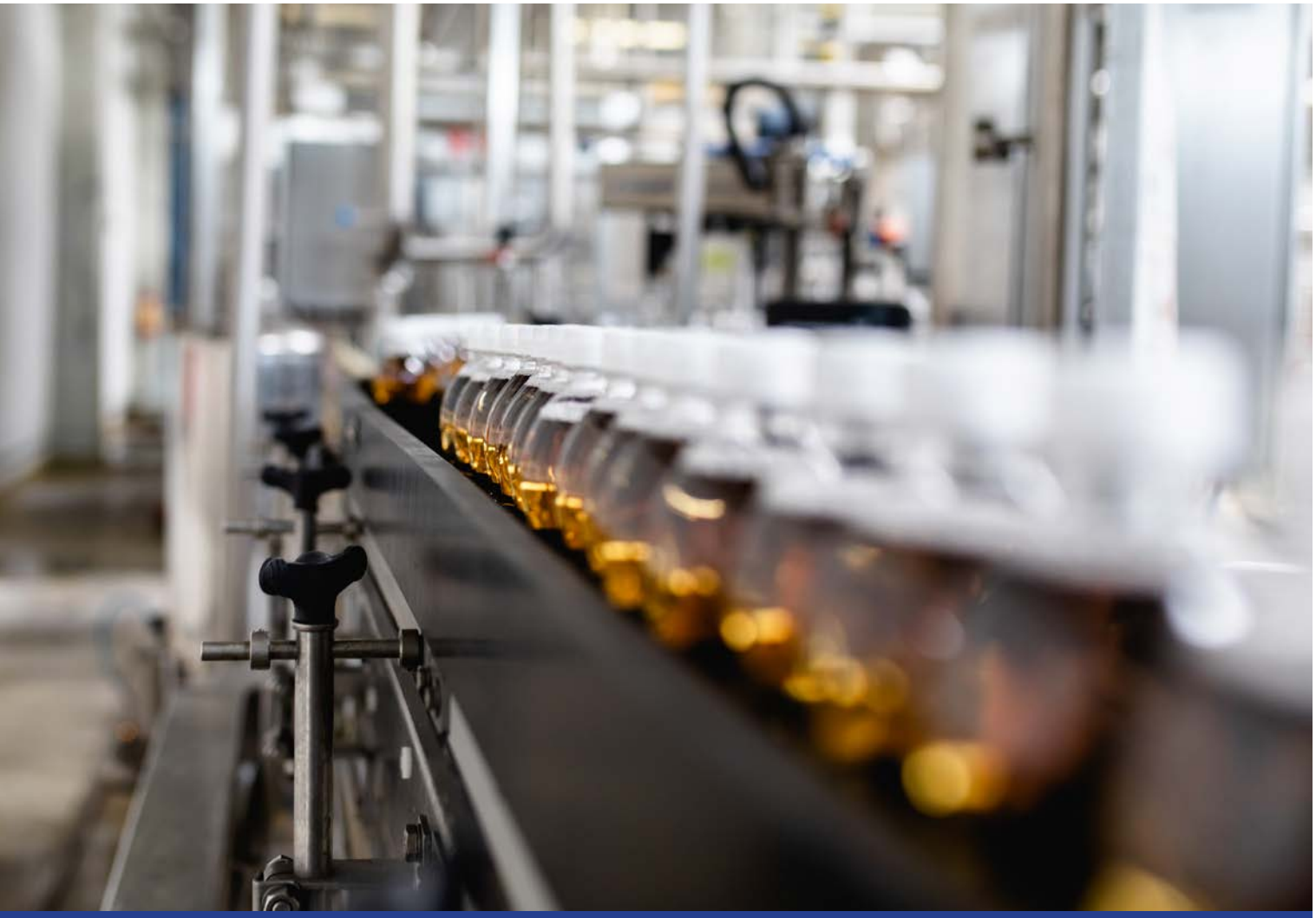

WHITEPAPER

Productive maintenance: How to optimise asset uptime and cost control in the food processing industry

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MAINTAINING PRODUCTIVITY & PROFITABILITY.

IN THE FOOD PROCESSING SECTOR, WHERE OPERATIONS ARE HEAVILY DEPENDENT ON A WIDE VARIETY OF PRODUCTION EQUIPMENT, EFFICIENT ASSET MANAGEMENT IS VITAL TO PROFITABILITY. THE COST OF DOWNTIME OF ANY TYPE, REGARDLESS OF IF IT RESULTS FROM EQUIPMENT FAILURE OR NOT, CAN QUICKLY ESCALATE, WITH RESEARCH ESTIMATING IT TO AVERAGE £180,000/ €213,000 PER HOUR ACROSS THE MANUFACTURING INDUSTRY (1). TO OPTIMISE PROFITS, MACHINERY MUST BE MAINTAINED IN A WAY THAT MINIMISES BOTH DOWNTIME AND COSTS. THIS PAPER SUMMARISES THE MAINTENANCE CHALLENGES INVOLVED IN THE FOOD PROCESSING SECTOR AND EXPLAINS HOW AN ENTERPRISE ASSET MANAGEMENT (EAM) SYSTEM CAN HELP SOLVE THEM.

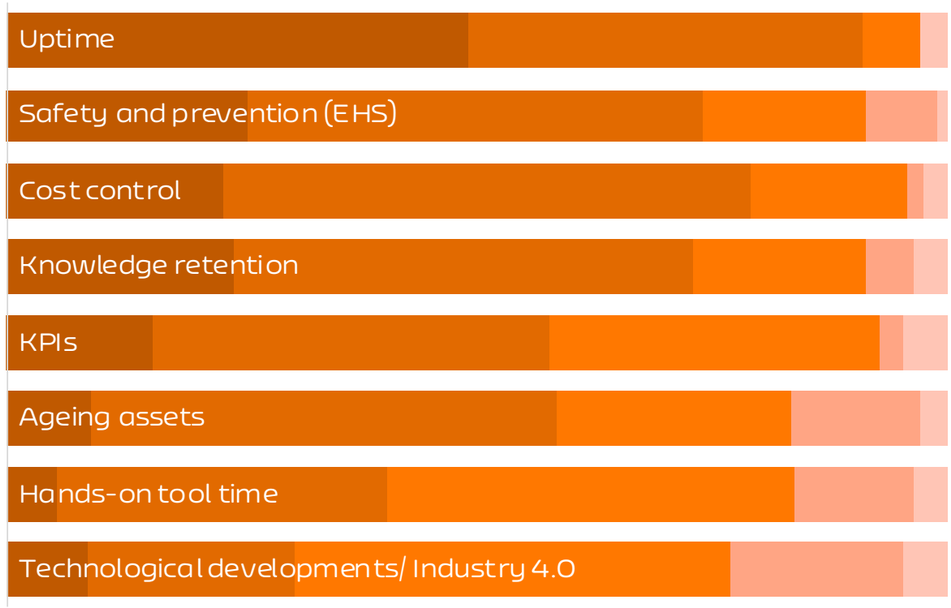


Figure 1 – Ranking of asset managers' main concerns in the food sector (source Ultimo 2020 EAM Trends Report)

The importance of asset uptime, cost control and resilience

As well as maintaining all assets in optimal condition and keeping production lines moving, businesses in this sector must ensure compliance with food safety regulations. The link between maintaining assets and upholding HSE (health, safety and environment) standards is especially close in food processing, as deficiencies in maintenance management can lead to contamination of products, resulting in fines, plant closures and in the worst cases consumer health emergencies.

An eco-system exists where managers and engineers, who are responsible for asset, plant, facilities, process, maintenance and HSE management, face constant pressure to improve productivity and keep food safe within tight budgets. They must also be agile in responding to changing demands and challenging new circumstances, like those posed by the COVID-19 pandemic.

Research for the Ultimo 2020 Enterprise Asset Management (EAM) Trend Report showed that the biggest concern for asset managers in the food industry is uptime, followed by cost control and HSE. (See Figure 1.) Based on this evidence the sector prioritises asset uptime more strongly than many others, as might be expected in view of its largely perishable products.

A recent study by Oneserve found that machine downtime is costing the British manufacturing industry more than 180 billion pounds each year. What's more, faulty machinery causes over 3 percent of all working days to be lost each year, which translates to 49 hours per company (2).

Uptime is fundamentally important, as a business cannot be productive and earn money if the necessary assets are not available for use. Unplanned downtime is especially disruptive, and equipment breakdowns or malfunctions can even be dangerous to workers.

Costs arising from downtime are numerous. Lost production means less product to sell. Failure to meet orders can diminish the manufacturer's reputation for reliability and damage its relationships further down the supply chain. Downtime resulting from a food safety breach may be even more worrying in that respect. Its consequences might include recalls, fines and negative PR.

The cost of investigating and repairing mechanical problems includes time, labour and the price of replacement parts or – in some cases – entire machines. Meanwhile, unfinished products and ingredients stranded on an unexpectedly halted production line may go to waste.

Businesses can survive shutdowns, but often at great cost. One UK-based food manufacturer had to suspend production at one of its chicken processing plants for five weeks in 2017 to deal with a food standards issue, with the estimated losses totalling up to £500,000 a week.

The same business was again forced to close another of its plants for two weeks in 2020, this time due to Covid. With nearly 60 of the facility's 560 staff testing positive, it took the precaution of suspending production. According to the UK Government information, food processing plants have been central to a number of localised Covid outbreaks. It was suggested that one factor contributing to this might be the nature of the work, which often involves close proximity to other workers, sharing of communal rest areas and even the need to speak loudly over the noise of machinery. (3)

A US-based meat producer saw its production capacity severely affected by the Covid pandemic. With hundreds of workers testing positive for the virus, it ended up closing several facilities and slowing down production in others. The impact on profitability was dire: in Q2 2020, the company's net income fell by 15 percent compared to the previous year. (4)

Whatever the reason for a shutdown, anyone in the food processing industry can appreciate that even a short break in production can be devastating. There may also be knock-on effects for companies with more than one plant, when moving production to other sites puts extra pressure on their assets. Similar pressures will undoubtedly have been felt by food businesses switching production from one product type to another during the pandemic, as large retailers demanded higher volumes of the most essential items. Agility and adaptability, made possible by well-organised asset management, has often been a key to survival when unexpected circumstances prevail.

Cost control

While improvements in asset uptime may increase productivity, they should not be achieved at the expense of excessive spending on maintenance. An appropriate balance, through careful cost control, is needed.

Maintenance costs are comprised of time, labour, parts and materials. Unintended waste can occur if, for example, more work is carried out than the resulting uptime benefit justifies. Efficiency in planning maintenance work and managing spare part stocks are other critical considerations.

On the other side of the equation, savings can be made by avoiding or reducing the various downtime-related costs referred to above. In addition, correctly maintained equipment can cut costs by extending the lifetime of parts and machines and optimising the energy efficiency of operations. Well-maintained equipment is also less likely to suffer malfunctions which might lead to rejected and wasted products.

In times of economic difficulty, like those experienced by many businesses during the Covid pandemic, it is important to know where the main costs lie. This allows sensible decisions to be made on where to cut costs without severely affecting future viability. With a well-informed approach to increasing cost efficiency, companies can remain strong and recover quickly.

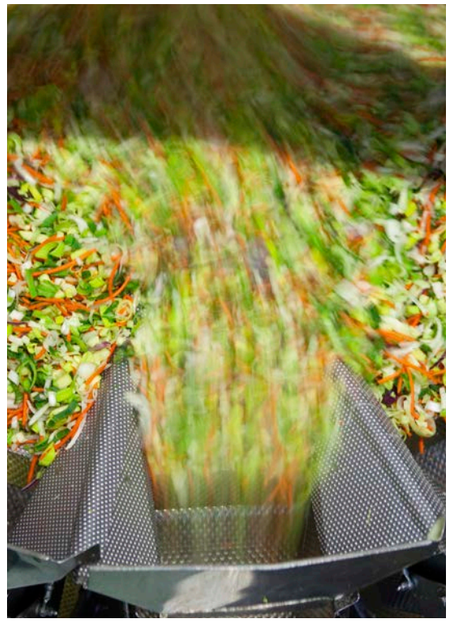
Resilience

As we have all learned from our Covid experiences, the future is hard to predict and there is always the chance of unexpected new challenges. Covid exposed the fragility of supply chains and caused additional difficulties for many food processing businesses.

For some it meant shutting down or delaying production, due to staff shortages or late arrival of materials. For others it meant having to cope with unprecedented demand for certain kinds of product.

The Covid epidemic saw restaurant and hospitality food consumption drop dramatically, while sales of food for consumption at home soared, putting food manufacturers under pressure to cater for the demand. This was particularly visible in frozen and packaged products. In March 2020, weekly sales of frozen foods were 63% higher than the year before in France whereas in Germany, sales of packaged foods were 56% higher year-on-year, with countries across the globe witnessing similar spikes. (5)

To respond resiliently to situations like this, and to cope with whatever else the future throws at them, companies need to future-proof their operations and maintenance processes. By increasing their flexibility, businesses and their assets can be ready to adapt to any change that threatens their uptime and cost control.



KEY CHALLENGES TO MAINTAINING UPTIME AND COST CONTROL.

INADEQUATE ASSET MAINTENANCE IS CLEARLY THE MOST OBVIOUS FACTOR PUTTING BUSINESSES AT RISK OF DOWNTIME. HOWEVER, EVEN WHERE CONSIDERABLE EFFORT IS MADE TO MAINTAIN ASSETS, A LACK OF STRATEGY, ORGANISATION OR WELL-FOUNDED DECISION-MAKING CAN REDUCE ITS EFFECTIVENESS.

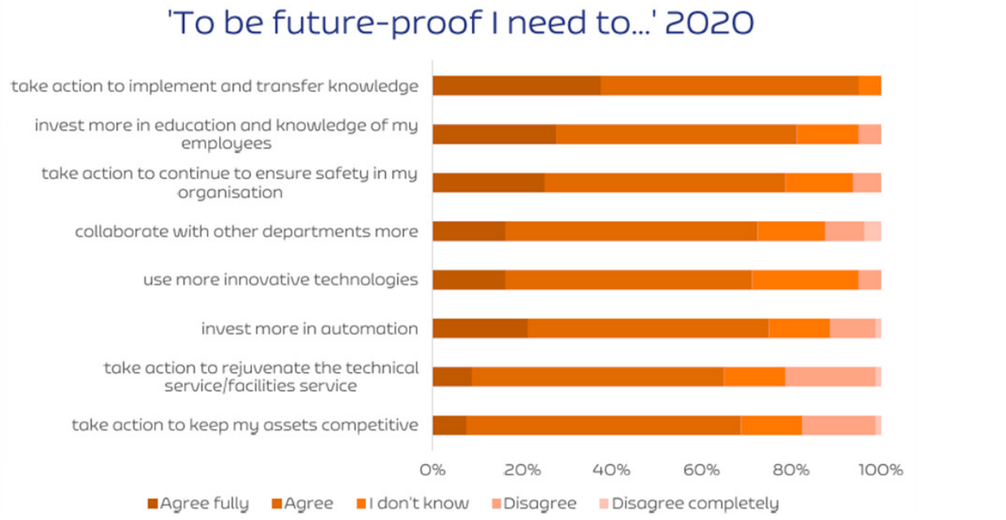


Figure 2 – Ranking of asset managers' future-proofing concerns (source Ultimo 2020 EAM Trends Report)

Uptime risks

Outdated approaches to maintenance are a fundamental threat to asset optimisation and availability. In particular, too much reliance may be placed on reactive – otherwise known as corrective – maintenance. In this scenario, maintenance action is taken only when a fault or malfunction arises. By the time it becomes noticeable, serious damage may already have been suffered. If a machine breaks down during operation, the time needed for repairs will be even longer and more disruptive.
Today there are many proactive maintenance options that reduce the risk of assets failing in service. As we will see later, the most advanced predictive maintenance approaches can forecast the optimum time for component replacement and minimise both planned and unplanned maintenance downtime.

Lack of data on which to base sound maintenance plans and decisions is another basic problem which leads to downtime risks. In some cases, for instance, there is no system for registering details of assets and their maintenance history. At the same time, increasing levels of digitalisation may be generating large amounts of potentially useful operational data which is not being analysed and utilised to improve maintenance and uptime. The speed, efficiency and effectiveness of maintenance work can be limited by failure to take advantage of modern mobile technology and remote connectivity solutions.

Without such solutions, responses are slower as maintenance engineers and managers have to spend much of their time travelling to sites. There are great flexibility benefits to be gained through remote access to assets, as some companies discovered during the Covid restrictions.

Many other obstacles, such as weather-related transport disruptions, can be overcome in the same way.

Mobile solutions, linked to simplified recording and accessibility of information in a well-organised system, are keys to effective retention and sharing of essential knowledge. In some businesses there is no easy way for different sites and teams to access the same information. This can result in each site adopting a different approach to the same problem, rather than applying a single, consistent, proven solution. It also means that the organisation cannot benefit fully from its staff's collective expertise.

This raises a future-proofing issue which has potential impacts on maintaining uptime: the ageing workforce. The knowledge of older employees needs to be retained by companies and passed on to younger staff. Ultimo's 2020 Enterprise Asset Management (EAM) Trend Report found that taking action to implement and transfer knowledge was the top priority for asset managers when seeking to future-proof their business. (See Figure 2.)

Cost control risks

Risks to maintaining cost control begin with lack of information, along with the use of outdated methods such as spreadsheets or, worse still, paper-based systems for tracking maintenance-related data. These approaches can easily lead to inconsistencies and errors, which may translate into poor cost control and extra downtime.

Digitisation of data and documentation is fundamentally important, as it makes information easier to use and share.Securing accurate digital records and documents is especially helpful in the areas of HSE and food safety compliance where, as we saw earlier, lapses can be extremely expensive.

Without digital processes, visibility into asset-related costs is limited. Importantly, an asset manager should be able to easily access the information about: how much the maintenance of a machine costs; how much it costs the company in lost production and other expenses if that machine is down; and what difference any change in maintenance has had on the machine's availability.

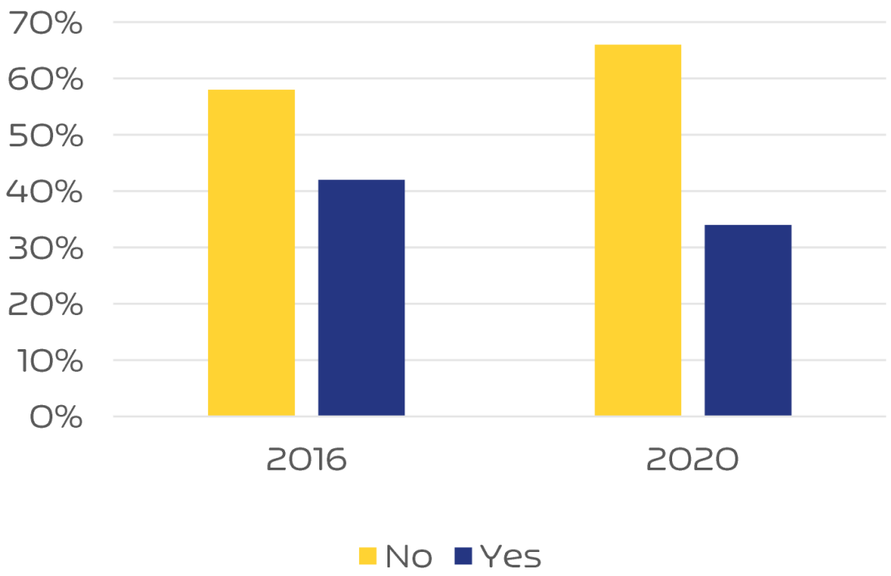


Figure 3 - Asset managers' awareness of machinery/asset uptime levels (source Ultimo 2020 EAM Trends Report)

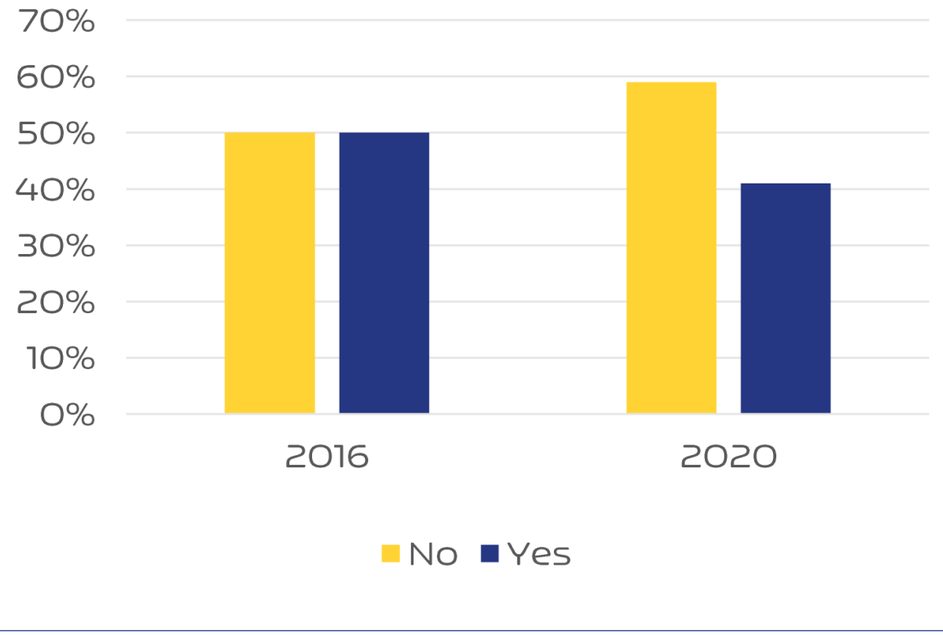


Figure 4 – Asset managers' awareness of machinery/asset downtime costs (source Ultimo 2020 EAM Trends Report)

Ultimo's 2020 Enterprise Asset Management (EAM) Trend Report found that, in the year of its publication, 65% of asset managers were unaware of the exact uptime of their machinery or assets. Meanwhile, 59% were unaware of the exact cost of machinery or asset downtime to their organisation. Furthermore, levels of awareness had actually dropped since 2016. (See Figures 3 and 4.)

Businesses often have no reliable way of measuring the performance of their assets and are therefore unable to identify those which are performing poorly. They may lack insight into such essential factors as the hours worked by machines, the causes of equipment failure and the time spent on specific maintenance tasks. Without data of this kind, it is virtually impossible to improve and streamline processes.

HOW AN EAM SYSTEM CAN MAXIMISE ASSET UPTIME AND CONTROL COSTS.

DATA SHOULD BE TREATED AS A VITAL ASSET, BUT ITS FULL VALUE CAN ONLY BE REALISED IF THE RIGHT DATA IS CAPTURED, MADE ACCESSIBLE AND ANALYSED TO PRODUCE ACTIONABLE INFORMATION. AN ENTERPRISE ASSET MANAGEMENT SYSTEM SUCH AS ULTIMO PROVIDES THE FRAMEWORK FOR RECORDING, SHARING, ANALYSING AND UTILISING DATA IN RELATION TO MAINTENANCE OPTIMISATION.

Enterprise Asset Management software can be used to manage the whole life cycle of each asset, from design to decommissioning, including the planning, optimisation, execution and tracking of all related maintenance activities. Its functionality and database take account of the user company's associated priorities, skills, materials, tools and information. It helps businesses not only to optimise asset performance but to increase employee productivity.

With the help of EAM software, companies can harness data to gain better visibility over their assets, optimise uptime, increase maintenance efficiency and improve cost control. The Ultimo EAM cloud platform gathers all relevant data, across single or multiple sites, into one place. In addition, it can integrate HSE software, data and management without the need for duplication in a separate system. It can also link easily to other systems, such as business intelligence (BI) platforms, to extract further insights from their combined 'Big Data'. EAM software enables users to interrogate the system's data and make data-driven decisions on what steps to take and when. In this way, critical maintenance workflows can be streamlined and asset uptime optimised. At the same time, the staff hours and other costs logged against specific maintenance tasks can be analysed. This helps, for example, in comparing preventive maintenance costs against evaluations of asset uptime benefits.

Another fundamental EAM function is to track asset performance, identify poorly performing assets and identify patterns and causes of failures. Based on this information, management can intervene to address recurrent problems and improve processes. EAM systems help businesses to maximise asset performance, uptime, lifetime and return on investment through the principle of constant measurement, learning and adjustment.

The improvement enabled by an EAM system moves companies towards more efficient and productive maintenance models and processes, with reduced short-term and long-term costs. This is largely a matter of finding the appropriate balance between maintenance spending and uptime gains. It should be noted that unlimited investment in maintenance work to avoid downtime is financially counterproductive. An effective EAM-assisted strategy will focus on maintenance optimisation. In other words, it will plan for the right amount of maintenance work, at just the right time, and will schedule bundles of actions to make the most of planned downtime opportunities.

A study of UK manufacturers found that over 50 percent of downtime is caused by hidden internal faults in the machinery. (6)

There are several distinct maintenance strategies to choose from and an EAM system will help to identify the best option for each situation. Across an organisation, the optimum solution may be a blend of more than one of these.

1. Corrective or reactive maintenance, implemented when failures occur, can be very expensive in terms of asset downtime and damage.

2. Scheduled preventive maintenance, in its simplest form, involves servicing assets and replacing parts according to a fixed routine. It can be wasteful, as sometimes the parts are not yet worn enough to need replacing.

3. Usage-based maintenance can reduce such wastage of labour, materials and parts. In this form of preventive maintenance, timing of actions is determined by hours operated or some other measure of asset use.

4. Condition-based maintenance uses measurements such as temperature and vibration to indicate when parts should be replaced. Condition can be checked at intervals, using hand-held devices, or monitored continuously via sensors with IoT (Internet of Things) connection.

5. Predictive maintenance takes this further by using large amounts of data to model component behaviour so that malfunctions can be predicted before they occur. Sometimes referred to as 'smart maintenance', it can be combined with artificial intelligence (AI) and machine learning (ML) for the most accurate predictions.

The costs of these different strategies vary with their differing equipment, maintenance software and training needs. For an asset which is unlikely to present serious downtime and cost consequences, even if it breaks down in service, corrective maintenance may sometimes be the most cost-effective approach.

For a machine whose failure would result in high costs or safety risks, the more advanced maintenance models may be justified. The most sophisticated approaches supported by EAM include reliability-centred maintenance (RCM), which can be used to determine the impacts of changing maintenance budgets and methods.

Amongst many high-level functions, an EAM system can produce instant reports and meet auditing needs with quick and simple access to relevant information. By enforcing and documenting compliance with food safety legislation such as IFS Food 6.1, its EHS software minimises the risk of fines and unplanned shutdowns. If retailers, for example, wish to audit the food processor's maintenance provision, it can easily be shown that the company is compliant, in full control of its assets, and a reliable partner.

Ultimo's cloud-based EAM system gives easy access to its information and functions for every authorised user, via desktop, laptop, tablet or smartphone. Use of mobile devices allows them to connect with assets, oversee maintenance and make records, via the IoT, wherever they may be. This means people can work more efficiently and flexibly, saving time on administration and travel.

Pre-set procedures and checklists ensure that everyone follows the same process every time, so minimising the risk of errors and enforcing best practice. Automatic notifications prompt the relevant managers to review and sign off jobs.

A growing area of mobile technology which can be integrated with EAM systems is virtual and augmented reality (VR and AR). For example, an on-site maintenance engineer might use it to share views of a machine with an expert who can then give live advice and instructions. As well as saving on travel, this helps to make the most of specialist expertise within the business.

EAM systems, in conjunction with mobile and connected solutions like those described above, have a major role to play in future-proofing assets and businesses. With holistic, consistent processes, applied across organisations and sites, assets are fit for high productivity with minimal downtime and long life. By simplifying and streamlining maintenance, and helping to control and reduce costs, they make businesses healthier and more resilient in the face of future pressures. Their flexibility equips companies to meet changes in demand or circumstances with an agile response – even when events are as unexpected and dramatic as a global pandemic.

In the case of Covid, for example, mobile EAM solutions were an invaluable aid to socially distanced working.

Looking further ahead, these solutions will help businesses to retain valuable practical knowledge when older asset management staff retire. In the meantime, their expertise will be effectively shared via the EAM system and will benefit the development of new generations of employees.

ULTIMO EAM – FOR A MORE PRODUCTIVE, PROFITABLE AND RESILIENT FUTURE.

EFFICIENT MAINTENANCE OF PRODUCTION ASSETS TO MAXIMISE UPTIME AND CONTROL COSTS IS ESSENTIAL TO PROFITABILITY IN THE FOOD PROCESSING SECTOR. THREATS TO ASSET UPTIME AND COST CONTROL INCLUDE: OUTDATED AND POORLY PLANNED APPROACHES TO MAINTENANCE AND INFORMATION MANAGEMENT; LACK OF DATA ON WHICH TO BASE SOUND DECISIONS; INSUFFICIENT UTILISATION OF DATA; SLOW, INFLEXIBLE AND INCONSISTENT PROCESSES; AND FAILURE TO RETAIN OR SHARE KNOWLEDGE.

An enterprise asset management system like Ultimo overcomes these obstacles and more with its single-platform data gathering, powerful analytical functionality and user-friendly application. It enables data-driven decisions which streamline maintenance workflows and operations, maximise asset uptime and cut costs. EAM software also ensures that facilities remain audit-ready and compliant with food safety legislation, thus avoiding the great expense of fines and unplanned shutdowns..

Mobile and connected EAM technology allows simple access to the system's information and functions, for greater work flexibility and consistent maintenance processes. Above all, an EAM system helps to future-proof businesses and their assets by maximising asset fitness, conserving financial resources, enabling agile responses to unexpected challenges and retaining valuable knowledge.

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Ultimo is the #1 EAM Cloud platform that provides its customers with control over their assets and an unmatched and proven Return On Investment. Its benefits include increased uptime; management of costs and an extension in the lifespan of equipment; reliable control information; ease of adherence to laws and regulations and the assurance of a safe working environment. With Ultimo you see vital signs and you take vital actions.

Live-link your assets and facilities.

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