

Using Simulation to Improve Value Stream Mapping.

**Presented by
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Introduction

- About CreateASoft, Inc.
 - In business for 11 years.
 - Provides software and simulation consulting services.
- Simcad Process Simulator.
 - Process modeling and simulation tool that is applied to multiple industries.

What Is Lean?

- Set of methods and concepts used to:
 - Reduce waste.
 - Decrease WIP.
 - Provide a streamline flow.
- Lean concepts are not industry specific.
 - Can benefit both the service and manufacturing environments.

Goals of Lean Systems

- Stabilize your processes.
 - Review capabilities, labor, and material flow.
- Standardize processes and flow.
- Simplify through Kaizen principals.

Key Lean Concepts

- Takt time.

- Available production time/total quantity desired.

- Cycle time.

- Elapsed time from the beginning of the operation until completion, also known as processing time.

- Value added time.

- Non-value added time.

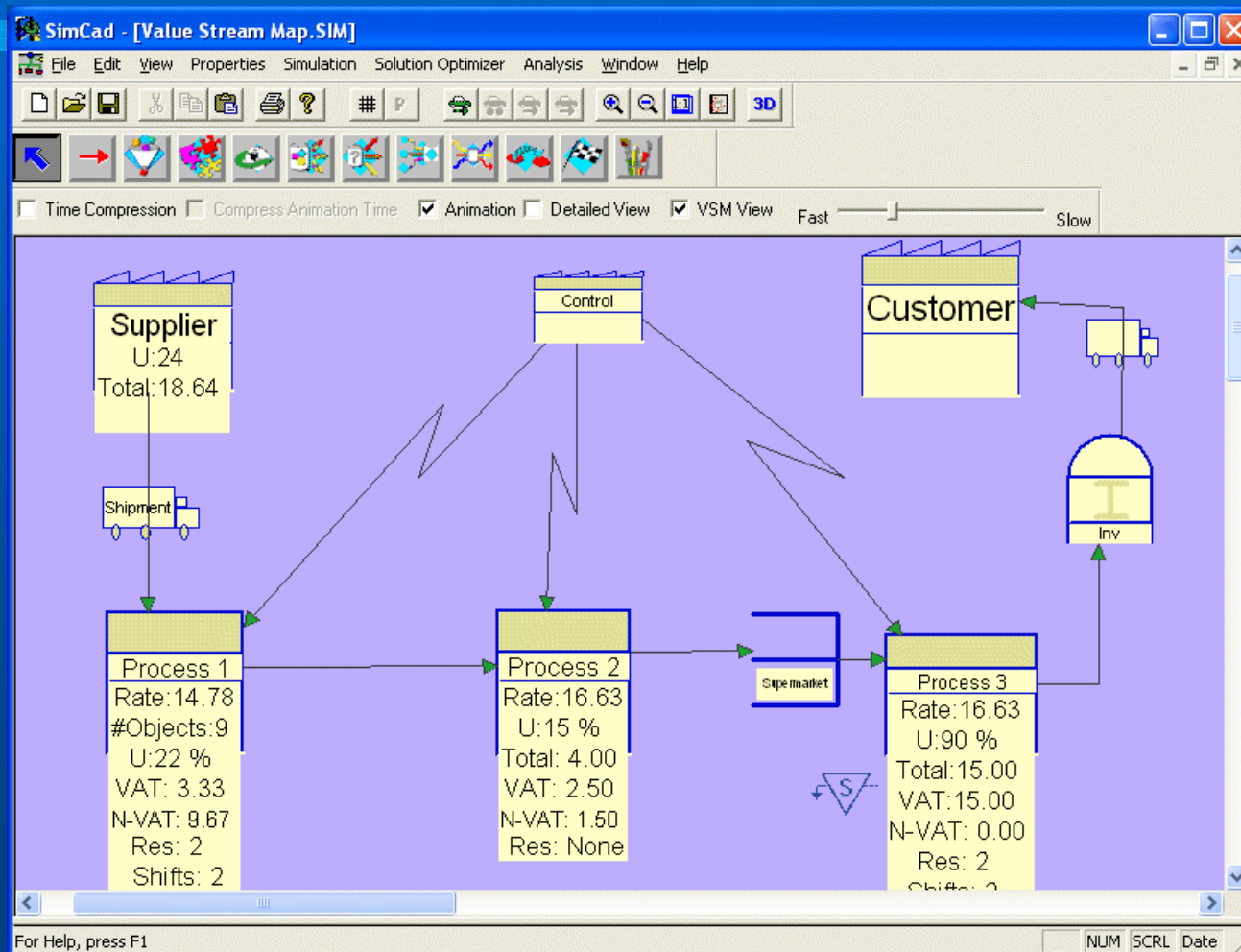
- Process efficiency.

- Value added time / total time.

Benefits of a Value Stream Map

- Gathers and displays a far broader range of information than a typical process map.
- Is at a higher level (5-10 boxes) than a typical process map.
- Is used at a broader level, from receiving of raw material to delivery of finished goods.
- Used to identify where to focus future projects, subprojects, and/or kaizen events.

A Value Stream Map



Value Stream Map Limitations

- Static map.
 - Changing the flow, product mix, resources, ... requires a redefinition and revalidation of the map.
- One level – no layering.
 - Inability to effectively show details where needed.
- Multiple map interaction can be difficult requiring a large effort.

Process Simulation

- Build and simulate based on the process map of the operation.
 - A process can consist of multiple sub-processes (cells).
- Process and travel constraints can be defined in the model.
- Resource schedules, MTBF, carriers, and flow routings are defined.

The Role of Simulation

- Simulation provides a tool to analyze, visualize, and experiment.
- Test and analyze improvement ideas before implementation.
- Evaluate migration scenarios.
- Forecasting and scheduling.

Simulating a Value Stream?

Process Simulation

- Defines behavior
- Provides process level view
- Defines constraints
- Dynamic behavior

Value Stream Map

- Defines overall flow
- Identifies “focus”
- Provides a quick and efficient flow analysis
- Static behavior

Dynamic Value Stream map

Dynamic Value Stream Mapping

- Values change based on input.
 - Dynamic data display and update based on the model input.
- Process flow may change based on the input.
- Contains all the elements of the static map.

Benefits of Dynamic VSM

- **Ease of validation.**
 - By changing the input to the flow, multiple scenarios can be tested.
 - Product mix testing is simplified and expedited.
- **Quick feedback on changes.**
 - Process flow changes can have positive or negative effect on the value stream.

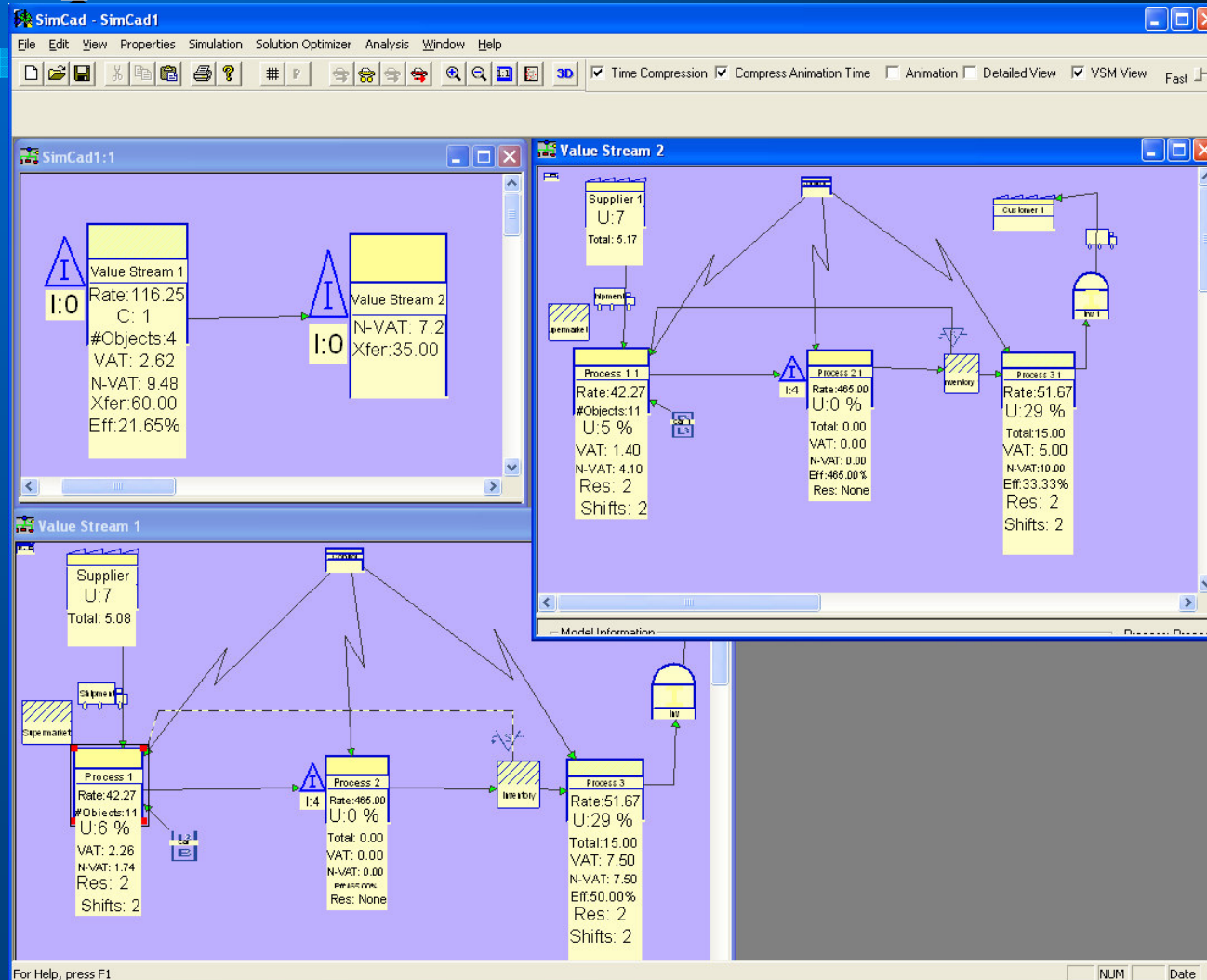
The Role of Simulation

- By merging process simulation and value stream mapping
 - Building a process flow results in a value stream map and vice versa.
- The dynamic behavior of the simulation environment lends itself to the dynamic value stream mapping.

Simulating Multiple VSMS

- Simulation tools (Simcad Pro) provide layering (cells) of the process flow.
 - A cell can contain its own value stream map.
 - Each cell can be analyzed and optimized independently.
- By connecting layers
 - Output of one value stream can become the input to another.

Multiple VSMs



Maintaining Improvement With Simulation

- A successful lean implementation requires:
 - An updated value stream map that reflects the current state of the operation.
 - An updated process map.
- Constant analysis of line modification.
 - Validate that the change does not divert from the lean initiative.
 - Analyze the change and reduce its impact on other sections of the operation.

Using Simulation

- By connecting the value stream map to the process map
 - Change to one affects the other.
 - Analysis and validation of one validates the other.
- Simulation is the best alternative for quick solution turnaround.
 - Provided that both process map and value stream map are linked together to avoid duplicate work.

Simcad Pro Approach

- Integrated value stream map and process map.
 - Computation of VAT, process efficiency, takt time deviation, and many others.
- Forecasting and scheduling.
 - Load existing WIP, forecasted orders, and generate the best production schedule.
- Ease of model creation.
 - Quick solution turnaround.

Using Simulation to Improve Value Stream Mapping.

Questions

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