Planning & scheduling for utilities: a modern approach

IFS Technology Spotlight

30-50%
Scheduled work that contains unresolved planning flaws

10-15%
Jobs in the field not started due to planning oversights

25%
Time engineers have to focus on engineering due to planning distractions

Utilities are responsible for a long list of deliverables and outcomes. From the maintenance of massive transformers and power lines down to the fuel consumption and carbon emissions of field service vehicles...and everything in between.

Layer on customer service calls, weather events, and worker safety, and it's easy to see why planning and scheduling are critical components to the operation's overall success.

While the utility maintains ongoing oversight, so do the regulators, keeping watch and ensuring service and maintenance happen promptly. Staying on top of all these moving pieces means the utility must plan, prioritize work, schedule activities, and align the right workers, skillsets, and equipment with each job.

This Technology Spotlight focuses on the existing deficiencies in how some utilities plan and schedule–and the ultimate cost the business must pay. We will examine how a modern approach to these critical capabilities not only offsets the shortfalls but also introduces greater efficiencies to protect–and even grow–the bottom line.

Planning & scheduling today

Over the past decade, we have seen some remarkable advances within the industry. For example, distributed energy generation, microgrids, augmented reality, geographical information systems, and even automated worker health checks. Yet many organizations remain rooted in the past, relying on manual spreadsheets, paper maps, and Gantt charts to carry the utility forward.

This lack of efficiency comes at a cost, and usually at the expense of work taking place in the field. In fact, most field crews expect that between 30-50% of their scheduled work will contain flaws that require resolution before the work can begin. An additional 10-15%[1] of jobs in the field are expected to stall due to oversights in the initial planning.

Engineers and designers are also impacted, often pulled from their work to help solve these problems and ensure the job is executed correctly. Some engineers estimate they spend as little as 25%[1] of their time doing engineering work due to these distractions.

[1] Western Energy Institute: **Planning, Scheduling & Execution**

The challenges of planning & scheduling

When the tools at hand are limited to spreadsheets, maps, and charts, it's no surprise that the result is also limited. For many utilities, planning and scheduling is a one-dimensional, linear activity that applies a timeline to the desired outcome based on available workers, equipment, and other components. Unfortunately, it's not that simple.

The limitations of this model are twofold. First, success is defined as completing the work on time and within budget. But what if a different resource line-up or timeline could achieve a better result? Due to a lack of technology, resources, and time, most planners cannot explore options that may achieve the same (or an even better) outcome more efficiently.

Secondly, when a plan is considered final, it becomes relatively static. If disruptions arise, the project stalls until the designers and engineers can devise a workaround. As we face climate change, global pandemics, disrupted supply chains, and other modern-day challenges, these disruptions will only increase.

Unable to predict, forecast, and optimize in real-time, the result is a reactive (and chaotic) environment. Work schedules do not align, assets fail, and–in many instances, established SLAs are missed. In worst-case scenarios, the business is unable to meet regulatory requirements for utility-owned assets and worker safety.

A modern approach

The best plans are built based on a broad view of the overall operation, extending beyond timelines and resources to consider business value and outcomes. By integrating business strategy into how we plan and schedule, we can ensure every result supports the objectives of the business.

Planning and scheduling optimization (PSO) technology provides active interconnectivity

between planning, scheduling, and execution. This bi-directional flow of information ensures the plan continually optimizes in real-time based on events happening in the field and elsewhere.

PSO technology involves four essential steps:

Step 1: weigh the options

What-if scenario exploration is critical for a range of operational requirements:

- Workload and capacity fluctuations
- Capital projects
- Critical events
- Asset inspection and maintenance
- Medium- and long-term planning

The plans and schedules for these scenarios are tested against various outcomes to help determine the best way to carry out the work.

Data is collected from different systems across the operation, e.g., SLAs, hourly staffing rates, OT rates, potential regulatory penalties, asset service schedules, and other details. These data points are integrated into the PSO system to help inform a range of possible outcomes.

For instance, a utility that encountered a single wildfire the previous year anticipates an increase in frequency due to climate change. Using PSO technology, the utility examines several scenarios with varying incidents to determine the resources, equipment, and material needed. Each recommendation stipulates the necessary personnel, including location, availability, skills, proficiency, certifications, and other considerations. Once the utility selects a recommendation, the plan is loaded into production.

Scenarios are tested by asking a range of questions. If overtime is authorized for a project to support an earlier completion date, are the increased labor costs offset by other efficiencies? Are there enough resources to cut the timeline in half? How would this affect other work?

By examining all potential outcomes, the utility knows with certainty how each scenario affects the overall operation and the bottom line.

Step 2: quantify the return

One of the most important advances PSO technology provides is value-based analysis. This capability transcends the simplistic question of whether or not a project will complete on time and within budget. Instead, it is a highly granular exploration of associated costs applied to various scenarios utilities must consider when building a work plan.

For example, due to unexpected delays in the field, a utility is at risk of missing an SLA deadline for which it will be penalized.

The PSO technology quickly determines if other work should be deprioritized to meet the SLA or if the reassignment of workers will result in an even greater cost to the utility. Trickle-down effects, such as additional truck rolls, worker overtime, and other factors, are considered in the overall value-based analysis.

This built-in business case capability assigns a real-time value to every decision the planner makes.

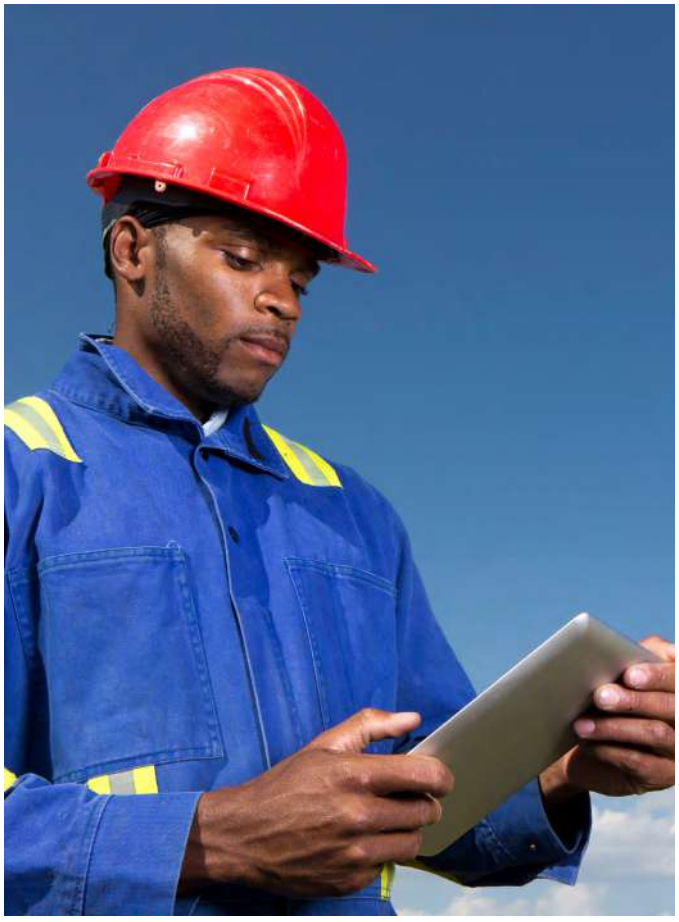
Step 3: continuous optimization

PSO technology continually refines a plan and its associated schedules. Machine learning and artificial intelligence apply proficiency algorithms that quickly examine and identify the most efficient path forward.

For example, an urgent repair is required in the field. The system recommends the best worker for the job, considering travel time, whether the necessary equipment is on hand, the overall efficiency of the worker for the specific repair, and even whether or not there are other jobs in the area to which the worker can be assigned to optimize efficiencies.

Unlike traditional planning solutions that typically provide a 2-week optimization window, PSO technology supports scheduling timeline horizons that can extend out across months to a full year. Additionally, the window of time when a plan or schedule is considered committed, and where it is no longer being continuously optimized, is also flexible and can be as short as two hours.

With PSO, optimization is always on. The technology analyzes and constantly moves pieces around to identify the optimal sequence of events, recommending the most efficient path forward.



Step 4: integrated workforce efficiencies

The final stage of any plan is the execution when the scheduling and other details are enabled and pushed out to dispatchers and workers in the field. This is where the efficacy of the plan is truly tested.

PSO technology integrates seamlessly with mobile workforce management (MWM) solutions, extending the functionality and efficiencies of the PSO system through to the work that is happening in the field.

The interconnectivity between all of the PSO steps–the bi-directional flow of information, plays a vital role in coordinating field activities where unanticipated anomalies are most likely to occur.

Dispatch must deal with these exceptions, relying on the PSO and MWM systems to respond in real-time to worker absences, injuries, crew changes, equipment issues, and other scenarios that can disrupt the schedule.

Using tools within MWM, dispatchers can evaluate schedule results and adjust or lock orders in place, allowing for unique scheduling constraints or requirements that PSO must respect. This granular control delivers a balance between automation, visibility, and control.

With the optimization engine running continually in the background, same-day changes are quickly examined and recommendations made, ensuring the work is carried out as efficiently as possible.

Summary

IFS works with utilities around the world to help optimize workforces and uncover meaningful moments of service. Combining PSO and MWM technologies from IFS allows organizations to understand how longer-term decisions trickle down to the day-to-day operations. With these insights, the utility is in control, quickly responding to demands in the field, reducing overall costs, and increasing efficiencies.

Visit our website or contact us to learn more.

About IFS

IFS develops and delivers cloud enterprise software for companies around the world who manufacture and distribute goods, build and maintain assets, and manage service-focused operations. Within our single platform, our industry specific products are innately connected to a single data model and use embedded digital innovation so that our customers can be their best when it really matters to their customers – at the Moment of Service.

The industry expertise of our people and of our growing ecosystem, together with a commitment to deliver value at every single step, has made IFS a recognized leader and the most recommended supplier in our sector. Our team of 4,500 employees every day live our values of agility, trustworthiness and collaboration in how we support our 10,000+ customers.

Learn more about how our enterprise software solutions can help your business today at ifs.com.

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