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## **Business Drivers and Job Scheduling**

This White Paper discusses the central role in the data center that job scheduling has played over the years and how that role is evolving. This paper highlights what users should look for as the market moves from traditional batch job scheduling to cross-platform and event-driven workload capabilities. The paper addresses key concerns driving IT management and how they translate into needs that can be addressed through job scheduling and process automation.

This White Paper also looks at the role of JAMS in addressing the automation requirements of the various personnel in IT -- Data Center Managers, Operations Staff, and Application Developers. JAMS helps IT organizations optimize the performance of batch processing across the enterprise. Key capabilities of JAMS include cross-platform scheduling, event-driven workloads, MS Workflow Foundation integration, and PowerShell and SharePoint support for Application Developers.

### **Introduction**

Traditional batch job scheduling held that business processes could be mapped out and executed in predictable patterns that followed business calendars. The idea was that certain business activities, and the systems that supported those activities, operated in sequential, predictable ways. Batch Job Scheduling tools were designed to support these monotonous routines. However, not all business units within the organization were working according to the same calendar and/or schedule.

For example, the finance department may base their activities on a calendar fiscal year, with an emphasis on monthly, quarterly, and year-end processes. Within the same company, manufacturing may adhere to a completely different schedule, with an emphasis on weekly processing for planning shipments and providing inventory analysis. Manufacturing may also have to deal with events that are irrelevant to the finance department, such as cyclical plant shutdowns and holiday periods.

The economic climate of today requires companies to respond very quickly to changing business conditions. With the above in mind, it might still be viable for a company's fiscal operations to run on a regular basis. However, reality dictates that manufacturing must be able to respond to market conditions very quickly in order to compete successfully. Economic pressures and changing business requirements mean that manufacturing must automate its processing systems in order to respond quickly and stay competitive. Automating key business processes in order to improve a company's responsiveness to the changing business climate requires a solution that is easy to use and implement, works across multiple platforms and applications, and fulfills the goal of enterprise process automation.

Traditional batch job scheduling products cannot meet today's enterprise automation needs, leading to the creation of a new type of solution to handle increasingly complex and demanding business requirements. This fast-paced business climate demands that IT staffs build infrastructures that create responsive and flexible platforms. Job scheduling tools with their rigid adherence to the limitations of automating tasks based on day, date and time don't meet this

requirement. New solutions are required that can automate and accelerate existing business processes and adapt to new processes and systems as they arise.

### **What is Job Scheduling?**

By definition, job scheduling is the orderly, reliable sequencing of batch programs. To handle these tasks, job scheduling software provides a host of features that allow it to schedule distributed workload efficiently and in a manner consistent with the goals of the business. For instance, all businesses rely on one or more business calendars. Calendars govern such things as when payroll is run, when reports are generated, and when fiscal months and quarters close. The key issues with calendars and other important scheduling features are flexibility and reliability: Can the scheduler adapt to the changing needs of the business, and deliver predictable results time after time?

Additionally, programs and applications need to run on a variety of platforms, at specified times, in specified sequences, and with varying levels of resource demands and prioritization. Schedulers need to be flexible enough to accommodate these varying technology, business and resource demands. If the job scheduler is able to sequence processes and manage resource conflicts, applications will execute faster and more predictably, and scheduling efficiency will increase. Unfortunately, most scheduling products only focus on sequential activities and ignore other events that could impact the overall productivity of the organization.

### **The Evolution of Job Scheduling**

Job scheduling has been around for decades and dates back to the mainframe where all business activity was driven through batch transactions. When an organization begins to manage its batch workload, most firms inevitably launch their jobs manually which require a great deal of human intervention. This is understandable and even appropriate, but it is also easy to see how quickly this approach breaks down as the number of machines, jobs, and scheduling dependencies increase exponentially.

Most operating systems provide a command line interface for launching tasks in a manual fashion. Microsoft Windows provides the Windows Task Scheduler that allows users to launch tasks immediately or at a specific time. Database personnel tend to lean on tools like SQL Server Agent while UNIX systems rely on Cron. These solutions represent the 'bare bones' of job scheduling and are in no way adequate for complex scheduling requirements that involve triggers, complex calendars, resource-based scheduling and alerting if and when processes fail.

### **Event-Based Scheduling**

To accelerate application processing, automation products must respond dynamically to the changing state of the business as represented by changes in the corporate data. Take the case where the inventory of a part has dropped below its reorder level. A typical scheduling approach would run a job at some interval – daily or weekly – to determine inventories. If the corporation wanted to accelerate this process, it would need to write a program to check this reorder quantity and take some subsequent action, such as ordering more parts. Depending on the nature of the application, several programs might need modification, which could potentially take significant time and money.

An event-based scheduling solution can accelerate this process with a completely different approach. With minimal effort, the solution can be configured to analyze changing application data and trigger events based on that data. The design of the solution allows it to interrogate a data value, check its status, and initiate events immediately or at some future time. IT personnel are then in a position to accelerate business processing without making expensive modifications to program source code.

## The Role of Business Applications in Job Scheduling

The surge of business applications from vendors like SAP and Oracle lead to additional changes in the distributed job scheduling world. Job scheduling traditionally emphasized the management of the various components in the IT infrastructure – the servers, network devices, CPU's databases, etc. Each of these components needed to be managed and monitored in some fashion and tools began to appear that addressed each of these areas.

Over time, IT personnel have been brought into the “mainstream” and have come to realize that focusing strictly on a given server or device without regard to the applications that these components supported was missing the big picture. As ERP vendors flourished, the goals became clearer and clearer – manage the business applications and not just the individual components. Most of these ERP vendors deliver some type of scheduling and management capability as part of the overall solution. However, in terms of job scheduling, this built-in functionality once again creates issues as each proprietary scheduling solution was designed with only its related ERP system in mind.

### Windows PowerShell

Microsoft recognizes the importance of batch processing to its enterprise customers and created Windows PowerShell to help address these requirements. PowerShell is a scripting language that provides more than 100 command line tools. Windows PowerShell consists of a command line shell and scripting language that allows IT Managers to pipe native .NET objects between commands.

With access to the entire .NET framework, Windows PowerShell can manipulate applications and data as well. Using PowerShell, IT Managers can accelerate automation and streamline batch processing. As PowerShell becomes more and more adopted by enterprise customers, job scheduling vendors will open up their solutions to PowerShell in order to take advantage of the additional functionality and flexibility provided.

### Key Concerns Driving IT Management

With all of the above in mind, IT Managers must ensure that the job scheduling solution that they employ helps to address key business objectives.

**Contain costs and achieve efficiencies.** Controlling IT costs continues to be a key requirement for IT organizations. IT budgets have been under pressure for a number of years and operational costs are significantly related to the number of IT staff required to perform specific functions. As automation streamlines many business functions, business process automation is critical to containing or reducing operational costs.

**Align IT with the Business.** In the new world order, IT is viewed as a service provider to the business, providing and managing services that deliver and support key business processes and applications. IT Management is now responsible for meeting SLA's for the various business units IT supports. Failure to do so results in poor customer service ratings and slower “time to market” for business applications.

**Meet Service Level Agreements (SLA's) and Key Performance Indicators (KPI's).** Service objectives for key processes must be achieved. Batch processing and completion times must be compared with service objectives, with provisions for resource allocations in order to meet business requirements.

**Improve the utilization of the existing infrastructure. “Greening IT.”** IT has always been under pressure to improve the efficiency and ROI of the IT hardware and software that have

already been deployed in the datacenter and throughout the organization. Now, with energy costs rising, IT Managers have yet another line item in their budget that is soaring. Allocating resources efficiently and improving process utilization are critical functions for ERP applications, databases, and transaction processing.

**Workload Balancing.** Workload balancing ensures that scarce computing resources are allocated appropriately among competing tasks and applications. Managing resource conflicts is of paramount importance when it comes to batch processing. Within the batch processing environment, IT Managers create multiple queues with varying degrees of priority to ensure that the most critical processes are run when needed, even if this means that these critical processes are run at the expense of less important processes. In order to increase the efficiency of the organization, an ongoing effort to analyze these loads is critical.

**Create workflow automation.** While automation continues to be a key strategy for improving IT efficiency, it is increasingly viewed as a means to ensure that required workflows and processes are executed correctly. Fundamentally, job scheduling software is used to manage the flow of work on systems. Many business processes are based on the completion of complex job sequences that are controlled by job scheduling software. Enterprise job scheduling brings automation and centralized control to the execution of the steps needed to execute business workloads and processes.

**Regulatory Compliance and Security.** Security and auditing have become increasingly important as batch job scheduling has expanded from its traditional role in the IT Department to its new role where everyone from IT Management and Application Developers to everyday users are exposed to the job scheduling system in some way. A job scheduling solution must be flexible and easy to use so that people in various departments can take advantage of the functionality. At the same time, the solution must provide a secure model so that users are only exposed to the functionality that they need in order to get their job done efficiently.

A secure batch processing system that meets regulatory compliance requirements will require varying levels of access to the system. While some members of IT will need full access to the solution, other users will need to be able to submit jobs while others may only be allowed to view the schedule. User-level security provides enough specificity to allow or deny access to the complete range of functions within the product.

### How JAMS Helps

JAMS represents the next generation of batch scheduling and workload management solutions. It represents an evolution from classic job and task scheduling to consolidated job management of pooled resources and to dynamic, automated, policy-driven workload management supporting business service objectives.

Listed below are key Business and IT issues that JAMS addresses.

**System-Level and Application-Level Scheduling.** System-level job scheduling invokes applications and does not include much detail of applications. Many enterprise applications, such as ERP solutions from SAP and Oracle, include their own simple batch processing engine as part of the ERP solution. However, these built-in solutions cannot support a variety of applications that may demand a batch processing engine. Since JAMS is delivered with exposed API's and built-in PowerShell and SharePoint support, JAMS snaps into all customer and packaged applications, thus allowing you to tie the processes together seamlessly from one application to another.

**Multi-Platform Support.** Job scheduling was initially designed to process workloads running in mainframe environments. Today, most organizations require some form of automation on every platform across the company. JAMS addresses this issue by delivering native support for a

wide range of platforms, such as Windows, UNIX, Linux, and OpenVMS. JAMS works across all of these platforms simultaneously, so that jobs can be coordinated across the enterprise. Using JAMS, a single group of IT staff can manage the schedules across multiple platforms without requiring specialized platform or application expertise.

**Development Solutions.** Most job schedulers are designed with Operations personnel in mind. With both PowerShell and SharePoint support, JAMS serves the development community as well. Developers are able to snap JAMS into their own custom applications, resulting in a faster “time to market” for custom applications.

**Event-Driven Job Scheduling.** Most job schedulers are driven by time-of-day and calendar processing requirements. The large growth in online and distributed applications has raised the need for event-driven scheduling. JAMS excels with event-driven job scheduling and extends automation to real-time and online applications.

**Workloads.** A workload may be defined as a related set of jobs or tasks that need to be executed. JAMS provides a clear view into workloads and the dependencies that exist within workloads. JAMS provides resource-based scheduling capabilities so that jobs and tasks will not run if the required resources to run that particular job or task are not available.

**Workflows.** A workflow depicts a sequence of steps that must be performed to accomplish a business process. Workflows revolve around the idea that each step involves rules and tasks that must be processed and passed on to the next step. JAMS provides comprehensive MS Workflow Foundation support. As a result, JAMS relates batch processes to the applications being supported. When a process or job does not run successfully, JAMS highlights the impact on the application and/or business unit that is being supported by that process.

**Security.** JAMS improves security over and above other scheduling solutions. JAMS allows you to specify various levels of access to JAMS. User A is allowed to create and manage batch processes. User B is allowed to submit jobs but has no ability to edit any processes. User C is allowed to view the schedule and see when jobs complete, jobs have been aborted, etc. The security model allows you to drop users into the various access levels you have created.

“To me, the thing that sets JAMS apart is the security model. That is specifically what I was looking for, the ability to control who can submit jobs, and who these jobs can run as. This is giving us a good way to delegate functions that run as privileged users to non-privileged users.”

Disciple Data, Inc. ([www.ddi.org](http://www.ddi.org))

## Crane Plastics and JAMS

Crane Plastics is an ISO 9001- 2000 registered manufacturer and supplier of quality custom plastic profile extrusions and a recognized leader in the thermoplastics industry for more than 60 years. Crane Plastics specializes in custom plastic profiles in PVC, wood composite, foam PVC, ABS, PP and other specialty thermoplastic raw materials in single, dual and tri-extrusions. Their two plants are located in Columbus, Ohio and Jacksboro, TN, and operate three shifts, 24 hours a day, five days a week.

As EDI became a standard way of communicating with clients, Crane Plastics was faced with the challenge of how to take customer information and turn it into a format that would flow seamlessly through the company’s ERP solution. As a long-time JAMS customer, the company once again turned to JAMS for an answer. Now, when Crane receives data from its customers, JAMS runs a number of processes in the background which take the data and turns it into orders that are then automatically pulled into Crane’s order entry system.

With goals of becoming a billion dollar company in the coming years, Crane Plastics can ill afford to have any hiccups when it comes to customer's orders. Senior management at Crane sleep easy at night knowing that JAMS is processing customer data 24 hours a day, 7 days a week.

### **Conclusion**

In today's business climate, there is a demand for process automation that spans a wide range of platforms and applications and, at the same time, offers comprehensive functionality and is easy to use. Users need to be able to take advantage of the implemented solution without spending countless hours in training sessions with the vendor or worse, bogging down their own internal help desk.

JAMS provides these capabilities and more in a straightforward and easy to implement solution. With a 20-year track record of success, JAMS is used by hundreds of organizations, both large and small. JAMS is used by one of the world's leading financial organizations to process more than 100,000 jobs per day and, at the same time, JAMS is being used by a regional SaaS provider to process healthcare claims online. Regardless of the complexity or simplicity of your batch processing and automation requirements, JAMS can help.

**For More Information:** To find out more about how *JAMS* can help you, contact us at:

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