



SUPPLY CHAIN, LOGISTICS, WAREHOUSE AND MANUFACTURING

Real Time Performance Management

TABLE OF CONTENTS

INTRODUCTION	3
Two Kinds of Visibility Are Critical	4
It's About Execution, Not Just Planning	4
Visual Factory and Facility Management	4
Supply Chain Event Management	4
MANAGING HUMAN PERFORMANCE	5
Real-Time Visibility	5
Supporting Kaizen: Continuous Improvement	5
Real-Time Data in Action	6
Powering Six Sigma Efforts in Real Time	6
Real-Time Performance Management	6
Why the Supply Chain?	7
LATENCY IN BUSINESS DECISION MAKING	7
RTPM System Functions	7
Function 1 – Data Collection: Capture the Information	7
Function 2 – Data Analysis: Apply Logic, Gauge Importance	8
Function 3 – Data Synthesis: Arrange, Calculate, Prepare	8
Function 4 – Data Presentation: Report and Get Attention	8
SUMMARY	9
ABOUT KORBYT	10

Introduction

From raw materials to production to the point of purchase, today's large-scale enterprises have warmed to established approaches for process improvements. Their quest is to meet difficult business challenges, such as improving quality, efficiency, productivity and time to market.

Approaches in use are typically proven, established methodologies: Six Sigma, Lean Production, Total Quality Management and others. Some may be used in different combinations, and some have been found to be better fits for specific types of businesses. As different as each methodology may appear, common threads run through practically all of them — a focus on measurement and metrics, and improvement of cycle times.

Especially in Lean and Six Sigma environments, time and quality are the two most important measures. While investments in facilities, equipment and machinery can contribute to solving problems in certain situations, people are always the key to making the metrics, productivity and quality measures the best they possibly can be.

At the simplest level, whether Lean and other quality objectives are met depends on three key determinants:

- How people perform
- Where people direct their efforts
- When people react to key events

Korbyt's real-time visual communication solutions deliver immense value in these environments. Employee-facing information enables organizations to directly and positively impact the How, Where and When across the most granular level of the operation: the people on the front lines who directly control the key metrics with their performance.

Keeping people better informed about key measures in real time fosters a performance-focused environment that can be more readily able to meet stated goals (the How). Additionally, well-informed employees can see where shortfalls against objectives may be occurring, enabling them to turn their attentions where needed (the Where).

Finally, when people are able to see key events occur, they are able to respond immediately (the When). Every organization will have its own set of logistical and tactical hurdles to meet Lean and Six Sigma objectives, or others, but improving time and quality is a universal and never-ending challenge for every operation.



Two Kinds of Visibility Are Critical

Metrics and communication of business events are critical in any organization with a focused approach to improving quality, processes, cycle times and efficiency, whether the operations use one of the brand-name established methodologies or an in-house, ad hoc program. Metrics can be based on quantities or carefully calculated against established benchmarks. Similarly, events can vary in complexity – from a truck arriving to an entire production line change. Every minute of every business day is packed with events and dynamically unfolding metrics. Korbyt's solutions communicate both key events and metrics, in whatever combination is needed, at any time, to assure productivity is being maximized, and that workers are making the most informed decisions on a moment-by-moment basis.

It's About Execution, Not Just Planning

Over the past decade, technology vendors attempting to solve quality and efficiency problems have done so through a focus on planning and coordination. Their solutions have given business managers the ability to streamline schedules, better coordinate supply chains and maintain a handle on inventories and labor – all at a big-picture planning level. There's little question that this approach has succeeded, giving many technology-savvy organizations a competitive advantage.

As these solutions become commonplace and the playing field is leveled, supply chain managers need to find clever new ways to capitalize further on their technology investments and give their organizations a competitive advantage.

Korbyt solutions apply technology in a way that's entirely different yet complementary to what's gone before. This is a trend that many believe will usher in the next decade in process improvement.

Korbyt's real-time solutions also make it possible for managers to alter how they manage toward key metrics within their established methodologies, such as Six Sigma. With a Korbyt solution in place, managers are no longer limited to feedback loops measured in hours or days. If something isn't working – or if something is working exceptionally

well— associates can see the results as they unfold in real time, rather than after the fact. Real-time information empowers employees to make real-time decisions.

Visual Factory and Facility Management

Visibility of key events, metrics and/or productivity data on the shop floor communicates goals and motivates employees, while highlighting a focus on achieving key measures. Today's information systems are designed to deliver a world of detailed performance data on material, transportation and labor management efforts.

Tragically, this valuable data often resides inside the system and isn't easily accessible by employees and managers, who could use the data to deliver value. Some existing systems do provide the capability for performance feedback, but they typically require that employees actively see the answers for themselves, in a way that's counter productive to the natural flow of work. Logging into a computer and digging for data creates a gap between the performance and the management of it.

Korbyt realtime solutions let managers bridge the gap between systems and people, putting information to work where it can make a difference as quickly as possible. Korbyt also enables organizations to push the information to the forefront, so that it is clearly visible within the workflow environment on the floor.

Supply Chain Event Management

As supply chains become leaner, even the smallest exception or event can cause a major disruption in a company's material and labor flow. Supply Chain Event Management (SCEM) is the practice of managing based on key events and minimizing their impact on a smooth and consistent flow of product or work being done.

Event management becomes easier with Korbyt technology as part of the solution:

- Korbyt is highly experienced and adept at monitoring diverse systems, filtering exceptions and events based on customized logic.

- **Korbyt can present actionable information to the proper audiences in real time.**

This enables a company to act immediately on exceptions – or on any event that impacts its supply chain – and modify processes and behaviors to maximize responsiveness and productivity. In many organizations, mere minutes of downtime or delays can cost staggering sums of money.

Korbyt real-time solutions enable the fastest possible response to key events, slashing costly downtime and delays. When facility and team measures are delivered to associates in real time, associates modify their behavior to improve their productivity without waiting to be told.

In many facilities, it's a common practice for associates to gather around PCs or bulletin boards near shift changes to see how their teams performed. Or, they'll view the previous day's numbers before they start the current day's shift.

While this is an acceptable practice, the figures on the monitor or on the bulletin board are final numbers: they cannot be changed. If numbers are less than stellar, all a team can do is hope to improve their performance during the next shift. Conversely, when performance statistics are delivered to the employees at their workstations in real time, they can maximize their performance by putting this information to immediate use.

MANAGING HUMAN PERFORMANCE

Real-Time Visibility

One popular methodology in use in Lean Manufacturing today is Mixed or Level-Loaded Production, also known as "Heijunka." This practice is essentially a tool developed by Toyota that allows companies to reduce inventory, decrease lead times and produce a variety of products on demand through a diversely trained workforce and systematic scheduling. Responding to data delivered to them in real time, associates on the floor can contribute to the success of a Heijunka program by more rapidly addressing bottlenecks as they arise and leveling workloads across production centers. Even when product is moving smoothly through a facility, associates should know if they are on pace with

current requirements. Real-time visibility tools give associates an instant view of downstream demands and upstream deliveries, and enable work centers to meet Takt time (a key throughput-related time metric) requirements in a Lean environment, even if the pace varies during the shift.

Supporting Kaizen: Continuous Improvement

Kaizen, a philosophy of continuous improvement popularized by its successful use at (again) Toyota, is another guiding methodology in use by many organizations today. One of the keys to success in a Kaizen environment is a high level of communication among all floor personnel.

Successful Kaizen programs are able to:

- **Compress order-to-delivery cycle times, while maintaining superior quality.**
- **Use methods to standardize operations, compare them against valid requirements.**
- **Improve on these operations to elevated requirements.**

Kaizen is an ongoing, cyclical process designed to facilitate continuous improvement.

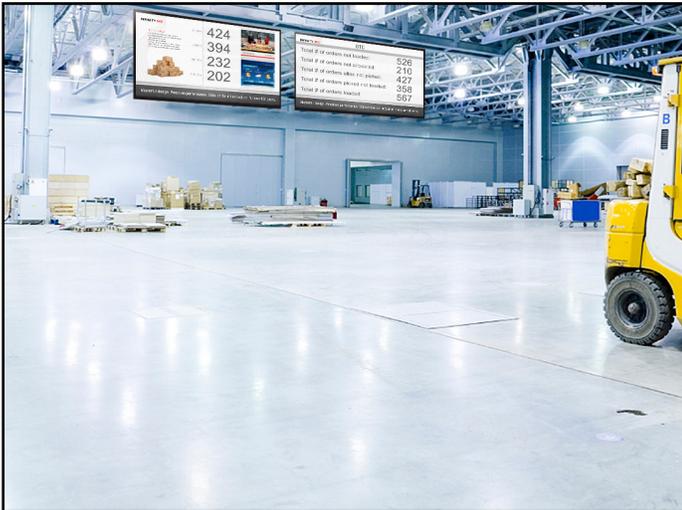
A keystone of a Kaizen program is to ensure that products and operations begin with the highest quality at their source. In using Korbyt's real-time visual solutions, one Lean manufacturing customer was able to increase productivity dramatically, while reducing the waste and scrap rate of their products throughout their supply chain.

When a defect or variation is discovered, Korbyt visual solutions can notify workers up and down the production line to trace the defect back to its root cause immediately. How much better is it to do so there and then, instead of an after the fact analysis in an office or from reports that are disconnected from the real-time production flow.

Simply showing real-time data, such as defect origin, key employee location and production to Takt time requirements, has enabled this Korbyt manufacturing customer to decrease defects, slash rework and scrap, and increase productivity by as much as 20 percent.

Real Time Data in Action

In one Korbyt deployment, throughput of teams at one facility is monitored against target objectives and displayed continuously. If performance falls below a certain threshold, teams and individuals are alerted by their names changing in color from green to red on strategically placed Korbyt NetLite II wallboards. These large format LED displays serve as real time performance scorecards for the center.



The senior vice president of logistics and distribution observed, “For my employees to meet their goals, they all know how to turn red to green,” noting also that the easy-to-understand displays also transcended any language barriers.

Associates at the center are empowered by knowing where they stand in regards to production quotas and quality metrics. Armed with this knowledge, workers can make immediate decisions that impact their job performance, such as working beyond their quota to achieve productivity bonuses, taking advantage of training opportunities upon meeting objectives and using “extra” time to perform maintenance or improve their center’s efficiency.

Senior management has noted higher productivity and more engaged supervisors, who now spend more time on the work floor, instead of monitoring results in front of their PC in an office.

Powering Six Sigma Efforts in Real Time

The heart of a Six Sigma program is the reduction of variation, and it is managed by a relentless statistical process to guide a company toward

the extraordinary Six Sigma level of 3.4 defects per million opportunities.

When following the processes of Define, Measure, Analyze, Improve and Control (DMAIC), the shorter the feedback loop, the more quickly and effectively one can implement the Improve step. Korbyt solutions gather the raw data in real time from the processes that are defined in a Six Sigma system. This input is the Measure of the processes and results, and it feeds directly into Korbyt’s SES analytical engine. The software’s logic then Analyzes the measures and calculates the pertinent metrics in real time.

The results are then communicated directly to the workforce in real time to help associates uncover areas to Improve. Korbyt’s real-time collection of data, metrics calculation and communication can bring an unprecedented level of Control to Six Sigma processes.

Korbyt visual solutions enable associates to receive immediate feedback on their actions, providing visibility of performance-to-goal statistics in real time, and as a result, giving them the opportunity to modify their behaviors to affect the optimal outcome of the process. It’s truly a radical shift in how performance is monitored and managed. With most traditional reporting practices, associates wait until after the fact to view their performance in relation to individual, team and company goals, by which time it is too late to modify behavior to meet or exceed tactical objectives.

Real-Time Performance Management

Real-time performance management (RTPM) is the sum of processes and techniques required for compressing the time between an event and the response. The focus of RTPM is to quickly utilize information for which value diminishes over time, thereby improving the speed and quality of decision making to improve performance, optimize throughput and avoid – or at least minimize the cost of – errors.

To date, RTPM systems have been deployed widely by many thousands of businesses worldwide. One industry where RTPM has been embraced is contact centers – an industry whose livelihood is strongly dependent on smart front-line decision making and the productivity of individual workers.

Early on, RTPM was an ideal fit for this industry, because the technologies at the heart of a contact center – phone switches, computer servers and other hardware – were simple to monitor for reporting purposes.

From a single phone switch, for example, it is possible for the reporting system to know the work status of each employee and monitor it over the course of a work day. It's also possible to see information that would otherwise be unknown, such as how long customers are waiting on the line on average (cycle times), what the longest call waiting is (bottlenecks) and much more. In a business where the key measures are speed and customer satisfaction, it's easy to see why RTPM would be highly valued and successful.

Why the Supply Chain?

The concept of introducing the technologies of RTPM into the supply chain is new, but is a very natural progression. Just consider how pervasive technology has become throughout the entire supply chain over the past few years. From transportation systems to RFID to automated equipment, somewhere within every operation today, computer systems are in use that “know” highly valuable information that could be of great use somewhere else.

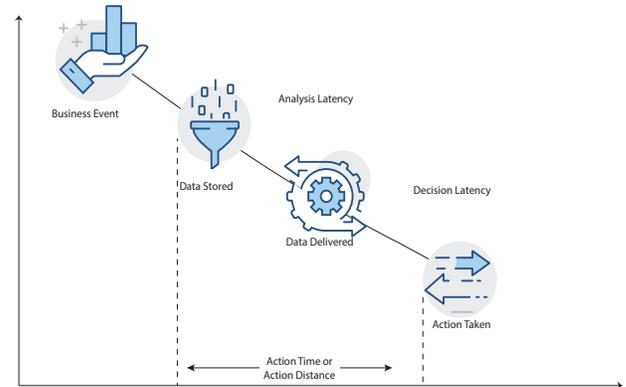
Just a few years ago, this was not the case, or systems were isolated islands within a larger sea. RTPM systems are designed to leverage greatly the value of existing systems by facilitating the flow of information, accelerating cycle times by automatically communicating key business events and keeping front-line workers apprised of key performance metrics persistently.

RTPM doesn't seek to replace any existing tools. Daily reports will still be valuable; weekly and monthly reports will certainly always have value in the quarterly review meeting.

RTPM leverages the technology that's already in place to make an impact here and now, or to reference an earlier section, the Where and When.

The information presented by the RTPM system is usually familiar already to the audience it reaches, so no learning curve is experienced. What is new is the immediacy in which the information is available and upon which it can be acted.

LATENCY IN BUSINESS DECISION MAKING



The above graphic portrays the traditional event/response model. The value of responding to an event declines in relation to the time it takes to execute the intermediate steps. RTPM is about compressing the time between the intermediate steps and moving the Action Taken closer to the Business Event.

RTPM System Functions

RTPM systems can be segmented into four distinct functions:

1. **Data Collection: Capture the information**
2. **Data Analysis: Apply logic, gauge importance**
3. **Data Synthesis: Arrange, calculate, prepare**
4. **Information Presentation: Report and get attention, if necessary**

Function 1 – Data Collection: Capture the Information

The first task of an RTPM system is to proactively collect, in real time, the operational statistics generated from multiple systems, including:

- **Warehouse management systems (WMS)**
- **Labor management systems (LMS)**
- **Manufacturing execution systems (MES)**
- **Transportation management systems (TMS)**
- **SAP and other ERP systems**
- **Production line equipment (actual PLCs)**
- **Inventory systems**

These systems likely come from numerous vendors, interface with multiple facilities and are housed in diverse locations throughout a global enterprise. RTPM systems typically gather information through the use of data interfaces, or “collectors,” that interconnect the RTPM system with each technology.

State-of-the-art RTPM systems, such as Korbyt's product line, provide a large portfolio of pre-fabricated data collectors that can be installed and deployed quickly and unobtrusively. Less sophisticated systems require data collectors to be custom built, or "hard coded," for each specific implementation. This process can prove troublesome over time whenever change is necessary, as each custom component can require expensive, lengthy retooling to regain its original function.

Such state-of-the-art solutions are also designed to scale easily across large facilities, multiple sites and even across the globe, if needed. Once the data has been collected, the RTPM system temporarily stores this massive volume of data in preparation for use in the subsequent analysis function.

Function 2 – Data Analysis: Apply Logic, Gauge Importance

The second task of an RTPM system is to identify whether the collected data is of importance, and if so, to what degree. This function, called the Analytics Phase, uses established, defined business rules to identify anomalies in operating trends that occur quickly and evolve over a period of time.

The analysis can be as simple as seeing that a product sorter's output has suddenly dropped dramatically, or that an abnormally large number of cartons are waiting at the docks, delaying outbound shipments.

The RTPM system also can spot subtle problematic trends through sophisticated comparisons between real-time data and historical data amassed over days, weeks and/or months.

Once the anomalous operating trends have been identified, the management team will find itself better prepared to avoid the disruptions most common to operating a distribution center or manufacturing facility. Of course, not all information that passes through the system even needs analysis.

But the greatest value of the RTPM system can be derived when it is used to its fullest extent. When something is going slightly awry, a warning can be subtle. If it continues to go further off course, the alert can be more urgent.

Function 3 – Data Synthesis: Arrange, Calculate, Prepare

Due to the high volume of data being collected

and analyzed, it would be nearly impossible to present the entire body of content in a manner that would facilitate rapid decision making. Therefore, the third function of the RTPM system is to filter, coalesce and prepare the data in order to create usable information that can be quickly and intuitively acted upon by the relevant parties within the enterprise.

For example, information relevant to associates, such as productivity per hour or team progress to goal, is presented directly to the associates. Information that is important to management, such as facility productivity and work center balancing, is presented to the managers.

The RTPM system filters out extraneous information and packages the relevant metrics in such a way that they can be understood easily by their intended audience. The filtering and repackaging of data into actionable information is entirely dependent on the organizational measures that management deems appropriate and the formats in which they ultimately want to see the information.

Function 4 – Information Presentation: Report and Get Attention, If Necessary

The last function is to deliver the information via a display medium that is best suited to:

- **Gain the attention of people tasked with responding and/or the affected teams.**
- **Fit the facilities, culture, methodologies and leadership of the organization.**
- **Facilitate a "live scoreboard" of operational performance as desired.**

In addition to personal managerial preferences, the physical constraints of the working environment usually play the greatest role in the type of display media chosen for any given application. Large open floor spaces with distant sight-lines and mobile workers lend themselves to fewer, larger high-visibility displays, while smaller, more confined environments with non-mobile workers can lend themselves to video-based or desktop PC software-based displays and even mobile device apps.

Sophisticated RTPM systems should provide a range of distribution and display options for presenting important content to individuals or groups throughout the enterprise, without forcing a particular type of display or presentation format

where it's not appropriate. A good system should allow managers to choose the medium best suited for delivering information – one that captures the attention of their teams without being intrusive to workflow in any way.

Today's modern RTPM systems also provide the ability to distribute the same content to different display media and in different formats to suit the respective media. For example, "cartons to be loaded" information may be shown in a table on a desktop display but may be presented as scrolling text on an LED wallboard or as a simple many text message on a mobile screen.

The hallmark of the fourth function of an RTPM system is to get the right information, to the right people, in the right format, at the right time, so that risks to operational effectiveness and opportunities to improve it can be seen quickly, understood and acted upon.

SUMMARY

Over the past several years, all the pieces have come together to enable great shifts in how companies are able to manage their manufacturing operations and supply chains, streamline inventories, and maximize efficiency and productivity. To this point, technology has solved planning problems with great agility.

With global networks and interconnected systems, managers today are able to see and coordinate the big picture of their operations with unprecedented ease. The next evolutionary step in applying technology to the supply chain is at the execution rather than the planning level. This will empower workers on the front lines with information they need to perform to goals and to make smarter decisions throughout the work day.

Korbyt solutions provide an extraordinary set of tools for improving productivity via general RTPM practices, as well as complement any process

improvement methodologies, such as Six Sigma, Lean, Kaizen, Total Quality Management and others. Korbyt solutions are an ideal fit because these proven methodologies are developed around metrics, cycle times and the communication of critical business events. Korbyt solutions leverage existing technology investments to communicate events and metrics exactly where needed, when needed, in a way that makes sense and that captures attention – all in real time.

Korbyt solutions are designed to align your workforce with business priorities as they unfold in real time, using innovative display, server and interface technologies that have led the industry for more than 30 years. Organizations can unleash the productivity enhancing power of real time data from systems of all kinds.

For rich, real time data displays, the breadth and depth of Korbyt's solutions are simply unmatched, with options from PC desktops to Wi Fi enabled video screens, LED wallboards and mobile devices.

When your business is ready to integrate your systems with real time visual communications, Korbyt can tailor a solution perfectly to your needs and get it deployed rapidly ,

- Real time and historical performance tracking
- Productivity data with alert triggering
- Problem notifications that adhere to established business rules
- Real time and historical performance web based scorecards and reports
- Real time data delivered to many end points, such as mobile phones, desktops and digital signage
- Enterprise video for corporate communications and data display





ABOUT KORBYT

Korbyt is the global leader in intelligent digital signage solutions. Korbyt goes beyond traditional communications to help businesses increase productivity, efficiency and engagement through digital messaging. By combining best-in-class software,

predictive analytics, and AI-assisted engagement tools with the most flexible content delivery ecosystem, Korbyt offers a single point of reference for integrated data visualization and real-time performance management.

Powering more than one million digital signs and displays, Korbyt delivers real-time information, insight and relevant content for mission-critical applications.