

VALUE CHAIN INNOVATION & REACTIVE CAPACITY

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COSTUME GALLERY: BUSINESS AND SOURCING FROM CHINA



Ellen Ferreira,
Owner and CEO,
Costume Gallery

- ▶ Dance costume wholesaler
- ▶ Based in Camden, New Jersey, U.S.
- ▶ Annual sales US\$ 100-120 million



- ▶ Demand is concentrated in April (highly seasonal)
- ▶ Production cost and shipping from China: \$3; Lead time: 3 Months
- ▶ Average Sales Price: \$35
- ▶ If Ellen sources from China, she must order before the Chinese new year holiday in January-February.
- ▶ Overage Cost ~ \$3 (assuming no salvage)
- ▶ Underage Cost ~ \$32



If you order from China, you are facing the newsvendor problem

BUSINESS MODEL INNOVATION: REACTIVE CAPACITY

- In addition to sourcing from China, Ellen decides to **also** use local sources

Local
Production

Average Cost: \$15
Lead time: 1-2 days



Avg. Price: \$35

Overseas
Contractors

Average Cost: \$3
Lead time: 2-3 Months

THE OVERSEAS ORDER (SPECULATIVE CAPACITY)

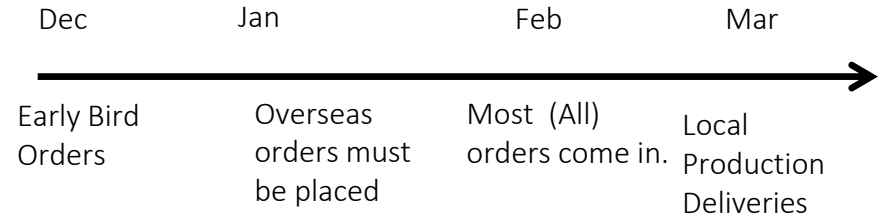
- Overage Cost ~ \$3 (assuming no salvage)
- Underage Cost = Consequence of producing too few in china
- Underage cost will no longer be \$32 but \$12 ($= \$32 - \20).

THE LOCAL ORDER (REACTIVE CAPACITY)

- Order is placed after observing demand
- Order more if china production falls short
- Do not order, if china production is excessive

OVERSEAS
ORDER

LOCAL ORDER



PROFITS

- What happens to profits by having both the local and overseas production possibilities?
- Profits are increased substantially by having the local option in addition to the overseas option
- The overseas capacity is known as speculative capacity, the local capacity is known as reactive capacity
- Having Reactive capacity is a type of a Real option

Change the game: The right way to go to China!

OTHER INDUSTRIES AND PRODUCTS WHERE THIS APPLIES



The New York Times

November 21, 2009

A Hamster Is the Season's Hottest Toy

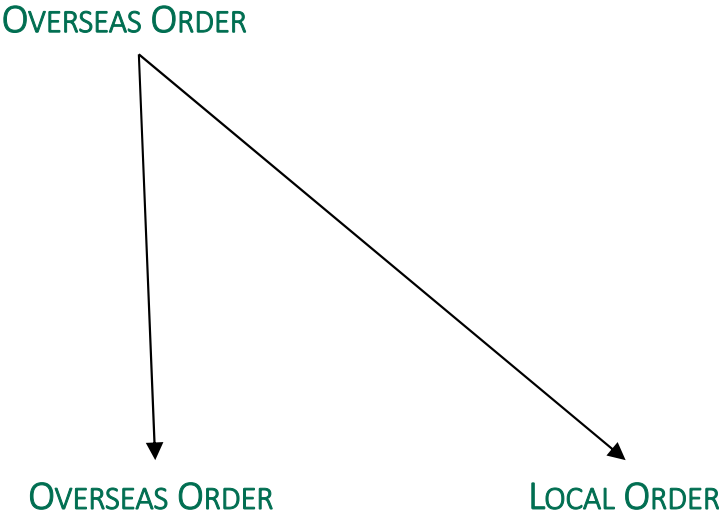
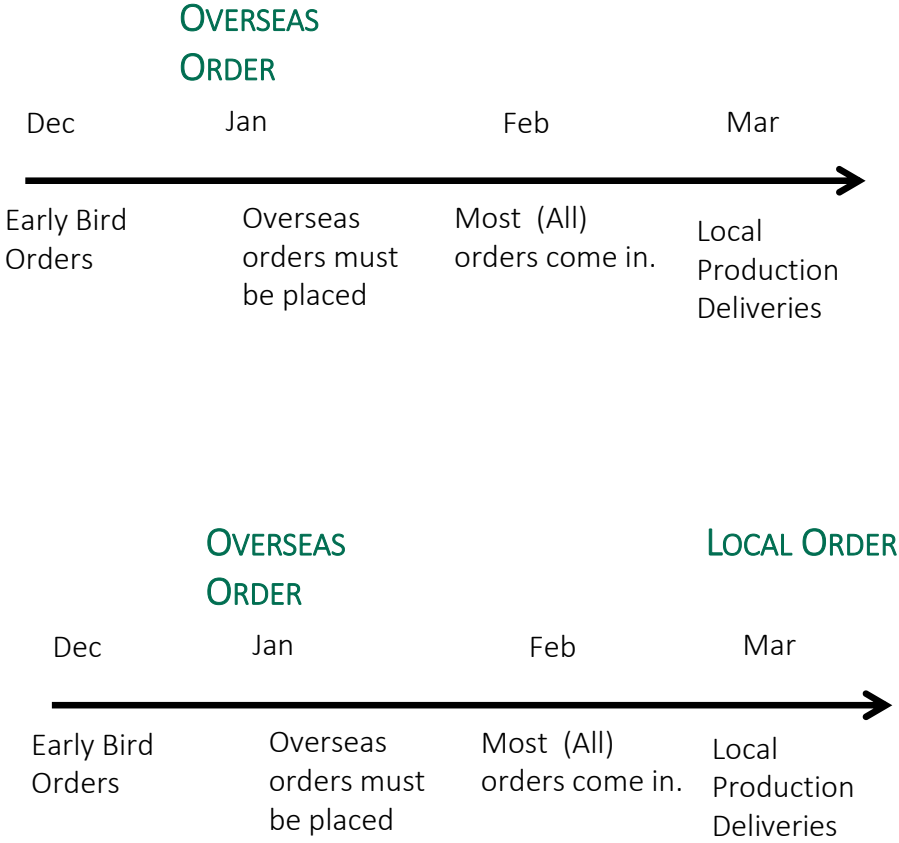
By [STEPHANIE ROSENBLOOM](#)

ZhuZhu Pet

猪猪



DECISION TIME-LINE : SPLIT DECISIONS



Splitting the decisions reduces the risk

BUSINESS MODEL INNOVATION II: ADVANCE PURCHASE DISCOUNTS

Local Production

Average Cost: \$15
Lead time: 1-2 days

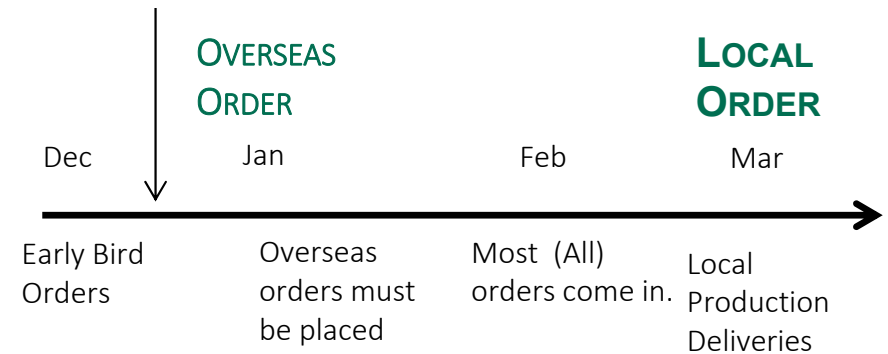


Avg. Price: \$35

Overseas Contractors

Average Cost: \$3
Lead time: 2-3 Months

ORDERS COMMITTED BY JAN
15TH GET A 15% DISCOUNT



DANCE SCHOOLS

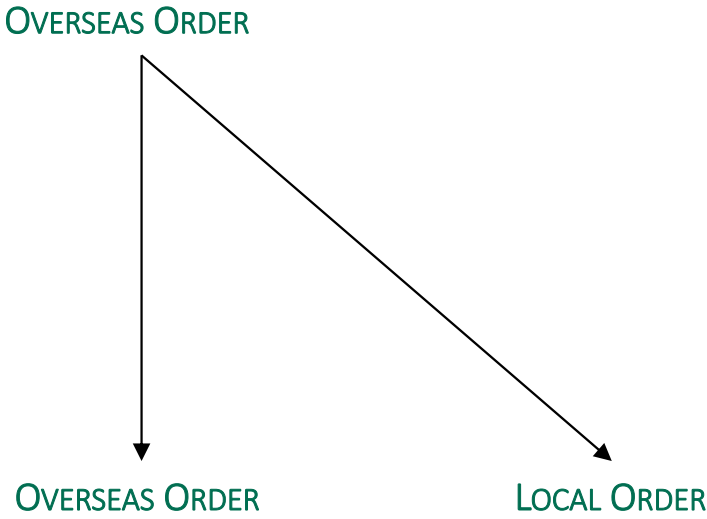
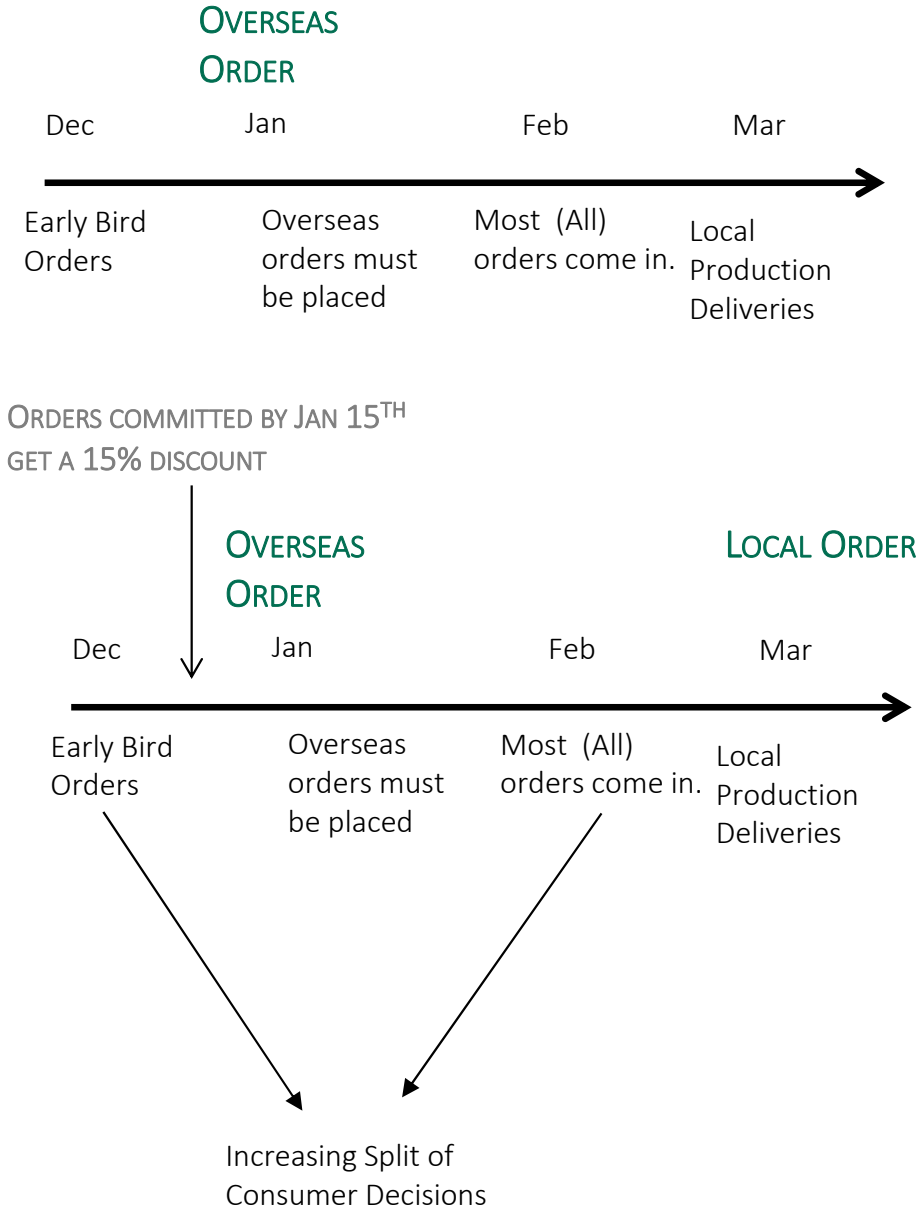
- ▶ In the original model, they have no incentive to place early orders... Why take the risk. (Kids change sizes, drop out, etc.)
- ▶ But now, they can increase their commissions by doing so.
- ▶ They have the information and ability to fix demand.
- ▶ So they order based on their best estimate.

COSTUME GALLERY

- ▶ It is losing money by giving a discount.
- ▶ But, it gains information and reduces mismatch costs.
- ▶ Early sales are usually a very good predictor

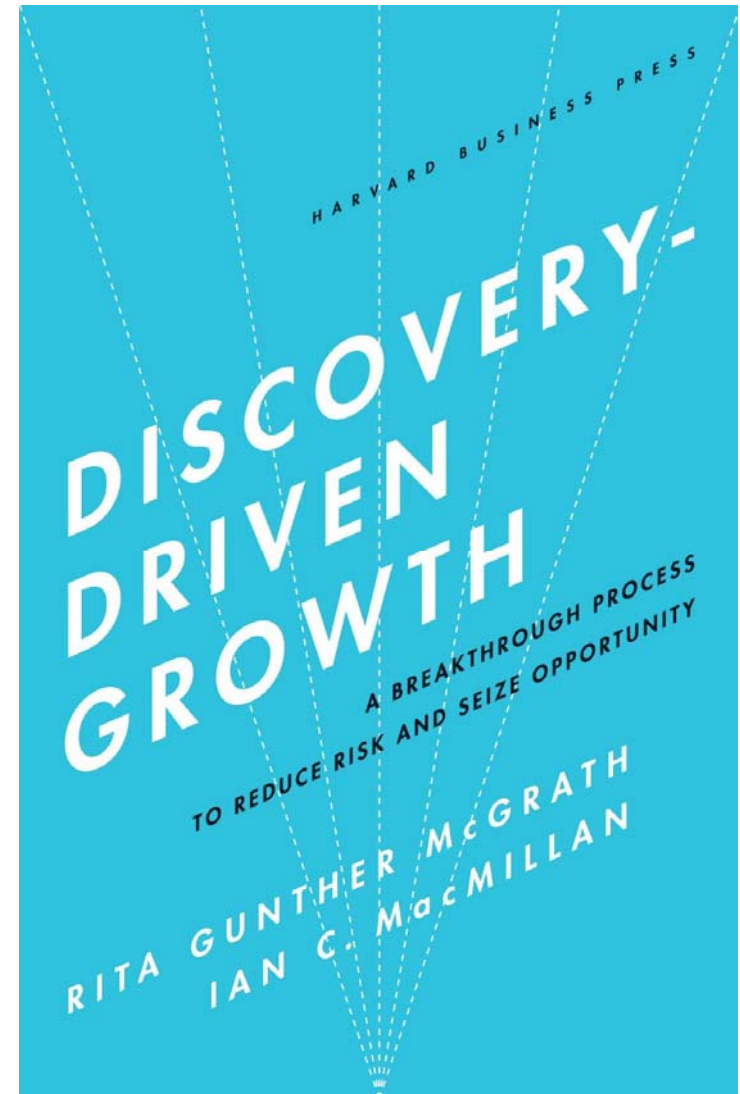
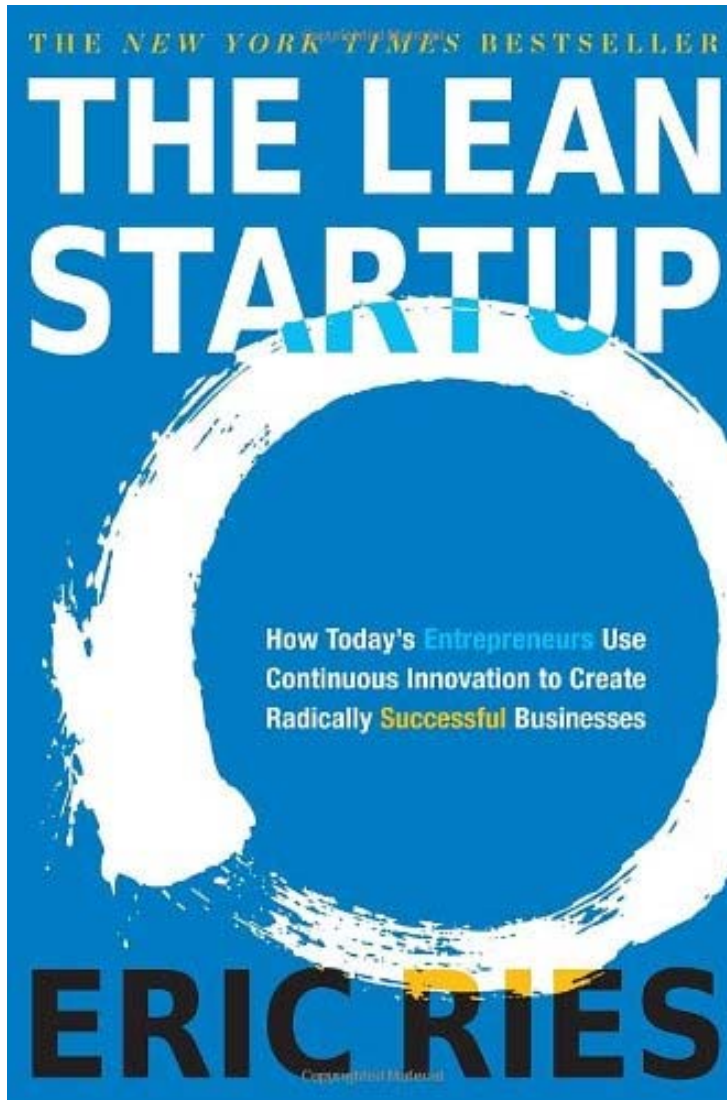
Everybody is better off!

DECISION TIME-LINE: SPLIT DECISIONS



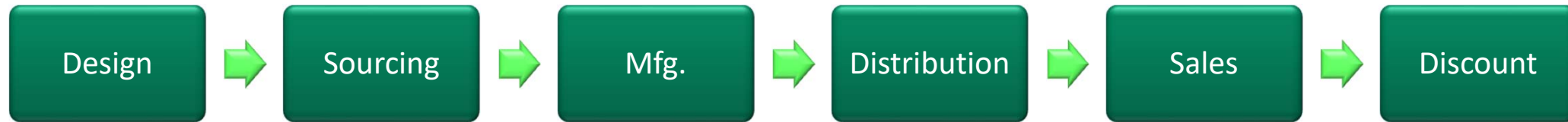
BMI: Split *customers'* decisions

DISCOVERY-DRIVEN GROWTH



Lean Start-up Method: Gradualize the steps/bets in decision-making via small and cheap experiments (reactive capacity)

THE FASHION INDUSTRY



Example



Grease Jacket from Costume Gallery's Catalogue



Retail Price: \$65

Cost: \$15 (production, shipping)

Margin: 77%†

Firm Profitability: 5%!!!!

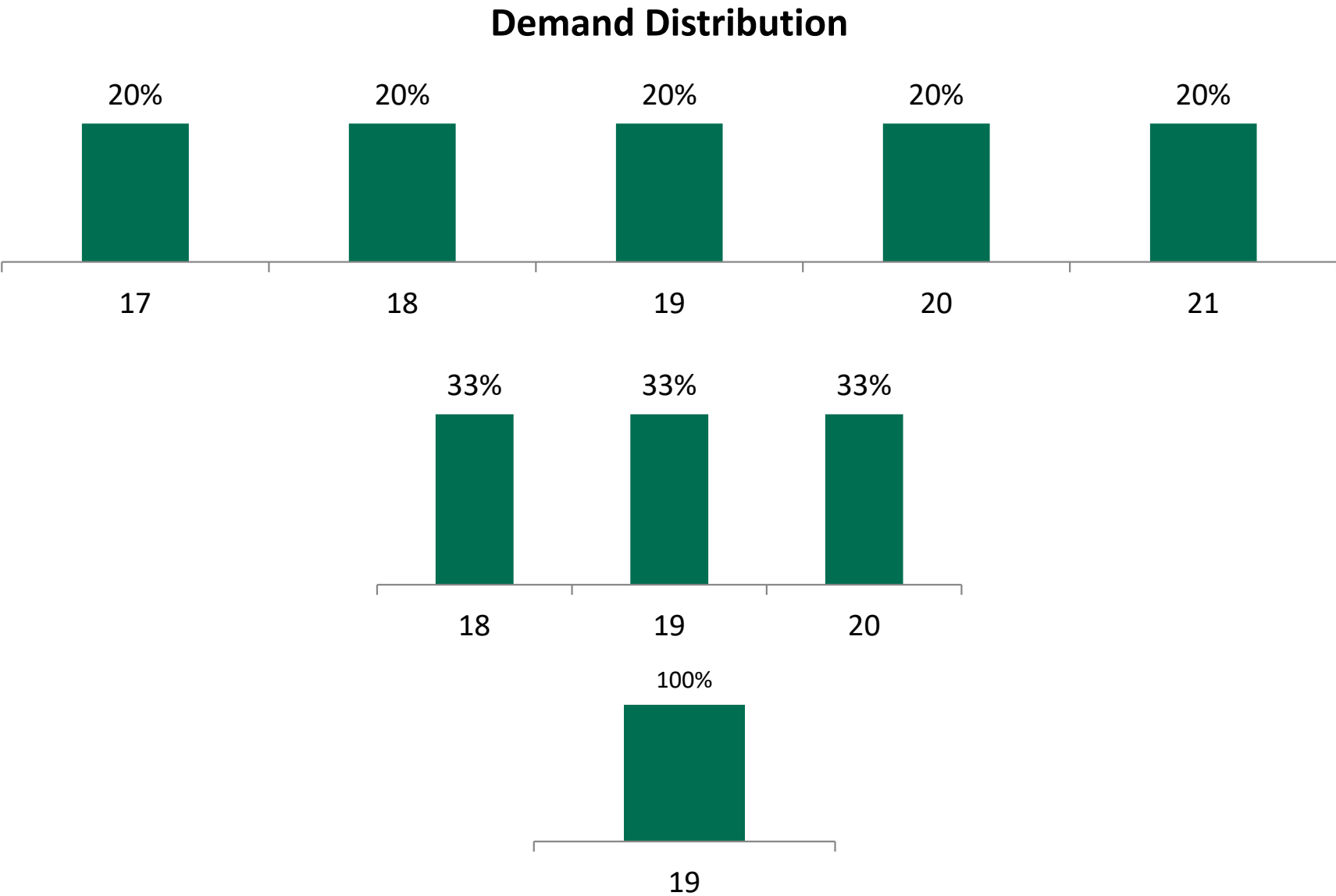
While Margins are high for fashion goods, but firm profitability is Very Low! Why?

- Demand for such products is driven by fickle trends and is notoriously hard to predict
- Consequently, firms end up with a lot of excess inventory which must be discounted. At the same time, many customers don't find what they want.

† Margins are indicative of the fashion garment industry, but bear no resemblance to Costume Gallery's actual margins

NEWSVENDOR QUIZ

- ▶ Three Newsvendors face the following Demand Distributions. Who will make the most money? (All Newsvendor act optimally)



ZARA'S FAST FASHION BUSINESS MODEL



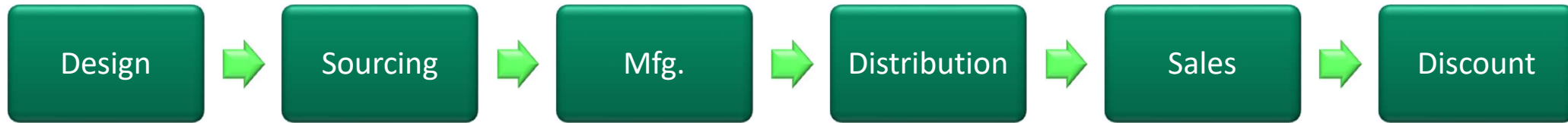
The New York Times

How Zara Grew Into the World's Largest Fashion Retailer

<https://www.nytimes.com/2012/11/11/magazine/how-zara-grew-into-the-worlds-largest-fashion-retailer.html>

[Zara Video Story on NyTimes](#)

LET'S UNDERSTAND ZARA



MARKS &
SPENCER



MARKS & SPENCER: CUSTOMER PROPOSITION AND BUSINESS PROCESS



Business Process

- ▶ Design Team defines detailed cloth specifications one year before store delivery.
- ▶ Merchandisers decide prices and quantities well before start of selling season.
- ▶ Stylists focus on quality improvements of traditional styles.
- ▶ Quality: High conformance to specification, quality of stitching, etc.
- ▶ Many Distributed Warehouses
- ▶ Seven Weeks of Inventory

Customer Proposition

- ▶ High “Quality” garments, traditional styles, plus sizes.

Clock-Speed

16 month cycle



ZARA: CUSTOMER PROPOSITION & BUSINESS PROCESS



Business Process

- ▶ Design Team develops platform models but holds off finalizing detailed design
- ▶ Single production. Production often falls short. New styles pick up unsatisfied demand.
- ▶ Internal Raw Material finishing capabilities, allowing for last minute changes
- ▶ Production is consolidated in Zara Industrial Areas (close to markets- Mexico, Spain)
- ▶ All new products every month
- ▶ Word of Mouth Advertising. Location, Location and Location!

Customer Proposition

- ▶ Trendy Stylish products, very affordable prices. Buy new styles often, high turnover.

Clock-Speed

21-29 day cycle

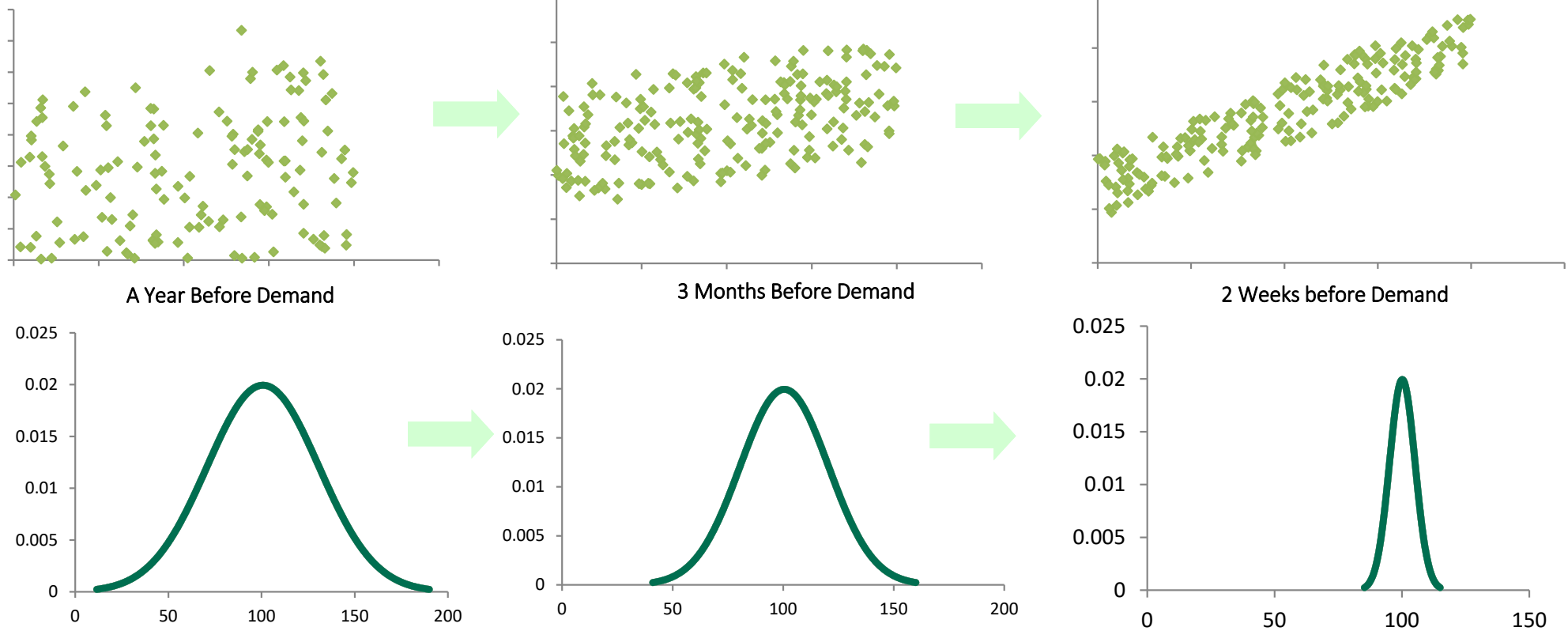


ZARA V/S M&S: KEY BUSINESS PROCESS DIFFERENCES

Marks & Spencer	Zara
Quantity Decision made 1 year before sales	Quantity Decisions made days before sales
Multiple, Distributed Warehouses	Centralized Warehouse
Detailed Designs are frozen well in advance	Platform designs are frozen and flexible capacity is booked. Detailed Product differentiation decision is postponed.
Demand is satisfied , leftover inventory is heavily discounted	Full Demand is often unsatisfied, Customers substitute other products.
Distant Production Location, Long lead times	Close Production Location, Short lead times
7 weeks of Inventory	Few days of inventory

ILLUSTRATIVE EXAMPLE: VALUE OF TIME (INFORMATION)

GRAPHS INDICATE FORECAST ACCURACY, CLOSENESS TO 45° LINE INDICATES HIGHER ACCURACY



Demand Forecasts become better with time as more information becomes available

Firm 1 orders 1 year ahead of Demand.

It's forecast is $D \sim N(\text{Mean}, \text{Variance1})$. Compute Newsvendor Quantity and Profit

Firm 2 orders 1 month ahead of Demand

It's forecast is $D \sim N(\text{Mean}, \text{Variance2})$, where $\text{Variance2} < \text{Variance1}$. Compute NV Qty & Profit.

Mismatch Costs will be higher for Firm 1, Newsvendor profits for Firm 2 will be higher!

Delaying Ordering Decisions reduces demand-supply mismatch, and increases profits

AGGREGATING DEMAND FROM TWO MARKETS

Geek Alert!

Market 1



DEMAND \sim NORMAL (μ , σ)

Market 2

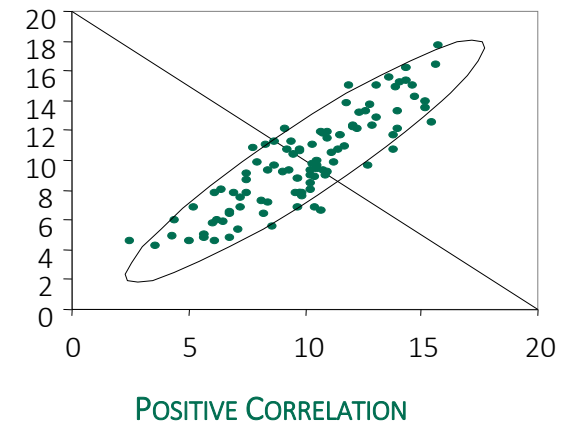
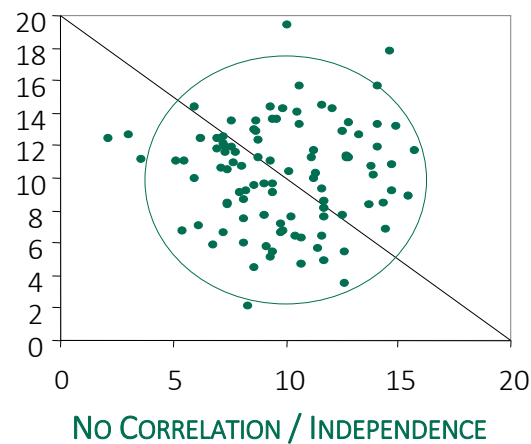
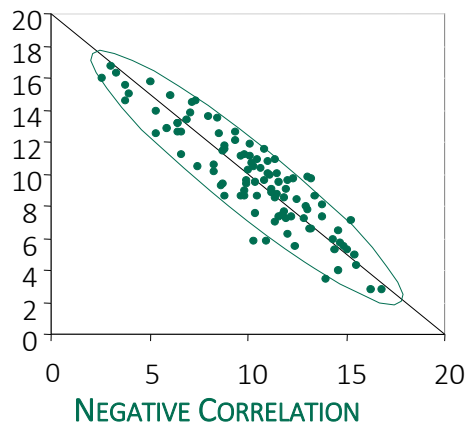


DEMAND \sim NORMAL (μ , σ)



Combined demand for the two markets ?

- The mean demand will be 2μ , but the combined standard deviation depends on the correlation between the two variables
- Correlation refers to how one random variable's outcome tends to be related to another random variable's outcome.



$$\text{Normal}(\mu, \sigma) + \text{Normal}(\mu, \sigma) = \text{Normal}(2\mu, \sigma(2(1+\rho))^{1/2})$$

Random demand for two products (x-axis is product 1, y-axis is product 2). In scenario 1 (left graph) the correlation is -0.9 , in scenario 2 (middle graph) the correlation is -0 and in scenario 3 (the right graph) the correlation is 0.90 . In all scenarios demand is Normally distributed for each product with mean 10 and standard deviation 3.

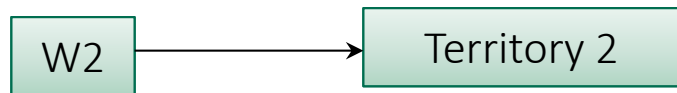
ILLUSTRATIVE EXAMPLE: VALUE OF CENTRALIZED WAREHOUSE (LOCATION POOLING)

Consider two supply chain designs

Decentralized Warehouses

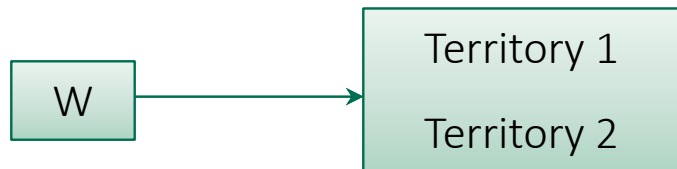


Demand from Territory 1: Normal (μ , σ)
This is the effective demand for W1. Compute NV Profits



Demand from Territory 2: Normal (μ , σ)
This is the effective demand for W2. Compute NV Profits

Centralized Warehouses



Demand for Warehouse is sum of Demand from Territory 1 and Territory 2.

Effective Demand: Normal (2μ , $\sigma (2(1+\rho))^{1/2}$), where ρ is the correlation between the two markets.
Compute NV Profit for Warehouse.

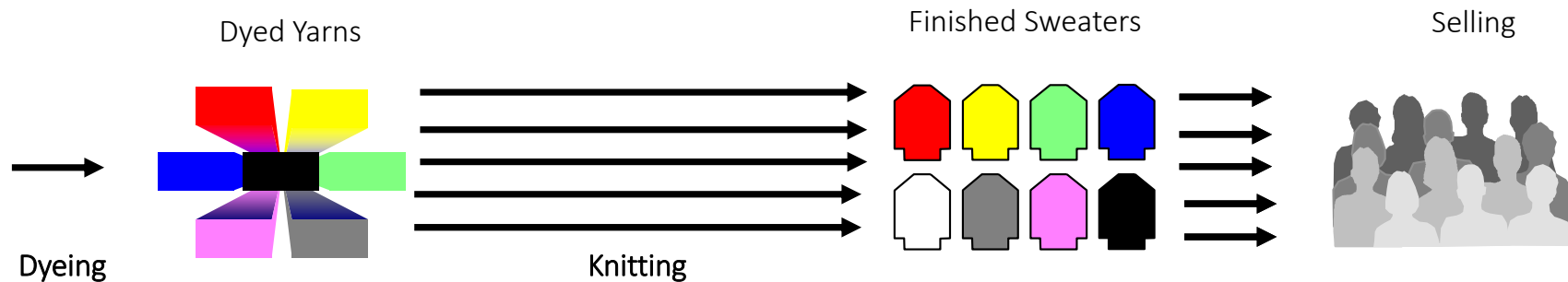
The variance in pooled demand is less than 2x the variance in original demands!

Having a centralized warehouse, reduces effective demand variance and increases Profits

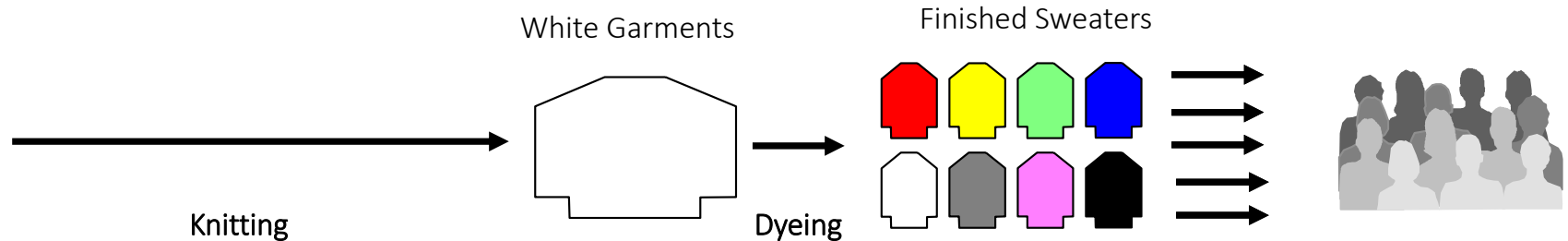
ILLUSTRATIVE EXAMPLE: VALUE OF PLATFORM DESIGNS (DELAYED DIFFERENTIATION)

UNITED COLORS
OF BENETTON.

Early Differentiation Process



Delayed Differentiation Process (Postponement)



- ▶ In an early differentiation process, dyeing and knitting quantities have to be decided on the basis of individual demand for colors.
- ▶ In a delayed differentiation process, knitting quantities can be decided on basis of *total* demand.
- ▶ **Total Demand has lower variance than the sum of variances of individual demand.** This will reduce total mismatch costs and increase profits.

Delayed Differentiation also leads to pooled demand, and reduces mismatch costs!

OTHER EXAMPLES OF DELAYED DIFFERENTIATION

► Campbell Soup:

- Manufacturers brand name and private label soup (same soup)
- Problem: Many different private labels (Giant, Kroger, A&P, etc)
- Solution: Hold inventory in cans without labels, add label only when demand is realized.



► Black and Decker:

- Sell the same drill to different retailers that want different packaging.
- Store drills and package only when demand is realized.



► iPhone:

- Customers want different color phones.
- Design the product so that iPhone cases can be added quickly and locally.



► Hewlett Packard:

- Sells printers in different countries. Different markets have different power supply conventions and require different product labeling.
- Designs and produces generic printers with special power supply modules that can be plugged in after demand is realized.



THE WORD OF THE DAY: SPEED IT UP!

Zara Thrives by Breaking All the Rules

How the Spanish apparel chain gets new designs into stores in two weeks while keeping costs low



A Zara store in Manhattan: Controlling the supply chain is key Jennifer S. Altman

BusinessWeek

- ▶ Zara continues to be recognized as the leader in “Fast Fashion”
- ▶ Zara’s business model is **risk-driven**: it’s not about margins, it’s about managing risks

ZARA TODAY: COMPETITORS ARE CATCHING UP BUT STILL HAVE A LONG WAY TO GO

THE WALL STREET JOURNAL.

**Pace-Setting Zara Seeks More Speed
To Fight Its Rising Cheap-Chic Rivals**

1. If you only copy a piece of Zara’s BM, you end up worse.
2. BMIs are very hard to copy. Require to change the culture of the organization.



Fast Fashion Industry: Zara changed the game and mindset from cost to speed!

KEY LESSONS

- ▶ 1st word of the day: **Split!** Splitting Decisions can reduce the consequences of getting bets wrong
- ▶ Advance Purchase Discounts: Split Consumer Purchases
- ▶ 2nd word of today is: **Speed it up!**
- ▶ Pooling Demand from various locations (Centralized Warehouse) reduces variance in demand (lower mismatch costs and higher newsvendor profits)
- ▶ Delaying Differentiation of products (platform designs) allows one to bet on joint demand for different product variants, which has lower variance (lower mismatch costs and higher newsvendor profits)
- ▶ Fewer discounts can change customer behavior and encourage immediate purchases and substitution.

From cost-driven to risk-driven business models – Reduce Information Risks

NEXT TIME

- ▶ Lecture 5: Tutorial on Newsvendor exercises
- ▶ Lecture 6: Relationships, contracts and platforms
- ▶ Read any articles mentioned in the Study Guide

