

# [Evaluating a demonstration of the near beer game](https://assignbuster.com/evaluating-a-demonstration-of-the-near-beer-game/)

[Food & Diet](https://assignbuster.com/essay-subjects/food-n-diet/)

## Introduction

The Beer Game is a logistics game created by Professors at Systems Dynamics Group, MIT in 60s to understand the key principles of supply chain management [Nienhaus, 2008]. The model we have used model is a single-player version of the beer game, where a user enters ‘ Vendor Orders’, which is delayed by 3 weeks before it becomes part of finished goods inventory.

The game begins in equilibrium. Customers are ordering 10 cases of beer and we have 10 case of inventory each week. The game is simple: in week 2, customers increase their orders from 10 cases of beer a week to 15 cases of beer. The objective is to bring the system to equilibrium while 15 caase of beer are now the norm.

## Did the situation get out of hand, or were you able to keep things under control?

We have gone through several rounds in game and found it is difficult to manage and control. Once played, it compelled us to plan and anticipate in advance understanding each member’s functioning and time taken to process to better calculate the raw material planning. There are two levels of game mentioned

First level is for novice in which the customers keep on waiting and get frustrated when their orders are not fulfilled

While the second level is for experts in which customers after getting frustrated no longer wait for order fulfillments

After going these rounds, we have come across the solution with minimum time lag which is presented below:

Here are the graphical representations of order position at various stages.

The graphs above have been generated from the data collected from the computer Beer Game and show the impact on the Supply Chain. The following explains the various terminology of the game.

The new customer orders increase only once at the beginning and has a long lasting effect on the total customer order.

The total customer order is a combination of the Cumulative Unfilled Orders and the New Customer Order.

The inventories graph presents the amount of items ordered by the supplier and how the inventory affects the size of order.

The Shipments Graph illustrates clearly the time difference between the orders and shipments, which indicate the delay that occurs because of the Supply Chain.

This graph is for novice level. This clearly explains that even though the customer orders are not changing much and have changed only to 15 beer cases after the first week order of 10 beer cases. But we see in the graph that it has led inventory level to vary with much higher span touching 25 beer cases while fluctuation in raw material ordering has further magnified- touching 40 cases of beer. This clearly demonstrates the bullwhip effect.

This graph is for the expert level but while playing customer has not left even though the order has not been met fully. This also demonstrates the bullwhip effect from week 1 to week 8. Again we can see that even though the new customer order has only changed to 15 in second weeks after starting from 10 in first week, the inventory level, order in transit, raw material order has fluctuated dramatically. With a special care that we should have sufficient inventory to meet the customer order resulting in excessive inventory of 50 in eighth week even after starting with 10 beer case inventory level only.

## In what ways do you think your experience in playing the game mirrors the real world?

## What supply chain management-related problems underlie the scenario of the Near Beer game?

The simulations present two major issues of Supply chain management (SCM)-

Bullwhip Effect and Coordination problems- both are leading to over or under-forecasting than the actual; or better put- logically reasonable. Some specific issues we have witnessed in this simulation are-

A tendency to over-purchase raw material, and hence we end up with extra inventory (for example when we choose consistent 25 beers to be produced, from week five, inventory started getting piled up.)

The machines were over-working to meet the requirement of equilibrium, but it was more due to improper forecast (like here we have ordered for 25 beers all the time). Hence, the machine run time has increased, just to produce more inventories.

There is a potential of the manufacturing and procurement delays, as we further move up in the simulation round, as at one point the number will fall short of the customer demands to eliminate issue #2 mentioned above.

Furthermore, as the backlog for orders increases, players order too much inventory, forcing their teammates into severe backlogs further down the supply chain.

The issues affect the motivation and enthusiasm of the staff as well and can cause frustration in the teams.

In both real supply chains and simulations of supply chains, cutting order-to-delivery time by half can cut supply chain fluctuations by 80%. In addition to savings from reduced inventory carry costs, operating costs also decline because less capacity is needed to handle extreme demand fluctuations.

## What solutions would you suggest to each of the characters within the game?

Based on the slow and activities in the SC in previous sections we arrive at some recommendations, mentioned below:

Work Breakdown:

Raw material orders – same day

Vendors – Raw Material deliveries 1w

Production (Brewing) 1w

Warehouse (Finished Goods Inventory) same day

Shipping – same day

To Customer: Empowerment of the supplier and supplier – sharing the forecasts on line

Logistic: Organise Transportation Improvement using alternative routes and minimise the 7 days duration to get the raw materials from different supplier (yeast, hops etc) to same day delivery (JIT techniques).

Operations & Procurement: Ordering should be done same day (reduce the Raw material Ordering duration through ERP) review Product&Services processes, Information Management, chain of: Suppliers Manufacturers Customers SCM “ pull model”

Raw material supplier: Review orders processing and implement B2B system able to get on line orders 24/7/365 days a week and trigger the manufacturer to produce the quantities and fill the warehouse, also to integrate their own requests for raw materials from their suppliers (e. g. packaging ).

Building strong relationship among all above partners to increases profitability of whole SC and enhancing customer satisfaction.

Enterprise Integration of the whole SC, implementing ERP modules fast and clear flow of information between SC members, helping also to minimize bullwhip effect in a most effective manner.

## How could a course in supply chain management assist the characters within the game?

Goals of Supply Chain Management are:

Integration of activities (EI) for efficient co-ordination avoiding duplication of effort.

Responsiveness, a supply chain should quickly respond to customer demands

Profitability, provide financial health for all participants in the chain

Use of collaborative Planning and Forecasting for Replenishment (CPFR) establishing formal guidelines for joint forecasting and planning or if possible implement Response-based model – as soon as the sale is made the cycle responds to the order, rather than carrying inventory in anticipation of the order

Cash-to-cash conversion time reduction – time to convert raw materials at the beginning of the supply chain into product sales at the end maximising the overall value generated (we should look also into a faster brewing technology if possible)

Logistics Synchronisation throughout the entire supply chain( between Customer order cycle, Replenishment cycle, Manufacturing cycle, Procurement cycle)

Customer-Driven Supply Chains “ Competition is no longer between companies; Competition today is between supply chains” An effective supply chain is one that meets the needs of all the customers, and collectively they must satisfy the needs of the end customer.

Focus on the development of relationships with customers (EI) rather than increase individual transactions with customers.

Arrive at value management stage where us as supplier becomes part of the buying organisation (getting involved in product design and processes)

Learn how we implement correctly an Enterprise Resource Planning System to reduce the “ bullwhip effect”, integrating financial and order information, reducing inventory levels, standardising production processing eliminating delays in receiving data, errors due to fatigue and duplication of work

Agree upon Management Strategies to increase total supply chain profitability and minimize bullwhip effect through information accuracy, better operational performance, building partnerships and trust

## Did you come across any frustrating moments when playing the game? If yes, explain

Initially yes: we did not have a clear understanding of the processes, the demand effect (bullwhip type), the durations, the order flow, material flow, and transportation issues.

Then we understood:

The Importance of Planning

How To Manage Customers Demand

How To Manage Vendors / Suppliers / Transportation

How To Manage Inventories

We learnt about the need for integration between supply chain members and how each member performance, impacts the chain performance and hence the customer deliveries.

Planning for production should consider the demand, order of raw materials and raw material procurement, transportation both for raw and finished goods.

## Conclusion

It was really a wonderful experience to play a “ Near Beer Game”. Information at the end customer leverages each Supply Chain (SC) members to raw material suppliers. It was much simpler to understand the Supply Chain Management concepts by this simulation. Customer’s demand is playing a key role to manage the functions of the other SC members like retailer, whole sellers, distributors, manufacturer, transporter, suppliers and thereby maintaining finished goods inventory, raw material inventory, work in process inventory, manufacturing planning to converge the market demand. By playing this game we came to conclusion that when the demand of the beer is certain, (15 Cases per week commencing from second week through full year) it would be easy to hold finished good, work in process and raw material inventory among SC partners and manage the production plan accordingly to cater unfilled order in addition to serve regular shipment to customers.

In a real world each suppliers have certain lead time to supply, time to delivery of the materials, time to process work in process inventory and time to deliver finished goods to end customers. Considering all these constraints SC Members should prepare a joint plan to produce and deliver the finished goods when the customer demands. If these functions are not coordinated, profitability of the whole supply chain will be eroded.

## Referances

Nienhaus, Joerg; Ziegenbein, Arne; Duijts, Christoph, How human behaviour amplifies the bullwhip effect – a study based on the beer distribution game online. Centre for Enterprise Sciences (BWI), Zurich