nextail

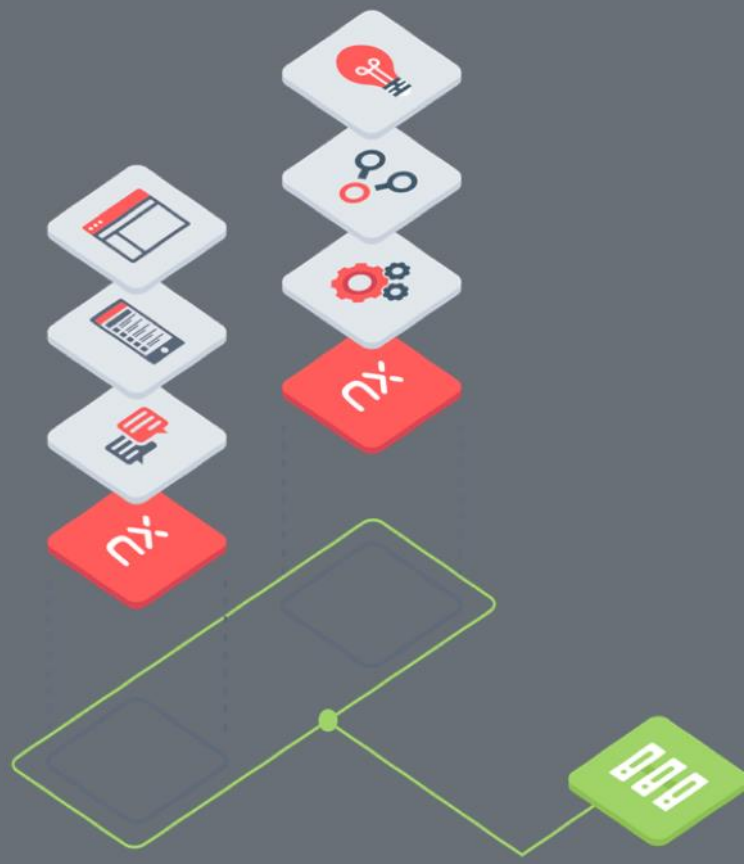
# First Allocation user guide

July 2020

Private and confidential

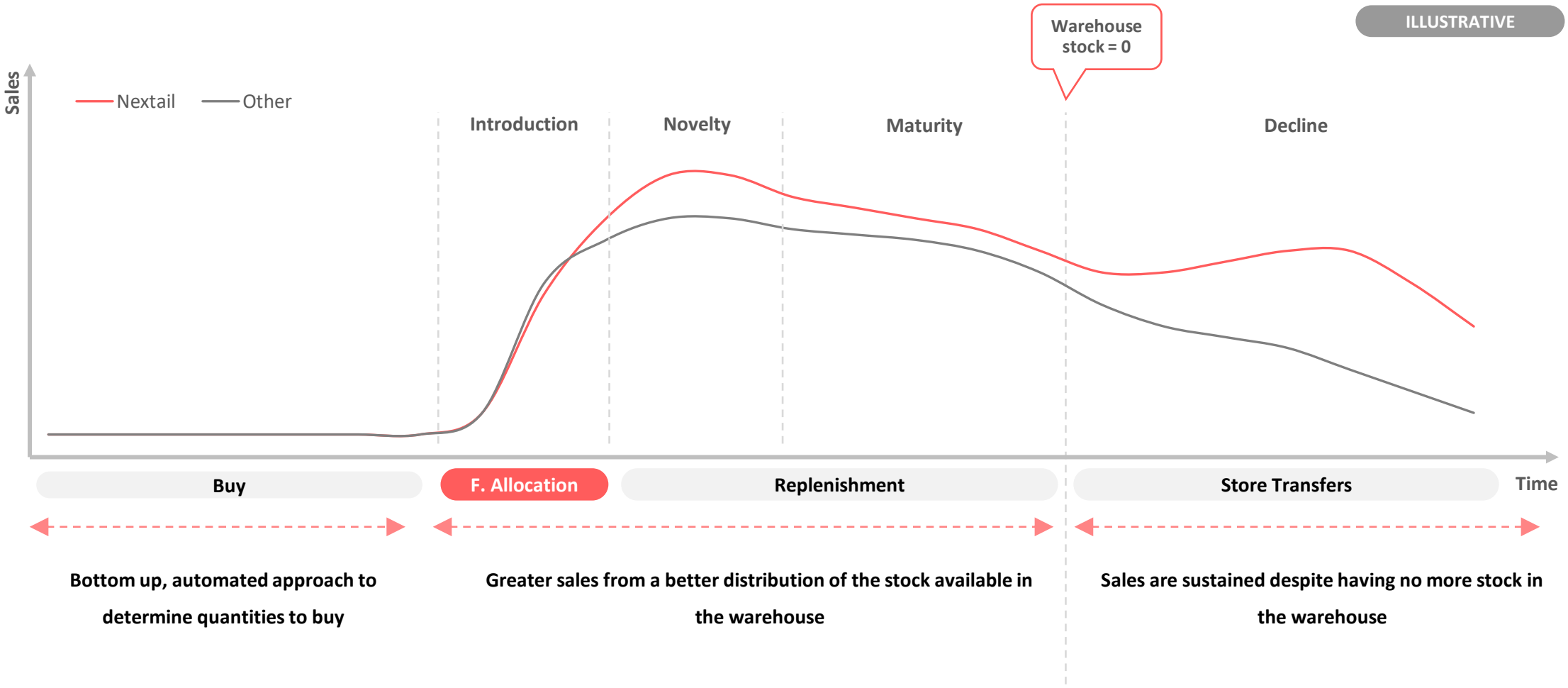

# At the end of this session we will expect you to

- Understand the two phases of Nextail's First Allocation (Demand Forecast and Global Optimisation)
- Be aware of all the criteria that affect Nextail's First Allocation
- Know how Nextail's Dashboard can support your First Allocation decision making



# Content

# After buying new products, first allocation module assigns an initial amount of stock to stores



*First Allocation can help capture more value with higher sales and*

*less lost sales due to a better product availability in stores*

# Nextail's first allocation algorithm aims at maximizing sales globally across the network and it is based on 5 guiding principles

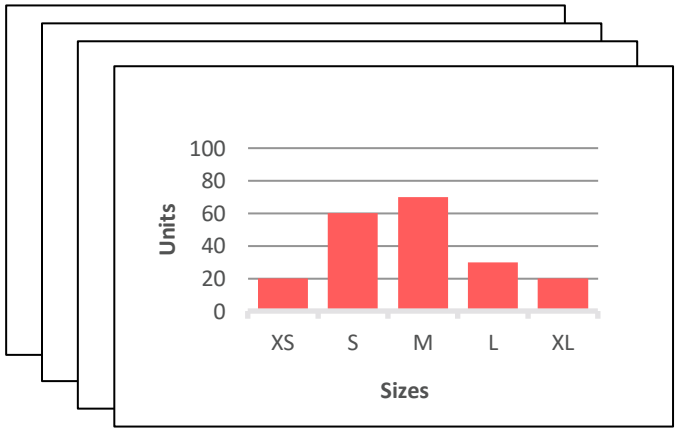
| | | Why that's important? |
|---|---|---|
| **Demand (not sales) forecast** | **Based on the sales probability and availability** | • Analyse sales of comparables in each store in their first/best weeks of sales<br>• Past mistakes in inventory allocation are not "carried over"<br>• The system corrects and actively prevents stockouts |
| **Global (not local) optimisation** | **Calculated as a whole, trying to achieve the global optimum** | • No local optimisation, no concern for "store level goals"<br>• Each unit is sent where it is more valuable |
| **Robustness over accuracy** | **Avoiding big mistakes preceeds over increasing accuracy** | • The system works well even with inaccurate or scarce data<br>• Robust system ensures best results over the long term, while maybe sacrificing small potential short term gains |
| **Meritocracy** | **The starting point is the existing stock, not store demand** | • No "competition between stores for the same item" |
| **Rich constraints set** | **Several constraints can be considered** | • "Constraints" allow to express business requirements |

# Nextail's First Allocation algorithm is divided in two phases: Demand Forecast and Global Optimization

First Allocation algorithm:

**1. Demand Forecast**

**2. Global Optimization**




What's the best I can do with each item of inventory I have while…

- Maximizing the sale probability
- Minimizing the cost of products to send
- Making sure constraints and business rules followed

Main forecast criteria

Main optimization criteria

*Demand Forecast & Global Optimisation consider different criteria*

*which play critical roles in the Nextail First Allocation algorithms*

# Different inputs are taken into account when the Demand Forecast is calculated

Main forecast criteria

Store 3

Store 2

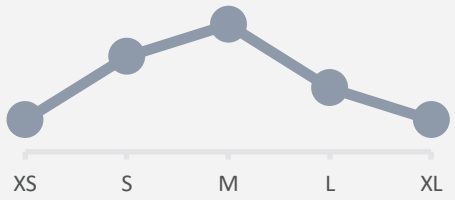
Store 1

## Sales forecast at product level

- Comparable products
- First weeks of sales (comparables)
- Weight of weeks
- Planning horizon
- Store stockouts
- Calendars
- Seasonality
- Promotions
- Store clusterization
- Other conditions

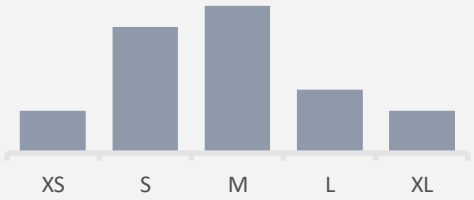
Forecast at product Level

## Size curve at the product level




| XS | S | M | L | XL |
|---|---|---|---|---|
| 10% | 20% | 30% | 30% | 10% |
| 1 | 2 | 3 | 3 | 1 |

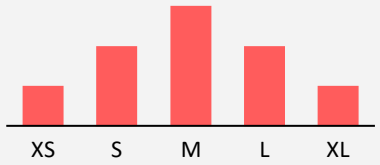
## Demand Forecast at SKU-level



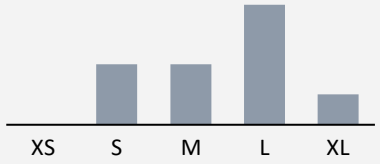
# Once a prediction of Demand is available, the next step is to Optimize the redistribution of stock to the different stores

Forecast phase

**Demand forecast at SKU-store level**




**Stock positions in warehouse**



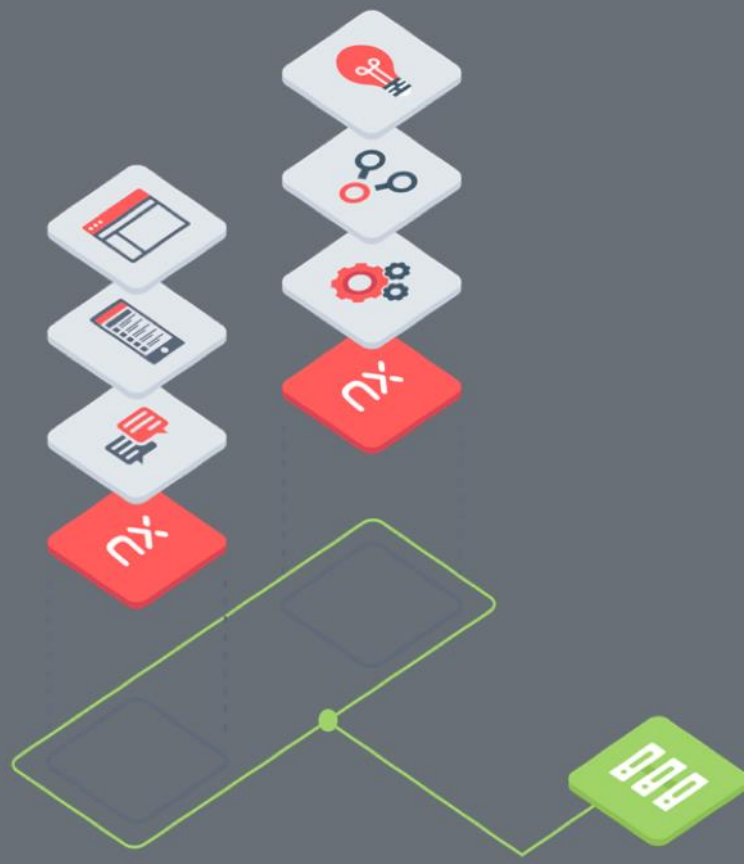

**Sales probability for each additional unit at SKU-store**

**Main optimization criteria**

**Store network**

- Sales product threshold
- Visual rules
- Minimum displays
- Prepacks
- Stores assortment
- Other conditions

**Qty to send for each SKU-store**



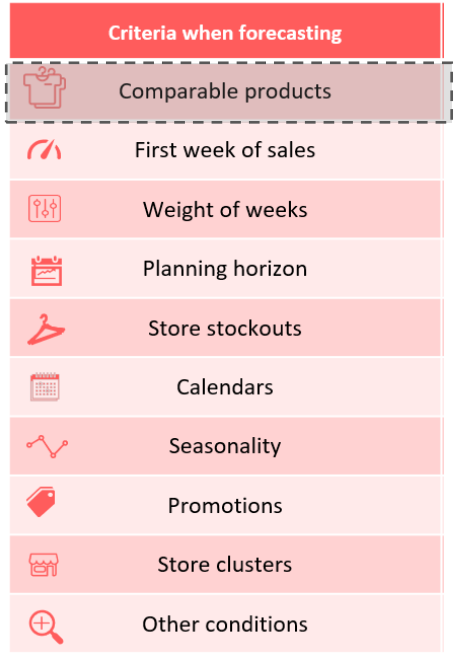
# Content

# Several criteria are considered in building a reliable Demand Forecast

| Criteria when forecasting | Embedded within the algorithm | Inputs you can influence |
|---|---|---|
| Comparable products | | ✔ |
| First week of sales | | ✔ |
| Weight of weeks | | ✔ |
| Planning horizon | | ✔ |
| Store stockouts | ✔ | |
| Calendars | | ✔ |
| Seasonality | ✔ | |
| Promotions | | ✔ |
| Store clusters | ✔ | |
| Other conditions | ✔ | |

*Some of the criteria are embedded within the algorithm, and some are inputs that you can influence*

# Nextail bases the demand estimation on how comparable products were sold in the past

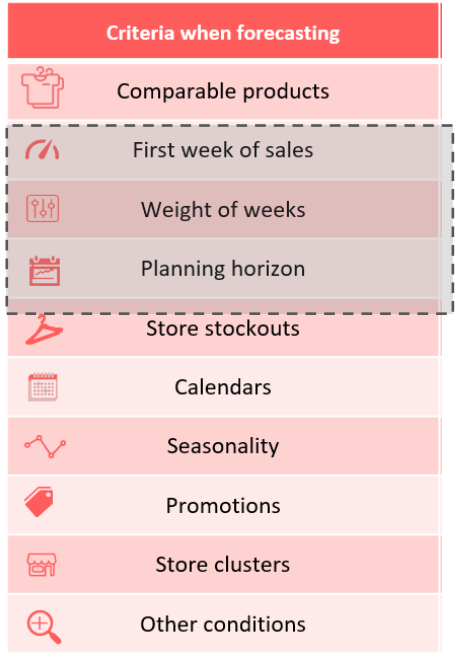



**Assignment of comparable products**

- Initial automatic proposal based on product attributes
- The selection is done using a comparability coefficient. The more attributes shared between products; the higher comparability coefficient will have.
- The demand forecast calculation is based on the performance of past products that are comparables
- Can be modified by the customer with different filtered criteria:

  - price range%
  - different categories (season, department…)
  -tags (sequin clothes, cashmere…)

# Two key inputs are first week sales and the weight of future sales days to be covered with the forecast




**First week of sales:**

- Number of first weeks of comparable products used for the forecast. Best weeks could be used too.
- When there is not past sales information we use store cluster information

**Weight of weeks:**

- % of weight assigned to each of the previous weeks

**Planning horizon:**

- Number of sales days to be covered with forecast calculation
- Linked to when the first replenishment is planned to take place
- The higher the planning horizon the higher the amount of stock we will allocate

# Information about store stock availability allows Nextail to have a real time understanding of demand

| Criteria when forecasting |
|---|
| Comparable products |
| First week of sales |
| Weight of weeks |
| Planning horizon |
| Store stockouts |
| Calendars |
| Seasonality |
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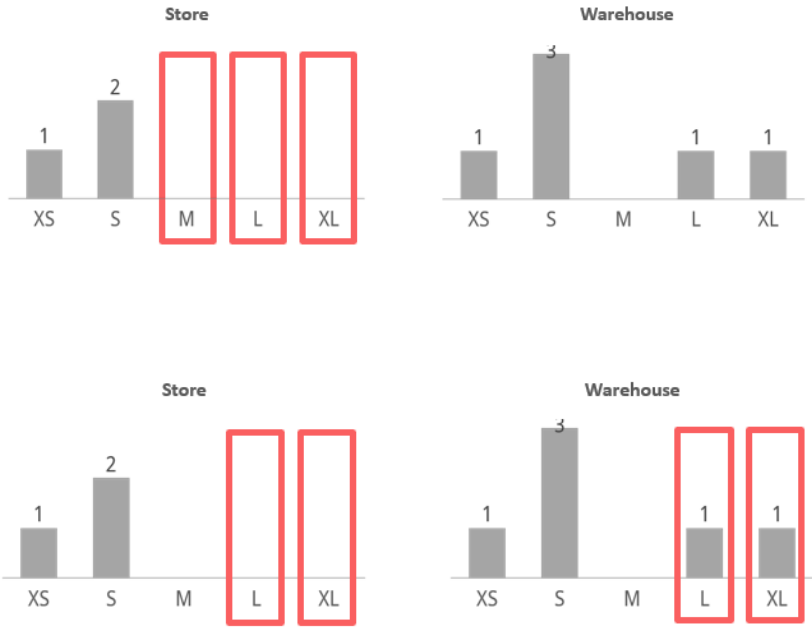
| Other conditions |




## Absolute Stockouts

**Definition:** measures SKU size gaps in a store vs. the SKU sizes it should have (in the example sizes M, L and XL have stockouts)

**Calculation:** 3 sizes with 0 stock in the store, out of 5 sizes in the store (Absolute Stockout = 60%)

## Real Stockouts

**Definition:** measures SKU size gaps in a store vs. the SKU sizes it should have adjusting for stock availability in warehouse. In the example, we only take into account stockouts that can be solved from warehouse (sizes L and XL). It is always less or equal than the absolute stockout

**Calculation:** 2 sizes with 0 stock in the store but with stock in the warehouse, out of 5 sizes in the store (Real Stockout = 40%)

**Nextail considers stockouts to understand the real demand of a product in a store**

# Demand forecasting is calculated for all stores in an optimization but, store orders can be sent only sent to a group of stores based on calendars

| Criteria when forecasting |
| --- |
| Comparable products |
| First week of sales |
| Weight of weeks |
| Planning horizon |
| Store stockouts |
| Calendars |
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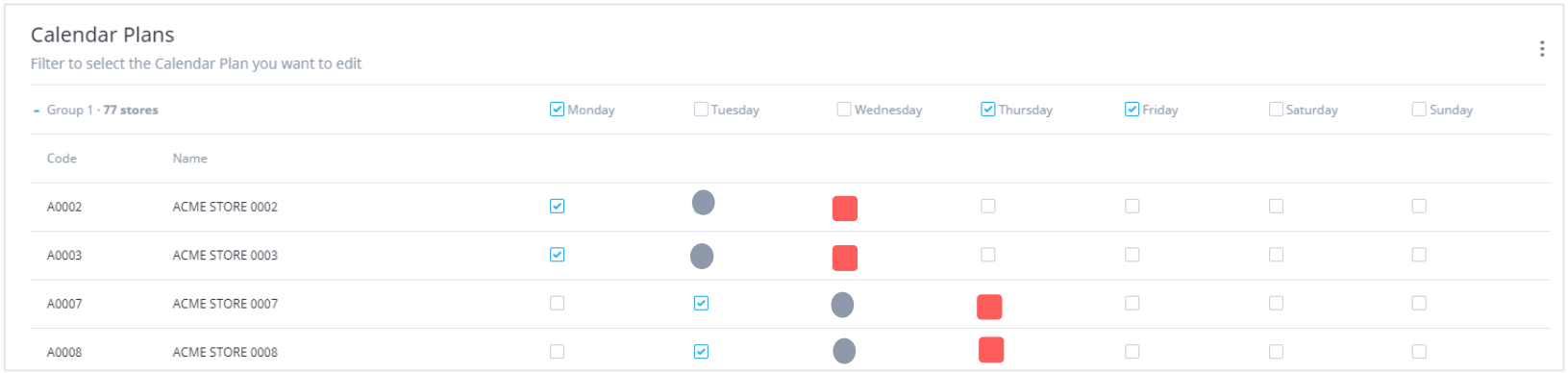
| Store clusters |
| Other conditions |

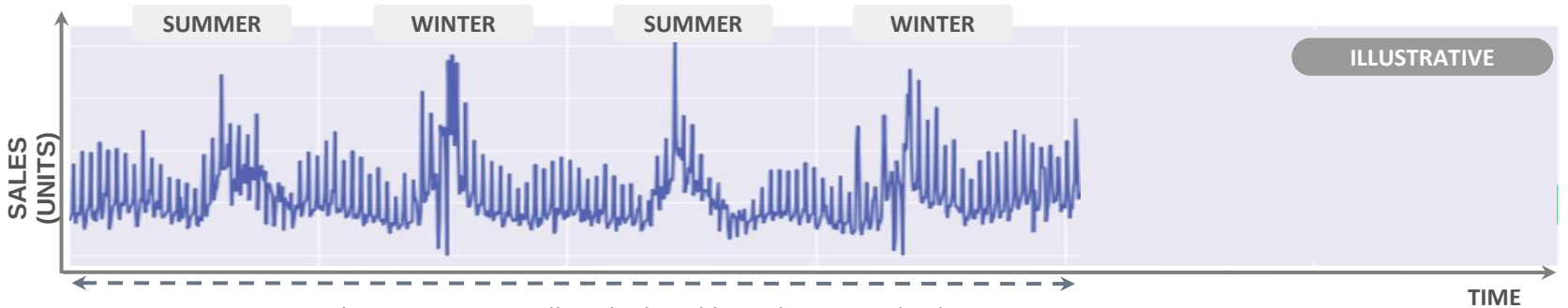
**Calendars:** It guarantees the stores receive the stock that they deserve calculating the need daily even if there is no warehouse order




**First Allocation calculates stock need for all the stores but only allocates stock (waybills) for the stores that are picked that day**

# The effect of recurring events (seasonality) is automatically calculated by Nextail

| Criteria when forecasting |
|---|
| Comparable products |
| First week of sales |
| Weight of weeks |
| Planning horizon |
| Store stockouts |
| Calendars |
| Seasonality |
| Promotions |
| Store clusters |
| Other conditions |



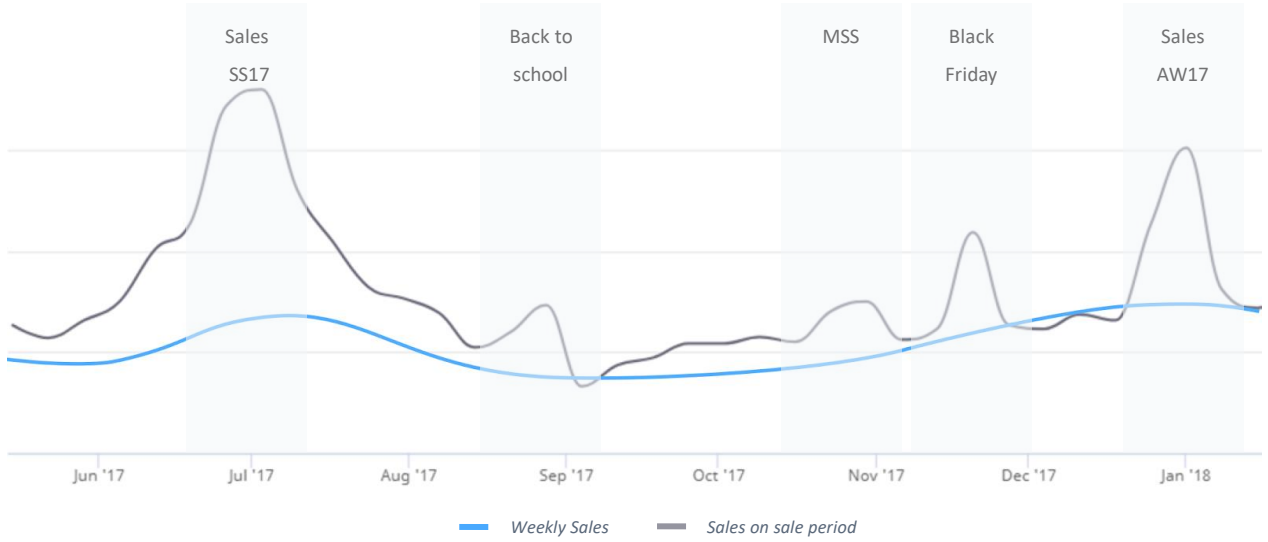

First, seasonality is automatically calculated based on actual sales

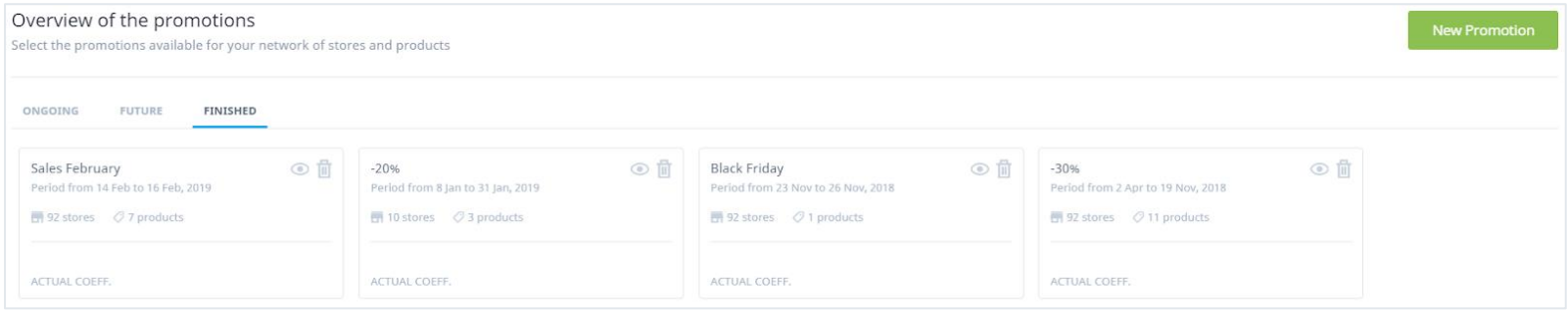

It is then automatically calculated for the near future, based on historical data

**Some of the events that happen every year at different moments (like Easter) are adjusted in the seasonal curves**

# The effect of non-recurring or movable events can be set up in Nextail's platform as promotions

| Criteria when forecasting |
| --- |
| Comparable products |
| First week of sales |
| Weight of weeks |
| Planning horizon |
| Store stockouts |
| Calendars |
| Seasonality |
| Promotions |
| Store clusters |
| Other conditions |



# Clustering stores is key when there is not enough information at store level

| Criteria when forecasting |
| --- |
| Comparable products |
| First week of sales |
| Weight of weeks |
| Planning horizon |
| Store stockouts |
| Calendars |
| Seasonality |
| Promotions |
| Store clusters |
| Other conditions |

**Store clusters:**

- Nextail calculates them based on average sales per product and velocity
- Based on best practices, the % of cases in which cluster data is used is less than 20%
- If preferred, Nextail can use a specific clusterization provided by the customer based on other criteria

# There are other conditions impacting forecast when store data is not robust enough

| Criteria when forecasting |
| --- |
| Comparable products |
| First week of sales |
| Weight of weeks |
| Planning horizon |
| Store stockouts |
| Calendars |
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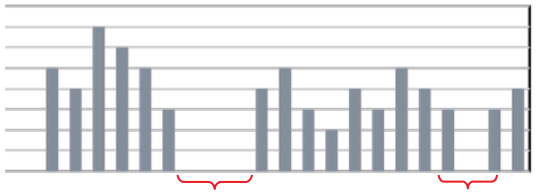
**Lack of sales data**

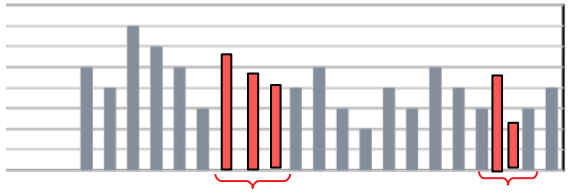
Data transmission

**Description of problem**



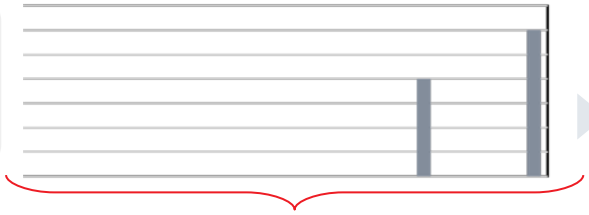
Enough historic data although there is some **missing data** of stock-outs

**Nextail's solution**

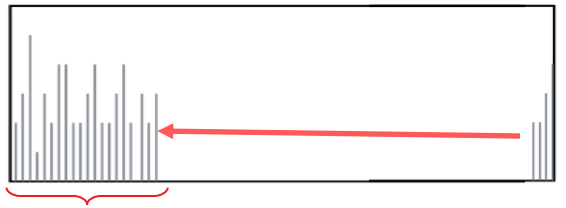


**Fill in blanks** by using the rest of the days and assigning them weight according to seasonality

**Products reintroduced in the WH after a long period without stock**



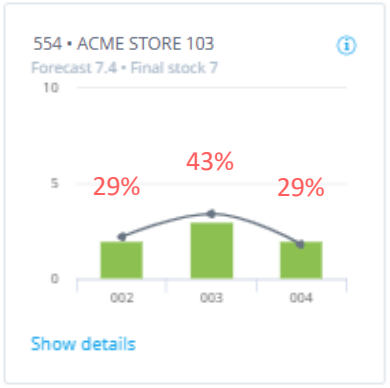
There is **not enough past-data** to elaborate a proper forecast



**Delve deeper into the historic data** until the product was available in the store and there is relevant data

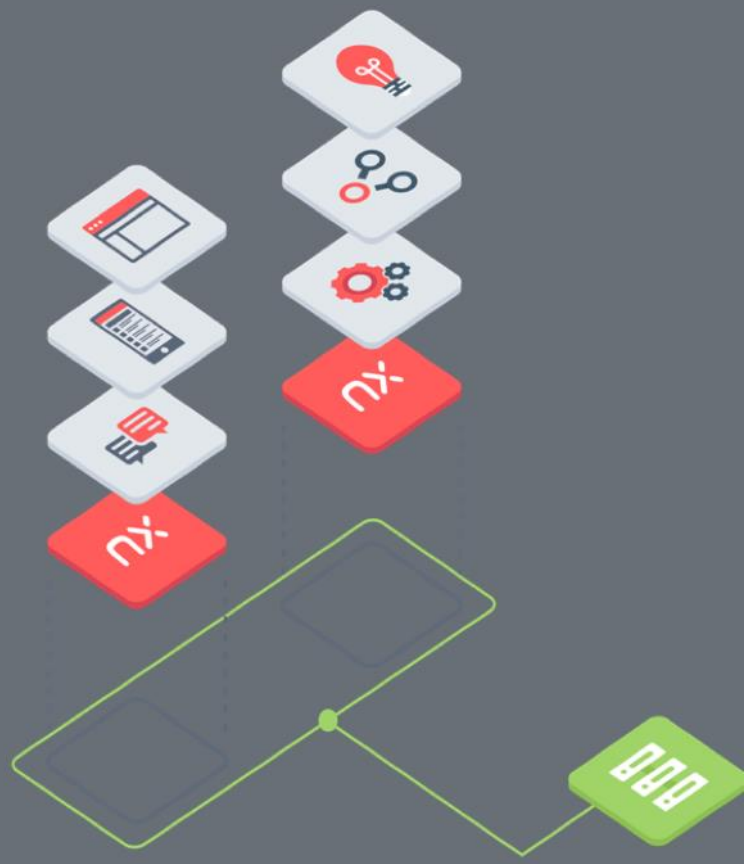
# Size curves are calculated once a week based on last 60 days sales and at different levels

ACME PRODUCT




- Size curves are used to understand the sales behavior of each size in each store and break down the total product forecast into a demand forecast at SKU level.
- Normally, size curves are calculated considering the following levels:
  - Store
  - Product categorization (family /subfamily/ department)
  - Size set
- You can request to change the number of days to calculate the size curve as needed:
  - Number of past days to calculate size curves
  - Maximum number of past days without activity when calculating size curves
  - Minimum number of past days needed to calculate size curves

**If data is not enough to calculate the size curves at this level Nextail algorithms goes one level above to ensure size curves are robust**



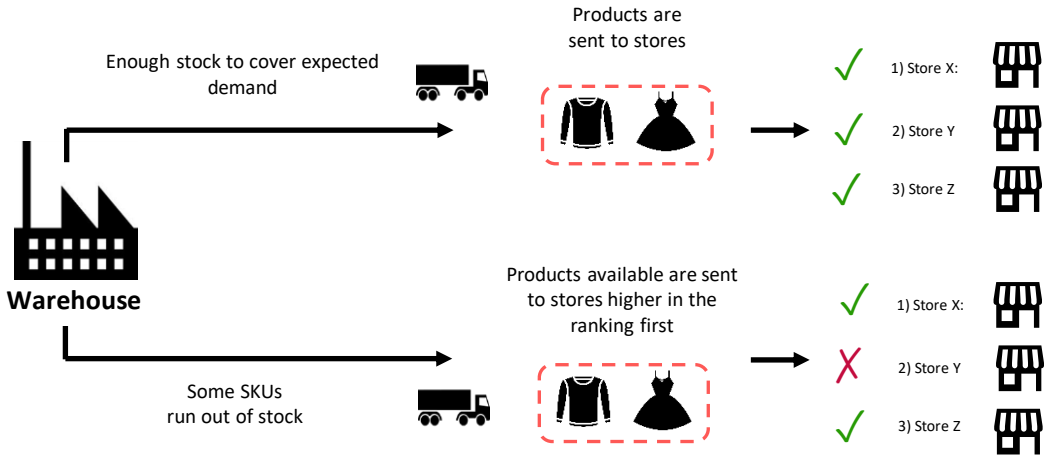
# Content

# The aim of global optimisation is to assign stock to stores that maximizes the sales potential across the network

## First Allocation optimisation engine

Allocates units of each “Product-Size (SKU)” in value order by sending them to the stores. This is done by considering probability of sale, logistics costs and value of keeping it in the warehouse, while applying different types of local restrictions

**Warehouse stock:**



# Several criteria are considered in Global Optimisation

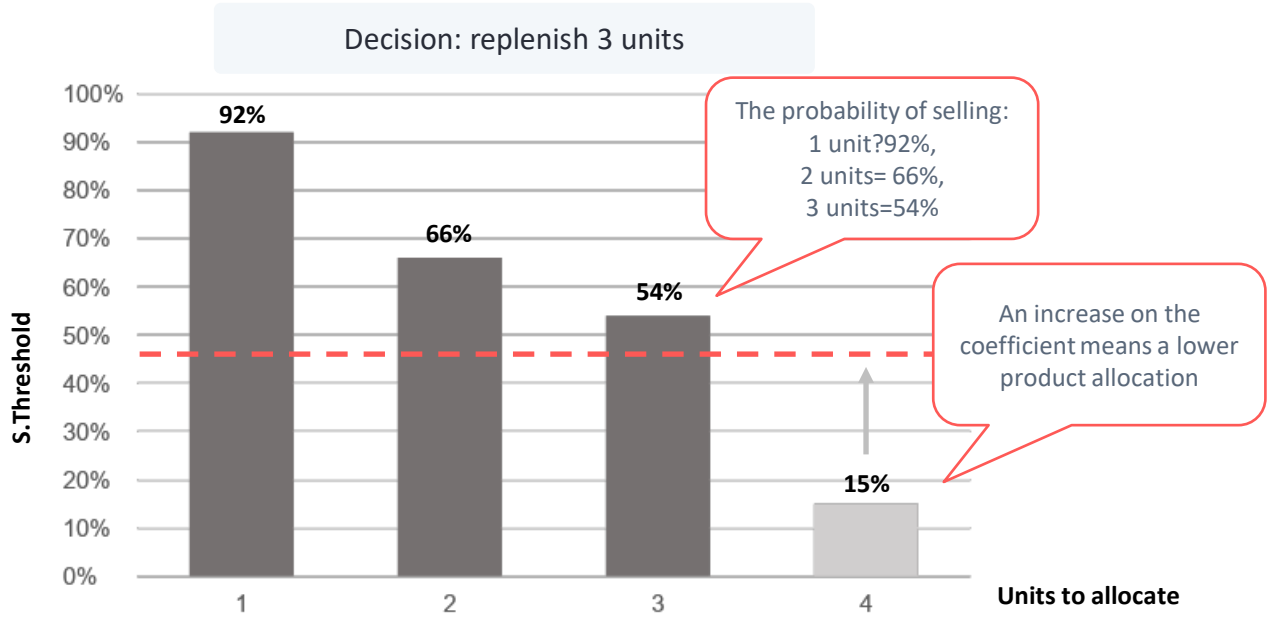
| Criteria for Global Optimisation | Embedded within the algorithm | Inputs you can influence |
|---|---|---|
| Sales product threshold | | ✔ |
| Visual rules | | ✔ |
| Minimum displays | | ✔ |
| Prepacks | ✔ | |
| Stores assortment | | ✔ |
| Other conditions | ✔ | ✔ |

*Some of the criteria are embedded within the algorithm, and some are inputs that you can influence*

# *Sales threshold* allows you to be more aggressive with the stock sent to the stores. This is the key parameter allocators will amend

| Criteria for Global Optimisation |
| --- |
| Sales product threshold |
| Visual rules |
| Minimum displays |
| Packs |
| Stores assortment |
| Other conditions |

- Probability threshold that causes an additional unit to be sent under the planning horizon
- It balances the trade-off between having overstock in the stores and having out-of-stocks
- It is defined at product level; it has the same value for all the stores

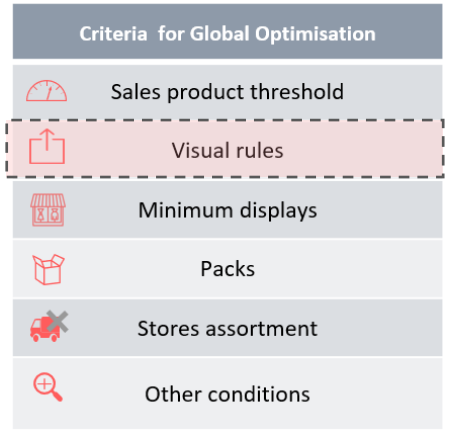


# Reducing the sales threshold of products with high stock levels in the warehouse makes a big impact on the number of units allocated

Product: 3105081

| Sales Threshold | Units allocated | Units left in WH |
|---|---|---|
| 30% | 141 units | 1397 units |
| 15% | 347 units | 1191 units |
| 5% | 535 units | 1003 units |

# Visual rules capture conditions that need to be met for a product to be displayed at a potential store




**Minimum units per product**

Min number at product level required to expose the product in the shop floor

***Example***

**8 units**

+

**Minimum % of sizes**

Min % of the size curve at product level required to expose the product in the shop floor

***Example***

**60%**

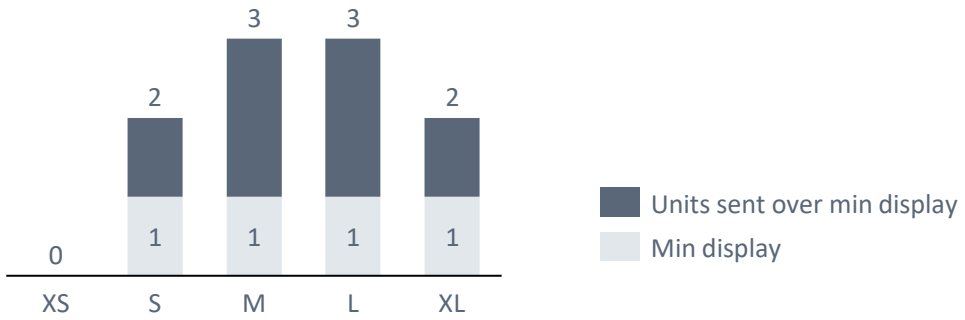
**The Nextail engine will always try to send or leave units in stores to comply with the visual rules**

# Minimum displays change the replenishment from “pull” to “push” based

| Criteria for Global Optimisation |
| --- |
| Sales product threshold |
| Visual rules |
| Minimum displays |
| Packs |
| Stores assortment |
| Other conditions |

**Min. displays:**

- Minimum amount of units of a product required for exhibiting it in a store
- It is typically worse (except if physical display is needed)
- They can be configured at SKU or product level
- Use cases:
  - Products requiring display (e.g. glasses, accessories, etc.)
  - Store windows (products displayed but not on sale)

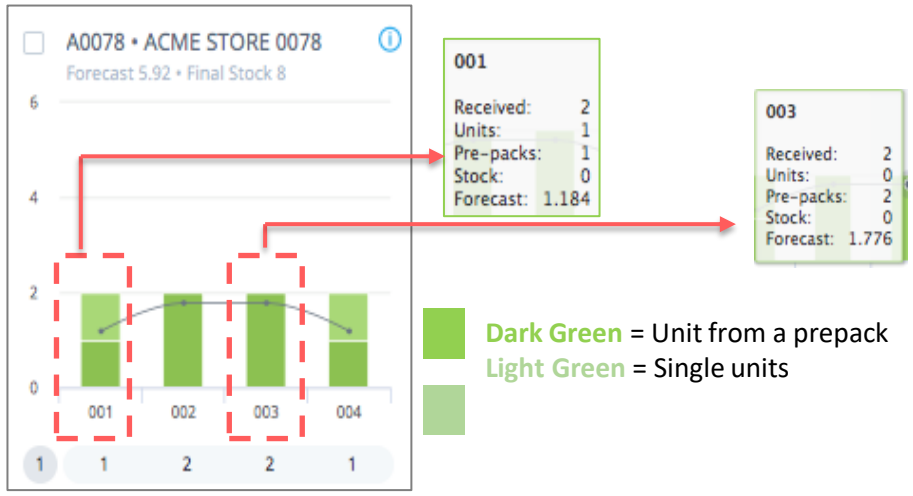


# Prepacks minimize the number of single units allocated, sending only the necessary single units to fulfill the forecasted demand

| Criteria for Global Optimisation |
| --- |
| Sales product threshold |
| Visual rules |
| Minimum displays |
| Packs |
| Stores assortment |
| Other conditions |

**Prepacks:**

- The algorithm will prioritize sending prepacks before sending single units
- Used when the suppliers send the products with units of different sizes in one physical content

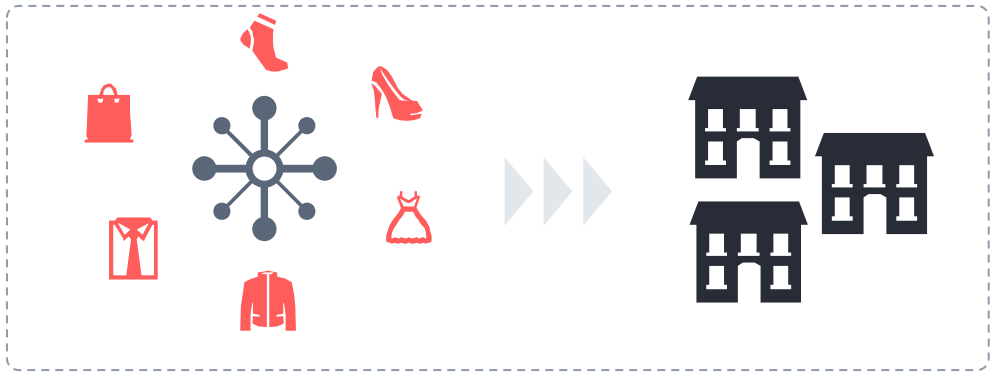


# Select a desired store category and assign to multiple products

| Criteria for Global Optimisation |
| --- |
| Sales product threshold |
| Visual rules |
| Minimum displays |
| Packs |
| Stores assortment |
| Other conditions |

**Stores assortment:**

- A desired store category can be selected to assign to multiple products
- All the products in the scope should be associated to at least one store
- The number of stores associate to each product can be reviewed in the platform



# Nextail allows you to include additional business restrictions for replenishment calculation


**Max stock:**

- Used to set a maximum storage capacity of a store.
- The algorithm will remove units less likely to be sold until the condition is met.

**Max order**

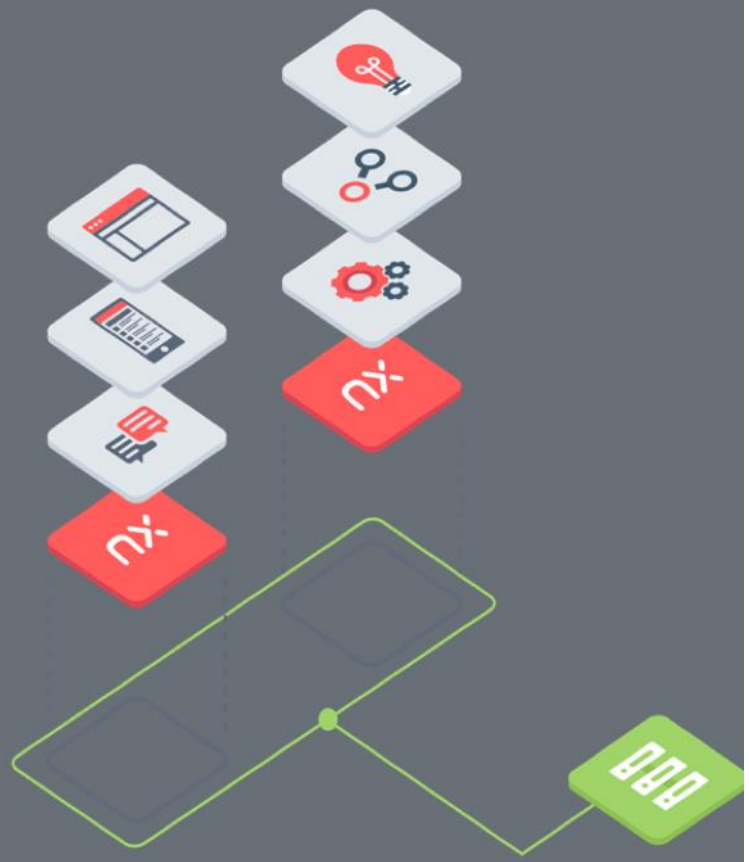
- Used to set a maximum number of units that a store can afford to receive.
- The algorithm will remove units less likely to be sold until the condition is met.

**Min order**

- Used to stablish a trigger when sending units to a store from the WH
- If a store doesn't cover the trigger with the units to be sent, it will not receive any units.

**Max number comparables**

- Used to overwrite default number of comparable products in a category between 0 to 100



# Content


# As a reminder, this session should leave you feeling confident on the following points:

- Understand the two phases of Nextail's First Allocation (Demand Forecast and Global Optimisation)
- Be aware of all the criteria that affect Nextail's First Allocation
- Know how Nextail's Dashboard can support your First Allocation decision making


# Did we achieve our goals?

- Understand the two phases of Nextail's First Allocation (Demand Forecast and Global Optimisation)
- Be aware of all the criteria that affect Nextail's First Allocation
- Know how Nextail's Dashboard can support your First Allocation decision making