

# STOCK ALLOCATION IN FASHION AND RETAIL INDUSTRIES

# WEBINAR AGENDA

- 1 Company Overview
- 2 Introduction
- 3 A need in a complex environment
- 4 The math behind
- 5 The process in the IT landscape
- 6 How to enhance D365 F&O



# COMPANY OVERVIEW



# WHERE WE ARE

## US

Chicago, Detroit, Kansas City,  
Seattle, St.Louis

## BRAZIL

Belo Horizonte, Sao Paolo

## UK

Basingstoke, Chester,  
Cockpole Green, **LONDON**

## FRANCE

Paris

## BENELUX

Amsterdam, Brussels,  
Luxembourg

## BELARUS

Minsk

## ITALY

Bari, Firenze, Milano, Padova,  
Parma, Roma, **TORINO**,  
Treviso, Trieste, Verona

## GERMANY

Berlin, Bremen, Düsseldorf,  
Frankfurt, **GÜTERSLOH**, Hamburg,  
Köln, München, Stuttgart

## POLAND

Katowice

## CROATIA

Zagreb

## ROMANIA

Bucharest

## INDIA

Kochi

## CHINA

Beijing, Nanjing



# INTRODUCTION



# WHAT'S STOCK ALLOCATION?

“**Stock or merchandise allocation** is commonly considered as the set of decisions and strategies made about how quantities held at a central point or in transit will be distributed amongst several points in a retail chain (outlets, stores, customers, etc.). Usually any allocation software deals with **stock allocation** whether the company is fulfilling sales orders or carrying out branch **stock** replenishment.”



# A NEED IN A COMPLEX ENVIRONMENT



# ALLOCATION MANAGEMENT IMPERATIVE

Stock allocation management methods should embrace:

1. Develop and Deliver an **integrated merchandising and fulfillment model**
2. **Establish Holistic Allocation Strategies** that enable **Stock Balance and Efficiency**, coupled with broad-based reporting capabilities
3. Provide an allocation solution that includes also a **Seasonal Forecast Algorithm embedded** within





# STOCK ALLOCATION ISSUES

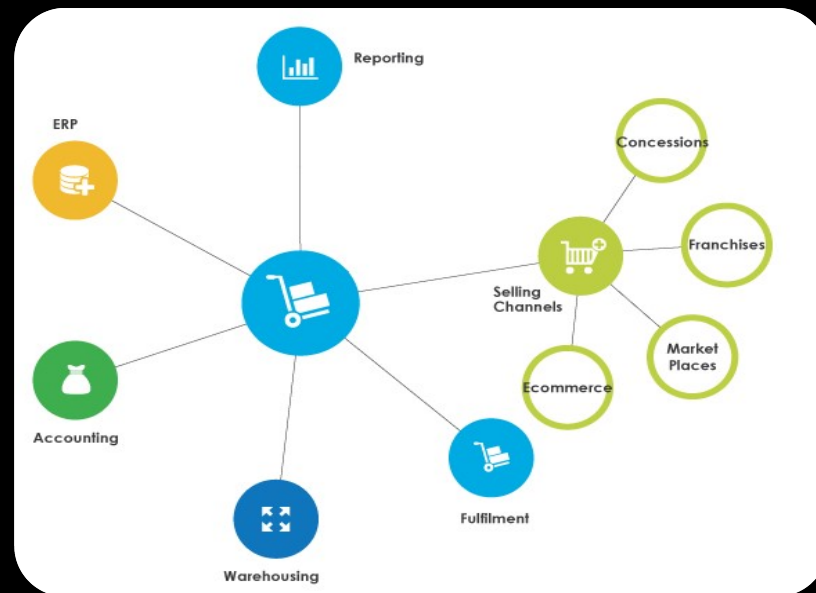
## Critical Points for the Retail (as well the fashion) Industries:

1. According to the industry, it may be based on Seasonal sells
2. It may includes also Carry-over styles
3. It may requires a Seasonal Forecast Framework
4. It may be based only on make to order strategies



# STOCK MANAGEMENT

## AND HOW THIS IMPACT OUR COMPANY



# THE MATH BEHIND



# OPERATIONAL RESEARCH?

## LINEAR OPTIMIZATION

**Linear optimization** is an **optimization method to achieve the best outcome** in a mathematical model whose requirements are represented by **linear relationships**.

**Definition:** a technique used for the optimization of a linear objective function, subject to linear equality and linear inequality constraints. Its feasible region is a convex polytope, which is a set defined as the intersection of finitely many half spaces, each of which is defined by a linear inequality. Its objective function is a real-valued affine (linear) function defined on this polyhedron. An algorithm finds a point in the polyhedron where this function has the smallest (or largest) value if such a point exists.

Linear programs are problems that can be expressed in canonical form as:

$$\begin{array}{ll} \text{Maximize} & c^T x \\ \text{subject to} & Ax \leq b \\ \text{and} & x \geq 0 \end{array}$$



**PERFECT IS ENEMY OF GOOD**



# ALGORITHM APPROACH

## AND HOW TO DEFINE A CORRECT PROCESS

1. Define the sub-set of elements to be allocated
2. Define the priority rules
3. Define the stock sources rules
4. Sort the sub-set according to the priority rules
5. Calculate the quantity according to the stock sources rules
  - I. CALCULATE QUANTITY PER FULFILLMENT?
  - II. CALCULATE QUANTITY PER A MINIMUM PERCENTAGE?
  - III. APPLY A SHARE THE WEALTH CRITERIA?
6. Present the result in a proper report



# THE PROCESS IN THE IT LANDSCAPE



# ALLOCATION MANAGEMENT IN THE ERP SYSTEMS

Enhance our ERP system or integrate a vertical solution?

Cluster Reply proposes their experience to enhance **Microsoft AX/D365 with dedicated process and functionalities** to meet the **unique and exacting needs of the fashion and apparel enterprises.**





# WHAT'S THE EXPECTED OUTPUT?

Usually a report:

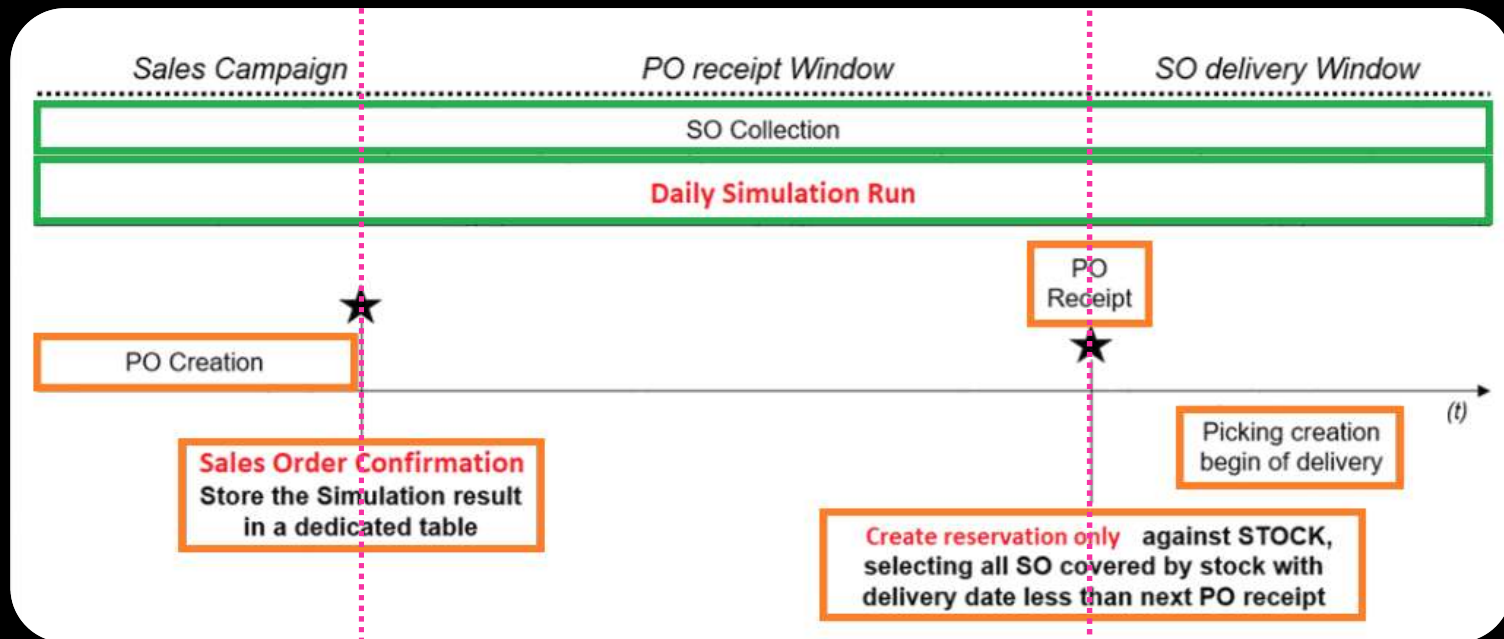
Allocation Executive	Customer Name	Sales Order	SD Wa	Requested	Requested Recd	Item ID	Brand	Color	Color Name	Purchase ord	Deliver	Allocation Line Orig	1	2	3	4	5	6	7	8	9	10
AL000112	Eminent, Inc. dba	SO000006	DSV-B	4/29/2019	5/15/2019	ZW0019	All SAINTS	200	TAN		1/1/1900	Allocated on stock										
	LA MODA GMBH	SO000005	DSV-B	6/17/2019	7/17/2019	B4BK0027	DIRK BIKKEMBERGS	001	BLACK	P000000093	#####	Allocated on order										
						B4BK0028	DIRK BIKKEMBERGS	001	BLACK	P000000095	#####	Allocated on order										
						B4BK0031	DIRK BIKKEMBERGS	001	WHITE/NAVY	P000000095	#####	Allocated on order										
						B4BK0040	DIRK BIKKEMBERGS	001	BLACK	P000000100	#####	Allocated on order										
						B4BK0045	DIRK BIKKEMBERGS	001	BLACK	P000000102	#####	Allocated on order										
						B4BK0047	DIRK BIKKEMBERGS	410	NAVY/RED	P000000141	#####	Allocated on order										
						B4BK0048	DIRK BIKKEMBERGS	100	WHITE/BLACK	P000000141	#####	Allocated on order										
						B4BK0004	DIRK BIKKEMBERGS	001	BLACK	P000000143	#####	Allocated on order										
						B4BK0040	DIRK BIKKEMBERGS	001	BLACK	P000000104	#####	Allocated on order										
						B4BK0053	DIRK BIKKEMBERGS	100	WHITE	P000000109	#####	Allocated on order										
						B4BK0056	DIRK BIKKEMBERGS	001	BLACK/WHITE	P000000109	#####	Allocated on order										
						B4BK0056	DIRK BIKKEMBERGS	021	GUNMETAL	P0000007??	#####	Allocated on order										
						B4BK0020	DIRK BIKKEMBERGS	001	BLACK/BLACK	P000		Allocated stock										
						B4BK0027	DIRK BIKKEMBERGS	410	NAVY	P000		order										
						B4BK0039	DIRK BIKKEMBERGS	001	BLACK/ORAN	P000		order										
						B4BK0045	DIRK BIKKEMBERGS	411	NAVY	P000000630	#####	Allocated on order										
						B4BK0045	DIRK BIKKEMBERGS	411	NAVY	P000000723	#####	Allocated on order										
						B4BK0045	DIRK BIKKEMBERGS	411	NAVY	P000000722	#####	Allocated on order										
						B4BK0045	DIRK BIKKEMBERGS	411	NAVY	P000000722	#####	Allocated on order										
						B4BK0055	DIRK BIKKEMBERGS	001	ETTE/BLA	P000001054	#####	Allocated on order										
						B4BK0055	DIRK BIKKEMBERGS	001	Y/BLUETT	P000000722	#####	Allocated on order										
						B4BK0011	DIRK BIKKEMBERGS	001	BLACK	P000001155	#####	Allocated on order										
						B4BK0012	DIRK BIKKEMBERGS	040	SILVER	P000001155	#####	Allocated on order										
						B4BK0031	DIRK BIKKEMBERGS	001	BLACK	P000000714	#####	Allocated on order										
						B4BK0034	DIRK BIKKEMBERGS	100	WHITE	P000000711	#####	Allocated on order										
						B4BK0045	DIRK BIKKEMBERGS	001	BLACK	P000001041	#####	Allocated on order										
						B4BK0060	DIRK BIKKEMBERGS	001	BLACK	P000000714	#####	Allocated on order										

Qty ordered vs allocated



# ALLOCATION PROCESS

## FULL DIAGRAM PROCESS



# ALLOCATION PROCESS

STEP BY STEP – CURRENTLY IN USE ON CUSTOMERS

**Complete allocation process:**

1. **Allocation Goods Simulation** – only result displayed at system
2. **Allocation Goods Confirmation** – blocks on orders involved
3. **Allocation Goods Reservation** – physical reservation at system

**Production of two different information:**

1. **PAS** – produced allocation solution
2. **ATS** – Available to sell



# LIVE DEMO ON D365FO



# LIVE DEMO ON D365 F&O

⚠ Checking minimum delivery percentage Customer: 004022; Zalando; Delivery percentage: 100.00%; Order Order ID: 012595 Reserved value is less than the minimum delivery percentage.

## Release to warehouse

Matrix Group by

Sales order ↑	Item	Product name	Quantity	Reserve now
012595	B1197466	MINNIE MOUSE PRINTED BADG...	300.00	
012595	B1M380433	101 MKW-3-166 PO# 171379 Q...	150.00	
012596	B1197466	MINNIE MOUSE PRINTED BADG...	400.00	160.00
012596	B1M380433	101 MKW-3-166 PO# 171379 Q...	280.00	224.00
012597	B1197466	MINNIE MOUSE PRINTED BADG...	300.00	50.00
012597	B1M380433	101 MKW-3-166 PO# 171379 Q...	150.00	51.00

## Sales lines

Select Remove Add Add all Add order Display dimensions Reservation Functions Warehouse Inventory transactions Log

Classificati...	Sales or...	Sales order ...	Customer	Name	Item number ↑	Product name	Status	Quantity avail...	Quantity	Reserve now	Size	Color	Delivery name
MEDIUM	012596	PreSales	004023	Lafayette	B1M380433	101 MKW-3-166 PO# 171379 QD...	Open order	0.00	25.00	20.00	6YR	100	Lafayette
MEDIUM	012596	PreSales	004023	Lafayette	B1M380433	101 MKW-3-166 PO# 171379 QD...	Open order	0.00	25.00	20.00	10YR	409	Lafayette
MEDIUM	012596	PreSales	004023	Lafayette	B1M380433	101 MKW-3-166 PO# 171379 QD...	Open order	0.00	25.00	20.00	5YR	409	Lafayette
MEDIUM	012596	PreSales	004023	Lafayette	B1M380433	101 MKW-3-166 PO# 171379 QD...	Open order	0.00	45.00	36.00	4YR	409	Lafayette
MEDIUM	012596	PreSales	004023	Lafayette	B1M380433	101 MKW-3-166 PO# 171379 QD...	Open order	0.00	45.00	36.00	6YR	409	Lafayette
KEY	012595	PreSales	004022	Zalando	B1M380433	101 MKW-3-166 PO# 171379 QD...	Open order	0.00	25.00		10YR	100	Zalando
KEY	012595	PreSales	004022	Zalando	B1M380433	101 MKW-3-166 PO# 171379 QD...	Open order	0.00	50.00		4YR	100	Zalando
KEY	012595	PreSales	004022	Zalando	B1M380433	101 MKW-3-166 PO# 171379 QD...	Open order	0.00	25.00		10YR	409	Zalando



# LIVE DEMO ON D365 F&O

## Release to warehouse

Sales order	Item	Product name	Quantity	Reserve now
012595	B1197466	MINNIE MOUSE PRINTED BADG...	300.00	275.00
012595	B1M380433	101 MKW-3-166 PO# 171379 Q...	150.00	150.00
012596	B1197466	MINNIE MOUSE PRINTED BADG...	400.00	225.00
012596	B1M380433	101 MKW-3-166 PO# 171379 Q...	280.00	280.00
012597	B1197466	MINNIE MOUSE PRINTED BADG...	300.00	80.00
012597	B1M380433	101 MKW-3-166 PO# 171379 Q...	150.00	80.00

Order line selection for allocation engine execution

Main allocation functionalities such as reservation functions

## Sales lines

Classification	Sales order	Sales order	Customer	Name	Item number	Product name	Status	Quantity avail...	Quantity	Reserve now	Size	Color	Delivery name
MEDIUM	012597	Direct	004024	Wilger fashion	B1197466	MINNIE MOUSE PRINTED BADGE ...	Open order	0.00	50.00		10YR	001	Wilger fashion
MEDIUM	012597	Direct	004024	Wilger fashion	B1197466	MINNIE MOUSE PRINTED BADGE ...	Open order	0.00	50.00		5YR	001	Wilger fashion
KEY	012595	PreSales	004022	Zalando	B1197466	MINNIE MOUSE PRINTED BADGE ...	Open order	0.00	50.00	50.00	6YR	100	Zalando
KEY	012595	PreSales	004022	Zalando	B1197466	MINNIE MOUSE PRINTED BADGE ...	Open order	0.00	50.00	50.00	4YR	100	Zalando
KEY	012595	PreSales	004022	Zalando	B1197466	MINNIE MOUSE PRINTED BADGE ...	Open order	0.00	50.00	25.00	10YR	409	Zalando
KEY	012595	PreSales	004022	Zalando	B1197466	MINNIE MOUSE PRINTED BADGE ...	Open order	0.00	50.00	50.00	5YR	409	Zalando
KEY	012595	PreSales	004022	Zalando	B1197466	MINNIE MOUSE PRINTED BADGE ...	Open order	0.00	50.00	50.00	*10YR	001	Zalando
KEY	012595	PreSales	004022	Zalando	B1197466	MINNIE MOUSE PRINTED BADGE ...	Open order	0.00	50.00	50.00	5YR	001	Zalando
MEDIUM	012597	Direct	004024	Wilger fashion	B1M380433	101 MKW-3-166 PO# 171379 OD...	Open order	0.00	25.00	25.00	10YR	001	Wilger fashion

Output versus expected solution based on stock level availability

Output versus expected solution based on stock level availability



# CONCLUSIONS



# **BENEFITS OF THE ADOPTION**

## **WHY IMPLEMENT AN ALLOCATION APPROACH?**

To obtain the following benefits:

- **Learn from your data with dedicated reports**
- **Increased Stock rotation**
- **Optimize the picking process**
- **Increased customer satisfaction with precise and punctual deliveries**
- **Ensure stores have the right product in the right quantity**

