

Disaster Recovery Eased with Juggler

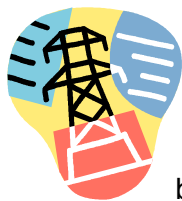
Recover rapidly from unexpected and potentially devastating events such as power outages, machine failure, data corruption, and transportation stoppages.

Businesses all over the world face resource optimization challenges . . . some occur routinely while others arise unheralded and unforeseen. In both cases, the issues are strategic and complex, and the solutions non-trivial. Accurate and timely resolution of these strategic challenges can make the difference between profit and loss.

Dynamic resource allocation is crucial to those markets where there is a high degree of task complexity, the need to optimize resource allocation given multiple constraints, and to optimize and reoptimize in real-time due to changing conditions such as resource breakdown.

Juggler not only helps businesses optimally juggle their routine, but complex resource challenges, but also helps users recover rapidly from the unexpected.

Power Outage Recovery



Plant/shop failure due to a power outage results in total loss of production. Usually, time to power recovery is indeterminable, and rolling blackouts may persist once power is restored. Further, in an ongoing energy crisis, businesses may be required to conserve power.

In August 2003, an energy crisis resulted in massive power outages from the U.S. Mid-West to the Eastern seaboard and the Province of Ontario in Canada affecting 50 million people. Automobile and aerospace manufacturing and the work of their job

shop suppliers came to a standstill. More than 50 assembly and other plants in Canada, Ohio and Michigan operated by General Motors Corp., Ford Motor Co. and DaimlerChrysler AG's Chrysler Group were paralyzed, leaving tens of thousands of workers idle.

During the initial stages of recovery, Ontario consumers who were lucky to receive any power, saw rolling power outages of 4 hours on and 1 hour off. A week later, and the entire Province was still in a state of emergency: government services (offices, libraries, leisure centres) were closed, and businesses and home owners were still being asked to conserve power. Summer power consumption peaks in the afternoon and evening, pushing the utilities close to applying a rolling blackout scenario even a week after the initial blackout event (Fig.1).

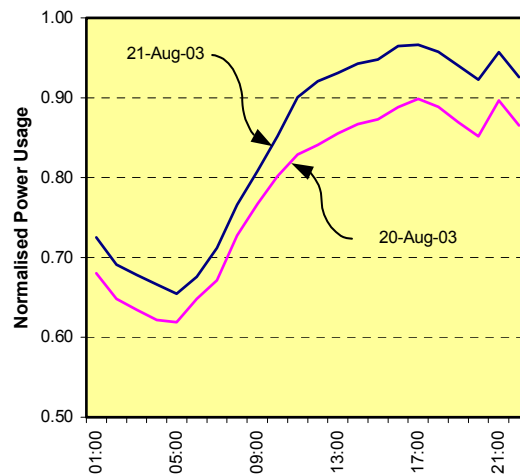


Figure 1: Blackout Recovery - Ontario electricity usage normalized to available power (Source: Independent Electricity Market Operator's Website)

Juggler provides its users with an up-to-date, full catalogue of the job portfolio. On a (battery-powered) laptop, business/client service managers will be able to perform

what-if scenarios during the power outage, and begin advising their clients of their work-around solutions and new delivery dates. Within minutes and even seconds, they acquire new optimal schedules ready to run when power is restored. If they had previously optimized the schedule for minimal cost, they might now choose to optimize for fastest delivery to lessen the inconvenience of the outage on their clients and to maximize goodwill.

California has also suffered an energy crisis and rolling blackouts. In January 2001, the CEO of ISO, the company that manages the State's major power grid said "Consider the millions and millions of customers and let's do quick math. I've got one 100-watt bulb, and 1 million customers turn off one extra bulb. That's 100 megawatts. We've got 10 million customers, so if they all turn off one bulb that could be 1,000 megawatts. You get the picture: Conservation can really make a huge difference."

Environmentally conscious businesses may carry out public power conservation requests, during state of emergencies and at other times, by choosing the minimal power consumption option in *Juggler*.

Since each schedule takes only seconds to optimize, a new option could be re-run as soon as factors change. For example, a low power consumption schedule could be run for the afternoon and evening shifts, and fast delivery for the night and morning shifts (Fig.1).

Machine Failure Recovery



Individual or grouped machine failure due to part failure, or perhaps a contained fire results in partial, though probably significant, loss of production. Whether this machine loss is short-term, long-term, or

permanent, *Juggler* eases recovery.

The business will immediately alert the software of which machines are unavailable and within seconds reoptimize all in-process and booked jobs for the remaining machines. Customers may be advised immediately of the new delivery times. If previously the schedule had been optimized for lowest cost, the business may now choose to optimize for shortest delivery time in order to maintain goodwill with its customers. Jambalaya's clients and their customers can be assured that the new delivery times are the best that can possibly be achieved under the circumstances.

Whilst the damage is being assessed, and especially if replacement machines are likely to be required, 'What If' scenarios might be run by Managers to determine which machines might be the optimal replacement/s for the portfolio of jobs typical for that business, or optimal to attend to a new business opportunity.

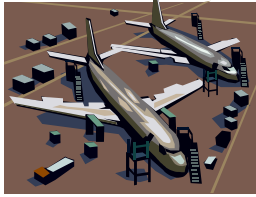
Jambalaya is available for consultation in a client's 'What If' scenario phase, and can help guide the client in the choice of new machines in the event of irreparable damage.

Data Recovery

	+2.000
0	+5.000
1	+1.500
0	+1.125
0	+1.062

Jambalaya recommends basic disaster recovery methods to its clients for protecting the job database used by *Juggler*. Regular backing up of the data is essential, as is storing a copy off site, such as on a remote server. On a fee for use basis, Jambalaya offers clients the ability to upload their data to Jambalaya's secure website.

Transportation Stoppage Recovery



Transportation stoppages resulting from power outages, strikes, terrorist threats, ice storms, tornadoes, flooding

and other natural disasters can affect trams, trains, planes, and even cars. Both commuting and shipment traffic can be impacted.

For transportation stoppages local to Jambalaya's clients, the impact of the subsequent absence of key personnel can be addressed by *Juggler*. Where these resources operate critical, value-generating assets, the impact is clearly devastating for business; the bottom line and goodwill.

The business will immediately alert the software of which employees will be absent and within seconds reoptimize all in-process and booked jobs for the machines that operators are available. Customers may be advised immediately of the new delivery times. If previously the schedule had been optimized for lowest cost, the business may now choose to optimize for shortest delivery time in order to maintain goodwill with its customers. Jambalaya's clients and their customers can be assured that the new delivery times are the best that can possibly be achieved under the circumstances.

Shipment issues may be addressed by quickly resetting/delaying the start date of those jobs waiting for raw materials to arrive. Reoptimization for quickest delivery is rapid, and the customer can be informed immediately of the new delivery date. The sooner the customer is alerted, the sooner the customer can themselves address a work-around solution.

Where outgoing shipments are an issue, *Juggler* can provide a schedule optimized for geographic areas.

About Jambalaya

Jambalaya® Technologies Inc., develops **real-time dynamic optimization** software tools focused on the value-creation elements of manufacturing businesses. Jambalaya distinguishes itself by recognizing the importance of process knowledge in effective resource allocation, using advanced optimization components to quickly find good solutions, and focusing on the value creation elements of an enterprise.

Juggler® by Jambalaya is a software based decision support system to simplify, enhance and optimize job allocation of CNC controlled materials processing machines, such as lasers used in Advanced Manufacturing.

Jambalaya only develops products in close collaboration with customers, and is currently assessing opportunities with potential customers in automotive, fashion, materials processing and optical/semiconductor manufacturing.

In all instances Jambalaya's expertise is being sought to determine the best solution given the dynamic constraints of the problem in the smallest amount of time (typically seconds).