



Aalto University  
School of Business

# Session 1.2: Understanding the supply chain

## 35E00750 Logistics Systems and Analytics

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# Learning objectives

1. Discuss the **goal** of a supply chain and explain **the impact of logistical decisions** on the success of a firm
2. Define the **three key supply chain decision phases** and explain the **significance of logistics systems**

# Supply chain goals and logistics

# What is a supply chain?

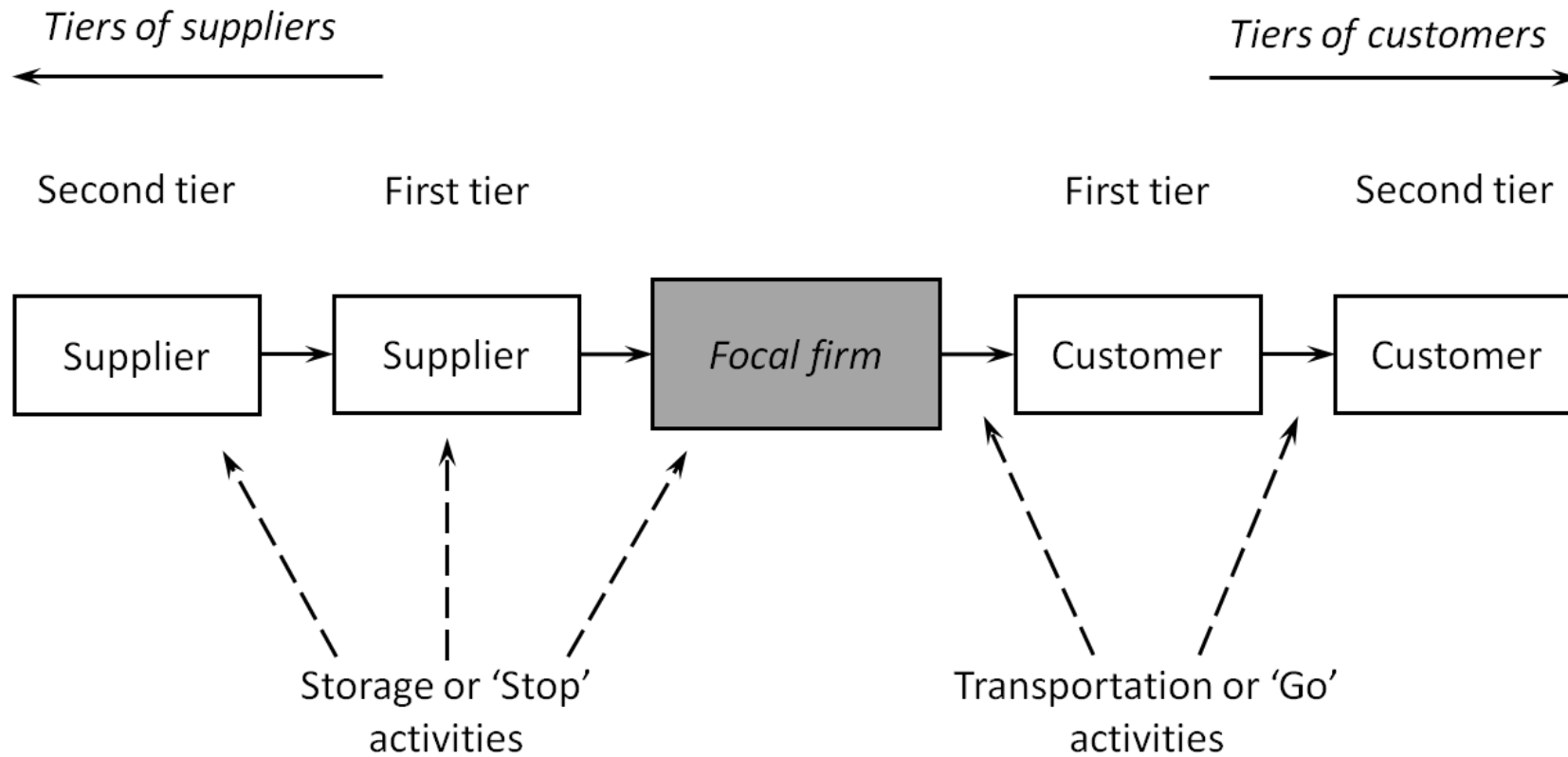
- **All parties involved, directly or indirectly, in fulfilling a customer request**
- **Includes manufacturers, suppliers, transporters, warehouses, retailers, and customers**
- **Supply chain includes all functions, particularly logistics in receiving and fulfilling a customer request**
- **How logistics system work?**
  - Inventory
  - Facilities
  - Transportation

**Logistics system** is made of a set of facilities linked by transportation (and inventory) services

**Supply chain** is a complex logistics system in which raw materials are converted into finished products and then distributed to final users

Ghiani et al. (2004)

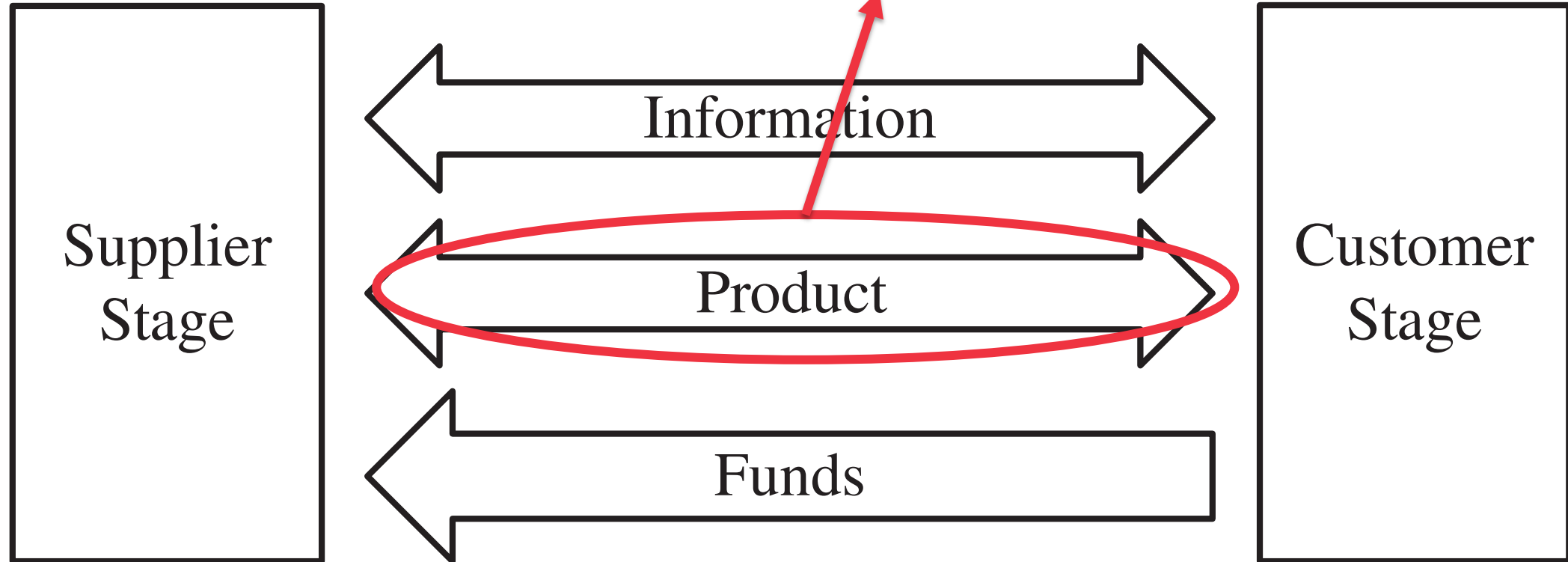
# A simplified supply chain



Grant et al. (2015)

# Flows in a supply chain

This is where logistical functions in a SC (transportation, facilities, and inventory) become crucial!



# Importance of logistical decisions

- **Successful cases**

- Walmart: from \$1 billion in sales in 1980 to \$482 billion in 2016
  - *Invested heavily in transportation and information that facilitate the effective flow of goods and information*
- Seven-Eleven Japan: from ¥ 1 billion in sales in 1974 to ¥ 2.7 trillion in 2016
- Dell: \$56 billion in 2006, adopted new supply chain strategies

- **Cases of failure**

- Webvan folded in two-three years
  - *Inability to design appropriate supply chain or manage information, product, and fund flows effectively*
- Borders, \$4 billion in 2004, declared bankruptcy in 2010
  - *Failure to adapt supply chains to a changing environment*

# Key supply chain decision phases



# Decision phases in a supply chain

- **Supply chain management (SCM) requires many decisions relating to the flow of information, products, and funds**
  - **Each decision should be made to raise the supply chain surplus**
- 1. Supply chain strategy**
    - How to structure the supply chain over the next several years
  - 2. Supply chain planning**
    - Decisions over the next quarter or year
  - 3. Supply chain operation**
    - Daily or weekly operational decisions



# Phase 1: Supply chain strategy

- **Decisions about the configuration of the supply chain, allocation of resources, and what processes each stage will perform over the next several years**
- **Strategic decisions**
  - Outsource supply chain functions
  - Locations and capacities of facilities
  - Products to be made or stored at various locations
  - Modes of transportation
  - Information system to be used
- **Supply chain strategy decisions are long-term and expensive to reverse**
  - Must take into account market uncertainty

# Strategy table for SC design

- Best design will vary depending on product characteristics
- Most cost-efficient source for speed is a key

	Manufacturing Location	International Freight Mode	Final Assembly Location	Order Fulfillment Location	Inventory Stocking Model
Fast but High Cost Option	In Country (e.g., US)	Air	In Country	In Country Factory/DC	Build-to-Stock
Intermediate Option	In Region (e.g., Mexico)	Truck /Rail	In Region	In Region Factory/DC	Configure-to-Order
Slow and Low Cost Option	Worldwide (e.g., China)	Ocean	Worldwide	Worldwide Factory/DC	Build-to-Order/ Customer Commit

Source: Olavson et al. (2010)

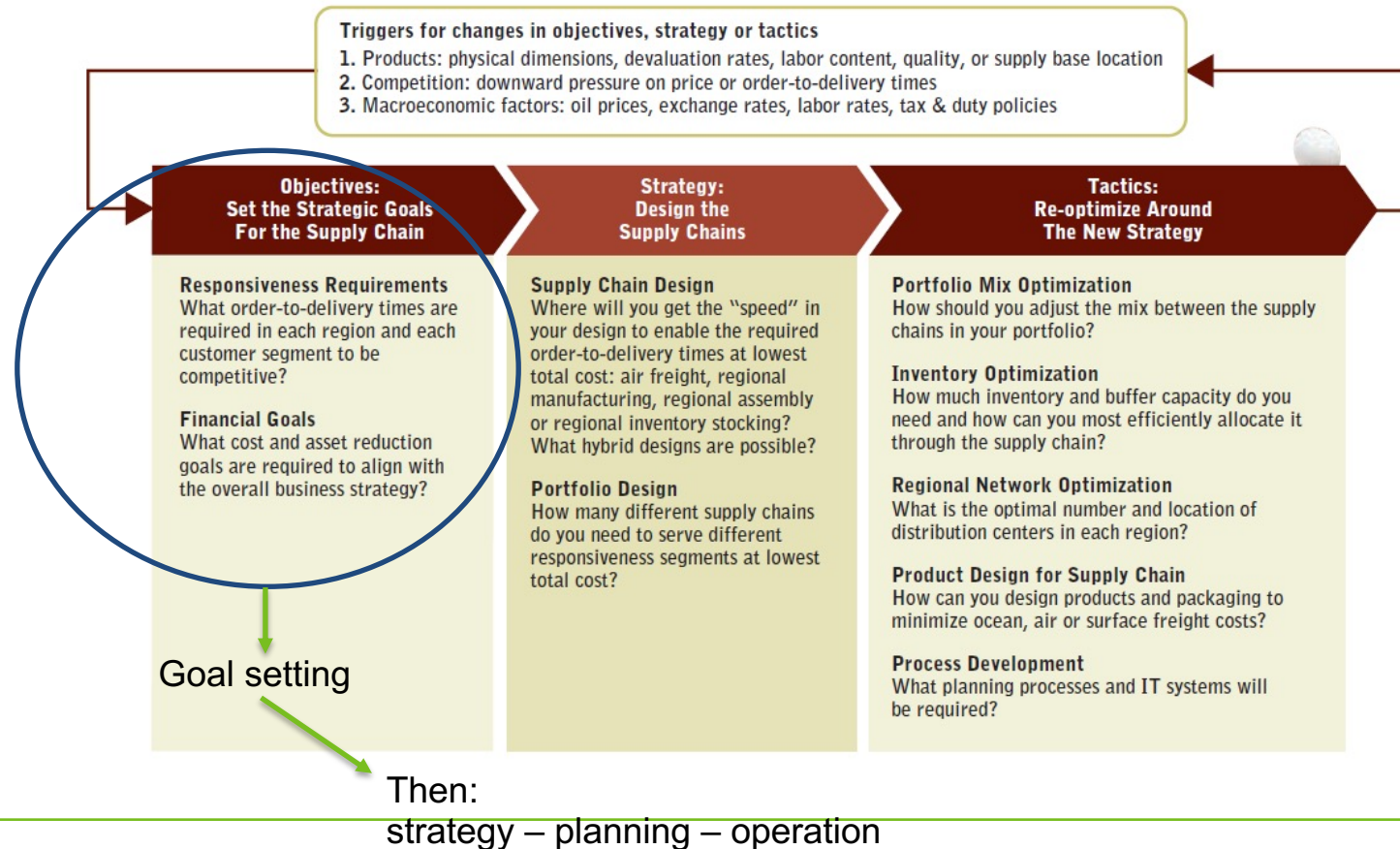
# Phase 2: Supply chain planning

- **A set of policies that govern short-term (a quarter or a year) operations**
  - **Fixed by the supply configuration from the strategic phase**
  - **Starts with a forecast of demand in the upcoming year**
  - **Planning decisions:**
    - Which markets will be supplied from which locations
    - Planned buildup of inventories
    - Subcontracting of manufacturing
    - Inventory policies to be followed
    - Timing and size of market promotions
  - **Must consider demand uncertainty, exchange rates, and competition over the time horizon in planning decisions**
-

# Phase 3: Supply chain operation

- **Decisions regarding individual customer orders (daily/weekly)**
  - **Supply chain configuration is fixed, and planning policies are defined**
  - **The goal is to handle incoming customer orders as effectively as possible**
  - **Operational decisions:**
    - Allocate orders to inventory or production
    - Set order due dates
    - Generate pick lists at a warehouse
    - Allocate an order to a particular shipment
    - Set delivery schedules
    - Place replenishment orders
  - **Much less uncertainty (short time horizon)**
-

# Framework for supply chain portfolios



Source: Olavson et al. (2010)



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# The Fresh Connection Simulation

# Benefits of “serious gaming”

© Academy of Management Learning & Education, 2009, Vol. 8, No. 4, 559–573.

## Using Simulation-Based Training to Enhance Management Education

EDUARDO SALAS  
JESSICA L. WILDMAN  
University of Central Florida

RONALD F. PICCOLO  
Rollins College

- Moves **beyond** mere teaching of theory
- Learning within a **reduced time frame**
- Offers a **more complex and realistic** learning environment than case studies ...
  - ... but in a more simplified and manageable context than real-life
- **Risk-free** environment for learning and experimentation
- Train skills that are necessary, but infrequently used (and, thus, need to be **sharpened**)
- More **engaging** and **enjoyable** than more traditional learning media



What is *The Fresh Connection*?

## The challenge

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The **Fresh Connection** is a producer of fruit juices in Northwestern Europe:

- ... but has suffered severe losses in the last year
- Poor supply chain performance:
  - Cannot meet promised service levels
  - Inventories either too high or too low
  - Shortages and obsolescence
  - Production costs are too high
  - Questionable supplier selection

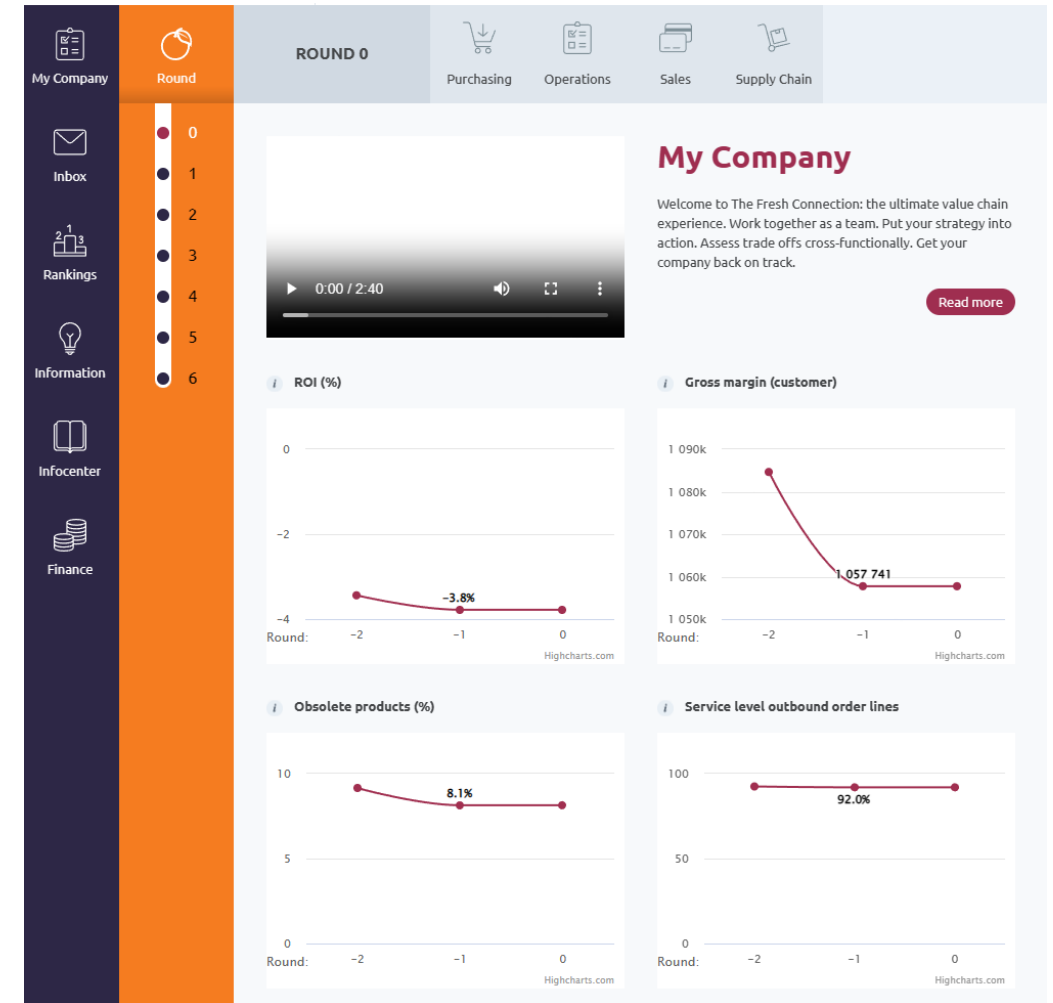


A new management team has been appointed consisting of five VPs with only one goal:

**Making the company profitable again!**

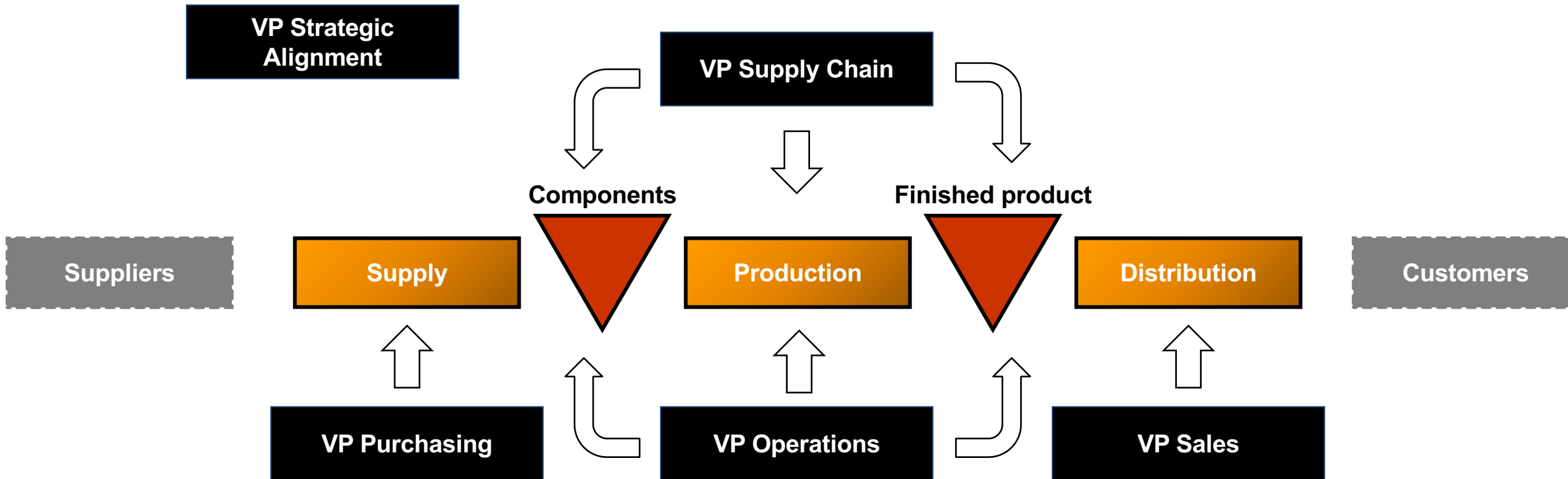
# What is *The Fresh Connection*?

- A **web-based simulation**, allowing you to:
  - Apply concepts from different course
  - Evaluate your own decisions
  - Reflect on your decisions from a theoretical perspective
  - Make mistakes (!)
- The learning outcomes of *the Fresh Connection* are ...
  - ... working together in a **cross-functional team**
  - ... to overcome **silos thinking**
  - ... gain some **experience** in supply chain management



What is *The Fresh Connection*?

## The roles



What is *The Fresh Connection*?

## The roles *Cont'd*

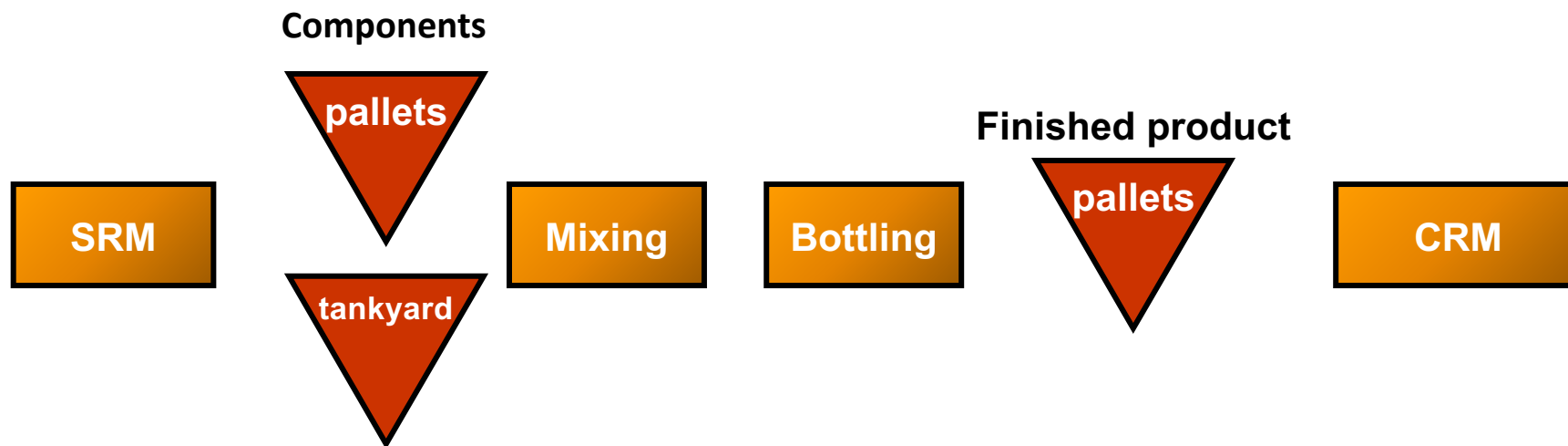
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- Each role has its own **interface** as this video by the Strategy Director clearly shows
  - Watch at home and look around yourself
- Besides the four standard roles, we play with an additional fifth role: **VP Strategic Alignment**
  - No decision power in-game ...
  - ... but needs to ensure that all decisions are aligned
  - also needs to oversee the structure and task division of the assignment

What is *The Fresh Connection*?

## The supply chain

- Make-to-stock environment
- Three warehouses and overflow warehouses when needed
- Two-stage production: Mixing and bottling
- Bottling line(s) and mixer(s) for all products

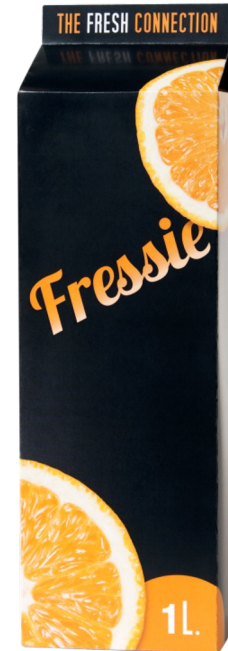


What is *The Fresh Connection*?

## The assortment

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- Two **packaging types**
  - 1L Cartons
  - 0.25L PET bottles
- Three **flavors** for each type
  - Orange
  - Orange C-Power
  - Orange/Mango
- Shelf life of finished products is **20 weeks**



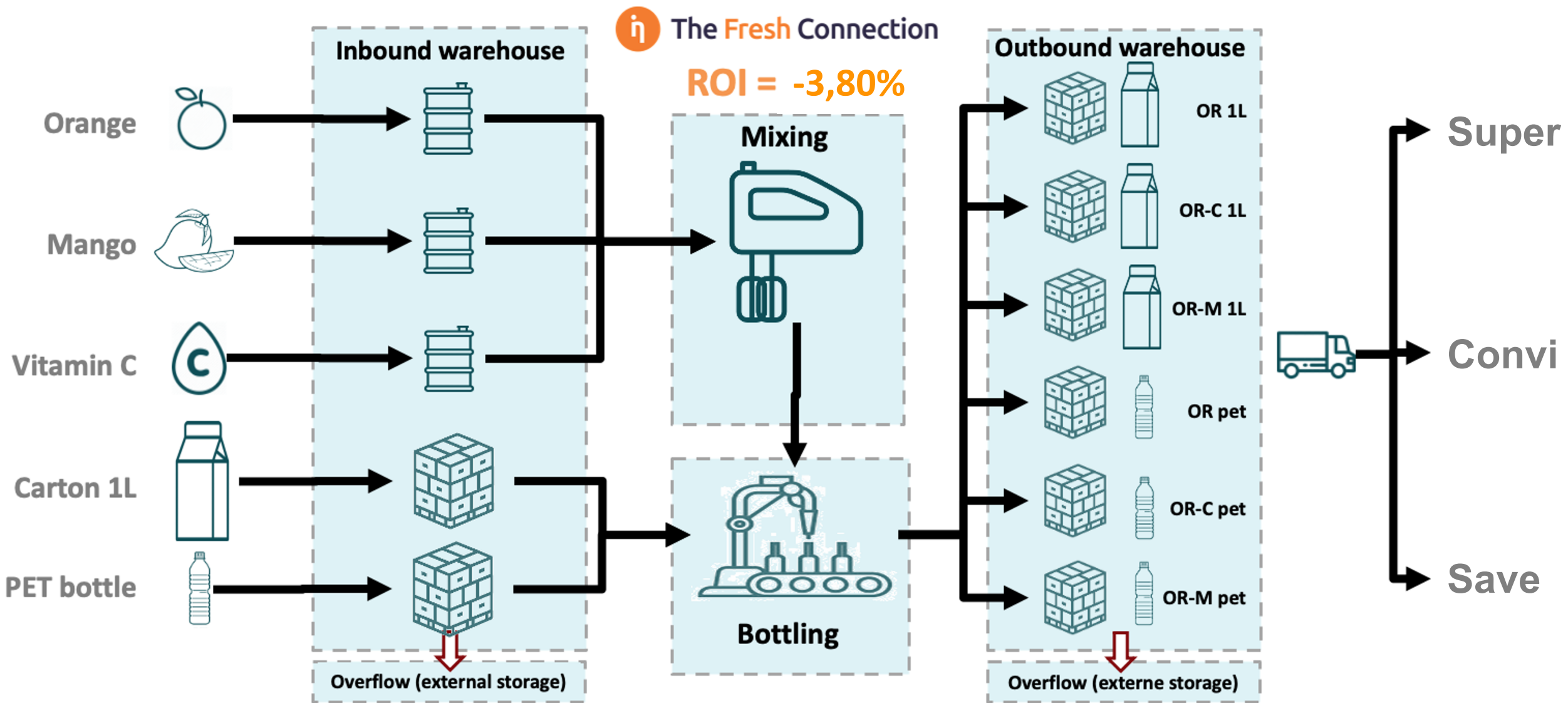
What is *The Fresh Connection*?

## The market

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- Three customers:
  - **Super**
    - 80 stores (5% of market)
    - Customer satisfaction at a bit higher price
  - **Convi**
    - 210 stores (12% of market)
    - Discounter
    - Only PET
  - **Save**
    - 140 stores (8% of market)
    - Cheapest supermarket







What is *The Fresh Connection*?

## The experience

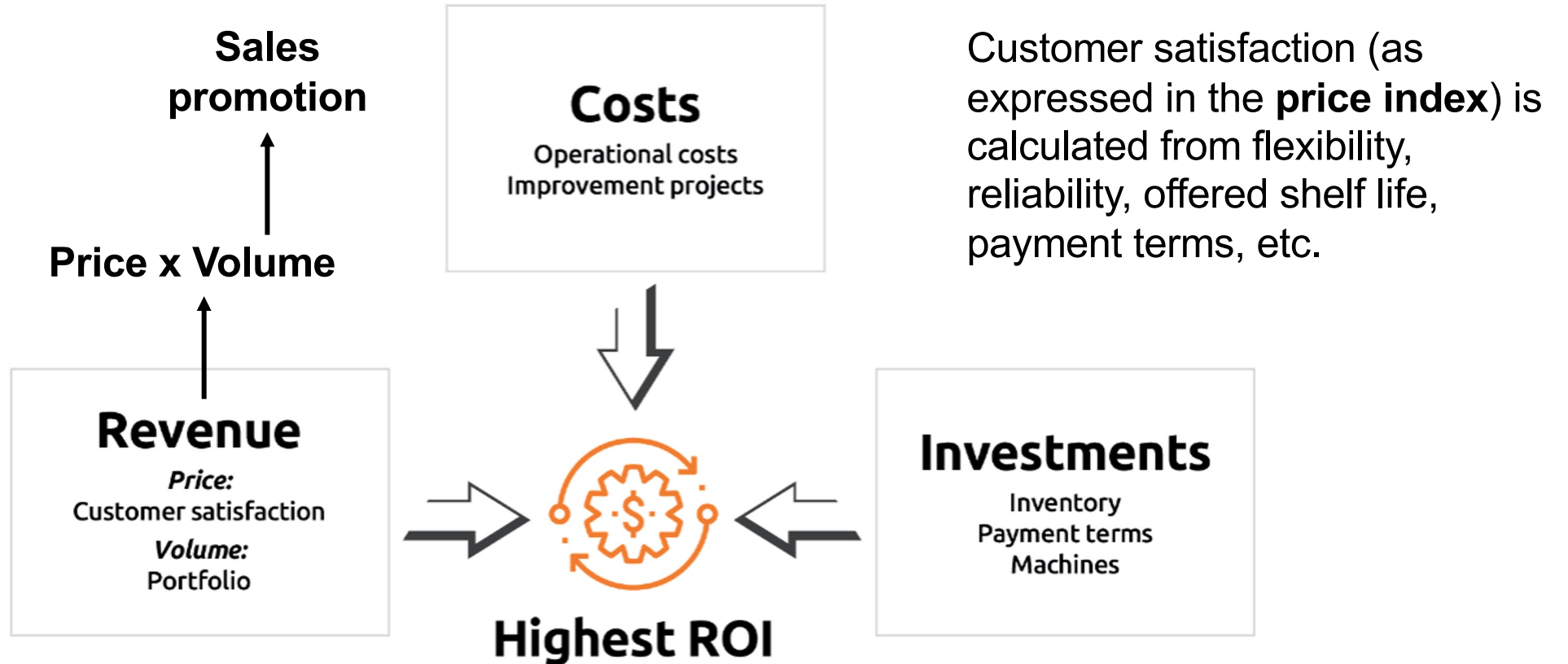
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- SCM is not the responsibility of only one function or manager, it is **teamwork!**
  - **Coordinated** decision-making is critical
- A **strategy** is necessary to have a common direction
- How to translate strategy into **action**?



What is *The Fresh Connection*?

## Performance evaluation



Round	SALES	SCM	OPERATIONS	PURCHASING
1	<ul style="list-style-type: none"> <li>• Service level</li> <li>• Order deadline</li> <li>• Shortage rule</li> <li>• Shelf life</li> <li>• Trade unit</li> <li>• Payment terms</li> </ul>	<ul style="list-style-type: none"> <li>• Safety stock Component</li> <li>• Safety stock Finished Goods</li> <li>• Production interval Fin. Goods</li> <li>• Lot size Component</li> <li>• Frozen period in production</li> </ul>	<ul style="list-style-type: none"> <li>• # shifts bottling</li> <li>• # Palletlocations INB. &amp; OUTB.</li> <li>• # FTE INB. &amp; OUTB.</li> <li>• SMED action</li> <li>• Increase speed</li> <li>• Intake time components</li> <li>• Preventive maintenance</li> <li>• “Solve breakdowns” training</li> <li>• Raw materials inspection</li> </ul>	<ul style="list-style-type: none"> <li>• Delivery window</li> <li>• Delivery reliability</li> <li>• Trade unit</li> <li>• Supplier selection</li> <li>• Payment terms</li> <li>• Component quality</li> <li>• Transport mode</li> </ul>
2-3	<ul style="list-style-type: none"> <li>• Promotional pressure</li> <li>• Assortment</li> <li>• Forecasting</li> </ul>	<ul style="list-style-type: none"> <li>• Production interval tool</li> </ul>	<ul style="list-style-type: none"> <li>• Machine selection mixing</li> <li>• Machine selection bottling</li> </ul>	<ul style="list-style-type: none"> <li>• Dual sourcing</li> </ul>

# Rules of the game

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- TFC is based on **teamwork**:
  - All team members must contribute to making decisions!
  - This is also required for all assignments that go with the game.
  - In case not all group members contribute to the assignments, **please communicate this proactively** so that we can try to address such issues.
  - There is an option to submit a **Peer Review Form** in case you think not all group members contributed to an assignment. Please submit this with the assignment.

## Next steps

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- Look around in the game (login information on MyCourses)
- Form groups of 4-5 and agree on who will take over which role in the game
  - Think of a clever **name** for your company
  - Examples: “Juice Kidding,” “Juice-in-time”
- Create an account at <https://my.inchange.com/>
  - Write down login information!
  - Confirm mail (check spam)

# Hints and tips

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- Key points:
  - **supply chain strategy** needs to fit to **competitive strategy** (will discuss in Lecture 2)
- **Familiarize** yourself with the game using your own account and the login details provided on MyCourses
- No decisions can be taken independently
  - Think about the dependencies and consequences of decisions in the game
  - **Teamwork** is everything!
- Time management
  - Have internal deadlines for your group to get a consensus
  - Think about the big picture -- Don't spend too much time on the details

## Welcome to The Ultimate Value Chain Experience

 The **Fresh** Connection    The **Cool** Connection    The **Blue** Connection

E-mail

Password

Remember me?

[Forgot your password?](#)

Log in

[No account yet? Register as a new user.](#)

### Code entry

Code

Submit



MY COURSES



7 active courses

### The **Fresh** Connection

The Fresh Connection delivers the ultimate value chain learning experience. Experience the power of true alignment and a well articulated supply chain strategy, supported by tactical skills and knowledge. Tear down functional silos and create the right cross functional mindset.

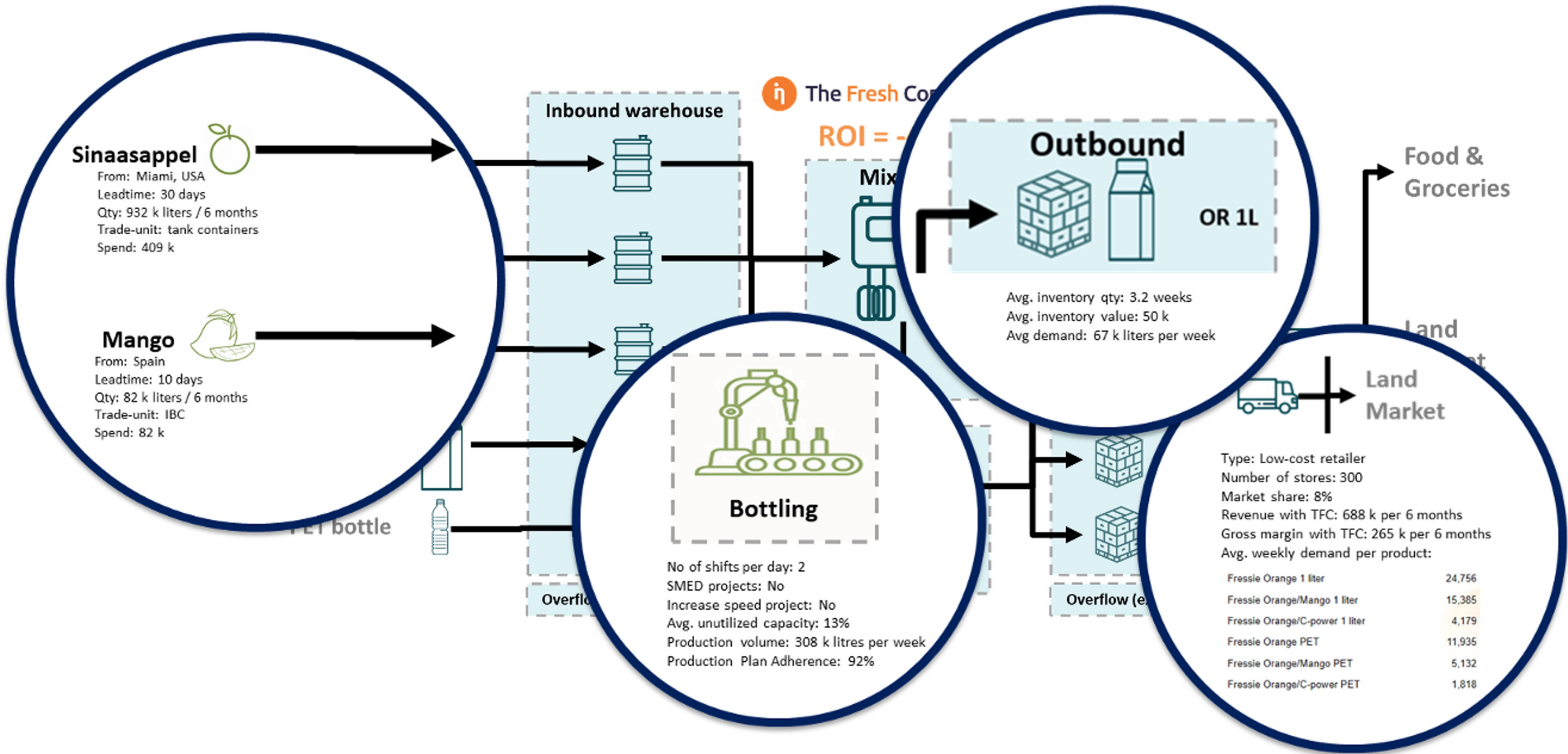
# Hints and tips *Cont'd*

- When it comes to preventing **penalties**, be aware of the danger of relying on averages
- Determining the **value-density matrix** may be helpful\*

	<i>Component value-density</i>			<i>Component usage (rotation)</i>		
	<b>Units per pallet</b>	<b>Price per unit</b>	<b>€ per pallet</b>	<b>€ per 6 months</b>	<b>Units per week</b>	<b>Pallets per week</b>
Pack						
PET						
Orange						
Mango						
Vitamin C						

\* Adapted from *Mastering the Supply Chain* by Ed Weenk





Example is adapted from *Mastering the Supply Chain* by Ed Weenk (information is different from our version)

# Hints and tips *Cont'd*

- **Map** the (stages in the) supply chain:

- **Step 1: Stages in the supply chain**

- Make a drawing of TFC's supply chain :

- Suppliers
- Inventories
- Production steps
- Customers

- And connect the different elements in a correct way



# Hints and tips *Cont'd*

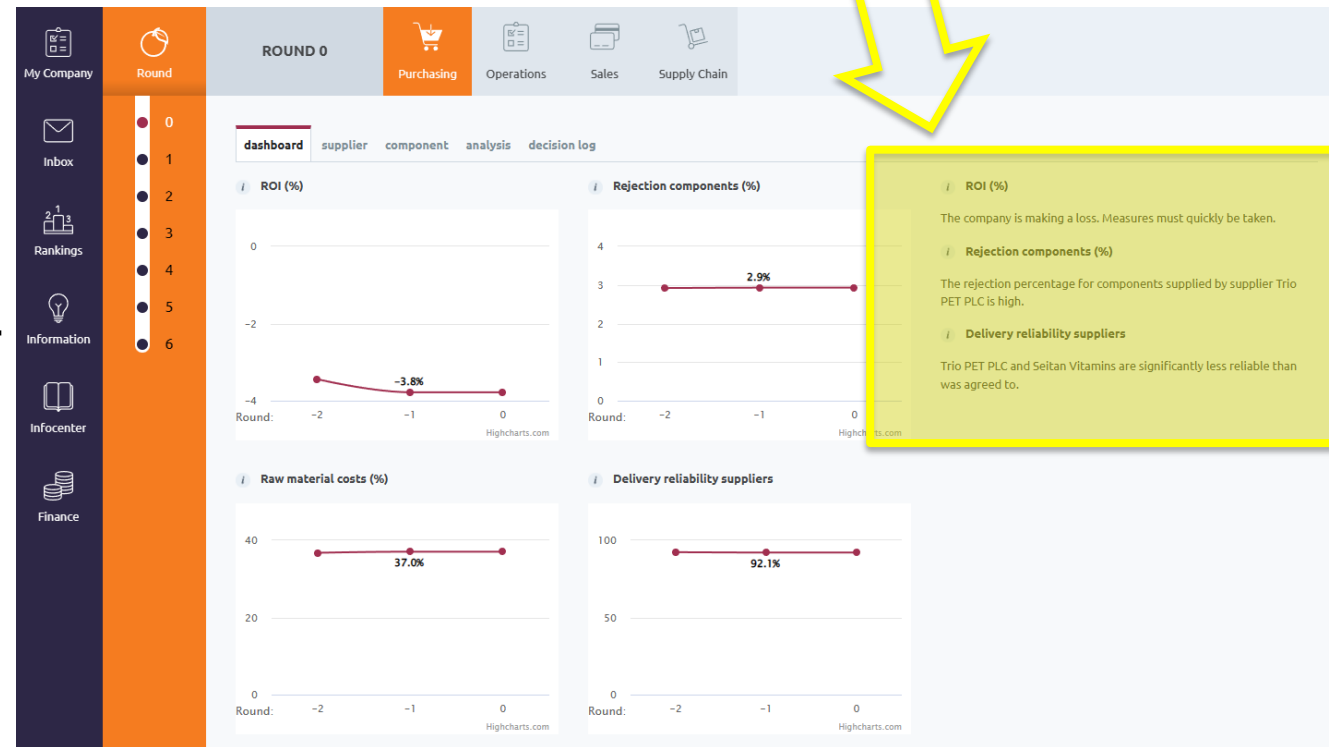
- **Step 2:** Add tactical parameters
  - For example:
    - Agreements with customers and suppliers
    - Safety stock levels, production cycles

The screenshot displays a dashboard interface for 'ROUND 0'. The top navigation bar includes 'Purchasing', 'Operations', 'Sales', and 'Supply Chain'. A yellow arrow points to the 'Supply Chain' menu item. Below the navigation bar, there are tabs for 'dashboard', 'supplier', 'component', 'analysis', and 'decision log'. The 'decision log' tab is active, showing a table of data for 'Pack' and 'PET' categories. The table lists various parameters and their values.

Category	Parameter	Value
Pack	Contract index	0.9940
	Quality	High
	Lead time (days)	15
	Certification	×
	Country	France
	Free capacity	18%
	Payment term (weeks)	4
PET	Contract index	0.9620
	Quality	Poor
	Lead time (days)	10
	Certification	×
	Country	Spain
	Free capacity	3%
	Payment term (weeks)	4

# Hints and tips *Cont'd*

- **Step 3: Add real performance**
  - For example
    - Volumes, service levels, ...
    - Capacity utilization, rejections, ...



# Hints and tips *Cont'd*

- **Step 4:** Indicate issues in **RED**
  - Which indicators worry you?

First step towards an **action plan**

Functional area	Observations	Proposed actions
Sales	Penalties with all customers Low delivery reliability ...	Promise less service or increase performance (check how with OPS and SCM) ...
Operations		
Supply chain		
Purchasing		

Example is adapted from *Mastering the Supply Chain* by Ed Weenk



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**Let's take a look at the  
group enrollment**

# Groups

## **Groups of min. 4 and max. 5 students**

- The working language should be English
- Learn to work with new people and people with different backgrounds
- Learn how to utilize different strengths and weaknesses
- Be inclusive and supportive

**We need to finalize the groups during Lecture 3**

# Practicalities

## Check your Aalto email regularly

- Emails from us and MyCourses announcements

## When emailing us, please...

- Include “LSA 2023...” in the subject line
- CC both of us (Tri and Teemu) and, preferably, CC all team members so that we don’t get duplicate emails from multiple team members





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# Thank you!

# Questions?

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