A Case Study: The Optimization of Database Job Scheduling in order to Minimize Server Utilization

The Problem:

A disease management company utilizes a server running Oracle 11g to compile patient information which is provided by the insurance companies it services. With the steady increase in the number of patients serviced, the server requires regular upgrades of both CPU and I/O resources. These hardware and software upgrades costs the company $3.1M every 30 to 36 months.

The company wanted to investigate if advanced production control could be implemented in order to defer the cost of upgrading the server.

The Solution:

An advanced job scheduling system using priority queuing was designed, developed and implemented. The scheduling algorithms incorporated business logic and included both workflow dependencies and contractual service level agreements.

The Design for Six Sigma (DFSS) methodology was utilized to ensure the needs of the server users as well as the business were well incorporated into the solution. Tools used included a Quality Function Deployment (QFD) to identify and prioritize the requirements of the job scheduling system, as well as a Failure Mode and Effects Analysis (FMEA) to mitigate the risks of incorporating such a system.

In order to validate the model without negatively impacting the business, the model was back-tested on all production jobs executed during a four month interval**. The simulation determined that implementation of the proposed scheduling policy would have resulted in a reduction of CPU utilization of 50% and a reduction of I/O utilization of 43% for supporting the production jobs. The average delay in execution for each job was under 4 hours, with 93% of jobs delayed less than 4 hours, and 97% less than 8 hours.**

The Outcome:

After implementation of the job scheduling system, the company realized an immediate reduction in CPU and I/O usage spikes, similar to what was seen in the simulation. This resulted in greater performance and availability from the database server.

The reduction in utilization is expected to defer each anticipated server upgrade by 3.75 years, resulting in a cost avoidance of $3.1M every six years.

About Exceptional Outcomes:

Exceptional Outcomes is a consultancy with specialties in inbound and outbound call center optimization, operations research, business intelligence and process excellence. They deliver training and software applications to clients in both the public and private sectors.

Exceptional Outcomes, LLC | info@exceptional-outcomes.com | www.exceptional-outcomes.com | **(615) 866 - 2649**