

# **Beer Game on Steroids (BGOS)**

**A Free SD-Based Simulation Tool for  
Teaching and Understanding  
Supply Chain Dynamics**

**J. Chris White**

# Where to get files and information:

File / Item	Link
<b>BGOS webpage</b> (download everything)	BeerGameOnSteroids.com <i>scmblox.com/get-bgos</i>
<b>BGOS LinkedIn page</b> (download decks)	<a href="http://www.linkedin.com/company/beer-game-on-steroids">www.linkedin.com/company/beer-game-on-steroids</a>
<b>J. Chris White</b>	<a href="mailto:jchriswhite@gmail.com">jchriswhite@gmail.com</a> <a href="mailto:jcwhite@scmblox.com">jcwhite@scmblox.com</a> <a href="http://www.linkedin.com/in/j-chris-white/">www.linkedin.com/in/j-chris-white/</a>
	<a href="http://scmblox.com">scmblox.com</a>

# Today's Critical Supply Chain Issues

- Impacts of tariffs
- Nearshoring, reshoring, etc.
- Disruptions and delays
- Extreme weather impacts



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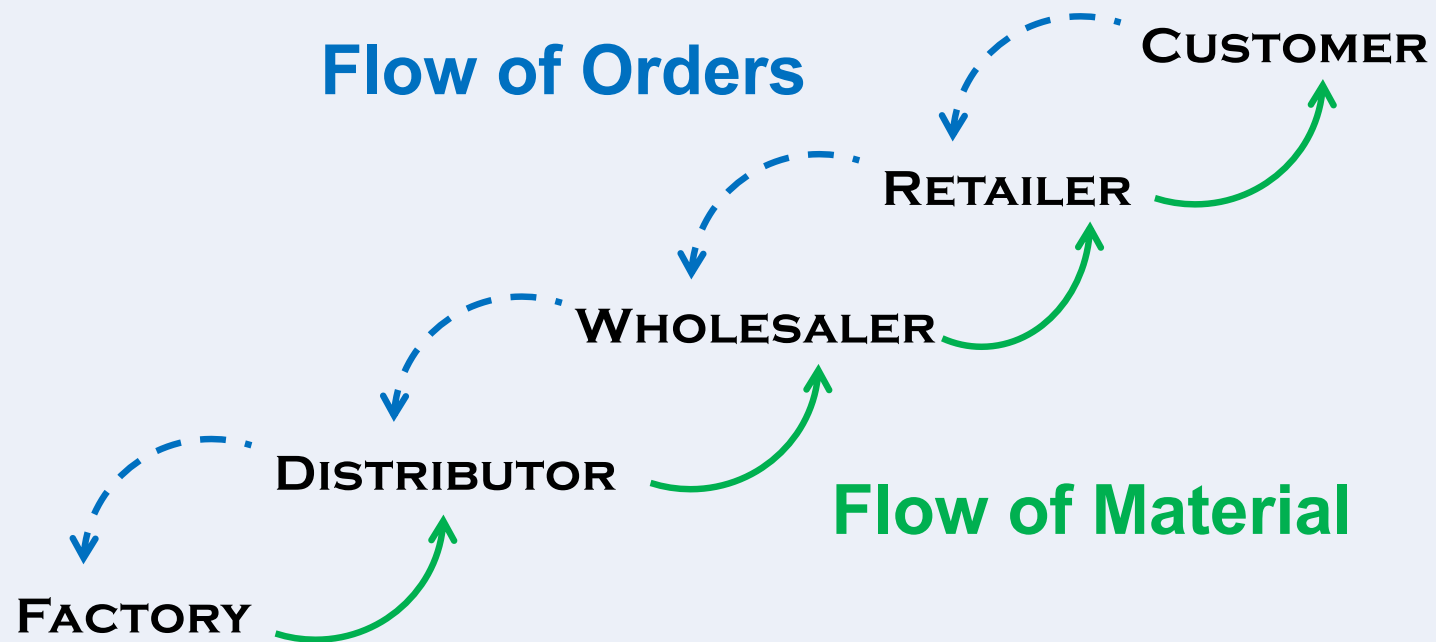
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## SD simulation can help!

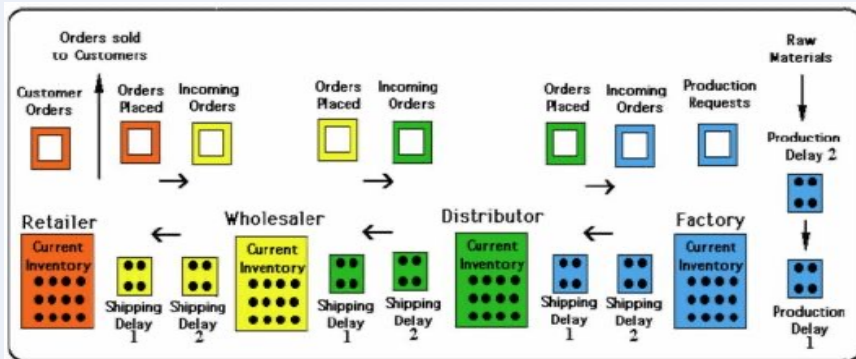
- Captures operational impacts
- Provides sandbox for testing alternatives
- Allows for “scientific experiments”
- Captures feedback mechanisms



# The Basic Beer Game



# In-Person Beer Game Example



**Multiple online versions:  
search “online beer game”**

# The Beer Game



Students at MIT Sloan School of Management playing the beer game, a role-playing simulation designed to teach principles of management science

Photo Credit: Courtesy of MIT Sloan School of Management

# Lessons from the Beer Game

- **No matter who plays the game, the results are the same:**
  - **Most teams end up 10X to 20X the optimal results.**
  - **Bullwhip effect: small fluctuations at the Retailer grow to large fluctuations for the Factory.**
  - **Everyone attempting to optimize their own performance leads to failure.**
  - **Even with the best intentions, the result is failure.**

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**The *structure* of a supply chain determines its *performance*.**

# **Overview and Purpose of BGOS**

- **What is BGOS?**
  - **Free supply chain simulation tool.**
  - **Drag-drop-connect multiple entities in a supply system of any size.**
  - **Each entity can be modified to alter the way it behaves and reacts.**

# Overview and Purpose of BGOS

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- **What is the purpose of BGOS?**

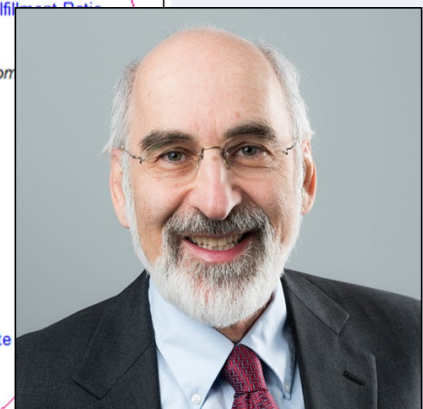
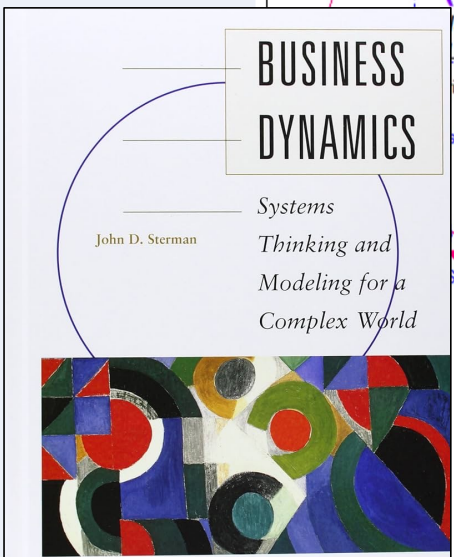
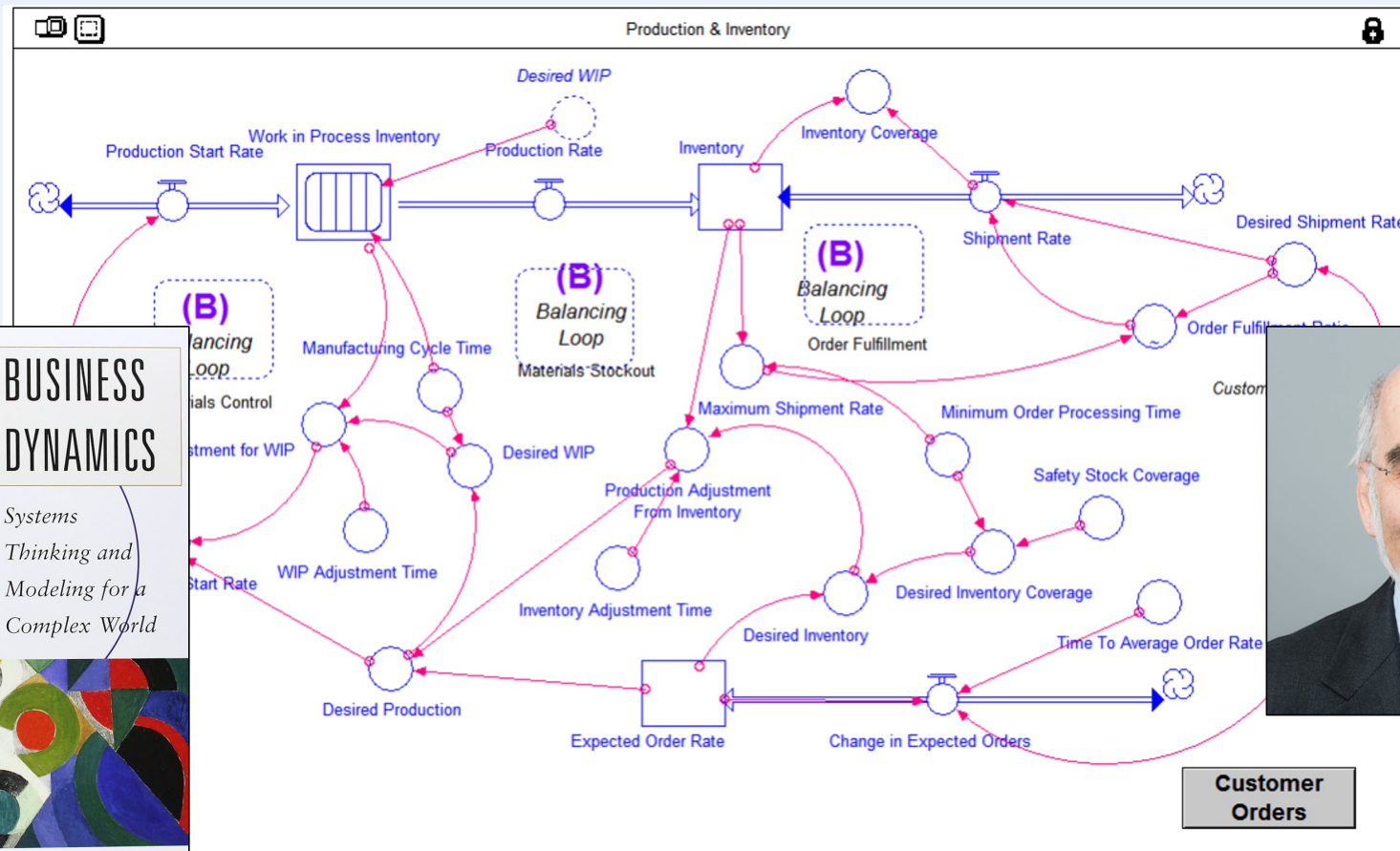
- Create more complex supply chains.
- Explore how supply chains under a variety of conditions.
- Increase a student's intuition of supply chain "physics" due to *structure*.

# Typical Instruction Approach

- **Student teams play the original Beer Game.**
- **Student teams build the original Beer Game in BGOS.**
- **Student teams run additional scenarios to observe more dynamics.**
  - **Ex: Impose additional demand patterns.**
  - **Ex: Modify the processing times of entities in the chain.**
- **Student teams expand on the original Beer Game to observe more dynamics.**
  - **Ex: Add an additional distribution center in the chain.**
  - **Ex: Add a second factory in the chain with its own distributors.**
- **Student teams report their findings and what they learned.**

# “Widget” Production Model

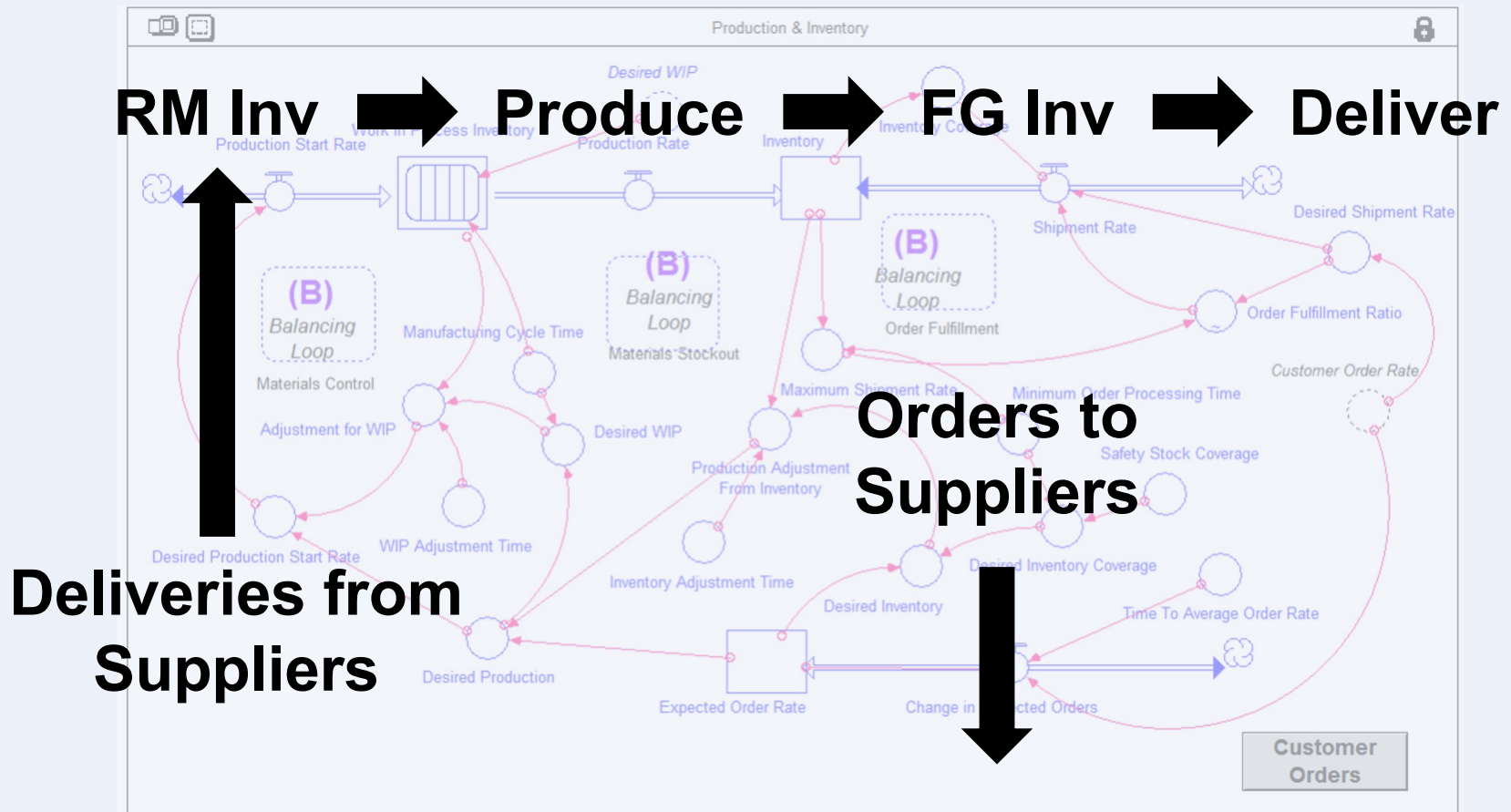
(Ref: Sterman, J.D., *Business Dynamics*, 2000, Ch. 18, used w/permission)



Customer Orders

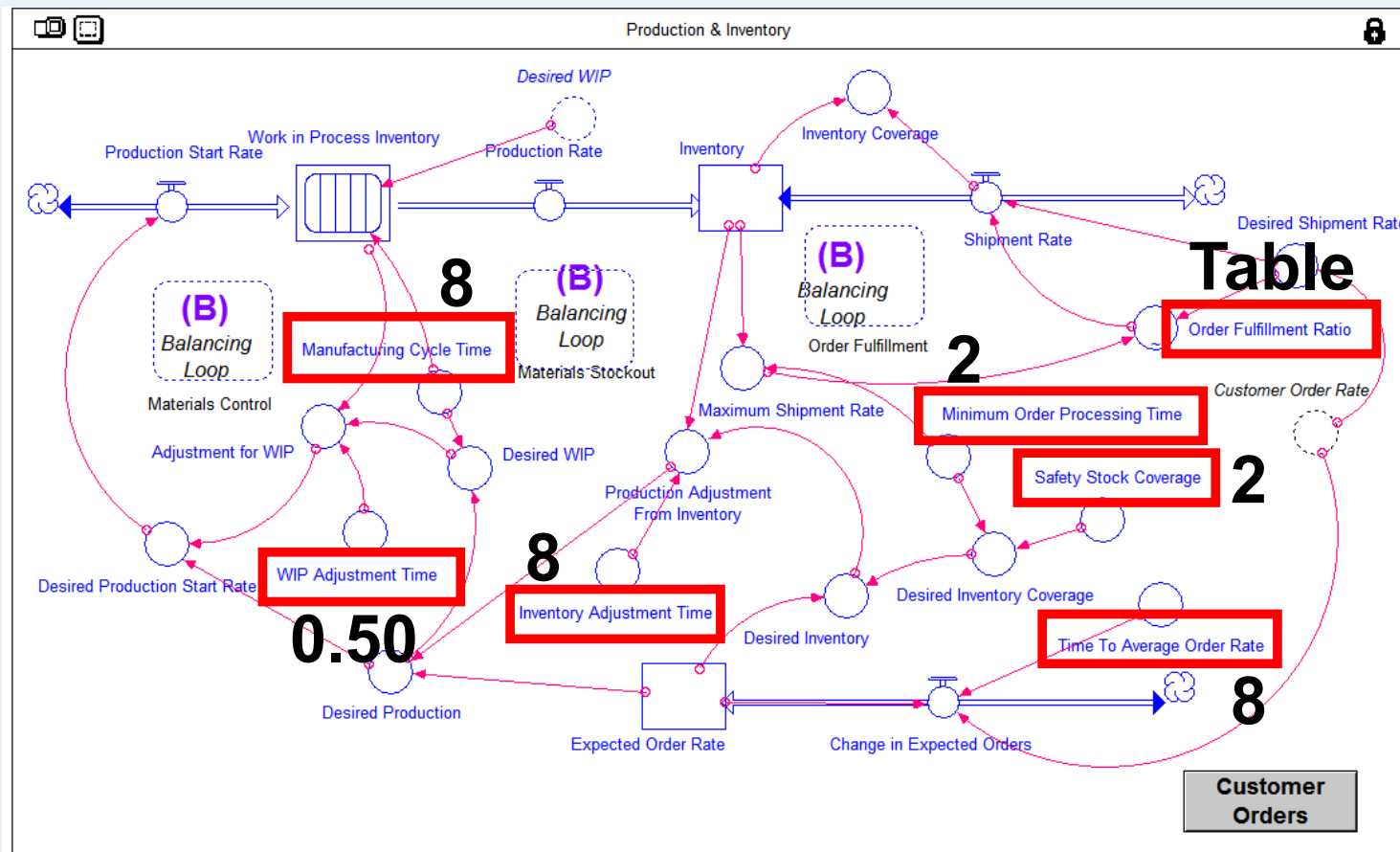
# “Widget” Production Model

(Ref: Sterman, J.D., *Business Dynamics*, 2000, Ch. 18, used w/permission)



# “Widget” Production Model – Default

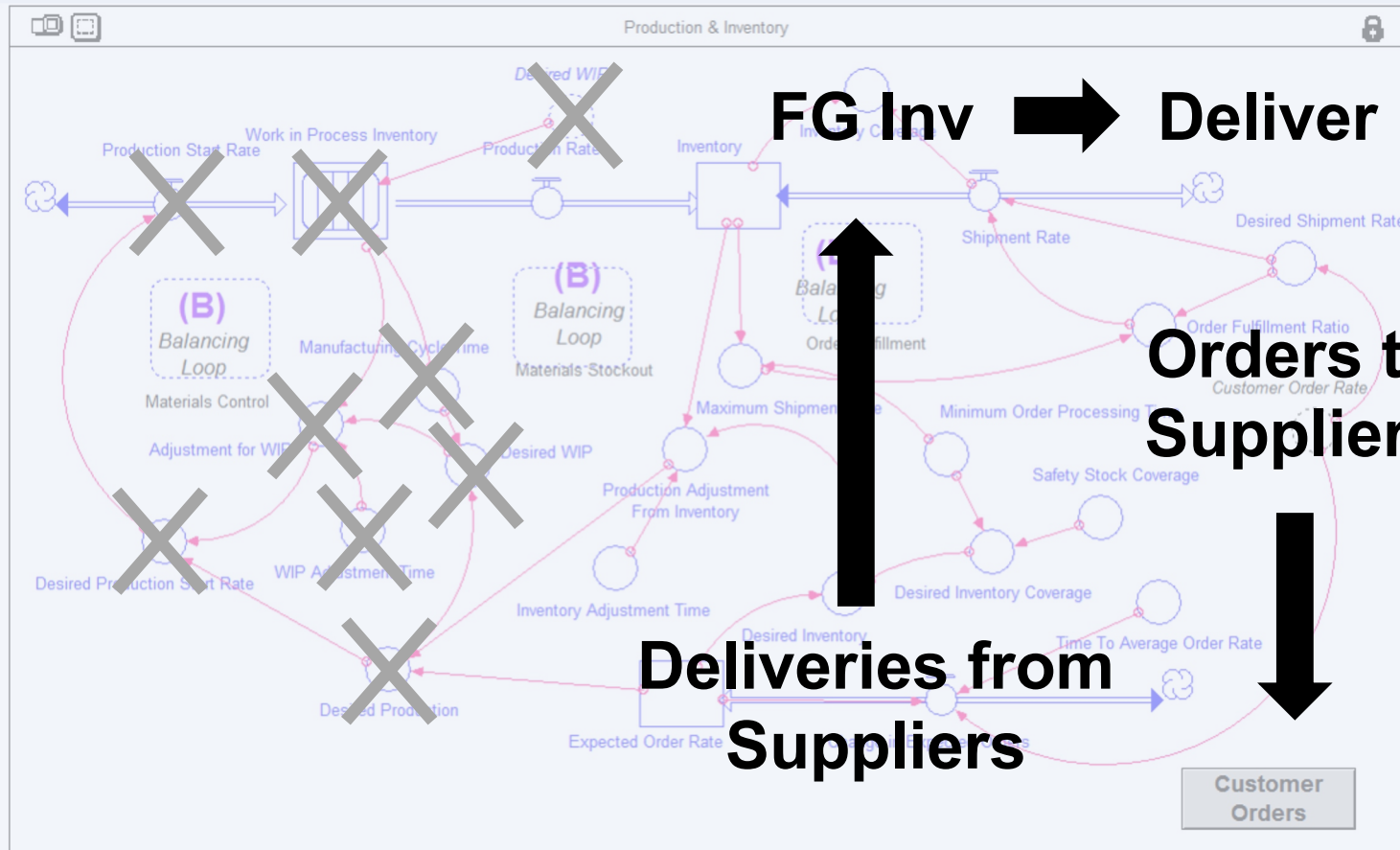
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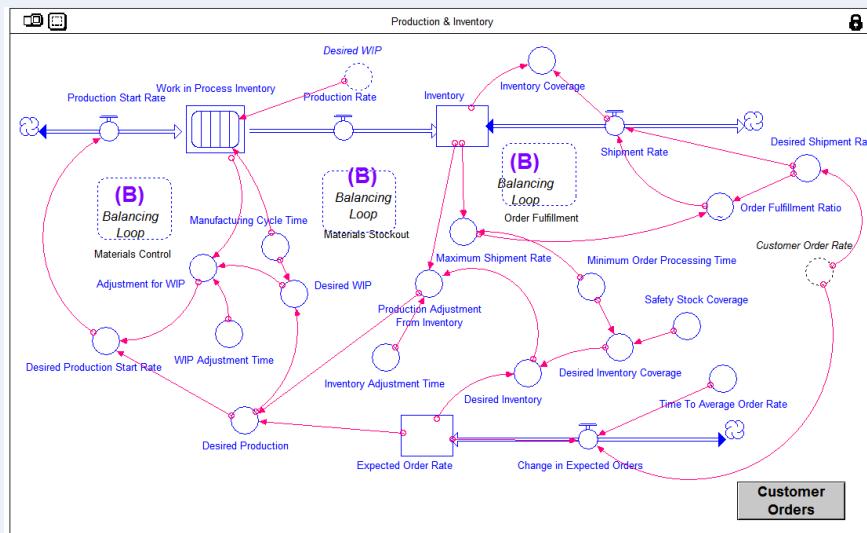


# Widget Warehouse Model

(Ref: Sterman, J.D., *Business Dynamics*, 2000, Ch. 18, used w/permission)



## Simulation “agent” model



**BGOS “icon”**



# BGOS Interface

The screenshot displays the SimBLOX Studio Model Creator interface for a project named "Beer Game 2". The main workspace shows a supply chain diagram with components: Factory, Warehouse, Customer, Wholesaler, Distributor, Retailer, and Customer. The "Brix Palettes" sidebar on the left contains icons for Factory, Warehouse, and Customer. The "Properties" panel on the right shows the definition and display properties for a selected "Factory" icon.

Definition	
Inventory Adjustment Time	8 Weeks
Manufacturing Cycle Time	8 Weeks
Minimum Order Processing Time	2 Weeks
Order Distributions	(Edit value...)
Order Fulfillment Ratio	(Edit value...)
Safety Stock Coverage	2 Weeks
Time to Average Order Rate	8 Weeks
WIP Adjustment Time	0.5

Display	
Image	System.Drawing.Bitmap

Identity	
name	Factory

Three callout boxes with arrows point to specific parts of the interface:

- Icons**: Points to the Brix Palettes sidebar.
- Drag-and-drop icons to build larger model**: Points to the main workspace.
- Input parameters for selected icon**: Points to the Properties panel.

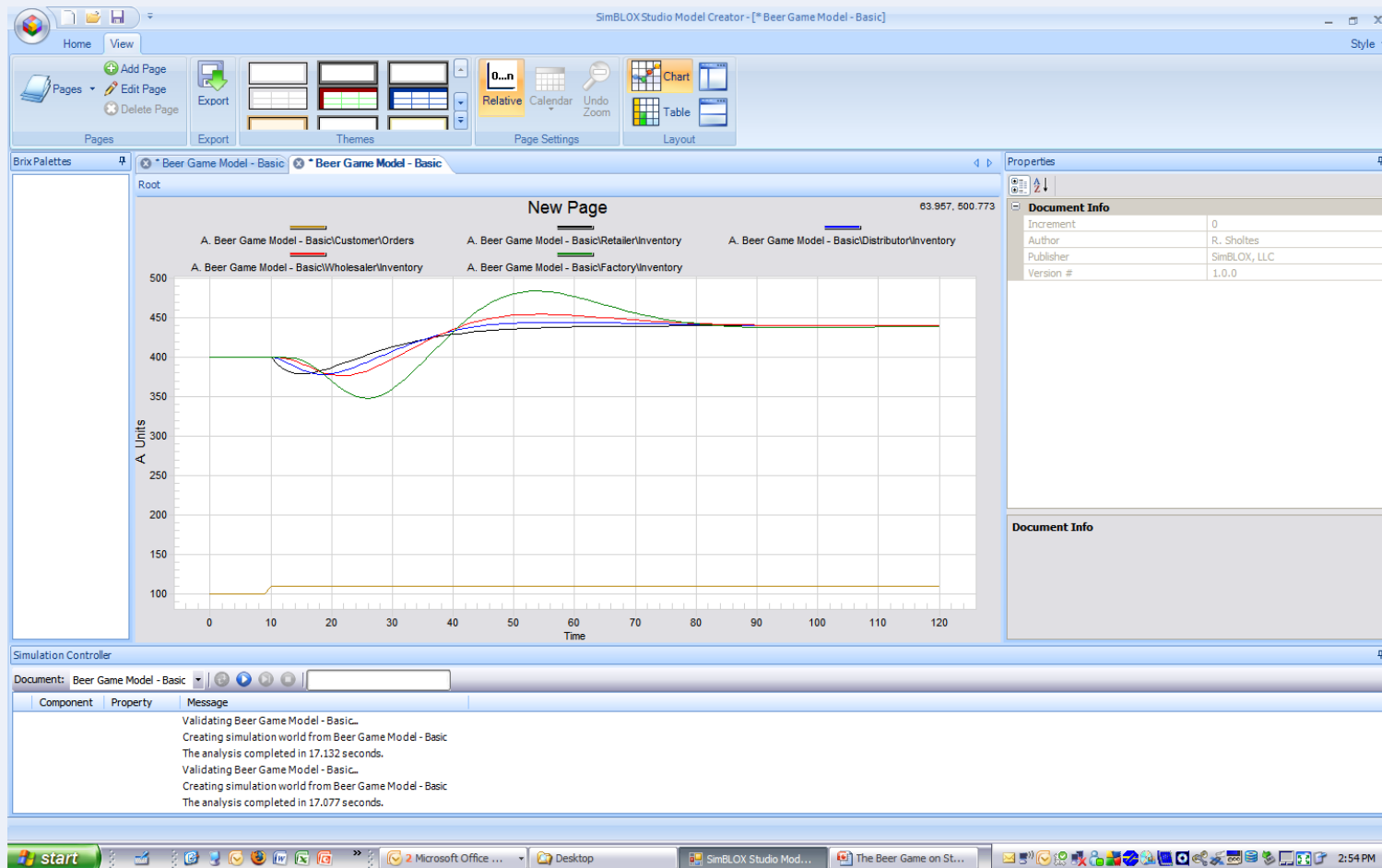
# BGOS Interface

The screenshot displays the BGOS interface, which is used for simulating the Beer Game. The main window shows a supply chain flow from Factory to Wholesaler, Distributor, and Retailer, ending at the Customer. The interface includes a menu bar (Home, View, Layout, Templates, Analysis), a toolbar with zoom and alignment tools, and a left sidebar with icons for Factory, Warehouse, and Customer. A central area shows the supply chain flow with icons for each stage. Three inset windows show detailed logic diagrams for the Factory, Wholesaler, and Retailer stages, each with a 'Customer Orders' input. A Properties panel on the right lists various parameters:

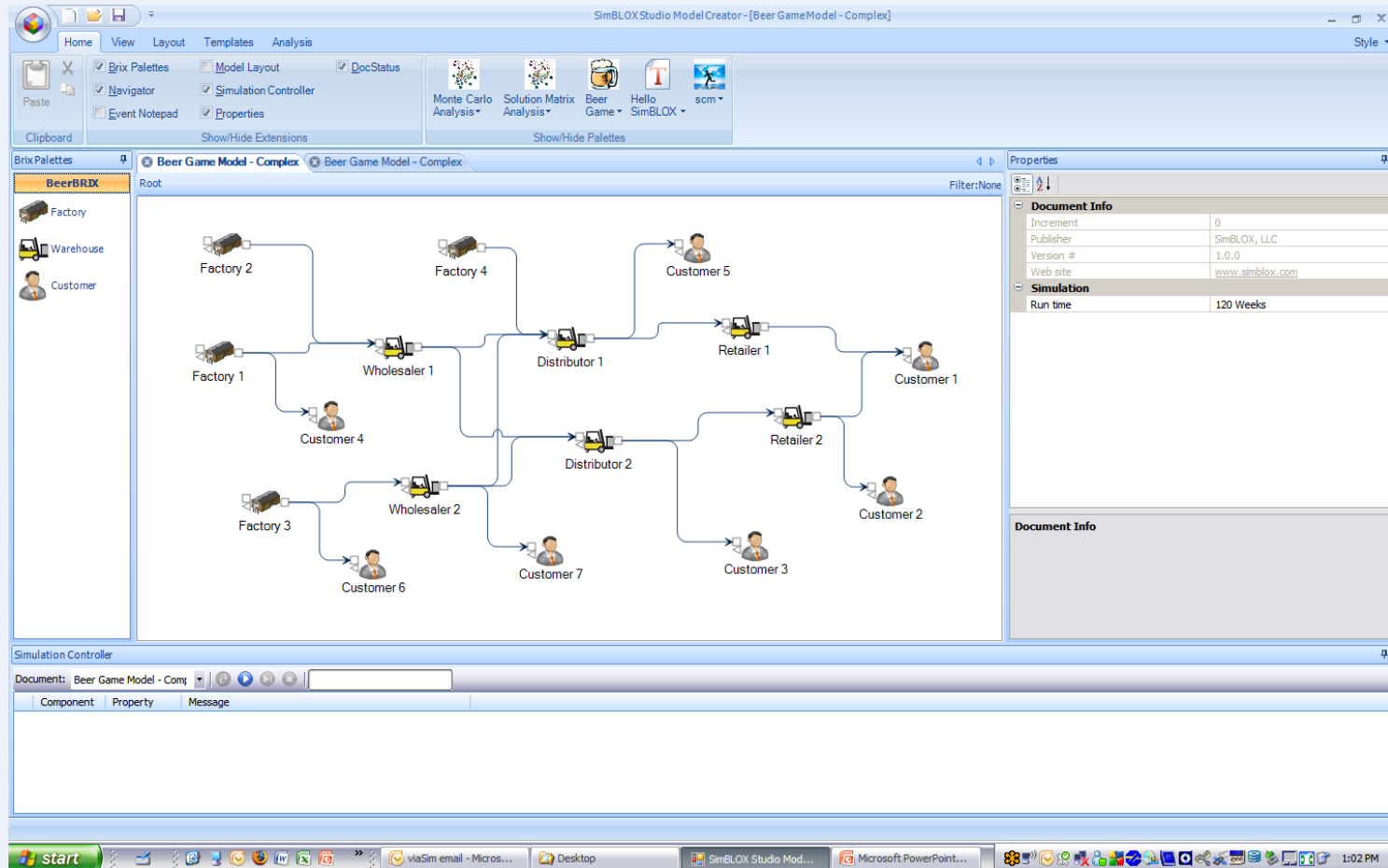
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The Properties panel also includes sections for Display (Image: System.Drawing.Bitmap) and Identity (name: Factory). The bottom taskbar shows the Windows Start button, several application icons, and the system clock at 2:41 PM.

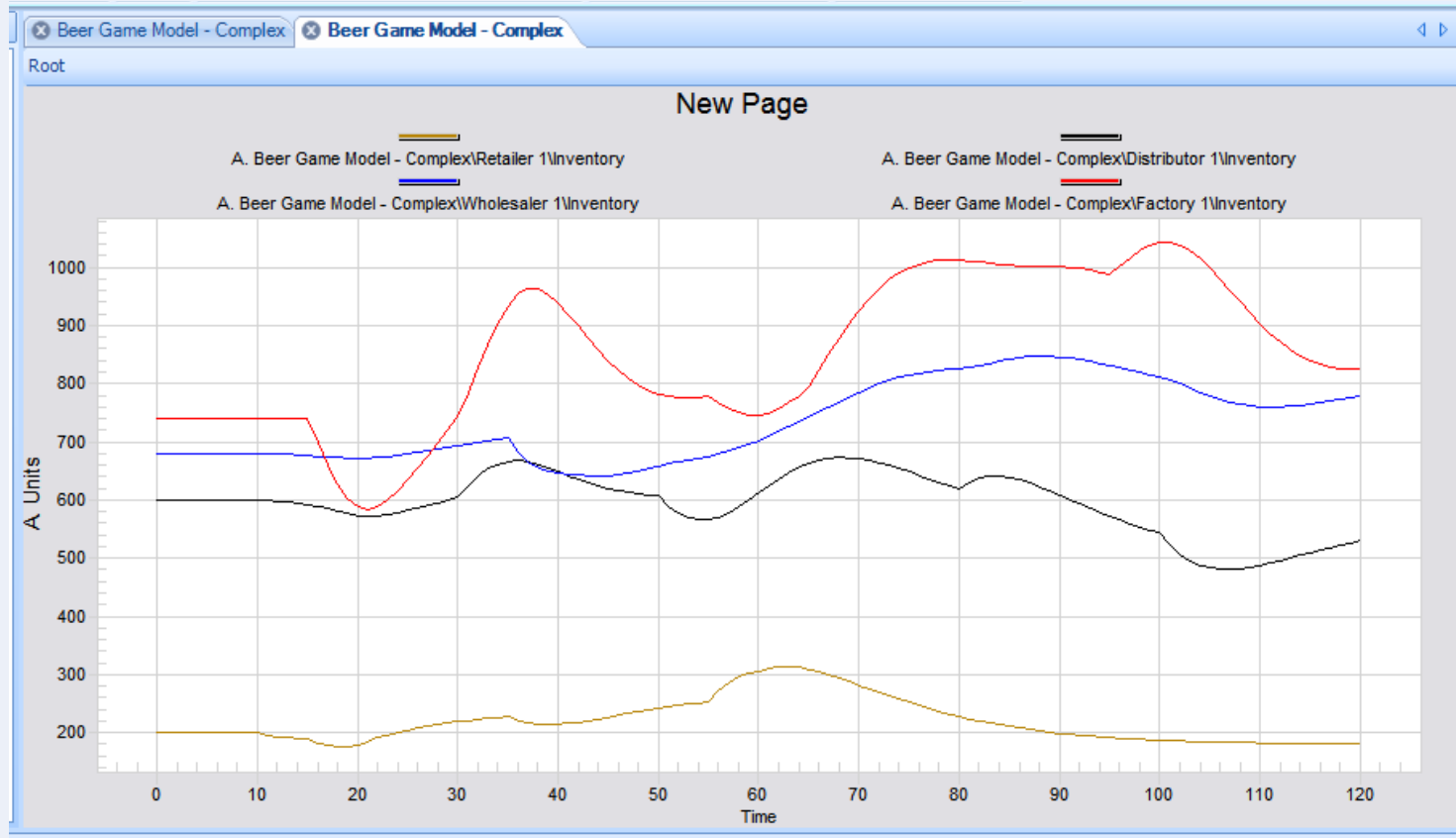
# Basic Beer Game Simulation Results



# More Complex Supply Chain



# More Complex Supply Chain Results



**Questions so far?**

**Demo of the Beer Game  
in BGOS**

# Scenarios

- **Basic traditional beer game.**
- **Expanded beer game with additional factory and competitor.**
- **Expanded beer game with production constraints.**

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# On Your Own

- **Pick one of the 3 scenarios we already did.**
- **Pick at least 3 variables to change. They can be in any entity.**
- **Change these variables one-at-a-time and view new results.**
- **Combine all changes together and view new results.**

# **Debrief and Discussion**

# **What did you see?**

- **Which scenario did you choose?**
- **Which variables did you change?**
- **Did the output results change as you predicted? Any insights?**
- **Did the scenario with all 3 changes combined provide any new insights?**

# Thank you!

# Any questions?

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<b>J. Chris White</b>	jchriswhite@gmail.com jcwhite@scmblox.com <i>www.linkedin.com/in/j-chris-white/</i>
	scmblox.com