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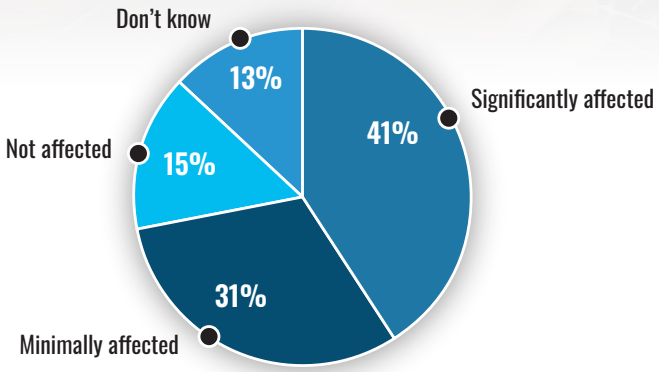
Coronavirus, back to work and beyond:

Best practices and technology selection

Survey results indicate cloud-based and mobile enterprise asset management drive productivity as businesses rebuild

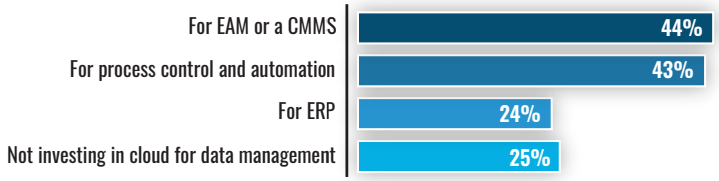
More than forty percent of respondents to an April 2020 survey of U.S. goods makers and distributors say their enterprise asset management (EAM) processes were significantly impacted by the COVID-19 epidemic (See chart below).

Impact of COVID-19 on Annual EAM Budgeting, Planning

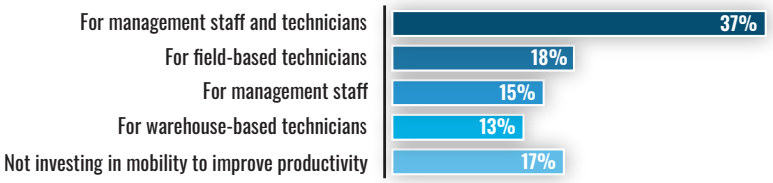


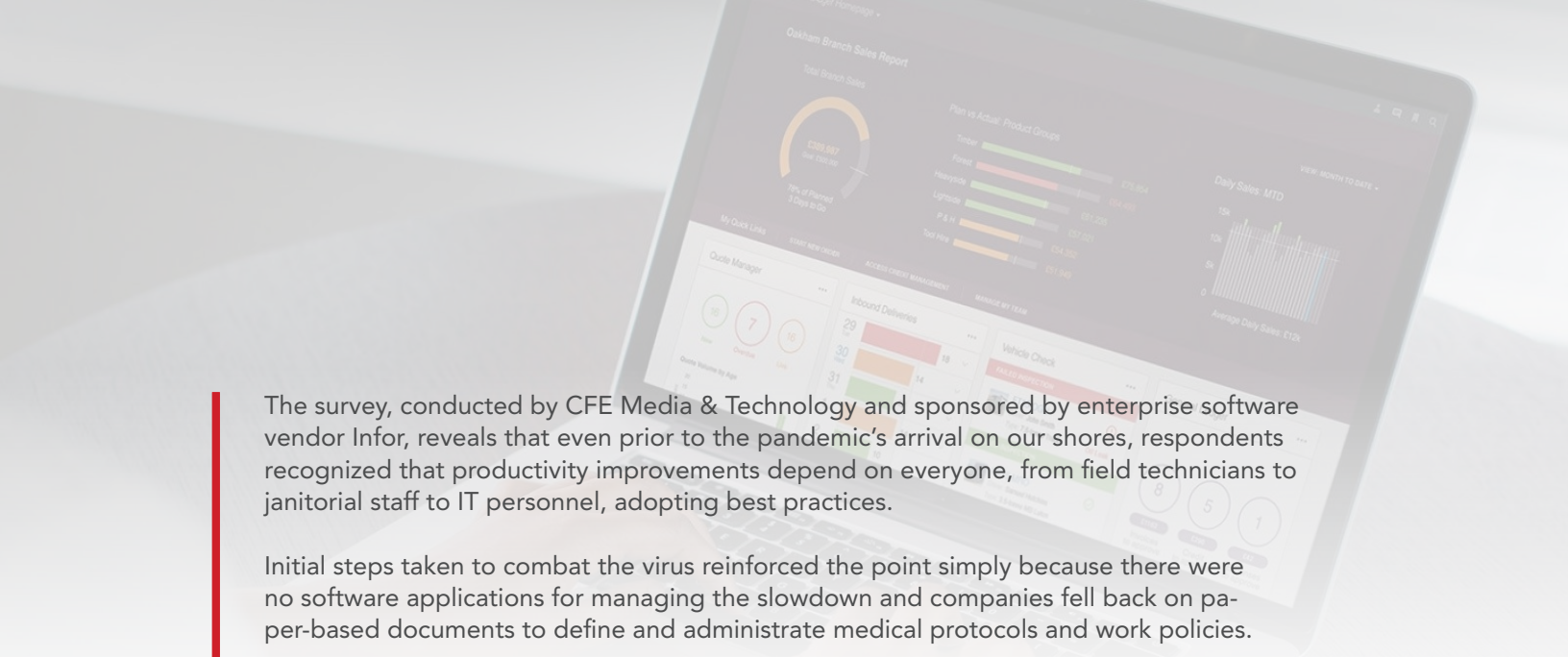
At the same time, more than three-quarters of these same executives, managers and technicians say their enterprises are already investing in cloud-based systems and technologies and in mobile applications to allow them to build — and rebuild — safe, productive, and compliant workplaces (See charts below).

Investing in Greater Use of Cloud for Data Management



Investing in Greater Use of Mobility to Improve Productivity





The survey, conducted by CFE Media & Technology and sponsored by enterprise software vendor Infor, reveals that even prior to the pandemic's arrival on our shores, respondents recognized that productivity improvements depend on everyone, from field technicians to janitorial staff to IT personnel, adopting best practices.

Initial steps taken to combat the virus reinforced the point simply because there were no software applications for managing the slowdown and companies fell back on paper-based documents to define and administrate medical protocols and work policies.

Today, the economy is reopening. Millions of employees worked from home — a first for many of them. Essential manufacturers shared information about a quickly changing landscape and steps they've taken to continue operations, including the following:

- Enforcement of social distancing measures
- Associate self-check or medical vetting prior to entering sites
- Enhanced hygiene protocols in production and operations areas based on Centers for Disease Control (CDC) guidelines

Moving forward, however, risk experts warn of an era of unforeseen financial impacts, frequent operational changes coupled with supply chain disruptions, and a rapidly changing workforce. Manufacturers' need for flexible, computerized support will be more apparent than ever.

"We want to use the crisis as a catalyst for building resilience into operations," said Joe Barkai, author of "The Outcome Economy," and speaker on emerging technologies and business models for manufacturing industries, in a recent interview.

Growing use and wide-ranging support for cloud-based systems and mobile access was seen by survey respondents as key to increased productivity and resource reliability. In addition, engineering and operations staff support greater use of machine-to-machine connectivity and condition-based monitoring for predictive maintenance.

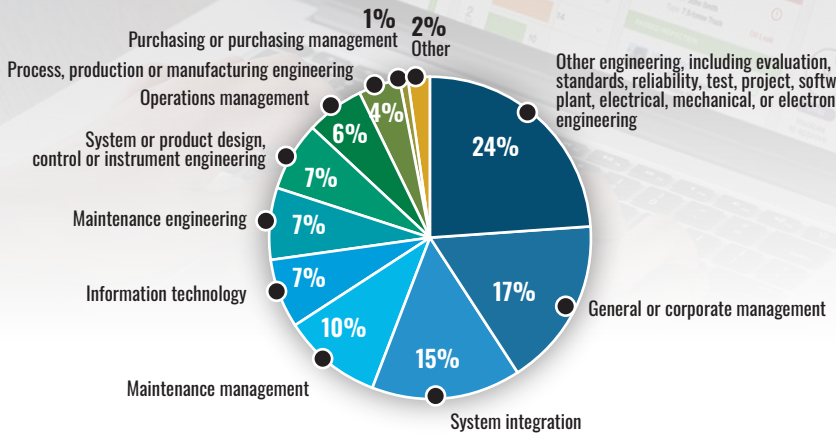
Read further in this special report to learn what matters most to executives, managers, engineers and technicians in manufacturing and distribution when it comes to application functionality, hardware specifications, and systems integration (See chart on page 4).

Additional expert commentary adds context and provides a sound basis for decision making, to ensure manufacturing and distribution enterprises get the most from technology investment in a time of constrained resources and market uncertainty.

Access from anywhere

It's the access-from-anywhere nature of cloud-based applications that's made it possible for

Job Function



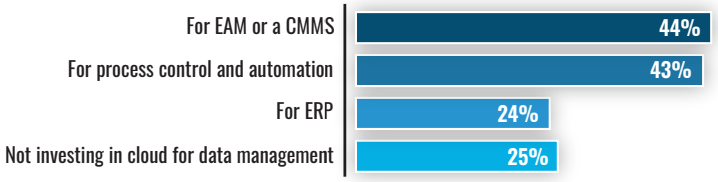
millions of U.S. engineers and knowledge workers, managers, and technicians to perform their job functions from home, enabling enterprises to stay current amidst the uncertainty surrounding the virus.

Manufacturing professionals either found it easy to work from home or they got up to speed quickly.

Cloud computing is the practice of using a network of remote servers hosted on the Internet to store, manage, and process data, rather than using a local server or a personal computer. Just as we stream video in our personal lives, we can access work-related software applications, securely, wherever we find a web browser.

More than 40% of respondents say their cloud computing investment includes EAM or computerized maintenance management software (CMMS) and/or process control and automation (See chart below).

Investing in Greater Use of Cloud for Data Management



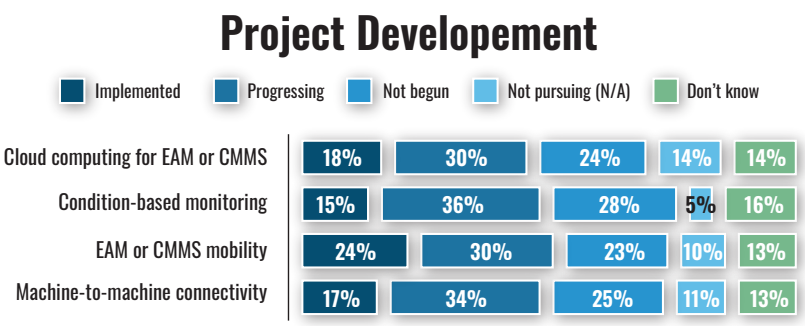
Cloud-based enterprise software gives manufacturers and distributors a nimbler platform to enable quick responses to customer needs, opportunities, and even crises, in

rapidly changing business environments. EAM software providers, for example, are already updating their systems to deal with the need for improved management of sanitization processes.

More generally, moving to the cloud reduces costs for managing and maintaining IT systems. The cloud provider furnishes upgrades automatically, whether for improved functionality or revamped regulatory environments, without requiring the enterprise to expend labor, deal with hassles, suffer delays or rebuild customizations.

Resources and costs expended with traditional on-premise software are gone. The provider takes responsibility for its software and can even supply the underlying technical infrastructure needed to access the solution. This includes server hardware and database maintenance and administration, document storage, technical upgrades, and ongoing enhancements.

Manufacturing enterprises have taken note. Nearly 50% of survey respondents said their company has either already implemented cloud based EAM or CMMS or that they are progressing toward it, while nearly an additional 25% said switching to cloud is on their radar (See chart below).



Safe & clean in the cloud

In the wake of the coronavirus' initial wave, a level of sanitation rigor beyond "employees must wash their hands before returning to work" is required. Imagine working in the food & beverage industry, as a maintenance technician responsible for the setup, breakdown, cleaning, configuration, and reconfiguration of production cells. How can the required level of rigor be achieved?

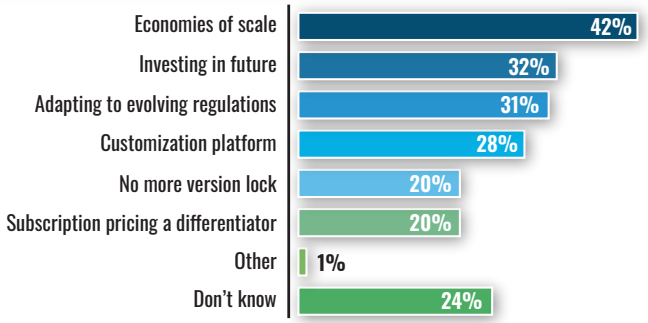
The time is right for automated maintenance check lists and workflows that provide necessary maintenance tracking. Staff scheduling, training, and manager signoffs also should be digitalized and integrated with specific information on staff skill sets, training, and qualifications.

In the immediate aftermath of the pandemic, organizations can expect more preparation, tracking, monitoring and post-mortem analysis of contamination incidents, from questions about maintenance frequency to employee education and qualifications.

For example, the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) has issued new guidelines around flushing heating and cooling systems, dictating more routine review of preventive maintenance practices.

More than 40% of survey respondents said that a primary purpose for investing in a cloud based EAM system or CMMS is to meet environmental, safety, and compliance goals (See chart 16). More than 30% of respondents realize that it is the economies of scale provided by multi-tenancy in the cloud that allows them to quickly adapt to evolving regulations (See chart below).

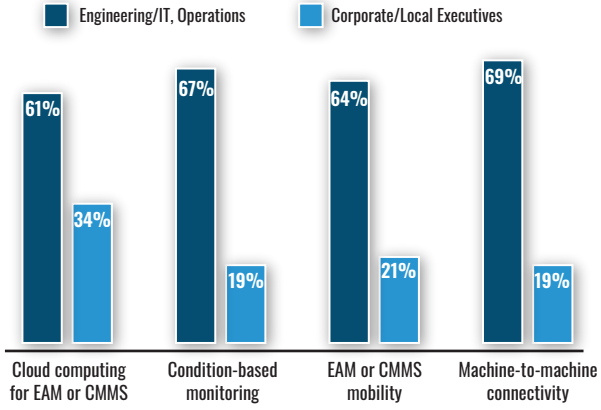
Why Does Multi-tenancy Matter?



Resilience going forward

The CFE Media survey reveals that it is the engineers, operations specialists, and technical ranks pushing for technology investment as the means to productivity enhancement, and convincing, and perhaps cajoling, corporate and local executive gatekeepers that the technologies are mature enough to deliver sought-after return on investment (See chart below).

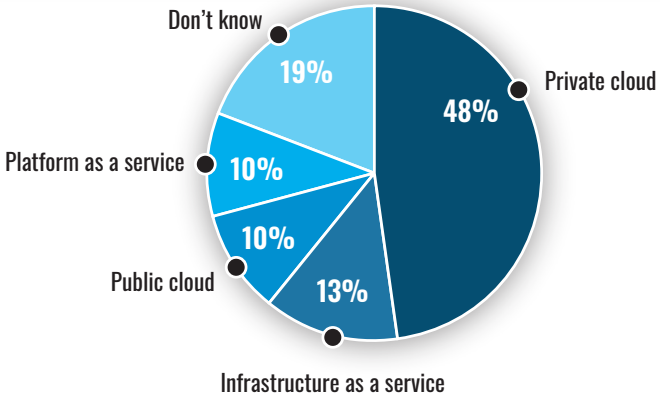
Technologies Being Explored or Pursued



In the wake of the pandemic's economic impact, companies must not only address immediate challenges in maintaining business continuity, such as adjusting to a rearranged market environment, but must also take steps now to mitigate the impact of future challenges.

The software-as-a-service model serves as a vaccine against certain outcomes. Survey respondents recognized this when they said cloud modalities that included software, platform, or infrastructure services were the best fit for their individual needs (See chart below).

Cloud Variety That Best Fits Respondent's Needs



Working with a service provider is protection against business-crippling events such as:

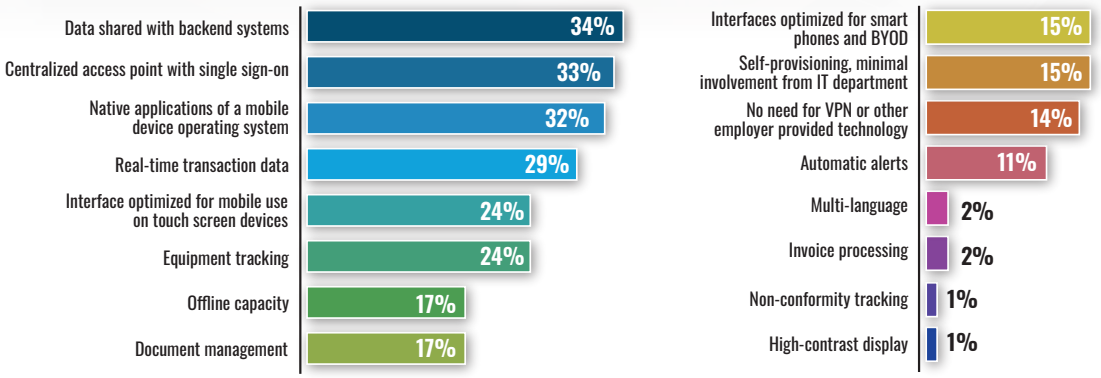
- Critical system failure — Rather than on-premise, the system is housed in a secure location and serviced by expert staff
- Loss of technical expertise — Cloud providers devote significant resources to ensuring staff are well versed in relevant hardware and software technologies
- Merger & acquisition — Cloud solutions deliver a unified view of data across systems, corporate wide
- Legacy bottlenecks — Cloud solutions provide a platform that supports dynamic scalability to handle peak loads without oversubscribing resources
- Security breaches and malicious attacks — The cloud service provider uses dedicated resources to monitor systems for security breaches and threats
- Expanding IT costs — System costs are predictable and contract-defined.

Mobility means real time

Industrial mobility is an approach to work in which workers can access many types of information from plant floors or field locations.

To survey respondents, the three most important mobile EAM system capabilities are the ability to share data with backend systems (34%), centralized access with single sign-on (33%), and native applications residing on a mobile device operating system (32%). In fact, respondents had a long list of mobility requirements to share (See chart below).

Important Capabilities for a Mobile EAM Application

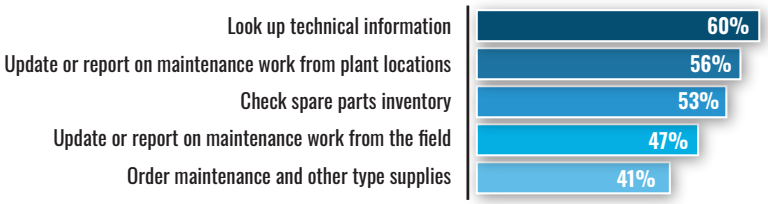


EAM's primary mission is to manage events, costs, and work processes. One reason mobility is important is that EAM is increasingly tasked with supporting responses to out-of-the-ordinary situations and catastrophic situations that can't wait for everyone to be on site.

In their situational response, managers and technicians can use mobility to access work orders, supporting documents, instruction manuals, and drawings and can record voice or video notes. After accessing the relevant information, the technician can document the work required, including when labor begins and ends, parts orders issued, work order closure, and entering closing codes to build out robust reports.

Survey respondents recognize the benefits, saying they use EAM in similar ways, to look up technical information (60%), update work orders (56%), check spare parts inventory (53%), update maintenance reports (47%), and order supplies (41%) (See chart below).

EAM, CMMS Cloud-based Mobile App Capabilities



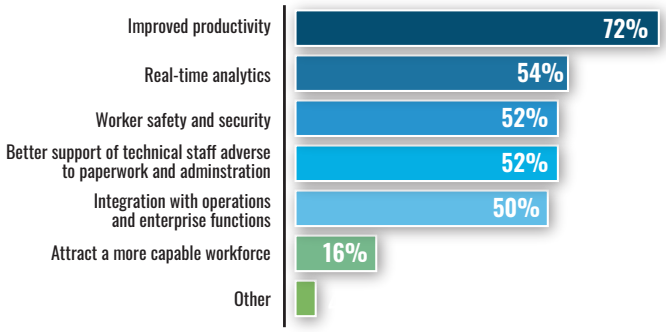
Current issues

In a recent CFE Media webinar, sponsored by Infor, attendees had several questions about the growing use of mobility, including the following:

- Who should have mobile access: managers or technicians?
- Who needs a tablet? Who needs a phone?
- Should personal devices be used?

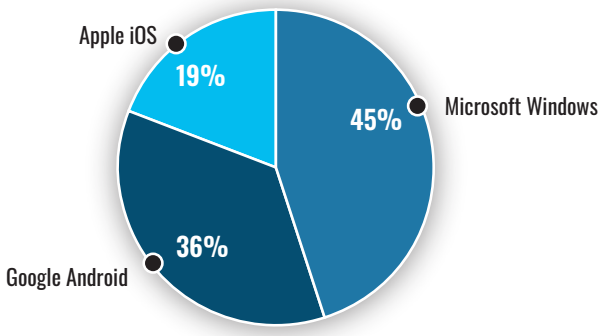
Infor emphasizes that EAM software is highly configurable to deliver role-based information. Fully 72% of survey respondents said their reasons for investing in mobile EAM included improving productivity for management staff and/or technicians (See chart below).

Purpose for Investing in Mobile EAM, CMMS



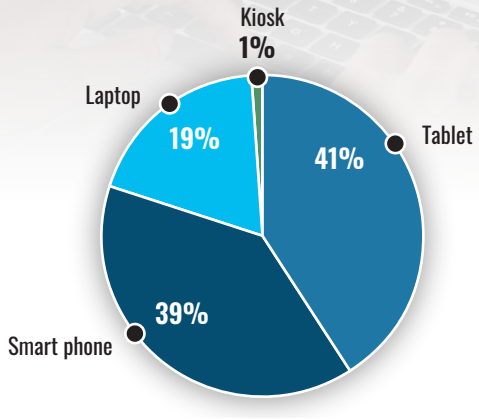
Today, Apple iOS and Google Android are the most popular mobile application operating systems, yet 45% of CFE Media survey respondents chose Microsoft Windows. Perhaps this reflects the popularity of Microsoft Windows for plant floor applications, including for supervisory control and data acquisition, commonly referred to as SCADA (See chart below).

Preferred Mobile Application Operating System



The form factor the survey respondents found most appropriate for EAM was nearly split down the middle, with the tablet (41%) running first, closely followed by smart phones (39%) (See chart below).

Most Appropriate Device for Mobile EAM Computing



Today, while most users assume they need to be connected, EAM can be accessed in connected or disconnected mode. The benefit is that real-time information is always in reach.

Finally, while some companies remain hesitant to allow employee associates to use their own devices for work purposes, the convenience and ease of use in carrying a single device leads many companies to allow it.

Concluding remarks

The most efficient EAM strategy will always include a system that gives manufacturers real-time visibility for better, faster decisions. An EAM system should have the flexibility, functionality, and scalability to manage data automatically, anytime, anywhere. Respondents to the CFE Media survey know that cloud-based and mobile systems enable these capabilities.

As the coronavirus loosens its grip on our daily lives, the new environments being fostered require more rigorous processes. The survey respondents agree that cloud and mobility support capabilities making the required rigor possible. In future, leading enterprises will look for ways they can comprehensively address these and other challenges, rather than simply react to them.

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