Improved Sales Effectiveness

Driving Recurring Neural Network Forecasts Down to the Front Line

LEAD Marketing Conference – November 2018

Presenters:

Andres Jejen, VP Product Management

AFS Technologies

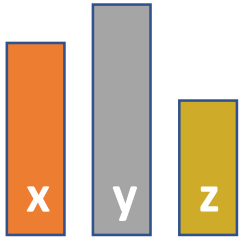
Bob Hannah, Managing Director

Data Ventures

LEAD Marketing Conference – November 2018

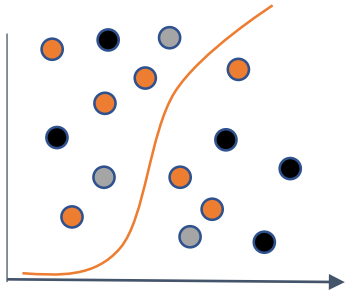
Types of Data Analysis

Descriptive



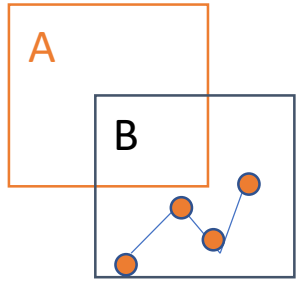
- Describe **What Happened**
- Employed heavily across most industries

Predictive



- Anticipate **What Will Happen** (inherently probabilistic)
- Employed in data driven organizations as a key source of insight

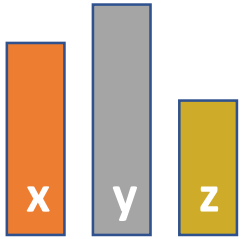
Prescriptive



- Provide recommendation on **What To Do** to achieve goal
- Employed heavily by leading data and internet companies

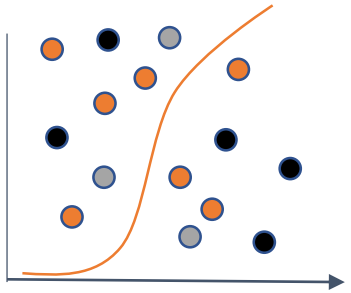
Types of Data Analysis

Descriptive



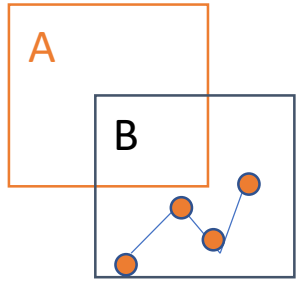
- Describe **What Happened**
- Employed heavily across most industries

Predictive



- Anticipate **What Will Happen** (inherently probabilistic)
- Employed in data driven organizations as a key source of insight

Prescriptive



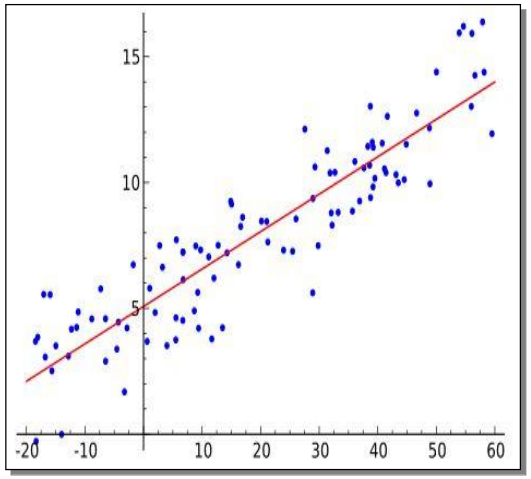
- Provide recommendation on **What To Do** to achieve goal
- Employed heavily by leading data and internet companies

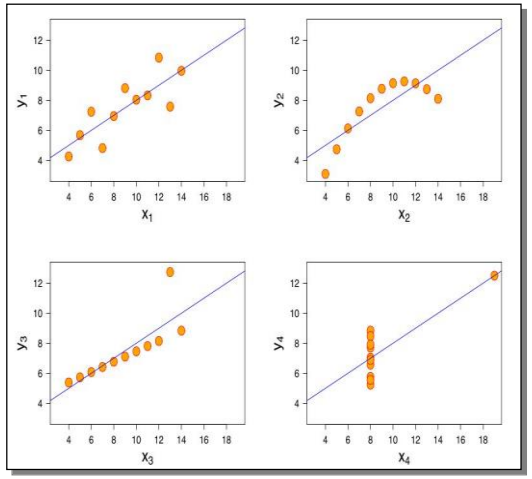
Focus on Machine Learning

DATAVENTURES

afs technologies

Linear Regression Analysis

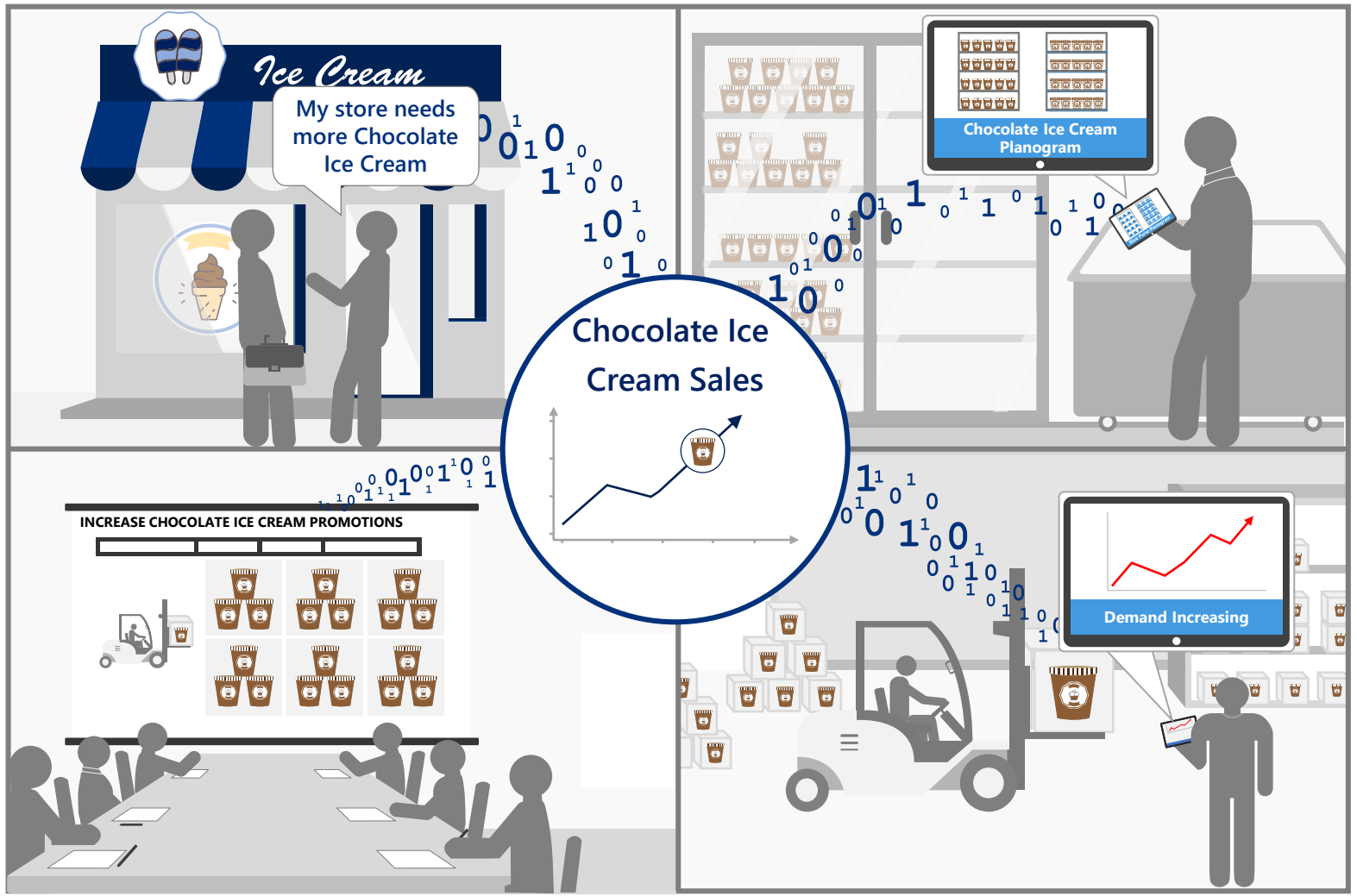




All of these scenarios have the same regression line!

- Tend to not perform well at predicting because they are **too simple**;
- Cannot handle inputs that are highly correlated with each other;
- If several inputs are correlated, their influence in the model is often over-counted, or the coefficient fit is poorly determined, resulting in less accurate forecasts (e.g. – "holiday" and "shared advertisement weeks" tend to occur simultaneously).
- **They are static**. Need to be updated regularly to reflect changing importance/influence of existing known variables, *and as new previously unknown factors appear.*

What to do with the data?



- Communicate **insights** to the front line is crucial
- **Planning** is just the beginning of the **iteration** – field forces have to **execute** and **report back**
- **Data** should not only be a representation, but an **enabler** for **decision** making
- Guided **selling** and Retail Activity **Optimization** require great amounts of **data** to be **effective**.

DATAVENTURES afs technologies

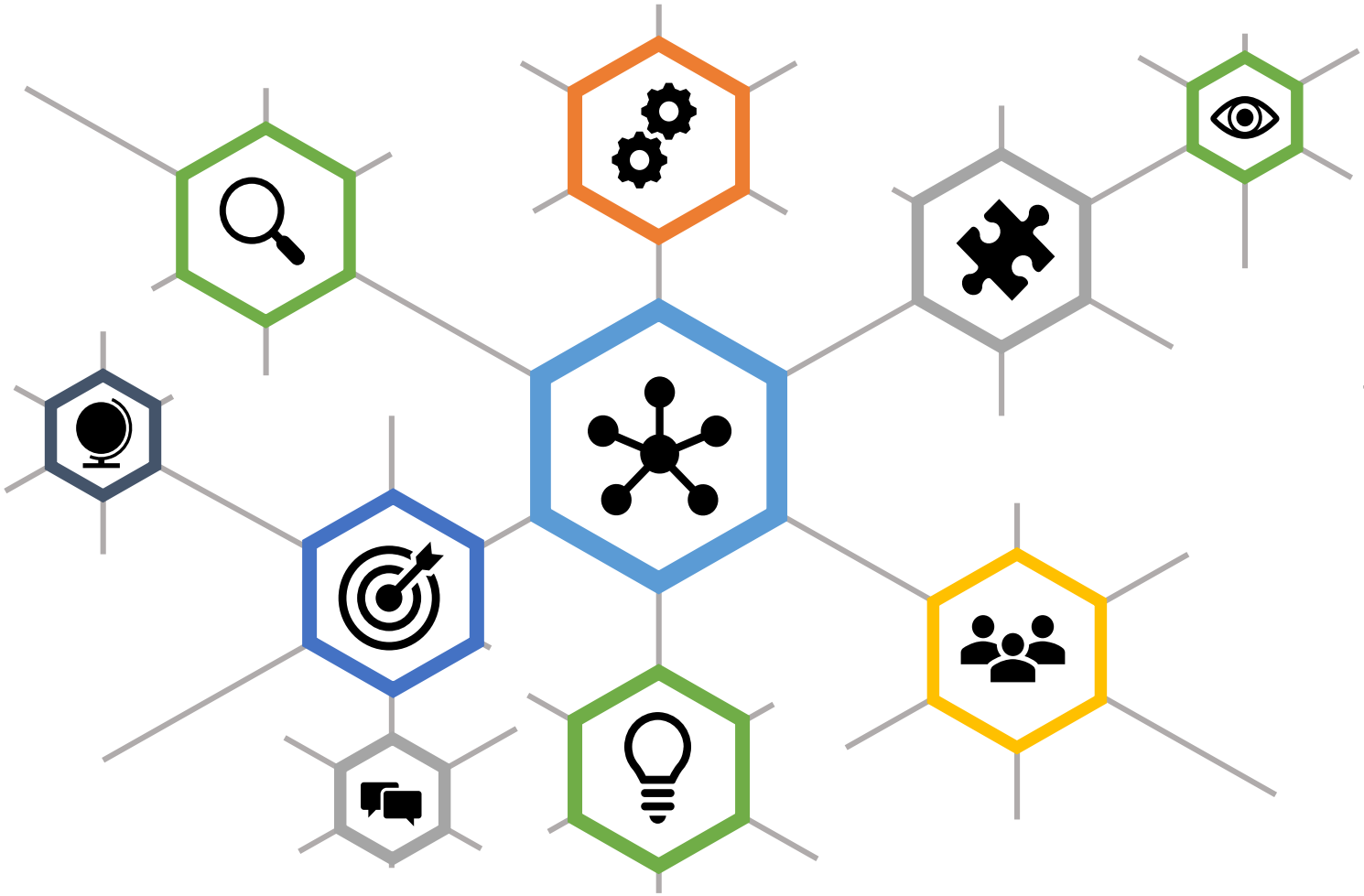
The solution?

DATA VENTURES RESERVOIR PLANNING (DVRP)

&

AFS TECHNOLOGIES RETAIL EXECUTION

Neural Networks

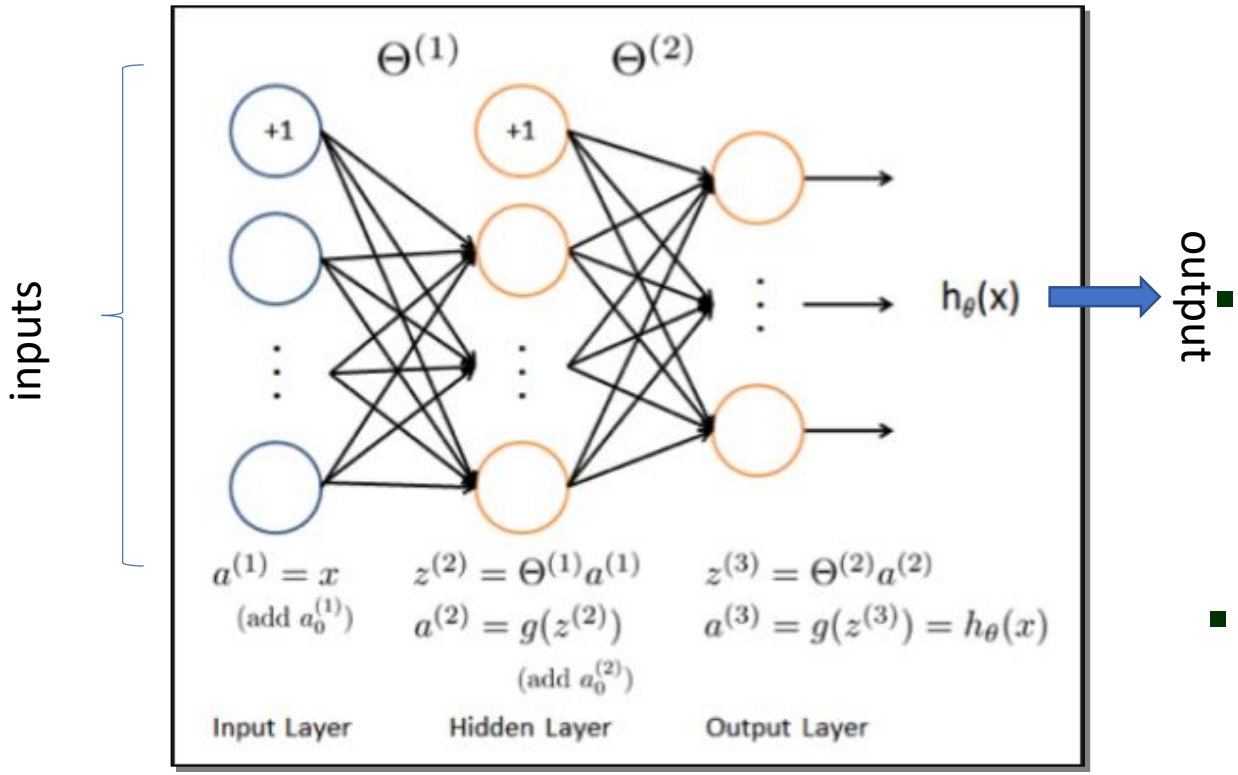


Artificial Neural Networks

- Iterative mathematical processes that select relevant input data from a large available pool of inputs.
- They assign a relative weighting for the selected inputs, which are used to generate forecasts.
- These are more accurate because they can capture non-linear dynamics..

Artificial Neural Networks try to emulate the behavior of Biological ones (e.g. the human brain), optimizing the analysis of data and adapting to the different inputs available.

Data Ventures Reservoir Planning



Recurrent Neural Networks

- DVRP(Data Ventures Reservoir Planning) is a leading-edge technology using Recurring Neural Network (RNN), which is a class of neural network (NN).
- The way that a Neural Network processes data is similar to the way that our brain interprets information – the most recent information is highly weighted.
- Compared to regular Neural Network, the RNN we developed has a context layer, which stores the output of the hidden layer for the previous pattern. It is a form of short-term memory which decays with time.

DATAVENTURES afs technologies

DVRP Architecture

Inputs

01 **SKU Prices at Retailers**
Own products, other SKUS for the Brand
Segregated Information by Chain.

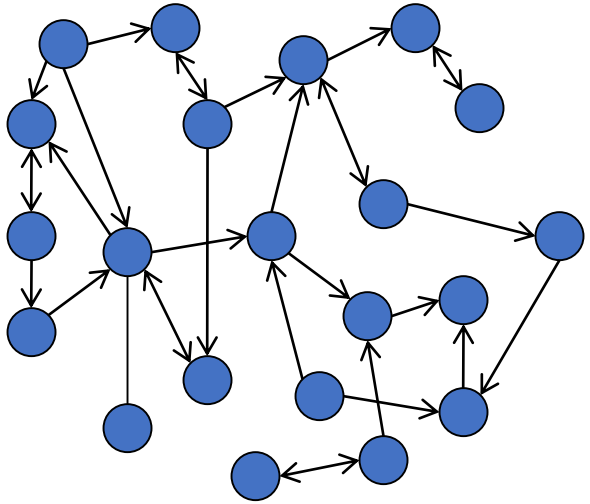
02 **Competitor Prices**
Comparable SKUs pricing (can be grouped by brand as well)
Also segregated by chain

03 **In Store conditions**
Deal structures, locations, agreed upon displays
Time referenced (e.g. per week)

04 **Other variables**
Season, week type (holiday vs. non holiday), partner events
Coupons, additional promo strategies

DVRP

Internal Units



Each Input/Factor is evaluated every week for value in forecast accuracy

Output

Output Units

- Vary by Retailer and by market
- Will change over time based on changing data/ situations

Proof Points

- For a major CPG, proven results: +25 point accuracy improvement using mix of POS and syndicated data
- With 100% Daily POS or T-Log, accuracy is even better

DVRP & CP³ Quick Facts

DATAVENTURES

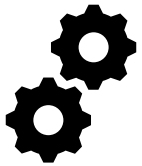
afs technologies

Building Business Processes

How to Leverage the Data?

Planning

Automate your planning processes. Modify your planning reactively and on the spot.



1

2

Execution

Focus on high value and high revenue generation activities. Visit the stores that matter the most. Spend an adequate amount of time.

Reporting

Have consolidated sources of data to review your business. Ensure compliance and consistency

3

4

Adoption

Best practices and empowerment shared across the organization by an adequate usage of the data.

DATAVENTURES

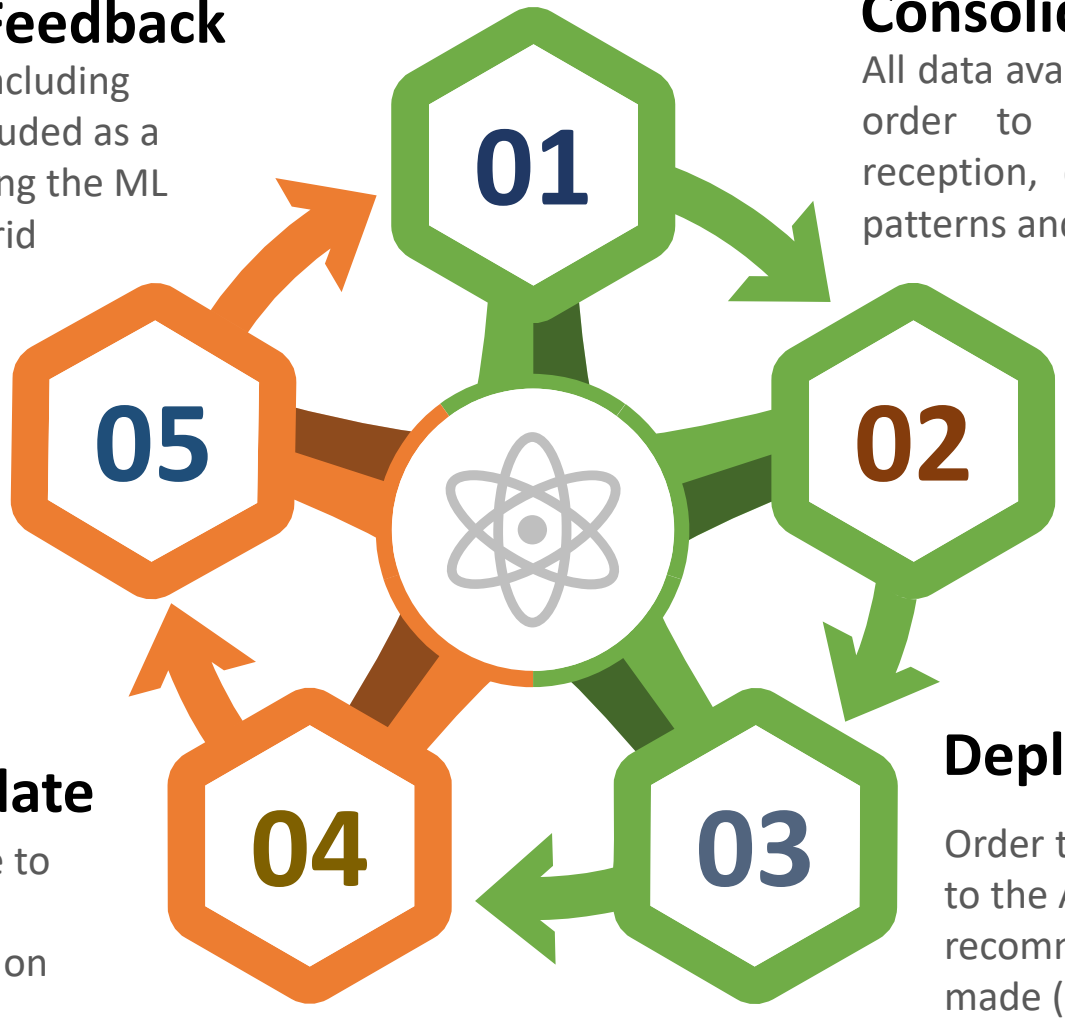
afs technologies

Bringing the data to the field

Predictive Ordering

Feedback

Data captured in the solution (including template modifications) are included as a variable in the analysis, enhancing the ML process done by the Planning Grid



Consolidate

All data available will need to be sent to CP^3 in order to feed the planning grid. After reception, data is normalized into common patterns and put into the analysis matrix.

Analyze

Based on the available data, CP^3 will perform all necessary analysis based on the configured model, locations, time periods and in general all variables defined by the customer.

Deploy

Order templates will be created and sent to the AFS solution with the recommendations based on the analysis made (items, quantities, sequences, etc.)

Execute

Users will receive the templates and place the orders, and any template modifications/additions/ deletions are captured to feedback the planning grid (the template itself won't change until the results are analyzed)

Validate

Business logic is applied on the AFS side to apply listings and restrictions, pricing, availability and any configuration made on the order entry process

DATAVENTURES afs technologies

Bringing the data to the field

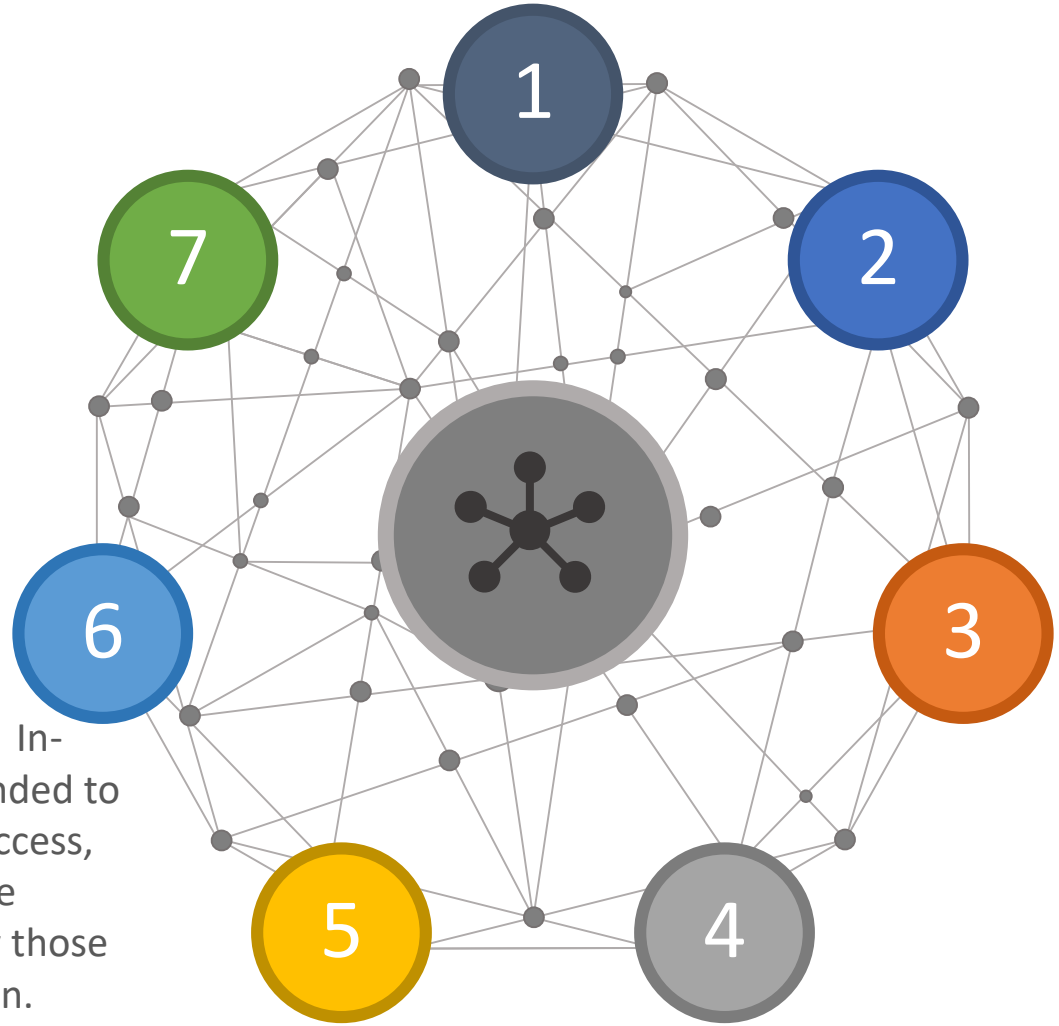
Retail Activity Optimization

Feedback

Users will evaluate the accuracy of the recommendations and indicate back to the planning system (as an additional input) if the recommendation was valuable or if any tweaks are needed.

What to do?

Based on the information available, In-Store activities are triggered and appended to the regular checks on the Picture of Success, as recommendations. Users can provide feedback about the value generated by those recommendations and the actions taken.



Automated Algorithms and data integration

Planning

Variables entered into CP^3 will serve also to determine what points of sale have relevance to be visited and which actions have to be conducted into a certain point of sale. This information is integrated into the AFS Solution.

Where to go?

CP^3 will issue recommendations about the Points of Sale that require a visit, as well as the level of urgency for such visits. Those recommendations are added to the AFS regular plan

Building Business Processes

Next-Gen RE & DSD

Execution Intelligence

Commercial Operations
Order Entry, Product Returns, Invoicing

Product Availability
Distribution, Out of Stocks, Inventory, Consignments

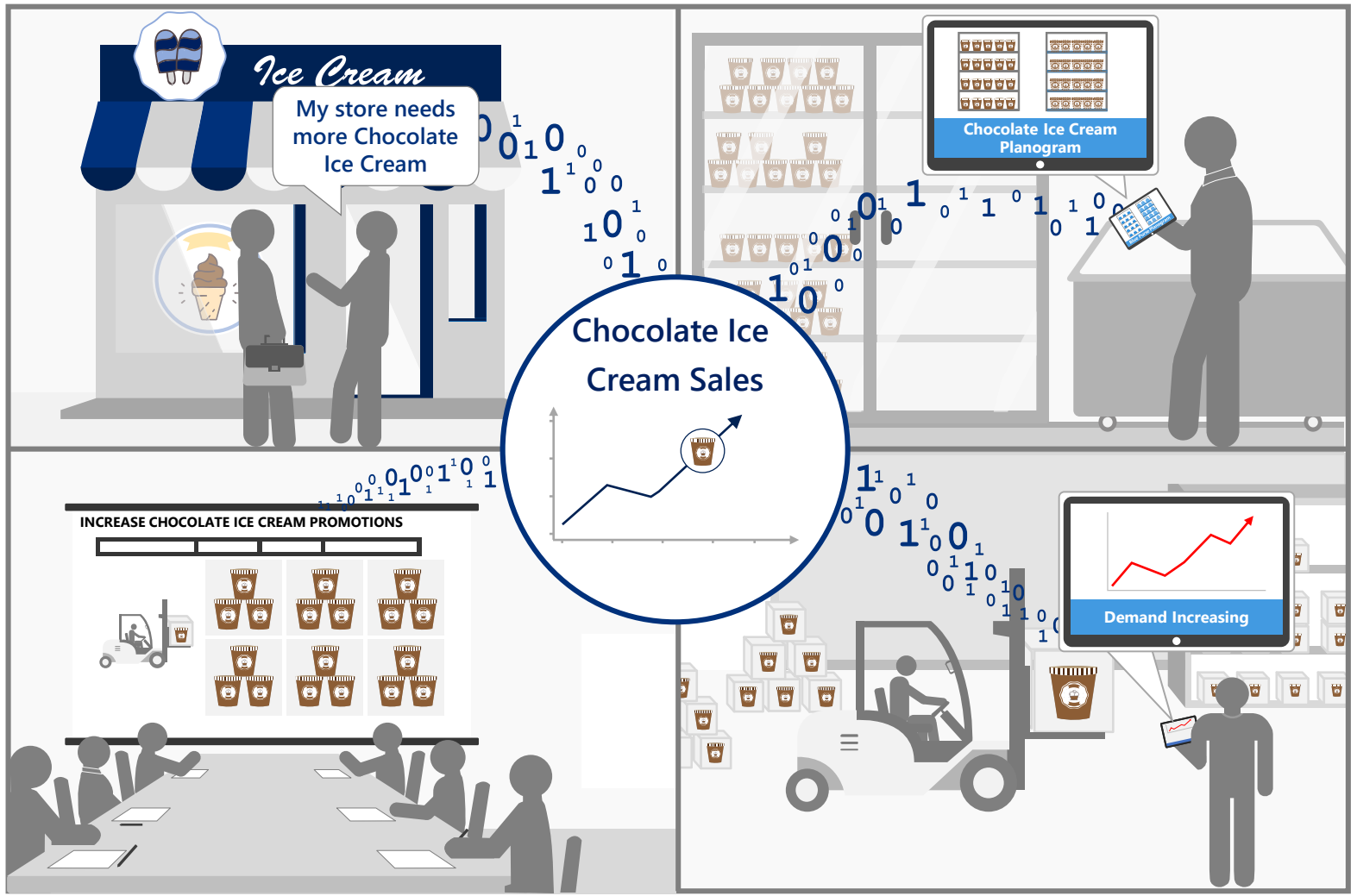
Direct Store Delivery
Van Sales, Inventory Management, Deliveries, Transfers

Time Effectiveness
Route Optimization, Geolocalization, Enhanced Planning

Promotion Compliance
Execution, Price validation, In Store checks

DATAVENTURES afs technologies

Empowering the Front Line with Insights



- Communicate **insights** to the front line is crucial
- **Planning** is just the beginning of the **iteration** – field forces have to **execute** and **report back**
- **Data** should not only be a representation, but an **enabler** for **decision** making
- Guided **selling** and Retail Activity **Optimization** require great amounts of **data** to be **effective**.

DATAVENTURES afs technologies

Any Questions?

afs technologies

DATAVENTURES

For more resources…

Visit

re.afsi.com

www.dataventures.com