Arthur D Little

Viewpoint

Transforming a utility company's front line

A framework to optimize field force utilization and productivity

Previously stable and involatile utilities are entering a fast-transforming environment that requires rapid, decisive, and strategic actions. Utilities currently face higher cost and margin pressures stemming from scale and age of the network as well as regulatory mandates and competition. To address these increasing pressures, we recommend utility companies to look within – specifically to their field force where improvements can yield significant cost savings while being conscious of maintaining service quality. In this Viewpoint, we present a digitization-enabled field force management framework that decision makers can apply to their organizations to realize their field force's full potential (in terms of improved productivity and utilization) and unlock cost savings.

The case for field force management

Utilities around the world are entering into a fast-transforming environment, forcing them to reconsider their "business as usual" practices when addressing exigent external and internal challenges. Externally, a utility's business is pressurized by an ever increasing number of new players disrupting the sector through convergence and adoption of new technologies; by regulation and policy pushing for higher operational and financial efficiencies; and by an increased complexity in running operations induced by rapid urbanization and decarbonization. Moreover, utilities face an increasingly aging infrastructure that requires not only high CAPEX but also more expensive and frequent inspections and maintenance. All these factors translate into increasing cost pressures that threaten utilities' bottom lines.

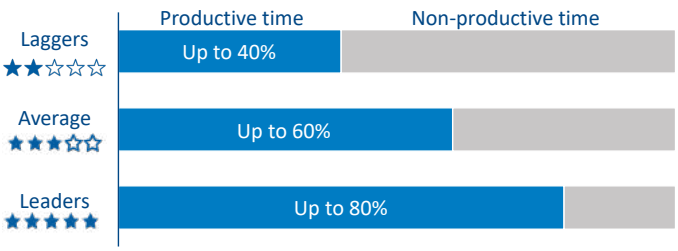
Among several measures utility companies should put in place to address these increasing pressures, improvements on field force deployment can yield significant cost savings, which varies greatly based on the maturity of the sector/economy. A utility company field force spends a typical shift across several productive and non-productive activity blocks; the purpose of this Viewpoint is to identify measures that can **maximize the former and minimize the latter**.

For starters, utilities should work to increase their field force's **utilization/wrench time**, which is the portion of time spent per shift working onsite over total available time (e.g., how much time per day the field force performs productive activities.)

In parallel, utilities should also maximize field force task productivity, or **productivity** for simplification, which is the amount of work completed onsite within wrench time (e.g., the speed at which individual activities are performed).

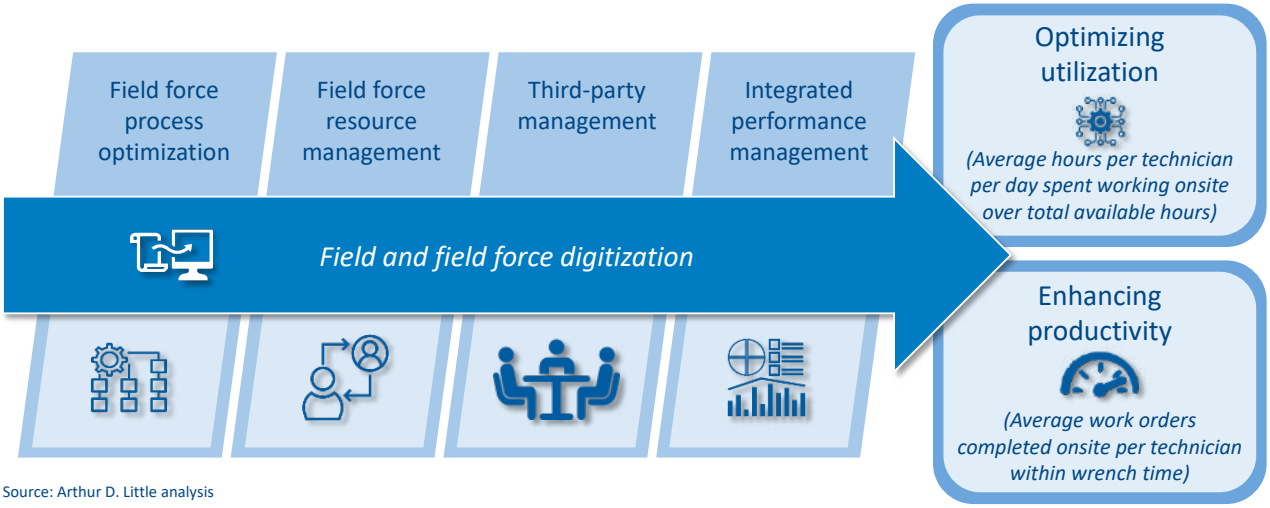
As illustrated in the figure below, utility companies can be segmented into three clusters based on daily utilization percentages: laggers, average, and leaders. Improving field force utilization could yield significant cost savings, especially in emerging countries where large numbers of utilities are in the laggers or average categories. For example, a utility company moving from a lagger rating to a best practice rating could realize savings of over 50% of its annual field force costs. To achieve that, utilities should address issues related to legacy processes, shift regimes, third-party management, lack of field performance indicators, and so forth. In parallel, improvements are also driven by increases in onsite productivity, which can yield extra cost savings to the aforementioned. To address that issue, utilities should look into current time norms, team size, capability specialization, field tools, and so on.

Field force utilization rate in utility companies



Source: Arthur D. Little analysis
Note: Based on an eight-hour shift

Field force management framework



Source: Arthur D. Little analysis

Case study: *Arthur D. Little was tasked with optimizing utilization and enhancing productivity for one of the world's largest utility company's distribution unit's field force*

Project and key challenges – Historical legacies

The client was among the largest utility distribution units globally (5 million+ customers and 500k+ km distribution network length). The unit's field force utilization and productivity were below industry levels. There was no system to collect, measure, and assess field force performance, and processes were non-standardized due to strong historical legacies.

Approach – Join the front line

We focused on identifying root causes and developing impactful optimization initiatives, which improve utilization and productivity. We immediately joined the field force during its daily shifts and conducted multiple interviews across the client's entire geographic coverage. The predominant root causes were related to legacy practices, systems operating in silos, and non-standardized methods to track performance. Following root-cause identification, we developed a five-pillar framework to transform the utility into a data-driven organization enabled by standardized processes and supported by connected digital systems.

Results – modern-day field force

We detailed a total of 35 optimization measures with potential cost savings of more than 30% of annual field force spending. The optimization measures were centered on standardizing processes, deploying a performance measurement system, and digitizing key activities to simultaneously enhance productivity and optimize utilization.

Holistic field force management framework

There is a clear business case for utility companies to focus on field force management optimization. Utilities should pursue a holistic approach to field force management to identify, analyze, and address challenges – ultimately transforming themselves into modern-day organizations. As the figure above illustrates, Arthur D. Little has developed a five-pillar framework that can enable and underly a utility company's modernization journey; digitization, the fifth pillar, is cross-cutting and its impact is reflected across the remaining four pillars – related to process optimization, resource management, third-party management, and performance management. Several digitization applications, illustrated in the figure on the next page, relevant to distribution field work are recommended across the four pillars. The following sections present the optimization measures that address challenges and enhance utilization and/or productivity across the framework pillars.

Field force process optimization

Field force processes often entail high potential for quick wins for utilities seeking to improve utilization and productivity. Field force processes sometimes suffer from lack of standardization, which may impact execution and jeopardize customer satisfaction. In addition, many processes are entrenched in legacy practices associated with unnecessary redundancies and do not take full advantage of the technology leap in the industry. It is important to have continuous review cycles for these processes to ensure standardization and lean process design as well as to adapt to the latest technology standards. Many field processes can be made leaner by adopting systems such as **mobile GIS applications**. For example, the fault localization process for underground cables could easily be conducted faster through the deployment of mobile GIS applications. Additionally, the deployment of an **advanced workforce management system** and its integration in process maps is a key optimization lever that utilities should adequately benefit from.

Such systems eliminate the need for workers to go to the office to collect work orders and report back with their inspection results.

Another challenge that faces utilities in this dimension is the disconnect between asset management and the field. Lack of timely feedback loops increases inconsistencies in design and leads to rework. To overcome this challenge, it is recommended to reduce barriers between asset management and the field and allow field engineers to work early on with the asset management teams to provide timely **constructability inputs**.

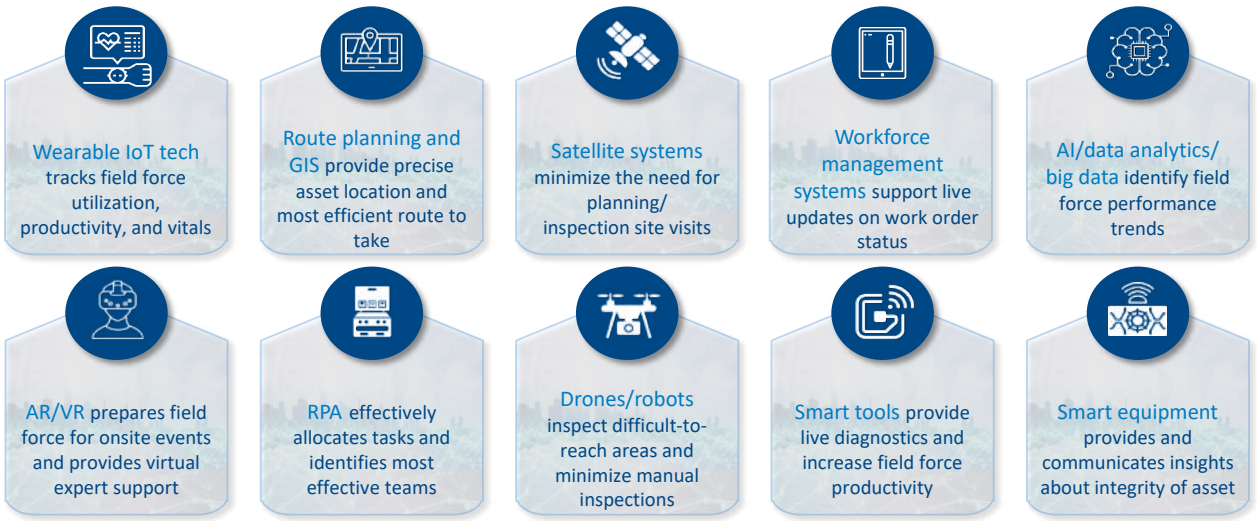
Field force resource management

Managing a workforce is particularly relevant for utility companies because of the large size of the field force. Challenges faced by select utilities relate to ineffective team deployment and the mismanagement of team sizing across demand fluctuations, which can be tackled with simple alterations in work order management as well as through the adoption of digital applications. In terms of team deployment, challenges relate to the sizing of the team as well as to the optimal task assignment for optimization of travel time and matching of skill set to the task requirement. To alleviate these challenges, certain functionalities of workforce management systems can be utilized. The **route planning** functionality, for example, can tackle travel time issues and has the potential of reducing travel time by 20% to 30%, as we have seen at several clients. This system can also integrate **robotic process automation (RPA) functionality** for automatic order assignment as well as an artificial intelligence (AI) layer that learns throughout the process to conduct smart assignment of work orders.

Beyond workforce management systems, the "smartization" of field equipment and tools plays a key role in enhancing productivity and in better utilizing the field force. **Smart tools**, like heat sensors, would communicate an asset's conditions to a control center, reducing time spent on inspections while also increasing accuracy of collected data. **AR/VR systems** enhance the efficacy of maintenance inspections as they allow for more comprehensive and convenient access to asset information. The use of cameras or **smart drones** to collect pictures of distribution assets that can then be analyzed by AI helps the field force improve the effectiveness and efficiency of inspections. Similarly, the deployment of **Earth observation and GNSS augmentation systems** can eliminate the need for certain inspection and planning site visits and frees time that can be spent elsewhere. **Wearable Internet of Things (IoT) technology** can also be leveraged to reduce team size while ensuring higher levels of field force safety by tracking vitals and providing external support. To begin, wearable technologies that track field force vitals eliminate the need of a safety watchman – sensors detect and communicate live whereabouts of the field force and provide information (e.g., heat stress) to indicate any risks. Wearables can also accurately track field force utilization and productivity rates. And wearables can provide remote support and real-time training for the field force. For example, by wearing a head-mounted camera, a remote senior engineer (wearing an AR/VR set) can provide onsite support and direction to the field force without physically being onsite.

As for demand fluctuations, the issue revolves around fluctuations within the day (night shift versus other shifts) and between seasons. Here, utilities can revert to either **soft borders** between teams or to development of **multiskilled workforce**. For example, some electricity distribution companies lower the borders between operations and maintenance, allowing operations personnel to conduct simple maintenance tasks at night shifts and even shifting that staff to perform maintenance activities during low season, where demand on operations is low.

Digital applications relevant to field work



Source: Arthur D. Little analysis

Third-party management

Globally, utility companies heavily rely on third-party manpower/contractors during periods of high demand or throughout the year to address existing workforce gaps, especially in regions with rigid labor laws. Given the third party's key role, it is imperative to ensure consistency in its quality in an efficient and effective manner. This is vital since low quality of third-party contractors often results in significant rework. For example, a utility company measured that 5%-8% of LV/MV faults are caused by contractors, while best-in-class utility companies experience less than 1% of contractor-related faults. A pragmatic approach to contractor quality management involves the utilization of **data analytics to cluster contractors according to performance**, where utilities can tailor inspection frequencies to contractors' performance. Utilities should link **contractual agreements** with third-party performance and include health and safety requirements and quality control clauses in contracts.

Integrated performance management

Performance management should be at the heart of any company. Challenges we have seen at utilities relate to the lack of a mechanism/system that tracks utilization and productivity. Furthermore, there is often a weak feedback loop between data generation/collection and key decision makers – reducing visibility on performance. The setup of a **data-driven performance management system is imperative to drive visibility and identify improvement areas across an organization**. Performance management systems can be built on three components: (1) content definition or field force performance KPIs; (2) governance process for setting up performance standards, measuring performance, synthesizing data, and reporting progress; and (3) systems that collect, collate, analyze, and report performance (in single multilayered dashboards). The availability of a data-driven performance management system and its effective implementation allows decision makers to identify and debug key issues that hinder field force utilization and productivity. In its advanced form, a performance management system may utilize advanced analytics systems and machine learning algorithms to identify anomalies in performance across field force activities.

Insights for decision makers

To stay relevant and address sector challenges, utilities should ensure that they include field force management in their transformation. By applying a comprehensive field force management framework and by leveraging digital technologies/applications, utilities can optimize field force processes, better manage their resources and third-party contractors, and ultimately set up a robust performance management system to enhance field force utilization and productivity – and significantly improve their bottom lines.

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Arthur D. Little

Arthur D. Little has been at the forefront of innovation since 1886. We are an acknowledged thought leader in linking strategy, innovation and transformation in technology-intensive and converging industries. We navigate our clients through changing business ecosystems to uncover new growth opportunities. We enable our clients to build innovation capabilities and transform their organizations.

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