



Identifying Cost Reduction and Performance Improvement Opportunities Through Simulation

Ethan Brown

Deloitte Consulting LLP

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Agenda

- Client Dynamics
- Project Team Constraints
- Manufacturing process overview
- Process complexities requiring modeling
- Defined key hypotheses for modeling
- Demonstration of the model
- Results of the simulation
- Benefits of using Simio
- Modeling challenges within consulting engagements
- Lessons learned

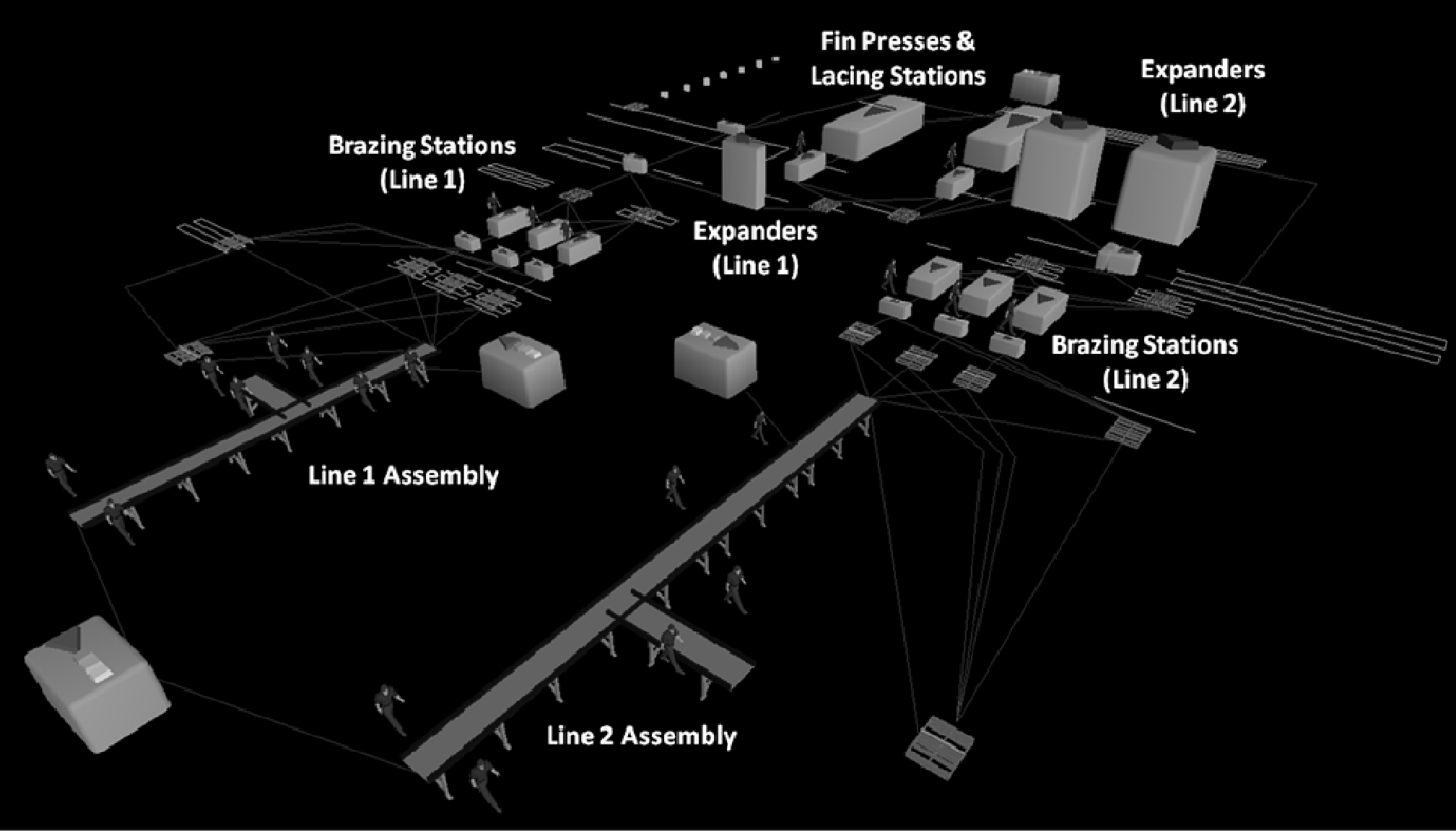
Client dynamics

- Client was facing higher costs and large amounts of capital tied up as inventory
- Production line was struggling to produce current required volumes and showed signs of being unable to produce targeted levels of projected volume
- Operating expenses were increasing due to constant overtime requirements
- Client desired a way to reduce cost from the process, reduce inventory, but increase the production capacity to eliminate overtime and position the company to attain future production goals

Project team constraints

- New manufacturing environment and industry
- Four week duration from start-to-finish to:
 - Understand the business
 - Identify opportunities to improve the process
 - Learn a new simulation package and model the current process and potential improvements
- An “alpha” version of the Simio software package

Manufacturing process overview



Process complexities requiring modeling

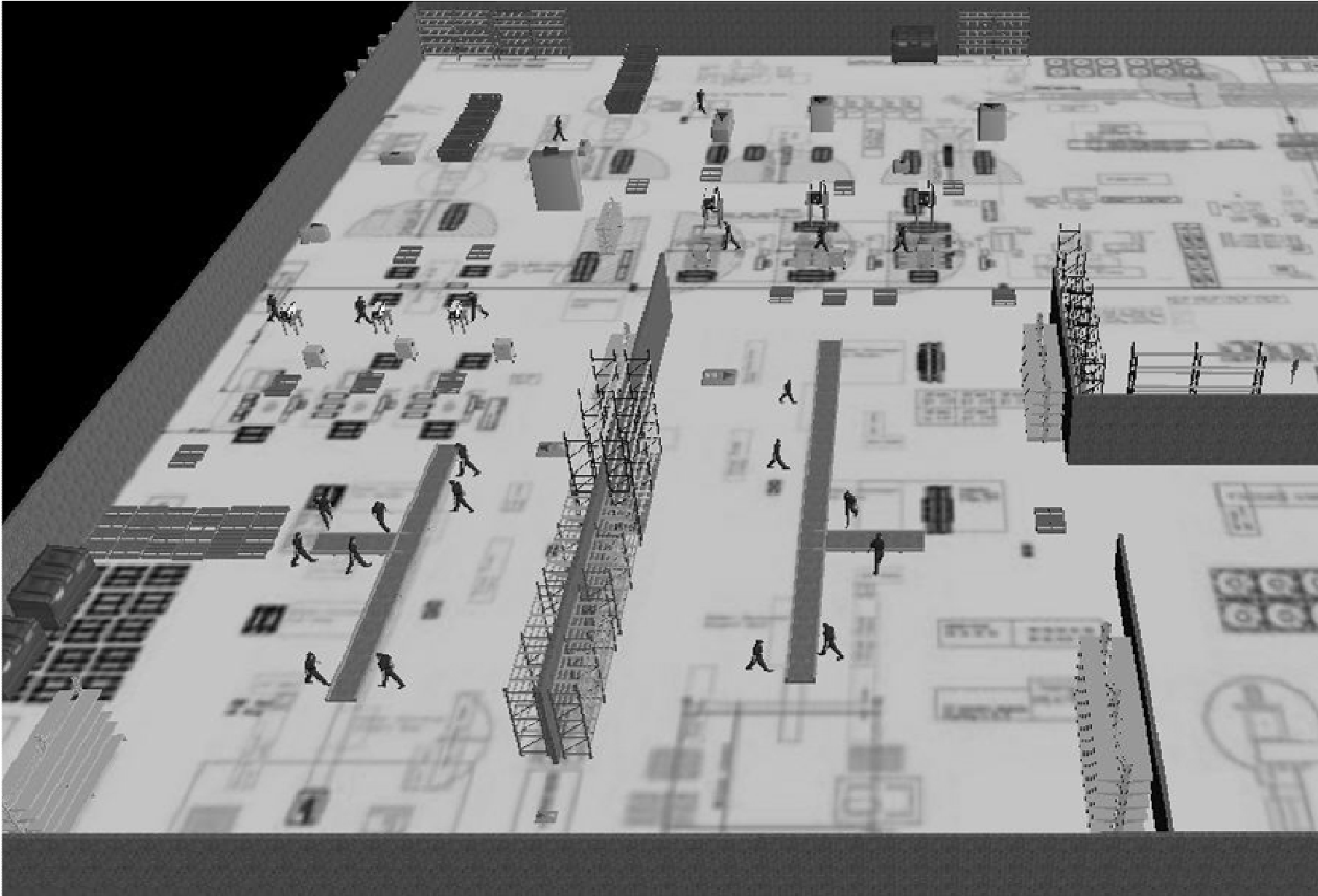
- Multiple production schedules are utilized
- Kitting units
- Assembly line moved at the pace of the slowest unit
- Some resources were shared between equipment
- Differing processing times
- Varying hours of operation

Defined key hypotheses for modeling

Hypotheses to improve throughput and reduce WIP:

- 1. Operations baseline:** developing a functional model that mimics the process
- 2. Schedule Integration:** aligning / streamlining the schedule
- 3. Kitting Availability:** increased kitting frequency to reduce WIP on the line and to reduce the frequency of kits being delayed or delivered incomplete
- 4. Part Presentation:** improving how parts were kitted to the line to improve the speed of picking / using the part
- 5. Workforce reduction:** that fewer people were required than were currently utilized on the line

Demonstration of the model



Results of the simulation

The four modeled improvements resulted in ~40% increase in throughput and ~35% decrease in WIP inventory.

Modeled Improvement	Avg. Throughput		Avg. WIP	
	Volume	Change	Volume	Change
Baseline performance	202	N/A	566	N/A
Schedule Integration	247	↑ 22%	358	↓ 37%
Kitting Availability	271	↑ 10%	361	↑ 1%
Part Presentation	285	↑ 5%	363	↑ 1%

Benefits of using Simio

- Free-form structure of Simio
- Powerful Standard Library
- Customization with Add-on processes
- “No code” object enhancements
- Capability to define any mathematical KPIs
- Advanced Ribbon” GUI
- Experiments with multi-processor support
- Model within model functionality
- Integrated 3D Animation

Modeling challenges within consulting engagements

The use of simulation in a consulting environment posed several challenges:

- Providing an accurate baseline of the process in order to gain confidence in predictive simulations
- Identifying / modeling improvement initiatives within the shortened window of consulting engagements
- Developing a model that is impenetrable to inquisitive review

Lessons learned

We identified several actions that could increase the speed / probability of acceptance:

- *White-board the model and walk client participants through the approach*
- *Incorporate local programming talent*
- *Utilize formerly constructed client simulation models*
- Complex is not always better

- Questions?