

# Throughput Improvement/Capacity Increase and Cost Reduction via Improved Production and Warehousing Layout

## Vertical

Manufacturing

Pharmaceutical

Healthcare

Portfolio

Logistics

Financial

Government

Business

## Genre

Case Study

Project Review

White Paper

Technology Overview

## Client

**Global supplier of industrial and consumer packaging products and services**

## Situation

A global provider of innovative packaging solutions and services had a four building manufacturing and warehousing site in the U.S. The facility was dedicated to servicing just one of their customers. They had to improve the facility's ability to meet increasing customer demand, while reducing operating costs and justifying capital requests.

They packaged printer equipment at the facility. To meet the ever increasing demands of the quickly changing technology markets, new products were continually being introduced along with the packaging to support them, while existing products also needed to be produced. It was a high mix, high volume environment.

The client's customer, who funded the facility operations demanded quantitative justification for any capital requests. To meet these demands, the client decided a process improvement initiative using discrete event simulation, seemed the best solution. It provided the data the customer required and a cost effective approach for visualizing the multiple product scenarios. The client was considering moving from this four building location to another smaller one to reduce costs and wanted to make sure this was a feasible pursuit. They chose ProModel's solution to provide a way for them to visualize and analyze data towards this short term goal while allowing them continued analysis for future optimization.

## Objective

The client's business objectives for the initiative were:

- Improve their ability to meet increasing customer demand
- Reduce operating costs
- Justify and illustrate the need for capital requests

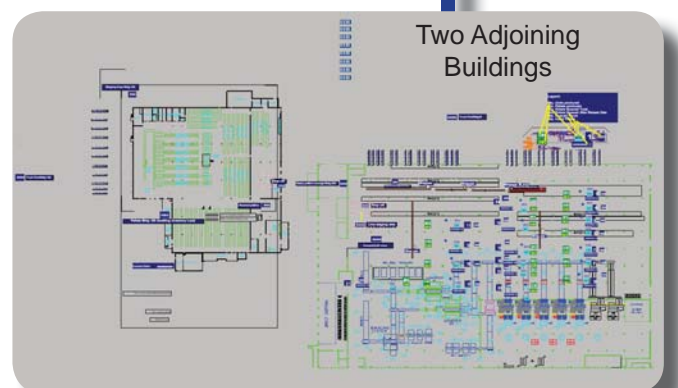
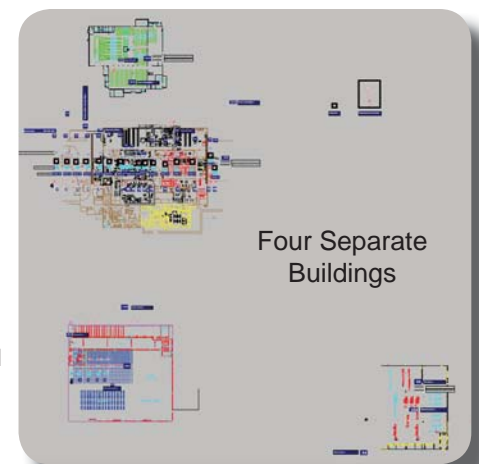
## Results

The output data that resulted from the simulation allowed them to determine the most effective facility operations parameters for:

- Square footage
- Appropriate racking
- Proper equipment placement
- Location of staged material
- SKU bin sizes
- Number of fork trucks

The model to the right shows the layout of the four facility site. The model below shows the improved flow that resulted from the two facility site and the analysis and visualization that resulted from the ProModel simulation solution. Estimated costs for facility relocation, new equipment purchases, and additional storage were all significantly reduced by using the simulation solution to plan for the new facilities. Implementing these parameters as recommended by the ProModel team dramatically improved the operating environment. Additionally, because the packaging lines of the client can handle multiple product types, the simulation model allowed the client to properly time the transfer of the packaging lines from the old facilities to the new facility without disrupting customer deliveries, and allowed the client to ascertain when/if new product lines can be introduced to satisfy the customer's delivery schedule. Overall the client increased capacity, improved throughput, gained control over inventory levels, and optimized utilization of packaging lines, fork trucks, and manpower.

They are now able to use the model to justify their requests for future capital investments. This same model continues to benefit them on a regular basis as part of their production planning operation.



**Solution**

To reduce operating costs, the client was considering closing one of the four facilities at the site. They were not certain if this change left enough space to accommodate required production and warehousing operations. ProModel was engaged to help them determine if this option was viable.

Soon after the project started, the client decided to move to a brand new site with only two adjoining buildings. This would reduce costs even more and simplify logistics. At this point ProModel's role changed considerably. We went from simply determining how to conduct operations during and after site consolidation to one in which an entire new site needed to be analyzed and optimized without affecting current operations and the ability to meet customer requirements.

The ProModel team designed a simulation solution to accurately predict key metrics. The solution used Excel files to interface with a complex model and allowed the client to enter the following key inputs:

- Production schedules: release dates, due dates, order quantities, package line preferences
- Times: truck Load and unload times, fork pickup in warehouse by storage type
- Number of pallets and trucks, pallet stacking from the warehouse
- Equipment downtimes
- Inventory by bldg: initial minimum, maximum, lead times, on-hand, allocated
- Sq. Ft. used
- Packaging speeds
- BOM of each finished good
- Number of resources

Entity	Location	Qty Each	First Time	Occurrences	
Production_order	Incoming_orders	1	0	0	
Production_order	Incoming_orders	1	0	0	
Production_order	Incoming_orders	1	0	0	
Production_order	Incoming_orders	1	0	0	
Production_order	Incoming_orders	1	0	0	
Production_order	Incoming_orders	1	0	0	
Production_order	Incoming_orders	1	0	0	
Production_order	Incoming_orders	1	0	0	
Production_order	Incoming_orders	1	0	0	
Production_order	Incoming_orders	1	0	0	
Production_order	Incoming_orders	1	0	0	
Production_order	Incomir	396	0	20040705	20040711
Production_order	Incomir	399	0	20040705	20040711
Production_order	Incomir	402	0	20040705	20040711
Production_order	Incomir	405	0	20040705	20040711
Production_order	Incomir	408	0	20040705	20040711
Production_order	Incomir	411	0	20040705	20040711
Matl SKU Num	ComponentA	CompA SKU Num	QtyA	ComponentB	
194		#N/A	0		
195		#N/A	0		
196	51649-80251		196	1 5185-3270	

These inputs resulted in data they could use to evaluate various alternatives. The data outputs consisted of:

- Utilization of packaging lines, forks, and operators
- On-time and missed release and due dates
- Excel listing of all events
- Inventory control behavior
- Quantity of storage
- Sq. ft. of storage required
- Re-order occurrences
- Time based count of orders and pallets in process
- Graph of number of Forks busy

The complexity of the model can be seen in the input and output charts shown here, as well as the model layout illustration.

