



Case Study Pharmaceutical Manufacturing Company

ACCELERATE AND OPTIMIZE MANUFACTURING AND QUALITY DECISION-MAKING VIA MORE COMPLETE DATA AND BETTER COMMUNICATION

The division of a leading pharmaceutical company is seeking to simplify and optimize manufacturing and quality tasks through the rapid flow, integration, and collaborative use of digital information along with greater visibility into product manufacturing and operational processes.

Introduction

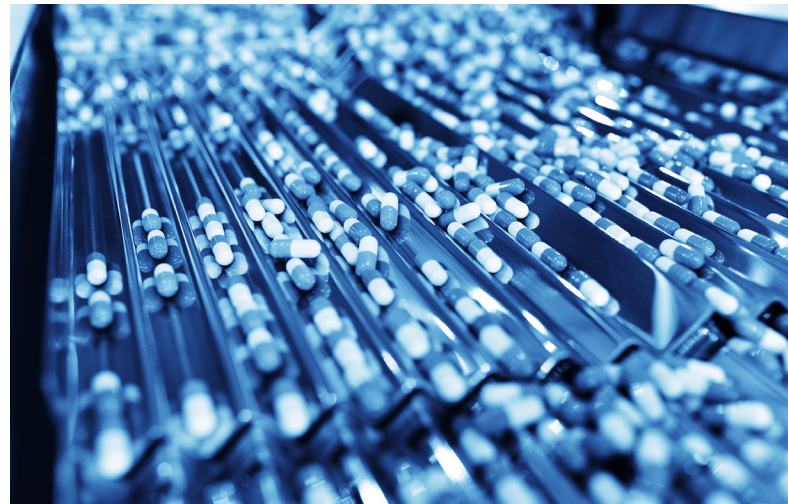
The division uses Keethings to accelerate decision-making on the shop floor and shift its operators' decision-making from a reactive to a proactive approach. To achieve these changes, the division wants to create new human-machine interactions, expand real-time shop floor collaboration, increase communication on its production lines as well as across the plant, and enhance equipment troubleshooting. It also wants to collect information to improve its manufacturing, maintenance, and supply chain processes.

The Challenge

This division is responsible for manufacturing and packaging a variety of consumer pharmaceutical products and wants to reduce the time needed to achieve continuous, high quality production of new products. The division finds that the speed and quality of decision-making on the shop floor, particularly in equipment troubleshooting, dramatically impacts the time to reach a consistent production level. It also found that decision-making in other areas such as quality, maintenance, and planning impacts the time to reach consistent production of new products.

The division believes that faster decision-making can only occur when the decision-makers have complete troubleshooting information and effective troubleshooting guides. It has already digitized data on production, quality, and variance from product specifications. To complete the information that the staff needs, the division wants to deliver better information on equipment status.

Today the operators' ability to maintain and fix the equipment is based on past experience, complex manuals, or contacting colleagues who may have some of the answers but not all of it. So, the division wants to provide maintenance and troubleshooting guides that operators can easily and quickly use. The division also needs to be able to



deliver that data to its operators wherever they are. To improve staff satisfaction, the division wants to change the operators' work situation so they can remotely monitor production problems. Today, operators must stand near a machine to see its alerts and alarms making the operators feel trapped. Also, some machines are unattended because there are not enough operators. The division wants their operators to know the status of all their equipment, monitor more equipment, and be mobile.

The Solution

To improve decision-making on the shop floor and achieve consistent production of new products faster, teams will use Keethings virtual work space to have one conversation around an activity. A virtual work space can be created for a problem, a specific machine, a batch of a new product, or even for an entire production line.

A Keethings virtual work space will display equipment warnings, alerts, and the status of equipment parameters such as temperature and power usage on a touchscreen or

user's smartphone. The relevant operators, supervisor, and machines will be invited to participate in the conversation inside the virtual work space. Equipment data can be delivered via a custom Bot so that the virtual work space receives continuous updates of equipment status and production.

Virtual work spaces and membership in those spaces can be created on an ad hoc or planned basis. Work spaces can be populated with a variety of content. Individuals subscribing to the virtual work space can add comments, videos, images such as screen shots, photos, and even documents and all are able to see the conversation and the information on their smartphone. Subject matter experts (SMEs), engineers and process engineers who may be in other plants, traveling or working on other problems can participate, thereby improving the leverage of their scarce expertise.

A virtual work space records what actions the operator took and if the alarm or warning is resolved. Plant staff can later run reports showing warnings, alarms, actions taken, and the dialog among the staff and then revise operating procedures and troubleshooting processes appropriately.

Within virtual work spaces, the division will solve another problem – guiding the operator to focus on the key alarms. For a particular batch, there may be 100-200 warnings and alarms of which five to ten are critical. The virtual work space can present prioritizations of warnings and alarms to help the operator to focus on the key problems.

The division can employ Keethings' Rich Media Cards (RMC) to present information that the operator can quickly use to respond to an equipment stoppage. RMCs are templates into which documents, checklists, real-time machine data, video, and other information can be formatted and presented. For each alarm and warning, maintenance staff can associate descriptions, help messages, severity level, error family, and other data and create a RMC card. So when an alarm or warning appears in the virtual work space, the appropriate RMC can be presented concurrently to help the operator take the right actions.

The division also will use Keethings to improve human-machine interactions in a proactive manner, termed 'reverse functionality'. A virtual work space can 'ask' the equipment for its status. Based on the machine type and the alarm type, a virtual work space can be populated with a list of five to ten standard questions that help the operator gather and report information necessary to fix the problem. When a senior expert is invited to the virtual work space, the data that he needs is already available to him without him re-asking questions.

Operators will be able to receive warnings and alerts remotely on their smartphone. No longer must they have visual contact with their equipment. They will be mobile and can circulate along the line or even outside the plant

knowing that if an error occurs on a machine that they are not in front of, they will receive that warning, error or alarm in moments along with the information to troubleshoot it. The division can ensure that their data is well protected. Because of Keethings' architecture of premise, hybrid, or cloud-based hosting, it can choose to run entirely within its firewall utilizing all the security available from its IT infrastructure.

Benefits

Most importantly, the division expects to see the benefits of simplified and optimized manufacturing and quality tasks because Keethings makes it easy to invite the right people to engage in a problem sooner so that issues do not need to escalate and involve more people. Information will be delivered to the virtual work space so that staff will not need to be contacted to provide information. With more appropriate staff engagement and faster delivery of more complete information, decision-making will be faster and consistent production of new products can be achieved sooner than in the past.

Virtual work spaces enable a 360-degree view of production – showing production data, troubleshooting activities, and equipment status. Management can make better decisions because they will have greater visibility into manufacturing operations as they will have 'all the right data'.

Keethings will improve job satisfaction as well. With Keethings' software sending warnings and alerts to them remotely, operators will have greater independence, as they are no longer trapped in front of a machine. They will also be able to work on more equipment, making their job more interesting.

The division expects equipment troubleshooting and preventative maintenance to improve, as operators will also now be able to record information about a problem at the moment the problem occurs rather than remembering later. With more data that can also be easily accessible, staff will be able to analyze and contribute to improving the manufacturing processes.

Future

The division envisions a time when its machine control strategy moves beyond just humans reacting to alarms and warnings. In the future, an alarm would first go to the Keethings software that, in turn, would apply logic and send commands to the machine to reset it. In another example, commands could be sent proactively to a packaging machine to adjust its tolerances to improve its fill rates.

As Keethings captures user-inputted information, other systems could extract that data and provide new performance metrics to measure manufacturing efficiency. The division also envisions Keethings enabling it to deliver information that today is difficult to collect and share.

For example, Keethings would combine messages from a machine with real-time equipment production data, test results, or lab equipment status and post them to a virtual work space or other systems in a plant or to users outside the plant. Today combining and delivering such data requires several people to accomplish.

The division sees expanding the use of Keethings beyond a single production line, lab, or batch. It sees Keethings as a way to enable collaboration and communication across other groups such as quality testing, maintenance,

and manufacturing planning. Simply by sharing data and conversations more widely and easily, the division expects to discover new efficiencies that will lead to improved operational equipment efficiency and production.

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