the appropriate number staff to each job can also be quite challenging. If staffing is inadequate, tasks get completed late. Conversely, if staffing is over capacity, idle time wreaks havoc on budgets, profitability, employee morale and even the company’s reputation in the industry.

The decision to send a new employee on a job instead of a more experienced, but also more expensive, engineer can also be a balancing act. Unexpected events can upset the best-laid plans.

A key facet of good staff scheduling is factoring in many variables at once and coming up with a methodology that not only makes sense for the bottom line but keeps employees satisfied and engaged in their work.

A successfully run enterprise capitalizes on the strengths of its workforce and takes advantage of all its resources’ specific capabilities and individual abilities to react quickly when needed. These factors all influence response time and effectiveness in any environment. Resources can be personnel, teams, equipment, or a combination of these. It is imperative to monitor and access these resources at all times, so when priorities change or a problem arises, the company has the ability to intervene in the schedule to find and allocate the best resources in the most effective, efficient manner.

Probably the most useful benefit of an automated schedule is that it provides the means to prepare for the unexpected. What if equipment breaks down? What if materials arrive damaged? What if the engineers finish their work early – can they swiftly and seamlessly be put to use elsewhere? By gaining visibility of the overall schedule, contingency plans can be initiated to meet unanticipated occurrences.

**Shift Rostering**

Shift rostering finds the optimal symmetry between conflicting organizational goals. Employee preferences can be held in a database that enables the scheduling system to balance employee needs and wants with corporate objectives, workload, working rules, and regulations. Traditionally one of the most sensitive and potentially painful aspects of personnel management has been the management of “rule relaxation.” With an automated schedule in place, management can clearly see the benefits and/or consequences of juggling employee requests, such as leaves and absences, with management objectives. Additionally, this powerful scheduling tool can be used to track task completions, duties, and activities during a shift or any given time frame, giving management a clear picture of its over- and under-achievers and enabling them to balance crews based on performance indicators.

**Analytics**

Schedule integration and real-time updating is the most effective way to get the big picture. It also is the most efficient way to provide the documentation that will allow back office support staff to produce invoices. A great additional benefit of good workflow scheduling is the ability to get paid sooner with less room for errors or disputes. Dynamic access to what is happening, when, and where improves efficiency not only at the job site but in the home office as well.

An added benefit of scheduling is the historic picture created when monitoring a schedule over time. Taking a critical look at past project trends, cyclical workloads, materials issues that may be a factor of predictable supply/demand problems, and employee allocation can give indications of where processes can be streamlined and methodology can be improved.
Demand Forecasting
Predicting future demand is possibly the most challenging, yet important aspect of any schedule optimization effort. Historical analyses can provide a basis for predictive modeling, but it takes all the tools in the scheduling arsenal to effectively deliver a picture of future needs. If the work schedule is integrated with other key components of business operations such as cost accounting, purchasing and materials, design and engineering processes, human resources, and reporting, then a complete picture can be built of expected demand level requirements.

Conclusion
The clearest benefits of implementing modern mobile field resource management solutions in the oil and gas sector are that they can significantly increase productivity of the resources available (people, equipment and crews) to meet commitments and increase profitability for each job and likelihood for future engagements.

It does this by ensuring the work gets done on time, every time at minimum cost. As the schedule progresses, management can monitor cost predictions and make adjustments where needed. Commitments aren’t made that cannot be kept and all parties know what to expect and when.

A further benefit is that it streamlines communication within the organization. A picture is created that shows where the company has been and where it is going. It also shows gaps in workload, and areas where resources may be stressed or compromised. If goals are not achieved, the automated schedule can help management see where changes can be realistically made to better handle situations in the future.

It also means that invoicing for the work can be managed more quickly, accurately and without disputes, easing cash flow and decreasing the losses incurred on unbilled work.
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