

CreateASoft, Inc.

The Process Improvement Company

Applying lean to the healthcare sector

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Outline

- Introduction
- Basic concepts of Lean.
- Applying Lean to Healthcare systems.
- Benefits of Lean in Healthcare.
- Q&A



About CreateASoft, Inc.

- In business since 1992
- Core technology: Simcad Process Simulator software
- Provides Simulation and Process Improvement services to the manufacturing and service industries in the areas of
 - Automation, manufacturing, and process improvement.
 - Lean transition and implementation.

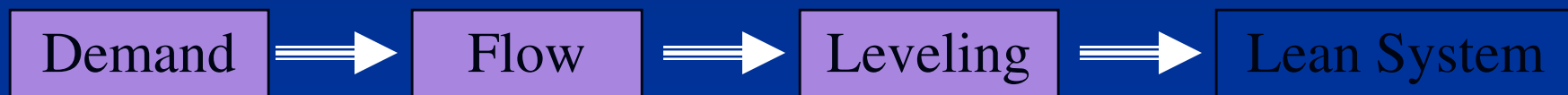


What is Lean?

- Lean manufacturing concepts.
 - Eliminate waste time.
 - Increase throughput.
 - Reduce overall cost.
 - Increase efficiency.
 - Improve quality.
- Heavily used in manufacturing.
- Finding its way to the service sector slowly.



Key Stages of Lean Application



- Demand identified by
 - Takt time, buffer inventory, safety inventory,...
- The Flow
 - Continuous flow, work cells, Kanban system, FIFO lanes, ...
- Leveling
 - Paced withdrawal, Heijunka (load leveling)...



Lean Methods

- The Kanban
 - Required in process inventory to maintain high efficiency.
- The Supermarket
 - An inventory buffer used to reduce the customer and variability
- Single Piece Flow paradigm.
- Processing to “Takt”.



Components of a Non-Lean environment

- Traditional batch implementation
 - Through the use of carts, bins, ...
- High inventory cost.
- Long lead time, with high dependence on order variability.
- Excessive resource travel – especially in the service sector.
- Reduced process and system efficiency.



The Healthcare Sector

- Traditionally viewed as “Patient Flow”.
- Should include
 - Resource travel, and schedules.
 - Inventory size and locations.
 - Document trail and document management.
 - Support operations such as cleaning, disinfecting, ...
- The healthcare sector involves all aspects the sector not just hospitals.



Traditional Healthcare issues

- Most healthcare systems suffer from one or more of,
 - Lack of a well defined process flow.
 - Excessive resource travel.
 - Inefficient processes, excessive wait time.
 - Long delays throughout the operation.
 - The human factor – How well do resources commit to the schedules.



Connecting lean concepts

- Waste in Healthcare
 - Nurses travel, patient movement, equipment availability, ...
 - Doctor's availability, lab delays, medicine availability.
 - Patient wait for services.
- Inventory sizing – the Kanban
 - Inventory levels for replenishment.
- Simplified processes – well defined flow.



Steps to applying lean

- A lean system should, if implemented correctly, correct most of the issues.
- For lean to succeed, there **MUST** be
 - A complete support and commitment from management.
 - An understanding among resources to accept the new paradigm.
 - A good and efficient plan to achieve the lean implementation.



How to Proceed

- Need to identify the area requiring the most improvement.
- Requires a high level analysis of the flow
 - Can be done through simulated value stream maps, or simulated process flow.
 - A manual analysis can be performed.
 - Static, does not include the time element in the analysis.
- Value Stream maps become a critical component to determine potential improvement.

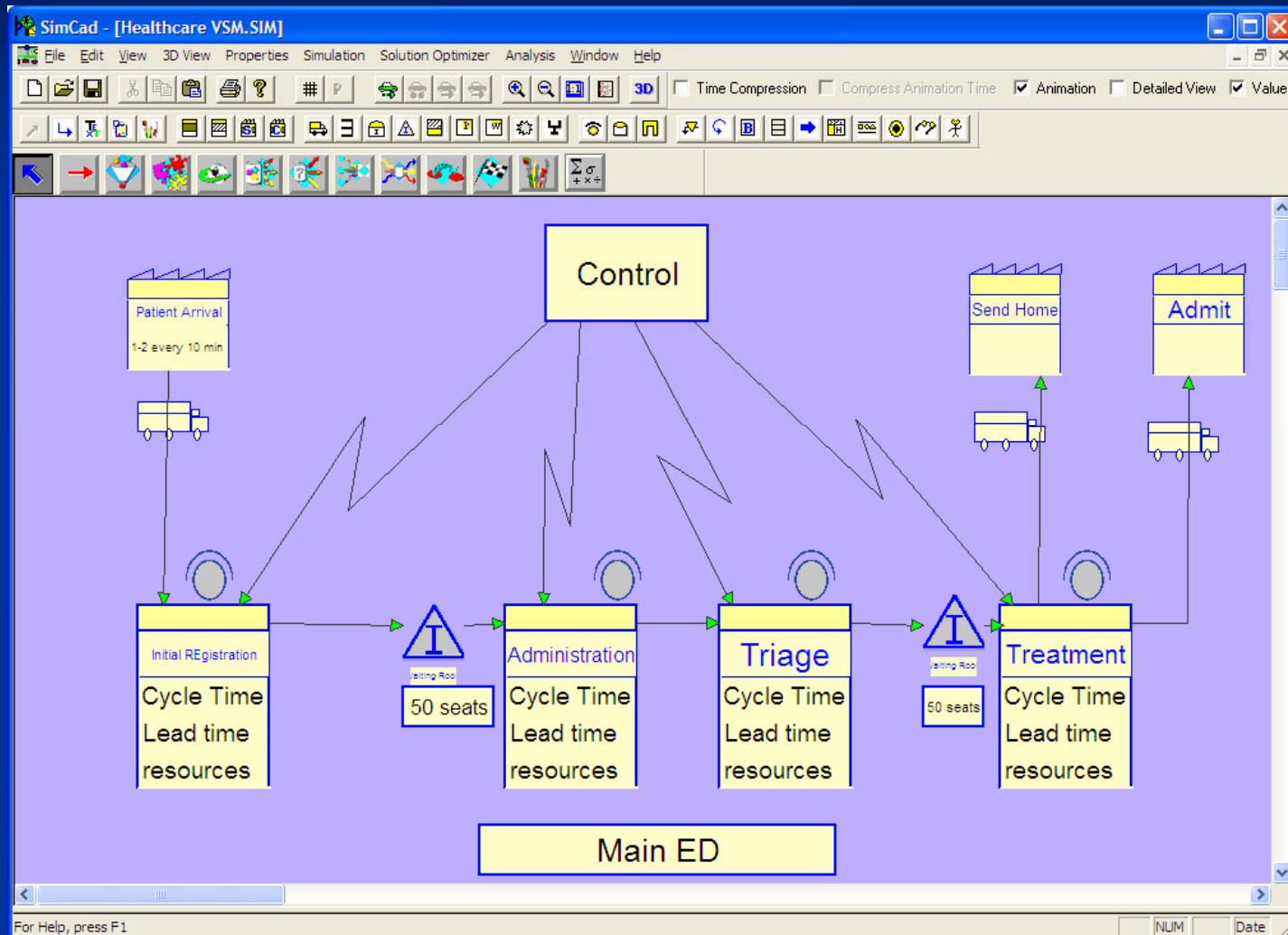


The value stream map

- Build a high level value stream of the critical flows.
 - Ignore detail during the initial phase.
 - View and validate the control flow.
- If Dynamic Value stream mapping is available, perform analysis to determine the effect of variability on the map.
 - Averages without variability will only provide a window into reality. Not enough for thorough analysis.



Example of a high level map



Dynamic Analysis

- Example using Simulation.
- Shows the effect of variability on the value stream.
- Allows for analysis of best, worst and average case scenarios.
- Provides a base line for future improvement.
- Helps in identifying potential improvement.



Expanding the VSM

- Processes that can contain multiple operations should be expanded.
 - In our example: Treatment and Triage need to be expanded.
- Second step is to expand the customers,
 - Admitting can be a new value stream map with its own process flows.



Applying Lean

- To main issues that provide big returns:
 - Resource Travel.
 - Inventory reduction.
 - Inventory positioning.
- Process flow changes may be required to achieve results.



Reducing travel

- Through simulation or tracking, the travel distance, and pattern of travel can be determined.
- Determine the longest set of paths in “travel time” not in distance.
 - Lean implies reduced time of travel, or waste time.
- Solution can include:
 - Repositioning of inventory locations.
 - Repositioning of terminals.
 - Modified flow patterns.



Determine the best solution

- For each potential solution, the following must be analyzed:
 - The effect of change on the current operation.
 - The effect of change on the rest of the operation.
 - Best, worst, and average case must be analyzed.
 - The best case may prove to be the most expensive.
- Plan a transition to the new flow.
 - If simulation is available, the transition system can be analyzed in more detail, and with less Risk.



Things to watch for

- Perform small changes at a time.
 - Major changes require more training, and incur additional costs.
- Document your progress.
 - With every change, allow the system to stabilize and people to adapt.
 - Provide a visual flow of the change if possible.
- Keep everyone informed of the progress and future improvement.



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