



Driving Insight Through Process Modeling

Dr. Lars Maaseidvaag

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Agenda

- Welcome to the Spring Series
- Introduction of MBB Webcast Series
 - Larry Goldman, MoreSteam.com
- Driving Insight Through Process Modeling
 - Dr. Lars Maaseidvaag, MoreSteam.com
- Open Discussion & Questions



MoreSteam.com – Company Background

- Founded 2000
- Over 300,000 Lean Six Sigma professionals trained
- Serving 45% of the Fortune 500
- First firm to offer the complete Black Belt curriculum online
- Courses reviewed and approved by ASQ
- Registered education provider of Project Management Institute (PMI)

Select Customers:



Master Black Belt Program

- Offered in partnership with Fisher College of Business at The Ohio State University
- Employs a Blended Learning model with world-class instruction delivered in both the classroom and online
- Covers the MBB Body of Knowledge, topics ranging from advanced *DOE* to *Leading Change* to *Finance for MBBs*
- Go to <http://www.moresteam.com/master-black-belt.cfm> for more information about curriculum, prerequisites, and schedule



Driving Insight Through Process Modeling



Dr. Lars Maaseidvaag

Senior Master Black Belt

- MoreSteam.com MBB Faculty – Integrates the learning of Lean tools and concepts with advanced process modeling methods
- Operations research and management consulting
- Curriculum Director, Accenture/George Group

Process Modeling



George Box, statistician extraordinaire:

“All models are wrong, some are useful.”

The modeling of a process is a continuous improvement process itself and needs to follow the DMAIC method.

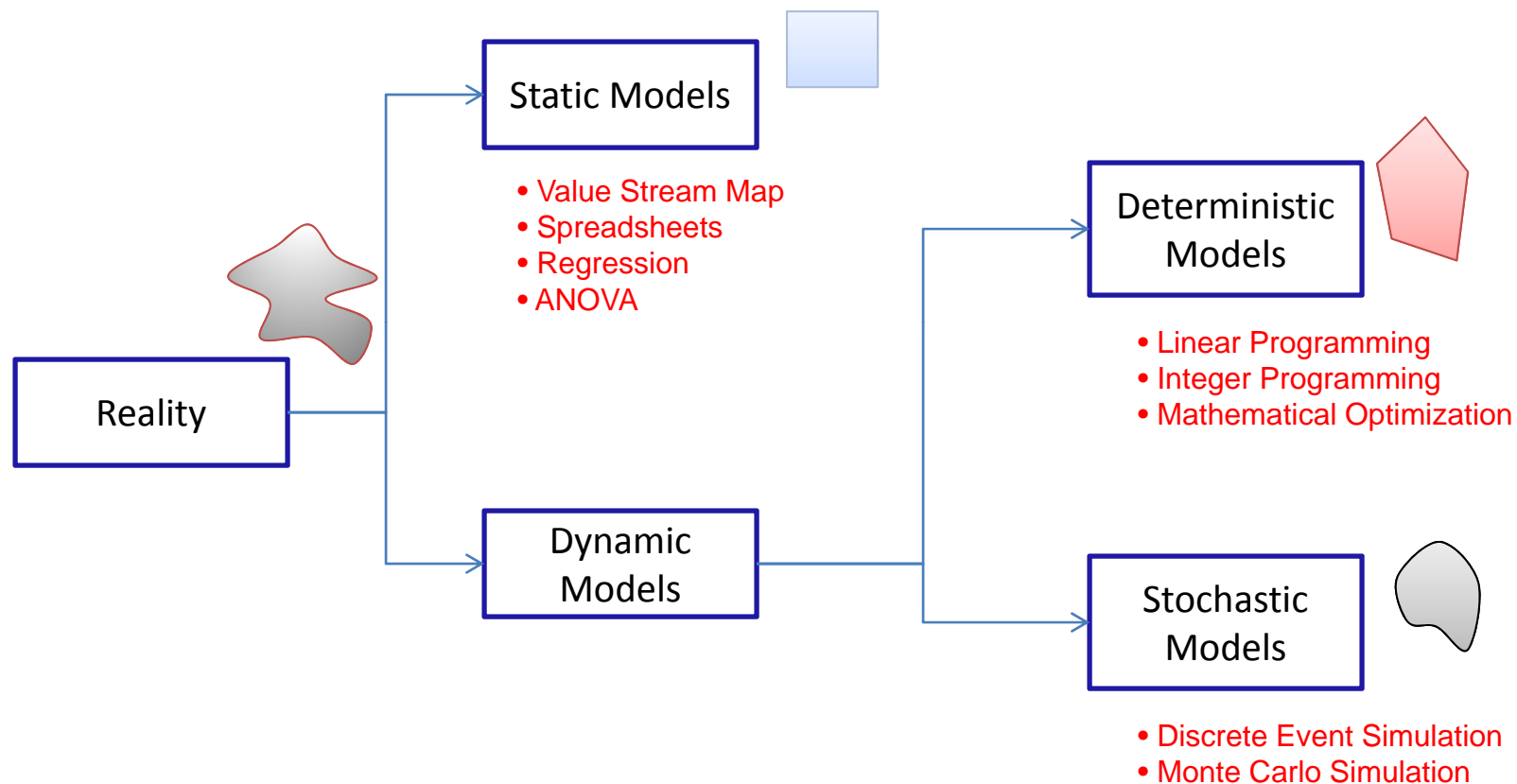
Failure to follow the DMAIC methodology can lead to many of the common process modeling errors:

- The model is unable to address true root causes
- The model was built with incomplete data
- The model was not validated against reality
- The wrong type of model was built

The Process of Process Modeling

- Define** – All process modeling begins with VOC and VOB, what problem needs to be solved. Process modeling is an *iterative exercise*, often requiring a series of successively more complex models to achieve the goals of the project.
- Measure** – Simple process models help us gain insight into the measurements we need. The Value Stream Map is a simple model, but probably the most valuable.
- Analyze** – More advanced static and dynamic models allow us to begin to understand and quantify relationships between process inputs and output.
- Improve** – Dynamic models allow us to pilot improvement options in a virtual environment, without the cost and risk of live pilots.
- Control** – Dynamic models allow us to examine failure modes and design contingencies.

Process Modeling Options



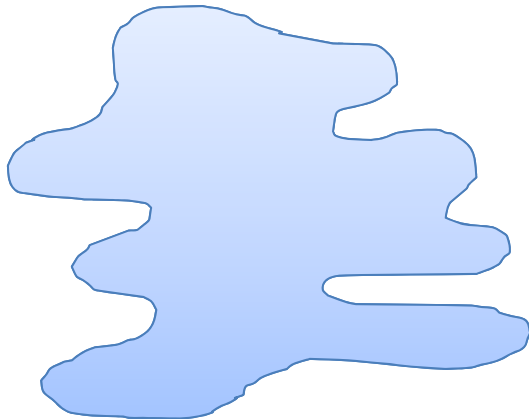
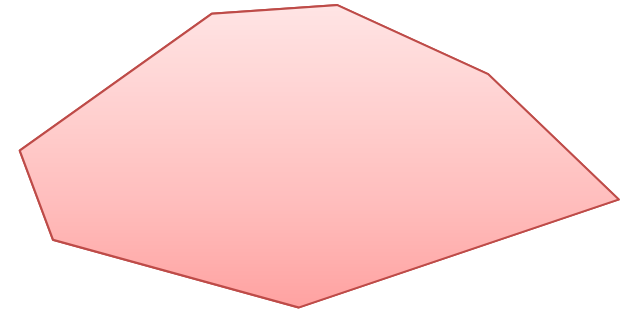
“All models are wrong, some are useful.”

Optimization vs. Simulation

Optimization is used to solve for a specific, optimal answer given the problem presented.

Some issues with optimization:

Benefits:



Simulation is used to test a given solution to see how it performs in the model.

Some issues with simulation:

Benefits:

The Components of Optimization

The objective function:

A mathematical equation that you seek to minimize or maximize

$$\text{Maximize } 2X + 6Y$$

The constraints:

Mathematical equations that limit your options and define your boundaries

Subject to:

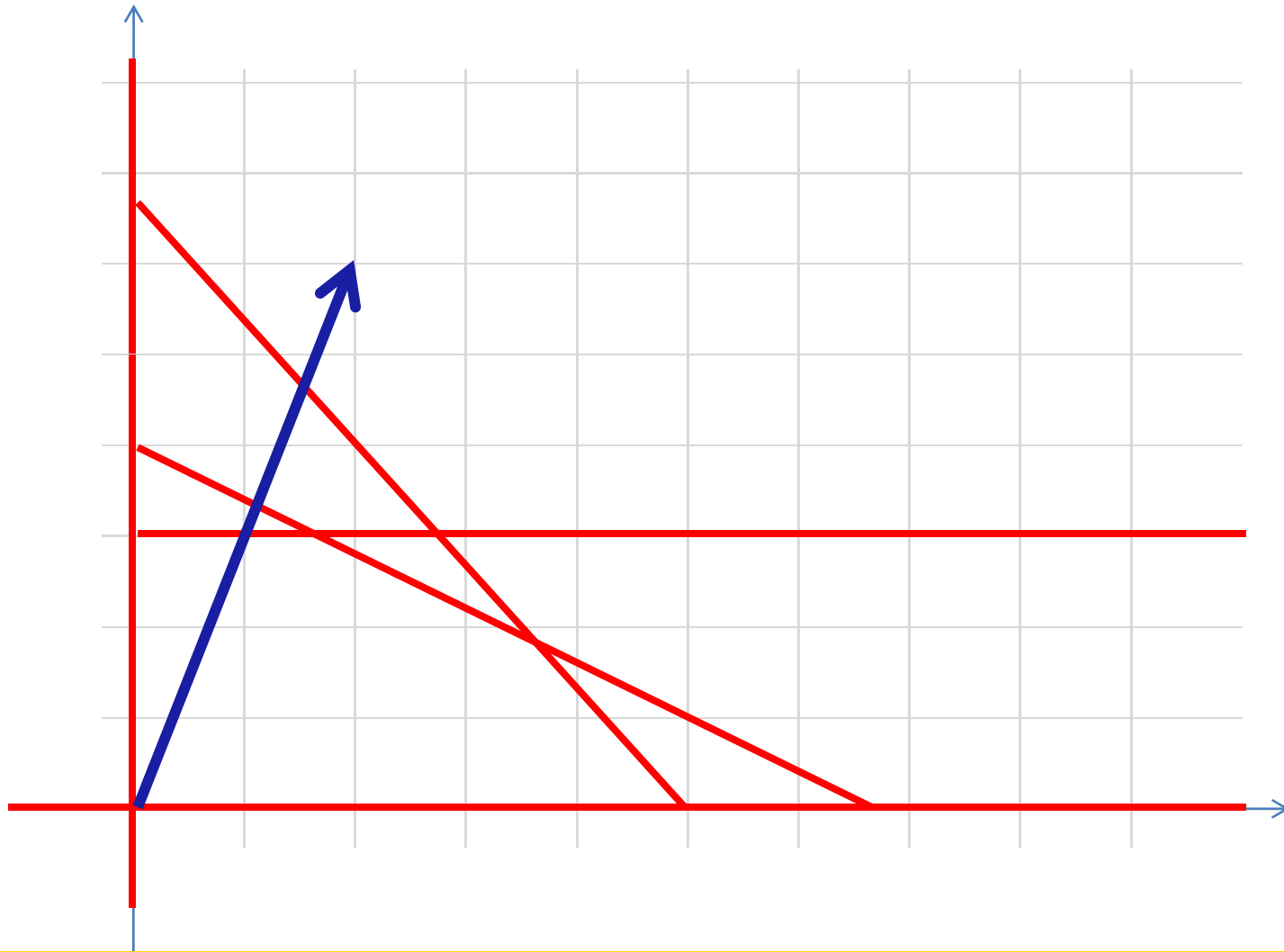
$$4X + 3Y \leq 20$$

$$3X + 5Y \leq 20$$

$$Y \leq 3$$

$$X, Y \geq 0$$

Graphical Solution



max: $2X + 6Y$

subject to:

$$4X + 3Y \leq 20$$

$$3X + 5Y \leq 20$$

$$Y \leq 3$$

$$X, Y \geq 0$$

Modeling Examples

- Optimization – Microsoft® Excel® Solver
- Simulation – MoreSteam.com's Process Playground

Summary

- There are many process modeling techniques available.
- Process modeling provides a powerful set of tools for driving deep insight into existing and new processes.
- Choose wisely, young padawan learner - creating process models of greater complexity than required only consumes time and resources, and may not be required to drive the insight required.



Thank you for joining us



Resource Links and Contacts

Questions? Comments? We'd love to hear from you.

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Additional Resources:

Archived presentation: <http://www.moresteam.com/presentations/process-modeling.cfm>

Master Black Belt Program: <http://www.moresteam.com/master-black-belt.cfm>